National Science Foundation

Twelfth Annual Report for the Fiscal Year Ended June 30, 1962

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LETTER OF TRANSMITTAL

WASHINGTON, D.C.,
January 15, 1963.

MY DEAR MR. PRESIDENT:

I have the honor to transmit herewith the Annual Report for Fiscal Year 1962 of the National Science Foundation for submission to the Congress as required by the National Science Foundation Act of 1950.

Respectfully,

ALAN T. WATERMAN
Director, National Science Foundation.

The Honorable
The President of the United States.

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THE DIRECTOR'S STATEMENT

Science and technology in our time have taken on a new order of magnitude that promises bold new achievements and poses problems of new dimensions. Nations have come to regard scientific and technological achievement as essential not only to national goals but as symbolic of national prestige and the object of international competition. More and more the responsibility for financing and often for operating research and educational enterprises is being assumed by national governments. The scope of today's research and development programs—some of them global and even extraterrestrial—have created extraordinary requirements for both funds and skilled manpower, thus making them the direct concern of government. Science, and especially technology, have become the subject of long-range planning and special management techniques. But the most important new dimension that science has acquired—and the one most fraught with far-reaching social problems—is its potentiality for creating radical or large-scale changes in man's environment.

The period since the war has witnessed in many countries a resurgence of engineering and industrial technology, radical and far-reaching advances in military research, and brilliant discoveries in science itself. These developments have given rise to large national undertakings in engineering and technology such as nuclear energy, nuclear-powered propulsion, ballistic missiles, and space vehicles. Such projects require very large budgets and engage the attention of management and labor in unprecedented ways.

Of one thing we can be certain: the advancement of science is inevitable and its consequences must be faced. Progress would be retarded by a devastating war or by some natural catastrophe, but it is inconceivable that mankind would now deliberately attempt to limit the forward march of science.

The breathtaking acceleration of science and technology is a phenomenon that carries with it a critical need for increasing study and attention, first because of the urgent requirement for planning that it forces and, second, as a social problem of far-reaching significance. Certain problems can already be identified that are of such magnitude, global significance, or involvement in human survival as to preclude confinement within national boundaries. Others will ultimately be forthcoming. Besides, from the scientific viewpoint alone, there are many aspects of modern basic research in which international cooperation and consultation are highly desirable, even essential.

On the planning side, one is necessarily concerned with objectives, feasibility, efficiency, and economy. These points become all important nowadays because of the necessity for overall planning. In private enterprise, in business and commerce, the element of competition has traditionally taken care of the quality of this type of planning. When planning is national in character, one has to compensate somehow for the lack of the corrective influence of this competitive factor. Unfortunately, our experience with program planning has grown far less rapidly than our organizations, so that the sheer task of collecting and analyzing data on which so vast an entity as a modern government can make decisions is one that is still to be solved.

Nevertheless, certain general considerations stand out. Recognizing the overall limitation in national terms with respect to what can be done in science and technology, a study of priorities indicates that a large proportion of the major undertakings stem from military requirements, others from promising and desirable commercial enterprises, still others from national needs apart from defense, such as health, housing, transportation, and communications. As a relatively new factor in modern times, there are increasingly insistent demands for elaborate basic research programs and facilities, such as high-energy nuclear accelerators, radio telescopes, high-altitude observations by balloons and rockets, and studies of the deep crust and upper mantle of the earth. Notable among such ambitious research and development plans are the exploration of space and broad programs such as oceanography and atmospheric sciences. All have varying degrees of justification for other than purely scientific purposes.

Any analysis of this huge and complicated problem should, in principle, start with a consideration of objectives. In an obvious but narrow sense, the objectives are clear, namely, military defense, health and welfare and other national needs, competitive trade, national prestige, and so on. Not so clear an objective is the degree of emphasis and support for novel research and determined probing into the unknown. The extent to which a nation provides for this type of research will depend upon its traditions, its maturity, and the state of its economy.

Closely related to the last point—the exploration of the unknown in science—is the broad objective of cultivating liberal and imaginative thought in science, not only for itself but as a major aspect of the development of human progress and culture. Because basic research in science is closely related to scholarly work in all disciplines and to the arts, it is the mark of a mature nation to allow full play to exploration of the mind in these directions.

Although the desirability and importance of such an ideal is surely understood by thoughtful people everywhere, it appears to be one that is very difficult for a country to adopt as a national objective. In the past, when science was not so closely related to technology, this goal could be pursued by private institutions, scientific and scholarly societies, and similar groups. However, as nations have become increasingly dependent upon science and technology, the outlook has altered radically. For one thing, the central government tends to become the principal source of support. For another, the sheer size of the effort, both in money and in manpower, forces the following courses of action: careful analysis of the specific objectives to be attained; appraisal of their significance, feasibility and cost; and full attention to planning and projections for the future.

The first major limitation to be encountered in the overall planning process is the one of funding, which sets an upper limit on the programs undertaken. Here the simplest solution would appear to be to identify the immediate objectives; to proceed, on the basis of careful studies of practicability, organization and procedures, with a selected series of undertakings;

and finally, to base the support of all scientific and technological activities, including the necessary basic research and allocation of manpower, on these specific objectives. This approach has its appeal from the standpoint of sound management practice and efficiency.

On closer examination, however, it is obvious that this solution is too narrow in conception and far too limited in outlook. It is, in fact, totally inadequate in a world of astonishing advances in knowledge, the development of new ideas, and truly sensational insights into an understanding of man's environment, with still more impressive possibilities in the offing. An age that has already embarked for the first time upon the exploration of outer space, of the depths of the oceans, and of the internal structure of the earth should surely include in its blueprint for the future the pursuit of the fundamental knowledge that such efforts uncover.

Thus our planning should encourage research in areas that are highly significant from the scientific point of view whether or not they appear to have any immediate practical application. Basic research should also contribute to the achievement of foreseeable objectives by providing aid along all lines that science itself finds significant and feasible. As a corollary, our system of education and our economy should, insofar as possible, be adaptable to profound changes with a minimum of dislocation. It is reasonable to suppose that the achievement of such adaptability will be greatly enhanced if education is focused on fundamentals and breadth as opposed to the narrow and specialized.

Financing is an important but by no means ultimate limiting condition. Fundamentally the most important limitation on planning is manpower. A firm upper limit is established at the outset by the proportion of the population that has the ability to enter the profession of science or engineering. The problem for a free society is one of identifying and motivating the fraction of the population who have such aptitudes and of providing for their education and training. In general, motivation depends primarily upon career opportunities. For the most highly gifted individuals, however, motivation may largely be the intellectual challenge of the field.

The support and encouragement of future leaders of scientific thought is not the whole story, however. Modern advances in science and technology require a host of skills for their execution. Provision must be made for the training of scientists and engineers at all levels of ability and for the education and training of persons with other skills to be associated with these large undertakings. Specifically, recent studies in this country indicate that the advancement of science and technology in the next decade requires at the least that the number of scientists and engineers with advanced degrees be doubled. Surveys of the distribution of abilities and current trends among the population indicate that this is entirely feasible. The problem is to provide motivation on the one hand and opportunity for training on the other. The primary requirements are provision for financing in terms of competent teaching, physical facilities, and payment of training costs.

Although planning requires attention to every stage of the education process, accomplishment of this objective, namely, the doubling of the number of scientists and engineers during the next decade, focuses attention upon the colleges and universities and their graduate schools. Essential are construction of adequate teaching and research facilities, provision of instructional and research equipment, and provision for the needed increases in research and teaching staff at institutions of higher education. Finally, and most important of all, at least 40 percent of students specializing in science and engineering should go into academic careers in order to provide research and instruction of the high quality that is required if the overall objective is to be met.

But it is not the rapid growth and complexity of science and technology that should concern us most deeply, nor the uncomfortable magnitude of the research and development effort in money and in manpower. Neither is it so much the extent to which progress in science and technology has captured man's minds and attention, though this comes closer to the point. It is man's new capacity to effect major changes in his environment and in himself. This is what should engage our most serious attention. Although every age has probably felt itself unique, it seems safe to say that ours *is* unique in the sense that man's challenge to nature and his increasing power over his environment have reached critical proportions.

Certain types of scientific and technological activities have existed throughout history. In the beginning, of course, man was chiefly interested in using his new discoveries to improve his subsistence, that is in applying them to crop and animal husbandry, to the construction of dwellings, and to other practical arts. Later, when men began to pursue science for its own sake, the body of new knowledge thus acquired contributed in an important way to technological innovation which has grown at a constantly accelerating rate.

Man has achieved great success in turning the forces of nature to his own use in everything from the simple water wheel to the harnessing of nuclear energy for peaceful purposes. Until recently, however, no technological advance has come even close to promising such sweeping accomplishments as weather modification, unlimited commercial power, artificial food, exploration and colonization of our sister planets, or to threatening drastic and sudden change in our environment, such as extermination by nuclear warfare or by lethal air and water pollution. It is true that failure to observe conservation practices with respect to forests and agriculture has seriously affected local living conditions in various parts of the world; but even here evidence is lacking that such neglect has brought about marked climatic changes (although admittedly it may have had long-range serious effects upon the welfare of the resident population).

Now, however, we find that within a relatively brief space of time a number of technological developments directly influence our environment and that the potentialities for the future—both good and bad—are even greater. One could cite by way of example the small but steady increase in the carbon dioxide content of the atmosphere resulting from fuel consumption; widespread pollution, including radioactive fallout; serious attempts at changing the weather; large scale experimentation with the radiation and other layers surrounding the earth; and suggestions for modification of ancient currents in the oceans. These are only a few of the areas actually subject to study or experiment; one must also take into account future developments that will certainly materialize. One has only to look at the progress in selected current research, such as genetics, molecular biology, experimental psychology, development of modern computers and the far-reaching implications of solid state physics, nuclear physics and chemistry, and plasma physics, to anticipate what some of the potentialities might be.

From the historical point of view, all of this may be regarded as a new stage in the struggle for existence of man and society—the stage where man has far more active and aggressive control over his environment than ever before. One may well raise the question as to whether in his new found freedom he is also giving ample consideration to the potential consequences of his experimentation.

The inescapable conclusion is that we should all be fully aware of the dangers as well as the benefits that may ensue from modern research programs. If every possible precaution is to be taken in dealing with experiments and pilot operations on a global scale, then it would seem indisputable that the careful traditional process of research be observed, so that each forward step in thought or procedure may be properly weighed and tested.

International cooperation is a time-honored tradition of science, and certainly there has never been a time in which such cooperation could be more fruitfully brought to bear on the problems of science than now. The hazards inherent in radioactive fallout, in nuclear explosions above the earth's atmosphere, in air and water pollution, and in the manipulation of weather and climate are problems for the entire world. Therefore, all nations should get together in the effort to determine the extent of the hazards and the types of controls that should be instituted.

Still other opportunities for fruitful cooperation are research areas large in scope and immense in cost—the exploration of space, upper atmosphere studies, meteorology, and oceanography. The efforts of the scientists and engineers of many nations are needed to maximize the accomplishments of projects of this magnitude. In undertakings such as space exploration, where the objectives must be weighed against what the economy can bear, several nations might find it possible to cooperate on projects that no single nation could afford to undertake.

We already have precedent for international cooperation in science in such highly successful ventures as the International Geophysical Year and programs that grew out of it—the Antarctic Program, the Indian Ocean Expedition, the International Year of the Quiet Sun, and research on the upper mantle of the earth's crust.

Much of the strength and success of these programs lies in the fact that they originated among the scientists themselves, growing naturally out of the progress of science and at the same time receiving the necessary support from the governments concerned.

Other striking examples of successful international cooperation in science are to be found in the regulatory and service agencies of the United Nations, such as the World Health Organization, the Food and Agricultural Organization, and the World Meteorological Organization. UNESCO has also played an important role in science, especially among the underdeveloped nations, to the extent of the funds provided by the member nations. Thus we find abundant precedent for successful international cooperation in solving some of the larger problems posed by modern scientific progress.

Necessity still mothers invention. But necessity as a primary motivation is fast disappearing. For a long time in his upward climb man was preoccupied with meeting his creature needs—food, shelter, clothing, protection against his natural enemies. When he acquired first technology and then science, he used the skills and knowledge these afforded to meet these basic needs more easily and efficiently. As he developed more sophisticated societies, the satisfaction of such needs gradually became a part of the social system and no longer required special attention except in case of natural catastrophe such as drought, floods, or epidemics that altered the normal course of things. In recent times man has employed science and technology to improve his material condition, increase his longevity, push back the frontiers of knowledge, and improve the lot of less advanced peoples. The question before him now is not one of further improvement but of innovation on a constantly growing scale. Man asks, both literally and figuratively: What new worlds can I conquer?

Science provides knowledge and we have had abundant evidence that knowledge is power. How are we going to use this power? Are we going to select the most promising opportunities and in single-minded fashion concentrate upon them? We must bear in mind that the more ambitious the program and the more elaborate the effort, the fewer such efforts can we undertake. Or, as a consequence of widespread pressures shall we pay first attention to serious problems of human welfare and existence?

Are we going to continue to exploit nature, including man, for immediate practical objectives, with minimum regard for possible long-range consequences? Will we go on ignoring conservation of natural resources? Is it likely that in the excitement of the chase or in the heat of competition we may fail to recognize certain risks or limitations, unforeseen at the outset? On the other hand, perhaps as the result of some disastrous undertaking, shall we become excessively timid about large-scale innovations or exploration?

We must not lose sight of the fact that the greater the innovation and the larger the effort, the heavier the responsibility for a thorough study of such matters as purpose, motivation, and consequence. Our aim should be not merely knowledge but understanding, and to the extent possible, wisdom. Thus, no matter to what degree we may commit ourselves to large and daring enterprises, we should now more than ever cultivate the basic research and concentrated study in science and other fields of learning that can provide this understanding and set us on the road to wisdom.

One thing is certain. Whatever major objectives or high adventures mankind undertakes, the highest degree of originality and the deepest insight will come from individual minds. Accordingly, not only the progress of science but its meaning and future promise are best fulfilled by ensuring the right and the opportunity for individuals to pursue research of their own choosing.

ALAN T. WATERMAN,
Director, National Science Foundation.

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Program Activities

of the

National Science Foundation

SUPPORT OF SCIENTIFIC RESEARCH

The National Science Foundation provides support for basic research across the full spectrum of the physical, life, and social sciences, primarily through grants to colleges and universities. Such grants are made not only for specific research projects, but also for problems broad in scope that often require collaboration of investigators in varied disciplines.

In addition to grants for the actual conduct of research, the Foundation also provides assistance for the construction of facilities essential to the progress of the national research effort. These include graduate research laboratories, major items of research equipment, and specialized scientific facilities, such as oceanographic vessels and nuclear accelerators.

Three national research centers have also been established by the Foundation—National Radio Astronomy Observatory at Green Bank, West Virginia; Kitt Peak National Observatory at Tucson, Arizona; and the National Center for Atmospheric Research at Boulder, Colorado. Their facilities are available to all qualified scientists, and are operated by non-profit corporations under contracts with the Foundation.

The Foundation has also been assigned the responsibility for the support and administration of a number of national research programs which involve the cooperation and participation of scientists of colleges and universities, other private institutions, and various Government agencies. These projects include the U.S. Antarctic Research Program, Project Mohole, the Indian Ocean Expedition, and the Weather Modification Program.

The Foundation's support of research is administered by the Division of Mathematical, Physical, and Engineering Sciences, the Division of Biological and Medical Sciences, the Division of Social Sciences, the Office of Antarctic Programs, and the Office of Institutional Programs.

Basic Research Projects

CURRENT RESEARCH IN THE MATHEMATICAL, PHYSICAL, AND ENGINEERING SCIENCES

The mathematical, physical, and engineering sciences are concerned with man's physical environment and encompass a wide variety of disciplines. Support is provided for research ranging from studies of distant galaxies to the rocks within the earth's crust, from the movement of air masses to that of ocean currents, from subnuclear particles to the particles in the ionosphere that cause the aurora borealis, and from the complex equation of turbulent flow to the mechanisms of chemical reaction. Knowledge gained in one field often finds application in other fields, with mathematics providing the basic language common to all fields. Facilities and research tools needed vary considerably from pencil and paper to oceanographic vessels to high energy accelerators to giant radio telescopes.

Because of the broad spectrum of subject matter covered, the Division of Mathematical, Physical, and Engineering Sciences is organized along traditional disciplinary lines paralleling the departmental organization of the universities where the research is accomplished. The Division, therefore, has six programs—Astronomy, Atmospheric Sciences, Chemistry, Earth Sciences, and Physics—and one section, Engineering Sciences, under which are a number of separate programs.

In addition, the Division is responsible for a number of national programs—Project Mohole for drilling under water through the crust of the earth into the mantle, Weather Modification, and for the physical science aspects of the International Indian Ocean Expedition. It is also responsible for three national research centers, managed for the Foundation by university corporations—Kitt Peak National Observatory, National Radio Astronomy Observatory, and the National Center for Atmospheric Research.

Astronomy

The astronomy program supports research dealing with all types of celestial phenomena—the solar system, stars, comets, galaxies, interstellar gas and dust, etc. Progress in this field has become ever more rapid because of the development, in recent years, of radio telescopes, the use of high-altitude balloons and space vehicles for observation, and the development of electronic-image intensification which increases manyfold the efficiency of existing optical instruments. Automation techniques are being used increasingly in both optical and radio astronomy making data collection much faster and easier. The establishment of two national observatories by the Foundation has made available essential facilities to the nation's astronomers which were beyond the financial capacity of any one university.

The newly developing field of neutrino astronomy which owes its existence to developments in nuclear physics is one that should have considerable impact on our understanding of the important role played by the exclusive neutrino, the least of all nuclear particles (without mass and without charge), in the evolution of stars and especially supernovae. Neutrinos are created in the nuclear fires that generate the energy inside stars, travel with the speed of light, and have a mean free path many times the size of the entire universe. Neutrinos are byproducts of thermonuclear reactions in stars, such as the well-known proton-proton reaction and the carbon cycle which both form helium out of hydrogen by fusion.

Although the neutrinos thus produced pass through the star without interference, they carry away only a small percentage of the energy (3 to 7 percent). But if the neutrino flux of a star, e.g., our own sun, could be detected, their energies and numbers would provide a direct verification of the reactions in the solar nuclear furnace. Detecting neutrinos is extremely difficult, because of the very slight interaction with matter. However, equipment for observational neutrino astronomy is under design by several investigators who plan to measure the sun's flux and the neutrino flux from supernovae.

An entirely new neutrino mechanism (electron-positron annihilation) occurs in the very hottest stars where the central temperature is 600 million degrees Kelvin or more. In these stars the neutrino process dominates all other modes of energy loss, and it provides a radically different view of how a star becomes a supernova. This means that such an extreme star can lose all its energy through neutrino emission in a few days, and that is about as good a description as can be given of a supernova.

Briefly, the new theory of supernovae has the following aspects. With the central energy radiated away so drastically, the star has to contract very fast. This quickly heats the central regions as well as the outer layers and in a short time all the nuclear fuel in the star is ignited, causing an explosion like a huge hydrogen bomb of stellar dimensions. At the same time a shock wave, produced at the center accelerates outwards. When this shock wave collides with the surface of the star the whole menagerie of elementary particles can be produced. Most of them soon decay into protons, electrons, and neutrinos with energies of 10–20 billion electron volts. This may be the mechanism for the creation of cosmic rays which later are accelerated again by collisions with interstellar magnetic fields. Even in the present state of detector technology, the neutrino flux of a galactic supernova can be detected.

Atmospheric Sciences

The atmosphere is a thermally active hydrodynamic system, compressible, non-homogeneous, viscous, and constantly in motion in nonlinear response to a complex of internal and cosmic forces. It interacts with the earth and ocean at its lower boundary and with the solar atmosphere at its outermost reaches. It is driven by sources and sinks of thermal energy which are caused by the variable reaction of the atmosphere to the sun's radiant energy, the latent heat involved in phase changes of water substance, the photochemical processes at upper levels of the atmosphere, and the transfer of heat to and from the underlying earth and ocean. An understanding of this exceedingly complex system is the goal of the Atmospheric Sciences program. Such understanding will surely assist in placing weather forecasting on a firmer scientific basis and may eventually provide man with the ability to control the weather.

Photochemical and electrical phenomena are being measured by Foundation grantees; the energy processes that influence the behavior of the atmosphere at the upper levels are being described; and light is being shed on the manner in which the upper atmosphere links solar activity with terrestrial phenomena. The ability to observe atmospheric changes from meteorological satellites is being rapidly exploited; also measurements employing indirect probes and isotope tracer techniques are demonstrating their effectiveness. For the first time, an adequate description of the atmosphere by physically significant measurements is within our grasp. Such quantitative measurements are contributing greatly to the rapid developments in theory and understanding of the phenomena observed. Two examples may be cited:

First, the brilliant work in closing the gap between the theory of fluid motions and the reality of nature as revealed in the synoptic representation of large-scale atmospheric motion systems. The successful blending of mathematical and physical insight, the power of the high-speed computer, and the ability to simulate atmospheric movement in rotating hydrodynamic tanks are contributing greatly to the determination of a valid explanation of the general circulation of the atmosphere.

Second, progress toward a physical explanation of condensation and precipitation phenomena. The physics of the condensation process, by which the phase transition from vapor to liquid or solid, in the presence of nuclei, now appears to be amenable to solution. The principal processes by which millions of cloud droplets come together to form precipitating elements are being treated quantitatively and the dynamics of cloud and the role of electrical field have been brought under serious study. Much remains to be done, but the rate of scientific progress following the classical work in modifying natural clouds has clearly demonstrated that important advances can result from an augmented effort in the field of cloud physics.

One of the key factors limiting expansion of research in the atmospheric sciences is the lack of sufficient numbers of trained investigators. Because research in the atmospheric sciences requires an interdisciplinary approach, not only are meteorologists needed but also chemists, physicists, mathematicians, and engineers. The Foundation, through its many support programs, is assisting in the augmentation of the needed manpower by providing new opportunities for attracting and training able and creative young scientists in this field.

The Weather Modification program is managed as an integral part of the Atmospheric Sciences program (see page 52). The National Center for Atmospheric Research, also supported through this program, is described on page 56.

Chemistry

Chemistry support is extended largely to research in organic chemistry, physical chemistry, inorganic chemistry, and analytical chemistry. Research in theoretical inorganic chemistry continues to grow, especially in coordination chemistry dealing with chelated metal ions because of their increasing importance in biology and medicine and for industrial applications; also in boron chemistry because of the possible value of boron for synthetic fuels and thermally stable inorganic polymers.

Unfortunately interest in inorganic chemistry, particularly synthetic inorganic chemistry, appears to be declining in this country. Because of the vital importance of research in this area, the Foundation with the advice of the scientific community established an ad hoc Committee on Inorganic Chemistry. As a result of their recommendation, a summer institute was held, as part of the Foundation's education program, this past summer for college teachers and undergraduates. An exchange program is being planned which will permit prominent European synthetic inorganic chemists to spend a year or two in academic institutions in this country teaching and conducting research and which also will permit prominent American physical inorganic chemists to do the same thing in European institutions. NSF is also providing increased support for inorganic chemistry. A Foundation-supported grantee prepared a number of hexacoordinated silicon compounds and from one of them a thermally stable phthalocyaninosiloxane polymer. This polymer exhibits exceptional stability and may find application as a high-temperature resistant material because the silicon-oxygen bridges are shielded within the center of the molecule.

In organic chemistry, more than half of the grants were for physical organic research—a concentration that has been aided by the availability of modern instrumentation. The projects include studies on the mechanisms, kinetics, and equilibria of reactions. Others were for synthetic studies and investigations of new chemistry and new reactions; synthesis and structure determination of natural products; and stereochemical and conformational analysis studies. Of particular interest was the synthesis for the first time of dilithium pentalenide, the first derivative of the pentalenyl dianion. This work may pave the way to pentalene itself, a bicyclic unsaturated compound that is of considerable theoretical interest.

Research in analytical chemistry continues to place major emphasis on the use of instrumental methods and a physical chemical approach to the solution of research problems. Radiography and chromatography are the areas of greatest current interest. Successful separation of inorganic substances, especially metals, has been achieved through extension of the gas-liquid chromatographic process. A Foundation grantee has accomplished a quantitative separation of volatile chlorides of tin and titanium. If it proves to have general applicability, this technique may be of tremendous assistance in the solution of such difficult problems as the separation of the rare earth metals.

In physical chemistry, there was increased support for radiofrequency and microwave spectroscopy, statistical and quantum mechanics, and catalysis and adsorption. Continuing support has been provided for research in the areas of thermodynamics, thermochemistry, reaction kinetics, colloid chemistry, optical spectroscopy, photochemistry, polymer chemistry, and crystal structure.

Earth Sciences

The Earth Sciences program supports basic research in geology, geochemistry, geophysics, and oceanography, as well as in such related fields as hydrology and soil science. In the solid earth sciences (geology, geochemistry, and geophysics) much of the support went into geochemical studies, particularly isotope research that was focused on geological problems. Increased interest was evident in geophysics, especially paleomagnetism and heat flow. Emphasis on the marine sciences was continued with increased support for physical oceanography, marine geology, chemical oceanography, and submarine geophysics.

In geochemistry the use of potassium-argon isotopes to date prehistoric man showed that man as a tool maker was 1,750,000 years old, almost twice as old as previously believed. In another geochemical study, samples from Gatun Lake (Panama Canal Zone) dated by radiocarbon yielded results suggesting a rapid rise in sea level in the period from 11,000 to 7,000 years before the present, followed by a much slower rise since then. These data are consistent with the evidence compiled in the temperate zones about the melting of the ice of the last great glaciation 11,400 years ago.

Research on tektites, which have become objects of more extensive study with the advent of the Space Age, was continued to determine whether these glassy bodies originated on the earth or came from outer space. Recent work has shown or confirmed the following: (1) Tektites are not fragments of larger pieces, but are essentially the same size and shape as when they were formed. (2) The mineral composition, magnetic properties, and low water content all indicate high temperatures of formation. (3) Strain patterns are similar to those found in other small bodies that are known to have cooled quickly from a molten state. (4) The similarity of tektites in any one area suggests that each particular group is related to an individual tektite shower that might have resulted from sudden impact of a meteorite or other body. (5) Laboratory analyses of Al^{26}, produced by exposure to cosmic radiation, showed that tektites contain about as much of this element as do other terrestrial materials. The low exposure of tektites to cosmic radiation is thus consistent with a terrestrial mode of origin, but does not rule out completely an extraterrestrial origin.

Geologic research involved a wide variety of studies including mineral research, physical and biostratigraphic studies of sedimentary rocks, studies of pollen, petrographic research, studies of glacial ice structures, and paleoclimatic and paleontological research. Based on mineralographic and X-ray study, one grantee has investigated the little known and very complex, manganese ore minerals. In yet another study, paleobotanical data show that the Sierra Nevada came into existence as a major topographic barrier at the end of Pliocene time. Miocene floras of deciduous hardwood species, collected from rocks that are today between 5,000 and 9,000 feet high, resemble modern forests in areas where relief is generally less than 2,000 feet. Therefore, most of the summit areas must have been relatively low in Miocene time. Paleoclimatic data is also consistent with this interpretation.

In oceanographic research a grantee has discovered that the "tongue" or radula of certain mollusks have "teeth" composed of magnetite, a magnetic oxide of iron, and that the radula of some snails have "teeth" of goethite, a hydrated iron oxide. These discoveries illustrate the complex nature of oceanographic studies and open up new avenues of research. There is, for example, a biochemical problem of how iron, a trace element in sea water, can be metabolized and concentrated within the organisms so as to be precipitated in concentrations up to 65 percent iron oxide. There is also the geochemical problem of the fate of these skeletal minerals after death of the organism and the problem of stability of goethite which is not generally found in marine sediments and of the instability of magnetite, usually considered to be resistant to natural chemical dissolution processes.

Notable also in oceanographic research was a Great Lakes study in which drilling operations from a floating barge penetrated hundreds of feet of sediments and showed bedrock valleys to be present more than 1,000 feet below sea level.

Engineering

During the year the status of the engineering sciences was strengthened by the establishment of the Engineering Section which supersedes and absorbs the Engineering Sciences program. Within the Section there are now programs in engineering chemistry, energetics, mechanics, materials, and systems.

Also, the National Science Foundation has adopted a policy which clarifies the engineering research supportable by the Foundation by indicating that intellectual pursuits at educational institutions intended to advance significantly the basic engineering capabilities of the country are eligible for support by the National Science Foundation as basic research in the engineering sciences. Such work must be of a true scientific nature and not routine engineering practice, and must meet the usual NSF standards of originality and excellence.

This action recognizes that, in addition to the basic engineering science research in the classical disciplines stemming from the physical sciences, meritorious research along the following lines has been and will continue to be important: the development of principles and techniques in systems engineering design, the development of principles and a philosophy for creative engineering, interdisciplinary research such as biomedical engineering, the principles of generation and control of energy systems and information systems, and the analysis and synthesis of processes and systems which contribute to the mastery of the environment.

A variety of engineering research has been supported by the Foundation. There is a noticeable growth trend in the broad area of plasma dynamics. Several projects have been motivated by the interest in space research. In many cases, the results of a particular basic research study may have future application in space activities as well as in other situations. For example, research on combustion, two-phase flow, heat transfer, materials, structural mechanics, and control systems could have space implications. One NSF-supported study of the effect of low-gravity environment upon fluid configuration in containers has indicated that short-duration experiments under low-gravity free-fall conditions may lead to false conclusions. Short-duration, low-gravity experiments show, for example, that the air in a container partially filled with water takes the form of a bubble in the center of the container. A theoretical analysis (later partially confirmed during a space flight) indicates that this condition will not prevail for a long-term experiment, and the air would again be in contact with the wall. However, the liquid configuration may be quite different from what would be expected under normal conditions. The results of this research could help lead the way to improved design of liquid-containing systems for use in space vehicles.

A significant advance over previous methods in chemical process control engineering has resulted from research conducted during the past year under an NSF grant. These researchers have developed a system for the control of a continuous chemical reaction which self-adjusts so that optimization of cost or yield of product may be achieved directly and continuously. Analysis of the response of the product yield to a small periodic change in a process variable, such as temperature or flow rate, provides the basis for automatic adjustment of the variable in such manner that the process operates at maximum yield or minimum cost. It is feasible to apply the control system to a catalytic reaction where catalyst activity is changing in an unknown manner. So far the system of control has been applied only to a simple chemical reaction.

Mathematical Sciences

Research in mathematics is extremely diversified, varying from abstract symbolic logic to quite concrete applied mathematics. New fields evolve continuously, and the old classifications become blurred by the emergence of such hybrid subjects of study as algebraic geometry, differential algebra, algebraic topology, topological dynamics, and differential topology. Even describing the subject matter of these varied disciplines is difficult because of the relative unintelligibility of most of modern mathematics to scientists well informed in other fields, yet all the physical sciences, and increasingly the biological and social sciences as well, are dependent on mathematics. Solutions to many of the problems which arise require some of the most advanced mathematical techniques presently available.

Among the significant results of Foundation-supported research this year are two cases of verification of conjectures that had been outstanding for many years. At a time of intense activity, new problems are followed by their solutions with great rapidity, and it is sometimes hard to gauge the difficulty of results, because results often appear deceptively simple in hindsight. It is therefore particularly heartening to see old problems that have tried the talents of generations of mathematicians yielding along with newer ones before the current concerted effort.

In the field of algebra, group theory has assumed a central role, and it has accordingly been the subject of a great deal of research over the years. Yet some of the most refractory problems are still to be found in the theory of finite groups, where, as in number theory, it is easy to make plausible conjectures that are very difficult to prove. One such conjecture, that all groups of odd order are solvable was confirmed this year.

In the field of topology, successful inroads have been made upon another famous conjecture. Around the turn of the century the great French mathematician, Henri Poincaré, observed that every closed, simply connected, two-dimensional manifold is a two-sphere, i.e., the surface of a three-dimensional ball, or something which can be obtained from it by stretching and shrinking without tearing or cutting. He was guided by a remarkably fine geometric intuition to conjecture that the analogous result holds true in the next higher dimension. More daring moderns have conjectured that analogous results hold true in all higher dimensions. The former is the original Poincaré conjecture; the latter, the generalized Poincaré conjecture. Strangely enough, the original conjecture still resists proof, as does the next higher case, but this year two independent proofs have been given for all dimensions thereafter. Together these two breakthroughs have set the stage for much further progress in differential topology.

Physics

At present, physicists are concentrating primarily on research into the properties of the solid state, of elementary particles, of nuclear structure, and of atoms and molecules. Consequently, most of the Foundation support for physics is provided in these subdisciplines.

With the availability of increased funds for physics research in the past year, university physicists have begun more and more to look to the Foundation for assistance. Support of solid state physics has shown a particularly large rate of expansion. In addition, the Foundation established a program of support for nuclear research facilities, and also was able to approve a number of grants of sufficient size to constitute the principal support for major research groups. Such support is exceptionally expensive considering that the overall cost of conducting a single significant experiment in high energy physics is roughly estimated at $250,000.

The major accomplishments in physics during the past twelve months have largely consisted of discoveries in elementary particles. Our Nation's considerable investment in multi-BeV accelerators has contributed greatly to advances in this branch of physics; both the number of known particles and our knowledge of their interactions have increased to a marked degree in recent months. The most exciting discovery, perhaps, was that of two distinct kinds of neutrinos, one associated with electron interactions, and the other with muon interactions. It seems to be a major step toward understanding how the muon and electron can appear to be identical even though the muon is 200 times heavier.

While NSF has not supported high energy accelerator laboratories directly, the "users" program provides an appreciable and rapidly growing measure of support for elementary particle physics. This program consists of making grants in support of university physicists who cooperate in conducting experiments at large accelerator laboratories, and who later carry out analysis and interpretation of resulting data at their home institutions. Through this program, NSF sponsorship has played a role in recent important developments of elementary particle physics. An example is the work of a group that analyzed the interactions of positive pions with deuterium, and became among the first to discover a new particle, the Eta meson, and to confirm the existence of the Omega meson.

Notable work was done during the past year in low temperature physics, particularly in work on the physical properties of liquid helium (at temperatures 2.2° above absolute zero). It has been known for some time that two types of waves can propagate through a liquid of this nature, which is described as being made up of two interpenetrating components—one a normal fluid, the other a superfluid without viscosity. A pressure wave, known as "first sound", propagates by oscillating the two fluid components in phase with one another. A thermal wave propagation, known as "second sound", involves out-of-phase oscillation. Several years ago a grantee predicted the existence of another form of wave disturbance in films of liquid helium. Termed "third sound", it would be one in which the superfluid component oscillates while the interpenetrating normal component remains fixed. Within the past year this investigator has demonstrated the existence of "third sound", and has measured its velocity as a function of the film thickness. It may be noted that this work presents one of those gratifying but infrequent cases where an investigator has carried out experimental confirmation of his own theoretical conceptions.

In atomic and molecular physics, one of the advances reported may supply the basis by which space scientists may determine the quantity of hydrogen in the atmosphere of the various planets of the solar system. Through the use of precision infrared spectroscopy, an important new band (the "forbidden" 1–0 band) has been observed. It is ten times brighter than had been predicted. The intensity of the band is proportional to the amount of hydrogen between the source and the observer.

CURRENT RESEARCH IN THE BIOLOGICAL AND MEDICAL SCIENCES

Developments in the biological and medical sciences over the past several years have moved with such rapidity and been of such major importance as to constitute a revolution. The emphasis in the biological field has shifted markedly from studies of the whole organism to investigations at the cellular and subcellular levels. The chemical and physical aspects of life processes have become much more clearly understood, in part through the application of outstanding technological advances, such as those made possible by the electron microscope, for example, and important breakthroughs in our knowledge of the hereditary processes. Much fuller understanding of the nature of life itself is now foreseeable, and the implications of this progress in terms of man's welfare are great.

The impact of this revolution on biology as a whole is profound, also. The biochemical and biophysical discoveries in biology at the molecular level, the startling advances in knowledge of gene-chromosome relationships, and the use of computer techniques have enriched the whole discipline. It is significant that the biological scientist today, whether he is working with the intricacies of the life processes going on within a single cell or with the whole organism or a community of organisms, is calling more and more for an interdisciplinary attack on his problems.

In performing its primary task of supporting basic research in the biological and medical sciences, the Division of Biological and Medical Sciences is organized on a functional basis which covers the total spectrum ranging from classical biology to the most modern experimental problems. The Division covers this spectrum under the following eight programs: Molecular Biology, Genetic Biology, Developmental Biology, Metabolic Biology, Regulatory Biology, Environmental Biology, Psychobiology, and Systematic Biology.

Support is provided primarily for research on an individual project basis, but occasionally, where feasible, it has been extended to cover broader coherent areas of research activity of several outstanding scientists. Such grants have been made, for example, in support of research programs in molecular genetics, somatic cell genetics, and evolution. Foundation assistance is also provided for specialized biological facilities, such as oceanographic research vessels, field stations, controlled environment installations, natural history museums, as well as for the acquisition of complex equipment needed for modern research.

Encouragement is also given to the development of research programs in neglected biological areas or in those showing particular promise. An example is tropical biology, which is at the same time both a neglected field and one of special promise. The Foundation is encouraging a noticeable upturn of interest in the New World tropics on the part of biologists in a number of American institutions.

Molecular Biology

The Molecular Biology program is concerned with investigation of biological systems at the molecular level. This involves the isolation, determination of structure, and the study of the reactivity of the compounds which make up such systems. It deals with research into the manner of organization of these molecules into the more complex aggregates which are the basis of biological structures; also with the dynamic aspects of the interactions between molecules which permit biological systems to persist in the face of their inherent instability, to reproduce themselves, and to maintain the same structure over many generations while concomitantly evolving into new forms over longer periods of time.

Molecular biology is concerned primarily with providing the means for the solution of biological problems rather than the solutions themselves. It is interdisciplinary in nature, not only within the biological sciences but also between the biological and physical sciences. It provides the meeting ground where the new approaches and techniques of chemistry, physics, and mathematics are applied to biological research.

Molecular biology has achieved some of its objectives, e.g., the delineation of the major aspects of structure of such biological macromolecules as DNA and protein, thereby contributing to the significant recent advances in understanding genetics and protein synthesis. Nevertheless, these advances have served only to emphasize the need for more detailed understanding of these molecular components. Consequently, the general areas of research support continue to be much like those making up the program in the past.

Certain research deals with the isolation and characterization of proteins, lipids, carbohydrates, nucleic acids, and with the investigation of some new types of compounds. One investigator has been developing information about the sulfolipids, which appear to play an important role in the structure of biological membranes. Another research effort is directed toward improving methods for investigating the precise sequence of bases in nucleic acid structures.

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A second area of research deals with the nature of interactions between molecules of the same kind or between molecules of different kinds. Biological structures are aggregates of molecules, whose association must be directed by quite specific types of interactions at a molecular and electronic level. Other highly specific reactions are involved in the action of hormones, enzymes, or antigen-antibody reactions. One investigator has developed a new reagent for investigating the active site of trypsin, a protein-digesting enzyme. Another has been able to separate an antibody molecule into component subunits and then recombine them to obtain active antibody again.

A third major category of grants supports studies of subcellular structures. Attempts are being made to understand the molecular organization of such complex cellular structures as membranes, mitochondria, microsomes and ribosomes, lysosomes, walls, and muscle fibrils. One example, also related to functional behavior, would be studies of mitochondria and the chemical factors which influence the contraction of the mitochondrial membrane. Other studies are concerned with the optical properties of muscle and still others with refinement of techniques of electron microscopy.

A fourth broad area relates to the interactions of living systems with energy. These range from studies of the basic biophysical process of photosynthesis to studies of the mechanisms of specific and active transport of molecules and ions through membranes. Answers are being sought in part by the study of biological systems and in part by the study of appropriate chemical systems. Some current studies deal with visual pigments, their modification by light, and attempts to relate these processes to the generation of the nerve impulse. At another extreme, an investigator has obtained evidence that the transport of sugar and of sodium across the intestinal membrane may be linked processes.

The investigation of biological problems at the molecular level has depended upon the application of new and more powerful methodology and instrumentation. Support of further developments in polarization microscopy, the perfection of a magnetically suspended ultracentrifuge rotor, the use of lasers in photoreactive processes, and the application of temperature-jump methods to very rapid biological reactions are all in keeping with this effort to maintain a rapid advance in the application of new technologies to biological problems.

Genetic Biology

The Genetic Biology program supports a variety of research projects, including preliminary and general investigations, studies of the nature and action of the genetic material, research in quantitative and mathematical genetics, and evolutionary studies.

The preliminary and general studies are concerned with establishing the existence of a genetic basis for observed variation, finding new hereditary traits, and the location of genes on the chromosomes.

Investigations of the transmission, chemical nature, and action of the genetic material comprise a large segment of the research now supported by the genetics program. A major breakthrough has resulted in the determination of the genetic code for certain amino acids (protein building blocks). Long strides have been made in studies on the details of gene-enzyme relations and the mechanisms of information transfer in micro-organisms. The techniques involved in answering the many unsolved problems in these areas are becoming clearer and the program is making great efforts to support this area while maintaining a balance in its support for all areas of genetic biology.

The extension of the detailed analysis of mutant protein structure to higher organisms and the correlation of these with specific changes in the hereditary material are important recent developments.

The course of genetic biology is also being profoundly influenced by investigations on the way in which certain elements within the genetic material function as regulators of the activity of "structural genes." A synthesis of knowledge is taking place concerning seemingly diverse phenomena in bacteria, higher plants, and insects which have in common controlled changes in gene activity. In addition, detailed morphological and biochemical studies of development in different genetic types are continuing. There appears a reasonable hope that these diverse approaches will lead to a new and highly fruitful attack on one of the most important problems in modern biology—differentiation.

Investigations of the nature of the hereditary material itself are being integrated in many cases with studies of gene-protein relationships and "regulatory" genetic elements. However, studies of genetic fine structure by means of rare recombinational events and investigations of the mechanisms underlying irradiation and chemical mutagenesis are continuing on a wide variety of organisms.

Studies on quantitative genetics and studies of continuous variation are still an important part of the program. These studies involve inbreeding, outcrossing, and selection. Mathematical theory and statistical methods relate to quantitative genetics; some studies require applications of electronic computers.

Projects on the genetic basis of evolutionary phenomena provide the remaining grants made in this program. Such studies are concerned with genetic differences between species and natural populations and include investigations of chromosome and gene variation, reproductive isolation, and hybridization. Grants in this area support studies on a wide variety of animals and plants—protozoans, marine invertebrates, insects, fishes and amphibians, a few lower plants, and numerous seed plants.

Metabolic Biology

Investigators supported through this program study the biochemical reactions by which the substance of living organisms is built up and broken down. Generally speaking, they observe the activities of enzymes and the changes which these organic catalysts bring about in the biochemical materials on which they act. Typical of the problems they are interested in: What happens to such a material, and what are the effects on the host organism of the new substance produced from it? What brings about an increase or decrease in the amount of a particular enzyme or the rate of its activity? Where in the cell do these changes take place?

Of continuing importance are complete determination of the sequences of enzyme action which lead to a given end product and show how a given biochemical is used in the living cell. For example, although it has long been known that sulfur and nitrogen are metabolized by certain bacteria, the enzymes involved and the intermediates formed in the process are only being determined now.

An integral part of metabolic processes is the conversion of energy to a usable form during the breakdown of foodstuffs. Thus, one grantee is trying to explain the reduced utilization of the sugar, glucose, when body temperature is lowered, as during surgery. Another investigator is studying the changes in size, characteristics, and activity of the subcellular elements, mitochondria, in relation to the ion absorption capacity of plant storage tissue during washing. It is on mitochondria that respiration (oxidation), one of the main energy-producing activities of the cell, takes place.

Significant research is being done on control of the operation of metabolic pathways by hormones, substrates, environmental factors, subcellular organization of enzymes, and biochemical intermediates. These factors may act in various ways; for example, by affecting permeability of the cell wall, by inhibiting enzyme activity through the socalled feedback mechanism, or by competing with the normal substrate for the active site on an enzyme. Another factor which controls metabolism—parasitism—is being intensely studied at present. Included are studies of infection by such organisms as rickettsiae and viruses which have few or no enzymes of their own. The investigators are striving to determine such things as the materials which a parasite requires from its host cell and the effect of the deoxyribonucleic acid (DNA) or ribonucleic acid (RNA) of the parasite on the replication of these substances in the host cell.

The synthesis of protein, particularly enzyme protein, is naturally of great interest. One NSF-supported researcher is conducting studies of the structure of the enzyme, alkaline phosphatase, in the bacterium *E. coli* as it is affected by mutational changes in the bacteria. Another's work is concerned with genetic and nongenetic mechanisms which control the rate of synthesis of the enzyme, beta-galactosidase.

In some of these projects, a possible medical application is apparent. For example, a grantee is studying the production and destruction of histamine, the substance which gives rise to allergic symptoms. Another is trying to synthesize a compound which will prevent the abnormal glycogen storage in the liver due to absence of a certain enzyme concerned with conversion of glycogen to glucose.

Developmental Biology

Developmental biology as a substantive discipline bridges a complete gamut of conceptual levels ranging from the whole organism, through its organs, cells, and intracellular constituents, down to the molecular level. At each of these levels, our concept of differentiation has a very different emphasis. As one NSF grantee has expressed it, in the whole organism (holodifferentiation), emphasis is on increasing heterogeneity—the origin, localization, and amplification of differences within an originally relatively homogeneous system. The early embryo acquires its heightened diversity and complexity through such processes as polarization, regionalization, and organogenesis. "In the process there are drastic changes of properties at all subordinate levels—cell groups, individual cells, cell organelles, states of molecular aggregation, molecular species. When the focus drops to the cell—cytodifferentiation—emphasis is on change of cell properties, appearance of 'new' cell types. 'Holodifferentiation' connotes diversification, 'cytodifferentiation' connotes change and stabilization of cell properties—frequently with decreasing rather than increasing diversity within the cell. Subcellular differentiation, on the other hand, emphasizes specialization, the concentration of diverse activities toward particular ones—especially those which lead to new synthetic products, sometimes 'exported' as secretion, sometimes accumulated as 'structure' between or within the producing cells. The general term 'differentiation' denotes any of these things at all of these levels, but it has special and different connotation with respect to each.

"In studying most biological phenomena, approaches are made at several levels, and questions frequently arise as to the relationship between the conclusions drawn at each of these levels. But in development the organism passes from level to level, and the conceptual problem, in part, precisely is to understand the process of conversion of properties at one level into those of the next." (Grobstein. 1962 *Amer. Scientist.* 50: 46–58.) However, it must be emphasized that although embryos invariably progress from one level to another, each of the three levels requires separate conceptual and technological approaches and that extrapolation of knowledge from the molecular level to the supracellular level must be done either with great caution or not done at all.

Investigations of differentiation at the molecular level, many of which are supported by this program, frequently attempt to elucidate mechanisms whereby enzymes, mucopolysaccharides, or morphogenetically characteristic proteins are regularly "caused" to appear within the cell during the course of development. The recent elaboration of the gene information theory (DNA–RNA–protein) has done much to clarify the role that has been and will be played by the embryologist. Integration of knowledge about differentiation at the molecular and supracellular levels must ultimately be based upon a reverse-information theory whereby the receptive cell (including its genome) receives messenger service both directly and indirectly from neighboring cells and tissues. Such a concept of information circulation is helpful because it formulates the old embryological principles such as "organizer" and "inductor" in today's more specific language, and it postulates that the DNA–RNA–protein doctrine is actually one segment of a cycle that extends from the DNA strand into the cytoplasm (genetic information) and ultimately into extracellular spaces. Feedback of developmental information arising from cell interactions occurs in the opposite direction. Many studies aimed toward elucidation of this information circulation are currently supported by this program.

Regulatory Biology

The Regulatory Biology program deals with research on the whole organism and its organ systems. Consequently, proposals submitted to this program originate from a very broad spectrum of the basic scientific disciplines. Not only are the classical areas of general and plant physiology represented, but such fields in the agricultural sciences as horticulture, agronomy, soil science, plant pathology, and veterinary medicine. Also, basic research in the field of the medical sciences, such as pharmacology, surgery, pathology radiology, neurology, microbiology, and endocrinology, is supported.

One area of support in particular is deserving of special mention—neurophysiology. Some of the advances made here by Foundation-supported investigators have been so great that what was originally pure exploratory research has now become an area of tremendous scope involving many disciplines.

Recent findings deal with the: (1) anatomy and functional organization of the nervous system, (2) nature of the origin and output of rhythmic impulses, (3) regulatory role played by feedback circuits and of central autogenic discharges, (4) nature of coding mechanisms in receptor and central neurons and its implications, (5) the nature of the nerve impulse, as well as chemical characteristics of the nerve cell, (6) central mechanisms controlling food intake, (7) interrelations with the endocrine system, and (8) neural control of behavior. They strongly suggest that continued support of a broad and concerted attack, involving many biological and physical disciplines, will soon result in outstanding discoveries regarding brain function.

Studies of the symbiotic relationships between animals are also being supported through this program and are being made by zoologists, medical scientists, and agricultural scientists. Of all such relationships the most fascinating and least understood is parasitism. While most animal parasites belong to the invertebrate phyla, these organisms affect practically all species of vertebrates investigated. The origin and evolution of parasitism is a matter of speculation. From the standpoint of natural selection it seems possible that out of populations of free-living forms in a common environment, altered individuals have emerged and associated together as host and parasite. In other words, certain invertebrates with parasitic potentials found vertebrates with host capacities. An NSF grantee has advanced a relatively new concept with respect to the origin and evolution of host-parasite relationships, the concept of acquired immunological tolerance. He was stimulated by the observation that if foreign antigens are allowed to make suitable contact with a test animal during an early period of life, this animal will acquire an immunological tolerance to a later contact with this antigen. If a vertebrate can be induced to regard invertebrate protoplasm or metabolites as compatible rather than foreign substance, then, in the absence of host reactivity, the invertebrate will be placed in a more advantageous situation to become a parasite.

Psychobiology

This program is concerned with studies of the integrated behavior of organisms, human and animal, and of the physiological and neurological processes underlying behavior. About 20 percent of the grants awarded in 1962 were for studies of animal behavior invloving fieldwork or a combination of field and laboratory research. Most of the remaining grants were for experimental laboratory studies—half with human and half with a variety of other laboratory animals.

Within the studies of animal behavior, the topics of widest interest are social behavior and communication. A number of the investigators conduct parts of their studies in the field, but then transport animals back to their laboratories for controlled experimentation and breeding. Examples of such studies include one on the behavior of Iguanid lizards and giant tortoises on the Galapagos Islands (techniques used include time-motion analyses, the use of models, and controlled contact of individuals) and one on the behavior of tree shrews, man's most primitive mammalian relatives. Other studies use physiological and experimental techniques to elucidate various aspects of the social behavior of ants and termites, including their communication and orientation. The variables controlling the evolution and maintenance of mimicry in butterflies are also being investigated. Studies are being made of the visual acuity of the dolphin beneath the water and in the air above, and of the social organization and behavior of primates in outdoor enclosures.

The more conventional laboratory studies deal with a much narrower range of species than do the field studies, because attention is directed to generalizations about such topics as learning, conditioning, sensory processes (chiefly vision), motives or drives, and social behavior. Examples include studies of the motor conditioning of dogs, the development of social behavior in rats, the visual system of the goldfish, central changes occurring under various conditions that produce impaired attentive behavior in monkeys, behavioral changes as a function of infusing micro-amounts of alcohol into the cerebral spinal fluid of rats, and the relationship between intensity of illumination and schooling behavior in fresh water fishes.

Laboratory studies of humans show interest in conditioning and learning, including verbal learning and concept formation. Examples are the processes followed by people in solving mathematical problems, the relationship between experimentally acquired verbal skills and performance in the identification of concepts, and the effect of various kinds of sensory deprivation upon different kinds of productive mental activities where intelligence is not a factor.

Environmental Biology

The Environmental Biology program is concerned with research dealing with the interactions of organisms with each other and with the physical, chemical, sociological, and other biological features of their environment. In terms of disciplines, this covers plant and animal ecology, including those areas sometimes identified more specifically as environmental physiology, paleoecology, palynology, limnology, biological oceanography, macro- and micro-bioclimatology, phytosociology, animal community and population dynamics, bioenergetics, life history studies, orientation and behavioral studies, environment-controlled distribution of organisms, biological productivity, and certain features of mycology and parasitology.

The following samples of research currently being supported will give an idea of the diversity of research which falls within the purview of the program.

One grantee who has established that alder trees contribute significantly to the natural productivity of lakes is now continuing his efforts to establish the role of trace elements in limiting the basic productivity of high altitude lakes. A number of studies of the factors which control bird migration are being supported by the program. One, in particular, deals with the further investigation of the environmental and behavioral influences associated with pre-migratory restlessness and navigation ability of birds. In a ready-made outdoor laboratory, the basic biological interactions of plant and animal communities of an isolated island have been under investigation. Earlier investigations, which were concerned with the major predator (wolves) and prey (beaver) animals in relation to vegetation and other ecological factors, are to be supplemented by a thorough examination of the role played by the other major animal population which is preyed upon (moose).

Research with a somewhat different objective is being supported to increase the geographical scope of certain moisture computations and thus lay the groundwork for the preparation and production of new and more realistic world maps revealing classification of climates based upon distribution of vegetation and soils. This investigation will be followed by scientists and national leaders who have become aware of the importance of more exacting investigations of the inter-relationships of plants and animals (including man) and macro- and micro-climatic conditions.

Support of biological oceanography continues to be one of the major activities of the program. A grant to continue and expand concerted investigations of the metabolism and food relations of certain marine zooplankton with respect to features in their life cycles exemplifies one type of assistance provided to the currently extensive U.S. effort. A purely basic investigation on the ecological implications of root grafting and the exchange of food and auxin between vigorous and suppressed tree "partners" may provide fundamental information useful in the interpretation of the role of root grafts in the transmission of diseases of economic importance, such as the Dutch elm disease. An attempt to correlate certain aspects of population genetics with population ecology should provide basic information on the evolutionary potential of a population and the closely intertwined genetic and ecological influences on natural selection. Specifically, the investigation will be concerned with the role of genetic variation in the population development of *Tribolium castaneum* (flour beetle).

The physiological adaptations of animals in counteracting extremes of environment is an area which is just opening up to study. At the forefront of such investigations is an analysis of the influences of ambient temperature on the physiological activities of reptiles which are active in nature at body temperature equaling or exceeding those of birds and mammals in comparison to such influences on reptile species in which heat resistance is much less highly developed.

Representative of a number of studies on the interpretation of vegetation and climate in earlier geological periods is a grant for the investigation of the early climatic and vegetational history of unglaciated humid and arid tropic regions. A major related objective in these African studies is an analysis of the development of equatorial lakes as ecological systems on the basis of chemical and biological information to be derived from examination of sediments and fossil materials contained in cores taken from such lakes.

The increasing cooperation of scientists trained in different disciplines in the biological sciences is exemplified by an interdisciplinary study designed to elucidate the subtle interactions which occur in a host-parasite relationship with a "controlled environment ecosystem." The investigators, in this case, use the host animal as an ecosystem in which the various genetic, physiological, nutritional, and other influences can be regulated to reveal the response in the parasite populations.

Systematic Biology

The field of systematics focuses attention on organisms themselves—their kind and diversity, and relationships among them. In order to understand organisms the systematist gathers, utilizes, and interprets data from comparative morphology, comparative physiology, comparative biochemistry, and comparative psychology, as well as from biogeography and ecology. Systematists are concerned with the origin of species and units of classification, and with the processes that govern their origin. This interest in evolutionary processes allies them with geneticists and ecologists, on the one hand, and with comparative morphologists, anatomists, and paleontologists, on the other. The formal classification of organisms and study of the methods and theoretical bases of classification fall within the scope of systematics. Systematists thus provide for the use of other biologists an organized arrangement of all forms of life.

A consideration of the range of projects that are supported by the program for Systematic Biology suggests something of the breadth and depth of systematic biology. Projects are diverse in regard to organisms, to habitat and geographic area, and to geologic time interval. The methods and approaches of systematists are likewise varied. An appreciation of this diversity can be gained from the following sample of projects being supported by this program: marine algae of Puerto Rico; moss flora of the Pacific Northwest; cytology and morphology of palms; cytogenetics of speciation in pines; biometric studies of butterfly weed; fossil and modern fern spores; fossil forests of Panama; revision of North and South American tortricid moths; ingestive and digestive organs of carabid beetles; paleontological studies of insect-bearing amber; larvae and juveniles of Western Atlantic flying fishes; biochemical systematic studies in the Leguminae, functional morphology of squamate reptiles; protein structure as evidence of relationships in birds; variability and evolution of dental and osteometric traits in rodents; principles of numerical taxonomy.

Representative of the sort of problem attacked by systematists is a grant-supported project for investigation of a glacial refugium (area not glaciated) on Kodiak Island. Two investigators had come independently to the conclusion, one on geological and the other on botanic grounds, that a major refugium existed on Kodiak Island during part of the Pleistocene. These scientists have been joined by two entomologists and a parasitologist, and the team is engaged in sampling the living biota of the refugium and surrounding areas and in searching for fossils from critical areas. The soil fauna will be of special interest, because soil-bound insects and other organisms often reflect accurately the history of a biota. Analysis of the collections will be aimed at evaluating the impact of this major glacial refugium on the regional flora and fauna.

Among the reports of results received during the past year from grantees, two may serve to illustrate further the scope of research supported by this program. Speciation of western newts has been the subject of a report by one grantee. Hybrids between species of these newts have been produced artificially, no hybrids being known in nature. Fertility of these hybrids and viability of the second generation offspring were generally high. Results of the breeding experiments thus suggest that speciation in western newts and preservation of the distinctness of species have been achieved through behavioral and other isolating mechanisms without development of basically incompatible genetic backgrounds. Characteristics which distinguish between species of western newts seem to be referable to a very limited number of genes. Important information on terrestrial vertebrate fossils from the Permian period (200 million years old) has been reported by another grantee. Previously the history of Permian terrestrial vertebrates was based in large part on early Permian fossils from North America and later Permian fossils from Russia and Africa. The picture was incomplete, however, due to a temporal gap between early and late Permian faunas. New discoveries in North America have brought to light faunas that are helping to bridge the former gap. These discoveries are shedding light on such phylogenetic problems as the evolution of mammal-like reptiles, those reptiles from which the mammals took origin, as well as Old and New World faunal resemblance; and on understanding of intercontinental correlation and of vertebrate faunal arrays characteristic of ancient terrestrial environments.

CURRENT RESEARCH IN THE SOCIAL SCIENCES

The expansion last year of the social sciences to full-fledged divisional status signified the importance attached by the Foundation to the social sciences. In the same way, the inclusion of the behavioral sciences within the purview of the President's Science Advisory Committee signified recognition on a national scale of the importance of the scientific study of behavior; the issuance of its publication "Strengthening the Behavioral Sciences" was a most significant event with clear implications for the future conduct of the Foundation's programs in support of behavioral science. It seems quite evident that the Foundation's encouragement of the social and behavioral sciences contributed greatly to the position expressed in the Committee's report.

The Division of Social Sciences is organized into four programs: *Anthropological Sciences*—including physical anthropology, archaeology, linguistics, and social and cultural anthropology; *Economic Sciences*—including econometrics, mathematical economics, economics of science and technology, economic and social geography, research of basic scientific nature on other economic topics, as well as research involving development or use of theories and methods of a non-mathematics character; *Sociological Sciences*—including demography, social psychology, sociology, psycholinguistics, and the sociology of science; and *History and Philosophy of Science.*

Anthropological Sciences

From the methodological point of view, the research supported includes accumulation of basic data (often from societies or groups under the threat of exinction in the near future), the investigation of ongoing social and biological processes, the recovery of past cultural events for the elucidation of time-ordered processes, and the development and testing of new research techniques. Perhaps the outstanding contribution of the program in the past and present has been the support of broadly oriented, coordinated studies of the many social and natural variables which interact to produce the cultural configuration of a particular society.

Each of the societies, past and present, in which man has lived represents an experiment in cultural adaptation, and, as modern societies are altered by contact with western civilizations, living evidence of man's variability is disappearing. Several studies supported by the program combine the coordinated approach with the realization that truly primitive peoples are fast vanishing and that it is urgent to collect data about them. In New Guinea, regions along the upland rivers and in high-altitude rain forests have been relatively undisturbed by influence from more complex societies and are just being opened to anthropological research. Careful investigation of demographic features, of systems of land use, and of concomitant social features will provide the foundation for important analyses of cultural adaptations of a primitive horticultural population to its environment and of cultural changes related to the forced elimination of certain aspects of former adaptations. For example, cross-cultural studies suggest that headhunting raids of primitive groups may have the functions of population dispersion, adjustment of male-female and age ratios, and prevention of over-exploitation of resources resulting from population growth. If warfare has similar functions in New Guinea, careful observation of the early effects of administrative suppression of headhunting should reveal either ready development of functional alternatives or anxiety and disorganization. Another research project having as its focal point the aboriginal peoples of New Guinea seeks through the study of population genetics, linguistic interrelationships, and cultural and psychological variation and change to clarify the interrelationships of language, culture, and biological properties.

Experimental investigation of ethnological problems is not possible because of the difficulties inherent in trying to control cultural variables. However, fortuitous circumstances in the Pacific make possible the study of continuities and change in five matched pairs of population units that have been forced to move from their homelands. These societies provide, in effect, natural experiments. In some instances the population unit was, before and after its removal, a single relatively self-contained and autonomous community; in others it became such only after members of different but related communities were assembled and transported to their new home. All have been relocated because of impending threats, such as over-population or natural disaster, or for political reasons, or both. The study of the outcomes of these several relocations differs from many other studies of change and stability in which the focus is more narrowly upon the transformation of single cultural traits, institutions, or complexes. Its results will contribute to the understanding and the theory, not only of cultural change, but also of community stress and viability, cultural diversification, environmental adaptation, and resettlement planning for future displaced populations in the Pacific and elsewhere.

The Pacific area is also being investigated archaeologically. Because of their extreme isolation in prehistoric times, the islands of the Pacific form a unique situation for the study of man and his culture. The project will provide the time-space framework for future investigations in Polynesia by giving special attention to prehistorical ecology. By uncovering what lies beneath the surface in east-central and western Polynesia, the origins of the Hawaiian, central Polynesian, and Maori cultures may be traced and cross-oceanic influences determined.

Support for anthropological linguistics covers projects on the languages of the Taos and Sioux Indians, and on Cherokee documents written in the Sequoyah syllabary. Testing of the lexicostatistical classification of related languages involves machine calculation of the percentages of cognates in each of many 100 word lists collected in Malayo-Polynesian languages. Classification of a large number of languages and study of significant indices of relationships will test the postulate that languages which exhibit significantly higher percentages of cognates in a basic vocabulary list are most closely related to each other. Statistical runs on Indo-European language relationships will further test the methods of lexicostatistical classification.

Economic Sciences

One of the youngest of the Foundation's programs, support of basic research in economics is developing rapidly both in size and in variety of projects.

A sampling of the grants made this year illustrates a variety of research methods. One theoretical analysis is directed toward discovering bargaining solutions for noncooperative games, and another will attempt to extend the usefulness of general equilibrium analysis in international trade. Still other research seeks resource allocation mechanisms of improved informational efficiency, combining welfare and organization theory. Several investigators will employ experimental techniques as yet less utilized in economics than in other social sciences or, of course, the natural sciences. One project of this kind will use experimental competitive markets; another will attempt by experimental means to amplify a simultaneous theoretical attack (along Bayesian lines) on statistical decision theory.

Simulation, a new technique made possible by the speed of the modern computer, may provide economics with a semiexperimental approach to certain classes of problems. The method is being employed, with the aid of grants, by several investigators. One economist is using this device to "shock" a basic econometric model which previously was incapable of generating economic fluctuations.

Research on the economic causes and effects of scientific and technological change is sponsored not only because of the special interests of the NSF in the area but also because of their significance in the American economy and their relationship to the theory of economic development. One grantee, who has undertaken a detailed study of patents in railroads, petroleum refining, and other fields, has reported evidence suggesting the historic shifts in inventive attention are intimately associated with unfolding economic needs and opportunities arising out of a changing social order. These research results would modify the familiar belief that technological progress is an independent cause of socioeconomic change. Though "cultural lags" (instances in which social arrangements are made obsolete by technological changes) undoubtedly exist, there also are chronic tendencies of technology to lag behind demand—"technological lags."

Sometimes new technology enters the economy through new capital formation, and even where this is not the case the investment rate is both a determinant of economic growth and a cause of economic fluctuations. To gain knowledge of this subject, grants have been made to several investigators. One will combine empirical and theoretical methods in attempting to explain inventory fluctuations, important causes of post-war business fluctuations in the United States. Foundation support will enable another economist to attempt to link capital theory and investment theory using randomly affected lags.

Sociological Sciences

Social scientists have long been aware of the limitations of research results based on small and fortuitious samples of Americans in some readily accessible locality. Several grants have been made by the program in previous years for studies involving comparative data from more than one nation. For example, one study involves the automobile industries and workers of Lansing, Michigan, and Turin, Italy. These two communities are similar in being dominated economically by the automobile industry, but differ in cultural setting. Comparisons will be made concerning the informal social structure of the factories, the occupational involvement and job satisfaction of employees, and the social integration of the communities and neighborhoods. These comparisons will help clarify which generalizations about American industrial plants and communities are culture-bound and which are more widely applicable.

A sociologist who has developed a theory of societal structure, is engaged in a test of aspects of his theory in Tokujawa, Japan. The theory was developed largely from studies in the United States, and a test in a very different culture, such as Japan, will challenge the generality of the theory.

A number of new grants during this fiscal year greatly extend the effort to differentiate between culture-bound generalizations about the U.S. and those that hold more broadly for social organizations and behavior. A grant was made to a team of investigators for a study of the effects of various child-rearing practices in the United States, Switzerland, and the Soviet Union. Many aspects of the personality and behavior of children will be studied in relation to the extent of training in the family, in boarding schools, and in semi-autonomous peer groups.

The International Sociological Association and UNESCO have cooperated in organizing a major cross-cultural study of mass communication. The study will examine, by careful objective methods, the content of motion pictures in at least 10 countries in Europe, Asia, and North and South America. Emphasis in the study is placed up the portrayal of film heroes, who are regarded as idealized images of the prevalent cultural values and also as an influence that may shape cultural values. Exactly comparable procedures of analysis will be used in all countries with NSF providing support for the United States portion.

These studies are examples, among others, of a strong trend in sociological research toward generalizing American studies by obtaining comparable data from other countries. This type of research should help clarify the extent to which findings of United States sociology are culture-bound.

The closely related effort to obtain more representative behavioral data within the United States has not progressed as far. One major difficulty in obtaining a representative United States sample for many kinds of studies is the massive cost and time commitment involved. It is not possible for each researcher, individually, to build up the elaborate research organization necessary for this purpose, and the duplication involved would be prohibitively expensive in any case. Hence, a special grant was made to the National Opinion Research Corporation to establish a national survey research facility with its services available to researchers all over the country. A periodic survey, on a carefully drawn representative sample, will be conducted to which individual researchers may append questions so as to obtain data needed for various studies. This will make it possible, at more modest cost, for an individual researcher to test hypotheses on a sample that gives surer grounds for inferring generality of his results.

One of the objectives of the program is to encourage studies that use a variety of methods, experimental and nonexperimental, in a concerted attack on some defined substantive area. Most proposals still use only experimental methods or only survey methods. An illustration of a more varied approach is a major project directed at empirically based formal theory of authority structures in organizations. The empirical aspect of the project makes use of surveys and observations in two large organizations—an industrial plant and a medical center—and simple laboratory experiments that are constructed as analogs of authority structures found in the large organizations. Survey data and observations in outside "real" organizations will be used to suggest hypotheses and designs for experiments, new independent variables that should be introduced in the laboratory, and changes in the theoretical models. Thus, the strategy is to work back and forth between the restricted but well-controlled environment of the laboratory and the richer, less-controlled environment of real organizations. In this way, it is hoped precise, mathematically expressed theory will be developed that can predict the more controlled experiments while still maintaining maximum relevance to the richer, uncontrolled real organizations.

A second major program objective is the development of more formal, empirically relevant theory. Several studies are aimed at developing mathematically based theory. One investigator has developed a complex model of interaction and discussion preceding an individual's decision, and is developing other models that may represent a variety of social processes, such as addiction, fashion, technological replacement, and social mobility. All of these models will be realized in computer programs.

A mathematically trained sociologist is undertaking research on intergenerational social mobility, with theories expressed in a mathematical model based on the theory of restricted permutations. The model is aimed at inferring causes of observed inequalities of mobility rates in different social strata. Preliminary research, applying the model to data from Denmark and Great Britain, suggests that, within the rather stringent assumptions of the model, occupational inheritance adequately explains observed unequal opportunities for mobility. Work is progressing toward relaxing the assumptions of the model and extending it to deal with such matters as social mobility through marriage, effects of innovations on mobility, and the chain of job changes precipitated by a single change.

A third investigator is conducting research aimed at analyzing social structures with computers and then simulating them in computer programs. Characteristics of persons at each point in a structure are programmed and the characteristic functioning of the structure is then determined. Also various theoretically significant elements of a social process (e.g., worker-management relations, communication nets, status systems) are programmed and stable states (if any) of these theoretical processes are determined by computer runs. The results from computer simulations are compared with data from studies of such varied topics as rebellious behavior in high schools, interaction in three-person groups, reward and participation in formal organizations, and the like.

Improved research methods, as has been pointed out, are of critical importance, and NSF has supported a number of projects which involve methodological innovations or developments. A recent grant will assist research on the role of reinforcement in the development of group structure. An ingenious experimental approach is employed in which groups are brought together for a discussion, with members being differentially reinforced for leadership behavior or some other selected class of role behavior. Reinforcement is given to each member without any member's knowing when others are reinforced. The design is unusual (for an experiment on this topic) in that there are no confederates in the experiment—all of the subjects are naive. Thus, the experimenters can alter behavior of a selected group member for experimental purposes without the directing and possibly distorting effects of programmed behavior by an experimental confederate in the group. The development of the technique may be quite valuable in experimental studies of small groups, social perception, role differentiation, and other areas.

Another grant in this area concerns the methods and costs of survey research. An attempt will be made to assess the costs involved in the various operations and methods of data collection and analysis currently in use. The aim is to determine which methods will yield the highest quality data for the lowest possible cost. The findings of this research should go a long way in encouraging the best use of financial and methodological resources in survey research.

History and Philosophy of Science

Support for the history of science ranges from studies of the works of individuals to studies of whole eras of scientific development. The latter often furnish the framework for the former, and thus support of both types is vital to the advance of the history of science. However, if the type of request received by the Foundation is indeed a valid indicator of research trends, historians of science have become increasingly interested in the broad aspects of scientific development. Projects supported by the program range in time from the early Greek mathematicians to the development of biological theory in modern Russia. Periods of greatest activity are, of course, of most interest. For example, science flourished in France and in England during the eighteenth and nineteenth centuries, and three grants awarded during fiscal year 1962 take this period of efflorescence as their major focus. One is concerned with the communities of intellectuals in England which encouraged and influenced the development and exchange of scientific ideas. Another will study scientific developments in Revolutionary and Napoleonic France, when analytical and celestial mechanics, chemistry, comparative anatomy, and experimental and clinical biology assumed essentially modern form in the hands of the great French scientists. The third links the exceptional scientific productivity of French pharmacology with the nineteenth century applications of chemistry to fields such as biology, hygiene, therapeutics, and toxicology.

Projects concerned with the influence of individuals on the course of scientific development include one in which the writings of Ptolemy will be translated and critically analyzed. A similar treatment of the writings of Erwin Schrödinger will result in a monograph which will deal not only with his development of wave mechanics but also with his interpretation of quantum mechanics and analyses of Darwinian and Greek philosophical concepts.

Although the philosophical foundations of science are a subject of basic importance to both the scientist and the philosopher, there are few workers in this field, a condition that is reflected in the relatively small number of grants awarded for philosophy of science. One researcher is receiving support for his continuing efforts to develop a new theory of probability based on the concept that all non-deductive inference is probability inference. The system constitutes an inductive logic, constructed on the basis of symbolic logic and measure theory. It also embraces a new theory of statistical inference, estimation, and amount of information. Thus the project belongs to the boundary region between logic, mathematics, and methodology of science.

An investigation of meaning, belief, and behavior is concerned primarily with a method for the semantic analysis of meaning. Another grant, for a joint research program of five eminent philosophers of science, is concerned with the basic concepts of current atomic and quantum theory, including the theory of measurement. Because of the diversity of views of the five participants, the joint effort will be mutually stimulating and may result in new understanding of the logical bases of physical theories, probability, induction, and statistics.

Because the philosophical bases of geology have until now been largely ignored in modern texts and anthologies of the philosophy of science, a grant has been awarded to prepare an annotated bibliography and index of philosophical concepts pertaining to geology, to be drawn from existing geological literature.

SIGNIFICANT RESEARCH DEVELOPMENTS

GENETIC CODE DETERMINED FOR PRODUCTION OF SPECIFIC AMINO ACIDS IN ENZYME MOLECULE—One of the most dramatic developments in biology today is the unraveling of the genetic code for the amino acids. During the last year, evidence has accumulated that the coded information for each amino acid in an enzyme molecule consists of triplets of the smallest subunits (nucleotides) of DNA (the hereditary material). Moreover, it has been possible to specify the nucleotide composition of the coding units for specific amino acids. The initial "cracking" of the code came from an *in vitro* system in which relatively simple combinations of amino acids were formed. In a brilliant combination of genetic experiments and biochemical studies, an NSF-supported investigator extended genetic coding to gene-enzyme relationships in a living system.

These experiments were conducted on normal and mutant forms of an enzyme, tryptophane synthetase, from the bacterium *Escherichia coli*. They indicate that genetic mutations which affect the same coding unit result in replacement of the same amino acid. If different sites within the same coding unit are changed by recombination in genetic experiments, different amino acids replace the original one in the enzyme. Moreover, each amino acid replacement observed so far can be explained as the consequence of a single nucleotide change in the corresponding coding unit, as worked out from the simpler, *in vitro* system.

The significance of these pioneering experiments extends beyond the present accomplishments. They indicate the road which will undoubtedly lead to the answering of many unsolved problems concerning the operation of the genetic code in directing enzyme synthesis.

* * *

Genetic Code Probably Not Universal Because of Evolutionary Changes in Translation Machinery—One of the general assumptions of investigators studying the mechanism of heredity has been that the genetic code is universal, i.e., that the meaning of a coding unit will remain the same for all organisms. However, this view assumes that the complex "translation machinery" for the information coded in DNA will remain permanently unchanged. Recent evidence has shown that mutations can occur in this translation machinery, which, in effect, alter the interpretation of the coded information.

The suggestion that such mutations do occur came from studies of certain mutants at a single "locus" of the T4 bacteriophage which infects the bacterium *Escherichia coli.* It has been found that these mutants, which all involve a simple change within one coding unit, may be inactive in infecting one strain of the bacterium, but may be active in an altered strain. The most reasonable explanation is that the altered bacterial strain carries a mutation in the translation machinery for the genetic code which changes the interpretation of the phage mutant coding unit from "nonsense" to an order for a specific amino acid. This would appear to be a very simple case of an inherited change in the translation machinery.

The discovery that mutations in the translation machinery probably occur led to a preliminary testing of the similarities and differences in the translation mechanisms from three widely separated forms—a bacterium, yeast, and rabbit. These tests involved isolating the essential ingredients of the translation machinery from the organisms involved and forming "mixed" *in vitro* systems. The ability of these systems to translate for specific amino acids was tested. Striking quantitative differences were found with certain amino acids. In these cases the "mixed" systems were much less effective in translating for the amino acid than the control systems where all the ingredients came from one organism.

Thus, differences in the translation machinery do exist and must be taken into account, although the fact that the mixed systems function at all suggests that the variability may be limited.

* * *

DNA of Virus Forces Infected Cell to Synthesize Viral RNA Rather Than Normal RNA—For a number of years, evidence has been accumulating that a virus which infects a cell takes over much of the machinery of the cell and uses it for its own reproduction. This has been shown very directly for the synthesis of ribonucleic acid (RNA) by an NSF grantee. Following virus infection, the cell stops making the RNA which it needs for its own survival and makes a new kind of RNA which is concerned with virus multiplication. Such new RNA has been isolated in purified form and its chemical structure shown to be different from that which the cell would normally make.

Since the virus used was of the deoxyribonucleic acid (DNA) type, these studies are also of great importance in the field of genetics. The virus can be regarded as a kind of counterfeit gene which not only is accepted as legal tender but drives the genuine currency out of circulation. The experiments very clearly support the current hypothesis that the DNA of the gene controls the synthesis of RNA which acts as the messenger to convey information to the cell as to what to make. However, they go farther and provide direct evidence for the theory that this messenger RNA is formed by using the DNA of the gene as a pattern. The RNA is not a copy of the DNA, but has more the relation of a print made from a photographic negative. Physico-chemical studies show that the new RNA formed under the influence of the virus DNA matches the DNA in this sense.

* * *

Isolation of Cell-free Extracts that Fix Nitrogen Opens Complex Enzyme System to Biochemical Analysis—Next to photosynthesis, by which atmospheric carbon dioxide is fixed, biological nitrogen fixation is the most important process in the incorporation of inorganic elements into the economy of the living cell. The basic process involved here is entry of molecular (atmospheric) nitrogen into a cell and its conversion to ammonia by reduction (addition of hydrogen). Ammonia nitrogen is then converted into various inorganic and organic substances such as nitrites, nitrates, and amino acids. Two NSF grantees are trying to unravel the biochemical details of these complicated processes.

Using whole-cell preparations of such nitrogen-fixing organisms as bacteria found in the roots of leguminous plants, they have confirmed the cell's need for the trace metal cobalt for maximum growth when any of several inorganic substances are used as the nitrogen source.

The isolation by these investigators of cell-free extracts which fix nitrogen opens the complicated enzyme system operating here to direct biochemical attack. It has been impossible, so far, to isolate and purify the individual enzymes involved, for these have proven to be very labile and very oxygen sensitive. However, the complex has been obtained in two parts, namely a nitrogen-activating portion and a pyruvate-metabolizing portion.

Pyruvate metabolism must take place concurrently for nitrogen fixation to occur. Apparently pyruvic acid serves as an energy source and as a hydrogen donor for the reduction of nitrogen. The intermediates formed from pyruvate have already been determined through the use of cell-free preparations. A very careful search has also been made with such preparations for intermediates between nitrogen and ammonia. The fact that free intermediates were not found, even when using whole cells, lends credence to the idea that nitrogen remains bound to an enzyme during its reduction. Various other facets of the fixation process, such as enzyme inhibition and the influence of atmospheric nitrogen pressure, have also been studied. It is interesting to note that light had no influence on nitrogen fixation in cell-free preparations of a photosynthetic bacterium.

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TECHNIQUE DEVELOPED FOR IDENTIFYING AND CHARACTERIZING SUBSTANCES WHICH INFLUENCE CELL DIFFERENTIATION DURING EMBRYONIC DEVELOPMENT—Embryonic development starts with the fertilization of a single egg cell. Through cell division, growth, and differentiation, the embryo develops into an amazingly complex organism composed of a great variety of highly specialized cells, such as liver, bone, lung, and nerve. The differentiation of the original fertilized egg cell into these various specialized cells is controlled by the chromosomes in the nucleus through blocking and/or triggering chemical reactions.

An NSF grantee experimenting with frog embryos injected albumin extracted from the nuclei of liver cells into recently fertilized frog eggs. He found that these cells divided and the embryo developed normally up to the gastrulation stage when cell differentiation begins. At that point cell division and development stopped—the embryo died.

He then went one step further and through microdissection removed the nucleus from a cell of one of the albumin-injected embryos just prior to cessation of development. The nucleus was transplanted into a newly laid unfertilized egg from which the native nucleus had been removed. This combination grew normally up to the gastrula stage and, as previously, stopped. These tests were repeated and the "blocked" nuclei were transplanted through seven generations of embryos. In each generation, development stopped at the same embryonic stage.

The conclusion is both inescapable and highly significant. The original macromolecules of albumin (contaminated with a small amount of RNA) produced an effect in the nuclei, or in the adhering cytoplasm, that persisted and consequently blocked development at a specific stage of embryogenesis. Such developmental blocks have been demonstrated repeatedly, but for the first time an approach has been developed that permits chemical characterization of specific molecules influencing a replicating system in the embryo.

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HEAVIEST RAINFALLS OCCUR IN FIRST AND THIRD QUARTERS OF LUNAR CYCLE—Statistical proof of the existence of a lunar effect on precipitation has been obtained by an NSF-supported researcher. He investigated the dates of excessive precipitation—wettest days—throughout the United States over a period of about 90 years. When these wettest days were plotted against the angular difference between the sun and moon, there was a conspicuous departure from the expected normal distribution.

The dates of extreme precipitation were recorded near the middle of the first and third quarters of the lunar cycle. The second and fourth weeks of the cycle were correspondingly deficient in heavy precipitation. The dates of the most extreme widespread rainfalls in the history of official U.S. meteorological observation were three times as frequent during the cyclic peak periods as during the cyclic trough periods.

It is not yet possible to advance a physical explanation for this phenomenon.

* * *

NEW FIELD OF CHEMISTRY MAY OPEN AS RESULT OF SYNTHESIS OF FIRST AROMATIC SILICON COMPOUND—An overwhelming percentage of all the chemical compounds occurring naturally or produced in the laboratory have the element carbon as their fundamental building block—gasoline, protein, sugar, plastics, rubber, etc. This results from the unique character of the carbon atom; it can join with other carbon atoms for open chains or for closed rings. Carbon chemistry is called organic chemistry, and the completely unsaturated ring compounds are called aromatic.

Silicon with a chemical structure similar to carbon has in the last decade or so been substituted for carbon in a number of chain compounds, such as the silicones, which have proven of great industrial value.

During the past year, a most significant discovery was made by an NSF grantee—the synthesis and characterization of the anion of silacyclopentadiene, the first aromatic compound containing silicon. This successful laboratory development paves the way for the synthesis of other aromatic silicon compounds, such as silabenzene, the silicon analog of benzene. A complete new field of chemistry with great potential thus becomes possible.

* * *

QUANTITATIVE DETERMINATION OF RELATIONSHIP BETWEEN MACHINABILITY AND PHYSICAL PROPERTIES OF MATERIALS MAKES POSSIBLE A MORE EFFICIENT AND ECONOMICAL MACHINING PROCESS—An NSF grantee has derived and experimentally verified a mathematical correlation between machinability and the physical properties of materials. He has found that he can evaluate or predict the quantitative measure of machinability, that is, the cutting speed in feet per minute that the work material may be moved by the cutting tool for a specified tool life (the length of time for the tool point to be worn away). The application of this mathematical correlation in place of expensive and time-consuming experiments will permit a more analytical approach to the problem of improving composition, choosing appropriate heat treatments, and recommending the best processing methods to ensure the most economical machining in metal-working industries. The machinability of a material is defined by three physical properties: (1) the percent reduction of area in a tensile test, (2) the Brinell hardness, and (3) the thermal conductivity. The derived relationship has been verified with experiments on a variety of different metals and alloys.

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SURFACE TEMPERATURES OF PLANETS OBTAINED AT NATIONAL RADIO ASTRONOMY OBSERVATORY—The surface temperature of Venus is far hotter than the boiling point of water, while that of Saturn is below the freezing point. Very accurate observations of radio radiation from these planets, at a wavelength of 10 cm., have been made at the National Radio Astronomy Observatory, Green Bank, W. Va., to provide new values for the temperatures of these two planets. Convincing evidence was obtained that the temperature of Venus is a rather surprising 610°K±50°K, or about 340°C. The comparable values for Saturn were 196°K±60°K, which is well below the freezing point of water.

National Research Programs

These programs include scientific research endeavors that are best planned, coordinated, and funded on a national program basis because of the scope of the projects. Such factors as geographic location and need for coordinating the research efforts of various Federal agencies and/or universities are involved.

U.S. ANTARCTIC RESEARCH PROGRAM

The United States Antarctic Research Program (USARP) enables scientists of the Nation's colleges, universities, and research centers to carry out a wide variety of basic research in Antarctica in all the sciences.

Biological investigations are concerned with studies of the life of the land area as well as marine biology in the surrounding oceans. In the earth sciences, research is being carried out in geology and glaciology, including seismic, gravity, and magnetic observations to determine thicknesses of the ice cap and rock strata. Meteorology and upper atmosphere physics programs cover studies of aurora, cosmic radiation, and similar phenomena. Aboard the USARP research vessel *USNS Eltanin* extensive programs are carried out in meteorology, upper atmosphere physics, biology, oceanography, and submarine geology.

The National Science Foundation plans, manages, coordinates, and funds the USARP through its Office of Antarctic Programs. The Foundation arranges for long-range and yearly scientific programs, and provides management and coordination for research programs in the field as well as in United States laboratories.

Serving in an advisory capacity to the Foundation is the Committee on Polar Research of the National Academy of Sciences. This committee represents the United States on the Scientific Committee on Antarctic Research (SCAR) of the International Council of Scientific Unions (ICSU). The Department of Defense provides logistic support to the scientific program in Antarctica.

International Antarctic Activities

Antarctic Treaty—The international cooperative scientific effort that proved so successful in enhancing the knowledge of the geographical and geophysical aspects of Antarctica during the International Geophysical Year prompted the 12 nations cooperating subsequent to the IGY to sign the Antarctic Treaty in June 1961. The treaty provides that the Antarctic shall be used only for peaceful purposes and that freedom of scientific investigation shall continue in this spirit of international cooperation. Under the Treaty the United States participates in exchanges of scientific personnel and information with other nations.

Scientific Exchange Program—The scientific exchange program with the Soviet Union, begun during the IGY, continues. In the present program in which personnel are now wintering over in the Antarctic, a U.S. biologist from Ohio State University has joined the Soviet expedition and is carrying out biological studies in the vicinity of Mirnyy Station. A Soviet scientist spent the 1961–62 austral summer at McMurdo studying meteorological data. Plans are also being explored with the Soviet Union to expand U.S.-Soviet Antarctic cooperative research activities between respective research vessels, for the exchange of additional scientific personnel between the expeditions and for better exchange of data and results. Arrangements are also being considered whereby scientists of Japan, Norway, Belgium and Chile may cooperate with U.S. scientists on an exchange basis.

Joint Scientific Program—A variety of joint activities are carried out cooperatively by the United States with other countries signatory to the Antarctic Treaty. With Australia and Argentina, the United States maintains programs at Wilkes and Ellsworth Stations respectively as cooperative stations. Scientific personnel are provided by both parties to this agreement. Australia and Argentina provide the logistic support at these stations and the United States provides scientific equipment and some personnel.

New Zealand provides the United States with a staging point for Antarctica which is helpful to the United States in maintaining its activities. In return for this service, the United States assists New Zealand by providing transportation of supplies and personnel for New Zealand to McMurdo Sound for the New Zealand Scott Base. This cooperation with New Zealand includes also the joint maintenance of scientific programs at the U.S. Hallett Station.

Australia has provided the United States with support of scientific parties on Macquarie Island, making possible certain programs in cosmic ray studies and biological observations. During the past year, Chile supported U.S. geologists in the Palmer Peninsula area. The United Kingdom provided support by which U.S. ornithologists carried out observations near South Georgia. Also, U.S. oceanographers cooperated with research personnel from Argentina in an oceanographic study of the Drake Passage.

Scientific Programs

During the 1962 fiscal year the Foundation supported 45 active field projects. Seventy-one per cent of the field projects represented work conducted by university groups. The following table shows the distribution of effort by discipline in terms of identifiable projects and people.

U.S. Antarctic Research Program—1962

Program	Active field projects	Number of people
Biology	17	25
Geology	8	31
Geophysics	1	10
Glaciology	3	15
Gravity	1	1
Meteorology	2	35
Oceanography	3	6
Seismology/Geomagnetism	1	6
Upper Atmosphere	8	31
Cartography	1	8
Total	45	168

BIOLOGY

Of the disciplines listed, biology has shown the most continued growth in programs and workers. The total of 17 active programs is being conducted through 9 universities involving a total of 25 scientific workers. Biological research was largely concentrated at McMurdo Station because of the well-equipped biological laboratory essential for the development of many of these field studies.

Three phases of Stanford University's continued investigations of the marine biology of McMurdo Sound were brought close to termination. Data collected over the past three years has provided information on the ecology of marine benthic communities, ecology and physiology of plankton, and the relation of invertebrate reproduction to biochemical aspects of food reserve cycles. Studies of fish metabolism and growth continue, utilizing tanks, aquaria, and metabolism chambers available at the McMurdo laboratory.

Functional morphology and histological work on the pycnogonids, or sea spiders, was carried out by scientists from the University of the Pacific. The Virginia Fisheries Laboratory shore-based marine program of parasites from fish, mainly the Nototheniidae, was completed this year with collections from Wilkes Station.

Two microbiological programs were undertaken in the McMurdo and Hallet Station area. An Ohio State University group made an ecological survey of soil bacteria at several different locations during the summer, with particular attention to quantitative reactions of the nitrogen cycle. In the wintering University of Texas program, aerobiological studies, viability and longevity studies, microbiology of an Antarctic saline pond, soil microorganisms, and skin flora of the isolated wintering personnel were included. An interesting result of culturing samples of 50-year-old yeast and tinned foods cached at Captain Scott's base camp was the surprising number of contaminant microbes that were still viable. The presence of microorganisms in soils was found to be highly variable, some soils yielding almost no organisms while others gave several hundred thousand per gram.

Interesting results were obtained by the University of California researchers studying the summer energy budget of Antarctic ponds and lakes in the dry valleys. Positive photosynthesis was evident in the dry-valley lakes beneath as much as 15 feet of ice, confirming similar findings in studies of plankton productivity under arctic sea ice. In the lakes studied, high light intensity is severely inhibiting for algae during midsummer. Productivity in the littoral zone, however, was appreciable higher than that recorded in the deeper parts of the lakes. Physical limnological and geochemical work was done at these lakes by the University of Kansas resarchers, who spent the field season mapping the lake bottoms, obtaining temperature profiles and water samples, and attempting to measure thermal conductivity of the bottom material. Both lakes showed high stratification, with relatively pure water just under the ice changing to much warmer, highly saline water near the bottom. More accurate measurements in Lake Bonney this year showed a bottom temperature of 77.9 degrees Fahrenheit.

In a botanical program, an Ohio State University investigator initiated a long-term study of algae, moss, and lichen growth rates at Hallett Station, by staking out numerous plots and thoroughly mapping the vegetation. The plots will be resurveyed in the coming seasons. Growth rate of individual lichen plants proved too small for determination in a single summer period.

The USARP bird-banding program by Johns Hopkins University was active at Hallett and McMurdo Station areas and on Bird Island near South Georgia in the Falkland Islands. At Bird Island two men began a long-term study of albatrosses by banding 10,196 birds and taking samples of stomach contents and blood sera. Routine banding, census-taking, and observing previously banded birds continued on the continent. In a homing experiment one of six skuas transported to the South Pole from the nesting area at Cape Crozier, returned from the Pole, having covered a distance of 825 miles. This is believed to be the longest distance ever covered in an experimental demonstration of homing by oceanic birds.

A Bernice P. Bishop Museum report on the zoogeography of Pacific and Antarctic insects summarizes the results of three years of insect trapping and collecting on the continent and from airplanes and ships within the limits of sub-Antarctica. Of the 50 recorded species of terrestrial arthropods of Antarctica, about one-half are biting lice on birds or suckling-lice on seals. The other half are ticks, mites, springtail fleas, and chironomid flies. Free-living insects and mites are found on exposed rock surfaces, generally associated with lichens, algae, or mosses, and usually hide in the plants or below the rocks. The researchers consider that a majority of the insects probably represent post-Pleistocene immigration, although the possibility that some are relics from an ancient temperate fauna cannot be discounted.

EARTH SCIENCES

Four major geological parties continued investigations of the vast ice-free mountain ranges of West Antarctica and the Transantarctic range. The first visit to the Sentinel Range of the Ellsworth Mountains, perhaps the most extensive of the world's unvisited mountain ranges, was made in the 1961–62 summer by a University of Minnesota party. Most of the rock outcrops visited are metasedimentary with large sills of basic igneous rock. Stratigraphic units of the northern part of the Sentinels included thick sequences of graywacke, slate, quartzite, and possibly tillite—all without fossils. A party from the U.S. Geological Survey completed work on the Thiel Mountains forming the easternmost range of the Transantarctic mountains that has been investigated. These mountains consist of a large flat-topped massif joined by an escarpment to a group of high nunataks. The most widespread rock is a quartz monotite porphyry. Flat-lying sedimentary and metasedimentary rocks, chiefly quartzite and argillite, are exposed in several of the peaks. A unique "siderolite" meteorite, in two pieces totaling about 70 pounds, was found by this party. Ohio State University completed the study of the Central Horlick Mountains where several sections in the highly fossiliferous Beacon formation were studied. The carboniferous tillite formation was about 800 feet thick, and some fossil assemblascs were located in the Horlick formation of the lower Devonian rocks between the tillite and the basement rocks. A coal bed about 10 feet thick was located in this area.

A series of previously unknown mountains and nunataks was discovered by the University of Wisconsin Ellsworth Land Traverse, at the base of the Peninsula. The locations of the outcrops, the configuration of the ice surface, and the seismic depths of the buried rock surface suggest that these nunataks are on an extension of the Peninsula Mountains. Near the Chilean Base O'Higgins another group from the University of Wisconsin investigated the stratigraphic and tectonic relationship of the peninsula area to the Andean Cordillera.

Three geological projects were active in the McMurdo Sound area. An Ohio State investigator worked on the glacial morphology of the dry valleys, collecting samples of algae which may be used to date recent glaciations. Soil scientists from Rutgers University determined in initial pedological reconnaissance that genetic soils do exist in Antarctica, most of them forming in an abiotic system though chemical and physical weathering was common. Findings of the University of Wisconsin geologists working with sand and ice-wedge polygons corroborated tentative conclusions that patterned ground is ubiquitous in the ice-free areas of the continent and should be useful for dating recent glaciations.

During the University of Wisconsin traverse, gravity measurements, magnetics recordings, seismic soundings, and glaciological studies were carried out in an area at the base of the peninsula. A large area north of the Ellsworth Mountains was found to have bedrock lying below sea level. Thus, a sub-ice channel between the Ross and Weddell Seas appears to be a reality, though this channel follows a circuitous route northeast and east of the Ross Sea skirting the northern edge of the Ellsworth Mountains. Another geophysical program of the University of Wisconsin was the interstation gravity network in which observers with portable gravimeters flew from place to place with resupply flights, making a total of 32 gravity ties from McMurdo Station to numerous inland points. The U.S. Coast and Geodetic Survey has been carrying out seismic studies since the International Geophysical Year, and following recommendation of SCAR, is now issuing quarterly reports on the earthquake epicenters located by the Antarctic station seismograph network.

UPPER ATMOSPHERE PHYSICS

Logistically and scientifically the highlight of the 1961–62 summer season was the establishment by air of a temporary station (Sky-Hi) near 75° S, 77° W, about 1400 miles from McMurdo Station and 600 miles east of Byrd Station. This was operated for approximately two months by upper atmosphere physicists. Studies of the ionosphere, geomagnetic variations, and very-low-frequency emissions showed results at considerable variance with those from the Byrd Station. Analysis of comparative data from Ski-Hi and its magnetically conjugate station near Quebec, Canada, by the National Bureau of Standards revealed a number of interesting items. Ionospheric absorption events were well correlated in time and intensity at the two ends of the field line though an exception to this was a sudden-commencement magnetic storm followed by a major absorption event at the southern end only. The amplitude of the absorption events at the two ends of the field line were unexpectedly equal. New information on the size of the conjugate area in Canada was gained by operating 3 riometers simultaneously at 80-km spacings. Very-low-frequency events were generally, though not always, similar at both conjugate points. The VLF emissions offer clear evidence of an acceleration mechanism which is apparently capable of continuously perturbing a small fraction of the existing ionosphere particles and then causing their dumping in the upper atmosphere approximately equally at each end of a magnetic field line. This site complements the present United States Antarctic station network as it is the only one lying outside the auroral zone. Plans are under way to make this facility a year-round base—the Eights Station—which will play a large role in the coming studies during the International Quiet Sun Year, 1964–65.

In the aurora and airglow program of the Arctic Institute of North America, research with auroral spectra has shown close correlations between auroral displays and variations of cosmic noise absorption measured at a frequency of 30 mc. Analysis of data from Byrd and Ellsworth Stations indicates further that auroral emissions have a high magnetic dependence in the auroral zone.

Other ionospheric physics programs included the investigation of whistlers and other VLF radio noise emissions by Stanford University, the U.S. Coast and Geodetic Survey's operation of magnetic recording stations, cosmic ray counting by the Bartol Research Foundation and the University of Maryland, and the vertical incidence ionosphere soundings by the National Bureau of Standards.

METEOROLOGY

Surface and upper air observations were continued in the meteorological field where radiometersondes were introduced, obtaining radiation parameter variations with altitude. Also a new program was initiated at McMurdo by Texas Western College for the explorations of the temperatures and winds at high altitude with meteorological rockets. At the U.S. Weather Bureau in Washington, several analysis studies using glacial, oceanographic, and meteorological data are under way. The meteorological feasibility of transosondes (constant-altitude balloons) is also being investigated. Winter radiation and heat exchange measurements at the South Pole in the 1961–62 summer provided information useful in a more accurate estimate of the continent's heat exchange. It appears that the atmosphere provides about twice as much heat to the snow surface during the polar night as during the six months of light, and that the light season warming of the air is not the result of warming from below but rather the result of vertical and horizontal atmosphere movements and direct atmospheric absorption of solar radiation.

SHIPBOARD PROGRAMS

During the year the USNS *Eltanin,* a 266-foot former ice-strengthened cargo ship, was converted to an Antarctic research ship. Shakedown cruises in the North Atlantic were completed in early 1962 and the ship started her first Antarctic cruise out of Valparaiso, Chile, in early summer 1962, working in the western Drake Passage and the Bellingshausen Sea. Thirteen research agencies are represented aboard the *Eltanin.*

Upper atmospheric physics work on the *Eltanin* includes operation of an airglow photometer and a riometer by the University of Alaska, Bartol Foundation's high-counting-rate plastic scintillator and meson telescope, a VLF–ELF and HF radio noise study in eight frequencies in the transmitting band by the U.S. Bureau of Standards. More emphasis will be placed on conjugate point studies when the route of the ship becomes conjugate to accessible land sites of northern United States, Canada, and Alaska.

The marine science activity includes Lamont Geological Observatory's current measurements by standard dynamic methods and by current meters on an anchored buoy system, and primary productivity studies. The University of Southern California biology program covers the biota of deep basins and trenches, deep benthic fishes, mid-water fauna, and surface primary productivity.

The California Institute of Technology has a grant to investigate the biogeochemistry of skeletal carbonates in a paleoecological study. Bernice P. Bishop Museum is using the ship as a moving platform for insect-trapping nets in an effort to learn more about insect transport to the continent from southern islands.

The U.S. Navy Hydrographic Office oceanographic work, concentrated on the *USS Burton Island,* included all standard physical oceanographic observations plus bottom coring, sediment grabs, plankton tows, and geomagnetic recording. Florida State University continued examination of ocean bottom cores. The Texas A & M researcher measured surface current profiles in the Drake Passage aboard an Argentine vessel. A grant to the Lamont Geological Observatory (Columbia University) provided support for a systematic oceanographic survey in the Drake Passage and in the South Antillean Sea on the *R/V Vema.*

In the United States, continued effort goes into the reduction and analysis of the data from the Antarctic. While most university research is undertaken by the field investigative groups, separate grants have been made for studies in meteorology, upper atmospheric physics, and glaciology. Support for the team approach to some of the major problems has been assisted by funds for continuation of polar centers at two major universities. To encourage analysis and presentation of data and to fulfill international obligations of data exchanges, plans are in hand for an antarctic monograph series, an antarctic series of folios, antarctic bibliography, and periodic publications of general interest regarding the nature, extent and personnel involved in antarctic research.

CARTOGRAPHY

The year 1962 was a notable one for Antarctic mapping. New field control techniques were tried and proved successful. Substantial progress was made in the preparation of maps in the 1:250,000 series and a new continental map was produced. United States Geological Survey topographic engineers, working with the Army helicopters supported by the Navy, successfully completed Topo North and South, a 1,100-mile topographic traverse in the mountains between Cape Adare and the Beardmore Glacier using electronic distance-measuring devices. The use of this technique resulted in the establishment of field control making possible the mapping of a 100,000-square-mile area. Another important development was the testing and proving of a technique to use daylight stars as a basis for position determination.

A new 1:5,000,000 scale map of Antarctica was produced by the American Geographical Society, undoubtedly the best map of the continent to date. Preparations were started that will result in the printing of a 1:3,000,000 scale map of Antarctica in four colors.

Compilation was completed and a contract was let by the Geological Survey for the preparation of a two-layer plastic relief model of Antarctica. Support was continued to the Office of Geography of the Department of Interior which is actively engaged in the naming of geographic features in Antarctica, coordinating this effort with similar groups in other countries.

Arrangements were begun for the production of an Antarctic Map Folio Series. Each folio, representing a special field of activity, will include maps, narrative, graphs and photographs to be used as a working tool for scientists.

INTERNATIONAL INDIAN OCEAN EXPEDITION

The International Indian Ocean Expedition (IIOE) is a scientific project of broad scope and magnitude designed to investigate one of the world's least-explored oceans. The Indian Ocean's 28 million square miles cover about 14 percent of the earth's surface and are surrounded by some of the world's most densely populated countries, yet between 1873 and 1957 fewer than 30 vessels carried out oceanographic investigations in its waters. Although there is intriguing evidence that the biological productivity of the ocean is high—higher than either the Atlantic or Pacific, almost half of its area has not ever been sampled biologically, and while a possible food resource washes over their doorsteps, many inhabitants of the surrounding region suffer from severe dietary protein deficiency.

The Indian Ocean is of great interest also to physical scientists. The basin's structure is virtually unknown. Moreover, as it is landlocked in the north, west, east, and cut off by equatorial currents on the south, the northern half of the Indian Ocean is the only body of water where there is a complete seasonal reversal of the prevailing wind. It is, therefore, a huge natural laboratory for observing the effects of wind stress on oceanic currents.

The above features and the lack of scientific attention to them are evidence of the need for a thorough exploration and analysis of the ocean's contents, structure, and relationship to the atmosphere above it. This need will be met by the 25 nations and 44 vessels participating in the IIOE; from 1962 through 1965 they will conduct broad systematic surveys as well as detailed individual investigations in such varied fields as biology, geology, chemistry, geophysics, bathymetry, and meteorology.

History and Organization of the U.S. Program

Initiated in 1958 under the auspices of the International Council of Scientific Unions and its Special Committee on Oceanographic Research, the IIOE is now coordinated by the Office of Oceanography of UNESCO. Initial planning for this country's participation was performed by the Committee on Oceanography of the National Academy of Sciences. United States participation was approved by the President in June 1960, and the National Science Foundation has been assigned full scientific responsibility for the U.S. program. NSF has encouraged research institutions in this country to submit proposals for projects connected with the IIOE, and in some cases has transferred funds to enable other Federal agencies to carry out urgent, related programs.

Although the participating scientists represent more than 100 colleges and universities, the actual conduct of the expedition is centered in those few institutions experienced and qualified in the logistics of ship operation. Thus, the biological sciences program is coordinated through the Woods Hole Oceanographic Institution; the physical sciences program is managed by the Lamont Geological Observatory, the Narragansett Laboratories of the University of Rhode Island, Scripps Institution of Oceanography, and Woods Hole; and the meteorological efforts are under the direction of the University of Hawaii, cooperating with Woods Hole and the Universities of Michigan and Washington.

Taking a leading part in the U.S. program will be *Atlantis II,* one of only two major vessels under the U.S. flag especially designed for research tasks. The former Presidential yacht *Williamsburg,* now renamed the *Anton Bruun,* will also be operated as a public vessel by Woods Hole; aboard this ship much of the biological work of the expedition will be carried out.

Scientific Programs

The study involves three major programs: biological, physical, and meteorological. The biological program is designed to increase knowledge of the abundance and distribution of living organisms and to gather information leading to a better understanding of the biological resources of the Indian Ocean. All U.S. ships will be equipped to sample plankton and observe surface biological phenomena; some will measure primary productivity as well.

The physical oceanography program will include chemical and isotopic analyses of water samples, measurement of current flow at various depths, and geophysical studies to aid in comprehending the nature of the sea floor and the crustal structure.

The meteorological studies will be concerned with the interactions between the ocean and the atmosphere. Essential to this will be a large-scale circulation study employing not only standard wind and weather observations from ship and shore stations and from two special Weather Bureau aircraft, but also new and special devices including an extensive series of meteorological rockets.

PROJECT MOHOLE

The ultimate objective of Project Mohole is to drill through the crust of the earth beneath the ocean to provide the first samples and direct measurements of the deep crust and the underlying mantle. The project, which is supported and administered by the National Science Foundation, is a cooperative plan by scientists throughout the country, organized under the National Academy of Sciences' AMSOC Committee.

Probably no single project within the scope of present technological capabilities would provide more information on a number of critical questions in geophysics. Samples of the deep crust and upper mantle would, for example, (1) render much more accurate the determinations of various rock layers, (2) establish the chemical composition and mineralogy of the top of the mantle to aid experiments in high-temperature, high-pressure mineralogy, (3) help determine possible causes of the anomalously high heat flow from the floor of the ocean, (4) provide data about the original isotopic composition of primordial lead and uranium, and (5) increase understanding of early stages of earth history.

Samples of material obtained from crustal layers, if the hole were drilled at sea, would provide a nearly continuous sedimentary record from the floor of the ocean down through the first rocks deposited in that part of the ocean basin. In addition, much evidence of the evolutionary process would be provided by fossil remains in the various sedimentary layers.

The rapid development of deep-drilling techniques by the petroleum industry in recent years has indicated the possibility of drilling to the mantle through the oceanic crust. Beneath the continents the Mohorovicic discontinuity, the boundary between the crust and its underlying mantle, lies at depths of from 25 to 40 kilometers (3 to 5 miles). Thus, drilling to the "Moho" at sea would take advantage of the fact that the crust is much thinner under oceans than continents.

Drilling in deep water from unanchored vessels had never been attempted until the experimental drillings, conducted by the AMSOC Committee with Foundation support, off La Jolla, California, and Guadalupe Island, Mexico, in early 1961. These tests proved the feasibility of drilling at sea using a specially conceived dynamic positioning system that enabled the drilling vessel to maintain station with its own power for prolonged periods under severe wind and wave conditions. Drilling at La Jolla, on the edge of the San Diego Trough, took place in 3,000 feet of water. Five holes were drilled, one to 1,035 feet, obtaining important scientific results in the form of the first samples of oceanic sediments from significant distances below the sea floor. Five holes also were drilled in 11,700 feet of water at Guadalupe to a maximum of 601 feet into the bottom. Samples were obtained for the first time of the second layer of the oceanic crust, found to be basalt at that site. The success of the operation resulted in further AMSOC recommendations to attempt the second phase of drilling all the way to the upper mantle.

Under Foundation support and administration, the second phase of Project Mohole was begun with the selection of Brown and Root, Inc., Houston, Texas, as the prime contractor for management, operations, and logistic support. Detailed engineering and feasibility studies are in progress. The project is expected to require between 3 and 5 years to complete.

WEATHER MODIFICATION

The National Science Foundation has supported a special program of research in the field of weather modification over the past four years, following passage of Public Law 85–510 of July 11, 1958. By that law, NSF was directed to "initiate and support a program of study, research and evaluation in the field of weather modification."

Since then the Foundation has not only supported a significant program of weather modification research, but in a larger sense it has maintained a central position of leadership in stimulating adequate and pertinent research throughout the scientific community, in the universities, and within the various laboratories of the Federal Government. Following the usual pattern of Foundation operation, the program is administered principally through grants and contracts with universities and other research groups. At the Government level this includes joint research efforts in the various Federal agencies concerned with weather modification, for example, the NSF-Weather Bureau-Navy hurricane modification program.

Under the NSF program a full range of laboratory and field experimental work along with theoretical studies is being pursued under the direction of research physicists, chemists, mathematicians, and engineers, as well as meteorologists. The problems of weather modification are interdisciplinary in nature and trained scientists from many fields find challenging and worthwhile problems to undertake. The program is managed as an integral part of the much broader program for atmospheric sciences, for weather modification is inseparable from the field of meteorology as a whole.

Under the NSF Weather Modification program some 37 individual research studies are now underway, mostly at university research centers. They range from a carefully designed field research effort at the University of Arizona where the objective is to determine whether aerial silver-iodide seeding can modify the cumulus clouds that form over the Santa Catalina Mountains of southeastern Arizona, to a planning conference at the South Dakota School of Mines and Technology where scientists and educators outlined a program of weather modification research for the Black Hills area of South Dakota. Other projects supported include a U.S. Weather Bureau investigation of the number and variation of freezing nuclei in the atmosphere and their relationship to global patterns of heavy rainfall, and a series of experiments by scientists from

Arthur D. Little, Inc. and the University of Illinois to find out how artificially induced electrical space charges affect the growth of cumulus clouds during the summer over an extensive weather station network in central Illinois.

Countries other than the United States are also conducting research and attempting to develop methods and techniques of weather modification suitable to their problems. For the first time all the known activity throughout the world was described and published in the NSF Third Annual Report on Weather Modification. The material for each of the national program reviews was supplied for the most part by scientists conducting research work in the countries themselves. Information on the USSR and Communist China was derived from scientific articles published in the open literature.

In fiscal year 1962, fifteen grants totalling $1.3 million were awarded for research in weather modification. The fourth annual report on weather modification, covering fiscal year 1962 activities, will be released shortly.

National Research Centers

Major national research centers are maintained by the Foundation in three important and rapidly developing fields of science—optical astronomy, radio astronomy, and atmospheric sciences. These centers have been established to provide essential facilities that U.S. colleges and universities, for reasons of cost or location, could not provide. Government installations funded through the Foundation, the three centers are managed by independent nonprofit corporations made up of groups of universities; they are available to all qualified United States scientists, and to visiting foreign scientists, subject to priorities based on scientific merit and feasibility of the proposed research. The centers provide facilities for both staff scientists and for university scientists who wish to supplement their campus-based research.

KITT PEAK NATIONAL OBSERVATORY

A considerable amount of major construction was completed during the fiscal year at this optical observatory, including most notably the 300-foot solar telescope, largest and most advanced such telescope ever built. The first solar image, 34 inches in diameter, was obtained on October 31, 1962, just two days before the dedication of the instrument. (See photo, page 68.)

This instrument has been named the Robert R. McMath Solar Telescope, in memory of the famous University of Michigan astronomer who, as first chairman of the Association of Universities for Research in Astronomy, Inc. (AURA)—the organization that operates Kitt Peak for NSF—was largely responsible for conceiving and bringing to fruition this project. The structure consists of a 110-foot high pedestal, a 500-foot inclined tunnel, much of which is underground, and an underground observing room with 70-foot deep pit for vacuum spectrographs. The telescope is equipped with preliminary optics including a 63-inch quartz flat for the heliostat and a 63-inch concave aluminum image-forming mirror with a 300-foot focal length.

Ten months of polishing and figuring on the primary mirror for an 84-inch stellar telescope came to a successful end during the year, and the mounting for the instrument was installed in the dome atop Kitt Peak. The mirror has been shown in shop tests to be extremely accurate—good to 1/20 wavelength up to its extreme edge. Additions to the Tucson headquarters building of the observatory were also finished during the year, and occupied by the solar and space divisions. A public highway to the observatory, designed and built under the auspices of the U.S. Bureau of Public Roads, was also completed.

The 36-inch telescope was during fiscal year 1962 the major instrument in operation at Kitt Peak. It has been used primarily for photometric studies. A 16-inch telescope was also installed on the peak, and is now in regular use in programs of photoelectric photometry.

Time for observing runs on the 36-inch telescope was scheduled for 13 visiting astronomers and 5 graduate students (202 nights), with staff astronomers and assistants assigned 153 nights. Among the programs carried out by visiting scientists were the observation of nearly 100 calibration stars and 20 galaxies in 12 spectral regions as part of a University of California project; the establishment of photometric standards by an astronomer from The Observatories, Cambridge, England, in regions of the Praesepe and Coma clusters; and photoelectric photometric observations by a visitor from the Institute for Advanced Study, Princeton, New Jersey. Close cooperation was maintained with visiting astronomers from the nearby University of Arizona, with four projects being carried on at Kitt Peak during the year by members of the Steward Observatory staff.

Spectroscopy and photometry occupied the major portions of the observing time of the staff astronomers. In addition, the Observatory's digital computer was used in an investigation of optical designs for telescope mirror systems and for astronomical instrumentation. A new spectral atlas is being compiled jointly by a Kitt Peak astronomer and an astronomer from the Steward Observatory of the University of Arizona.

Preliminary design and engineering studies of a 150-inch reflecting telescope are under way, and a program of rocket astronomy using Aerobee-borne photometers and spectrometers is planned. Instrument packages are also being prepared for inclusion in deep space probes of the National Aeronautics and Space Administration.

NATIONAL RADIO ASTRONOMY OBSERVATORY

Located at Green Bank, West Virginia, this scientific laboratory is presently operating a 300-foot radio telescope (completed in September 1962), an 85-foot fully steerable radio telescope, and several smaller instruments including a 40-foot automated dish, a 20-foot telescope, a 12-foot telescope, and a 120-foot standard-gain horn antenna. A 30-foot instrument is used for continuing interference measurements. Construction of a 140-foot fully steerable radio telescope was resumed in May 1962, with award by Associated Universities, Inc., which operates the facility for NSF, of three contracts for fabrication and erection of components for the instrument.

In September 1962, Dr. D. S. Heeschen was appointed Director of the Observatory. Dr. Heeschen had previously served as Acting Director following the retirement of Dr. Otto Struve in December 1961.

Successful completion of the 300-foot "transit" telescope has given scientists at NRAO the world's largest movable radio telescope. Not a fully steerable dish, the parabolic reflector can be moved in a north-south direction only. Observing procedure is to point the instrument at the area of sky to be studied, and allow rotation of the earth to carry the radio source through the telescope's beam. During this "transit", the data are automatically recorded on paper charts, printed out, and punched at high speed onto tapes for subsequent analysis in a digital computer.

Test observations with the telescope began September 20, 1962, and were so successful that a full program of research was immediately started. For the first series of observations, instrumentation has been installed to make possible the recording of two radio frequencies simultaneously.

The 40-foot transit telescope was completed during the winter, and regular daily observations began in March 1962. The telescope, receivers, and calibration signals are all automatically controlled by a digital control system.

Research programs carried out by the observatory staff included planetary observations (Venus, Saturn, Jupiter) galactic studies, atmospheric effects, and work on information theory.

The full time scientific staff of the observatory reached 10 on June 30, 1962, with additional staff in engineering, operation of telescopes, research assistants and technicians, operation, maintenance, clerical, and administrative employees. Approximately 30 graduate and undergraduate students in astronomy, mathematics, physics, electronic engineering, and related fields spend an average of three months each at the Observatory during the year, in addition to the frequent visits by established scientists for research purposes utilizing the NRAO facilities.

NATIONAL CENTER FOR ATMOSPHERIC RESEARCH

During fiscal year 1962 the National Center for Atmospheric Research, at Boulder, Colorado, made a vigorous beginning toward fulfilling its role in the advancement of atmospheric science research. Operated for the Foundation by the University Corporation for Atmospheric Research, it is designed as a center for interdisciplinary investigation of fundamental processes in the atmosphere, including influences on it from below (the ocean and ground surfaces), and from space (particularly the sun).

As an institution in which men with many varying scientific specialties work in close cooperation and proximity, NCAR hopes to achieve substantial progress in improving existing theory concerning the atmosphere and its behavior, essential prerequisite to a better understanding of the factors affecting changes of weather and climate over various time periods. Such a theory is also essential to a realistic assessment of the extent to which weather modification or control may be possible. Long-range research programs now under way at NCAR may also produce theoretical bases that will assist researchers in attaining solutions of other atmospheric problems.

The research program of NCAR is pursued in two closely affiliated laboratories: the Laboratory of Atmospheric Sciences, which was established during fiscal year 1962, and the High Altitude Observatory, which was founded in 1946 and merged with the University Corporation for Atmospheric Research in December 1961. Within these laboratories, research efforts are organized around the work and interests of individual senior program scientists.

In the Laboratory of Atmospheric Sciences, research efforts under the direction of seven senior scientists and their assistants are now under way.

The laboratory's research is divided into four broad problem-area categories: dynamical aspects; thermodynamical, chemical, and physical aspects; interaction between the atmosphere and the underlying ground or ocean surface; and interaction between the terrestrial atmosphere and astrophysical phenomena. During the summer of 1962 a visitor program was carried out, with 18 scientists participating.

The High Altitude Observatory brings to NCAR an outstanding group of scientists whose chief research efforts, on solar-terrestrial effects, will complement and extend the work of the Laboratory of Atmospheric Sciences. HAO has a staff of about 75 persons, of which 15 are independent program scientists at the Ph. D. level or equivalent, and an additional 35 in the scientific and professional category. HAO operates an observing station at Climax, Colorado, a radio astronomy observing site north of Boulder, and a central headquarters on the campus of the University of Colorado. It is supported by a variety of private and Government sources.

The Center moved into new temporary quarters in Boulder in May 1962, in a building leased from the University of Colorado. Architectural plans are being prepared for construction of a permanent facility on the Table Mountain site just outside Boulder. This beautiful site of 570 acres was donated to the Foundation by the people of the State of Colorado, through their State legislature, as a permanent site for the NCAR headquarters.

The first of the NCAR national programs, the scientific balloon program, is approaching a level of operation where it can make significant contributions to a national scientific need. A year-round facility devoted exclusively to scientific balloon flights has been constructed at Palestine, Texas, and is known as the National Scientific Balloon Flight Station. Completed during the summer of 1962, it will be the location of the STRATOSCOPE II balloon-borne telescope flights of Princeton University in 1963 and following years, as well as other scientific balloon projects now planned by a number of institutions. The station was established as an integral part of a program to stimulate improvement in balloon technology for use in scientific experiments, and to make balloons more readily accessible to scientists who need their unique ability to float a large platform for heavy instruments at high altitudes over a long period of time.

A two-story prefabricated operations and laboratory building and asphaltic concrete launching area was completed during 1962, and a "Stratoport" erected to house the Princeton University 36″ Stratoscope telescope.

GRADUATE-LEVEL RESEARCH FACILITIES

Graduate laboratories are used principally by faculty members and their research associates for the conduct of their scientific investigations. They have a further important use in that they serve the needs of graduate and postdoctoral students working on thesis or independent research problems. A considerable portion of the research supported by the Federal Government is conducted in these laboratories. Therefore, with the increasing level of Federal research support being provided, and the growing need for scientific knowledge and research training that results from investigations being conducted in these laboratories, it is of utmost importance that they be maintained at maximum productivity.

Most of the laboratories for graduate-level research, however, are outmoded and overcrowded. The rapid technological advances of the last few years, the tremendous increases in the volume of research being conducted, and the growing numbers of students striving to enter graduate training in the sciences have combined to tax existing facilities far beyond their operational capacities. At the same time the financial resources of most institutions of higher learning are being strained to the utmost to meet the constantly rising costs of operating their total educational programs. The result is that these expanded facility needs cannot be provided from funds now available to the institutions; additional outside assistance is urgently required. The Foundation, through this program, is providing limited support to colleges and universities so that they can partially undertake the needed expansion and upgrading of these graduate facilities.

Initially, only university departments with on-going doctoral training in science or engineering were eligible for support. In January 1962, the program was expanded to include: (1) institutions offering the master's degree with the requirement of research participation and a thesis, and (2) non-profit research institutions having arrangements for graduate training with degree-granting institutions. Provision was also made for general purpose laboratory equipment in an amount not to exceed 10 percent of allowable construction costs.

In fiscal year 1962 a total of $26 million was awarded for graduate-level facilities.

In the life and social sciences, the major portion of the grants were made in the animal and plant sciences, while in the physical sciences by far the greatest share was for chemistry, physics, and engineering.

The number of proposals for new construction as compared to those for renovation shows a continuing upward trend. Facilities being planned seem to involve to a great extent construction of large buildings.

The size of requests cover a wide range from $1,100 for fixed equipment for a two-room botany laboratory and $2,000 for the remodeling of one room for work in atmospheric sciences to $2.2 million for construction of a building for the behavioral sciences and $3.1 million for an addition to a chemistry building.

Well over half of the 1962 fiscal year grants were for amounts of less than $50,000. The two largest grants were $1.6 million for the construction of a 7-floor life sciences building and $1.4 million for the construction of a 15-story behavioral sciences building.

SPECIALIZED BIOLOGICAL AND MEDICAL SCIENCES RESEARCH FACILITIES

This program is designed to support installations that are unique in the sense of geographical location, purpose, regional usage, or a combination thereof, and that are not usually a part of the normal departmental organizational structure of colleges or universities. There is no fixed requirement as to the amount of funds which the institution must itself raise before becoming eligible. In some instances the Foundation provides the full cost.

The specialized facilities program provides support for: (1) maintenance of research materials, including museum research collections, genetic stock centers, and repositories for special research materials; (2) maintenance and operation of research installations, including field stations, marine biology stations, special university laboratories or institutes, and other private nonprofit laboratories; and (3) development of new facilities, including unique designs of existing types of facilities, special applications of such complex tools as computers and reactors, and new departures.

Twenty-eight grants totaling $3.1 million were awarded during 1962 in this program. The following are examples of the awards made. A grant was made to the University of Michigan to establish a major facility for research in animal biosystematics. The facility will consist of a 31,000-square foot wing addition to the existing Museum of Zoology. This wing will contain controlled environment, photo-period, and acoustical rooms, animal maintenance facilities, biochemical laboratories, and other special features designed to permit application of the latest techniques of biochemistry, physiology, genetics, and behavioral science to the field of systematics.

Two grants were made for special research facilities at the University of California, Davis, and at Washington State University. The first is for an animal centrifuge laboratory designed to permit study of chronic acceleration effects. The second is for a controlled-environment irradiation facility for the study of the effects of radiation on plant structure and function. Two biological field stations received grants for construction and improvement of their research facilities: Mountain Lake Biological Station of the University of Virginia and the University of Colorado Science Lodge. In both instances the additional facilities will permit a modest expansion of the research programs involving both local and visiting scientists.

Grants were made to small marine stations, the University of Florida Marine Station and the Walla Walla College Biological Station, for acquisition of motor boats in the 32 to 40-foot range for marine biological research. One will be newly constructed and the other converted from a fishing vessel.

In addition to such aid to small marine stations, two grants were made for the development of the biological phases of marine and oceanographic research. (For details see section on "Oceanographic Research Vessels and Facilities", page 61.)

UNIVERSITY COMPUTING FACILITIES

This program provides partial support for the rental or acquisition of high-speed computers of advanced design at universities for use in basic research and available to all departments of the university. Computers are proving of ever-increasing value as tools for research and training in virtually every imaginable scientific field. The need for these tools is accelerating rapidly, for as the speed and power of computers rise, problems previously insoluble because of their complexity and magnitude become susceptible to solution.

The Foundation has made grants to assist our educational institutions to acquire computers of all sizes—from the small to the very large.

In selecting institutions to support under this program, the Foundation uses the following criteria: (1) weighing the capacities of the institution's staff to develop the proposed computing center as an important adjunct to basic research; (2) selecting institutions with due regard to achieving good geographic distribution in terms of the needs of the scientific community; and (3) requiring institutions to indicate a plan for self-support of the facility as well as to demonstrate a capacity to provide the other capital funds needed.

In fiscal year 1962, 11 grants were made totalling $2,975,000.

UNIVERSITY NUCLEAR RESEARCH FACILITIES

Recent advances in the theoretical description of the atomic nucleus, together with recent design improvements in cyclotrons and Van de Graaff accelerators, have resulted in the development of a program for establishing and improving low-energy nuclear physics research facilities.

The theoretical advances have resulted in a need for refined measurements of energy levels, spin assignments, and other characteristics of the nucleus so that the synthesis of current theoretical models can be further advanced. Many of these refined measurements are now possible through extension of Van de Graaff accelerator ranges to particles with energies of up to 20 MeV (million electron volts), and improvements in cyclotron design to permit well-controlled beams up to 40 MeV. Until about five years ago Van de Graaff accelerators were restricted to energies less than 8 MeV.

This year the Foundation made a group of 8 grants, totalling $6.2 million, in furtherance of the new program. These eight accelerators are expected to play an important role in the Nation's effort in nuclear structure physics.

OCEANOGRAPHIC RESEARCH VESSELS AND FACILITIES

The 210-foot research vessel, *Atlantis II,* launched in September 1962, is one of the very few designed specifically for oceanographic research. The ship, built with funds provided by the National Science Foundation, is to be used by the Woods Hole Oceanographic Institution. After a few trial cruises, it will be assigned for duty in the Indian Ocean as part of the International Indian Ocean Expedition.

Approximately $6 million was provided in fiscal year 1962 for smaller craft, shore facilities, and buoy systems. Grants were made to the Scripps Institution of Oceanography for a special biological research vessel and a related shore laboratory which will contain a circular towing tank for underwater studies of marine organisms and man, also for a hydraulic laboratory; to Johns Hopkins and Oregon State universities for oceanographic laboratory buildings; to A & M College of Texas for conversion of an Army freighter (FS) into an oceanographic research vessel; and to Woods Hole Oceanographic Institution for a laboratory of chemical and biological oceanography.

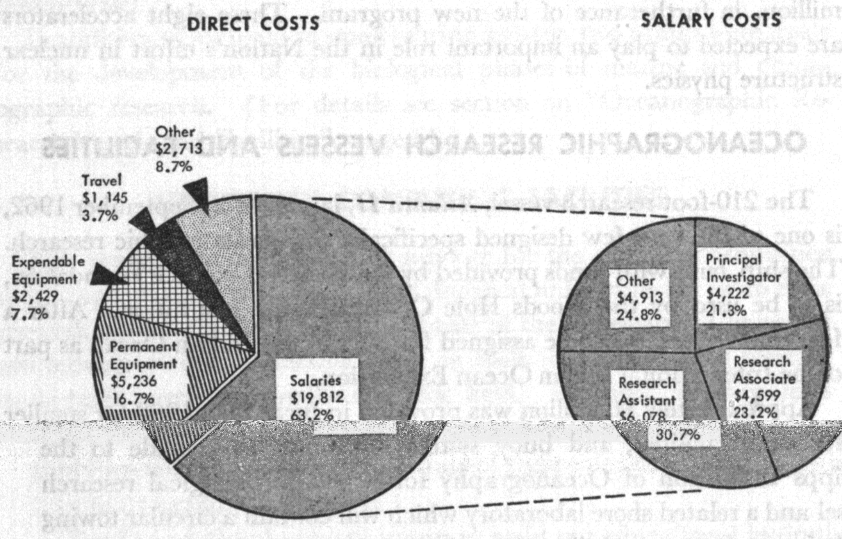
The USNS *Eltanin* joined the U.S. Antarctic Research Program during the fiscal year. Owned and operated by the Military Sea Transportation Service, the former cargo ship was converted by the Foundation into a multi-discipline research vessel. A description of its role in Antarctic research is described on page 47.

Fiscal Analysis of Research Programs

Grants for support of basic research totaled 2,572 in fiscal year 1962 and were awarded to 381 institutions throughout the United States and its possessions. Research obligations amounted to $157 million—$96 million for research grants, $47 million for facilities, $10 million for national research centers; plus $4 million for the Indian Ocean Expedition and Project Mohole.

Research grants in 1962 averaged $36,822 for a period of slightly less than 2 years. Grants in the mathematical, physical, and engineering sciences averaged $41,616; in the social sciences, $34,389; and in the biological and medical sciences, $31,842.

The accompanying table summarizes the research grant program by subject categories. A detailed list of grants showing institution, principal grantee, title of project, duration and amount is given in Appendix C.



Note: Based on Average grant of $36,822.

Figure 1. *Distribution of Research Grant Funds, by Type of Expenditure, Fiscal Year 1962.*

Table 1.—*National Science Foundation Grants, By Fields of Science, Fiscal Year 1962*

Field	Number	Amount
Biological and medical sciences:		
Developmental biology	83	$3, 012, 300
Environmental biology	144	3, 961, 400
Genetic biology	80	3, 149, 212
Metabolic biology	119	4, 365, 850
Molecular biology	161	6, 977, 100
Psychobiology	98	2, 545, 700
Regulatory biology	150	4, 599, 600
Systematic biology	186	3, 149, 850
General biology	20	1, 390, 070
Subtotal	1, 041	$33, 151, 082
Mathematical, physical and engineering sciences:		
Astronomy	73	3, 332, 600
Atmospheric sciences (including weather modification)	74	5, 395, 412
Chemistry	259	8, 003, 285
Earth sciences	171	6, 313, 130
Mathematical sciences	203	7, 054, 245
Physics	170	10, 745, 300
Engineering sciences	242	8, 844, 825
Subtotal	1, 192	$49, 688, 797
Social Sciences:		
Anthropological sciences	94	2, 184, 545
Economic sciences	36	1, 995, 550
History & Philosophy of science	27	668, 100
Sociological sciences	65	2, 945, 950
Subtotal	222	$7, 744, 145
Antarctic research (life & physical sciences)	117	5, 448, 516
TOTAL	2, 572	$96, 082, 540

INSTITUTIONAL GRANTS

Institutional grants assist colleges and universities in developing and balancing their programs of research and education in the sciences. These grants provide flexible support, which enables institutions to move freely in the strengthening of neglected or emerging areas of their scientific activities and to correct imbalances that result from the large amount of Federal money granted for specific research projects.

The Foundation recognizes that a college or university is in the best position to determine the means by which it can strengthen its scientific endeavors and thereby contribute to the progress of science. Educational institutions must have independence of choice and economic capability in order to reach their educational goals. The responsibility for the administration of institutional grants, therefore, resides in the colleges and universities which receive them. With the limitation that they must be expended for science and science-related activities, institutional grant funds may be used at the discretion of recipient institutions.

Preliminary reports from the recipients of 1961 institutional grants show three main kinds of uses of the funds: (1) faculty research grants, (2) purchase of equipment for research and teaching, and (3) provision for institution-wide scientific needs. The reports testify to the value of the new program and commend the Foundation for its recognition of the principle of institutional freedom and its simplified procedures for the administration of the grants.

In 1962 colleges and universities receiving basic research grant payments from the Foundation during the year April 1, 1961–March 31, 1962 were eligible to apply for Institutional Grants. The following formula was used for computing grants made during 1962: 100 percent of the Foundation's basic research grant payments up to $5,000, plus 5 percent of such payments in excess of $5,000. The maximum grant to any one institution was limited to $50,000.

Grants totaling $3,730,634 were made to 302 institutions in 1962. Grants were made to colleges and universities in every State, the District of Columbia, and Puerto Rico. Seventeen of the grants were for the maximum amount. More than half (167) were for $6,000 or more.

NATIONAL SCIENCE FOUNDATION

A Photographic Sampling of Foundation-Supported Activities

Photo Credits

Page 67: Shinya Inoué, Dartmouth College. Pages 68 and 69: NSF Photos. Page 70: Photographs copyright 1962 (c) Jerome Halberstadt. Page 71: NSF Photos from Archie Carr, University of Florida. Page 72: University of Wisconsin. Page 73: (Top) NSF Photo; (Bottom) Stanford University. Page 74: (Top) William Long; (Bottom) NSF Photo by Tom Nastos, U.S. Weather Bureau.

Special Microscope Shows Living Cells in Process of Division

Mitotic division, the process whereby a cell divides and the genetic material is transferred from the old cell to the two new cells, is shown clearly in this remarkable plate obtained by an NSF grantee Shinya Inoué of Dartmouth College. Using a special polarizing microscope, the photo shows a living cell (isolated from the fruit of the African blood lily) actually undergoing nuclear division. The dark chromosome pairs that are just about to separate, and the bright spindle fibers that will pull the chromosomes apart, can both be clearly seen.

Time-lapse motion pictures of these cells taken through the polarizing microscope show how the molecules in the spindle fibers behave during cell division.

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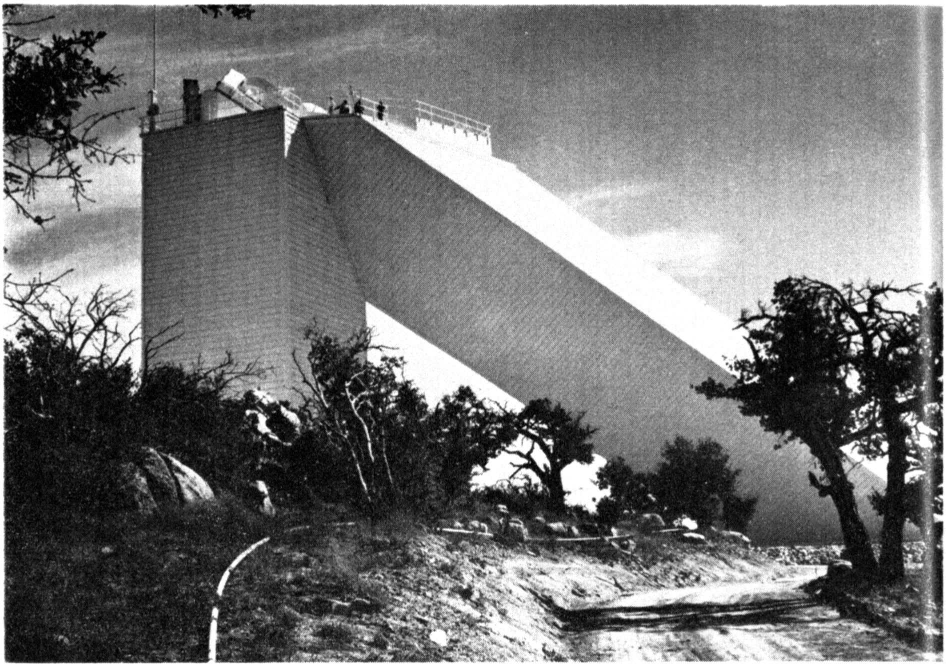
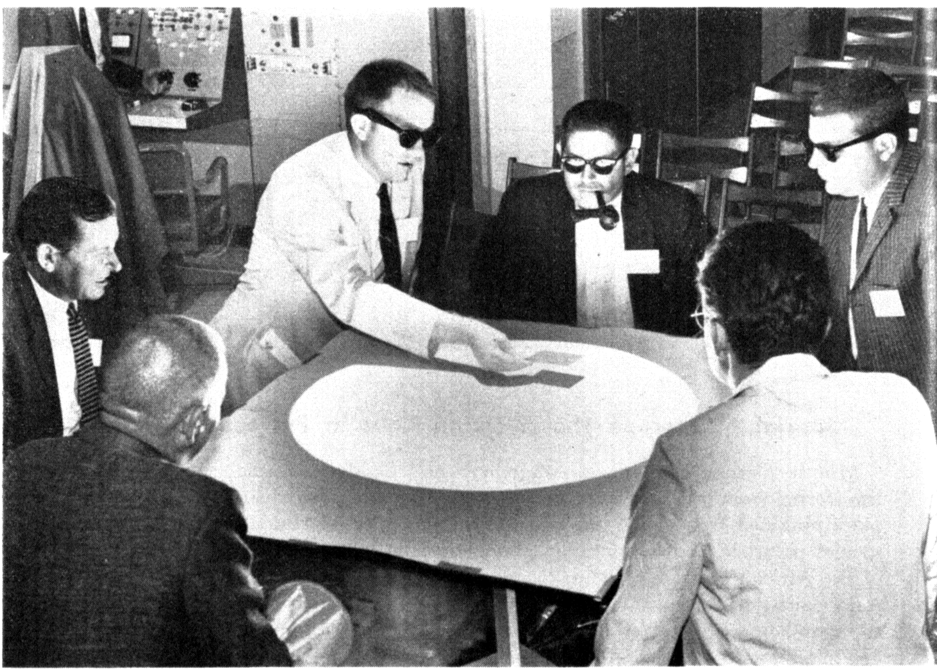
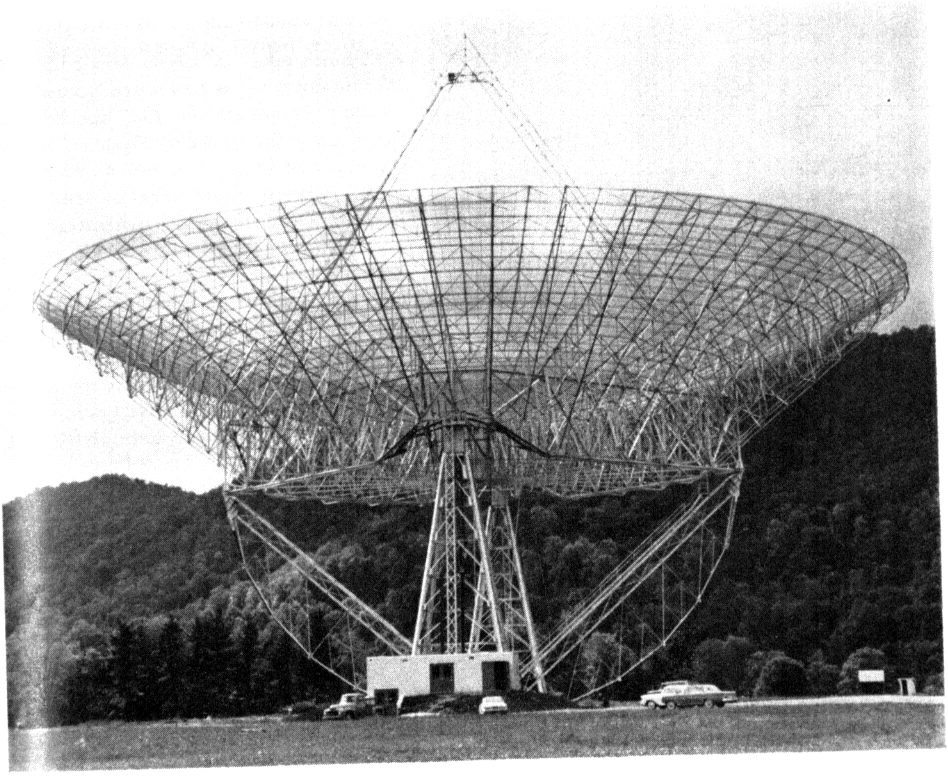






Important New Research Tools for Astronomers

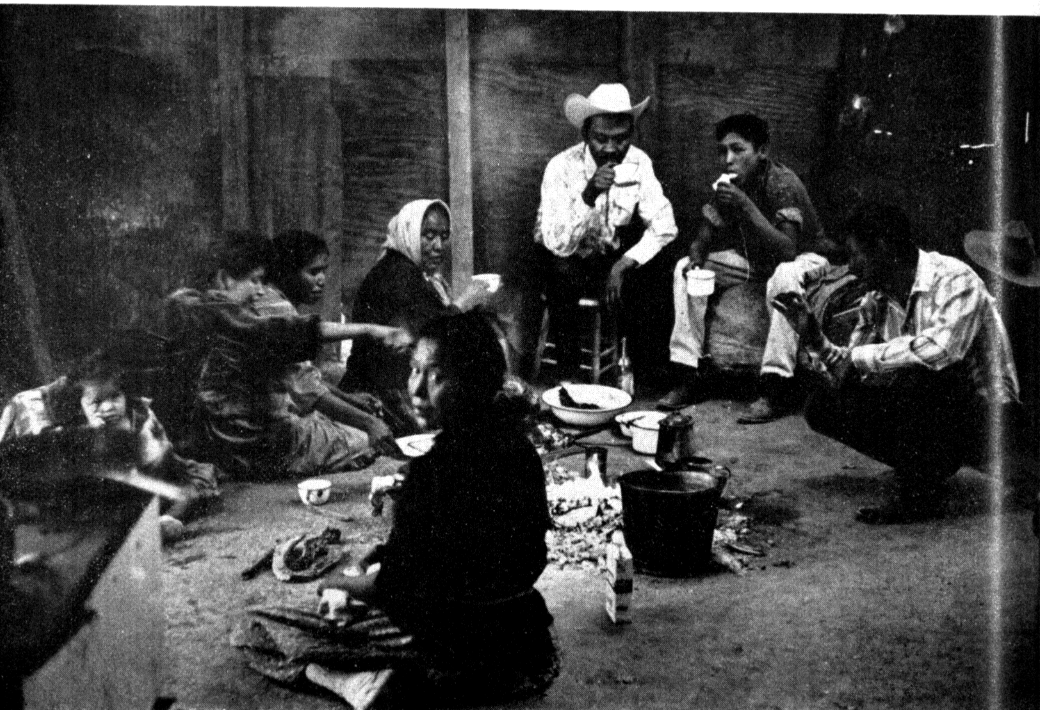
Completion of the 300-foot transit radio telescope (above) at the National Radio Astronomy Observatory in September 1962, was followed by a short testing period after which a full research program was immediately started. At present the largest movable radio telescope in the world, it is instrumented to record two radio frequencies simultaneously, and began observations on the planet Jupiter.

On Oct. 2, 1962, the 300-foot solar telescope at the Kitt Park National Observatory was dedicated (photos at left). Also the largest instrument of its type in the world, it produces images of the sun 34 inches in diameter in its underground observing room; one of the first of such images is shown in the lower photo, being observed by astronomers and visitors on dedication day. It is hoped that with this instrument, the true physical properties of the small-scale structure of the sun can for the first time be determined.

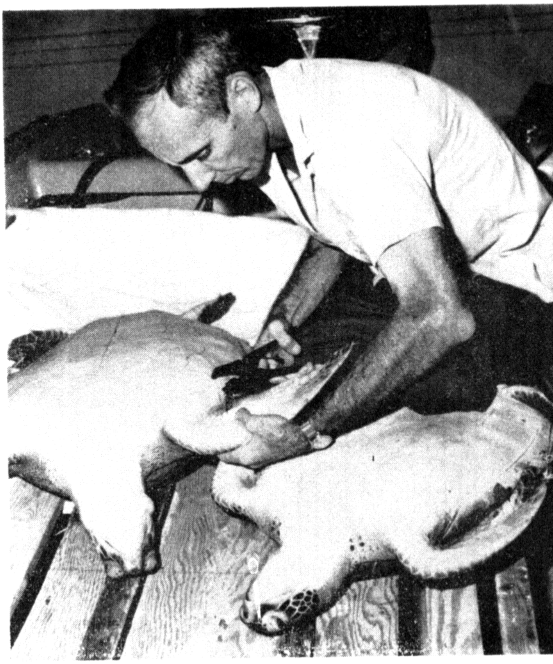
The National Radio Astronomy Observatory is located at Green Bank, West Virginia, and the Kitt Peak National Observatory is near Tucson, Arizona. Both are national research laboratories sponsored and funded by the Foundation. For further information, see page 53.

Field Institute in Anthropology

Photos taken in a New Mexico Navaho community, as part of a study conducted by the Harvard-Columbia Special Field Institute in Anthropology. Graduate students in ethnology and social anthropology spent three months under the guidance of a senior scientist, working on the history, habits, cultures, and religious ceremonies of Navaho, Zuni, Laguna, Acoma, and Hopi Indians. Interviews with the Indians, who received remuneration in return for their information and assistance, were carried on with the aid of an interpreter. These photos show preparation of a sheep hide (left) and a family group during mealtime.



Sea Turtles Provide Clues to Understanding Animal Orientation



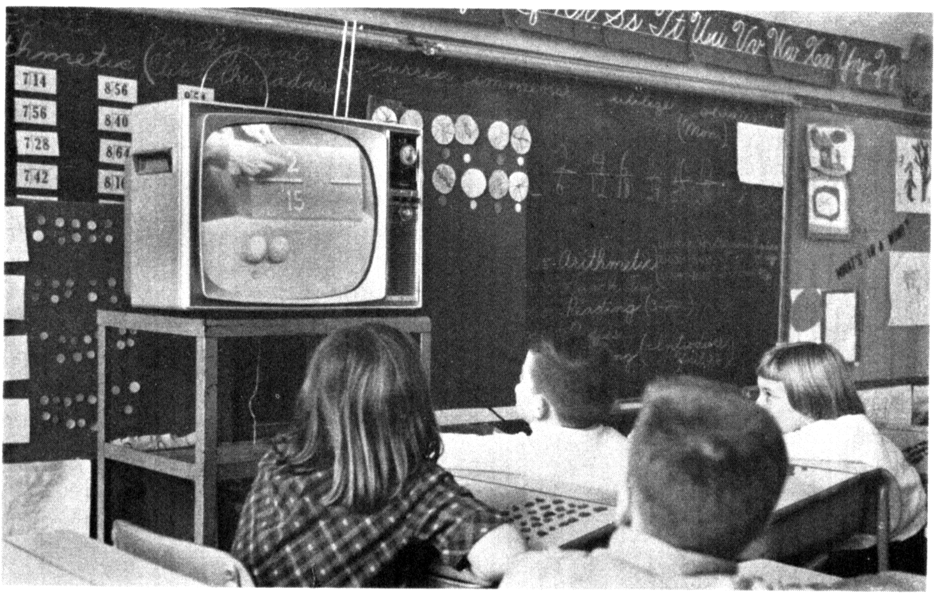
The marine green turtle appears to be one of nature's champion navigators. Turtle migration throughout the Caribbean, and between Brazil and tiny, isolated Ascension Island in the south Atlantic, probably involves celestial navigation. Work on the behavior, movement, and ecology of the five genera of sea turtles indicates that there is much to be learned about their highly developed travel-orientation senses. These photos show the NSF grantee tagging a year-old specimen (top right), and female green turtles trudging toward the sea after nesting, on Ascension Island.

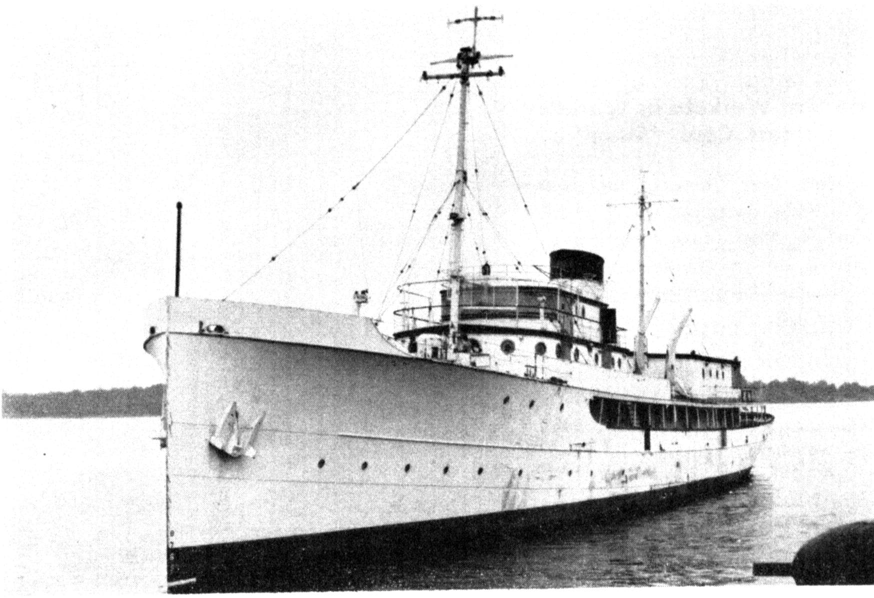
Arithmetic by Television: Teacher

A Project Associate and Television Teacher presents sets of equivalent number pairs, for a fourth grade arithmetic class in Madison, Wisconsin. This is part of an effort to establish a sound basis for teaching a modern arithmetic curriculum in elementary schools through the use of television.

Arithmetic by Television: Students

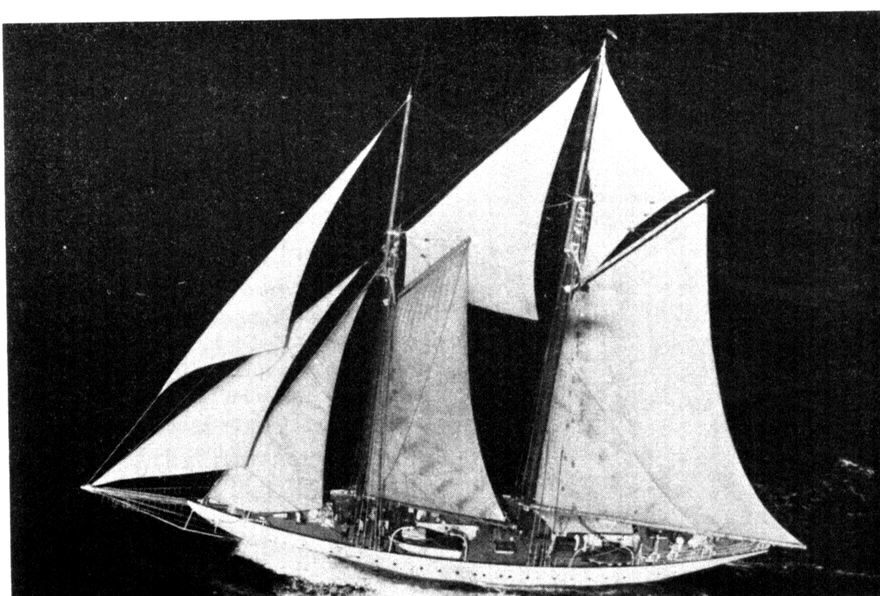
A fourth grade arithmetic class at Nichols School, Madison, Wisconsin, watches a television lesson in arithmetic. Sets of equivalent number pairs are being discussed. The program, an NSF-sponsored project of the University of Wisconsin, is also used in grades 5 and 6. Telecast in Madison and Milwaukee, it has also been used in Racine and other Wisconsin cities, with the cooperation of WHA–TV and WMVS. In view of the vast number of elementary schools and teachers, it is believed by the project participants that television is an excellent medium through which new concepts can be presented directly in the classroom.





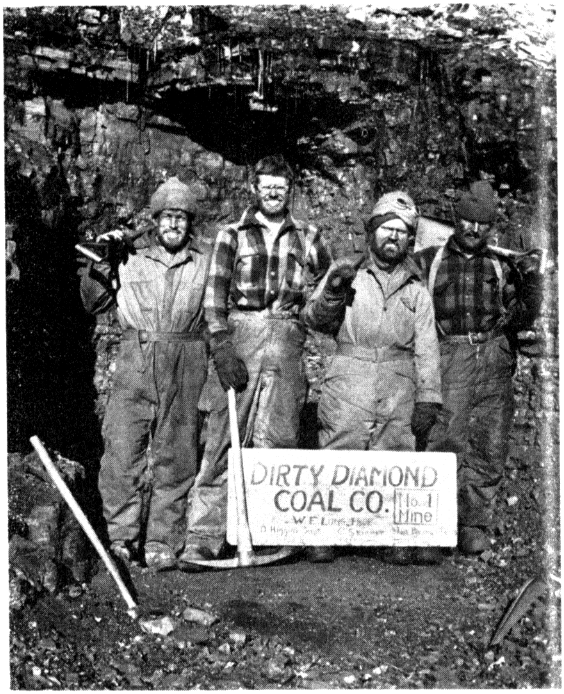
Laboratory and Classroom Afloat

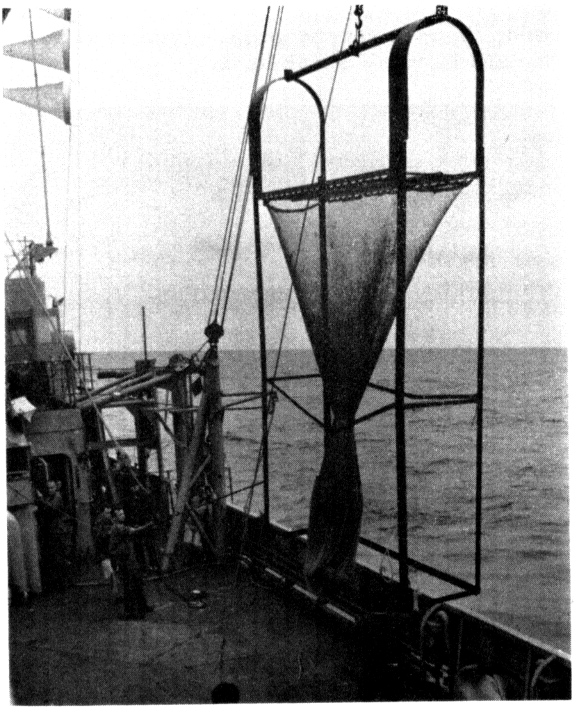
Formerly the Presidential yacht *Williamsburg,* the newly named *Anton Bruun* (above) has been made available to NSF as a floating biological research laboratory for the International Indian Ocean Expedition. The *Te Vega* (below), a 135-foot schooner formerly used in the West Indies as a pleasure yacht, has been chartered by Stanford University as a floating classroom for the graduate training-research program of the Hopkins Marine Station, with the aid of NSF grants.



Modern Workers in World's Coldest Coal "Mine"

These four "miners," members of a field party in the Central Horlick Mountains, Antarctica, carried out a geological reconnaissance project as part of NSF's U.S. Antarctic Research Program. In a coal bed about 350 miles from the South Pole, they excavated to a depth of about 20 feet and recovered coal samples less weathered than any hitherto taken in the Antarctic.





Antarctic Research at Sea

The USNS *Eltanin,* converted to a seagoing research laboratory, has begun a series of scientific cruises during which scientists from many different institutions and many different disciplines can undertake fundamental research. This photo shows a huge beam trawl hauled aboard, from a depth of 20,000 feet, to be emptied for specimens of ocean bottom sediment and marine life. The nets in upper left are part of another project, investigating air-borne insect distribution.

EDUCATION IN THE SCIENCES

The Division of Scientific Personnel and Education continued in 1962 to support those activities which appear to have the greatest potential for improving science education in the United States. These include: further training of scientists and science students, supplementary training for teachers of science, mathematics, and engineering, improved course content and instructional materials, and various special projects in science education designed to assist individuals and institutions in improving their capabilites.

Continued and increased support was provided for established programs; new programs were introduced; the level of support was raised for promising experimental projects; and greater emphasis was placed on exploring and planning new approaches for existing institutions in upgrading science education. Approximately $88 million was obligated in fiscal year 1962 for education programs. Participation of institutes, teachers, and students in these programs increased considerably during the year. A total of 625 institutions, scientific societies, and comparable organizations were awarded grants to conduct such programs. Fellowships offered increased to 4,800. Approximately 40,800 opportunities for scientific study were made available at teacher-training institutes. A total of 15,000 undergraduate college and high school students participated in various NSF-supported training programs during the year.

Among the special projects in science education receiving noteworthy attention during the year was the new Undergraduate Instructional Scientific Equipment Program. This program was designed to assist institutions with the purchase—on a matching fund basis—of new and modern scientific equipment for improvement of science teaching at the undergraduate level. The demand for such funds far exceeded the supply.

The success of course-content improvement projects at the secondary school level has stimulated great interest in similar efforts for the elementary, junior high school, and college levels, and for certain specialized fields of science. The Foundation during 1962 has been conducting exploratory and feasibility studies before embarking on major programs in this area.

Special Projects in Science Education

The Foundation's efforts in experimental testing and development of promising new directions in science education are centered in the activities of Special Projects in Science Education. Here new ideas are constantly being conceived, designed, developed, tested, and evaluated. Even those current activities which have become well established, with comparatively long histories and national acceptance, have either experienced major changes this year or will undergo major changes next year.

Four major program categories are administered under Special Projects in Science Education: Undergraduate Science Education Programs, Research Participation and Scientific Activities for Teachers, Specialized Advanced Science Education Projects, and Secondary School Programs.

UNDERGRADUATE SCIENCE EDUCATION PROGRAMS

The several Undergraduate Science Education Programs offer unique opportunities to undergraduate institutions to improve the quality of education in the sciences. The three programs described below are intended to prepare the Nation's most able undergraduates to understand and contribute to the ever-expanding realm of science.

Undergraduate Science Education

The Undergraduate Science Education Program supports at colleges, universities, and non-profit research institutions a number of activities which have been designed to provide special opportunities for the scholarly development of outstanding undergraduates interested in the sciences. The program is aimed at developing new and expanded means for such undergraduates to advance in their understanding of science and in their ability to employ effective investigative procedures.

Through the research participation aspects of the program, able undergraduates are brought into direct contact with research and research scientists. It is intended that this research experience will stimulate the participant into developing fully his potential for scientific research and college teaching. The program also permits novel approaches to fostering independent study by individuals. It is recognized that regular undergraduate courses may not provide the high-ability undergraduate with the challenge or variety of experiences which he may gain from working independently.

In addition to the mathematical, physical, medical, biological, and engineering sciences, areas of the social sciences such as anthropology, sociology, psychology, and economics and the history of science are included in the program. During 1962 the interest in mathematics and the social sciences increased appreciably.

The growing interest of the academic community in the Undergraduate Science Education Program is evidenced in part by the increasing number of requests for support submitted to the Foundation. In 1962, 551 grants were approved, providing opportunities for 6,500 undergraduates.

With each year of operation, the evidence of this program's success becomes more convincing. Research reports by Undergraduate Science Education participants (as either sole authors or co-authors) have become a common occurrence in major scientific journals. It is also significant that two Undergraduate Science Education participants were named Rhodes Scholars in 1961 and that one of the top ten undergraduates in the country named by *Newsweek* in 1961 was an Undergraduate Science Education participant.

Undergraduate Instructional Scientific Equipment Program

The Undergraduate Instructional Scientific Equipment Program, initiated in fiscal year 1962, was established to assist colleges and universities offering baccalaureates in the sciences by providing funds for the purchase of scientific equipment for undergraduate instruction. These funds, up to $25,000 per proposal, are granted on a matching basis. Proposals are allocated to institutions on the basis of the number of their science graduates, from one proposal for the smallest institution to six for the largest.

Priority was given to those teaching units where recognition of the need for improvement of the content and focus of undergraduate courses was accompanied by adequate staffing and supported by detailed and realistic planning. Need alone, unsupported by thoughtful assessment of the present and future positions of the disciplinary unit, did not qualify an institution for support.

The urgent need for this program and the great interest in it were evidenced by the fact that 783 institutions submitted a total of 1,127 proposals (over 70 percent of the eligible institutions applied) requesting over $16,000,000 in funds. Grants totaling $5,010,180 were made in support of 334 proposals from 263 institutions, representing approximately 30 percent of the requests for support.

Supplementary Training for Undergraduates

Worthy projects which are directed toward the improvement of science instruction for undergraduates but do not follow the format of the Undergraduate Science Education Program are supported as supplementary training for undergraduates. Conferences to study undergraduate curricula requirements in particular disciplines, the provision of teaching experience for undergraduate science majors, and unusual faculty-student conferences represent the types of activities supported under this program.

Among the grants made last year was one in support of the Conference on Undergraduate Research in Mathematics. The Foundation has been informed that the Committee on Textbook Selection of the International Congress of Mathematicians selected this conference report for display at the International Congress at Stockholm.

SPECIAL REPORT ON THE UNDERGRADUATE INSTRUCTIONAL SCIENTIFIC EQUIPMENT PROGRAM

Great advances in the state of knowledge in the sciences have motivated many educational institutions to re-examine their courses of study in undergraduate science. The need for this examination has been accentuated not only by an increasing number of student enrollments, but by recent developments such as:

(1) Increased quality of instructional materials available in science and mathematics at the secondary school level, accompanied by increased subject-matter competence among secondary school teachers of science and mathematics.

(2) Rapid expansion of the volume of scientific and technical knowledge—with the corresponding increase in the rate of obsolescence of college courses.

(3) Increased experience with various programs which demonstrate the capacity of able undergraduates to undertake significant responsibility for their own education—new or strengthened honors programs, undergraduate research participation activities, and other comparable "independent study" opportunities.

In institutions where planning and development in science education have occurred, it is not uncommon to find that substantial progress in the implementation of new procedures or in the improvement of old procedures is limited or restricted because the institution is unable to provide an adequate supply of new and modern undergraduate instructional scientific equipment. The Undergraduate Instructional Scientific

Equipment Program was designed to render assistance under these circumstances by providing funds for the purchase of the necessary equipment. These funds, up to a maximum of $25,000 per proposal, were granted on a matching basis.

During 1961–62, the first year of this program's existence, a total of 1,125 proposals were submitted by 783 institutions, requesting a total sum of $16 million. In all, 70 percent of the 1,110 eligible institutions submitted 74 percent of the 1,509 allowable proposals.

The magnitude of this program was far below the level which would be required to eliminate—or even alleviate substantially—the general shortage of instructional scientific equipment, a shortage which exists in some degree in every institution. Hence this program sought to identify situations in a state of "constructive ferment," where there was strong evidence of substantive improvement in some discrete aspect of the instructional program and where the improvement would be enhanced by the availability of suitable instructional equipment. As the announcement of this program stated, priority was given to those disciplinary units where recognition of the need for improvement of the content and focus of undergraduate courses was accompanied by adequate staff and supported by detailed and realistic planning. Need alone, unsupported by evidence of thoughtful assessment of the present and future position of the disciplinary unit, did not qualify an institution for support.

Grants totaling $5 million were made in support of 334 proposals from 263 institutions. Thus, approximately 30 percent of the proposals resulted in grants; 33 percent of the schools requesting grants received support at some level—in many cases substantially below the level requested.

Each institution was permitted to submit a maximum of from one to six proposals depending on the output of science baccalaureates during 1959–60. Funds were allocated in reasonable proportion to this output. The distribution by discipline was as follows:

Biology	26 percent
Chemistry	24 percent
Physics	23 percent
Engineering	13 percent
Computers	7 percent
Earth Sciences	3 percent
Social Sciences	3 percent
Mathematics	1 percent

The equipment provided under these grants covered a wide variety of requests. Support for up to half of the cost of twenty small computers was provided. Some institutions requested equipment to improve one detailed area, such as physiology or microbiology, while others sought improvement of the entire range of offerings in a broad area such as biology. Some sought to improve their undergraduate research facilities, while others concentrated on freshman and sophomore level needs.

While the massive national need for instructional equipment (estimated to be in excess of $300 million) cannot be eliminated by any modest program, the Foundation's Undergraduate Instructional Scientific Equipment Program provides a significant challenge and opportunity for institutions to develop further the quality of their undergraduate science programs.

RESEARCH PARTICIPATION AND SCIENTIFIC ACTIVITIES FOR TEACHERS

Projects in this area cover a wide range of activities directed toward the improvement of subject-matter competence and scientific background of college and high school teachers, the promotion of interchange of ideas among college and high school teachers, and the development of cooperative programs among colleges and universities. These objectives are approached through research participation programs and through conferences and seminars, visiting scientists programs, and the support of "associations" of collegiate institutions.

Research Participation for College Teachers

This program provides a means for college science teachers (including those junior college teachers who are qualified) to gain research experience during the summer. Teachers with limited opportunity to conduct research during the academic year are given a chance to obtain the stimulation and identity with science which research so effectively provides. Usually they participate as junior colleagues in research projects being carried on by experienced investigators.

The program is sufficiently flexible to meet several research needs of college teachers. Predoctoral teachers may commence projects leading to thesis research problems; others may complete such projects. Postdoctoral teachers are encouraged to participate, especially when their home institutions do not have adequate research facilities, and thus keep active in research. Postdoctoral participants, for the first time this year, outnumbered predoctoral participants.

A total of 51 grants were made, providing research participation for 427 teachers during the summer and 105 during the academic year.

Research Participation for High School Teachers

This program provides a means for a limited number of qualified high school science teachers (and junior college science teachers not qualified for the companion Research Participation for College Teachers program) to gain research experience with competent investigators at colleges, universities, and nonprofit research organizations. This experience is expected to raise the level of the teacher's classroom instruction by improving his understanding of science and the scientific method. In some cases the teachers are able to carry out research which may lead to an advanced degree. An unexpected dividend derived from this program is the stimulus given to the college and university departments through the presence of the high school teachers. Provisions are made for a limited number of academic-year extensions to allow selected participants to continue their research at their home institution. In many cases the grantee institutions attempt to administer these funds on a matching basis in order to keep local school boards informed of the teacher's efforts to improve his professional qualifications.

The level of operation was intentionally kept at approximately that of last year because of the belief that there are only limited numbers of qualified high school teachers available to the program. There were 47 grants made in 1962, thus providing training opportunities for 370 participants during the summer and 115 during the academic year.

Supplementary Training for Science Teachers

This program provides support for science teacher training projects which do not fit any of the Foundation's established teacher-oriented programs such as fellowships, institutes, research participation, or advanced science seminars. The Foundation has encouraged the development of novel approaches to improving the competence of science, mathematics, and engineering teachers—especially with respect to the subject matter they teach. The Supplementary Training program provides the administrative flexibility necessary to give these one-of-a-kind experimental proposals individual consideration. Through this mechanism it is possible to lend effective support to the Foundation's encouragement of imaginative and creative planning on the part of those concerned with the competence of science, mathematics, and engineering teachers. Eighteen grants were made.

Visiting Scientists Program

The Visiting Scientists Program consists of two types of special projects: (a) the "college" projects concerned with visiting American scientists and directed toward the small colleges and developing universities, and (b) the "foreign" projects concerned with visiting foreign scientists and aimed largely at the major graduate centers. Both kinds of projects are administered through appropriate professional societies, which select the lecturers and arrange itineraries.

It is the major objective of each of these programs to provide for students, undergraduate and graduate, respectively, the stimulus that comes from informal and personal contact with recognized scientists, and at the same time to provide for exchange of information between visitor and local staff, and for guidance to local staff and administration members on questions related to curricula and science education. The foreign visitor program is usually strongly research-oriented.

In the projects involving American scientists during fiscal year 1962 (i.e., during academic year 1961–62) 14 programs were in operation providing approximately 3,600 days of visits annually to some 1,400 science departments. In academic year 1962–63, the number of programs will increase to 17 or 18 and will provide approximately 3,900 days of visits. Current level of operations in the foreign scientists program supports about 2,200 days of visits annually.

SPECIALIZED ADVANCED SCIENCE EDUCATION PROJECTS

Specialized Advanced Science Education Projects embrace two major functions that are linked with the general effort to improve the quality of education in the sciences. One function is programmatic in nature, involving administration of the Advanced Science Seminar and Public Understanding of Science programs; the other, which is less restrained by program boundaries and guidelines, is concerned with exploring and selecting new ideas, and devising methods of advancing science education.

Advanced Science Seminars

Advanced Science Seminars are based on advanced treatment of subject matter. They frequently deal with interdisciplinary approaches, as in oceanography or space science, and are intended for specialists. Many are field station programs.

The varied format and specialized nature of the program are illustrated by a "Conference on Lunar Exploration" which was held at Virginia Polytechnic Institute, with the lecturers including the most distinguished space scientists in the country; a program in marine science supported at Woods Hole Oceanographic Institute in "Theoretical Studies in Geophysical Fluid Dynamics"; in marine biology at the Marine Science

Institute of the University of Texas; in "Nuclear Rocket Propulsion" at the University of Florida; field studies in anthropology in New Mexico under a grant to Harvard; and a program in "Dynamical Astronomy" at the Yale University Observatory. Participants in all of these seminars, together with 34 others, were college faculty, advanced graduate students, or a combination of both.

In several instances, courses designed solely for advanced graduate students were supported to meet a critical need during the summer months for distinguished graduate courses for participants selected on a national basis.

Public Understanding of Science

The Public Understanding of Science Program is dedicated to the development of materials and programs that are designed to help intelligent non-scientists achieve an appreciation of science without attempting to train them to be scientists. The principal instrumentalities thus far supported include conferences between scientists and representatives of the mass media of communication, such as editors, science writers, and public information officers; the preparation of science films for educational television; and the planning of new educational television series. Through such individuals and devices the program aims to develop in the nonscientific public some appreciation of scientific methods and the significance of the term "research," of the element of uncertainty and limitations of science, as well as of its possibilities, and of the value of opinions voiced by scientists, both as experts in their fields and as citizens.

Science Education Developmental Projects

The mission-oriented aspect of the Developmental Projects continues to search for and test appropriate means for providing comprehensive support of science in institutions that are striving to maintain or achieve educational excellence in the face of the expanding population of students. In practical terms this involves identifying competent scientists of catalytic temperament who, when given adequate support, can implement a master plan that works toward a synthesis of the best that American higher education is capable of offering. Accordingly, the Developmental Projects work closely with other organizational units of the Foundation in handling proposals that contain a master plan. These proposals usually cover a single department or disciplinary unit which, to be structured effectively, requires a range of kinds of support not offered by a single program or unit of the Foundation. Inclusive grants of this type require, on the part of the Foundation, a degree of flexibility that programmatic activities seldom provide.

In fiscal year 1962 three grants were awarded in the developmental area: to Reed College for a summer program in inorganic chemistry for college chemistry teachers and undergraduate students majoring in chemistry; to the University of Oklahoma for the establishment of a training program in meteorology; and to the American Astronomical Society for a conference on graduate education in astronomy.

PROGRAMS FOR SECONDARY SCHOOL STUDENTS

The talented secondary school student has, more often than not, remained unchallenged by traditional educational practices in the high schools. As part of the Foundation's broad program for education in the sciences, stimulation of the potential scientist during his formative years is considered an important function. Programs for secondary school students attempt to introduce students to new experiences which will draw upon their abilities to the fullest extent. Prominent among these are a variety of activities which bring them into contact with scholars, research scientists, and college-level science teachers. Substantive programs have been designed so that students may experience in some depth the fascination of advanced work in science or mathematics, taking care at the same time that such programs do not materially duplicate work available at either the high school or college level.

Summer Science Training Programs for Secondary School Students

Now in its fourth year, the Summer Science Training Program for Secondary School Students (SSTP) provides opportunities for selected high-ability secondary school students to obtain a close and intimate view of an area of science, in direct association with qualified scientists, during the summer months. (In a few exceptional cases, programs are conducted on a part-time basis during the academic year.) Summer programs range in length from 5 to 13 weeks.

Individual programs are conducted by colleges, universities, and nonprofit research organizations. Instruction is at the college level. Offerings fall into two general types: (1) classroom instruction, with concomitant laboratory work and occasional field trips and (2) assignment of the student as a junior member of a team engaged on a *bona fide* research project. These categories are not exclusive; many programs combine elements of both types, and the difference is mainly one of emphasis. Both types have proved to be very effective in stimulating interest in science careers, in improving study habits, developing more intelligent choices of optional subjects, and facilitating the student's later adjustment to college life.

During this fiscal year 154 grants were made in this program, providing instruction for 6,000 students.

Cooperative College-School Science Program

The Cooperative College-School Science Program provides opportunities for higher educational institutions to present programs, as collaborative efforts with secondary schools, for the improvement of school science instruction. Projects typically group qualified secondary school students with teachers in intensive college-directed learning programs which may be course-oriented or provide research participation experience. The teacher participants serve as instructional aides, or in other suitable ways, thus gaining experience with advanced subject matter and with its impact on superior students. A desired result is that the teachers may develop improved science projects for capable students in their own schools.

A total of 34 grants were made in this program in fiscal year 1962. Projects supported involve 2,100 participants, 13 percent of whom are secondary school teachers. Seventeen of the projects are summer offerings and the remainder academic year or combined summer and academic year projects.

State Academies of Science

The State Academies of Science Program provides support to State academies and comparable organizations, enabling them to carry out a variety of projects aimed at strengthening science education. Representing as they do the scientific community at State or local levels, and being conversant with local requirements, academies are well suited to present effective multidisciplinary programs operating over restricted geographic regions. Fifty-five grants were awarded in this program in fiscal year 1962.

An effort was made in the State Academies of Science Program in fiscal year 1962 to encourage the development of programs oriented toward college students and teachers. Such programs may provide meetings at which undergraduates present results of scientific research and may arrange visits of scientists to small colleges to advise students and teachers on current possibilities and requirements of graduate study. It is believed that these programs can effectively complement the Undergraduate Research Program of the Foundation.

Supplementary Science Projects for Students

This program supports experimental projects, generally of a one-of-a-kind type.

Four grants were made for the following purposes: to the National Academy of Sciences for the distribution of a career information booklet on mathematics; to the National Science Teachers Association for the partial support of an American student delegation to the International Youth Science Fortnight in Great Britain; to Dartmouth College to support a program for the improvement of science education in the high schools of New Hampshire, to be conducted with the cooperation of St. Paul's School and the New Hampshire State Department of Education; and to the Council of Chief State School Officers for the preparation of a catalogue of instructional scientific equipment for secondary school use.

Holiday Science Lectures

Patterned after the famous Christmas Lectures of the Royal Institution of London, the Holiday Science Lecture project is an effort to bring distinguished scientists to students all over the Nation in a five-day lecture series during Christmas and Easter vacations. The project was originally supported under a grant to Rockefeller Institute of New York City, and is now administered by the American Association for the Advancement of Science. During the past year, Dr. Paul Weiss lectured in San Francisco and Dr. Rene Dubos in Cincinnati, repeating the series which they had developed under the Rockefeller Institute grant. During the 1963 calendar year there will be six to eight lectures in a variety of disciplines presented in selected cities across the country.

Visiting Scientists (Secondary Schools)

This special project enables professional societies in the basic disciplines—mathematics, chemistry, physics, and biology—to send distinguished scientists into secondary schools throughout the United States upon a school's request for such visitors. The visitors typically lecture on their scientific specialty, inform the students about opportunities in such fields of science, outline desirable educational programs for students wishing to enter scientific fields, confer with teachers and school administrators on new developments in curriculum and laboratory experiments, etc. The number of visits in any one State is small, for this is a national program which concentrates on those States where visiting scientists are not available under the State Academies of Science Program.

Traveling Science Libraries

This program is conducted by the American Association for the Advancement of Science under grants from the National Science Foundation. Its primary purpose is to circulate to secondary and elementary schools, on a temporary loan basis, sets of selected books on science and mathematics. Also included in the program is the preparation and distribution of annotated book lists for the guidance of students and librarians contemplating the purchase of science books.

Initiated in 1955, the program was designed to serve secondary schools only and has been continuously supported through annual grants. Widespread distribution of the traveling libraries has so encouraged the acquisition of science books by school systems that further Foundation support of this phase of the activity is no longer necessary. Consequently, no grants were made in this program in fiscal year 1962, and the circulation of such libraries under previous grants was discontinued on June 30, 1962.

In the fall of 1959, circulation of a second group of science and mathematics books specifically selected to meet the needs and interests of elementary school students was initiated. In three years of operation the Traveling Elementary Science Library has reached 2,386 schools. Because of the many schools not yet served and the growing interest in science instruction in the elementary schools, this part of the program is being continued during academic year 1962–63.

Course Content Improvement Programs

The Course Content Improvement Program of the Foundation is designed to bring scholarship of the highest order to the development of courses and instructional materials for all educational levels, reflecting contemporary scientific knowledge and points of view in science, mathematics, and engineering.

Continued large-scale effort of scholars and teachers is necessary if instructional materials are to keep pace with the rapid progress of science. Furthermore, the rapidly growing need for persons highly trained in science demands the efforts of our best teachers and scholars in providing the best course materials and course sequences they can devise. There has been a growing interest among scientists and teachers in collaborating in this effort.

A brief review of work being supported by the Foundation is given below followed by a more extensive report on work in physics.

COURSE CONTENT IMPROVEMENT STUDIES IN MATHEMATICS, SCIENCE, AND ENGINEERING

This program has as its objective the production of improved up-to-date course materials for school and college programs in mathematics, science, and engineering. To this end, support is provided to leading scientists, assisted by teachers, for research and development work on course content. The material thus produced and information about its use are made widely available to schools and colleges. However, the material must make its way on its own merits and the decision as to its adoption is left entirely up to the judgment of the college or local school systems.

Elementary and Junior High Schools

Small-scale projects aimed at developing, experimentally, appropriate sequences for elementary schools have been continued, in science at the University of California and the University of Illinois, and in mathematics at Stanford University. Webster College has received support for a project concerned with the development of elementary mathematics materials. The School Mathematics Study Group plans to complete a final revision of courses for grades 4–6 (during the summer of 1962) and to start work on mathematics for the primary grades.

A grant has been made to the American Association for the Advancement of Science (AAAS) for establishment of a planning and coordinating group to provide guidance and liaison among projects dealing with science for elementary schools. In order that a variety of materials and approaches may be available for schools, more than one major project is being supported. Both the AAAS and Educational Services Incorporated have received grants to conduct studies, with participation of scientists and teachers from various parts of the Nation, aimed at an exploration of the concepts and materials best suited for use in the elementary classroom.

Secondary Schools

The table on the following page shows the status of the major study groups developing new course material for secondary schools.

Approximately 20 percent of the high school students enrolled in physics in the United States are now taking the Physical Science Study Committee (PSSC) course. In addition, as is indicated in the table, many teachers are using various parts of the course materials in their conventional physics course.

Subject	Year Begun	Present Status	Use 1961–62	
			Teachers	Students
Physics (PSSC)	1956	Commercial version available.	1,800–2,000 Partial Use by 1,000.	80, 000
Mathematics (SMSG).	1958	Definitive version available—Grades 7–12.	Unknown	409, 000
Chemistry (CBAP).	1958	Revised version in trial schools; commercial version, Sept. 1963.	200	10, 000
Biology (BSCS)	1959	Revised versions in trial schools; commercial versions, Sept. 1963.	500	50, 000
Chemistry (CHEM Study).	1960	Revised version in trial schools; commercial version, Sept. 1963.	124	12, 000

Approximately 100 volumes of School Mathematics Study Group (SMSG) materials are in definitive form. The group plans to withdraw these books as soon as comparable volumes by individual authors are commercially available. Other SMSG activities this year include the production of additional books in a monograph series, programming of the ninth grade algebra course, an alternative geometry course, modification of the course for ostensibly less able students, and extensive evaluation studies.

A grant for an alternative sequence in mathematics has been made to the University of Illinois for the support of the University of Illinois Committee on School Mathematics, a pioneer group in mathematics reform, previously supported by the University of Illinois and the Carnegie Corporation. With this earlier support, materials were produced for grade 9–12 and have been tested in schools. On the basis of these tests, a new and improved approach—beginning with the 7th grade and continuing the sequences through the 12th grade—is planned.

The Chemical Bond Approach Project (CBAP) and the Chemical Education Material Study (CHEM Study) have continued testing in schools in preparation for producing final versions of the courses to be published commercially in 1963. The latter group has started production of a film series that is expected to number 20–30 films.

The Biological Sciences Curriculum Study (BSCS) continued testing its three approaches to biology and expects that commercial versions will be available in 1963. In addition to textbooks and laboratory manuals, the courses include a program of intensive laboratory work and research-oriented material for gifted students. Supplementary material being developed includes teachers' guides, a handbook for teachers, films on laboratory techniques, an annotated list of existing films suitable for use in the three courses, and a series of pamphlets on biological subjects for both teachers and students.

In addition to these major projects, smaller ones in other areas have been supported. Through a previous grant to the American Geological Institute, a sourcebook on geology and the earth sciences for elementary school and secondary school courses has been completed and is now commercially available. A grant was made to the American Anthropological Society for exploration of the use of anthropological materials in elementary and secondary schools and for the preparation (for use in the schools) of source material in anthropology in the form of bibliographies and pamphlets.

Colleges and Universities

The success of the Committee on the Undergraduate Program in Mathematics and the Commission on College Physics in stimulating, coördinating, and disseminating information on work aimed at improving undergraduate instruction has led leaders in other disciplines to establish similar organizations. The Foundation now supports, in addition to the groups in mathematics and physics mentioned above, the Advisory Council on College Chemistry, the Geological Educational Orientation Study, and the Commission on Engineering Education. It is likely that groups in other disciplines will form in the coming year.

As an example of the type of activities of these groups, some of the accomplishments of the Commission on College Physics may be cited. The Commission instigated and assisted in a series of conferences on "The Curriculum for Undergraduate Majors in Physics." The Commission's Committee on Instructional Films and Apparatus initiated projects in these fields which are carried on at colleges and universities and by professional organizations. A series of paperback books for college use was begun as was a series of *Resource Letters* for college teachers. Each letter provides a guide to some of the literature, apparatus, and films available on a given topic for use by the instructor who is not an expert or specialist in that topic.

Panels of the Committee on the Undergraduate Program in Mathematics have prepared curriculum recommendations for the various groups of students who take undergradutae mathematics, including prospective teachers. Suggested course outlines have been prepared with the hope that they will stimulate the writing of new texts. A consultants bureau has been established to bring information about the work of the committee directly to the colleges, and to provide first-hand information for the further work of the committee.

The Commission on Engineering Education will explore the curriculum needs in the rapidly changing field of engineering and will seek means for the continuing education of the engineering faculty staff.

A grant has been made to the National Academy of Sciences-National Research Council to support a study group on educational policy in agriculture aimed at an assessment of the needs for new courses and curricula in this field.

In addition to grants in support of the activities of coordinating and other study groups, a number of grants have been made for the development of specific courses and materials. Some of these are related to, or stimulated by, the "nerve center" groups, while others have arisen independently. Typical grants include those to the:

(1) University of Illinios—for the development of a research-oriented analytical chemistry course.
(2) American Society for Engineering Education—for a study of ceramic engineering curricula.
(3) Case Institute of Technology—for materials for dynamics instruction through the use of a personal analog computer.
(4) Cornell University—for an experimental teaching program in algebra.
(5) University of Maryland—for materials in mathematics for elementary school teachers.
(6) Educational Services Incorporated—for a text, laboratory experiments, and film on semiconductor electronics.

Work has continued at the Massachusetts Institute of Technology and at Washington University on the development of new approaches and materials for introductory college physics courses, and at Harvard University on the development of a new biology course. A group centered at the University of California has now produced the manuscript for two college-level resource books in anthropology entitled "The Teaching of Anthropology" and "Resources for the Teaching of Anthropology."

SUPPLEMENTARY TEACHING AIDS

Under the *Science Teaching Equipment Development Program* support is provided for developing prototypes of new instructional equipment. This year 43 grants were made, bringing the total number of projects supported under this program to 137. Several projects in chemistry and physics are designed to employ recent research developments as the basis for new experiments for undergraduates. The fact that almost half the proposals were in engineering indicates the serious attention now being given to the modernization of engineering laboratory experiments.

Support is also given to production of films designed to increase the effectiveness of teaching by bringing into the classroom phenomena not readily available through other means, presentations by outstanding teachers and scientists, illustrations of laboratory techniques, and films to be used primarily for teacher-training purposes. Film projects have been supported in a number of fields. Among these are the following grants:

(1) Iowa State University—for plant biology films for college courses.
(2) Indiana University—for developmental anatomy films.
(3) Educational Services Incorporated—for films on semiconductor electronics as part of the set of course materials previously mentioned; —for motion pictures as an instructional aid in fluid dynamics courses; —for films of demonstration and laboratory experiments for college and university physics courses.

Some of the film projects initiated in previous years have been continued during fiscal year 1962. These include the production of films and tapes of a mathematics course for educational television use at the University of Wisconsin. This course, at the fifth and sixth grade levels, is aimed at teacher education concurrent with classroom use. The television course "The New Biology" intended primarily for teachers has been shown this year on television networks and educational television stations. NSF supported production of films and tapes of this course for further educational use. Films recording the customs, technologies, and ceremonies of Indian tribes in the western United States continue to be supported by the Foundation as are films on archaeological research centered around archaeological salvage projects in reservior areas which will soon be flooded.

SPECIAL REPORT ON STUDIES IN PHYSICS

Changes in education can now be added to the roster of events which have altered the face of physics in the twentieth century. Relativity, quantum mechanics, parity, strange particles, solid state, fission, fusion, nuclear weapons, radar screens, automation—words like these evoke an image of a science changing rapidly in fundamental factual and theoretical content, technological product, and politico-social implication. Requirements for increasingly complex apparatus, teams of investigators, and real understanding of physics by more and more people at many levels in industry and government are further illustration of the profoundly different status of physics as compared with 60 or 30 or even 10 years ago.

In the middle 1950's scientists and educators began to see that events like these—in all fields of human endeavor and interest—made it essential that research-oriented scholars join forces in a continuing search for new ways of providing an educational program reflecting contemporary insights into modes of inquiry, ways of learning, and the evolving structure of subjects.

The first major frontal attack was on the problem of creating a better physics course for the high school. Previously physicists had merely complained about the inclusion of too much technology in physics courses, the failure to reflect the unity of physical thought, the tendency to compound a patchwork by inserting bits and pieces about recent developments. The most significant development came in 1956, when a group of physicists drawn from such research centers as Massachusetts Institute of Technology, California Institute of Technology, University of Illinois, Cornell University, Harvard University, and Bell Laboratories decided to work on the development of as good a high school program as they could devise. From the outset they recognized that they must bring in, as equal partners, exceptionally competent teachers and schoolmen who knew students and school situations. The result was the formation of the Physical Science Study Committee in the fall of 1956. The group set itself the goal of devising a one-year course in physics, to be taught at the eleventh or twelfth grade level, suitable at least for those students who normally take physics in high school. The course was to lead students to think their way through fundamental physics, drawing in appropriate ways upon all aids to learning—textbooks, laboratory work, supplementary readings, examinations, audiovisual aids, and—above all—teachers. As Dr. Jerrold Zacharias, Chairman of the Physical Science Study Committee, puts it: "The teacher will always be the best 'learning aid' of all."

In the summer of 1957 the Physical Science Study Committee brought several scores of physicists and teachers to Cambridge, Massachusetts, to begin the task of developing the new course. A very preliminary version was tried in eight schools by eight of the teacher-writers during the 1957–58 academic year while developmental work continued, influenced by feedback from classroom trial. Greatly expanded work in the summer of 1958 permitted trial during the 1958–59 school year in nearly 300 schools, reflecting a variety of conditions but using especially trained teachers. Syllabus, text, laboratory apparatus, films, supplementary readings, teachers' guide, teacher training, examinations, and other components of the instructional systems underwent continuing development and modification. In the 1959–60 school year the course was being used in some 600 schools. The collaboration of hundreds of research physicists, college teachers, high school teachers, science writers, instrument makers, film experts, and other specialists finally made possible the preparation of a set of materials which was made available through commercial channels to all interested schools and teachers in time for the 1961–62 academic year.

The work of the Physical Science Study Committee (PSSC) quickly led physicists and teachers to see an ever-widening range of problems requiring the attention of the best minds. It became clear that work must continue on producing better films, an improved text and other basic materials, a growing library of supplemental readings, more information on effectiveness of the materials, new examinations; also continuing opportunities must be provided for physics teachers to meet and collaborate.

Some colleges began to use the PSSC course but found that they needed more material. Early in the PSSC activity, work had been done on certain areas (relativity, angular momentum, etc.) which had to be excluded from the published materials in order to keep within the one-year limit. The interest of the colleges in this approach led to a major effort in the development of text, laboratory, and film materials on "advanced topics" which it was believed could be used in a second high school course or a beginning college program. Physicists and schools throughout the world had by this time begun to be interested in the PSSC approach. In contrast to present American practice, secondary school physics in most countries is taught over a three- or four-year period. Physicists in other lands were therefore much interested in the advanced topics—and this work is now being carried out by a team drawn from Canada, New Zealand, Sweden, and the United States.

Since the beginning of this venture, the people involved in the PSSC have emphasized the view that their creation is only one of the intellectually and pedagogically valid approaches to secondary school physics.

The development of models and materials for alternative approaches will require dedicated work on the part of scientists and teachers of high competence. In recent months interest in one alternative approach has grown, and there is even some possibility that the work can be done in part by an international team.

As students come from high school with improved preparation, colleges have the opportunity to offer them more sophisticated programs. This and other factors are leading many physics departments to examine their entire undergraduate curriculum. Work with initial emphasis on reformation of introductory courses, is under way at such centers as California Institute of Technology, Washington University, The University of California (Berkeley), Rensselaer Polytechnic Institute, Massachusetts Institute of Technology, and other institutions. Particular attention is being directed to providing laboratory experience that leads students to self-directed exploration of fundamental data and ideas, to presenting from the start a contemporary viewpoint, and to providing practice in physical modes of thought. Physicists in colleges and universities have also seen that motion pictures permit them to bring into the classroom a range of experimentation, demonstration, and discussion by outstanding thinkers not possible by other means; a number of project groups are exploring this avenue.

There is general agreement that diversity and variety of approach are essential in the national effort to improve courses, but this diversity creates problems in correlation of effort. Manpower and funds have limits. Concerted reflection and action are required to define problems, devise some guidelines, make sure that someone is giving attention to most of the promising approaches and important problems, and provide centralized information services so that each project group knows what others are doing and each college can avail itself of the products of all projects to whatever extent it chooses. This is the mission of the Commission on College Physics, an autonomous group of physicists formed to stimulate reform in college physics programs.

Somewhat to the surprise of physicists in the United States, course-content improvement efforts undertaken to meet American needs have turned out to be of great interest to many other countries. Because it has had a longer history of development, the PSSC course has attracted special attention.

Seminars, conferences, and other meetings on the course have been conducted, with the aid of U.S. personnel, in Great Britain (sponsored by the Organization for Economic Cooperation and Development), Austria, Scandinavia, Israel, Italy, Brazil, Japan, Pakistan, and India. Translations and adaptations are currently being prepared in several countries. Perhaps even more important is the fact that the PSSC illustrates the results of a method of reconstructing science curricula through collaborative work by research scholars and teaching scholars.

The work in physics has also had a horizontal impact in the United States itself. Its success has encouraged scientists and scholars in other fields to formulate comparable campaigns. The results of their work, in turn, feed back into the physics program: for example, new developments in mathematics curricula provide powerful tools for instruction in physics.

Institute Programs

The Foundation's institute programs are designed to increase the effectiveness of the teaching of science, mathematics, and engineering in the Nation's schools by improving the subject-matter competence of teachers through the group training approach. They have as their goal helping teachers keep well informed concerning changes in their rapidly growing scientific fields and assisting those teachers whose basic training in science and mathematics has been inadquate. Institutes provide supplementary training for high school, college, and technical institute teachers, as well as for a limited number of elementary school teachers and supervisory personnel. At the college level these programs show increasing concern with "teachers of teachers."

Three major types of institutes conforming to the time patterns available to teachers for work and study, and allowing for variation within types as dictated by changing needs in the educational world, are supported: (1) Summer Institutes, which provide generally 4 to 12 weeks of full-time study during the summer period when schools usually are not in session; (2) Academic Year Institutes, which provide full-time study during the regular school sessions for a relatively small number of teachers who take leaves of absence for one year; (3) In-Service Institutes, which provide part-time study opportunities for teachers who are simultaneously holding full-time positions in the schools.

College Conferences serving special needs for extending knowledge in specialized fields are also operated for periods of up to four weeks during times of the year best suited to the schedules of college faculty members.

Because teachers at the several levels of the educational spectrum have somewhat different objectives—and frequently quite different academic backgrounds—from those of the usual professional students in scientific fields, institutes are commonly based on specially planned classes and group activities. A secondary objective of the program is, therefore, to encourage colleges and universities to establish "pre-service" courses or curricula that more effectively meet the subject-matter needs of teachers in science, mathematics, and engineering. Although this objective is being achieved, to at least a limited degree, much more needs to be done to assure adequate competence in subject matter of teachers.

By offering a type of training which enables teachers to take courses of study expressly designed for the inservice teacher, the Foundation is providing motivation and support which help those who are presently teaching to upgrade their subject-matter competence, and is thereby directly affecting the quality of science teaching in the Nation's schools at all levels. It is also demonstrating to colleges and universities the need to review carefully science and mathematics courses now available to both pre-service and inservice teachers who seek to improve their competence in these areas. A review of this kind serves to reveal to institutions the need for revision in curricula and for the development of study opportunities which more effectively meet the subject-matter needs of teachers both during their initial years of training and in later years of professional work. On a long-range basis, this helps to upgrade generally the programs of study in science, mathematics, and engineering for all students.

Since the inception of institute programs in 1953, the Foundation has made grants for the support of more than 3,300 institutes, which have provided over 156,000 opportunities for study in science, mathematics, and engineering. During fiscal year 1962 the Foundation provided support for 911 institutes. Of this number, 35 percent were for part-time study during the regular school year, 7 percent were for full-time study during the regular school year, and 58 percent were for full-time study during the summer. These institutes made provision for some 40,800 opportunities for study.

During the summer of 1962 some 100 foreign teachers and students were provided places in various summer institutes. Travel funds for these persons, for the most part, are provided by the Asia Foundation, African-American Institute, Ford Foundation, American Friends of the Middle East, Department of State, etc.

In order to add strength to the staffs of the summer institutes and to add to the knowledge of the teachers attending these institutes, the Visiting Foreign Staff Project was again supported in 1962. In this project, the American Association for the Advancement of Science arranged for approximately 15 eminent foreign scientists and mathematicians to visit some of the summer institutes in this country. Each foreign scientist spent several days giving lectures, offering seminars, and taking part in informal discussions with the institute participants at each of the six to nine institutes he visited.

CHARACTERISTICS OF INSTITUTE APPLICANT POPULATION

Research conducted during the past year indicates that, while there is a significant turnover in the institutes program's target population, approximately 35 percent of the teachers currently teaching secondary school science or mathematics have attended at least one NSF institute program. Another 13 percent applied but were not accepted and about 52 percent have not applied to any of the teacher-training programs supported by the Foundation. Having already conducted research in the area of the characteristics of the institute applicant population, the staff, aided by a contractual arrangement with the American Institute for Research, has initiated a study of that portion of the secondary school science and mathematics teacher population which has not applied to any NSF teacher-training program.

Studies show that there are some distinct differences between those teachers who apply and those who do not apply to the teacher-training programs. The applicant, particularly the successful applicant, tends to be a subject-matter oriented teacher who definitely finds satisfaction in intellectually stimulating situations. Such applicants are interested in furthering their intellectual self-improvement, whether through NSF institutes or local educational workshops. These individuals do not experience as much conflict between their professional and family obligations as do the non-applicant group and, compared with their non-applicant counterparts, they have a much higher level of drive or motivation.

This finding is important in that it appears from the study that the current non-applicant group, which is over half of the institute program's target population, is a low-drive, low-motivation group which seems content to accept the *status quo* rather than to make any significant move toward self-improvement or change of any sort. Thus it is likely that the non-applicant perceives himself as being less well prepared than his applicant counterpart and he tends to feel that the programs as they now exist, or at least as they have existed in the past, would be "beyond his depth" (despite the fact that there are institutes which would not be too advanced). Further, the non-applicant is generally less professionally oriented; he reads fewer journals concerning education, mathematics, or science; and he is less likely to join a mathematics or science organization or voluntarily attend meetings of this type of organization. Another problem is that a major sub-group of this non-applicant population is composed of those teachers who teach mathematics and science for only a small percentage of their workday and who may have a primary interest in a field other than science or mathematics. Such a person is likely to say that he is an English teacher and then parenthetically state that he also teaches two classes of mathematics each day. However, this same teacher may be the only mathematics teacher in his school. The results of these studies have important implications for the future directions of the Foundation's institute programs.

SUMMER INSTITUTES

Summer institutes offer instruction on a full-time basis during a part of the summer at various colleges and universities throughout the Nation. The sponsoring institutions receive Foundation support covering participant and operational costs.

Table 2.—*Distribution of Summer Institutes, 1962, by Field of Study*

Field	High School Teachers	High School and College Teachers	College Teachers
Anthropology	2	....	2
Astronomy	2	....	....
Biology	48	2	6
Chemistry	29	3	6
Earth Sciences	24	....	1
Engineering	....	....	12
History & Philosophy of Science	....	....	1
Isotope Technology	....	....	5
Mathematics	106	2	10
Physics	23	....	3
Psychology	1	....	3
Radiation Biology	18	1	5
Radiation in Physical Sciences	....	....	3
Regional Science	....	....	1
Science Curriculum	2	....	....
Multiple Fields & General Science	157	1	....
Total	412	9	58

Summer Institutes for Secondary School Teachers

For the summer of 1962 the Foundation awarded grants for 421 institutes to support 21,000 secondary school teachers of science and mathematics.

Disciplines encompassed by these summer institutes represent virtually all fields of the sciences (both natural and social), and include both traditional approaches to subject matter and the newer approaches developed through the Foundation's course content improvement programs.

Geographically, the 1962 summer institutes were distributed throughout the 50 States, the District of Columbia, and Puerto Rico. As in previous years, there was a wide variety of types of institutions represented among the host colleges and universities.

Summer Institutes for College Teachers

For the summer of 1962, support was granted for 67 summer institutes for college teachers; 58 of these were for college teachers exclusively, and 9 combined secondary-school and college teacher participation. This permitted participation of an estimated 1,900 teachers.

Examination of the completed applications for places and the number of places available in summer institutes for college teachers indicates that there is a major task yet to be accomplished and many teachers yet to be provided with training. The average number of estimated applications per available place is slightly over four for the summer of 1962, and new programs in psychology, social science in general, and radiation in the physical sciences have been added to subject matter previously covered.

Several new aspects appeared in the program for the summer of 1962. One involved cooperation with the Atomic Energy Commission in three institutes in radiation in the physical sciences; for these institutes AEC pays the operational costs and NSF provides support funds for 75 participants. Also new to the program were three institutes in psychology and physchological statistics. These institutes represented very different approaches designed for quite different groups of participants, and emphasized quantitative social science rather than social studies. Another new program aspect involved support of an institute in regional science at the University of California, Berkeley. The training, endorsed by the Regional Science Association, took cognizance of the recent rapid changes in social science and emphasized the use of statistics in the study of regional and spatial structures. Geographers and economists have expressed great interest in this field.

Summer Institutes for Elementary School Personnel

Twenty-one summer institutes for elementary school personnel were held in 1962. Grants for these institutes provided support for 712 participants.

The needs in this area of training are tremendous and the Division is actively pursuing studies of the best methods of attack on the problem. Work is progressing on course content and teacher source materials, particularly in mathematics, but also in physics and astronomy. Work is also being done through AAAS on guidelines for elementary school teacher training.

It is a safe prediction that there will be a great expansion of the programs for the supplementary training of elementary school personnel. If the training is not done through programs of the Foundation, it certainly will be done through other programs. The merits of the Foundation's program lie in the relationships already established between the Foundation and the various departments of mathematics and science in the academic institutions. Very probably the greatest contribution that can be made by the summer institutes program of the Foundation is in the training of the "key" teachers and the supervisors of elementary science and mathematics.

Summer Institutes for Technical Institute Personnel

Two grants made in fiscal year 1962 provided study opportunities for 80 participants. The program is presently designed to strengthen the subject-matter competence in mathematics and science of individuals who teach at technical schools and of junior college teachers who have teaching responsibilities in technical curricula.

Summer Conferences for College Teachers

For the summer of 1962 a total of 35 conferences were supported. Grants for these conferences provided stipends for 985 participants.

A college conference may be essentially a short-term summer institute, but frequently the subject matter is more specific and more sophisticated, being especially designed for a clientele which consists of well-qualified specialists who need only to be brought up-to-date or made aware of some very recent development in their field or of some subdivisions thereof. This type of activity is a versatile tool for improving the quality of college teaching, for conferences may cover a specialized topic until the need of the participants is met, and then the conference may move quickly to other topics where an apparent need exists. Thus, college conferences can deal with an almost endless group of specialized topics which are constantly developing in all scientific fields. Further, many college teachers are available for training for short periods of time only. Proposals received in this program have reflected a significant increase in interest in programs designed specifically for college teachers of prospective elementary and secondary school teachers.

Since the college conference is most effective when conducted at a time when a large fraction of the target clientele can attend, and since this time varies with the nature of the subject field, proposals for projects to be held at any time during the year will be considered in the future.

ACADEMIC YEAR INSTITUTES

The Academic Year Institute Program supports the efforts of universities and colleges in providing opportunities for secondary school and college teachers of science and mathematics to study intensively appropriate sequences of courses in the subject matter of their disciplines on a full-time basis for 9 to 12 months.

Since this program was introduced in 1956–57, with two institutes, the number of institutes supported has increased to 55 for academic year 1962–63. These institutes provide training opportunities for 1,725 secondary school teachers and 105 teachers in small colleges.

A trend which will be of increasing significance in the future is the marked growth in the portion of the program directed toward college teachers. The grant program for fiscal year 1962 is supporting 105 college teachers at 14 universities, as compared with 75 at 8 institutions during the previous fiscal year. Since the emphasis in this program is on training opportunities for "teachers of teachers" in liberal arts colleges, teacher training institutions, and junior colleges, the effects upon the future graduates of teacher training programs will considerably multiply the present direct efforts.

Pilot programs were underway during 1961–62 at the University of Wisconsin in advanced training for potential science and mathematics supervisors, and at Oklahoma State University in a fifth-year program providing strong pre-service training in science for recent college graduates who are certified as teachers. These experimental programs are being extended in 1962–63 to six institutes providing sixth-year training for potential supervisors and to six institutes providing fifth-year programs for pre-service teachers. Such developments as these are particularly significant since they may lead to noteworthy improvements in the general training of teachers.

IN-SERVICE INSTITUTES

In-service institutes offer instruction on a part-time basis during the academic year at colleges or universities, or at off-campus centers, so that teachers may attend while still teaching full-time in their schools. Participating teachers receive no stipends, but receive modest travel and book allowances. The sponsoring institutions receive Foundation support to cover the participant and operational costs.

In-Service Institutes for Secondary School Teachers

During the 1961–62 school year about 11,500 teachers received instruction in a total of 253 in-service institutes. A significant increase was made in the program for 1962–63, with 284 grants awarded for the support of approximately 13,770 secondary school teachers, and including all but two States. In addition, a small number of college teachers were accommodated in this program. The principal expansion of the program has been in reaching many local areas not previously served by this program and in providing a greater number of programs in science for junior high school teachers.

Approximately half of the course work offered in these institutes is in the field of mathematics, with the remainder covering the range of the biological and physical sciences. The new course-content developments are increasingly offered in in-service programs, with approximately 33 percent of the institutes presenting programs related to one or more of the "new curricula" projects. These institutes will help to provide teachers with the background which will enable them to introduce into their classrooms those portions of the new materials which they deem desirable.

The increase in the total opportunities made available under this program appears to be the major accomplishment during fiscal year 1962. At the same time, a significant innovation has been the development of the combination of summer institutes with in-service institutes which will offer coordinated programs frequently leading to the master's degree.

This year, major attention was given to obtaining a maximum geographical coverage of the country consistent with scientific excellence; to consolidating institutes which are on one campus so as to promote efficiency and flexibility; and to visiting institutes—especially at the smaller colleges which do not have other NSF-supported programs.

It has been observed at a number of institutions that an in-service institute has been the opening wedge in awakening faculty interest in improvement of science education, especially in the training of future teachers. At the same time, the in-service institutes have provided opportunities for colleges and universities to work more closely with the secondary schools in their areas.

In-Service Institutes for Elementary School Personnel

In-service institutes for elementary school personnel first received Foundation support in academic year 1959–60 on an experimental basis. For academic year 1962–63 a total of 35 grants providing support for 1,060 participants were made. This program is by its nature somewhat restricted in geographical distribution of the participants, and frequently it contains a more heterogeneous group of participants than that attending summer institutes for elementary school personnel. However, while it lacks the advantages gained by the participants' living together, the in-service institute is probably the most effective mechanism for the training or retraining of a large number of elementary teachers at a low unit cost. It has the advantage of taking place at a time when the teacher is engaged in teaching and can, in many instances, put the training to immediate use.

Fellowship Programs

The Foundation's fellowship programs are intended to strengthen the Nation's scientific potential by enabling persons of unusually high ability to increase their competence in science, mathematics, and engineering through the pursuit of advanced scientific study or scientific work. Since the inception of NSF fellowship programs in fiscal year 1952, approximately 21,000 fellows have been supported in seven fellowship programs. Fellowship recipients were selected solely on the basis of their ability from among nearly 80,000 applicants.

Table 3.—*NSF Fellowship Programs, 1962*

Programs	No. of Applicants	No. of Awards Offered
Graduate Fellowships	5, 961	1, 761
Cooperative Graduate Fellowships	4, 118	1. 200
Summer Fellowships for Graduate Teaching Assistants	1, 818	868
Postdoctoral Fellowships	897	245
Senior Postdoctoral Fellowships	270	92
Science Faculty Fellowships	864	325
Summer Fellowships for Secondary School Teachers	1, 569	300
Totals	15, 497	4, 791

In the total NSF fellowship programs the number of applicants increased 19 percent over the number for fiscal year 1961. Marked increases were noted in the Postdoctoral (37 percent), Graduate Teaching Assistants (33 percent), Cooperative Graduate (27 percent), and Graduate (22 percent) Fellowship Programs. Applications in the Senior Postdoctoral Program remained essentially constant, but, for the second consecutive year, there was a decrease in the number of applicants for Summer Fellowships for Secondary School Teachers.

It is perhaps significant that applications in the Graduate and Cooperative Graduate Fellowship Programs combined exceed 10,000 whereas the number of Graduate Program applicants in fiscal year 1958—just prior to the introduction of the Cooperative Graduate Program—was only 3,804.

In addition to the NSF fellowship programs, the Foundation continued to administer one extramural fellowship program—the North Atlantic Treaty Organization (NATO) Postdoctoral Fellowships in Science.

Applications for NATO Postdoctoral Fellowships in Science were received from 244 individuals, an increase of 93 over the previous year. A total of 48 awards were made.

GRADUATE FELLOWSHIPS

Graduate Fellowships (the first fellowship activity established by the Foundation) provide support to unusually able students to permit them to complete their graduate studies with the least possible delay.

A record 5,961 individuals submitted applications in the fiscal year 1962 program, representing an increase of 1,086 over the number for the previous year. Although 1,761 awards were offered (224 more than in the past year), this number included 733 renewals, the result being that only one out of five of the new applicants was successful in obtaining an award.

COOPERATIVE GRADUATE FELLOWSHIPS

These fellowships, similar to the Graduate Fellowships, differ from them only in financial provisions and in administrative aims and procedures. A greater degree of institutional participation is involved, especially with respect to the initial evaluation and the recommendation of applicants.

For fiscal year 1962 the "recommendation numbers" assigned to the participating institutions were substantially increased, with every school being permitted to recommend at least 20 applicants for fellowships. Although the number of applicants (4,118) and the number of awards offered (1,200) reached new highs, the "success ratio" was lower than in any previous year.

SUMMER FELLOWSHIPS FOR GRADUATE TEACHING ASSISTANTS

These awards make it possible for Graduate Teaching Assistants in science, mathematics, and engineering to devote full summer periods to their own academic pursuits.

The sharp increase in the number of applicants this year (33 percent over the number for fiscal year 1961) was probably due mainly to the removal of "recommendation numbers" which had in earlier years limited the number of applicants in this program. Institutions were encouraged to recommend as many individuals as they considered qualified for these awards.

The 868 fellowships offered represented an increase of 243 over the number offered in the previous year.

POSTDOCTORAL FELLOWSHIPS

During fiscal year 1962 this program continued to enable persons who had recently obtained their doctorates to undertake additional advanced training as investigators in their specialized fields. Applications rose from 656 in fiscal year 1961 to 897—the greatest number in the program's 11-year history. Available funds permitted the awarding of 245 fellowships—only 10 more than the number offered in the previous year.

SENIOR POSTDOCTORAL FELLOWSHIPS

Senior Postdoctoral Fellowships are designed to offer well-established scientists, mathematicians, and engineers the opportunity to pursue additional study and/or research with a view toward increasing their competence in their specialized fields or toward broadening their knowledge in related fields of science, mathematics, and engineering.

Applications were received from 270 individuals and 92 awards were offered.

SCIENCE FACULTY FELLOWSHIPS

These fellowships provide an opportunity for college and university teachers of science, mathematics, and engineering with at least three years of science teaching experience at the collegiate level to improve their competence as teachers by obtaining additional advanced training in their own or related fields.

In fiscal year 1962, for the first time, the program was open to applications in the social science areas supported by the Foundation. Of a total of 864 applicants, 39 were social scientists—10 of whom were offered awards. Awards offered totaled 325, including 118 in the various engineering fields.

SUMMER FELLOWSHIPS FOR SECONDARY SCHOOL TEACHERS OF SCIENCE AND MATHEMATICS

This program emphasizes study by the fellows in the natural sciences and mathematics at a level acceptable to their fellowship institutions toward the traditional advanced degrees in science and mathemtics.

Both the number of applicants and the number of awards offered decreased for the second consecutive year, although the proportion of successful applicants was slightly higher than in fiscal year 1961. The present level of approximately 300 new awards per year appears to be optimum for this program.

NORTH ATLANTIC TREATY ORGANIZATION (NATO) POSTDOCTORAL FELLOWSHIPS IN SCIENCE

For the fourth consecutive year the Foundation administered, in behalf of the Department of State, the program of NATO Postdoctoral Fellowships in Science. These awards enable United States citizens and nationals to study abroad, primarily in the NATO countries. Other NATO member nations select fellows from among their own nationals. Of the awards accepted this year, 35 were for study and research in the physical sciences (including 4 in mathematics), 11 in the life sciences, and 2 in economics.

Surveys of Manpower Resources for Science and Technology

Long-range and continuing studies conducted by the Foundation are providing a variety of information and analyses on the education, professional qualifications, and employment of scientific and technical personnel. This information is made available for Foundation, other Federal agency, and public use as required for the management, operation, and evaluation of scientific manpower programs of all types. Activities include support and publication of studies and surveys, and the maintenance of the National Register of Scientific and Technical Personnel.

NATIONAL REGISTER OF SCIENTIFIC AND TECHNICAL PERSONNEL

During 1962 analysis of National Register data collected during 1960 was completed, and preparation was made for the 1962 recircularization of the register.

Analyses of the first 120,000 returns to the 1960 National Register were published in three preliminary reports: *Scientific Manpower Bulletin No. 14,* "Earnings of American Scientists, 1960;" *Scientific Manpower Bulletin No. 15,* "Geographic Distribution of Scientists in the National Register of Scientific and Technical Personnel, 1960;" and *Scientific Manpower Bulletin No. 16,* "Foreign-Language Proficiency of Scientists Reporting to the National Register of Scientific and Technical Personnel, 1960." The total number of individual scientists included in the final analyses of the 1960 data was 201,292.

These analyses culminated in a final report, *American Science Manpower, 1960.* (See table 4 and figure 2.) A special report, "Summary Characteristics of Scientists Reporting to the National Register of Scientific and Technical Personnel, 1960" was released as *Scientific Manpower Bulletin No. 17.* This Bulletin and the 1962 Questionnaire and Specialties List were mailed to American scientists during April 1962 by the cooperating national professional societies to initiate the 1962 registration. As of June 30, 1962, a total of 202,000 questionnaires had been received by the societies, with an anticipation that about 245,000 individual registrants would be included in the complete 1962 National Register.

Detailed information on scientific and technical personnel in the National Register was furnished in response to requests from the scientific community, Government agencies, industry, universities, etc. These requests may be categorized as:

1. Statistical information related to salaries, educational level, work activities, age distribution, types of employers of scientific and technical personnel, and other factors.
2. Numbers of registrants located in specific geographical areas, i.e., State, county, or metropolitan area.
3. Information on the techniques for establishing rosters for use by industrial establishments, educational institutions, and foreign countries.
4. Identification of individual scientists with specialized qualifications for foreign visit activities, international teaching assignments, and special studies to be conducted by Government agencies.

Table 4.—*Highlights of General Characteristics of Registrants, 1960*

Characteristics	Number	Percent
All registered scientists	201, 292	100
Men	186, 553	93
Women	13, 551	7
No report of sex	1, 188	....
Employment of status:		
Full-time civilian employed	172, 721	86
Active military duty	3, 945	2
Students	12, 905	6
All others	11, 721	6
Type of Employer:		
Educational institutions	55, 663	28
Government organizations	32, 364	16
Nonprofit institutions	8, 855	4
Industry, business, and self-employed	90, 986	45
All others, including military	13, 424	7
Professional experience:		
1 year or less	6, 827	3
2–4	29, 556	15
5–9	46, 152	23
10–14	40, 615	20
15–19	22, 145	11
20 or more	46, 761	23
No report of experience	9, 236	5
Work activity:		
Research, development, and design	74, 949	37
Teaching	29, 539	15
Management or administration	48, 914	24
All others	47, 890	24
Highest degree:		
Bachelor's	73, 555	37
Master's	50, 515	25
Professional medical	5, 432	3
Ph. D	62, 610	31
No report of degree	9, 180	4
Age groups:		
20–29	36, 627	18
30–39	79, 981	40
40–49	49, 102	24
50–59	23, 643	12
60 and over	9, 890	5
No report of age	2, 049	1
Median age 38 years.		

Source: National Register of Scientific and Technical Personnel, 1960.

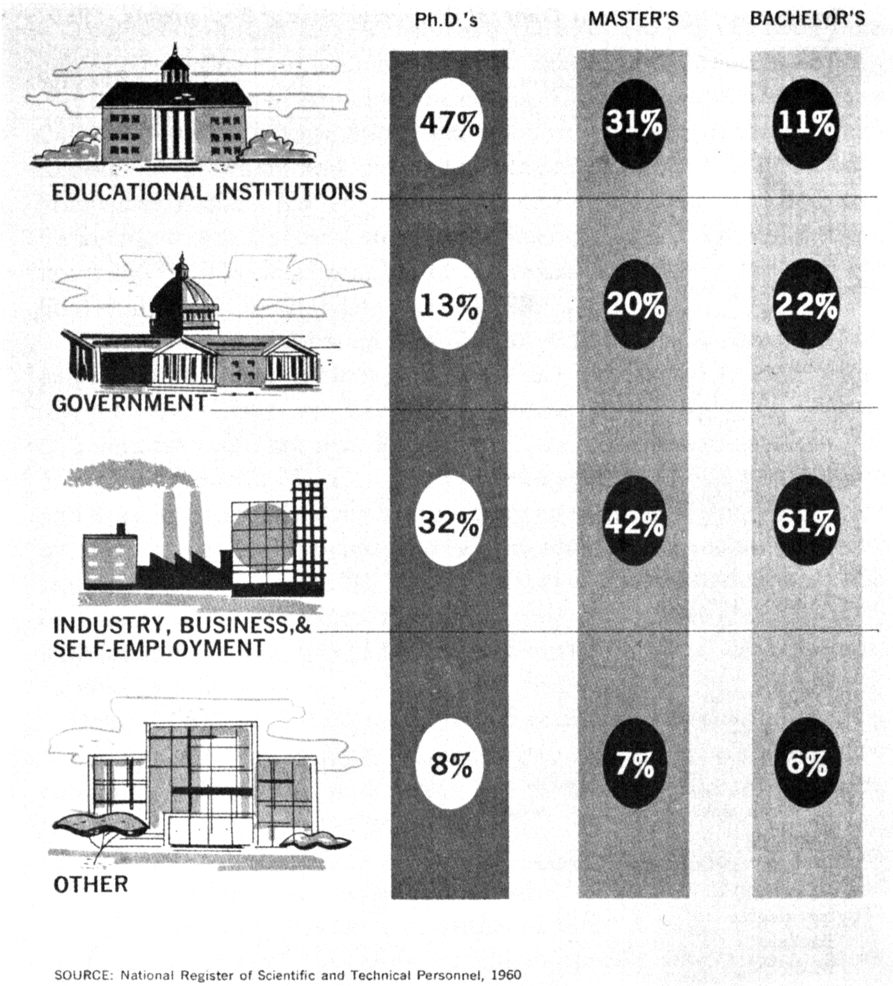


Figure 2. ***Type of Employer of Scientist Holding Bachelor's, Master's, and Ph. D. Degrees***

SCIENTIFIC MANPOWER STUDIES

Major studies of scientific and technical manpower undertaken by or on behalf of the Foundation are directed at providing information on critical manpower problems and aspects of scientific manpower potentials. Among the more important projects under way in fiscal year 1962 were studies of: Qualifications and Service Loads of Secondary School Teachers of Science and Mathematics; Evaluation of Sino-Soviet Bloc Countries in the Development of Scientific and Technical Manpower Resources of Other Countries; Offerings and Enrollments in Science and Mathematics in Non-public Secondary Schools; Sources and Extent of Financial Support of Graduate Students; Doctorate Production in United States Universities, 1920–61; Labor Market Behavior of Scientists and Engineers in Jet and Missile Production; and a Survey of Professional and Technical Manpower, based on a postcensorial survey.

During 1962, the Manpower Studies publications issued by the Foundation included:

Education and Professional Manpower in the USSR—The study was the result of a three-year research project and emphasized the development of Soviet education and specialized manpower resources in the entire context of total Communist ideology—political, economic, social, and cultural. The study covered topics such as the recent educational reform, the structure of the Soviet educational system (primary, secondary, specialized, and higher education), advanced degrees and Soviet research and academic personnel, and the employment of professional and specialized manpower in the Soviet Union. Some of the findings of this project were: (1) the Soviet Union is producing two to three times as many scientific and technical professional graduates yearly as the United States; (2) Soviet production of science and engineering professionals is seen as continuing at high levels throughout the 1960's; (3) professional instruction provided these graduates, though extensive in fundamentals of science and engineering, was found to be directed toward narrowly defined specialties.

Employment in Professional Mathematical Work in Industry and Government—Presents the findings of a survey of mathematical employment other than teaching. Data were collected on the age, education, experience and other characteristics of persons engaged in mathematical work, as well as on the nature of the current positions, functions performed, and income received (see table 5). Information on mathematics content required for work in this field will be useful to educators concerned with mathematics curriculum in the light of the changing requirements of the Nation's technology. The chief employers of persons engaged in mathematical work were found to be aircraft and electrical equipment manufacturers and the U.S. Department of Defense. Approximately 94 percent of the survey respondents had at least a bachelor's degree, and one-third had advanced degrees (7 percent the doc-

Table 5.—*Educational Level of Persons in Mathematical Employment,[1] By Employer, 1960*

Employer	Number Reporting	Percent distribution by educational level				
		Total	Doctor's degree	Master's degree	Bachelor's degree	No degree
All employers	[2] 9, 815	100	7. 2	25. 7	61. 3	5. 8
Private industry	7, 098	100	7. 4	26. 5	61. 4	4. 7
Aircraft & parts	1, 961	100	5. 9	25. 1	63. 3	5. 7
Transportation equipment (except aircraft)	208	100	6. 7	28. 4	62. 5	2. 4
Electrical equipment	1, 226	100	8. 7	27. 5	58. 9	4. 9
Machinery (except electrical)	601	100	11. 8	26. 9	55. 5	5. 8
Professional and scientific instruments	186	100	10. 8	29. 6	58. 0	1. 6
Other durable manufacturing	521	100	4. 8	31. 0	58. 6	5. 6
Petroleum products and extraction	451	100	12. 4	27. 1	58. 9	1. 6
Chemicals and allied products	317	100	17. 1	32. 6	47. 1	3. 2
Other nondurable manufacturing	169	100	10. 7	31. 4	53. 8	4. 1
Insurance	909	100	. 8	20. 7	73. 3	5. 2
Other nonmanufacturing	549	100	6. 4	27. 3	63. 0	3. 3
Federal Government	2, 493	100	5. 8	22. 5	62. 4	9. 3
Army	929	100	3. 1	19. 4	60. 2	17. 3
Navy	577	100	7. 1	22. 5	66. 9	3. 5
Air Force	453	100	5. 3	26. 5	61. 1	7. 1
National Aeronautics & Space Administration	231	100	3. 5	16. 0	76. 2	4. 3
Commerce	104	100	20. 2	21. 1	57. 7	1. 0
All other agencies	199	100	10. 0	35. 7	50. 8	3. 5
Nonprofit organizations	224	100	20. 5	35. 3	43. 3	. 9

[1] Other than teaching.
[2] Excludes 167 respondents who did not specify educational level.
Source: National Science Foundation.

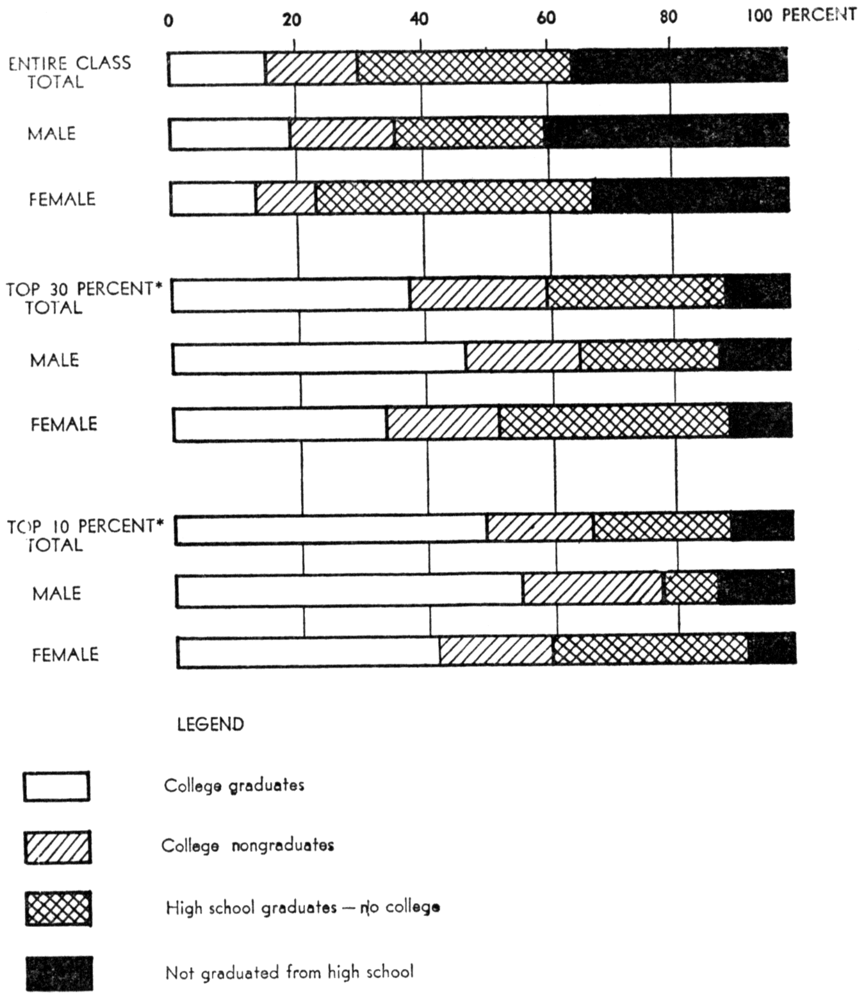
torate). Three-fifths of the respondents were under 35 years of age and one respondent in seven was a woman.

The Long-Range Demand for Scientific and Technical Personnel—Provides results of a study undertaken to develop a systematic methodology for the long-range projection of demand for scientific and technical personnel through separate analyses and projections for each principal segment of the economy. The report describes a methodology and presents projections to 1970, illustrating the procedures and calling attention to the areas where more or better data and analytical techniques are needed. The report concludes that much additional data are needed in order to analyze accurately future supply-demand relationships. The continued development of comparable statistics on scientists, engineers, and technicians for all segments of the economy and more comprehensive data on the educational background and other characteristics of such personnel are prerequisites for such a study, according to the report.

Women in Scientific Careers—Contains information on the employment and education of women in relation to scientific careers, including data on occupational status, age, marital status, educational attainment, and employment status. The study analyzed the factors controlling women's selection of and participation in scientific careers—giving consideration to such items as the loss of interest attributed to the educational system and the influence of personal, cultural, social, academic and economic factors on women's choice of careers.

Scientific and Technical Personnel in Industry, 1960—Includes information on the number of scientists and engineers (by discipline) and technicians employed by industrial concerns and other functions.

The Duration of Formal Education for High-Ability Youth—Presents an analysis of available information on the flow of youth from high school to college and progress through college to the bachelor's degree. These subjects are analyzed for all students and for those in the top 10 percent and top 30 percent ability levels. (See figure 3.) The study indicates that about two-thirds, rather than the frequently stated one-half, of the abler high school graduates do not enter college. Among talented boys, three-quarters to four-fifths of the high school graduates continue their education. On the other hand, less than one-half of the men and less than one-third of the women with high ability complete an undergraduate college education.



*Mental ability levels characteristic of top 30 percent and top 10 percent of high school graduates.

Figure 3. ***Percentages of 17-Year-Olds in 1955 Expected to Graduate From College (Through Full-Time Study)***

DISSEMINATION OF SCIENTIFIC INFORMATION

All scientific research produces information. All scientific research uses information. Maximum scientific progress requires maximum effectiveness in the dissemination of research-produced knowledge. Improving the control and dissemination of scientific information for the benefit of U.S. scientists is the fundamental mission of the Foundation's Office of Science Information Service (OSIS). Fiscal year 1962 marks the third full year of operation under directives the Foundation received from the President and the Congress in 1958–59.*

An extensive and highly complex, but relatively uncoordinated, scientific information system has existed in the U.S. for many years. It being neither desirable nor possible to wipe this system out and start completely anew, the plans and programs of the Office of Science Information Service necessarily involve simultaneously two basic efforts:

1. Promoting the study and development of new and better techniques and systems for controlling and disseminating scientific information.
2. Maintaining and improving existing services in this field.

Highlights

Three areas of scientific information can serve to illustrate and highlight the increased emergence in 1962 of an integrated pattern of OSIS activity that points toward a coordinated national scientific information system.

GRANTS AS "MEANS" AND "ENDS"

In Fiscal Year 1962, OSIS made 232 grants (including contracts and purchase orders) totaling $7,575,000. During this same period, 311 formal proposals were received requesting over $16,000,000. Grants can be used merely to insure the achievement of immediate, more or less unrelated ends. But they also can be important *means* in a planned, coordinated program looking toward the accomplishment of

*Title IX, National Defense Education Act of 1958 and March 1959 Amendment to the Executive Order 10521.

major, long-term objectives. In the OSIS grant program, NSF places heavy emphasis upon the latter aspect.

Those grants solely or predominantly in the "means" category naturally are concerned largely with promoting the development of new and improved ways of handling, controlling, and disseminating scientific information, the ultimate goal being the achievement of a coordinated, effective national system. Such grants mostly can be grouped in terms of the following steps:

1. Obtaining a comprehensive picture of the existing situation.
2. Determining the information practices and needs of users of scientific information.
3. Carrying on studies and research on improved methods.
4. Supporting programs to test and evaluate new procedures and systems.

Among means-type projects illustrative of Foundation support along these lines in fiscal year 1962 are the extensive communications studies that the American Institute of Biological Sciences, the American Institute of Physics, and the American Psychological Association are conducting in their respective fields. An important aspect of these investigations is the description and analysis of present information activities and services. The same is true of the large-scale study of the abstracting-indexing problem recently launched by the National Federation of Science Abstracting and Indexing Services.

In the past, work directed specifically toward determining the information practices of scientists has been supported at Columbia University and the Case Institute of Technology. Obtaining such knowledge, which is basic to the analysis of needs, is another of the goals of the broad disciplinary and abstracting-indexing projects mentioned above. A Syracuse University analysis of how and to what extent scientists are using the translated USSR journals impinges on this objective.

Studies and research on improved methods of information handling have emphasized fundamental investigations related to the mechanization both of the storage and retrieval of information and of translation. Representative of such work funded during 1962 are projects in linguistic research at the Universities of Pennsylvania and Texas and a study of new mathematical techniques of subject classification by the Cambridge (England) Language Research Unit. Other work looking toward improved procedures, but not directly linked to mechanization, includes a project at Georgia Institute of Technology on the training of information specialists; one by John I. Thompson Company on the distribution of Government reports; and work by Arthur D. Little, Inc. on centralization of various aspects of information handling.

Experimental programs to test and evaluate new procedures and techniques are a logical follow-up of the preceding study and research activities. Among efforts of this kind is a project completed during 1962 by the British Association of Special Libraries and Information Bureaux (ASLIB). By making a comparative study of the retrieval efficiency of four indexing and classification schemes, ASLIB developed a test method that has been applied to several operating systems, among them the American Society for Metals-Western Reserve University metallurgical searching service. Work is continuing under a new grant on both testing methods and evaluation of various indexing techniques.

Experimental development and test programs looking toward new procedures or systems for use in operating situations are the *Mathematical Reviews*' experiments and test runs with the Photon (a photocomposition device) for mathematical composition, and *Chemical Abstracts*' work in mechanizing certain aspects of its chemical information handling.

NSF has also supported conferences closely related to various phases of developing improved information procedures. Among such meetings in 1962 were a mechanical translation conference on syntactic analysis in Princeton, N.J., a workshop on information system design organized by the University of California (Los Angeles) and the American Documentation Institute, and a storage and retrieval workshop held by the U.S. Patent Office.

On the other hand, many grants necessarily are directed *primarily* toward meeting immediate needs and emergency situations. Examples include temporary and emergency funding of primary and abstracting-indexing journals, support of monographic publications, subsidy of translation journals, assistance to sceintific societies for special projects, and the like. Even these can and do have important implications as means toward an ultimate, overall objective. Abstracting-indexing support, for example, is granted along lines that will aid in coordinating all such efforts. In brief, a very large fraction of the total grant effort in 1962 was either predominantly "means" in nature or had significant implications beyond any immediate ends that were met.

A FEDERAL SCIENTIFIC INFORMATION PROGRAM

The Government, being itself a major producer and user of scientific information, possesses a large and complex internal program in this field. For the total U.S. system to be fully effective, intra-Government scientific information activities must be coordinated both with each other and with the extra-Government pattern. Effecting coordination within the Federal establishment is complicated by the varying basic missions of different scientific information groups. Any over-all coordinating effort must try to combine maximum value to the national scientific effort with minimum jeopardy to the various programs' individual responsibilities.

The Foundation's plan for discharging its Federal coordinating responsibility has involved, as a minimum, the cooperative development of a Government system that could provide any U.S. scientist or scientific organization promptly and reliably with: (1) information on the nature and status of Federally supported research in progress; (2) announcements, abstracts, and indexes of reports issued on such research; (3) access to copies of these reports; and (4) a single source of information on where answers can be obtained to substantive scientific questions.

During 1962, significant additional progress was made toward this composite goal, through the joint efforts of OSIS and the several other agencies involved. Organizational mechanics were completed on the expansion of the former Bio-Sciences Information Exchange into the Science Information Exchange (SIE), which will cover the physical, and eventually the social, as well as the life sciences. The SIE maintains and provides information on who is performing what research where. To begin with, only research supported by Federal grants and contracts is being covered. Planning calls for further extension of the scope beyond Government-sponsored R&D.

In the field of technical report literature, the Office of Technical Services (OTS) of the Department of Commerce has for some years published the abstracting journal *U.S. Government Research Reports* (USGRR). As a result of the Foundation's work with OTS and the report-originating agencies, USGRR's coverage has increased steadily for the past three years. During 1962, it became essentially complete for unrestricted Atomic Energy Commission (AEC) reports, National Aeronautics and Space Agency (NASA) reports, and Department of Defense reports held by the Armed Services Technical Information Agency (ASTIA). To provide rapid subject-oriented announcement of technical reports, NSF promoted the establishment of a *Keywords Index* of documents, that later will be abstracted in USGRR. The first issue of this semimonthly journal appeared just at the close of the fiscal year.

USGRR always has carried information on how to obtain copies of all documents it abstracted. Thus, expansion of USGRR's coverage automatically has made many more technical reports easily available to the scientific and technical community. Also, a reference collection of all reports covered by USGRR has been maintained for some years in the Library of Congress. Eleven more such regional report centers were established during fiscal year 1962 in selected universities and libraries scattered across the nation, increasing many-fold the number of scientists and engineers with ready-reference access to these documents.

As noted above, the Science Information Exchange is designed to meet the need for a single source of information on the nature and status of Federally supported research. A somewhat analogous need has been for a center that could dispense knowledge regarding the multitude of information services available within and outside of Government—that is, for a single source to which a scientist or an organization might go to find out where answers can best be obtained to specific questions. Toward the end of fiscal year 1962, plans were completed for the establishment of such a referral center in the Library of Congress during fiscal year 1963.

Supplementing these actions, which are tied specifically to the four minimum objectives stated previously, have been studies and surveys pertinent to a coordinated Federal information program as a whole.

But the Federal Government also has a scientific information responsibility beyond its own immediate operations. For example, various journals published by scientific societies are essential research tools for Government programs and find their principal (sometimes almost their total) market in the Federal establishment. NSF has played, and continues to play, a major coordinating role in these situations by calling together representatives of all parties concerned, private and Government, to work out fair and mutually beneficial patterns of support. A major 1962 advance in this problem area was the adoption by the Federal Council on Science and Technology, at NSF's recommendation, of a standardized Government policy favoring the honoring of journal page charges that increasingly are being levied by nonprofit scientific publishers. Enunciation of this policy was particularly significant in that it marked the recognition by the Council that dissemination of research results is an integral element in the R&D sequence and, therefore, properly should be supported from research funds.

MECHANICAL TRANSLATION (MT) AND COORDINATION

One 1962 development in MT deserves special mention as a particularly significant coordinating advance. Encouraged by NSF's promotion of increased coordination in all Federal information programs, NSF, the Department of Defense, and the Central Intelligence Agency, developed, during 1962, plans for a joint research and development program for automatic language processing, with particular attention to MT.

Documentation Research

The Documentation Research program concerns almost entirely the first of the two fundamental objectives of OSIS. It is directed principally toward stimulating and supporting studies, research, and experimentation along three general lines: (1) Identifying and assessing the information needs of scientists, (2) developing new and more effective systems—mechanized where advantageous—for handling and controlling scientific information, and (3) achieving mechanized translation of foreign language material into English.

COMMUNICATION PROBLEMS AND INFORMATION NEEDS OF SCIENTISTS

Several major communications studies were mentioned previously. The one being conducted by the American Psychological Association includes the following topics: Communication and information practices of a sample of productive research psychologists; tools and techniques employed by psychologists who have prepared review papers; comparative coverage of *Psychological Abstracts* and the *Annual Review of Psychology;* the readership of psychological journals and the use of *Psychological Abstracts;* cross-citations among psychological journals and images of journals held by psychologists; the information exchange that takes place at meetings; the characteristics and patterns of communication within specialized societies or groupings in the field of psychology; and comparison of concepts expressed in titles of papers with those employed in indexing the papers. Another new study undertaken by the Advance Information Systems, Inc., is concerned with behavioral factors in information systems.

INFORMATION ORGANIZATION AND SEARCHING

In the important University of Pennsylvania project on linguistic research, an exact, mechanizable procedure is being devised for converting a complex sentence into a much simpler form that will maintain the original meaning but be more amenable to machine processing for information retrieval. Much new knowledge about the English language is resulting from this work, and the development of computer programs to accomplish automatically the grammatical and transformational decomposition of English sentences is well along.

Other continuing projects showing significant progress this year include research by the National Bureau of Standards on the mechanical processing of both pictorial and linguistic information*, development by the National Biomedical Research Foundation of a computer program for automatically producing a tabular form of coordinate index, and an Advanced Information Systems, Inc. study of large file organization with emphasis on self-organizing capabilities.

Among the new projects are a Lehigh University study of models of information retrieval systems, Western Reserve University research on automatic processing of abstracts for storage and retrieval, and an engineering terminology study by the Engineers Joint Council.

MECHANICAL TRANSLATION (MT)

Probably the most significant 1962 development in MT was the three-agency agreement previously mentioned regarding future research and development. In U.S. basic research in this field, a major portion of which NSF supports, considerable progress was made in fundamental studies of language structure including the design of computer programs to aid in language analysis, the compilation of bilingual computer dictionary programs, and the development of computer programs for steps in the translation process. Also of considerable importance this year was the third in a series of working conferences of MT investigators. This one was devoted to certain phases of the syntactic analysis of languages.

EVALUATION OF INFORMATION SYSTEMS AND PROCEDURES

The Association of Specialized Libraries and Information Bureaus project, already mentioned, is an example of significant NSF-supported work in this area, one which is increasingly being emphasized in the OSIS program. Because of a lack of rigorous standards on which to base quality judgments, two exploratory studies were launched to develop criteria for evaluating information systems and procedures. They were recommended by a National Academy of Sciences-National Research Council (NAS–NRC) committee set up to study this question and were conducted by Stanford Research Institute and Arthur Anderson and Company.

Other NSF-funded 1962 projects with significant evaluative aspects included: A test program of the ASM–WRU metallurgical searching service, the results of which are being evaluated by NAS–NRC; a survey by users of this service by the Bureau of Social Science Research; and an NAS–NRC study of chemical notation systems to determine the

*Jointly supported by NSF and the Patent Office.

uses currently being made of them and their strengths and weaknesses for organizing and searching information on chemical structures. Late in the year a grant was made to the Massachusetts Institute of Technology to design and establish in the Boston area, a test environment in which controlled tests can be made of information system components and new types of service.

SURVEYS AND REPORTS

Two extensive state-of-the-art reports were issued with NSF support—on character recognition, by the National Bureau of Standards, and on coordinate indexing, by Documentation Incorporated. The Documentation Research program continued to compile and publish its semiannual report on *Current Research and Development in Scientific Documentation,* the May 1962 issue containing some 450 descriptions of R&D projects and studies in the U.S. and 20 other countries. During the year the program also surveyed operating systems that employ new techniques or devices and prepared for publication the third edition of its series *Nonconventional Technical Information Systems in Current Use.*

Support of Scientific Publications

The activities of this program (SSP) are directed toward the goal of an optimum publication system for dissemination of research results. The program considers such a system to consist of two basic, related parts: primary publications for first reports of the results of research and secondary publications or services for reference purposes.

NSF concern with primary publication is largely a national problem, but the growth of world publication of scientific research results has broadened consideration of secondary reference services to the international level, especially in abstracting-indexing which is the keystone of scientific reference service. Projects supported are of two types, those that aid existing publications and services, and others that experiment with new techniques. Although the proposals received by SSP are many and varied, a major factor in their screening is their contribution toward providing prompt publication of the results of scientific research in a usable quantity and form.

Kinds of projects supported during 1962 included: modernizing and expanding coverage of abstracting-indexing services; publishing significant single items, including monographs, symposium proceedings, reviews, data compilations, and bibliographies; launching new primary journals; eliminating manuscript backlogs of existing journals; and experimenting with new publication-oriented information techniques. Representative projects of particular significance follow.

SUPPORT OF PRIMARY PUBLICATIONS

During 1962 this program supported the launching of three new journals: *Applied Optics, Applied Physics Letters,* and *Malacologia.* The first of these, which began publication in January 1962, is directed toward physical, electron, and space optics; lens design; optical engineering; and plasma and solid state physics. Although jointly sponsored by the American Institute of Physics and the Optical Society of America, *Applied Optics* is published independently by the latter. The new journal is devoted largely to original research and to reviews of major research topics; articles may be published in English, French, German, and Russian. *Applied Physics Letters,* a second rapid publication medium in physics, is aimed at providing a quick announcement service for short papers in a number of fields not covered by *Physical Review Letters,* the first such journal initiated with NSF support. *Malacologia* provides a medium for literature in the field of mollusks; at present such literature is scattered through many journals. Research in this field is moving at a rapid rate in many countries, and this new outlet will allow more prompt publication of good papers in systematic and experimental areas of malacology. All NSF funding of primary journals is done on a temporary basis.

More than half of the grants made for the support of publication of 31 monographs during 1962 were in biology, where outlets, particularly for taxonomic volumes, appear limited.

The Pacific Science Congress and the International Physiological Congress were two international meetings receiving publication support.

STUDIES AND EXPERIMENTS IN SCIENTIFIC COMMUNICATION

The New York Botanical Garden pilot project on a machine coding system for plant taxonomy produced the first volume of the planned *International Index.* This volume contains all the plant families. Orders, genera, and species have also been coded. Subsequent volumes will contain this information.

Representative of the five catalogs and handbooks supported during 1962 is the "Checklist of Amphibians and Reptiles", an ambitious experimental project undertaken by the American Society of Ichthyologists and Herpetologists that will offer complete summaries of all North and South American species.

The American Institute of Physics Documentation Study mailed a questionnaire during 1962 to some 1500 physicists to determine how physicists describe their own fields of activity. Analysis of these descriptions will form a basis for compiling improved subject indexes, and designing a more adequate reference retrieval system for physics literature.

With NSF support, a group of Latin American editors attended the February 1962 meeting of the U.S. Conference of Biological Editors (CBE). At this meeting they organized a Latin American CBE to provide a forum to promote improved biological journal publication in their countries. As an initial project they are working on a Spanish style manual similar to CBE's "Style Manual for Biological Journals."

SUPPORT OF SECONDARY SERVICES

Support was continued for improved operation and expansion of several major abstracting-indexing services including *Mathematical Reviews, International AeroSpace Abstracts, GeoScience Abstracts, Biological Abstracts,* and *Chemical Abstracts.*

The Operations Research Society of America (ORSA) initiated publication of the *International Abstracts in Operations Research* with NSF grant funds. In addition to the conventional author and subject indexes, each issue of IAOR contains a "Digest" that lists abstracts serially and describes the referenced publication by key words indicating principal topics and methodology and by letter codes representing bibliographic, computational, experimental, and other aspects of the contents.

Support of specialized bibliographies was limited, and only experimental indexing projects were considered. Six grants were made during 1962 for the publication of compilations in such diverse subjects as ethnography of South America, radio astronomy, and palynology.

NSF support during 1962 played a significant role in a number of activities relative to mechanization of abstracting-indexing procedures. For example, grant funds provided for the purchase of a Photon by the American Mathematical Society for use in developing complex mathematical photocomposition. Conversion to tape typewriters by *Engineering Index* will enable them to initiate monthly issues and to prepare these, as well as the annual issue, from a single typing. Permuted indexes were published by both *Chemical Abstracts* and *Biological Abstracts.* Large scale application of this indexing technique is relatively recent, however, and funds were provided for further experiments. A grant was made for an experimental citation index in the field of statistical methodolgy. *Chemical Abstract's* mechanized file of chemical compounds, permitting computer searches for both molecular and structural correlations, approached productive level of coverage, and codes were developed to relate biological, physical, and physiological properties to the appropriate chemical entity.

Foreign Science Information

The basic mission of the Foreign Science Information program is to promote the effective availability in the United States of scientific research results published in foreign countries and to foster interchange of scientific information between these countries and the United States. This mission is implemented by encouraging the broadest possible communication between U.S. scientists and their counterparts throughout the world. Program activities are designed:

1. To promote effective acquisition of foreign scientific publications through purchase and by exchange between U.S. and foreign organizations.
2. To provide data to the U.S. scientific community on sources and availability of foreign scientific information, which includes support for scientific and technical reference aids.
3. To increase the scope and quantity of translations of the most important foreign scientific publications.
4. To stimulate cooperation with international organizations in support of projects which will add to the U.S. store of information and materially improve scientific communication on an international scale.

TRANSLATIONS

Emphasis was placed upon encouraging professional groups to obtain access to foreign scientific literature through programs of selective translation, principally from the Russian, and to inaugurate new programs for the translation of Japanese scientific journals in physics, chemistry, biology, and selected areas of engineering. By the end of the fiscal year, NSF was supporting, through grants to scientific societies and universities, the cover-to-cover translation of 42 Soviet scientific and technical journals and selected translations from 13 others.

An example of a highly selective translation journal is *International Chemical Engineering,* inaugurated by the American Institute of Chemical Engineers, which concentrates on the literature of the Sino-Soviet bloc. Funds were granted to the American Mathematical Society for translation of the Communist Chinese journal, *Acta Mathematica Sinica.* Also, the American Institute of Physics was supported in a cooperative arrangement with the Japan Physical Society to encourage the dissemination in the U.S. of the English-language journal, *Japanese Bulletin of Applied Physics.*

Overseas translation activities carried out during fiscal year 1962 under Public Law 480 (Agricultural Trade Development and Assistance Act of 1954) constitute another important effort to utilize the results of foreign research and to stimulate international scientific cooperation. This program is being carried on in Israel, Poland, and Yugoslavia by Federal agencies using foreign currencies accruing through the sale of U.S. agricultural commodities overseas. A total of 25,800 pages of Russian, 13,000 pages of Polish, and 4,300 pages of Serbo-Croatian material was translated and disseminated in the U.S. in fiscal year 1962, under Foundation leadership. In addition, simultaneous English language editions of the leading Polish and Yugoslav primary journals are now under way.

STUDIES AND REFERENCE AIDS

Considerable emphasis was placed on studies of scientific research and information activities in foreign countries. These included compilation of directories of foreign scientific research institutions and scientists, reviews of the state-of-the-art of sciences in foreign countries, science information activities in foreign countries and international organizations, and preparation of bibliographic guides to foreign scientific publications.

There was a similar concentrated effort to produce guides for the scientific community relating to foreign scientific literature available in the United States, both in the original languages and in translation.

INTERNATIONAL ACTIVITIES

The FSI program has been instrumental in developing measures for closer coordination of science information activities among international scientific and information organizations, such as United Nations Educational, Scientific, and Cultural Organization, International Council of Scientific Unions, Federation of International Documentation, International Federation of Library Associations, International Organization for Standardization, and others. Assistance has also been rendered to appropriate U.S. agencies and organizations in the development and strengthening of information activities within, or supported by, these and similar international organizations.

RESOURCES AND EXCHANGES OF INFORMATION

Finally, emphasis was placed during the past year on fostering programs for the acquisition and exchange of foreign scientific publications. With NSF support, a large-scale exchange has been worked out by the American Mathematical Society and the Lenin State Library whereby multiple copies of some 700 Soviet scientific periodicals come directly to approximately 75 U.S. research libraries. The American Mathematical Society provides U.S. publications in return.

Research Data and Information Services

The two general problem areas of primary concern to this program are: (1) the Government system for the control and dissemination of scientific information stemming from Federally supported research and development, and (2) specialized data and information centers. These categories obviously are not mutually exclusive since the Federal information complex includes a number of specialized services, and many privately sponsored centers handle certain Government-originated materials and include Federal agencies among their users.

Major 1962 emphasis continued to be on stimulating and, where appropriate, supporting the coordination of various Federal information activities, looking toward the development of a balanced, effective overall Government system.

THE FEDERAL SCIENTIFIC INFORMATION SYSTEM

NSF's major role in these activities has been to encourage and work with the Federal agencies that are operationally involved. In some cases financial support also has been provided, usually for necessary experimentation or to speed up initiation of specific projects.

The Science Information Exchange, an expansion of a similar project of some years' standing in the life sciences, increasingly is providing information on Federally supported research in progress in the physical and biological sciences. Plans call for later extension to include the social sciences and to cover privately sponsored research. Abstracting coverage by *U.S. Government Research Reports* has become essentially complete for unrestricted AEC, NASA, and ASTIA-held Department of

Defense reports. OTS' new *Keywords Index* now can provide prompt, subject-oriented announcement of reports subsequently abstracted in U.S. Government Research Reports. Twelve regional report centers give scientists and engineers in major U.S. research and development centers ready reference access to the technical reports covered by USGRR. At the end of the fiscal year, the Library of Congress had just begun to establish a referral center that will provide a single source to which a scientist or engineer can go for information on where answers to substantive scientific questions can best be obtained.

Supplementary to these specific steps in the direction of a well-coordinated Federal information system have been studies on the initial distribution of technical reports, on the practicability and implications of various degrees of centralization of Federal information activities, and on problems of compatibility between existing information systems.

DATA AND INFORMATION CENTERS

The continued growth in the number and use of scientific data, reference, and information centers has resulted in numerous requests to the Foundation for funds to establish and support such operations. NSF activities in this area are designed to develop basic information on the use and value of data centers and the services they perform.

Late in the year the Foundation initiated, as a part of a general continuing study, a comparative economic analysis of two different hypothetical information systems—one, a subject-oriented information service network and the other, a geographically-oriented network. The study, being carried out by a private firm, involves the construction of models characteristic of the two systems and the formulation of various mathematical expressions of the systems, through the use of which a comparative economic analysis is being made.

Under contract to the Foundation, the Battelle Memorial Institute carried out an extensive survey of specialized science information services in the physical and biological sciences. A directory based on the survey and listing more than 400 such groups was published during 1962. Entitled "Specialized Science Information Services in the United States," the directory is designed for use as a reference aid for working scientists and engineers.

A grant was made to the American Society of Mechanical Engineers for the establishment of a scientific film library service on flow visualization research data in fluid mechanics. Purpose of the project is to improve the dissemination of such data available on motion picture film and, at the same time, to serve as an experiment in the use of scientific film as a medium for exchange of information among scientists.

Education and Training

Although not established as a formal program, the OSIS education and training activity functioned during 1962 in much the same manner as the programs described above. The fundamental overall mission of this effort continues to be the improvement of the competence of: (1) science librarians and information specialists in organizing, controlling, and disseminating scientific information, and (2) scientists and engineers in the use and presentation of the results of scientific research. The Foundation's long-range objective is to encourage the development in U.S. colleges and universities of curricula, of various kinds and at a variety of levels, that will accomplish this two-phase mission. NSF's own role in stimulating and promoting such curriculum development requires it to study, on a continuing basis, the needs for trained manpower in these areas; to work with the universities and scientific groups in establishing program requirements for training the needed manpower; and to develop within the Foundation an effective, realistic plan of encouragement and support.

During the past year, activity in this program has concentrated on the initial aspects of the first of the mission areas. Studies were conducted in-house to obtain current information on educational programs, both academic and non-academic, for training information personnel. Library school curricula were surveyed to determine the extent to which course offerings prepare librarians for work with science collections or science information centers. Also, a survey was conducted of curricula in other departments of universities to determine the extent to which they are applicable to training students for work with science information. Finally, the content of various conferences, institutes, and short courses on science information activities was examined to determine its relevancy to training programs for librarians and information specialists.

In addition to the in-house activity, a grant was made to the Georgia Institute of Technology for a study of various factors that affect development of educational programs for information specialists. These include development of curricula, recruiting students, faculty requirements, and the relative values of short courses and degree programs. Preliminary conclusions developed from the study indicate that university programs for training specialized personnel for work in various aspects of science information can and should be developed.

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Studies for support and encouragement of educational programs was also a major project in the 1962 education and training activity. The planning and development was coordinated with the NSF Division of Scientific Personnel and Education (SPE). Implementation by this division is expected to begin during the next fiscal year.

SCIENCE RESOURCES PLANNING

Science today is a foremost national resource, a potent economic stimulus, and a key to national development and relations among nations. Because of his increasing reliance on scientific output, man must ensure that science will have the resources to meet present and future needs.

The primary resources of science are people—the scientists and engineers who teach, do research and development, and manage production; and the technicians and other specialists who assist them. Other resources of science are the equipment and facilities they use, and the institutions in which they work. Equally important are the funds that support science activities.

The increasingly rapid development of science and technology makes it necessary to be able to analyze trends, to study effects of Federal programs on the conduct of research and teaching in science, and to anticipate future demands on the Nation's science resources. To meet these needs, the Foundation established, in October 1961, the Science Resources Planning Office to serve as a focal point for studies relevant to the formulation of national policy for research and education in science and engineering.

SRPO responds to the needs of the Office of Science and Technology, the Federal Council for Science and Technology, the President's Science Advisory Committee, as well as other organizations concerned with policy for science and technology. The Science Resources Planning Office coordinates long-range planning within the Foundation. It is assisted in its activities by the Office of Economic and Statistical Studies and by the Manpower Studies Section of the Division of Scientific Personnel and Education Studies Section.

As a basis for science resources planning relevant to the formulation of national policy for research and education in science and engineering, the Foundation has conducted or participated in two general kinds of projects: (1) determination of present national resources, capabilities, and probable growth in scientific potential; and (2) exploration of scientific relations of colleges and universities with the Federal Government.

On such project is the Federal Agency Survey of Research and Development Levels Projected to 1970. The survey is being conducted for the Federal Council for Science and Technology and includes the eight agencies represented on the Council plus Agency for International Development (AID) and Federal Aviation Agency.

A second survey concerns the adequacy of physical facilities, including apparatus and equipment, used for teaching and for research, in all fields of science and engineering in educational institutions. In the past several years, requirements for such facilities have increased faster than their acquisition. Needs have arisen both from greater numbers of faculty and students and from unprecedented expansion of research activity under Federal support. Quantitative sampling of educational institutions should show anticipated facility requirements for the next ten years, as well as capabilities of institutions to meet the costs of expansion of facilities.

Another study considers instrumentation and its effects on research. Instrumentation often has an appreciable effect on both manpower and budgets. Manpower demands may, for example, be diminished by new instruments which reduce the number of assistants needed to record or analyze data. Other advances may open up new scientific opportunities and thus draw additional personnel into instrumented research efforts. The study is also aimed to yield quantitative data on the "inflation" of research costs owing to instrumentation, and on ratios of cost-per-person in highly instrumented fields of research. Such data constitute important inputs for long-range planning.

New dimensions in the involvement of colleges and universities with research and development have posed new problems in the organization and administration of colleges and universities. To investigate these problems, preliminary steps have been taken to initiate a survey of influences of R&D on such factors as academic organization, participation of faculty and graduate students in R&D, extramural consultant services, patent policy, and specially-financed research laboratories and institutes.

To stimulate and improve the practice of long-range planning in science, the Foundation has undertaken a series of basic analytical studies to provide better understanding of planning and policy-making. Typical is one concerned with the interdependence of scientific progress and the competition for scientists and engineers at the doctoral level. The study is analyzing the long-range effects of varying degrees of "feedback" of new doctoral scientists and engineers into educational institutions.

To provide general guidance for planning, conceptual frameworks are being developed for relating activities of the Foundation to the scientific endeavor of the Federal Government and of the nation as a whole. In this connection the general philosophy and goals of the Foundation are being evaluated in relation to the fulfillment of its mission in the future. Questions include the support of critical areas of science; educational needs to meet expected growth in scientific manpower; and expansion of facilities for research and for education in science, at all academic levels. A parallel study bears on the future levels of NSF support programs such as those in research grants and in fellowships.

ASSESSING THE NATIONAL RESEARCH AND DEVELOPMENT EFFORT

The Foundation conducts or sponsors detailed economic analyses and statistical surveys of the national research and development effort, measured by both funds and manpower. The studies, directed or conducted by the Foundation's Office of Economic and Statistical Studies, provide trend data for the past eight years. (See appendix H for a list of publications reporting the results of these activities.)

Comprehensive annual surveys are conducted of expenditures for research and development by both industry and the Federal Government, which comprise the two largest of the four survey sectors. Surveys of colleges and universities involve operating and capital expenditures for research and development, scientific manpower, and scientific equipment and facilities, the latter including projections as well as current data. In the fourth sector are the nonprofit research institutes and private foundations. (A study of scientific research supported by the private foundations in 1960 was reported in the Foundation's bulletin, *Reviews of Data on Research & Development,* Number 35.)

Related components of science and technology are also being measured. Projects are underway to survey scientific information activities of both industry and the Federal Government. During the past year data on these activities in the Federal sector were published.

TREND IN R&D FUNDS, 1953–54—1960–61

During the fiscal year, the Foundation published a time series on the intersectoral transfer of funds for research and development as well as for basic research for 1953–54 through 1960–61.

Expenditures for the performance of research and development in the natural sciences in the United States were estimated at about $15 billion in 1961–62. This amount is nearly triple the $5.2 billion for 1953–54 reported in the first NSF survey. (See tables 6a, 6b, 7a, 7b.)

Most of the data in these tables are obtained from the Foundation's statistical surveys in which more than 90 percent of organizations queried have provided responses. Time series on R&D expenditures for years prior to those covered by the Foundation contain only fragmentary data and are based on limited studies.

The transfer tables provide a basis for further study and analysis. From them may be obtained a statistical framework of sixteen possible

Table 6a. Time Series on Transfers of Funds Used for Performance of Research and Development, by Sector, Distributed by Source, 1953–54—1960–61 [a]

[millions of dollars]

Year	Total R&D	Federal Government: Total funds used	Federal Government: Source: Federal Government	Industry: Total funds used	Industry: Sources: Federal Government	Industry: Sources: Industry	Colleges and universities: Total funds used	Colleges and universities: Sources: Federal Government	Colleges and universities: Sources: Industry	Colleges and universities: Sources: Colleges and universities [b]	Colleges and universities: Sources: Other nonprofit institutions	Other nonprofit institutions: Total funds used	Other nonprofit institutions: Sources: Federal Government	Other nonprofit institutions: Sources: Industry	Other nonprofit institutions: Sources: Other nonprofit institutions [b]
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
PERFORMANCE 1953–54	5,150	970		3,630			450					100			
Source			970		1,430	2,200		280	20	130	20		60	20	20
PERFORMANCE 1954–55	5,620	950		[c] 4,070			[c] 480					[c] 120			
Source			950		1,730	2,320		300	20	140	20		70	25	25
PERFORMANCE 1955–56	6,390	1,090		[c] 4,640			[c] 530					[c] 130			
Source			1,090		2,180	2,460		330	20	155	25		70	30	30
PERFORMANCE 1956–57	8,610	1,280		6,540			[c] 650					[c] 140			
Source			1,280		3,330	3,210		415	25	180	30		70	30	40
PERFORMANCE 1957–58	10,030	1,440		7,660			780					150			
Source			1,440		4,330	3,330		530	30	190	30		80	30	40
PERFORMANCE 1958–59	11,070	1,730		8,300			[c] 840					[c] 200			
Source			1,730		4,760	3,540		570	40	190	40		110	40	50
PERFORMANCE 1959–60 (prelim.)	12,620	1,830		9,550			[c] 1,000					[c] 240			
Source			1,830		5,610	3,940		720	40	200	40		130	50	60
PERFORMANCE 1960–61 (prelim.)	14,040	2,060		10,500			[c] 1,200					[c] 280			
Source			2,060		6,130	4,370		890	50	210	50		140	70	70

[a] Data on sources of funds are based on reports by the performers.

[b] State and local government funds spent for research and development by the colleges and universities and other nonprofit institutions are included with the respective sector's own funds.

[c] Estimates derived from related available information. No sector survey took place in this year.

Note: Expenditures of Federal contract research centers administered by industry, colleges and universities, and other nonprofit institutions are included in the totals of the respective sectors.

Source: National Science Foundation, March 1962.

Table 6b. Sources of Funds Used for Research and Development, by Sector, 1953–54—1960–61 [a]

[millions of dollars]

Year	Total	Federal Government	Industry	Colleges and universities [b]	Other nonprofit institutions [b]
1953–54	$5,150	$2,740	$2,240	$130	$40
1954–55	5,620	3,070	2,365	140	45
1955–56	6,390	3,670	2,510	155	55
1956–57	8,610	5,095	3,265	180	70
1957–58	10,030	6,380	3,390	190	70
1958–59	11,070	7,170	3,620	190	90
1959–60 (prelim.)	12,620	8,290	4,030	200	100
1960–61 (prelim.)	14,040	9,220	4,490	210	120

[a] Data are based on reports by the performers.

[b] State and local government funds spent for research and development by the colleges and universities and other nonprofit institutions are included with the respective sector's own funds.

Note: With the exception of data for 1953–54 and 1957–58, the years in which surveys covered all sectors, data on sectors as sources of funds are estimates.

Source: National Science Foundation, March 1962.

source-performer relationships for the year covered. The presentation facilitates comparison of the R&D financing role of each of the sectors with respect to the others. The data for 1960–61 repeat the pattern shown for previous years. In 1960–61, the Federal Government was the primary source of R&D funds, with respondents reporting receipts from this sector of more than $9 billion, or 65 percent of the total outlay of $14 billion. Industry was again the largest performer, spending $10.5 billion in current operating costs of research and development.

In 1960–61 funds used in the performance of basic research in the natural sciences rose to an estimated $1.3 billion, nearly three times the $430 million spent for basic research in 1953–54.

Over the eight-year period, an increase occurred of more than 400 percent in the dollar volume of federally-performed basic research, largely owing to accelerated space research programs. During the same period, funds used by colleges and universities, traditionally the home of basic research, increased 175 percent. The average increase for all sectors was 200 percent.

As in previous years, in 1960–61 the colleges and universities expended more than other sectors in the performance of basic research—$575 million, or 44 percent of the total. The Federal Government provided the largest portion of total funds for basic research, more than one-half, or about $745 million. Of this amount $350 million went to colleges and universities.

Table 7a. *Time Series on Transfers of Funds Used for Performance of Basic Research, by Sector, Distributed by Source, 1953–54—1960–61* [a]

[millions of dollars]

Year	Total basic research (1)	Federal Government: Total funds used (2)	Federal Government: Source: Federal Government (3)	Industry: Total funds used (4)	Industry: Sources: Federal Government (5)	Industry: Sources: Industry (6)	Colleges and universities: Total funds used (7)	Colleges and universities: Sources: Federal Government (8)	Colleges and universities: Sources: Industry (9)	Colleges and universities: Sources: Colleges and universities [b] (10)	Colleges and universities: Sources: Other nonprofit institutions (11)	Other nonprofit institutions: Total funds used (12)	Other nonprofit institutions: Sources: Federal Government (13)	Other nonprofit institutions: Sources: Industry (14)	Other nonprofit institutions: Sources: Other nonprofit institutions [b] (15)
PERFORMANCE 1953–54	432	47		151			208					26			
Source			47		19	132		119	11	62	16		10	4	12
PERFORMANCE 1954–55	485	55		[c] 166			[c] 230					[c] 34			
Source			55		n.a.	n.a.		129	11	70	20		15	4	15
PERFORMANCE 1955–56	547	65		[c] 189			[c] 250					[c] 43			
Source			65		n.a.	n.a.		144	11	75	20		20	5	18
PERFORMANCE 1956–57	694	90		253			[c] 300					[c] 51			
Source			90		n.a.	n.a.		173	12	90	25		25	5	21
PERFORMANCE 1957–58	834	111		271			392					60			
Source			111		41	230		240	14	111	27		30	5	25
PERFORMANCE 1958–59	1,016	221		305			[c] 420					[c] 70			
Source			221		55	250		256	17	118	29		35	6	29
PERFORMANCE 1959–60 (prelim.)	1,150	220		345			[c] 500					[c] 85			
Source			220		79	266		305	20	140	35		42	7	36
PERFORMANCE 1960–61 (prelim.)	1,302	245		382			[c] 575					[c] 100			
Source			245		100	282		350	23	161	41		50	8	42

[a] Data on sources of funds are based on reports by the performers.

[b] *State and local government funds spent for basic research by the colleges and universities and other nonprofit institutions are included with the respective sector's own funds.*

[c] *Estimates derived from related available information. No sector survey took place in this year.*

n.a.—Not available.

Note: Expenditures of Federal contract research centers administered by industry, colleges and universities, and other nonprofit institutions are included in the totals of the respective sectors.

Source: National Science Foundation, March 1962.

Table 7b. *Sources of Funds Used for Basic Research, by Sector, 1953–54—1960–61* [a]

[millions of dollars]

Year	Total	Federal Government	Industry	Colleges and universities [b]	Other nonprofit institutions [b]
1953–54	$432	$195	$147	$62	$28
1954–55	485	n.a.	n.a.	n.a.	n.a.
1955–56	547	n.a.	n.a.	n.a.	n.a.
1956–57	694	n.a.	n.a.	n.a.	n.a.
1957–58	834	422	249	111	52
1958–59	1,016	565	275	118	58
1959–60 (prelim.)	1,150	646	293	140	71
1960–61 (prelim.)	1,302	745	313	161	83

[a] Data are based on reports by the performers.

[b] State and local government funds spent for basic research by the colleges and universities and other nonprofit institutions are included with the respective sector's own funds.

n.a.—Not available.

Note: With the exception of data for 1953–54 and 1957–58, the years in which surveys covered all sectors, data on sectors as sources of funds are estimates.

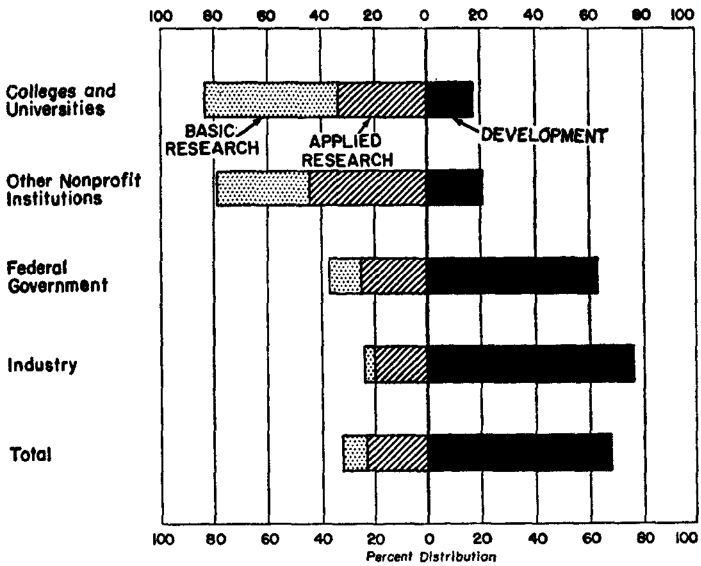
Source: National Science Foundation, March 1962.

R&D FUNDS BY CHARACTER OF WORK

During the past year, for the first time national totals of R&D expenditures were separately classified by basic research, applied research, and development for each sector. Earlier estimates by the National Science Foundation of national totals have been limited to research and development and its basic research component, owing to the difficulty of separately identifying data on applied research and on development.

Available data for years preceding 1959–60 indicate the relatively constant distribution of funds among the three components of research and development. Basic research outlays have amounted to 8–9 percent of total R&D funds. Somewhat less than 75 percent of total R&D funds have been concentrated in the category of development. Applied research expenditures have accounted for the remainder. (See figure 4.)

At the sector level, industry and the Federal Government expended the greatest proportion of their R&D funds in the performance of development. This is consistent with the emphasis on development in defense and space projects conducted in these sectors. While basic research accounts for the largest proportion of R&D expenditures in colleges and universities, applied research receives more funds than either of the other two components of research and development in other nonprofit institutions.



Note: Data on Federal estimates of applied research and development were not obtained directly by survey but were derived from available related information.

Figure 4. Basic Research, Applied Research, and Development—Percent Distribution of Funds Used in Performance, by Sector, 1959–60

SCIENTISTS AND ENGINEERS IN RESEARCH AND DEVELOPMENT

About 387,000 scientists and engineers were employed in research and development in the natural sciences in 1960 (including engineering) in all sectors of the economy (measured in terms of full-time equivalents, F.T.E.), compared with 327,000 in 1958, and 223,000 in 1954. (See table 8.)

The rate of growth in the number of R&D scientists and engineers appears to have declined from 1958 to 1960 as compared with growth from 1954 to 1958. In the later period, the number of scientists and engineers employed in research and development increased about nine percent per year. Between 1954 and 1958, the increase was about 12 percent per year.

COMPARISON OF FUNDS AND PERSONNEL FOR RESEARCH AND DEVELOPMENT

Over the entire period for which data are available, 1954 through 1960, the increase in professional scientific personnel was almost 75 percent. During the same period, R&D funds increased more than 140 percent. Because total funds have risen more rapidly than total employment for research and development, the overall cost per R&D scientist or engineer (F.T.E.) increased. From about $23,000 in 1954, it rose to $31,000 in 1958, and $33,000 in 1960.

Table 8. *Scientists and Engineers in Research and Development, by Sector, 1954, 1958, and 1960* [a]

Sector	1954	1958	1960 (Prelim.)
	Full-time equivalents		
Total	223,200	327,100	387,000
Federal Government [b]	29,500	40,200	41,800
Industry [c]	164,100	239,500	286,200
Colleges and universities [c]	25,200	42,000	52,000
Other nonprofit institutions [c]	4,400	5,400	7,000

[a] Data consist of number of full-time employees plus the full-time equivalent of part-time employees.
[b] Limited to civilian personnel.
[c] Include professional research personnel employed at research centers administered by organizations under contract with Federal agencies.

Source: National Science Foundation, March 1962.

RESEARCH AND DEVELOPMENT AND THE GROSS NATIONAL PRODUCT

R&D expenditures have grown considerably faster than total national expenditures for goods and services as measured by the gross national product. (See figure 5.)

In 1953–54, when the current dollar value of the gross national product was $365.4 billion, funds expended for research and development, also in current dollars, amounted to $5.2 billion, or 1.4 percent of the GNP. By 1960–61, the gross national product was $504.4 billion and R&D expenditures were $14.0 billion, or about 2.8 percent of the gross national product.

R&D DATA ON FOREIGN COUNTRIES

The Foundation is expanding data collection activities on research and development to include information from other countries. A report on funds for science and technology in the Soviet Union is in preparation. Similar studies are planned of the Eastern European countries and Communist China. Totals are to be developed comparable with U.S. data.

Representatives of the Organization for Economic Co-operation and Development (OECD) have sought Foundation advice on the conduct of surveys of research and development in member countries.

SPECIAL ECONOMIC STUDIES

Growing out of and supplementing the information provided by the statistical program are many special economic studies conducted concurrently with the fund surveys. Some key studies which have recently been completed or begun are described in this section.

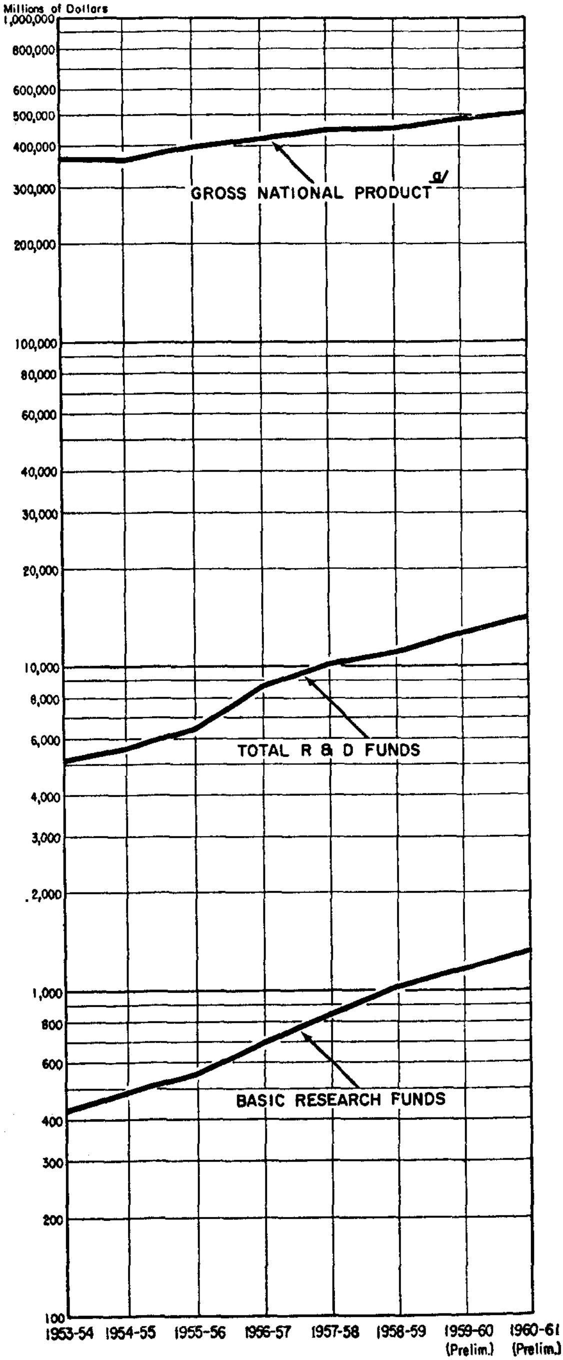


Figure 5. Trends in the Gross National Product, R&D Funds, and Basic Research Funds, 1953–54—1960–61

[a] Gross national product data refer to calendar years, 1953, 1954, *et seq.*

Source: R&D data. National Science Foundation (March 1962). For GNP data, see U.S. Department of Commerce, Office of Business Economics, *Survey of Current Business*, July 1961.

Cost Index—Related to the statistical work is a project to construct a cost index that can be used to measure trends for research and development in terms of constant dollars. The measurement of the performance and financing of research and development discussed previously is expressed in current dollars.

Scientific Output—In connection with the Foundation's interest in developing measures of scientific activities in terms of data on scientific publication and patents, it has conducted a study of industry practices regarding the publication of basic research findings.

Relation of Industrial R&D Data to Other Economic Data—A study is under way to relate the data on industrial R&D funds to statistics collected by the Bureau of the Census and the Internal Revenue Service, such as value added, net profits, and capital expenditures, of such factors in an attempt to quantify the influence of such factors on company growth. Likewise, Internal Revenue data such as company sales will be correlated with funds for research and development.

Indirect Costs—To provide data on indirect costs of research grants and contracts, the Foundation surveyed present practices in colleges and universities with regard to reimbursement to them of indirect costs incurred in the performance of federally sponsored research. These findings, useful in government councils and congressional deliberations, answered questions on the amounts and sources of funds needed in addition to the funds for direct costs of Federal research grants or contracts.

Inventory of Projects on Social Implications of Science and Technology—The third annual inventory of current research projects dealing with economic and social implications of science and technology indicated that 262 projects are under way in this area in colleges and universities.

Innovation in Industrial Firms—Under contract with the Foundation, the Carnegie Institute of Technology has investigated innovations within a firm and within the economy. The Foundation published a report on diffusion of innovation within an industry and one on diffusion within individual firms. The Institute is turning its attention to the subject of decision-making with respect to R&D spending.

Research Proposals—Under contract with the Foundation, New York University and the University of Michigan conducted a study of the factors affecting the acceptance or rejection of research proposals in their institutions. A report is in preparation on the status of the proposals, the fields of science, ranks of the originators, and agencies to which they were submitted.

NATIONAL SCIENCE FOUNDATION

The Developing Role of the National Science Foundation in International Science

THE DEVELOPING ROLE OF THE NATIONAL SCIENCE FOUNDATION IN INTERNATIONAL SCIENCE

Although man's hopes of resolving ideological and political differences seem to meet frustration at every turn, international cooperation in science is not only a reality but is constantly growing. Increasingly, the National Science Foundation is being called upon to lead United States participation in this growing worldwide effort to decipher nature's cryptogram.

The challenges and the promise of science could readily absorb both the money and energies that nations have in the past devoted to far less fruitful occupations, such as the harassment of their neighbors. Science and technology are now a matter of keen rivalry among nations, but such rivalry could be directed into more constructive channels. Perhaps it is not too much to say that in the present state of affairs, science, especially in its more fundamental aspects, is one of the few subjects on which nations can agree. A number of factors are responsible for this gratifying trend.

The first is the nature of science, which is not limited in its development by either national boundaries or geographical barriers. The history of science is replete with examples of discoveries that have occurred independently and almost simultaneously in various countries of the world.

Second is the tradition among scholars of sharing research plans and findings. This kind of cooperation is one of science's most ancient and honored institutions. The early annals of science consist largely of the correspondence of scholars, and one finds them journeying great distances to visit one another, despite the incredible hardships of travel in earlier centuries. Today the means of both communication and transportation have been so miraculously transformed by modern technology that scientists may not only exchange their views with ease and rapidity but may also interrupt their teaching or their research for brief visits across the world.

Third, a steady improvement in economic conditions plus recognition of the importance of foreign travel to research enable a growing number of scholars to travel to scientific meetings and to visit their fellow scientists along the way.

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Finally, a significant factor that is contributing to international cooperation in science is the growing realization that problems which are global in scope require for their solution the combined efforts of scientists in many parts of the world. Astronomy, oceanography, meteorology, and, of course, the phenomena of outer space, can be effectively studied only on a worldwide basis; moreover, problems of nutrition, disease, fresh water resources, pollution of the atmosphere, and contamination of food sources are universal. Not only do they require the best minds of many countries for their adequate solution but they need regional and local study for complete understanding of the problem at hand.

The International Geophysical Year

The value of the synoptic system of data accumulation and collation became evident during the 18-month period of the International Geophysical Year (IGY) between July 1957 and December 1958. Sixty-six nations of the world teamed their resources during that period to conduct the most concentrated study ever undertaken of the earth as a planet. The IGY marked the first of a series of international science activities which the National Science Foundation managed and administered for the United States Government. The Foundation accepted the task of coordinating the Federal effort for the IGY at the request of the National Academy of Sciences-National Research Council, adhering body to the International Council of Scientific Unions which organized the IGY program. To underpin the effort of the United States in the IGY, the Congress made available to the Foundation, on its request, a total of $43.5 million. Thereupon, with the advice and operational planning by the IGY Committee of the NAS–NRC, the Foundation carried forward the program by grants to universities and research organizations and by transfers to other Federal agencies.

These funds made possible a magnificent effort by scientists themselves, financed and supported by the people of the United States through the Congress. Geopolitical differences were submerged under the cosmic weight of geophysical research as scientists of East and West worked together in a mighty effort to gather new knowledge about the planet earth, about the sun, and a wide variety of extraterrestrial phenomena.

Possibly of even more abiding significance than the fulfillment of its scientific mission, the IGY removed the Antarctic from the sphere of political influence and dedicated it to the advancement of man's knowledge. Twelve nations, signatory to the Antarctic Treaty of 1959, reserved the area for scientific exploration and experiment. It was not to be contaminated by nuclear explosions nor used for disposal of radioactive waste. Furthermore, research that proved so fruitful during the IGY was not terminated as it closed but has rather been broadened and extended to include a variety of biological, geological, and other studies not originally planned as part of the IGY program.

United States Antarctic Research Program (USARP)

The global significance of Antarctica, its isolation and vast size, and the magnitude of the scientific and environmental problems it presents, preclude gaining major insights through studies conducted only in a single nation, or in any brief span of years.

Scientific observations, however comprehensive, are of limited significance unless they are part of similar observations throughout a wide area made during significant periods of time. Simultaneous observations in many studies greatly increase the usefulness of what is learned. Rapid progress in scientific studies in Antarctica requires a network of stations that make their findings available to scientists everywhere. Only by coordinated gathering and disseminating of data in this manner are scientists enabled to piece into meaningful form facts that by themselves could not be related either to each other or to broad problems involving studies far removed from the area.

The concept of a cooperative scientific program undertaken on a large scale, embracing many aspects of science, calls for the cooperative efforts of scientists everywhere, and support from many governments. Therefore, in August of 1960 the President directed the National Science Foundation "to exercise the principal coordinating and management role in the development and carrying out of an integrated U.S. scientific program in the Antarctic." The same directive instructed the Foundation to coordinate and arrange for the conduct of cooperative scientific programs with other nations participating in the Antarctic.

The productive and constructive interrelationship of scientists from many nations that had its genesis in the IGY has been continued and expanded in the research that is now being carried forward under Foundation auspices in the Antarctic. Scientists of the world involved in Antarctic research formed the Scientific Committee on Antarctic Research (SCAR) under the International Council of Scientific Unions (ICSU). In the United States, at the request of the Foundation, the Committee on Polar Research advises the Foundation on the long range program in the Antarctic.

The seven-station network operated by the United States during the IGY in Antarctica was reduced to four—Byrd, Hallett, McMurdo, and Pole. The Department of Defense, through the U.S. Naval Support Force, Antarctica, provides logistical support to USARP at these stations, such support involving air and ship transportation to and from the continent, air transportation within the continent, and maintenance of the stations.

For several years parties of United States scientists have conducted both winter and summer programs at Argentine and Chilean stations in the Palmer Peninsula area. U.S. scientists have also conducted programs at Wilkes Station, maintained by Australia, and in a bilateral exchange with the U.S.S.R., research has been performed for more than four years at Russia's Mirnyy Station.

Australia has maintained U.S. entomologists and physicists on Macquarie Island, in the Pacific between Australia and the Antarctic continent. The British Antarctic Service has provided transportation and facilities to a bird-banding program conducted on Bird Island, near South Georgia. (For additional information about the work of the Foundation in the Antarctic, see page 40.)

The International Indian Ocean Expedition

From the fertile seedbed of international scientific cooperation sown by the IGY there germinated many fruitful plans for further exploration of the world's natural resources. Once again the National Science Foundation was called upon to provide United States leadership for a new effort, this time a massive scientific survey of the resources of the least known of the oceans, the Indian Ocean. A White House announcement of June 1960 directed the Foundation to plan and coordinate Federal support for U.S. participation in the International Indian Ocean Expedition. The scientific assault on the Indian Ocean will involve an armada of approximately 40 vessels and scientists from 30 nations.

The United States program for the Expedition will be devoted to the scientific examination of four areas of great interest. The first of these areas is divided into four parts: (1) the origin of the ocean basin; (2) forces that have shaped and are continuing to shape the basin; (3) resemblances between this piece of the earth's crust and any other; and (4) differences between this piece of the Indian Ocean basin and other ocean basins. Techniques to be used in attempting to answer these questions will be primarily geophysical and geological, and will have been or will be employed on expeditions sent out by Scripps Institution of Oceanography, Lamont Geological Observatory, and Woods Hole Oceanographic Institution.

The second broad area of investigation involves the chemical and physical properties of the Indian Ocean, and includes a study of the motions of these waters. Sampling will be done in predetermined patterns, with respect both to horizontal distribution and to vertical spacing. Studies will encompass concurrent precise measurements of water temperature; subsequent chemical and isotopic analyses of the water samples; and determination of current flow at various depths by numerous means. Although all United States ships participating in the IIOE will be equipped for such water sampling, the direct measurement of current flow is the particular objective of a University of Rhode Island expedition embarked in the Scripps Institution vessel ARGO.

The third major field of interest is the living populations, plant and animal, of the Indian Ocean. All United States ships will be equipped to sample plankton and to observe surface biological phenomena, and some will measure primary productivity. The research vessel *Anton Bruun* will have biological oceanography as her primary mission, and the Stanford University vessel *Te Vega* will concentrate on biological and physiological studies of island groups and other shallow water areas.

The fourth main area of research is concerned with the interaction between the ocean and the atmosphere. Several of the U.S. research vessels that will work in the Indian Ocean will be equipped to make upper-air meteorological observations, but the United States will have the greater part of its meteorological effort based ashore. Observations from meteorological aircraft of the U.S. Weather Bureau and of Woods Hole Oceanographic Institution, working in connection with the International Meteorological Center that has been established with the assistance of the Government of India and the United Nations Special Fund; from meteorological satellites; and from meteorological buoys (to be planted in the Bay of Bengal and Arabian Sea with the help of the Indian Navy), will be utilized in the program.

The International Year of the Quiet Sun

A third scientific venture of worldwide significance that emerged rather directly from the stimulating environment of the IGY is known as the International Year of the Quiet Sun (IQSY). The program of the IQSY was originally proposed by the International Committee on Geophysics (CIG) of the International Council of Scientific Unions at ICSU's September 1961 meeting in London. In authorizing United States participation, President Kennedy, in a letter to the Director of the National Science Foundation, observed: ". . . As a natural complement to the strikingly successful International Geophysical Year, it is an attractive proposal and the attention and planning that have already been devoted to it by the scientific community assures that it will make an important contribution to the understanding of our environment.

"I am pleased to authorize, with this letter, United States participation in the program. In addition, I hereby designate the National Science Foundation as the responsible agency to correlate the Federal Government's regular activities which contribute to the program and to coordinate and make necessary budgetary arrangements for those additional activities which may be required . . ."

As during the IGY, the National Academy of Sciences-National Research Council is developing the United States scientific programs of the IQSY and will work on these programs in cooperation with the Foundation.

The IQSY program is not to be regarded as a small repetition of the IGY. Full advantage will be taken of the new knowledge of solar-terrestrial relationships gained during the IGY and also of the improved and new techniques of geophysical research. Certain types of IGY synoptic programs will be repeated, but in many fields new experiments have been suggested stemming from the knowledge gained from the IGY and also from the fact that certain experiments and observations will be possible that could not have been made during the maximum portion of the solar cycle.

The international program calls for observations of solar activity, geomagnetism, aurora and airglow, ionospheric physics, and cosmic rays; for space research; and for meteorology and aeronomy. Emphasis will be placed on solar mechanisms; determining the state of the interplanetary medium during solar minimum; mapping the earth's radiation zone to establish its configuration and density at minimum; observing solar events and the transit through the interplanetary medium of the solar plasmoids and the interaction of the plasmoids with the geomagnetosphere; observing at magnetically conjugate points on the earth the auroral, ionospheric, geomagnetic, and hydromagnetic consequences of such interactions; determining the energy content of the solar ionizing radiations that influence the aeronomy of the middle atmosphere; studying the winds and circulation of the ionospheric regions; determining the basic photochemical character of the middle atmosphere and ionosphere in its least disturbed condition; and undertaking such programs as studies of the low energy portion of the galactic cosmic-ray spectrum that are best done during times of solar quiet. Also included will be the completion of certain network synoptic programs of aurora, geomagnetism, ionospheric physics, and cosmic rays throughout the present solar cycle; therefore, it was suggested that these networks be operated for the IQSY with coverage at least as complete as was done for IGY, making such modifications as might be desirable in the light of the IGY experience.

United States-Japan Committee on Scientific Cooperation

Based on plans agreed upon during the past year, it will not be long before teams of United States and Japanese scientists will be studying the volcanoes of Hawaii and Japan, comparing, developing, and sharing instrumentation and working together to analyze and evaluate data. The result should be the advancement of science in both countries beyond what each could have accomplished working alone. This would be but one in a wide range of cooperative scientific activities—exchanges of scholars, exchange of scientific information, joint research on the Pacific Ocean, and research in the medical sciences. The U.S.-Japan program for scientific cooperation is the most advanced example of a new approach to international science activities being urged forward by the Foundation—the advancement of science through cooperative activities in which the cooperating countries provide both scientists and a part of the support.

Opportunity for the Foundation to open this new road to international scientific cooperation grew out of an agreement between President Kennedy and Prime Minister Ikeda of Japan, in June of 1961, to establish the U.S.-Japan Committee on Scientific Cooperation. Chosen to head the United States Delegation was Harry C. Kelly, the Associate Director of the Foundation for Educational and International Activities. Delegations representing the two governments met first in Japan in December 1961, and later in the United States in May 1962.

At its May meeting, the Committee adopted recommendations for consideration and action by their governments concerning (1) the exchange of scholars in the sciences, and (2) the exchange of scientific and technical information and materials. The Committee adopted as well, recommendations to be considered for prompt implementation by their governments relating to (1) scientific investigations of the Pacific Oceans, (2) animal and plant geography and ecology in the Pacific area, and (3) research in the medical sciences. The date of the next meeting of the Committee has been tentatively set for May 1963.

The Foundation's In-House Support of International Scientific Activities

Mid-century science, as we have noted above, presented a challenging environment for the advancement of international amity, and mid-century scientists representing many nations of the world have effected, through close cooperation, significant scientific achievements. On the part of the United States, the National Science Foundation was privileged to play a leading role in the broad, all-encompassing program of the International Geophysical Year, and is privileged to provide leadership for the United States Antarctic Research Program, the International Indian Ocean Expedition, the International Year of the Quiet Sun, and the United States-Japan Committee on Scientific Cooperation.

Despite its preoccupation with such "extra-curricular" responsibilities, the Foundation has maintained the steadily increasing pace of its own "curriculums" in international science activity. In-house programs of the Foundation in international science cover a wide spectrum of support represented by grants for research in environments unnatural to the United States, others in science education that contribute to strengthening science in the United States through close cooperation with educational leaders in other countries, and still others that speed the acquisition of the published results of research performed by scientists of repute throughout the world. Examples come readily to mind in support of:

• • • • Tropical biology in one of the earth's last great frontiers—the tropics, homeland of over three-quarters of all living things.

• • • • Astronomy in Australia for one of the world's largest radio telescopes to observe objects in the southern hemisphere that are not accessible from northern latitudes; in Chile where site surveys are underway for the new Chilean Astronomical Station to increase further the scanning of astronomical objects now out of range in the northern hemisphere. Each will be available for use by U.S. astronomers.

• • • • Education in the sciences that (1) provide opportunities for educational leaders from abroad to participate in NSF teacher-training programs, (2) enable U.S. scientists to attend Advanced Study Institutes abroad, (3) support activities under inter-Academy agreement for the exchange of scientists between the United States and the U.S.S.R., (4) continue administration by the Foundation, in behalf of the State Department, of NATO Postdoctoral Fellowships and Senior Visiting Fellowships for the Organization for Economic Cooperation and Development, and to establish a new international fellowship program—

the Senior Foreign Scientist Fellowship Program, (5) continue the Visiting Scientists Program which brings to the United States distinguished foreign scientists to broaden the perspectives of our own science faculties and graduate students, (6) make possible publication of *Education and Professional Manpower in the U.S.S.R.*, by Nicholas DeWitt, Research Associate of the Russian Research Center, Harvard University—definitive source of information about professional employment and education in the Soviet Union.

• • • • Programs designed to provide U.S. scientists with the published results of scientific research in other nations—including acquiring foreign scientific publications through purchase or exchange, provision of data on sources and availability of foreign scientific information, increasing the scope and quantity of translations, and stimulating cooperation with international organizations to increase the store of information and improve scientific communication on an international scale. Specific examples of such activities are: establishment of a center at Massachusetts Institute of Technology to announce and make available Communist Chinese scientific publication; support of massive exchanges with the U.S.S.R. in Soviet and Chinese mathematical publications; preparation of guides to scientific publications in a number of languages; support of directories of Soviet scientists and of Japanese scientific periodicals and research institutions; support of increased U.S. abstracting coverage of Soviet bloc material in a number of sciences; support of cover-to-cover translation of over 40 Soviet scientific journals and of selective translation of papers in others; support of guides to U.S. scientists to the scientific literature of the U.S.S.R., Japan, and East European countries; cooperation, with partial support of some activities, with U.N. Educational, Scientific and Cultural Organization, International Conference of Scientific Unions Abstracting Board, European Productivity Agency (EPA), Organization for Economic Cooperation and Development (OECD), International Federation of Library Associations (IFLA), and International Standards Organization (ISO); and participation in, with partial support of, the Pacific Science Congress and other such conferences.

• • • • Maintenance in Tokyo, Paris, and Rio de Janeiro of one or two Foundation representatives—professionals who work closely with Scientific Attachés representing the U.S. Department of State and whose primary tasks are to establish at those localities scientific liaison, and scientific information gathering and dissemination, and to foster exchange of scientists.

Any recitation of accomplishment by the National Science Foundation in international science would be incomplete, and indeed presumptuous, if it ignored the contributing strengths supplied by the several agencies and institutions with which the Foundation works closely in fulfilling its high missions. No undertaking of the U.S. Government involving relationships with other nations moves into action without the knowledge and support of the Department of State. Broad surveillance of official United States interests in and relationships with international science is exercised by that Department through its Office of International Scientific Affairs. From this office the Foundation invariably receives warm support and cooperation at every juncture of its attempts to establish productive international relations in science. Similarly, the execution of Foundation-supported programs in the Antarctic and in the Indian Ocean would have been quite impossible had it not been for the ready and willing logistic strengths supplied by the Department of the Navy, whose men and ships contributed immeasurably to the success of many scientific missions. Nor could have the Foundation's responsibilities in these vast scientific explorations been discharged effectively without the constant and full-bodied support and encouragement extended at every turn by the officers and scientists associated with the National Academy of Sciences-National Research Council who, in very substantial measure, have provided sound counsel and leadership for this Nation's effort in international scientific cooperation.

APPENDICES

✓ = not here
in Nov 1992

APPENDIX A

National Science Board, Staff, Committees, and Advisory Panels

NATIONAL SCIENCE BOARD*

Terms Expire May 10, 1964

DETLEV W. BRONK (Chairman of the Board), President, The Rockefeller Institute, New York, N.Y.
LEE A. DUBRIDGE (Vice Chairman of the Board), President, California Institute of Technology, Pasadena, Calif.
ROBERT F. LOEB, Bard Professor of Medicine Emeritus, Columbia University, New York, N.Y.
KEVIN MCCANN, President, The Defiance College, Defiance, Ohio
JANE A. RUSSELL (Mrs. Alfred E. Wilhelmi), Associate Professor of Biochemistry, Emory University, Atlanta, Ga.
PAUL B. SEARS, Professor Emeritus, Conservation Program, Osborn Botanical Laboratory, Yale University, New Haven, Conn.
ERNEST H. VOLWILER, Consultant, Abbott Laboratories, North Chicago, Ill.
MALCOLM M. WILLEY, Vice President, Academic Administration, University of Minnesota, Minneapolis, Minn.

Terms Expire May 10, 1966

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THE REVEREND THEODORE M. HESBURGH, C.S.C., President, University of Notre Dame, Notre Dame, Ind.
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E. F. Osborn, Vice President for Research, Pennsylvania State University, University Park, Pa.

Kenneth G. Picha, School of Mechanical Engineering, Georgia Institute of Technology, Atlanta, Ga.

Frederick D. Rossini, Dean, College of Sciences, Associate Dean, Graduate School, University of Notre Dame, Notre Dame, Ind.

S. Town Stephenson, Dean of Faculty, Washington State University, Pullman, Wash.

Kurt F. Wendt, Dean, College of Engineering, University of Wisconsin, Madison, Wis.

D. J. Zaffarano, Chairman, Department of Physics, Iowa State University, Ames, Iowa.

Advisory Panel for Mathematical Sciences

Raoul H. Bott, Department of Mathematics, Harvard University, Cambridge, Mass.

Mahlon M. Day, Department of Mathematics, University of Illinois, Urbana, Ill.

Edwin E. Floyd, Department of Mathematics, University of Virginia, Charlottesville, Va.

Gilbert Hunt, Department of Mathematics, Princeton University, Princeton, N.J.

Irving Kaplansky, Department of Mathematics, University of Chicago, Chicago, Ill.

Peter D. Lax, Institute of Mathematical Sciences, New York University, New York, N.Y.

Hans Samelson, Department of Mathematics, Stanford University, Stanford, Calif.

Henry Scheffe, Statistical Laboratory, University of California, Berkeley, Calif.

I. M. Singer, Department of Mathematics, Massachusetts Institute of Technology, Cambridge, Mass.

Advisory Panel for Molecular Biology

Andrew A. Benson, Department of Biophysics and Nuclear Medicine, University of California, Los Angeles, Calif.

Walter D. Bonner, Jr., Professor of Physical Biochemistry and Plant Physiology, The Johnson Foundation, University of Pennsylvania, Philadelphia, Pa.

Jerome Gross, Massachusetts General Hospital, Boston, Mass.

Matthew S. Meselson, The Biological Laboratories, Harvard University Cambridge, Mass.

Manual F. Morales, Cardiovascular Research Institute, Department of Biochemistry, University of California, San Francisco, Calif.

Aaron Novick, Institute for Molecular Biology, University of Oregon, Eugene, Oreg.

Harold A. Scheraga, Department of Chemistry, Cornell University, Ithaca, N.Y.

S. Jonathan Singer, Department of Biology, University of California, La Jolla, Calif.

Jonathan B. Wittenberg, Department of Physiology, Albert Einstein College of Medicine, Yeshiva University, New York, N.Y.

Advisory Panel for Metabolic Biology

Daniel Billen, M. D. Anderson Hospital and Tumor Institute, University of Texas, Houston, Tex.

Ralph I. Dorfman, Worcester Foundation for Experimental Biology, Shrewsbury, Mass.

Martin Gibbs, Department of Biochemistry, Cornell University, Ithaca, N.Y.

James A. Olson, Department of Biochemistry, University of Florida College of Medicine, Gainesville, Fla.

SYDNEY C. RITTENBERG, Department of Bacteriology, University of Southern California, Los Angeles, Calif.

JOHN R. TOTTER, Chairman, Division of Biological Sciences, University of Georgia, Athens, Ga.

I. ZELITCH, Biochemistry Department, Connecticut Agricultural Experiment Station, New Haven, Conn.

Advisory Panel for Physics

TOM W. BONNER, Department of Physics, William Marsh Rice University, Houston, Tex.

JOHN G. DAUNT, Department of Physics, The Ohio State University, Columbus, Ohio

LESLIE L. FOLDY, Department of Physics, Case Institute of Technology, Cleveland, Ohio

DONALD A. GLASER, Biology Department, Massachusetts Institute of Technology, Cambridge, Mass.

MAURICE GOLDHABER, Brookhaven National Laboratory, Upton, Long Island, N.Y.

KENNETH GREISEN, Laboratory of Nuclear Studies, Cornell University, Ithaca, N.Y.

W. CONYERS HERRING, Bell Telephone Laboratories, Murray Hill, N.J.

EMIL J. KONOPINSKI, Department of Physics, Indiana University, Bloomington, Ind.

GEORGE E. PAKE (Chairman), Department of Physics, Stanford University, Stanford, Calif.

Advisory Panel for Psychobiology

CLETUS J. BURKE, Britannica Center for Studies in Learning and Motivation, Menlo Park, Calif.

VINCENT G. DETHIER, Department of Zoology, University of Pennsylvania, Philadelphia, Pa.

JOHN T. EMLEN, Department of Zoology, University of Wisconsin, Madison, Wis.

NORMAN GUTTMAN, Department of Psychology, Duke University, Durham, N.C.

HAROLD W. HAKE, Department of Psychology, University of Illinois, Urbana, Ill.

HOWARD H. KENDLER, Department of Psychology, New York University, New York, N.Y.

CARL PFAFFMANN, Department of Psychology, Brown University, Providence, R.I.

FLOYD RATLIFF, Rockefeller Institute, New York, N.Y.

Advisory Panel for Radio Telescopes

RONALD N. BRACEWELL, Radio Science Laboratory, Stanford University, Stanford, Calif.

BERNARD F. BURKE, Carnegie Institution of Washington, Washington, D.C.

PAUL CHENEA, Division of Engineering Sciences, Purdue University, Lafayette, Ind.

L. J. CHU, Department of Electrical Engineering, Massachusetts Institute of Technology, Cambridge, Mass.

RICHARD M. EMBERSON, Associated Universities, Inc., New York, N.Y.

WILLIAM E. GORDON, Department of Electrical Engineering, Cornell University, Ithaca, N.Y.

DAVID S. HEESCHEN, National Radio Astronomy Observatory, Green Bank, W. Va.

R. MINKOWSKI, Radio Astronomy Observatory, University of California, Berkeley, Calif.

JOHN R. PIERCE (Chairman), Bell Telephone Laboratories, Inc., Murray Hill, N.J.

GEORGE W. SWENSON, JR., The Observatory, University of Illinois, Urbana, Ill.

JAMES H. TREXLER, Naval Research Laboratory, Washington, D.C.

JOHN G. BOLTON, (Consultant), California Institute of Technology, Pasadena, Calif.

Advisory Panel for Regulatory Biology

ALBERT E. DIMOND, Department of Plant Pathology and Botany, Connecticut Agricultural Experiment Station, New Haven, Conn.

ROY P. FORSTER, Department of Zoology, Dartmouth College, Hanover, N.H.

PAUL J. KRAMER, Department of Botany, Duke University, Durham, N.C.

GILBERT H. MUDGE, Department of Pharmacology and Experimental Therapeutics, Johns Hopkins University, Baltimore, Md.

ERLING J. ORDAL, Department of Microbiology, University of Washington, Seattle, Wash.

WILBUR H. SAWYER, Department of Pharmacology, Columbia University, New York, N.Y.

ROBERT D. TSCHIRGI, Department of Physiology, University of California, School of Medicine, Los Angeles, Calif.

WILLIAM VAN DER KLOOT, Department of Physiology and Biophysics, New York University, New York, N.Y.

Advisory Panel for Scientific Manpower Information

JAMES W. COLE, JR., School of Chemistry, University of Virginia, Charlottesville, Va.
HAROLD GOLDSTEIN, Chief, Division of Manpower and Employment Statistics, Bureau of Labor Statistics, U.S. Department of Labor, Washington, D.C.
ALBERT KAY, Director, Office of Manpower Supply, Department of Defense, The Pentagon, Washington, D.C.
CHARLES V. KIDD, Associate Director of Institutional Relations, National Institutes of Health, Bethesda, Md.
RAY W. MAYHEW, Owens-Illinois Glass Company, Toledo, Ohio
JAMES C. O'BRIEN, Director of Personnel, Department of Health, Education, and Welfare, Washington, D.C.
PHILIP N. POWERS (Chairman), Head, Department of Nuclear Engineering, Purdue University, West Lafayette, Ind.
M. H. TRYTTEN, Director, Office of Scientific Personnel, National Research Council, National Academy of Sciences, Washington, D.C.
J. FLETCHER WELLEMEYER (Private Consultant), Washington, D.C.
DAEL WOLFLE, Executive Officer, American Association for the Advancement of Science, Washington, D.C.

Advisory Panel for Sociology

RICHARD CHRISTIE, Department of Social Psychology, Columbia University, New York, N.Y.
JAMES S. COLEMAN, Department of Social Relations, Johns Hopkins University, Baltimore, Md.
DAVID GOLD, Department of Sociology, State University of Iowa, Iowa City, Iowa
EDWARD E. JONES, Department of Psychology, Duke University, Durham, N.C.
ELIHU KATZ, Department of Sociology, University of Chicago, Chicago, Ill.
WILLIAM W. LAMBERT, Department of Psychology, Cornell University, Ithaca, N.Y.
HERBERT RUBENSTEIN, Operational Applications Laboratory, Bedford, Mass.

Advisory Panel for Special Projects in Science Education Section

R. H. BING, Department of Mathematics, University of Wisconsin, Madison, Wis.
MARCUS HOBBS, Dean, Duke University, Durham, N.C.
JAMES JENSEN, President, Oregon State University, Corvallis, Oreg.
FRANCIS KEPPEL, Dean of Education, Harvard University, Cambridge, Mass.
JOSEPH L. MCCARTHY, Dean, Graduate School, University of Washington, Seattle, Wash.
ROBERT MACVICAR, Dean, Graduate School, Vice President, Academic Affairs, Oklahoma State University, Stillwater, Okla.
JOHN W. OSWALD, Vice President-Executive Assistant, University of California, Berkeley, Calif.
HOWARD M. PHILLIPS, President, Alabama College, Montevallo, Ala.
JOSEPH B. PLATT, President, Harvey Mudd College, Claremont, Calif.
F. W. SEARS, Department of Physics, Dartmouth College, Hanover, N.H.
OSWALD TIPPO, Provost, University of Colorado, Boulder, Colo.
SAMUEL WILKS, Department of Mathematics, Princeton University, Princeton, N.J.

Advisory Panel for Systematic Biology

LEWIS E. ANDERSON, Department of Botany, Duke University, Durham, N.C.
GEORGE F. EDMUNDS, Division of Biology, University of Utah, Salt Lake City, Utah
PAUL L. ILLG, Department of Zoology, University of Washington, Seattle, Wash.
HAROLD W. MANTER, Department of Zoology, University of Nebraska, Lincoln, Nebr.
GEORGE W. MARTIN, Department of Botany, State University of Iowa, Iowa City, Iowa
ALDEN H. MILLER, Museum of Vertebrate Zoology, University of California, Berkeley, Calif.
BOBB SCHAEFFER, American Museum of Natural History, New York, N.Y.

Advisory Panel for University Computing Facilities

MARY A. B. BRAZIER, Brain Research Institute, University of California, Los Angeles, Calif.

PAUL HORST, Department of Psychology, University of Washington, Seattle, Wash.

NICHOLAS C. METROPOLIS, Department of Physics, University of Chicago, Chicago, Ill.

PHILIP M. MORSE, Department of Physics, Massachusetts Institute of Technology, Cambridge, Mass.

J. BARKLEY ROSSER, Department of Mathematics, Cornell University, Ithaca, N.Y.

HERBERT A. SIMON, Professor of Administration and Head of Department of Industrial Management, Carnegie Institute of Technology, Pittsburgh, Pa.

CHARLES V. L. SMITH, National Aeronautics & Space Administration, Goddard Space Flight Center, Washington, D.C.

FREDERICK T. WALL, Dean, Graduate School, University of Illinois, Urbana, Ill.

Advisory Panel for Weather Modification

EUGENE BOLLAY, Director of Research, Meteorological Instrumentation, Borg-Warner Controls, Santa Barbara, Calif.

REUBEN G. GUSTAVSON (Chairman), University of Arizona, Tucson, Ariz.

VICTOR K. LAMER, Department of Chemistry, Columbia University, New York, N.Y.

OSCAR KEMPTHORNE, Department of Statistics, Iowa State University of Science and Technology, Ames, Iowa

STEPHEN E. REYNOLDS, State Capitol, Santa Fe, N. Mex.

BERNARD VONNEGUT, Arthur D. Little, Inc., Cambridge, Mass.

APPENDIX B

Financial Report for Fiscal Year 1962

Salaries and Expenses Appropriation

Receipts

Appropriated for fiscal year 1962	$263,250,000	
Unobligated balance from fiscal year 1961	1,422,002	
Less:		
Budget Bureau Reserve	−2,750,000	
Transfer to General Services Administration for space rental	−209,400	
Total availability		$261,712,602

Obligations

Basic Research Support:	
Basic Research Project Grants:	
Biological and Medical Sciences	$31,981,686
Mathematical, Physical & Engineering Sciences	45,080,605
Social Sciences	7,695,072
Institutional Grants	3,730,634
International Science Act—Research	200,962
Subtotal	88,688,959
Research Facilities Support:	
Graduate Research Laboratories	26,089,317
Specialized Biological Research Facilities	3,099,007
University Computing Facilities	2,975,000
University Nuclear Research Facilities	5,999,985
Hawaii Institute of Geophysics	2,700,000
Oceanographic Research Vessels & Facilities	5,899,800
Subtotal	46,763,109
National Research Centers:	
National Radio Astronomy Observatory	5,696,000
Kitt Peak National Observatory	2,877,600
Chilean Astronomical Station	50,000
National Center for Atmospheric Research	1,100,000
Subtotal	9,723,600
National Research Programs:	
Antarctic Research Program	7,187,722
Indian Ocean Expedition	2,116,900
Deep Crustal Studies of the Earth (Mohole)	1,649,999
Weather Modification	1,327,560
Subtotal	12,282,181

Obligations—Continued

Science Information Services:		
Dissemination Programs	$7,531,171	
Foreign Currency Program	967,054	
International Scientific Information Exchanges	703,069	
Subtotal	9,201,294	
Science Education Programs:		
Fellowships	16,800,000	
Institutes	40,875,972	
Research Participation & Scientific Activities for Teachers	2,374,450	
Science Education for Undergraduate Students	4,372,639	
Science Education for Secondary School Students	3,419,051	
Specialized Advanced Science Education Projects	1,405,779	
Instructional Equipment for Undergraduate Education	5,018,860	
Course Content Improvement	8,989,756	
International Science Activities-Education	342,801	
Subtotal	83,599,308	
Science Resources Planning:		
Science Resources Planning Analyses	25,025	
Economic and Statistical Studies	315,107	
Scientific Personnel and Education Studies	1,147,899	
Subtotal	1,488,031	
Program Development and Management	8,977,545	
Total, NSF	260,724,027	
Allocation to Other Government Agencies	97,426	
Total obligations, fiscal year 1962		$260,821,453
Unobligated balance carried forward to FY 1963		891,149
TOTAL		261,712,602

INTERNATIONAL GEOPHYSICAL YEAR APPROPRIATIONS

Receipts

Total unobligated balance from fiscal year 1961	$39,629	
Total availability		$39,629

Obligations

Technical programs	—$88	
Total obligations, fiscal year 1961		—88
Unobligated balance (not available for obligation in fiscal year 1962)		39,717
Total		39,629

Trust Fund

Receipts

Unobligated balance from fiscal year 1961	$5,240	
Donations from private sources	2,333	
Total availability		$7,573

Obligations

Total obligations fiscal year 1962	$883	
Unobligated balance carried forward into fiscal year 1963	6,690	
Total		7,573

APPENDIX C

Grants for Basic Research

ANTHROPOLOGICAL SCIENCES

AMERICAN UNIVERSITY, Washington, D.C.; Olov R. T. Janse; *Early Western Influences in Vietnam;* 2 years; $20,800

BERNICE P. BISHOP MUSEUM, Honolulu Hawaii; Kenneth P. Emory; *Polynesian Archaeology*; 3 years; $77,200

BRANDEIS UNIVERSITY, Waltham, Mass.; James E. Duffy; *African Social Institutions;* 1 year; $3,500

Robert A. Manners; *The Changing Culture of the Kipsigis Tribe of Kenya;* 1 year; $3,700

BROOKLYN COLLEGE, Brooklyn, N.Y.; Robert W. Ehrich; *Excavations at Homolka;* 1 year; $1,400

BROWN UNIVERSITY, Providence, R.I.; J. L. Giddings; *Beach Ridge Dating;* 1 year; $3,000

CATHOLIC UNIVERSITY, Washington, D.C.; Svend Frederiksen; *Collection of Eskimo Texts*; 1 year; $12,800

CHICAGO NATURAL HISTORY MUSEUM, Ill.; Paul S. Martin; *Cultural Stability in the Upper Little Colorado River Drainage;* 1 year; $1,800

Paul S. Martin; *Archaeological Investigation in the Upper Little Colorado Drainage;* 1 year; $28,800

COLUMBIA UNIVERSITY, New York, N.Y.; Ralph S. Solecki; *Neanderthal Tibiae from Shanidar Cave;* 1 year; $1,900

Andrew P. Vayda; *Human Ecology of the New Guinea Rain Forest;* 2 years; $65,200

DARTMOUTH COLLEGE, Hanover, N.H.; Gordon M. Day; *Abenaki Dialects;* 1 year; $11,600

Elmer Harp, Jr.; *Dorset Eskimo Culture;* 3 years; $36,100

Robert A. McKennan; *Tanana Indians of Alaska;* 1 year; $6,700

GEORGE WASHINGTON UNIVERSITY, Washington, D.C.; John M. Campbell; *Archaeology of Anaktuvuk Pass;* 1 year; $4,800

GREAT PLAINS HISTORICAL ASSOCIATIONS, Lawton, Okla.; Adrian D. Anderson; *Paleo-Indian Cultural Remains;* 1 year; $3,200

HAMLINE UNIVERSITY, St. Paul, Minn.; Leland R. Cooper; *Aboriginal Cultural Horizons in Minnesota;* 1 year; $4,600

HARVARD UNIVERSITY, Cambridge, Mass.; Douglas L. Oliver; *Anthropological Study of the Society Islands;* 2 years; $11,700

John W. M. Whiting; *Social Structure of Two African Communities;* 2 years; $14,400

HUMAN RELATIONS AREA FILES, New Haven, Conn.; Frank M. LeBar; *Atlas of Southeast Asian Cultures;* 1 year; $3,500

Peter J. Wilson; *Social Structures in Madagascar;* 1 year; $13,700

IDAHO STATE COLLEGE, Pocatello; Earl H. Swanson; *Archaeological Exploration in Eastern Idaho;* 1 year; $6,700

ILLINOIS ARCHAEOLOGICAL SURVEY, Urbana; Melvin L. Fowler, Southern Illinois University; *Archaeology of the Mississippi River Valley;* 1 year; $62,300

ILLINOIS STATE MUSEUM, Springfield; Joseph R. Caldwell and Emily J. Blasingham; *Archaeological Study of Starved Rock;* 1 year; $11,400

INDIANA UNIVERSITY, Bloomington; Joseph Hickerson; *North American Indian Music;* 1 year; $600

INSTITUTE FOR ADVANCED STUDY, Princeton, N.J.; Stephen Foltiny; *Cultural Interrelations During the Bronze and Early Iron Ages;* 1 year; $3,300

LONDON SCHOOL OF ECONOMICS AND POLITICAL SCIENCE, London, Eng; Raymond Firth; *Comparative Study of Extra-Familial Kinship;* 2 years; $44,600

LOS ANGELES STATE COLLEGE FOUNDATION, Los Angeles, Calif.; Louis C. Faron; *Cognatic Social Systems;* 2 years; $21,100

MICHIGAN STATE UNIVERSITY, East Lansing; Moreau S. Maxwell; *Pre-Dorset of Baffin Island;* 2 years; $19,700

MISSISSIPPI DEPARTMENT OF ARCHIVES & HISTORY, Jackson; Robert S. Neitzel; *Archaeology of the Grand Village Site;* 2 years; $15,500

MUSEUM OF NEW MEXICO, Santa Fe; Bertha P. Dutton; *Anasazi Migrations;* 1 year; $12,000

NEBRASKA STATE HISTORICAL SOCIETY, Lincoln; Marvin F. Kivett; *Archaeological Investigation of the Logan Creek Complex;* 1 year; $12,700

OSHKOSH PUBLIC MUSEUM, Oshkosh, Wis.; Robert Ritzenthaler; *The Riverside Site;* 3 years; $16,900

PENNSYLVANIA STATE UNIVERSITY, University Park; William T. Sanders; *Prehispanic Settlement Patterns of Teotihuacan;* 1 year; $16,500

ROBERT S. PEABODY FOUNDATION FOR ARCHAEOLOGY, Andover, Mass.; Frederick Johnson; *Radiocarbon Chronology for Tehuacan;* 2 years; $14,300

Richard S. MacNeish; *Tehuacan Archaeological Investigations;* 2 years; $40,300

SACRAMENTO STATE COLLEGE FOUNDATION, Sacramento, Calif.; Thomas Rhys Williams; *Dusun Anthropology;* 2 years; $30,000

SAN FERNANDO VALLEY STATE COLLEGE FOUNDATION, Northridge, Calif.; Raoul Naroll; *An Index of Social Development;* 2 years; $4,600

SCHOOL OF ORIENTAL AND AFRICAN STUDIES, London, England; C. von Furer-Haimendorf; *Anthropological Study of Nepal;* 1 year; $15,100

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SOUTHERN ILLINOIS UNIVERSITY, Carbondale; Philip J. Dark; *Analysis of Benin Art;* 2 years; $12,700

SOUTHERN METHODIST UNIVERSITY, Dallas, Tex.; Frederick Kilpatrick; *The Inali Letters;* 1 year; $16,200

TULANE UNIVERSITY, New Orleans, La.; John L. Fischer; *The Effects of Household Composition on Personality;* 1 year; $14,900

Henry Orenstein; *Social Change in Bombay;* 1 year; $3,600

E. Wyllys Andrews; *Development of Pre-Columbian Culture at Dzibilchaltun;* 3 years; $35,400

STANFORD UNIVERSITY, Stanford, Calif.; A. Kimball Romney; *Semantic Structure in Tzeltal;* 2 years; $20,200

STATE HISTORICAL SOCIETY OF WISCONSIN, Madison; Joan Freeman; *Skeletal Remains from Price Site III;* 1 year; $5,100

STATE UNIVERSITY OF SOUTH DAKOTA, Vermillion; Ella C. Deloria; *Sioux Language;* 2 years; $15,500

U.S. SMITHSONIAN INSTITUTION, Washington, D.C.; Frank H. H. Roberts, Jr.; *Settlement Patterns in the Missouri Valley;* 1 year; $30,100

T. Dale Stewart; *Shanidar IV-VI Neanderthals;* 1 year; $4,100

UNIVERSITY OF ALASKA, College; Michael E. Krauss; *Aboriginal Languages of Alaska;* 1 year; $28,800

UNIVERSITY OF ARIZONA, Tucson; Richard B. Woodbury; *Pre-Industrial Systems of Water Management;* 2 years; $36,300

UNIVERSITY OF ARKANSAS, Fayetteville; Charles R. McGimsey, III; *Mound C at the Crenshaw Site;* 1 year; $2,900

UNIVERSITY OF BUFFALO, Buffalo, N.Y.; George L. Trager; *Language of the Taos Indians;* 2 years; $16,200

Marian E. White; *Settlement Pattern Change and the Development of Agriculture;* 2 years; $17,700

UNIVERSITY OF CALIFORNIA, Berkeley; Joseph B. Birdsell, Los Angeles; *Dynamic Demography;* 1 year; $3,800

J. Desmond Clark; *Archaeology of Northern Rhodesia;* 2 years; $26,400

Sherburne F. Cook, Robert F. Heizer, Berkeley, and Martin A. Baumhoff, Davis; *Prehistoric California Demography;* 2 years; $15,900

Robert I. Levy, San Francisco; *Psychology of Change in the Society Islands;* 2 years; $49,800

John T. Hitchcock, Los Angeles; *Study of a Nepalese Tribe;* 1 year; $3,420

H. B. Nicholson, Los Angeles; *Excavations at Cerro Portezuelo;* 1 year; $5,400

UNIVERSITY OF CHICAGO, Chicago, Ill.; Robert J. Braidwood; *The Appearance of Food Production in Southwest Asia;* 1 year; $4,000

Seth Leacock; *A Religious Cult of Northern Brazil;* 1 year; $11,500

A. Leo Oppenheim; *Society and Demography in Ancient Babylonia;* 2 years; $15,200

David M. Schneider; *Comparative Study of Extra-Familial Kinship;* $3,700

David M. Schneider; *Comparative Study of Extra-Familial Kinship;* 2 years; $55,200

UNIVERSITY OF FLORIDA, Gainesville; John M. Goggin; *Ethnohistoric Study of Early Florida Indians;* 1 year; $7,400

UNIVERSITY OF ILLINOIS, Urbana; Elaine A. Bluhm; *Archaeology of Rock River Valley;* 1 year; $9,700

UNIVERSITY OF MICHIGAN, Ann Arbor; Elman R. Service; *Organization of Hunting-Gathering Bands;* 1 year; $13,700

UNIVERSITY OF MINNESOTA, Minneapolis; Elden Johnson; *Archaeology of Glacial Lake Agassiz Basin;* 6 months; $725

UNIVERSITY OF NORTH CAROLINA, Chapel Hill; Richard W. Lieban; *A Sociocultural Study of Medicine;* 1 year; $13,700

UNIVERSITY OF OREGON, Eugene; Homer G. Barnett; *Culture Change and Stability in Displaced Communities;* 5 years; $224,700

Vernon R. Dorjahn; *Urbanism in Sierra Leone;* 1 year; $27,900

UNIVERSITY OF PENNSYLVANIA, Philadelphia, Pa.; Froelich Rainey and Robert H. Dyson, Jr.; *Analysis of Hasanlu Data;* 1 year; $10,800

Ruben E. Reina; *Community Study in the Peten;* 1 year; $6,200

UNIVERSITY OF ROCHESTER, Rochester, N.Y.; Rene Millon; *Map of Teotihuacan;* 3 years; $75,700

UNIVERSITY OF THE STATE OF NEW YORK, Albany; William A. Ritchie; *Aboriginal Settlement Patterns in the Northeast;* 3 years; $22,700

UNIVERSITY OF UTAH, Salt Lake City; Charles E. Dibble; *Translation of Sahagun's Books VI and XI;* 1 year; $7,200

Jesse D. Jennings; *The Desert Archaic and Fremont Cultures;* 3 years; $36,000

UNIVERSITY OF VIRGINIA, Charlottesville; Peter R. Goethals; *Sumbawan Social Structure;* 2 years; $20,400

UNIVERSITY OF WASHINGTON, Seattle; Robert E. Greengo; *Archaeology of the Columbia Valley;* 2 years; $18,700

Sol Saporta; *Psycholinguistic Analysis of Consonant Clusters;* 1 year; $7,200

James B. Watson; *Dynamics and Microevolution of a Human Community;* 2 years; $96,000

UNIVERSITY OF WICHITA, Wichita, Kans.; Lowell D. Holmes; *Leadership in Samoan Society;* 2 years; $24,900

UNIVERSITY OF WISCONSIN, Madison; Chester S. Chard; *Korean Prehistory;* 3 years; $35,600

Chester S. Chard; *Archaeological Investigation of Howard Pass, Alaska;* 2 years; $15,000

William S. Laughlin and William G. Reeder; *Aleut-Konyag Prehistory;* 1 year; $36,000

WASHINGTON UNIVERSITY, St. Louis, Mo.; John W. Bennett; *Habitat, Institutions, and Economic Development;* 2 years; $37,800

WASHINGTON STATE UNIVERSITY, Pullman; Richard D. Daugherty; *Columbia Basin Chronology;* 2 years; $31,100

WICHITA FOUNDATION, INCORPORATED., Wichita, Kans.; Herbert W. Dick, Taos, N. Mex.; *Picuris Pueblo Archaeology;* 1 year; $30,100

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YALE UNIVERSITY, New Haven, Conn.; Harold C. Conklin; *Ethnoecological Study of the Philippines;* 4 years; $122,100

Isidore Dyen; *Lexicostatistical Classification of Related Languages;* 4 years; $59,900

Leopold Pospisil; *Law and Informal Social Control;* 1 year; $19,100

Charles A. Reed; *Paleoecology of the Nile;* 3 years; $41,400

Irving Rouse; *Dating of Caribbean Cultures;* 1 year; $2,400

ASTRONOMY

ASSOCIATION OF UNIVERSITIES FOR RESEARCH IN ASTRONOMY, INC., Tucson, Ariz.; C. D. Shane; *Site Survey in Chile;* 1 year; $125,000

CALIFORNIA INSTITUTE OF TECHNOLOGY, Pasadena; Fritz Zwicky; *Supernova Search;* $2,400

CARNEGIE INSTITUTION OF WASHINGTON, Washington D.C.; Merle A. Tuve; *Radio Astronomy H-Line Installation in South America;* 2 years; $58,000

Merle A. Tuve; *Development of Image Tubes for Telescopes;* 1 year; $120,000

CASE INSTITUTE OF TECHNOLOGY, Cleveland, Ohio; S. W. McCuskey; *Low Dispersion Stellar Spectroscopy;* 19 months; $51,700

COLGATE UNIVERSITY, Hamilton, N.Y.; Harold H. Lane; *Observation of Flare Stars;* 1 year; $14,900

GEORGETOWN UNIVERSITY, Washington, D.C.; Francis J. Heyden and Carl C. Kiess; *Analysis of the Solar and Sunspot Spectra;* 1 year; $33,200

HARVARD UNIVERSITY, Cambridge, Mass.; Sergei Gaposchkin and Cecilia Payne Gaposchkin; *Variable Stars in the Small Magellanic Cloud;* 3 years; $32,400

Leo Goldberg; *Vacuum Ultraviolet Spectroscopy;* 1 year; $50,000

David Layzer; *Spatial Distribution of Galaxies and Radio Sources;* 1 year; $16,000

David Layzer; *Atomic Energy Levels and Transition Probabilities;* 3 months; $33,300

A. Edward Lilley; *Hydrogen-Line Radio Astronomy;* 1 year; $150,000

Alan Maxwell, Fort Davis, Tex.; *Research with a C-Band Radiometer;* 1 year; $75,000

Fred L. Whipple; *Harvard Radio Meteor Project;* 1 year; $125,000

INDIANA UNIVERSITY FOUNDATION, Bloomington; James Cuffey; *Short Period Variable Stars in the Globular Cluster Messier 53;* 2 years; $12,700

Frank K. Edmondson; *Observations of Asteroids on I.A.U. "Critical List";* 2 years; $25,000

Stuart R. Pottasch; *Transition Region Between the Solar Chromosphere and Solar Corona;* 1 year; $7,400

LOWELL OBSERVATORY, Flagstaff, Ariz.; Frank Holden; *Visual Observations of Close Double Stars;* 2 years; $25,100

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge; George R. Harrison; *Extension of Techniques of Ruling Large Diffraction Gratings;* 2 years; $74,400

Henry J. Zimmermann and Sander Weinreb; *To Detect the Galactic Deuterium Line;* 6 months; $2,000

NATIONAL ACADEMY OF SCIENCES-NATIONAL RESEARCH COUNCIL, Washington, D.C.; S. D. Cornell; *Committee on Radio Frequency Allocations for Scientific Research;* 1 year; $13,000

S. D. Cornell; *Committee on Radio Frequency Allocations for Scientific Research;* 1 year; $30,800

Hugh Odishaw; *ICSU Committee on Space Research (COSPAR);* 1 year; $10,000

OHIO STATE UNIVERSITY RESEARCH FOUNDATION, Columbus; John D. Kraus; *Completion of the 360-foot Standing-Parabola, Tiltable-Flat-Sheet-Reflector, Radio Telescope;* 1 year; $16,700

John D. Kraus; *Radio Astronomy Using the 360-foot Radio Telescope;* 1 year; $51,800

Walter E. Mitchell, Jr.; *The Solar Spectrum in the Range 0.295–5.0 Microns;* 3 years; $12,100

OHIO WESLEYAN UNIVERSITY, Delaware; John D. Kraus; *Observatory Facility for 360-Foot Radio Telescope;* 1 year; $1,025

PAN AMERICAN COLLEGE, Edinburg, Tex.; Paul R. Engle; *Photoelectric Stellar Photometry;* 1 year; $12,700

PRINCETON UNIVERSITY, Princeton, N.J.; Martin Schwarzschild; *Project Stratoscope II;* 1 year; $792,900

RENSSELAER POLYTECHNIC INSTITUTE, Troy, N.Y.; J. Mayo Greenberg; *The Scattering of Light by Small Particles;* 2 years; $60,000

RIPON COLLEGE, Ripon, Wis.; Dino Zei; *Possible Turbulence in Sunspots;* 1 year; $5,600

UNIVERSITY OF SOUTHERN CALIFORNIA; Willard Van Tuyl Rusch; *Millimeter-Wavelength Radio Astronomy;* 6 months; $2,600

SAN DIEGO STATE COLLEGE FOUNDATION; San Diego, Calif.; Burt Nelson; *Photoelectric Study of Eclipsing Binary Stars;* 6 months; $11,000

SMITH COLLEGE; Northampton, Mass.; Edward C. Olson; *Spectrographic Investigation of Selected Eclipsing Binary Systems;* 2 years; $14,600

STANFORD UNIVERSITY; Stanford, Calif.; Ronald N. Bracewell; *Microwave Spectroheliograms;* 1 year; $10,500

Ronald N. Bracewell; *Microwave Radio Telescope Design Study;* 1 year; $222,000

V. R. Eshleman; *Radar Studies of the Cislunar Medium and the Lunar Surface;* 1 year; $40,000

U.S. DEPARTMENT OF COMMERCE, NATIONAL BUREAU OF STANDARDS; Washington, D.C.; Lewis M. Branscomb; *Joint Institute for Laboratory Astrophysics;* 14 months; $90,000

U.S. OFFICE OF NAVAL RESEARCH, Washington, D.C.; Wayne C. Hall; *Laboratory High Temperature Spectroscopy;* 1 year; $75,000

U.S. SMITHSONIAN INSTITUTE, Washington, D.C.; Charles A. Whitney, Astrophysical Observatory, Cambridge, Mass.; *Stellar Atmospheres;* $21,100

UNIVERSIDAD NACIONAL DE LA PLATA, Argentina; Carlos Oton Rudiger Jaschek; *Photoelectric Photometry;* 1 year; $12,500

UNIVERSITY OF ARIZONA, Tucson; Harold L. Johnson; *Infrared Photometry;* 1 year; $18,000

Harold L. Johnson; *UBVRIJK Photometry of the Brightest Stars;* 6 months; $51,000

Hugh M. Johnson; *The Orion Nebula and the Associated Star Cluster;* 2 years; $3,750
Gerard P. Kuiper; *Asteroids Research;* 9 months; $9,600

UNIVERSITY OF CALIFORNIA, Berkeley; Geoffrey Burbidge and E. Margaret Burbidge, San Diego; *Structure and Dynamics of External Galaxies;* 2 months; $4,600
George H. Herbig, Mt. Hamilton; *High Dispersion Stellar Spectrography;* 3 years; $16,000
Stanislavs Vasilevskis, Lick Observatory, Mt. Hamilton; *Equipment for Surveying and Automatic Measurement of Astrographic Plates*; $2,000
Stanislavs Vasilevskis, Lick Observatory, Mt. Hamilton; *Yellow-Corrected Lens for Carnegie Astrograph;* 1 year; $38,000
Harold Weaver; *Determination of Kinematic Properties of Stars in the Solar Neighborhood and the Distribution of Mass in the Galaxy;* 1 year; $11,100

UNIVERSITY OF CHICAGO, Chicago, Ill.; W. Albert Hiltner; *Image Tube Spectrograph;* 2 years; $38,500
W. A. Hiltner; *Purchase of a Rotatable Telescope*; 1 year; $80,000
George Van Biesbroeck; *Astrometric Investigations;* 1 year; $15,600

UNIVERSITY OF COLORADO, Boulder; George Gamow; *Properties of Spherical and Elliptical Galaxies;* 1 year; $11,300

UNIVERSITY OF ILLINOIS, Urbana; Ivan R. King; *Dynamics of Stellar Systems;* 2 years; $23,400
George C. McVittie; *Completion of the 600x400 ft. Parabolic Cylinder Radio Telescope at the Vermilion River Observatory;* 6 months; $25,900
G. S. Swenson, Jr.; *Latitude Dependence of Radio Star Scintillation;* 1 year; $14,100

UNIVERSITY OF KANSAS, Lawrence; Henry G. Horak: *Investigations and Computations in Radiative Transfer;* 3 years; $21,400

UNIVERSITY OF MICHIGAN, Ann Arbor; Fred T. Haddock; *Solar Radio Bursts;* 1 year; $25,600
George Makhov; *Design and Construction of an X-Band Ruby Maser Radiometer;* 1 year; $100,000
Charles W. Mautz; *Measurement of F-Values Using a Shock Tube;* 1 year; $34,500
Freeman D. Miller; *Plate Holders for Curtis Schmidt Telescope;* 1 year; $2,200
Freeman D. Miller; *Photographic Studies of Comets;* 15 Months; $18,600

UNIVERSITY OF MINNESOTA, Minneapolis; Willem J. Luyten; *Proper Motion Survey;* 3 years; $39,600

UNIVERSITY OF OREGON, Eugene; E. G. Ebbighausen; *Period Changes of Algol and Orbital Elements of Spectroscopic Binaries;* 1 year; $750
E. G. Ebbighausen; *The Spectroscopic Orbital Elements and the Rotation Effect for alpha Coronae Borealis;* 2 months; $3,200

UNIVERSITY OF PENNSYLVANIA, Philadelphia; Frank Bradshaw Wood; *Site Survey in New Zealand;* 1 year; $10,200

UNIVERSITY OF ROCHESTER, N.Y.; H. Lawrence Helfer; *Interaction of Stellar and Interstellar Material;* 2 years; $35,800

UNIVERSITY OF SYDNEY, Sydney, Australia; B. Y. Mills; *Extension of Mills Cross Radio Telescope;* 5 years; $149,000

UNIVERSITY OF TEXAS, Austin; Gerard H. de Vaucouleurs; *Isophotometry of Bright Southern Galaxies;* 18 months; $11,900
Charles W. Tolbert; *Design Study of a Large Millimeter Wave Antenna*; 1 year; $10,000

UNIVERSITY OF WISCONSIN, Madison; Julian E. Mack; *Interference Spectroscopic Study of the Zodiacal Light;* 1 year; $25,500
Donald E. Osterbrock; *Photoelectric Photometry of Comets and Nebulae;* 2 years; $22,100

WESLEYAN UNIVERSITY, Middletown, Conn.; Heinrich K. Eichhorn; *Measurement of Parallaxes and Proper Motions;* 2 years; $30,100

YALE UNIVERSITY, New Haven, Conn.; Harlan H. Smith and James N. Douglas; *Planetary Non-thermal Radio Emission;* 1 year; $64,000

ATMOSPHERIC SCIENCES

COLORADO STATE UNIVERSITY, RESEARCH FOUNDATION, Fort Collins; Richard A. Schleusener; *Hailstorms in the High Plains;* 18 months; $115,800

CORNELL UNIVERSITY, Ithaca, N.Y.; Carl W. Gartlein; *Support of WDC–A Aurora Visual Center;* 1 year; $16,500

DARTMOUTH COLLEGE, Hanover, N.H.; Millett G. Morgan; *Study of Atmospheric Whistlers;* 1 year; $45,000

GEORGIA INSTITUTE OF TECHNOLOGY, Atlanta; Clyde Orr, Jr.; *Photophoresis as Related to Meteorological Phenomena;* 2 years; $25,900

HIGH ALTITUDE OBSERVATORY OF THE UNIVERSITY OF COLORADO, Boulder; Richard T. Hansen; *Operation of IGY World Data Center A-Solar Activity;* 1 year; $17,700

HOKKAIDO UNIVERSITY, Sapporo, Japan; Ukichiro Nakaya; *The Formation and Structure of Snowfall;* 3 years; $49,000

INSTITUTO GEOFISICO DE HUANCAVO, Lima, Peru; Mateo Casaverde; *Geomagnetic Investigations in Peru, Bolivia, and Chile;* 18 months; $19,000

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge; Jule G. Charney; *Application of High-Speed Computers to Dynamical Meteorology and Oceanography;* 3 years; $50,000
Jule G. Charney; *Application of High-Speed Computers to Dynamical Meteorology and Oceanography;* $520,800
Raymond Hide; *Hydrodynamics of Rotating Fluids;* 1 year; $170,000
Henry G. Houghton and Pauline M. Austin; *Role of Cellular Activity in the Precipitation Process;* 3 years; $241,000

NATIONAL ACADEMY OF SCIENCES, National Research Council, Washington, D.C.; Hugh Odishaw; *World Data Center A-Coordination Center;* 1 year; $19,630
Hugh Odishaw; *Operation of World Data Center A-Rockets and Satellites;* 1 year; $23,150
Hugh Odishaw; *Support of World Data Center A-Rockets and Satellites Subcenter;* 1 year; $19,800
John R. Sievers; *Activities of the Com-*

mittee on Atmospheric Sciences; 1 year; $45,100

M. A. Tuve; *Support of the Committee for the International Year of the Quiet Sun;* 1 year; $7,500

NEW YORK UNIVERSITY, New York, N.Y.; Serge A. Korff; *Energetic Neutrons at High Altitudes;* 1 year; $50,000

OREGON STATE UNIVERSITY, Corvallis; Fred W. Decker and Lyle D. Calvin; *Showers of Small Hail and Related Atmospheric Phenomena in the Oregon Coast Range;* 1 year; $26,000

PENNSYLVANIA STATE UNIVERSITY, University Park; Sidney A. Bowhill; *Theoretical Studies of Ionospheric Recombination During Solar Eclipses;* 2 years; $43,000

E. R. Schmerling; *Region F Processes;* 1 year; $25,000

A. H. Waynick; *Ionospheric Investigations;* 3 years; $69,700

RESEARCH FOUNDATION OF STATE UNIVERSITY OF NEW YORK, Albany; Vincent J. Schaefer; *Cloud Physics Field Research;* 1 year; $17,400

STANFORD UNIVERSITY, Stanford, Calif.; R. A. Helliwell; *Synoptic Study of Whistlers and VLF Emissions;* 2 years; $62,300

U.S. ATOMIC ENERGY COMMISSION, New York, N.Y.; Morris Goldberg; *Use of AEC-7090 Computer;* 1 year; $3,600

U.S. DEPARTMENT OF COMMERCE, National Bureau of Standards, Washington, D.C.; F. W. Brown, Boulder, Colo.; *Operation of IGY World Data Center A for Airglow and Ionosphere;* 1 year; $50.250

F. W. Brown, Boulder, Colo.; *IGY World Data Center A for Airglow and Ionosphere;* 1 year; $50,000

Howard F. McMurdie; *Study of Silver Iodide in Connection With Its Use in Weather Control;* 2 years; $50,000

U.S. DEPARTMENT OF COMMERCE, Weather Bureau, Washington, D.C.; F. W. Reichelderfer; *Support of World Data Center A for Meteorology and Nuclear Radiation;* 1 year; $5,000

U.S. NAVAL RESEARCH LABORATORY, Washington, D.C.; H. Friedman and T. A. Chubb; *Upper Air Research Rocket Evaluation;* 1 year; $48,700

U.S. OFFICE OF NAVAL RESEARCH, Washington, D.C.; James Hughes; *NOMAD Weather Station for the International Indian Ocean Expedition;* 1 year; $50,000

UNIVERSITY COLLEGE, Ibadan, Nigeria; C. A. Onwumechilli; *Equatorial Electrojets;* 1 year; $22,000

UNIVERSITY OF ALASKA, College; Carl S. Benson; *Snow Survey on the Arctic Slope of Alaska;* 1 year; $24,000

Leif Owren; *Auroral Sound Waves;* 1 year; $22,800

Merle J. Young; *Operation of IGY World Data Center A for Aurora* (Instrumental); 1 year; $57,400

Merle J. Young; *Extension of Ascaplotting Work at IGY World Data Center A-Aurora (Instrumental)*; 5 months; $3,732

UNIVERSITY OF ARIZONA, Tucson; A. M. J. "Tom" Gehrels; *Diffuse Radiation Within Planetary Atmospheres;* 2 years; $179,800

A. Richard Kassander, Jr. and Louis J. Battan; *Physics of Clouds and of Cloud Modification;* 2 years; $92,500

UNIVERSITY OF CALIFORNIA, Berkeley; Charles D. Keeling, La Jolla; *Carbon Dioxide in Atmosphere and Its Exchange with the Ocean;* 3 years; $244,400

Jorgen Holmboe, Los Angeles; *The Instability Mechanism of Large Scale Atmospheric Flow;* 3 years; $137,500

Zdenek Sekera, Los Angeles; *Diffuse Radiation Within Planetary Atmospheres Using Balloons;* 2 years; $60,000

UNIVERSITY OF CANTERBURY, Christchurch, New Zealand; John B. Gregory; *Procurement of Equipment for Upper Atmosphere Research;* 1 year; $19,600

UNIVERSITY OF CHICAGO, Chicago, Ill.; Roscoe R. Braham, Jr.; *Physical Effects of Silver Iodide Seeding in Cumulus Clouds;* 1 year; $200,000

Horace R. Byers; *Research in Cloud Physics;* 2 years; $300,000

Tetsuya Fujita; *Mesoscale Disturbances;* 3 years; $50,000

Tetsuya Fujita; *Mesoscale Disturbances;* $94,000

UNIVERSITY OF COLORADO, Boulder; William A. Rense; *Theoretical Physics of Upper Air and Solar Atmosphere;* $4,860

UNIVERSITY OF HAWAII, Honolulu; Colin S. Ramage; *Support of United States Meteorology Program of the Indian Ocean Expedition;* 3 years; $97,200

Colin S. Ramage; *Atmospheric Circulation Project for the International Indian Ocean Expedition;* 1 year; $146,600

Walter R. Steiger; *Cosmic Ray Neutron Monitor;* 5 years; $24,500

UNIVERSITY OF MICHIGAN, Ann Arbor; Edward S. Epstein; *Dynamics of the Stratosphere;* 3 years; $59,800

Donald J. Portman; *Heat and Water Vapor Exchange for the International Indian Ocean Expedition;* 3 Years; $231,900

UNIVERSITY OF MINNESOTA, Minneapolis; George D. Freier; *Basic Field Quantities Arising from Electricity in the Earth's Atmosphere;* 2 years; $47,800

Paul J. Kellogg; *Operation of IGY World Data Center A for Cosmic Rays;* 1 year; $17,000

Alfred O. C. Nier; *Composition of Upper Atmosphere with Rocket-Borne Magnetic Mass Spectrometers;* 6 months; $5,000

John R. Winckler and Edward P. Ney; *Balloon Monitoring of Cosmic Rays, Solar Phenomena, and Particles from the Earth's Exosphere;* 1 year; $219,000

John R. Winckler and Edward P. Ney; *Balloon Monitoring of Cosmic Rays, Solar Phenomena, and Particles from the Earth's Exosphere;* 1 year; $200,000

UNIVERSITY OF MISSOURI, Columbia; Wayne L. Decker; *Analysis of Records from Rain Gauges Obtained During 1961 by The University of Chicago Cumulus Cloud Research Project;* 1 year; $7,500

UNIVERSITY OF NEVADA, Reno; Wendell A. Mordy; *Numerical Computation of the Growth of Cloud Droplets;* 2 years; $44,800

UNIVERSITY OF NEW ENGLAND, Armidale, New South Wales, Australia; Neville H. Fletcher; *Extension of Ice Crystal Nucleation Theory;* 2 years; $12,500

UNIVERSITY OF NEW HAMPSHIRE, Durham; John A. Lockwood; *Intensity-Time Variations in the Nucleonic Component of the Cosmic Radiation;* 3 years; $26,100

UNIVERSITY OF OKLAHOMA RESEARCH INSTITUTE, Norman; Yoshikazu Sasaki; *Numerical-Dynamical Studies of Mesometeorological Phenomena;* 2 years; $84,300

UNIVERSITY OF PITTSBURGH, Pa.; Thomas M. Donahue; *Sodium and Hydrogen Resonance Radiation in the Atmosphere and the Exosphere;* 2 years; $90,000

UNIVERSITY OF TEXAS, Austin; John R. Gerhardt; *Radar Precipitation Studies;* 2 years; $50,000

UNIVERSITY OF UTAH, Salt Lake City; Franklin S. Harris, Jr.; *Heterogeneous Nucleation of Ice;* 3 Years; $59,400

UNIVERSITY OF WASHINGTON, Seattle; Phil E. Church; *Winter Cloud Characteristics and Micrometeorology Studies on Blue Glacier;* 2 years; $64,400

Robert G. Fleagle; *Wind, Temperature and Humidity Profiles at Sea;* 3 months, $4,950

Robert G. Fleagle; *Energy Transfer Near the Earth's Surface;* 1 Year; $100,000

UNIVERSITY OF WISCONSIN, Madison; Julian E. Mack; *Upper Atmosphere High Resolution Spectroscopy;* 2 Years; $95,000

UTAH STATE UNIVERSITY, Logan; Clayton Clark; *Measurement of Motion of Sporadic E Patches;* 3 Years; $22,500

WOODS HOLE OCEANOGRAPHIC INSTITUTION; Woods Hole, Mass.; Andrew F. Bunker; *Air-Sea Interaction for the International Indian Ocean Expedition;* 1 year; $97,000

Andrew F. Bunker; *Research Aircraft for Meteorological Program of the International Indian Ocean Expedition;* 1 year; $100,000

A. H. Woodcock and D. C. Blanchard; *Origin of Raindrop Spectra and Shower Rains and Electrical Properties of Oceanic Air and Rains;* 1 year; $33,000

YALE UNIVERSITY, New Haven, Conn.; Peter P. Wegener; *Rate of Condensation of Water Vapor in the Metastable State;* $14,200

CHEMISTRY

BOSTON COLLEGE, Chestnut Hill, Mass.; Joseph Bornstein; *Mechanism of the Rearrangement Accompanying the Addition of Fluorine to 1, 1-Diarylethylenes;* 3 years; $21,600

BOSTON UNIVERSITY, Mass.; Walter J. Gensler; *Migration of Atoms in Vinyl Ethers Under Heterogeneous Catalysis;* 3 years; $23,300

BRANDEIS UNIVERSITY, Waltham, Mass.; Myron Rosenblum; *Thermal Decomposition of Oxadiazinones;* 3 years; $28,600

BRIGHAM YOUNG UNIVERSITY, Provo, Utah; H. Tracy Hall; *High Pressure, High Temperature Studies;* 3 years; $150,000

J. Bevan Ott; *Thermodynamic Investigation of Complex Formation in Solutions of Nonelectrolytes;* 2 years; $17,000

BROWN UNIVERSITY, Providence, R.I.; J. F. Bunnett; *Mechanism and Reactivity in Substitution at Unsaturated Centers;* 8 months; $4,600

Joseph F. Bunnett; *Mechanism of Acid Catalyzed Reactions;* 3 years; $33,400

Richard L. Carlin; *Electronic Behavior in Transition Metal Complexes;* 2 years; $21,600

Robert H. Cole; *Dielectric Properties and Molecular Interactions in Compressed Gases;* 2 years; $30,000

J. F. Neumer; *Proton Transfer Process Between Azo and Hydrazo Compounds;* 3 years; $17,000

BRYN MAWR COLLEGE, Bryn Mawr, Pa.; Ernst Berliner; *Relative Reactivities of Polynuclear Aromatic Systems;* 3 years; $11,000

CALIFORNIA INSTITUTE OF TECHNOLOGY, Pasadena; Fred C. Anson; *Electron Transfer Mechanisms in the Electrooxidation of Inorganic Cations;* 3 years; $35,600

George S. Hammond; *Mechanisms of Photochemical and Radical Reactions;* 5 years; $93,800

Harden M. McConnell; *Radiation Effects in Organic Crystals;* 2 years; $88,500

CARLETON COLLEGE, Northfield, Minn.; Richard W. Ramette; *Thermodynamic Studies of Solubility in Protium and Deuterium Oxides;* 3 years; $17,600

CARNEGIE INSTITUTE OF TECHNOLOGY, Pittsburgh, Pa.; Albert A. Caretto, Jr.; *Radiochemical Studies of High Energy Nuclear Reactions;* 2 years; $26,700

Allan K. Colter; *Chemical Behavior of Charge-Transfer Complexes;* 3 years, $39,300

Loren G. Hepler; *Thermochemical Investigations;* 2 years; $31,600

Robert R. Holmes; *Pentacoordinated Molecules;* 2 years; $15,600

CASE INSTITUTE OF TECHNOLOGY, Cleveland, Ohio; Peter Kovacic; *Reactions of Metal Halides with Organic Compounds;* 2 years; $18,900

CLEMSON COLLEGE, Clemson, S.C.; Frederick Lindstrom; *Glyoxal bis-(2-hydroxyanil) Derivatives as Analytical Reagents;* 3 years; $18,500

COLUMBIA UNIVERSITY, New York, N.Y.; Charles O. Beckmann; *Nuclear Magnetic Resonance Spectrometer;* 1 year; $16,000

Ronald Breslow; *d-Orbital Conjugation;* 3 years; $56,200

CORNELL UNIVERSITY, Ithaca, N.Y.; Alfred T. Blomquist; *Highly Unsaturated Small Carbon-Ring Systems;* 3 years; $85,500

David H. Geske; *Electron Spin Resonance of Electrochemically Generated Free Radicals;* 2 years; $28,900

James L. Hoard; *Structural Analysis of Multidentate Chelates of Ferric Iron and the Rare Earths;* 3 years; $72,800

Jerrold Meinwald; *Highly Strained Bridged Systems;* 3 years; $58,100

William T. Miller, Jr.; *Reaction of Fluoroolefins with Nucleophiles; Chemistry of Fluorocarbanions;* $4,000

Charles F. Wilcox, Jr.; *Chemical and Physical Properties of Bicyclo (2.2.1) Heptane Derivatives;* 3 years; $32,800

DARTMOUTH COLLEGE, Hanover, N.H.; Walter H. Stockmayer; *Physical Chemistry of High Polymers;* 2 years; $55,800

DUKE UNIVERSITY, Durham, N.C.; Charles K. Bradsher; *Aromatic Cations and Aromatic Cyclization;* 3 years; $35,800

William R. Krigbaum; *Thermodynamic Investigation of Crystalline Poly (1-Olefins)* 2 years; $25,200

EARLHAM COLLEGE, Richmond, Ind.; Wilmer J. Stratton; *Unusual Metal Chelate Compounds with Azine Ligands;* 30 months; $22,000

EMORY UNIVERSITY, Atlanta, Ga.; J. H. Goldstein and Leon Mandell; *Purchase of Nuclear Magnetic Resonance Spectrometer;* 1 year; $14,000

Leon Mandell; *Synthesis of Medium Sized Rings;* 2 years; $13,100

FLORIDA STATE UNIVERSITY, Tallahassee; Michael Kasha; *Purchase of a Proton Magnetic Resonance Spectrometer;* 1 year; $19,000

GEORGETOWN UNIVERSITY, Washington, D.C.; Joseph E. Earley; *Oxidation States in Metallic Ions—II;* 2 years; $28,800

GEORGIA INSTITUTE OF TECHNOLOGY, Atlanta; James R. Cox, Jr.; *Mechanisms of Homolytic Reactions of Aromatic Diazo Compounds;* 2 years; $26,900

William H. Eberhardt; *Magnetic Rotation Spectra of Simple Molecules;* 2 years; $57,700

Hermenegild A. Flaschka; *Application of Chelons in Analytical Chemistry;* 2 years; $29,500

Henry M. Neumann and Harold R. Hunt; *Electron Transfer Reactions of Complex Ions of Transition Metals;* 2 years; $27,800

HAMILTON COLLEGE, Clinton, N.Y.; Donald J. Denney and James W. Ring; *Dielectric Relaxation in Polar Liquids and their Solutions;* 2 years; $11,300

HARVARD UNIVERSITY, *Cambridge,* Mass.; Paul D. Bartlett; *Mechanisms of Organic Reactions;* 3 years; $10,000

Paul D. Bartlett; *Mechanisms of Organic Reactions;* $55,200

G. B. Kistiakowsky; *Unstable Intermediates in Gas Phase Reactions;* $10,000

William N. Lipscomb; *Crystal and Molecular Structure Studies at Very Low Temperatures;* $5,000

E. Bright Wilson, Jr.; *Acoustic Relaxation in Gases;* 2 years; $27,700

HOWARD UNIVERSITY, Washington, D.C.; Kelso B. Morris; *Electrical Conductivities and Densities for Certain Molten Systems;* $2,000

ILLINOIS INSTITUTE OF TECHNOLOGY, Chicago; John E. Frey; *Interaction of Halogens With Borazine and Some of Its Derivatives;* 2 years; $24,500

Arthur E. Martell; *Metal Chelate Compounds in Homogeneous Catalysis;* 2 years; $23,800

INDIANA UNIVERSITY FOUNDATION, Bloomington; Edward J. Bair; *Spectrometric Studies of Atomic Flames;* 2 years; $18,400

Harry G. Day; *Purchase of a Nuclear Magnetic Resonance Spectrometer;* 1 year; $18,700

Ernest Wenkert; *Diterpenoid Natural Products;* 2 years; $44,900

IOWA STATE UNIVERSITY, Ames; Charles H. DePuy; *Ring-Opening of Cyclopropanols;* 2 years; $36,100

Glen A. Russell; *Electrophilic Substitution on Saturated Carbon Atoms;* 6 months; $2,300

John G. Verkade; *Chemistry of Bicyclic Phosphorus Compounds;* 2 years; $25,700

JOHNS HOPKINS UNIVERSITY, Baltimore, Md.; Dean W. Robinson; *Spectral Studies of Solids;* 2 years; $36,200

KANSAS STATE UNIVERSITY, Manhattan, Kans.; Warren W. Brandt; *Spectrofluorimetric Examination of Luminescence Phenomena;* 2 years; $20,600

Warren W. Brandt; *Purchase of a Proton Magnetic Resonance Spectrometer;* 1 year; $16,000

Kenneth Conrow; *Covalent Tropilidenes and Tropylium Ions: Kinetics and Equilibria;* 3 years; $22,800

LAFAYETTE COLLEGE, Easton, Pa.; Thomas G. Miller; *Rearrangements of 4,4-Disubstituted-2,5-cyclohexadienes;* 2 years; $6,400

LOS ANGELES STATE COLLEGE FOUNDATION, Los Angeles, Calif.; David H. Klein; *Coprecipitation by Mixed Crystal Formation;* 2 years; $11,900

Thomas P. Onak; *Rearrangement of a Substituted Pentaborane System;* 2 years; $10,800

LOUISIANA STATE UNIVERSITY, Baton Rouge; Paul E. Koenig; *Applications of Metal Nitrides in the Field of Organic Systhesis;* 2 years; $16,100

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge; Glenn A. Berchtold; *Reactions of Enamines;* 3 years; $27,500

Klaus Biemann; *High Resolution Mass Spectra of Complex Organic Molecules;* 3 years; $77,400

George H. Buchi; *Photochemical Reactions;* 3 years; $70,100

Richard C. Lord; *Methods and Applications of Far Infrared Spectroscopy;* 2 years; $109,800

Dietmar Seyferth; *Unsaturated Organometallics;* 2 years; $29,100

David P. Shoemaker; *Low-Energy Electron Diffraction Study of Metal Surfaces and Chemisorbed Molecules;* 2 years; $19,300

Meyers, Cal Y.; *Participation in the 140th Meeting of the American Chemical Society;* $675

MICHIGAN STATE UNIVERSITY, East Lansing; Gerasimos J. Karabatsos; *Mechanisms of Organic Reactions by Use of Isotopes;* 3 years; $19,000

Max T. Rogers; *Application of NMR Spectroscopy to Problems in Molecular Structure;* 2 years; $43,800

Max T. Rogers; *Purchase of Electron Paramagnetic Resonance Spectrometer;* 1 year; $30,200

MONTANA STATE COLLEGE, Bozeman; Charles N. Caughlan; *Structures of Mixed Alkoxides of Titanium;* 2 years; $15,700

Ray Woodriff; *Atomic Absorption Spectrometry for Quantitative Rare Earth Analyses;* 2 years; $6,500

NEW MEXICO INSTITUTE OF MINING AND TECHNOLOGY, Socorro; K. R. Brower; *Measurement and Interpretation of the Volume Change of Activation in Various Organic Reactions;* 2 years; $12,300

NORTHWESTERN UNIVERSITY, Evanston, Ill.; Frederick G. Bordwell; *Stereochemistry of Additions to Carbon-Carbon Double Bonds;* 3 years; $39,300

Arthur A. Frost; *Quantum Mechanical Calculation of the Electronic Energy of Simple Molecules;* 2 years; $37,500

Pierce W. Selwood; *Molecular Interactions at Solid Surfaces;* 2 years; $34,000

Donald E. Smith; *Chemical and Electrochemical Kinetics Employing Polarography;* 3 years; $21,200

OHIO STATE UNIVERSITY RESEARCH FOUNDATION, Columbus; Jack G. Calvert; *Mechanism of Heterogeneous Reactions Photosensitized at the Surface of Solids;* 3 years; $44,900

Michael P. Cava; *Condensed Cyclobutane Aromatic Compounds;* 3 years; $8,800

Michael P. Cava; *Condensed Cyclobutane Aromatic Compounds;* $65,000

Alfred B. Garrett; *Nuclear Magnetic Resonance Spectrometer Accessories;* 1 year; $5,500

Alfred B. Garrett, *Purchase of a Proton Magnetic Resonance Spectrometer;* 1 year; $20,000

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Michael Szwarc, Syracuse; *Chemistry of Free Radicals;* —— $60,000

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Robert W. Parry, Robert C. Taylor and Christer E. Nordman; *Chemistry of the Bridge and Coordinate Bond in Inorganic Systems;* 2 years; $103,200

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DEVELOPMENTAL BIOLOGY

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UNIVERSITY OF ILLINOIS, Urbana; Pierson J. Van Alten, Chicago; *Development of the Immune Response in the Chick;* 2 years; $28,000

UNIVERSITY OF KANSAS, Lawrence; J. Eugene Fox; *Chemistry and Biology of a Plant Growth Regulator;* 3 years; $31,000

UNIVERSITY OF MAINE, Orono; Alton M. Mun; *Donor-host Spleen Cell Interaction in Inbred Embryos;* 3 years; $37,000

UNIVERSITY OF MICHIGAN, Ann Arbor; Norman E. Kemp; *Differentiation of Sub-Microscopic Structure During Development;* 2 years; $26,500

UNIVERSITY OF MINNESOTA, Minneapolis; Mykola H. Haydak and Narayan G. Patel; *Caste Development in Honeybees;* 2 years; $16,900

Nelson T. Spratt, Jr.; *Developmental Potentialities of the Early Chick Blastoderm;* 3 years; $28,900

UNIVERSITY OF OREGON MEDICAL SCHOOL, Portland; Richard B. Lyons; *Chemical Differentiation in Developing Sea Urchin Embryos;* 2 years; $17,900

UNIVERSITY OF PITTSBURGH, Pittsburgh, Pa.; Joan Elger Gottlieb; *Vegetative Dimorphism in the Shoot System of Vascular Plants;* 3 years; $14,800

Peter Gray; *Improved Techniques of Electron Microscopy;* 3 years; $18,200

UNIVERSITY OF SOUTH CAROLINA, Columbia; John M. Herr, Jr.; *Rearrangement of Nuclei in the Immature Megagametophyte;* 2 years; $13,000

UNIVERSITY OF VIRGINIA, Charlottesville; Dietrich Bodenstein; *The Role of Hormones and Nerves in Insect Growth;* 4 years; $43,700

UNIVERSITY OF WASHINGTON, Seattle; Edward C. Roosen-Runge; *Gametogenesis in Hydromedusae;* 3 years; $9,700

UNIVERSITY OF WISCONSIN, Madison; Robert Auerbach; *Control Mechanisms in Lymphoid Differentiation;* 3 years; $61,600

Hans Ris; *Tissue Culture Research;* 3 years; $29,000

VILLANOVA UNIVERSITY, Villanova, Pa.; Roman Maksymowych; *Cell Division and*

Tissue Differentiation in Leaf Development; 2 years; $13,000

WESTERN RESERVE UNIVERSITY, Cleveland, Ohio; Allison L. Burnett; *Growth and Cell Differentiation in Hydra;* 3 years; $75,700

Howard A. Schneiderman; *Studies of Insect Fine Structure;* 5 years; $146,800

WILLIAM MARSH RICE UNIVERSITY, Houston, Tex.; Allen C. Enders; *Mechanisms of Implantation in Mammals;* 2 years; $37,700

WILSON COLLEGE, Chambersburg, Pa.; M. Jean Allen; *Studies of Polychaete Development;* 2 years; $25,200

WITTENBERG UNIVERSITY, Springfield, Ohio; Knut J. Norstog; *Growth and Differentiation of Barley Embryos;* 2 years; $9,000

YALE UNIVERSITY, New Haven, Conn.; John H. Miller and Pauline M. Miller; *Patterns of Cell Expansion in Fern Gametophytes;* 1 year; $9,000

Ian K. Ross; *Cytology, Morphogenesis and Heterothallism in the Myxomycetes;* 2 years; $16,300

EARTH SCIENCES

ALFRED UNIVERSITY, Alfred, N.Y.; Taro Takahashi; *Solubility of Lead Sulfide in Water at Elevated Temperatures and Pressures;* 1 year; $17,000

AMERICAN GEOGRAPHICAL SOCIETY, New York, N.Y.; William O. Field; *Continuation of World Data Center A: Glaciology;* 6 months; $12,950

AMHERST COLLEGE, Amherst, Mass.; Bruce B. Benson; *Mass Spectrometric Studies of Atmospheric Gases, of Gases Dissolved in the Oceans, and of Sea Water;* 2 years; $59,000

BRIGHAM YOUNG UNIVERSITY, Provo, Utah; Kenneth C. Bullock; *Acquisition of a Vertical Reflecting Projector;* 1 year; $5,660

David L. Clark; *Biostratigraphic Study of the Eastern Great Basin Paleozoic;* 3 years; $31,000

BROWN UNIVERSITY, Providence, R.I.; Richard A. Yund; *Equilibrium-Phase Relations in the System Cu-Fe-O-S and Their Geologic Application;* 2 years; $49,800

CALIFORNIA INSTITUTE OF TECHNOLOGY, Pasadena; Arden L. Albee; *Chemical Equilibrium in Coexisting Phases of Quartz-Muscovite Rock;* 3 years; $34,900

Arden L. Albee; *The Boundary of the Timiskaming and Grenville Subprovinces Near Lake Temagami, Ontario;* 2 years; $2,300

Clarence R. Allen and Frank Press; *Geophysical Investigations of Geologic Structures in the Western United States;* 2 years; $63,500

Clarence R. Allen and Robert V. Sharp; *Field Study of the San Jacinto Fault System in Southeastern California;* 2 years; $2,400

Arthur J. Boucot; *Silurian and Lower Devonian Shelly Faunas;* 3 years; $50,000

W. Barclay Kamb; *Crystal Structures of the High-Pressure Forms of Ice;* 2 years; $27,500

Robert P. Sharp; *Methods of Chemical Analyses;* 1 year; $14,500

Hugh P. Taylor, Jr.; *Oxygen Isotopic Composition of Silicate Rocks and Minerals;* 2 years; $16,600

G. J. Wasserburg; *Rare Gases in Nature and Problems in Absolute Age Determination;* 3 years; $59,300

COLORADO SCHOOL OF MINES, Golden; M. A. Klugman; *Primary Dispersion Haloes in Wall-Rock and Ore Bodies;* 2 years; $27,000

COLUMBIA UNIVERSITY, New York, N.Y.; Wallace S. Broecker, Palisades; *Development of an Alpha-Spectrometer for Use in U Inequilibrium Studies;* 1 year; $15,500

Wallace S. Broecker, Palisades; *Application of the Radiocarbon Method to the Precise Dating of Late and Post Glacial Events;* 3 years; $27,200

William A. Cassidy, Palisades; *Study of Meteoritic Impact Sites;* 1 year; $22,800

David B. Ericson, Palisades; *Pleistocene Oceanography as Recorded in Deep-Sea Sediment Cores;* 3 years; $49,800

Maurice Ewing, Palisades; *Participation in the International Indian Ocean Expedition;* 1 year; $150,000

Maurice Ewing, Palisades; *Support for Research Vessel VEMA;* 1 year; $180,000

CORNELL UNIVERSITY, Ithaca, N.Y.; E. P. Wheeler, 2d; *Anorthosite and Adamellite Bodies of Northern Labrador;* 1 year; $6,000

FLORIDA STATE UNIVERSITY, Tallahassee; Lyman D. Toulmin; *Paleocene and Eocene Foraminifera from the Chattahoochee River, Alabama and Georgia;* 2 years; $11,900

FRANKLIN AND MARSHALL COLLEGE, Lancaster, Pa.; John H. Moss; *Glacial Geology of the Boulder River Drainage Basin, Northern Beartooth Mountains, Montana;* 2 years; $11,500

GEOLOGICAL SURVEY OF ISRAEL, Jerusalem, Israel; David Neev; *Submarine Geology and Physical Oceanography of the Eastern Mediterranean;* 3 years; $30,000

HARVARD UNIVERSITY, Cambridge, Mass.; Elso S. Barghoorn; *Pre-Cambrian Plant Fossils and the Organic Geo-chemistry of Pre-Cambrian Sediments;* 3 years; $26,900

Alan V. Jopling; *Origin of Caliche;* 1 year; $1,000

Bernhard Kummel; *Zonation, Faunal Evolution, and Paleogeography of the Lower Triassic;* 3½ years; $36,700

Henry Stommel; *Research in Oceanic Physics;* 1 year; $40,000

Harry B. Whittington; *Preparation and Publication of Monographs on Ordovician Trilobites from Western Newfoundland;* 3 years; $13,000

IOWA STATE UNIVERSITY, Ames; Wayne H. Scholtes; *Genesis of Soils and Soil Landscapes in the Cary and Iowan Drift Areas in Iowa;* 2 years; $19,500

JOHNS HOPKINS UNIVERSITY, Baltimore, Md.; Ernst Cloos; *Purchase of a Caesar-Saltzman Vertical Reflecting Projector;* 1 year; $5,600

Hans P. Eugster; *Low Grade Metamorphic Reactions;* 2 years; $22,700

Richard S. Fiske and Aaron C. Waters; *Chemical and Mineralogical Variations of the Columbia River Basalts, and of the Andesites of the Cascade Mountains;* 2 years; $53,640

Clifford A. Hopson, Johns Hopkins University, and William S. Wise, University of California, Santa Barbara; *Mineralogy, Chemistry and Field Associations of Pyroxene Andesite at Mt. Hood and Mt. Rainier;* 2 years; $26,000

LEHIGH UNIVERSITY, Bethlehem, Pa.; Dale R. Simpson; *Synthesis and Stability of the Mineral Apatite;* 2 years; $20,000

Bradford Willard; *The Harvey Bassler Collection;* 1 year; $3,500

LOS ANGELES STATE COLLEGE FOUNDATION, Los Angeles, Calif.; James N. Gundersen; *Stratigraphy and Mineralogy of Biwabik Iron Formation, Northern Minnesota;* 2 years; $8,800

LOUISIANA STATE UNIVERSITY, Baton Rouge; John C. Ferm; *Study of the Kittanning Formation;* 3 years; $22,700

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge; M. J. Buerger; *Structures and Properties of Crystals;* 2 years; $59,900

William H. Dennen; *The Abundance and Distribution of Trace Elements in Quartz;* 2 years; $14,250

MONTANA STATE COLLEGE, Bozeman; William J. McMannis, John de la Montagne and Robert A. Chadwick; *Geology of Gallatin Range, Montana;* 2 years; $30,000

MONTANA STATE UNIVERSITY, Missoula; John Hower; *Chemical Composition and Structure of Natural Illites and Synthesis of Illite;* 3 years; $35,000

NATIONAL ACADEMY OF SCIENCES-NATIONAL RESEARCH COUNCIL, Washington, D.C.; Linn Hoover; *Experimental Drilling in Deep Water;* 1 year; $147,200

Linn Hoover; *Support of the Coordinator, International Indian Ocean Expedition;* 1 year; $44,200

NEW MEXICO INSTITUTE OF MINING AND TECHNOLOGY, Socorro; Frederick J. Kuellmer; *Structural Variation of Alkali Feldspars, Micas, and Silica Minerals Within Some Igneous and Metamorphic Rocks;* 2 years; $32,500

NEW YORK UNIVERSITY, New York; Willard J. Pierson, Jr.; *The Breaking of Waves in Deep Water as Related to Particle Motions in Long Crested Random Seas;* 6 months; $19,300

NORTHWESTERN UNIVERSITY, Evanston, Ill.; E. H. Timothy Whitten; *The Quantitative Composition, Variation, and Structure of Rock-Masses, Particularly Granitoid Rocks;* 1 year; $22,900

OBERLIN COLLEGE, Oberlin, Ohio; Fred Foreman; *Pleistocene-Pliocene Stratigraphy;* 2 years; $10,300

OCCIDENTAL COLLEGE, Los Angeles, Calif.; Joseph H. Birman; *Late Wisconsin and Post Wisconsin Glacial History in the Middle East;* 3 months; $3,000

OHIO STATE UNIVERSITY RESEARCH FOUNDATION, Columbus; Richard P. Goldthwait; *A Quantitative Analysis of Possible Factors Contributing to Slope Form in Relation to Micro-Climate;* 1 year; $4,440

Richard P. Goldthwait and R. J. Price; *Ice-contact Deposits at Terminus of Casement Glacier, Alaska;* 1 year; $10,800

OREGON STATE UNIVERSITY, Corvallis; Joseph W. Berg, Jr. and Wayne V. Burt; *Gravitational Studies in Oregon;* 2 years; $28,300

Wayne V. Burt; *Oregon Oceanographic Studies;* 1 year; $140,000

PENNSYLVANIA STATE UNIVERSITY, University Park; I. L. Barnes; *Solubilities of Ore Minerals in Hydrothermal Sulfide Solutions;* 2 years; $30,000

Thomas F. Bates; *X-ray Amorphous Mineral Materials and Their Role in the Weathering Process;* $5,000

C. Wayne Burnham and Richard H. Jahns; *Role of Water and Other Volatiles in Magmatic Processes;* 2 years; $112,900

MacKenzie L. Keith; *Isotopic Composition of Fossils and Limestones;* 2 years; $28,900

Rustum Roy; *Phase Transition Studies. The Influence of Defects and Strain;* 3 years; $40,800

William Spackman; *Characteristics of Modern Organic Sediments and Their Use in the Identification, Description and Interpretation of Carbonaceous Rocks and Rock Sequences;* 2 years; $29,200

O. F. Tuttle; *Pressure-Temperature Conditions Required for Melting in the Earth's Crust;* 2 years; $67,200

Harold D. Wright; *Distribution and Solubilities of Trace Elements in Sulfide Minerals;* 2 years; $30,000

P. J. Wyllie; *The Petrogenetic Links Between Carbonatites and Alkali Peridotite Magmas;* 2 years; $47,900

POMONA COLLEGE, Claremont, Calif.; Alexander K. Baird and Donald B. McIntyre; *Distributions of Major Elements in Batholith Rocks in Southern California and Their Petrogenetic Significance;* 2 years; $46,600

PRINCETON UNIVERSITY, Princeton, N.J.; William E. Bonini; *Analysis of Gravity Anomalies in Northwestern United States;* 2 years; $14,250

William E. Bonini; *Seismic Crustal Measurements;* 1 year; $10,850

Erling Dorf; *Floras and Age Relationships of the Late Volcanic Sequence in the Absaroka Mountains, Wyoming;* 2 years; $9,900

PRINCIPIA COLLEGE, Elsah, Ill.; Forbes Robertson; *A Petrographic and Chemical Investigation of Brasilian Lateritic Products;* 3 years; $9,950

RESEARCH ASSOCIATION OF THE UNIVERSITY OF TOKYO, Tokyo, Japan; Keiiti Aki; *Earthquake Mechanism from Surface Waves;* 2 years; $23,000

RESEARCH FOUNDATION OF STATE UNIVERSITY OF NEW YORK, Albany; Hugh E. Hunter, Binghamton; *Petrology of the Basic Intrusive Rocks of the Wichita Mountains;* 1 year; $16,200

ROBERT S. PEABODY FOUNDATION FOR ARCHAEOLOGY, Andover, Mass.; Frederick Johnson; *Preparation and Distribution of Radiocarbon Dates;* 1 year; $15,000

Clyde P. Ross, Denver, Colo.; *The Origin of the Idaho Batholith;* 18 months; $9,000

ST. LAWRENCE UNIVERSITY, Canton, N.Y.; Robert O. Bloomer; *Geology of the Grenville Complex in Northwestern New York;* 3 years; $15,350

STANFORD UNIVERSITY, Stanford, Calif.; John W. Harbaugh; *Dolomite in Modern Sediments;* 18 months; $23,500

TEXAS AGRICULTURAL & MECHANICAL RESEARCH FOUNDATION, College Station; Robert O. Reid; *Exchange Characteristics and Salinity Regime of Shallow Coastal Bay Systems;* 2 years; $39,700

TEXAS TECHNOLOGICAL COLLEGE, Lubbock; John G. Dennis; *Basic English Terminology for the International Tectonic Dictionary;* 1 year; $11,400

U.S. DEPARTMENT OF COMMERCE, COAST AND GEODETIC SURVEY, Washington, D.C.; J. H. Nelson; *World Data Center A for Geomagnetism, Seismology, and Gravity;* 1 year; $38,000

U.S. DEPARTMENT OF THE NAVY, OFFICE OF NAVAL RESEARCH, Washington, D.C.; W. T. Sawyer; *Support of the Committee on Oceanography of the National Academy of Sciences;* 1 year; $18,000

U.S. INFORMATION AGENCY, Washington, D.C.; Turner B. Shelton; *Partial Funding of Documentary Film of Operation Mohole;* 1 year; $25,000

U.S. NAVY HYDROGRAPHIC OFFICE, Washington, D.C.; R. D. Fusselman; *National Oceanographic Data Center;* 1 year; $80,000

UNIVERSIDAD MAYOR DE SAN ANDRES, La Paz, Bolivia; Reynaldo Salgueiro; *Gravity and Geomagnetism Studies in Bolivia;* 3 years; $33,000

UNIVERSIDAD NACIONAL AUTONOMA DE MEXICO, Mexico City; Guillermo P. Salas and Fred B. Phleger; *Oceanography and Sedimentology of Coastal Lagoons on the East Coast of Mexico;* 3 years; $27,500

UNIVERSITY COLLEGE OF RHODESIA & NYASALAND, Salisbury, Southern Rhodesia; Dennis I. Gough; *Paleomagnetic Studies in Southern Rhodesia;* $2,300

UNIVERSITY OF ALASKA, College; Troy L. Pewé; *Glaciological Investigation in Central Alaska;* 1 year; $11,300

UNIVERSITY OF ARIZONA, Tucson; John W. Anthony; *X-Ray Diffractometer for Use in Current Research;* 1 year; $10,700

John F. Lance; *Paleontology and Stratigraphy of Pleistocene Deposits, San Pedro Valley, Arizona;* 2 years; $21,500

Mark A. Melton; *Fluvial and Related Geomorphic Processes of Arid and Semi-Arid Regions;* 2 years; $40,000

William G. McGinnies; *Dendrochronology of Bristlecone Pine (Pinus aristata Engelm) as a Basis for the Extension of Dendroclimatic Indices;* 2 years; $50,000

Joseph F. Schreiber, Jr.; *Environments of Sedimentation, Wilcox Playa;* 2 years; $12,500

UNIVERSITY OF CALIFORNIA, Berkeley; Perry Byerly; *The Energy in Earthquakes;* 1 year; $10,000

Richard L. Hay; *Occurrence and Origin of Authigenic Aluminosilicate Minerals in Saline Lakes;* 2 years; $17,400

Stanley H. Ward; *Polarizations of Natural Magnetic Fields by Major Geological Structures;* 1 year; $25,000

J. J. Jurinak, Davis; *Surface Chemistry of Clay Minerals;* 2 years; $14,350

Edward D. Goldberg, La Jolla; *Atlantic Ocean-Mediterranean Sea Research Program During the Scripps Institution of Oceanography Expedition Zephyrus;* 4 months; $100,800

John D. Isaacs, La Jolla; *Research Surveys of the California Current System;* 1 year; $99,000

M. N. Bramlette, La Jolla; *Diatom Distribution in Oceans;* 1 year; $6,300

Tsaihwa J. Chow, La Jolla; *Chemical Speciation of Trace Metallic Elements in the Sea;* 2 years; $31,600

Harmon Craig, La Jolla; *Geochemistry of Volcanic Gases and Waters;* 1 year; $24,700

Albert E. J. Engel, La Jolla; *Properties and Origin of Graywacke Sediments as a Guide to Crustal Evolution;* 2 years; $30,000

Robert L. Fisher, La Jolla; *Participation in the International Indian Ocean Expedition;* 1 year; $150,000

W. R. Riedel, Y. R. Nayudu, and R. L. Fisher, La Jolla; *General Survey and Publication of the Lithology and Stratigraphy of Deep-Sea Sediment Cores, and of Bathymetric Data, Collected by Scripps' Expeditions;* 2 years; $50,000

Margaret K. Robinson, La Jolla; *Computation of Seasonal Variation in Sea Temperature from Incomplete Time Series;* 2 years; $28,600

George G. Shor, Jr., La Jolla; *Investigations of Crustal Structure Along the Alaskan Coast;* 1 year; $94,400

George G. Shor, Jr., La Jolla; *Mohole Site Selection Studies;* 1 year; $169,000

Richard P. Von Herzen, La Jolla; *Heat Flow Through the Ocean Floor;* 2 years; $198,800

Leason H. Adams and George C. Kennedy, Los Angeles; *Rapidly Running Transitions at Very High Pressures;* 1 year; $25,000

Daniel I. Axelrod and William S. Ting, Los Angeles; *Acquisition of a Polarizing Photomicroscope;* 1 year; $7,100

Gerhard Oertel, Los Angeles; *Mechanical Anisotropy of Solids During Deformation;* 2 years; $27,200

Ronald L. Shreve, Los Angeles; *Surface Velocity and Changes in Level of Austerdals Glacier, Norway, 1957–1960;* 1 year; $1,700

George Tunell, Los Angeles; *Ore-Forming Processes in Mercury and Antimony Ore Deposits;* 2 years; $28,000

Frank W. Dickson, Riverside; *Ore-Forming Processes;* 2 years; $40,000

Frank W. Dickson, Riverside; *Geochemistry and Field Studies of Borate Mineral Genesis;* 2 years; $15,400

P. F. Pratt, Riverside; *The Chemistry of Nickel in Soils;* 2 years; $12,000

Robert L. Fisher and William R. Riedel, San Diego; *Detailed Field Study of Topography and Stratigraphy in Parts of the Western Pacific;* 1 year; $370,000

UNIVERSITY OF CHICAGO, Ill.; Robert N. Clayton; *Stable Isotope Fractionation in Nature;* 2 years; $78,500

Julian R. Goldsmith; *The Crystal Chemistry of Some Carbonates and Silicates;* 2 years; $33,400

John C. Jamieson; *Physical Behavior of Solids Under Very High Pressures;* 3 years; $48,800

James McLelland; *Mechanics of Dike Formation and the Relationship to Tectonic Environment of Igneous Rocks;* 2 years; $12,000

Joseph V. Smith and Hans Ramberg; *X-Ray Microprobe Analyzer;* 1 year; $88,700

UNIVERSITY OF COLORADO, Boulder; William C. Bradley; *Bedrock Form and Deformation of Marine Terraces Near Santa Cruz, California;* 2 years; $10,750

UNIVERSITY OF FLORIDA, Gainesville; Per Bruum; *Determination of Sediment Transportation by Means of Fluorescent Tracers;* 2 years; $35,100

UNIVERSITY OF GEORGIA, Athens; Charles A. Salotti; *High-Temperature Sulfide Deposits of the Southern Appalachians;* 2 years; $17,500

UNIVERSITY OF HAWAII, Honolulu; Martin J. Vitousek; *Physical Oceanographic Research in Connection with the Fanning Island Expedition, 1962;* 1 year; $11,800

UNIVERSITY OF HOUSTON, Tex.; Jules R. Du Bar; *Geologic Relationship of Pleistocene Terraces and Shorelines in the Carolinas;* 2 years; $25,000

UNIVERSITY OF ILLINOIS, Urbana; Arnold Klute; *Soil Water Diffusivity and Conductivity Functions of Unsaturated Soils;* 3 years; $36,400

UNIVERSITY OF KANSAS, Lawrence; William Kenneth Hamblin; *Origin and Significance of Reverse Drag, Fault-Flexure Displacements;* $1,700

UNIVERSITY OF MAINE, Orono; Harold W. Borns, Jr.; *Late Glacial and Early Post Glacial Geologic History of Portions of the Kennebec and Penobscot River Valleys of Maine;* 18 months; $14,620

UNIVERSITY OF MIAMI, Coral Gables; Cesare Emiliani and G. A. Rusnak, Miami; *Caribbean Deep-Sea Cores and Associated Research Problems;* 2 years; $75,000

Cesare Emiliani, Miami; *Geochemistry of Marine Sediments;* 1 year; $18,200

Friedrich F. Koczy, Miami; *The Geochemistry of Radioactive Elements in the Marine Environment;* 2 years; $45,400

G. A. Rusnak and Cesare Emiliani; *Late Pleistocene Stratigraphy in Deep-Sea Cores;* 1 year; $9,200

Gene A. Rusnak, Miami; *Radiocarbon Dating Laboratory;* $5,000

Gene A. Rusnak, Miami; *Rates Sedimentation and Chronology of Late Pleistocene Events by Radiocarbon Dating;* 1 year; $25,000

UNIVERSITY OF MICHIGAN, Ann Arbor; Edwin N. Goddard and Louis I. Briggs; *Crustal Deformation in the Sangre de Cristo Range, Colorado;* 2 years; $13,500

UNIVERSITY OF MINNESOTA, Minneapolis; Paul W. Gast; *Contact Metamorphic Effects on Isotopic Mineral Ages;* 2 years; $40,000

Peter Signer; *Rare Gases in Meteorites;* 2 years; $88,900

Frederick M. Swain; *Carbon Cycles of the Geologic Past;* 2 years; $35,600

H. E. Wright, Jr.; *Pleistocene Limnology in the Western United States;* 3 years; $34,000

UNIVERSITY OF MISSOURI, Columbia; C. Edmund Marshall; *Equilibria and Kinetics of Reactions Between Aluminosilicate Minerals and Aqueous Solutions;* 2 years; $46,850

UNIVERSITY OF NORTH DAKOTA, Grand Forks; Wilson M. Laird; *Alaskan Dead-Ice Deposits, Land Forms, and Limnology of Supraglacial and Proglacial Freshwater Lakes and Streams;* 2 years; $38,000

UNIVERSITY OF OKLAHOMA, Research Institute, Norman; Charles J. Mankin; *Mineralogy and Chemistry of Permian Shale, Anadarko Basin, Oklahoma, Kansas, and Texas;* 2 years; $35,500

Leonard R. Wilson; *Palynology of Pennsylvanian Coals in Oklahoma and Adjacent States;* 2 years; $21,300

UNIVERSITY OF OTAGO, Dunedin, New Zealand; Douglas S. Coombs; *Evolution of the New Zealand Geosyncline and Related Problems Bearing on Low Grade Metamorphism;* 1 year; $10,000

UNIVERSITY OF PITTSBURGH, Pa.; A. F. Frederickson; *Procurement of X-Ray Equipment;* 1 year; $18,000

Takesi Nagata; *Chemical and Piezo-Remanent Magnetism;* 1 year; $12,000

UNIVERSITY OF RHODE ISLAND, Kingston; John A. Knauss; *Equatorial Circulation of the Indian Ocean;* 30 months; $100,000

UNIVERSITY OF SOUTHERN CALIFORNIA, Los Angeles; George V. Chilingar; *Overburden Pressure and Moisture Content of Silicic Acid, Organic Colloids, and Various Clays;* 1 year; $4,250

Paul Saltman and K. O. Emery; *Amino Acids in Basin Sediments off Southern California;* $2,250

UNIVERSITY OF TASMANIA, Hobart, Tasmania, Australia; S. Warren Carey and Gordon H. Newstead; *Research on Seismological Instrumentation and Techniques in Tasmania;* 3 years; $30,900

UNIVERSITY OF TEXAS, Austin; Peter T. Flawn and Earle F. McBride; *Middle Tertiary Volcanism and Igneous Intrusion in South Texas and Northeastern Mexico;* 2 years; $18,000

UNIVERSITY OF WASHINGTON, Seattle; M. Grant Gross; *X-Ray Diffraction and X-Ray Spectrographic Studies of Marine Sediments;* 1 year; $50,500

Maurice Rattray, Jr.; *Dynamics of Estuarine Circulation;* 1 year; $12,600

Francis A. Richards; *Mass Spectrometric, Gas Chromatographic, and Related Studies of Dissolved Gases in the Ocean;* 2 years; $60,000

UNIVERSITY OF WICHITA, Wichita, Kans.; Paul Tasch; *Leonardian Conchostracans;* 6 months; $1,320

UNIVERSITY OF WISCONSIN, Madison; Lewis M. Cline; *Late Paleozoic Sedimentation in the Ouachita Geosyncline, Oklahoma;* 3 years; $33,500

Robert M. Gates; *Gneiss Domes in the Western Highlands of Connecticut;* 3 years; $40,000

Robert P. Meyer and George P. Woollard; *The Seismic Study of Crustal Structure Utilizing Recent Technological Advances;* 1 year; $79,500

John C. Rose; *Definitive Establishment of an International Gravity Standard;* 2 years; $20,900

George P. Woollard and Robert P. Meyer; *Seismic Study of Crustal Structure;* 1 year; $97,400

G. P. Woollard and N. A. Ostenso; *Gravity Investigations of the Arctic Ocean Basin;* 1 year; $18,500

UNIVERSITY OF WYOMING, Laramie; Ronald B. Parker; *Fabrics of Argillaceous Rocks;* 3 years; $28,500

WESTERN WASHINGTON COLLEGE OF EDUCATION, Bellingham; Donald J. Easterbrook; *Fossiliferous Marine Glacial Drifts of Northern Puget Sound, Washington;* 2 years; $7,000

WHITWORTH COLLEGE, Spokane, Wash.; Edwin A. Olson; *Natural Variations in the*

Radiocarbon Concentration of Wood; 3 years; $41,900

WICHITA FOUNDATION, INC., Wichita, Kans.; Fred Wendorf, Fort Burgwin Research Center, Taos, N. Mex.; *A Paleoecological Study of Late Pleistocene and Early Recent Deposits of the Northern Llano Estacado, Eastern New Mexico and Adjacent West Texas;* 18 months; $34,000

WOODS HOLE OCEANOGRAPHIC INSTITUTE, Woods Hole, Mass.; Carl O. Bowin; *Reconnaissance Gravity Survey of the Republic of Haiti;* 1 year; $7,700

T. Ferris Webster; *Transfer of Momentum and Kinetic Energy in the Gulf Stream;* 1 year; $85,400

YALE UNIVERSITY, New Haven, Conn.; Elwyn L. Simons; *Late Cretaceous and Early Cenozoic Faunas, Southern Bighorn Basin, Wyoming;* 1 year; $6,400

Minze Stuiver; *Isotopic Carbon, with Special Reference to Geochronometry;* 2 years; $33,900

Karl K. Turekian; *Geochemistry and Mineralogy of the Deep-Sea Sediments of the Atlantic Ocean and Adjacent Regions;* 2 years; $50,000

ECONOMICS

CORNELL UNIVERSITY, Ithaca, N.Y.; George H. Hildebrand and Ta-Chung Liu; *Manufacturing Production Functions;* 2 years; $77,500

Barclay G. Jones; *The Shapes of American Cities;* 15 months; $30,000

DUKE UNIVERSITY, Durham, N.C.; Frank A. Hanna; *Relationships of Economic Variables;* 3 years; $153,000

HARVARD UNIVERSITY, Cambridge, Mass.; Andre Daniere; *Specification of Regression Structures;* 1 year; $8,100

Wassily W. Leontief; *Basic Research on Input-Output Analysis;* 5 years; $250,000

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PENNSYLVANIA STATE UNIVERSITY, University Park; Paul Grun; *Cytology and Genetics of Varying Plasmon Factors of Species of Solanum;* 2 years; $14,400

James E. Wright, Jr.; *Immunogenetic Studies in Salmonidae and Esocidae;* 2 years; $14,000

PRINCETON UNIVERSITY, Princeton, N.J.; Bruce M. Eberhart; *Control of B-Glucosidase Activity in Neurospora Crassa;* 2 years; $16,400

PURDUE RESEARCH FOUNDATION, Lafayette, Ind.; Seymour Benzer; *Genetic Fine Structure;* 5 years; $490,000

RESEARCH FOUNDATION, OKLAHOMA STATE UNIVERSITY, Stillwater; Margaret H. Brooks; *Gene Action in Cytoplasmic Male Sterility in Sorghum;* 2 years; $12,900

RUTGERS, THE STATE UNIVERSITY, New Brunswick, N.J.; Oved Shifriss; *Genetics of Sex Expression in Plants;* 3 years; $48,300

SAN DIEGO STATE COLLEGE FOUNDATION, San Diego, Calif.; Frank J. Ratty; *Position Effect and Mutation in Drosophila Melanogaster;* 1 year; $10,800

STANFORD UNIVERSITY, Stanford, Calif.; Charles Yanofsky; *Mutational Alterations of Tryptophan Synthetase;* 3 years; $122,500

UNIVERSITY OF ALBERTA, Edmonton, Alberta, Canada; Royal F. Ruth; *Estimation of Immunogenetic Incompatibilities;* 2 years; $15,600

UNIVERSITY OF CALIFORNIA, Berkeley; G. Ledyard Stebbins, Davis; *Developmental Genetics of Single Gene Differences in Barley;* 2 years; $78,800

Hans Abplanalp, Davis and Everett R. Dempster, Berkeley; *Radiation-induced Variability in Selection for Polygenic Traits;* 3 years; $73,100

Elof Axel Carlson, Los Angeles; *Induced and Spontaneous Mutations;* 2 years; $53,300

Bernard O. Phinney, Los Angeles; *Dwarf Mutants of Zea Mays;* 3 years; $98,500

James L. Walters, Santa Barbara; *Hybrids in Natural Population Paeonia;* 1 year; $8,100

UNIVERSITY OF CHICAGO, Ill.; John Lee Hubby and Lynn H. Throckmorton; *Pteridine Metabolism in Drosophila;* 2 years; $22,000

Robert Williams Tuveson; *Heterocaryosis and Parasexual Recombination Within and Between Presumed Fungal Species;* 2 years; $11,800

UNIVERSITY OF FLORIDA, Gainesville; John R. Edwardson; *Cytoplasmic Male Sterility in Higher Plants;* 2 years; $26,800

UNIVERSITY OF HAWAII, Honolulu; James L. Brewbaker; *Genetic Studies of Pollen Cell Elongation;* 2 years; $37,300

Newton E. Morton; *Genetic Studies of Human Populations;* 2 years; $16,200

UNIVERSITY OF MIAMI, Coral Gables, Fla.; Sheldon Greer; *Chemical Studies of Deoxyribonucleic Acids;* 1 year; $13,400

UNIVERSITY OF MICHIGAN, Ann Arbor; Robert R. Miller; *Speciation in Poeciliid Fishes;* 2 years; $31,900

Erich Steiner; *Incompatibility Studies in Oenothera;* 3 years; $13,400

UNIVERSITY OF MISSOURI, Columbia; Charles Shields Gowans; *Mutation and Genetic Fine Structure in Chlamydomonas;* 2 years; $32,600

UNIVERSITY OF NORTH CAROLINA, Chapel Hill; D. U. Gerstel, Raleigh; *Genetic Instability in Nicotiana;* 2 years; $22,400

Walton C. Gregory, Raleigh; *Cytogenetics of Arachis;* 2 years; $30,000

H. F. Robinson, Raleigh; *Genetic and Cytological Studies in the Fungi;* 2 years; $27,900

Ben W. Smith; *Evolution of Sex-Determining Mechanisms in Rumex;* 1 year; $17,500

UNIVERSITY OF OKLAHOMA, Norman; Alice M. Brues; *Test of Selection Hypotheses for ABO Blood Groups;* 1 year; $1,900

UNIVERSITY OF PENNSYLVANIA, Philadelphia; Joseph S. Gots; *Gene-Enzyme Interactions in Bacteria;* 2 years; $29,800

P. W. Whiting; *Cytology and Genetics of Polyploids in Mormoniella Vitripennis;* 1 year; $10,300

UNIVERSITY OF ROME, Rome, Italy; Giuseppe Montalenti; *Population and Biochemical Genetics of Humans in Italy;* 2 years; $57,900

UNIVERSITY OF SOUTHERN CALIFORNIA, Los Angeles; Henry Drexler; *Mechanism of Prophage Immunity;* 1 year; $3,300

UNIVERSITY OF TEXAS, Austin; David P. Bloch; *Histone Synthesis and Role of Histones in Cell Division and Cell Development;* 1 year; $16,900

Felix L. Haas, Houston; *Induction of Genetic Change;* 1 year; $6,100

UNIVERSITY OF UTAH, Salt Lake City; Robert K. Vickery, Jr.; *Cytogenetic Studies of the Patterns of Evolution in Mimulus;* 3 months; $1,100

Robert K. Vickery, Jr.; *The Genetic Control of Anthocyanin Pigment Production and Distribution in Mimulus;* 1 year; $4,600

UNIVERSITY OF WASHINGTON, Seattle; David R. Stadler; *Genetic Fine Structure of Neurospora;* 3 years; $49,100

UNIVERSITY OF WISCONSIN, Madison; Seymour Abrahamson; *Genetic Effects of Irradiation in Drosophila;* 3 years; $65,700

W. H. Gabelman; *Interactions of Genes and Cytoplasm in Pollen Sterile Plants;* 1 year; $9,500

Hans Ris; *Ultrastructure of Genetic System in Plasmids;* 3 years; $26,800

VIRGINIA POLYTECHNIC INSTITUTE, Blacksburg; Joyce M. Howell and J. Clark Osborne; *Genetic Basis of Skeletal Defects;* 1 year; $4,000

F. Clifford Johnson; *Variability in Natural Populations;* 2 years; $15,700

WASHINGTON STATE UNIVERSITY, Pullman; Calvin F. Konzak; *A Mutable Genetic System in Triticum;* 2 years; $19,400

WASHINGTON UNIVERSITY, St. Louis, Mo.; Harrison D. Stalker and Hampton L. Carson; *Evolutionary Studies in Drosophila;* 3 years; $67,100

WAYNE STATE UNIVERSITY, Detroit Mich.; James Maniotis; *Biological Studies of Pyrenomycetous Fungi;* 1 year; $11,800

WESTERN RESERVE UNIVERSITY, Cleveland, Ohio; Boris Ephrussi; *Genetics of Normal and Abnormal Cell Variation;* 5 years; $349,100

WILLIAM MARSH RICE UNIVERSITY, Houston, Tex.; Val W. Woodward; *Comparison of Genetic and Complementation Maps in Neurospora Crassa;* 1 year; $16,100

WISTAR INSTITUTE OF ANATOMY AND BIOLOGY, Philadelphia, Pa.; Andrzej W. Kozinski; *Transfer and Replication of DNA in Phage;* 1 year; $34,700

WOMAN'S MEDICAL COLLEGE OF PENNSYLVANIA, Philadelphia; Max Levitan; *Linkage Associations and Chromosome Aberrations;* 3 years; $37,000

YALE UNIVERSITY, New Haven, Conn.; Edward A. Adelberg; *Genetic Regulation of Governing Amino Acid Biosynthesis in Bacteria;* 3 years; $85,100

Harry P. Rappaport; *Transforming Principle and Protease Enzymes of Bacillus Subtilis;* 3 years; $41,900

Charles L. Remington; *Evolutionary Processes in Insects;* 2 years; $57,700

HISTORY AND PHILOSOPHY OF SCIENCE

AMERICAN INSTITUTE OF PHYSICS, New York, N.Y.; John A. Wheeler; *The Quantum Revolution;* 3 years; $203,000

AMERICAN UNIVERSITY, Washington, D.C.; Eduard Farber; *The Chemistry of Oxidation;* 1 year; $13,500

BROWN UNIVERSITY, Providence, R.I.; David Joravsky; *A History of Michurinist Biology;* 2 years; $9,100

CITY COLLEGE, New York, N.Y.; Edward Rosen; *Kepler's Lunar Astronomy;* 1 year; $21,400

COLUMBIA UNIVERSITY, New York, N.Y.; Daniel A. Greenberg and Daniel E. Gershenson; *The Physical Theories of Aristotle;* 1 year; $12,000

CORNELL UNIVERSITY, Ithaca, N.Y.; Howard B. Adelmann; *Malpighi's Correspondence and Protocols;* 2 years; $38,500

Max Black; *Foundations of Logic and Mathematics;* 2 years; $17,200

HARVARD UNIVERSITY, Cambridge, Mass.; Israel Scheffler; *Theory of Scientific Structure;* 1 year; $2,300

PRINCETON UNIVERSITY, Princeton, N.J.; Charles C. Gillispie; *Science in Revolutionary and Napoleonic France;* 2 years; $34,800

ST. LOUIS UNIVERSITY, St. Louis, Mo.; John F. Daly; *Analysis of Mathematical Manuscripts;* 1 year; $12,600

SOUTHERN METHODIST UNIVERSITY, Dallas, Tex.; Claude C. Albritton, Jr.; *Bibliography of the Philosophy of Geology;* 1 year; $8,900

SYRACUSE UNIVERSITY RESEARCH INSTITUTE, Syracuse, N.Y.; Albert D. Menut; Critical Edition of Oresme's *Le Livre du ciel et du monde;* 1 year; $11,500

U.S. SMITHSONIAN INSTITUTION, Washington, D.C.; Walter F. Cannon; *Scientific Community in England, 1820–1860;* 2 years; $18,100

UNIVERSITY OF CALIFORNIA, Berkeley; Benson Mates; *History of Ancient Formal Logic;* 2 years; $12,500

Rudolf Carnap, Los Angeles; *Theory of Inductive Probability;* 3 years; $73,200

UNIVERSITY OF CHICAGO, Ill.; Henryk Mehlberg; *Philosophical Foundations of Atomic Physics;* 2 years; $20,000

UNIVERSITY OF MICHIGAN, Ann Arbor; Arthur W. Burks; *Cause, Chance, and Reason;* 2 years; $6,500

Phillip S. Jones; *Development of the Concept of Complex Numbers;* 1 year; $17,400

UNIVERSITY OF MINNESOTA, Minneapolis; Herbert Feigl; *The Foundations of Probability;* 1 year; $26,300

UNIVERSITY OF NEVADA, Reno; William T. Scott; *Writings of Erwin Schrodinger;* 2 years; $8,000

UNIVERSITY OF PITTSBURGH, Pittsburgh, Pa.; Nicholas Rescher; *Arabic Contributions to Logic;* 2 years; $16,400

UNIVERSITY OF TEXAS, Austin; Alex Berman; *Science and French Pharmacy: 1800–1873;* 2 years; $16,400

Richard M. Martin; *Meaning, Belief, and Behavior;* 1 year; $9,800

UNIVERSITY OF WISCONSIN, Madison; Marshall Clagett; *Medieval Mathematics and Physics;* 1 year; $27,900

Marshall Clagett; *Euclid in the Middle Ages;* 1 year; $4,500

William D. Stahlman; *The Writings of Ptolemy;* 2 years; $20,400

Julius R. Weinberg; *Theories of Induction;* 2 years; $5,900

MATHEMATICAL SCIENCES

AMERICAN MATHEMATICAL SOCIETY, Providence, R.I.; Gordon L. Walker; *Relativity and Differential Geometry;* 1 year; $79,000

BRANDEIS UNIVERSITY, Waltham, Mass.; Arnold S. Shapiro; *Topology;* 1 year; $45,000

BROWN UNIVERSITY, Providence, R.I.; Katsumi Nomizu; *Geometric Structures on Differentiable Manifolds;* 2 years; $40,000

R. S. Rivlin; *Nonlinear Continuum Physics;* 2 years; $60,000

M. Rosenblatt; *Random Processes;* 1 year; $44,000

BUCKNELL UNIVERSITY, Lewisburg, Pa.; Herbert F. Eckberg; *Expansion of Computer Center;* 1 year; $25,000

CALIFORNIA INSTITUTE OF TECHNOLOGY, Pasadena; R. P. Dilworth; *Group, Lattice, and Matrix Theory;* 1 year; $53,000

A. Erdelyi; *Functional Analysis and Its Applications;* 1 year; $40,000

G. D. McCann; *Methods for Parallel Use of a Computer;* 1 year; $100,000

CARNEGIE INSTITUTE OF TECHNOLOGY, Pittsburgh Pa.; Henry S. Leonard, Jr.; *Finite Linear Groups;* 2 years; $5,300

Victor J. Mizel; *A Quasi-Linear Wave Equation;* 2 years; $10,500

Roger N. Pederson; *Elliptic Partial Differential Equations;* 2 years; $15,000

CLARKSON COLLEGE OF TECHNOLOGY, Potsdam, N.Y.; H. L. Shulman; *Establishment of a Computing Center;* 1 year; $24,000

COLORADO STATE UNIVERSITY RESEARCH FOUNDATION, Fort Collins; Donald L. Bentley; *Mathematical Models for Transportation of Nerve Impulses;* 2 years; $9,500

Kenzo Seo; *A Sequential Three Decision Problem;* 2 years; $9,200

COLUMBIA UNIVERSITY, New York, N.Y.; S. Eilenberg; *Functional Analysis;* 2 years; $93,000

CORNELL UNIVERSITY, Ithaca, N.Y.; W. H. J. Fuchs; *Mathematical Analysis;* 2 years; $120,000

Israel N. Herstein; *Rings and Groups;* 1 year; $14,000

Geoffrey S. S. Ludford; *Hydromagnetics;* 2 years; $30,000

Wolfgang Rindler; *Relativity Theory;* 1 year; $6,400

Lionel Weiss; *Probabilistic Models in Industrial Engineering;* 2 years; $38,000

DARTMOUTH COLLEGE, Hanover, N.H.; Thomas E. Kurtz; *Maintenance and Operation of a Computing Center;* 18 months; $15,000

DUKE UNIVERSITY, Durham, N.C.; Thomas M. Gallie, Jr.; *Translation of Mechanical Languages;* 1 year; $10,600

FLORIDA STATE UNIVERSITY, Tallahassee; Nicholas Heerema; *Valuation Rings;* 1 year; $11,000

GALLAUDET COLLEGE, Washington, D.C.; George E. Detmold; *Establishment of a Computing Center;* 1 year; $30,000

HARVARD UNIVERSITY, Cambridge, Mass.; R. Bott; *Differential Geometry and Topology;* 1 year; $50,000

Richard Brauer; *Groups and Algebraic Geometry;* 2 years, $110,000

George W. Mackey; *Group Representations;* 1 year; $11,800

HARVEY MUDD COLLEGE, Claremont, Calif.; Courtney S. Coleman; *The Qualitative Theory of Ordinary Differential Equations;* 2 years; $6,200

Joseph B. Platt; *Establishment of a Computing Center;* 1 year; $15,000

HAVERFORD COLLEGE, Haverford, Pa.; Louis C. Green; *Establishment of a Computing Center;* 1 year; $40,000

ILLINOIS INSTITUTE OF TECHNOLOGY, Chicago; Abe Sklar; *Summation Formulae;* 2 years; $20,400

INDIANA UNIVERSITY FOUNDATION, Bloomington; J. W. T. Youngs and L. C. Young; *Measure Theory;* 2 years; $45,000

INSTITUTE FOR ADVANCED STUDY, Princeton, N.J.; Deane Montgomery; *Problems in Algebra and Topology;* 1 year; $90,000

Hassler Whitney; *Problems in Analysis;* 1 year; $90,000

IOWA STATE UNIVERSITY, Ames; Oscar Kempthorne; *Optimization;* 1 year; $17,800

Bernard Vinograde; *Coefficient Fields for Local Algebras;* 2 months; $3,900

JOHNS HOPKINS UNIVERSITY, Baltimore, Md.; F. I. Mautner; *Functional Analysis and Groups;* 2 years; $53,000

Clifford A. Truesdell; *Nonlinear Mechanics of Materials;* 19 months; $37,000

KENTUCKY RESEARCH FOUNDATION, Lexington; Wimberly C. Royster; *Univalent Functions and Faber Series;* 8 months; $6,800

KENYON COLLEGE, Gambier, Ohio; Otton M. Nikodym; *Boolean Lattices;* 2 years; $13,900

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge; Warren Ambrose; *Geometry and Number Theory;* 1 year; $70,000

Kenkichi Iwasawa; *Problems in Algebra;* 1 year; $53,000

Norman Levinson and Irving E. Segal; *Problems in Analysis;* 1 year; $85,000

Chia-Chiao Lin, Eric Reissner, and Gerald B. Whitham; *Problems in Mechanics;* 1 year; $73,000

Philip M. Morse; *Computer Time-Sharing Techniques;* 1 year; $71,500

MICHIGAN STATE UNIVERSITY, East Lansing; Leo Katz; *Problems in Statistics and Probability;* 2 years; $90,000

Lawrence W. Von Tersch; *Expansion of Computing Center;* 1 year; $400,000

NEW MEXICO STATE UNIVERSITY, University Park; Edward O. Thorp and Seymour Goldberg; *Linear Operators;* 2 years; $24,000

NEW YORK UNIVERSITY, New York; Chia-Kun Chu; *Problems in Magnetohydrodynamics Using Higher Order Theory;* 2 years; $14,000

Morris Kline; *Electromagnetic Theory;* 1 year; $110,000

Wilhelm Magnus; *Combinatorial Group Theory;* 1 year; $33,000

NEWARK COLLEGE OF ENGINEERING, N.J.; Frederick G. Lehman; *Establishment of a Computing Center;* 1 year; $15,000

NORTHWESTERN UNIVERSITY, Evanston, Ill.; Hsien Chung Wang; *Transformation Groups;* 1 year; $30,300

Harry R. Rymer; *Expansion of a Computer Center;* 1 year; $200,000

OREGON STATE UNIVERSITY, Corvallis; R. G. Buschman; *Integral Transformations;* 1 year; $7,000

William J. Firey; *Means of Convex Bodies;* 2 years; $15,000

Watson Fulks; *Parabolic Partial Differential Equations;* 1 year; $16,400

PENNSYLVANIA STATE UNIVERSITY, University Park; Carl Faith; *Theory of Rings;* 2 years; $9,000

William J. Pervin; *Syntopogenic Structures;* 2 years; $14,400

PORTLAND STATE COLLEGE, Portland, Oreg.; John B. Butler, Jr.; *Vibration Problems of Infinite Beams and Plates of Non-Uniform Section;* 2 years; $5,400

PRATT INSTITUTE, Brooklyn, N.Y.; Gideon Peyser; *Differentiability Theorems for Partial Differential Equations;* 2 years; $6,800

PRINCETON UNIVERSITY, Princeton, N.J.; Alonzo Church; *Mathematical Logic;* 1 year; $49,000

Gilbert Hunt; *Potential Theory and Probability;* 3 months; $5,100

John C. Moore; *Problems in Topology and Algebra;* 1 year; $50,000

Donald C. Spencer; *Continuous Pseudogroups;* 1 year; $12,900

Donald C. Spencer; *Differentiable Manifolds and Sheaves;* 1 year; $13,400

PURDUE RESEARCH FOUNDATION, Lafayette, Ind.; Casper Goffman; *Topics in Real Functions;* 2 years; $73,500

Michael Golomb; *Differential Equations;* 2 years; $66,000

QUEENS COLLEGE, Flushing, N.Y.; Edward Paulson; *Sequential Procedures for Multiple Decision Problems;* 15 months; $9,000

REED COLLEGE, Portland, Oreg.; J. B. Roberts; *Polynomial Identities;* 2 years; $13,700

RUTGERS, THE STATE UNIVERSITY, New Brunswick, N.J.; Richard M. Cohn; *Finite Differences;* 1 year; $20,400

Kenneth G. Wolfson; *Endomorphism Rings;* 1 year; $6,000

ST. MARY'S UNIVERSITY OF SAN ANTONIO, Tex.; James F. Gray; *Establishment of a Computing Center;* 1 year; $10,000

SOUTH DAKOTA SCHOOL OF MINES AND TECHNOLOGY, Rapid City; Louis C. Barrett; *Establishment of a Computing Center;* 1 year; $15,000

STANFORD UNIVERSITY, Stanford, Calif.; Stefan Bergman; *Theory of Several Complex Variables;* 2 years; $72,000

Isidore Heller; *Incidence Matrices;* 1 year; $18,000

John G. Herriot; *Algorithmic Methods in Numerical Analysis;* 2 years; $14,000

John Myhill; *Cardinal Arithmetic;* 2 years; $21,000

Ingram Olkin; *Multivariate Theory;* 1 year; $37,000

Halsey Royden; *Function Theory;* 1 year; $76,000

Hans Samelson; *Topology and Complex Manifolds;* 2 years; $66,000

Charles M. Stein; *Statistical Theory and Probability Models;* 1 year; $49,000

William W. Tait; *Quantifier Elimination;* 1 year; $6,300

STEVENS INSTITUTE OF TECHNOLOGY, Hoboken, N.J.; Anthony Ralston; *Establishment of a Computing Center;* 1 year; $40,000

Lawrence H. Russell; *Interpolation Formulae;* 1 year; $5,350

SYRACUSE UNIVERSITY RESEARCH INSTITUTE, N.Y.; Carl W. Kohls; *Rings of Continuous Functions;* 2 years; $16,700

TULANE UNIVERSITY, New Orleans, La.; Alfred H. Clifford and Alexander D. Wallace; *Augmented Algebraic Systems;* 1 year; $63,000

Fred B. Wright; *Banach Algebras and Ergodic Theory;* 2 years; $74,000

UNIVERSITY OF ALASKA, College; Francis D. Parker; *Establishment of a Computer Center;* 3 years; $40,000

UNIVERSITY OF ARIZONA, Tucson; M. S. Cheema; *Combinatorial Problems in Number Theory;* 2 years; $8,000

Harvey Cohn; *Biquadratic Fields;* 2 years; $61,000

Berthold Schweizer; *Geometric Characterization of Associative Functions;* 1 year; $9,000

Edwin W. Titt; *Partial Differential Equations;* 1 year; $17,000

UNIVERSITY OF ARKANSAS, Fayetteville; James E. Scroggs; *Singularities of Vector-Valued Functions;* 2 years; $9,500

UNIVERSITY OF BUFFALO, N.Y.; Raymond Ewell; *Establishment of a Computing Center;* 1 year; $75,000

UNIVERSITY OF CALIFORNIA, Berkeley; S. S. Chern; *Riemannian Geometry;* 1 year; $69,000

William Craig; *Mathematical Logic;* 2 years; $37,000

Bernard Friedman; *Field Theories;* 1 year; $44,000

George B. Dantzig; *Programming Under Uncertainty;* 2 years; $47,500

John L. Kelley; *Functional Analysis;* 2 years; $90,000

Tilla S. Klotz; *Conformal Structure of Surfaces in E^3;* 1 year; $3,600

Antoni A. Kosinski; *Acyclic Multivalent Mappings;* 3 years; $11,440

Charles B. Morrey, Jr.; *Continuum Mechanics;* 1 year; $15,700

Jerzy Neyman; *Stochastic Models;* 1 year; $74,000

Edwin H. Spanier; *Algebraic Topology and Differential Geometry;* 1 year; $62,000

Alfred Tarski; *Metamathematics;* 18 months; $95,000

Robert L. Vaught; *Theory of Models in Metamathematics;* 2 years; $25,000

Frantisek Wolf; *Operator Theory;* 2 years; $80,000

Richard F. Arens, Los Angeles; *Functional Analysis and Applications;* 2 years; $77,000

Richard Montague, Los Angeles; *Metamathematics;* 1 year; $13,000

Barrett O'Neill, Los Angeles; *Differential Geometry in the Large;* 1 year; $10,300

Charles B. Tompkins, Los Angeles; *Expansion of Computing Center;* 1 year; $375,000

Clay L. Perry, San Diego; *Support of Computing Center;* 1 year; $40,000

Andrew M. Bruckner, Santa Barbara; *Superadditive Functions;* 1 year; $4,700

Paul J. Kelly, Santa Barbara; *Projective-Metric Properties of Convex Bodies;* 1 year; $8,400

UNIVERSITY OF CHICAGO, Ill.; A. A. Albert and Irving Kaplansky; *Problems in Algebra;* 1 year; $45,000

William Kruskal; *Statistical Inference;* 1 year; $40,000

Saunders MacLane; *Algebraic Topology;* 1 year; $49,000

Richard G. Swan; *Algebraic Topology;* 2 years; $17,000

Antoni Zygmund; *Real Variables and Singular Integrals;* 1 year; $69,000

UNIVERSITY OF CINCINNATI, Ohio; Campbell Crockett; *Expansion of a Computer Center;* 1 year; $39,500

F. J. Wagner; *Compactifications of Topological Spaces;* 3 months; $2,650

UNIVERSITY OF COLORADO, Boulder; Sarvadaman Chowla; *Dirichlet L-Series;* 2 years; $70,000

Burton W. Jones; *Quadradric Forms and Algebraic Curves;* 2 years; $62,000

Eugene H. Wilson; *Expansion of Computing Center;* 1 year; $300,000

UNIVERSITY OF DELAWARE, Newark; C. C. Braunschweiger; *Linear Space Geometry;* 2 years; $6,400

Robert F. Jackson; *Expansion of Computing Center;* 1 year; $40,000

UNIVERSITY OF ILLINOIS, Urbana; Colin R. Blyth; *Sequential Probability;* 2 years; $82,000

David G. Bourgin; *Manifolds and Topological Spaces;* 1 year; $55,000

Donald L. Burkholder; *Conditional Expectation and Sufficient Statistics;* 7 months; $10,000

Mahlon M. Day; *Functional Analysis;* 1 year; $34,000

Richard P. Jerrard; *The Knaster Conjecture;* 2 years; $7,000

W. J. Trjitzinsky; *Metric Theory;* 15 months; $19,400

Herbert S. Wilf; *The Theory of Entire Functions;* 2 years; $6,600

UNIVERSITY OF MARYLAND, College Park; Robert E. Fullerton; *Problems in Functional Analysis;* 1 year; $15,000

John M. Horvath; *Algebraic Geometry;* 1 year; $5,500

Bruce L. Reinhard; *Pseudogroups in the Large;* 2 years; $23,000

UNIVERSITY OF MASSACHUSETTS, Amherst; Richard S. Stein; *Expansion of Computing Center;* 3 years; $40,000

UNIVERSITY OF MIAMI, Coral Gables, Fla.; John H. Curtiss; *Establishment of a Computing Center;* 1 year; $40,000

Andrew Sobczyk; *Topological Spaces and Algebras;* 2 years; $20,000

Paul M. Swingle; *Connected Sets;* 2 years; $34,300

UNIVERSITY OF MICHIGAN, Ann Arbor; Arthur W. Burks; *Theory of Automata;* 2 years; $46,000

Paul S. Dwyer; *Finite Sampling;* 1 year; $13,000

Paul R. Halmos; *Hilbert Space and Ergodic Theory;* 1 year; $33,000

Donald G. Higman; *Problems in Finite Groups;* 2 years; $64,700

Yukihiro Kodama; *Topology of Manifolds;* 10 months; $8,000

Maxwell O. Reade; *Quasi-Conformal Mapping;* 2 years; $64,500

Ronald H. Rosen; *Structure of Manifolds;* 1 year; $8,800

Joseph L. Ullman; *Approximation Theory;* 1 year; $12,000

Oscar Wesler; *Stochastic Programming;* 2 years; $68,000

UNIVERSITY OF MINNESOTA, Minneapolis; Erwin Engeler; *Theory of Models;* 1 year; $4,200

Laurence R. Harper; *Structure of Simple Power-Associative Algebras;* 2 years; $7,000

Jesus Gil de Lamadrid; *Topological Vector Spaces;* 1 year; $7,000

Lawrence Markus; *Problems in Analysis;* 1 year; $72,000

Milton Sobel; *Decision Theory;* 1 year; $39,000

Marvin L. Stein; *Expansion of a Computing Center;* 1 year; $500,000

James G. Wendel; *Algebraic Approach to Probability;* 1 year; $14,500

UNIVERSITY OF MISSISSIPPI, University; Charles F. Haywood; *Expansion of a Computing Center;* 1 year; $18,000

UNIVERSITY OF MISSOURI, Columbia; Ralph E. Lee, Rolla; *Expansion of Computing Center;* 3 years; $20,000

UNIVERSITY OF NEW HAMPSHIRE, Durham; Robert J. Silverman; *Problems in Functional Analysis and Algebra;* 2 years; $24,000

UNIVERSITY OF NEW MEXICO, Albuquerque; Julius R. Blum; *Problems in Probability and Stochastic Processes;* 2 years; $63,000

Ignace I. Kolodner; *Differential Equations and Related Problems in Analysis;* 2 years; $70,000

UNIVERSITY OF NOTRE DAME, Notre Dame, Ind.; Wilhelm F. Stoll; *Differentiable and Complex Manifolds;* 2 years; $66,000

UNIVERSITY OF OREGON, Eugene, Frank W. Anderson; *Rings of Quotients;* 2 years; $26,500

Fred C. Andrews and Donald R. Truax; *Several-Sample Problems;* 2 years; $34,000

Ivan Niven; *Sequences of Integers;* 2 years; $29,900

UNIVERSITY OF PENNSYLVANIA, Philadelphia; Edwin J. Akutowicz; *Theory of Distributions;* 3 months; $5,000

David K. Harrison; Extensions of Fields and Algebras; 2 years; $9,250

I. J. Schoenberg; *Number Theory;* 1 year; $85,000

I. J. Schoenberg; *Schlicht Functions;* 1 year; $13,700

Alan Wilson; *Functions with Harmonic Support;* 2 years; $11,700

Chung-Tao Yang; *Transformation Groups;* 1 year; $9,000

UNIVERSITY OF ROCHESTER, Rochester, N.Y.; Leonard Gillman; *Rings of Continuous Functions;* 14 months; $12,700

Thomas A. Keenan; *Expansion of a Computer Center;* 1 year; $200,000

Arthur H. Stone; *Metric Spaces;* 2 years; $30,000

Dorothy M. Stone; *Function Spaces;* 1 year; $14,400

UNIVERSITY OF SOUTH CAROLINA, Columbia; Charles A. Nicol; *The Ramanujan Function;* 1 year; $4,000

UNIVERSITY OF SOUTHERN CALIFORNIA, Los Angeles; Richard L. Williamson; *Operation of a Computing Center;* 3 years; $75,000

UNIVERSITY OF TENNESSEE, Knoxville; John H. Barrett; *Boundary Value Problems;* 2 years; $13,000

Eckford Cohen; *Arithmetical Functions of Several Variables;* 2 years; $15,600

UNIVERSITY OF TEXAS, Austin; H. S. Vandiver; *Theory of Numbers;* 2 years; $30,000

UNIVERSITY OF UTAH, Salt Lake City; W. J. Coles; *Behavior of Solutions of Certain Differential Equations;* 1 year; $7,000

UNIVERSITY OF VERMONT, Burlington; Howard M. Smith, Jr.; *Expansion of Computing Center;* 1 year; $15,000

UNIVERSITY OF VIRGINIA, Charlottesville; Alan Batson; *Expansion of Computing Center;* 3 years; $13,000

Gordon T. Whyburn; *Problems in Analysis and Topology;* 2 years; $52,000

Victor L. Klee, Jr.; *Convexity and Functional Analysis;* 2 years; $60,000

UNIVERSITY OF WASHINGTON, Seattle; Ross A. Beaumont and Richard S. Pierce; *Modules, Rings, and Groups;* 1 year; $38,000

Frank Brownell; *Differential Operators and Stochastic Processes;* 1 year; $46,000

Douglas G. Chapman; *Statistical Models for Exploited Populations;* 2 years; $39,000

Edwin Hewitt; *Problems in Functional Analysis;* 2 years; $80,000

UNIVERSITY OF WISCONSIN, Madison; A. N. Feldzamen; *Operator Theory;* 2 years; $23,600

Jacob Korevaar and Wolfgang Wasow; *Classical Analysis;* 1 year; $34,000

J. Marshall Osborn; *Matrices;* 2 years; $33,000

Van Der Corput, J. G.; *Asymptotic Expansions;* 2 years; $30,000

VILLANOVA UNIVERSITY, Villanova, Pa.; Emil Amelotti; *Establishment of Computing Center;* 1 year; $20,000

WASHINGTON STATE UNIVERSITY, Pullman; K. A. Bush; *Combinatorial Problems;* 2 years; $15,000

Ottis W. Rechard; *Expansion of a Computing Center;* 1 year; $200,000

WAYNE STATE UNIVERSITY, Detroit, Mich.; Walter Hoffman; *Expansion of Computing Center;* 3 years; $250,000

WESLEYAN UNIVERSITY, Middletown, Conn.; Thornton L. Page; *Expansion of a Computing Center;* 1 year; $24,000

WEST VIRGINIA UNIVERSITY, Morgantown; Henry W. Gould; *Binomial Coefficient Summations;* $1,455

WESTERN MICHIGAN UNIVERSITY, Kalamazoo; George G. Mallinson; *Establishment of a Computing Center;* 1 year; $15,000

WESTERN RESERVE UNIVERSITY, Cleveland, Ohio; William M. Huebsch; *Differential Topology;* 2 years; $30,600

WESTERN WASHINGTON STATE COLLEGE, Bellingham; James E. McFarland; *Establishment of a Computing Center;* 1 year; $10,000

YALE UNIVERSITY, New Haven, Conn.; Felix E. Browder; *Partial Differential Equations;* 2 years; $37,500

G. A. Hedlund and William S. Massey, *Topology and Topological Dynamics;* 2 years; $46,200

Nathan Jacobson; *Research in Algebra;* 2 years; $47,000

Nathan Jacobson; *Topics in Jordan Algebras;* 9 months; $6,500

Shizuo Kakutani and Charles E. Rickart; *Functional Analysis;* 2 years; $46,000

George D. Mostow; *Lie Groups;* 2 years; $45,000

YESHIVA UNIVERSITY, New York, N.Y.; Harry E. Rauch; *Differential Geometry in the Large;* 2 years; $70,000

METABOLIC BIOLOGY

ALBERT EINSTEIN MEDICAL CENTER, Philadelphia, Pa.; David H. Ezekiel; *Structure and Function of Bacterial Nuclear Bodies;* 2 years; $45,000

Herman Friedman; *Nucleoproteins and Subcellular Particles in Antibody Formation;* 2 years; $33,600

Albert S. Kaplan; *Nucleic Acids Synthesized by Pseudorabies Virus-Infected Cells;* 2 years; $57,200

Henry C. Reeves; *Alpha-Hydroxyglutarate Synthetase;* 2 years; $36,000

Murray Strassman; *Biosynthesis of Valine, Leucine and Lysine;* 2 years; $32,500

ARIZONA STATE UNIVERSITY, Tempe; John N. Aronson; *Sporulating Bacilli;* 2 years; $10,000

BIO-RESEARCH INSTITUTE, INC., Cambridge, Mass.; Peter Bernfeld; *Macroanionic Enzyme Inhibition;* 2 years; $18,000

BRANDEIS UNIVERSITY, Waltham, Mass.; Jerome A. Schiff; *Sulfur Metabolism in Algae;* 2 years; $33,000

BRIGHAM YOUNG UNIVERSITY, Provo, Utah; Jay V. Beck; *Metabolism of Thiobacillus Autotrophic Bacteria;* 2 years; $24,000

Willard H. Bradshaw and Jay V. Beck; *Low Potential Electron Transfer Systems in Purine Fermenting Clostridia;* 2 years; $31,750

Richard D. Sagers; *Acetate Formation in Anaerobic Microorganisms;* 2 years; $25,400

BROWN UNIVERSITY, Providence, R.I.; Frank G. Rothman; *Structural Studies on E. coli Alkaline Phosphatase in Relation to Genetic Phenomena;* 3 years; $53,800

CALIFORNIA INSTITUTE OF TECHNOLOGY, Pasadena; James Bonner; *Chemical Study of Plant Growth and Development;* 3 years; $80,000

COLORADO STATE UNIVERSITY RESEARCH FOUNDATION, Fort Collins; Arthur R. Schulz; *Mechanism of Photophosphorylation;* 2 years; $18,000

COLUMBIA UNIVERSITY, New York, N.Y.; Philip Feigelson; *Mechanisms of Mammalian Substrate and Hormonal Induced Enzyme Formation;* 3 years; $73,600

Alvin I. Krasna; *Enzyme Hydrogenase in Hydrogen Photosynthesis;* 2 years; $33,400

I. B. Wilson; *Studies in Enzyme Theory;* 3 years; $41,100

CORNELL UNIVERSITY, Ithaca, N.Y.; James L. Gaylor; *Biosynthetic Precursors of Bile Acids and Steroidal Hormones;* 2 years; $16,900

Martin Gibbs; *Pathways of Carbohydrate Metabolism;* 3 years; $86,000

Robert B. Reeves; *Metabolic Control in Working Anaerobic Muscle;* 2 years; $37,900

Shoichi Steven Hotta, New York, N.Y.; *Cellular Sulfhydryl Groups;* 2 years; $21,700

CREIGHTON UNIVERSITY, Omaha, Nebr.; W. C. Cordes; *Fatty Acid Synthesis in Elodea;* 1 year; $2,000

DARTMOUTH COLLEGE, Hanover, N.H.; Samuel F. Conti; *Development and Physiology of Photosynthetic Bacteria;* 2 years; $13,000

DICKINSON COLLEGE, Carlisle, Pa.; Barbara B. McDonald; *DNA Metabolism in Macro and Micronuclei of Tetrahymena Pyriformis;* 3 years; $18,700

FORDHAM UNIVERSITY, New York, N.Y.; Friedrich F. Nord; *Structural, Biochemical and Physico-chemical Studies on Lignins;* 2 years; $30,000

FOUNDATION FOR RESEARCH ON THE NERVOUS SYSTEM, Boston, Mass.; Robert F. Gilfillan; *Phagocytosis, Selection Growth, and Survival of Primary and Established Cell Cultures;* 2 years; $28,700

FUND FOR ADVANCEMENT OF EDUCATION AND RESEARCH IN THE UNIVERSITY OF KENTUCKY MEDICAL CENTER, Lexington; J. W. Archdeacon; *Bone Marrow Cells and Relation to Adenosinetriphosphatase Activity;* 2 years; $16,000

GOUCHER COLLEGE, Baltimore, Md.; Helen B. Funk and Helene A. Nathan; *Conversions of Pteridines by Enzymes;* 2 years; $15,000

Clifford R. Noll, Jr.; *Diphosphopyridine Nucleotide linked Dehydrogenases;* 2 years; $13,000

HAHNEMANN MEDICAL COLLEGE AND HOSPITAL, Philadelphia, Pa.; Albert G. Moat; *Site and Mode of Action of Biotin in Metabolic Reactions;* 2 years; $37,400

HARVARD UNIVERSITY, Cambridge, Mass.; Albert E. Renold; *Hormonal and Nutritional Control of Amino Acid and Protein Metabolism in Adipose Tissue;* 3 years; $50,000

INDIANA UNIVERSITY FOUNDATION, Bloomington; Donald J. Niederpruem, Indianapolis; *Metabolism of Schizophyllum Commune;* 2 years; $9,400

INSTITUT PASTEUR, Paris, France; Melvin Cohn; *Investigations of Antibody and Enzyme Synthesis;* 1 year; $6,700

INSTITUTE FOR CANCER RESEARCH, Philadelphia, Pa.; Murray Strassman and Sidney Weinhouse; *Biosynthesis of Valine, Leucine and Lysine;* 3 years; $35,200

INSTITUTE FOR MUSCLE DISEASE, INCORPORATED, New York, N.Y.; Alexander Sandow and Maurice B. Feinstein; *Metabolism in Skeletal Muscle Contraction;* 2 years; $21,500

JOHNS HOPKINS UNIVERSITY, Baltimore, Md.; Manfred M. Mayer; *Cytotoxic Reactions Mediated by Antibody and Complement, and Related Phenomena;* 3 years; $78,000

KAISER FOUNDATION RESEARCH INSTITUTE; Oakland Calif.; Morton Rothstein; *Lysine Metabolism in Algae;* 2 years; $20,000

LOUISIANA STATE UNIVERSITY, Baton Rouge; A. D. Larson; *Bacterial Metabolism of Isopropylamine and Alpha-aminoisobutyric Acid;* 2 years; $11,700

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge; Edward Herbert; *Synthesis of Ribonucleic Acid and Role of Ribonucleic Acid in Protein Synthesis;* 2 years; $64,000

Richard I. Mateles; *Dynamics of Microbial Response and Accommodation;* 2 years; $25,000

MICHIGAN STATE UNIVERSITY, East Lansing; Robert Bandurski; *Metabolism of Microorganisms;* 3 years; $58,900

Edward C. Cantino; *Relation Between Biochemical and Morphological Differentiation in Water Fungus, Blastocladiella Emersonii;* 3 years; $39,200

N. E. Tolbert; *The Glycolate Pathway in Plant Metabolism;* 3 years; $60,000

MONTANA STATE COLLEGE, Bozeman; Donald Reed; *Relation of Carbohydrate Metabolism to Mineral Nutrition of Plants;* 2 years; $12,000

MOUNT SINAI MEDICAL RESEARCH FOUNDATION, Chicago, Ill.; S. G. A. Alivisatos; *Metabolism of Histamine and of Related Compounds;* 3 years; $45,000

NEW YORK UNIVERSITY, New York; Jerard Hurwitz; *Effect of Viral Infection on RNA Metabolism;* 3 years; $62,600

NORTH DAKOTA STATE UNIVERSITY, Fargo; D. Stuart Frear; *Metabolism Studies of Germinating Flax Rust Uredospores;* 3 years; $24,700

NORTHWESTERN UNIVERSITY, Evanston, Ill.; Ralph A. Slepecky; *Morphogenesis of Bacterial Spores;* 3 years; $36,000

Chiadao Chen, Chicago; *Cardiotonic Steroids in the Toad;* 2 years; $17,800

OREGON STATE UNIVERSITY, Corvallis; David W. Loomis; *Equipment for Biosynthesis of Terpenes;* 1 year; $5,500

Donald J. Reed; *Relation of Carbohydrate Metabolism to Mineral Nutrition of Plants;* 2 years; $12,000

C. H. Wang; *Instrumentation for Carbohydrate Catabolism;* 1 year; $13,000

PENNSYLVANIA STATE UNIVERSITY, University Park; L. N. Zimmerman; *Arginine Dihydrolase Enzyme System;* 2 years; $19,500

PURDUE RESEARCH FOUNDATION, Lafayette, Ind.; Joseph Kuc and E. B. Williams; *Metabolic Pathways Controlling Host-Parasite Relationships;* 1 year; $19,200

Leonard E. Mortenson; *Electron Transport and Nitrogen Fixation in Anaerobic Bacteria;* 2 years; $36,000

RESEARCH FOUNDATION, OKLAHOMA STATE UNIVERSITY, Stillwater; Eric C. Noller; *Effect of Lysozyme-Potentiating Treatments on Gram-Negative Bacteria;* 2 years; $19,600

ROCKEFELLER INSTITUTE, New York, N.Y.; Martin A. Rizack; *Enzyme Activity in Adipose Tissue;* 2 years; $24,000

RUTGERS, THE STATE UNIVERSITY, New Brunswick, N.J.; Werner Braun; *Effects of Cellular Components;* 3 years; $72,400

ST. MARGARET'S HOSPITAL, Boston, Mass.; Anthony J. Sbarra and Robert F. Gilfillan; *Biochemical Phenomena Associated with Phagocytosis;* 2 years; $30,000

SETON HALL COLLEGE OF MEDICINE AND DENTISTRY, Jersey City, N.J.; Katherine F. Lewis; *Lysine Biosynthesis in Fungi;* 2 years; $19,000

TEMPLE UNIVERSITY, Philadelphia, Pa.; M. Strassman and S. Weinhouse; *Biosynthesis of Valine, Leucine and Lysine;* 3 years; $34,000

TUFTS UNIVERSITY, Medford, Mass.; Louis Shuster, Boston; *Nucleotide Metabolism in Germinating Seeds;* 2 years; $30,000

UNIVERSITY OF ARIZONA, Tucson; Irving Yall; *S-Adenosylmethionine and Purine Metabolism in Yeasts;* 2 years; $22,900

UNIVERSITY OF CALIFORNIA, Berkeley; Daniel I. Arnon; *Nitrogen Assimilation and Photosynthesis;* 1 year; $35,000

I. L. Chaikoff; *Interrelations Between Fatty Acid and Carbohydrate Metabolism;* 3 years; $61,600

Michael Doudoroff; *Structure and Formation of Photosynthetic Apparatus in Bacteria and Blue-Green Algae;* 2 years; $65,700

Sanford S. Elberg; *Intramonocytic Metabolism of Brucella Melitensis;* 2 years; $25,000

David P. Hackett; *Respiratory Hydrogen Transport Chain in Plants;* 2 years; $38,200

W. Z. Hassid and Raymond A. Dedonder; *Biosynthesis of Saccharides from Sugar Nucleotides;* 1 year; $16,500

W. Z. Hassid; *Sugar Nucleotides in Plants;* 5 years; $175,000

W. Terry Jenkins; *Decarboxylases and Deaminases of E. Coli;* 2 years; $17,200

Allen G. Marr, Davis; *Biochemical Cytology of Bacteria;* 3 years; $65,100

T. E. Weier and C. R. Stocking, Davis; *Ultrastructure of Chloroplasts;* 3 years; $46,800

Rafael J. Martinez, Los Angeles; *Genus Spirillum;* 2 years; $30,000

Leland M. Shannon and Arthur Wallace, Los Angeles; *Malonic Acid and Its Role as a Metabolic Regulator;* 2 years; $24,000

Irving Zabin, Los Angeles; *Sphingolipide Metabolism;* 2 years; $38,400

Ernest Kun, San Francisco; *Determination of the Biological Role of Enzymes;* 3 years; $32,000

Philip C. Laris, Santa Barbara; *Adenosinetriphosphatase and Sugar Transport Mechanism;* 2 years; $13,700

UNIVERSITY OF CHICAGO, Ill.; Lawrence Bogorad & Wayne J. McIlrath; *Photocontrol of Certain Metabolic Systems in Plants;* 3 years; $46,800

UNIVERSITY OF CINCINNATI, Cincinnati, Ohio; George W. Kittinger; *Regulation of Adrenocortical Hormone Production in the Rat;* 3 years; $19,000

Herman C. Lichstein; *Metabolic Control Mechanisms in the Bacterial Cell;* 3 years; $51,900

UNIVERSITY OF FLORIDA, Gainesville; W. S. Silver and George J. Fritz; *Analytical Mass Spectrometer;* 1 year; $33,300

UNIVERSITY OF GEORGIA, Athens; Milton J. Cormier; *Mechanism of Bioluminescent Reactions;* 3 years; $54,000

Robert G. Eagon; *Carbohydrate Metabolism of Pseudomonas Natriegens;* 2 years; $20,000

UNIVERSITY OF HAWAII, Honolulu; Bruce J. Rogers; *Catabolism of 3-amino-1,2,4-triazole and Related Heterocyclic Rings in Plants;* 3 years; $14,400

Theodore Winnick; *Mechanisms of Biosynthesis of Polypeptides;* 4 months; $12,000

Theodore Winnick; *Biosynthesis and Physiological role of Gramacidin Peptides in Bacillus Brevis;* 1 year; $15,000

UNIVERSITY OF ILLINOIS, Urbana; H. H. Draper; *Metabolism of Alpha Tocopherol in Animals;* 2 years; $22,200

I. C. Gunsalus; *Isoprenoid Metabolism: Terpene Biosynthesis and Degradation;* 5 years; $206,400

B. L. Larson; *Secretory Activity and Protein Synthesis;* 2 years; $32,000

R. S. Wolfe; *Metabolic Reactions in Bacteria;* 3 years; $42,900

UNIVERSITY OF MARYLAND, College Park; Leslie C. Costello; *Relationship of Metabolism to Embryological Development of Ascaris Lumbricoides Var. Suum;* 2 years; $20,000

UNIVERSITY OF MASSACHUSETTS, Amherst; Henry N. Little; *Biosynthesis of Metalloporphyrins and Metalloporphyrin Proteins;* 3 years; $29,800

UNIVERSITY OF MICHIGAN, Ann Arbor; I. A. Bernstein; *Biosynthesis of Deoxyribose;* 3 years; $39,000

Peter M. Ray; *Metabolic Processes Involved in Growth of Plant Cells;* 3 years; $36,000

Alfred S. Sussman; *A Developmental Study of Neurospora;* 3 years; $57,500

Conrad S. Yocum; *Biological Nitrogen Fixation;* 2 years; $35,000

UNIVERSITY OF OREGON, Eugene; Aaron Novick; *Regulatory Mechanisms;* 3 years; $90,000

UNIVERSITY OF PENNSYLVANIA, Philadelphia; Walter D. Bonner; *Mechanisms of Cellular Oxidations in Plant Tissues;* 2 years; $49,300

Martin Schwartz; *Light Reaction of Photosynthesis;* 2 years; $12,000

UNIVERSITY OF PITTSBURGH, Pittsburgh, Pa.; David S. Feingold; *Utilization of Deoxy-and Dideoxyaldohexoses by Microorganisms;* 2 years; $40,000

UNIVERSITY OF ROCHESTER, N.Y.; Wolf Vishniac; *Enzymatic Reactions in Microbial Metabolism;* 4 months; $3,100

Wolf Vishniac; *Autotrophic Metabolism;* 2 years; $34,000

UNIVERSITY OF TENNESSEE, Knoxville, Guy T. Barry; *Bacteriocinic Microorganisms;* 2 years; $40,000

Samuel R. Tipton; *Thyroid Binding Capacity of Serum and Tissue Fractions;* 2 years; $20,000

William E. Jefferson, Jr., Memphis; *Steroids on Metabolism and Composition of Fungal Mycelium;* 1 year; $10,000

UNIVERSITY OF TEXAS, Austin; James L. Larimer; *Respiratory Proteins in Crustacea;* 2 years; $32,000

UNIVERSITY OF WISCONSIN, Madison; John W. Porter; *Biosynthesis of Isprenoid Compounds;* 3 years; $32,000

Charles J. Sih; *Enzymatic Mechanism of Steroid Ring A Aromatization;* 2 years; $27,000

Folke Skoog; *Regulation of Growth and Morphogenesis in Plants;* 5 years; $192,700

UTAH STATE UNIVERSITY, Logan; Frank R. Stermitz, *Alkaloid Biosynthesis and Metabolism;* 2 years; $16,800

VANDERBILT UNIVERSITY, Nashville, Tenn.; Jane Harting Park; *Mechanism of Catalysis of 3-Phosphoglyceraldehyde Dehydrogenase;* 3 years; $36,000

H. C. Meng; *Lipid Metabolism in Adipose Tissue;* 3 years; $45,000

John H. Schneider; *Nucleic Acid-Like Diphenylamine Chromogen;* 2 years; $15,000

WAKE FOREST COLLEGE, Winston-Salem, N.C.; Walter J. Bo; *Synthesis of Glycogen from Uridinediphosphoglucose in the Uterus;* 2 years; $14,600

WASHINGTON UNIVERSITY, St. Louis, Mo.; Oliver H. Lowry; *Riboflavin Enzymes in Growth and Deficiency;* 3 years; $61,600

WEST VIRGINIA UNIVERSITY, Morgantown; Jerald L. Connelly; *Oxidative Decarboxylation of A-Keto Acids Derived from Branched-Chain Amino Acids;* 2 years; $27,500

WORCESTER FOUNDATION FOR EXPERIMENTAL BIOLOGY, INC., Shrewsbury, Mass.; Oscar Hechter; *The Mode of Insulin Action;* 2 years; $33,400

YESHIVA UNIVERSITY, New York, N.Y.; Abraham White; *Mechanism of Effects of Adrenal Cortical Steroids on Lymphoid Tissue;* 3 years; $45,000

MOLECULAR BIOLOGY

ALBERT EINSTEIN MEDICAL CENTER, Philadelphia, Pa.; Robert J. Suhadolnik; *Biogenesis of Alkaloids;* 2 years; $60,000

AMERICAN FOUNDATION FOR BIOLOGICAL RESEARCH, Madison, Wis.; Basile J. Luyet; *Freezing of Biological Material;* 1 year; $50,000

AUBURN UNIVERSITY, Auburn, Alabama; W. F. Head, Jr; *Fluorescent Antibody System;* 1 year; $4,000

Bauer, Hugo; *Histidine Metabolism;* 2 years; $8,000

BERMUDA BIOLOGICAL STATION FOR RESEARCH, INC., St. George's West, Bermuda; Donald G. Comb; *Biochemistry of Differentiation;* 1 year; $4,500

BRANDEIS UNIVERSITY, Waltham, Mass.; Max Chretien; *Additional Equipment for Science Shop;* 1 year; $10,000

Orrie M. Friedman; *Studies on the Reaction of DNA with Diazomethane;* 2 years; $25,000

Thomas C. Hollocher; *Mechanisms of Enzymatic Reactions;* 2 years; $50,000

Helen Van Vunakis; *Structure of Functional Groups in Biologically Active Molecules;* 2 years; $35,000

BROWN UNIVERSITY, Providence, R.I.; Paul R. Gross; *Nucleic Acid Synthesis During the Cell Cycle of Sea Urchin Eggs;* 1 year; $1,600

CALIFORNIA INSTITUTE OF TECHNOLOGY, Pasadena; Richard E. Marsh and Robert B. Corey; *Structure of Crystals;* 2 years; $30,000

A. Van Harreveld; *Water and Electrolyte Distribution in Central Nervous Tissue;* 2 years; $25,000

Carl Niemann; *Synthesis and Degradation of Peptides;* 2 years; $38,000

CHICAGO MEDICAL SCHOOL, Ill.; Robert K. Crane; *Mechanism of Intestinal Absorption;* 2 years; $90,000

COLUMBIA UNIVERSITY, New York, N.Y.; Jay Glasel and D. Rittenberg; *Biochemical Studies Utilizing Nuclear Magnetic Resonance Spectroscopy;* 2 years; $100,000

Irving Goodman; *Biological Action in Low Molecular Weight Compounds;* 2 years; $30,000

Elvin A. Kabat; *Immunochemical Studies on Polysaccharides;* 3 years; $180,000

David Shemin; *Synthesis and Function of Porphyrins and Related Compounds; Synthesis of Enzymes;* 3 years; $175,000

P. R. Srinivasan; *The Mechanism of Transfer of Genetic Information Between Nucleus and Cytoplasm;* 2 years; $11,000

CORNELL UNIVERSITY, Ithaca, N.Y.; Thomas C. Bruice; *Mechanism of Transamination of Amino Acids;* 2 years; $50,000

Robert W. Holley; *Biosynthesis of Proteins;* 3 years; $50,000

DARTMOUTH COLLEGE, Hanover, N.H.; Shinya Inoue; *Analysis of Fine Structure of Living Cells;* 2 years; $125,000

Arthur J. Samuels; *Optical Rotatory Dispersion of Muscle Enzymes and Sub-Units;* 1 year; $6,000

Andrew G. Szent-Gyorgyi; *Proteins, Contraction, and Morphogenesis of Muscle;* 2 years; $200,000

DUKE UNIVERSITY, Durham, N.C.; John W. Moore; *Ionic Conductance Studies;* 2 years; $50,000

DUQUESNE UNIVERSITY, Pittsburgh, Pa.; Norman C. Li; *Metal Binding to Biologically Important Compounds;* 2 years; $26,000

EASTERN PENNSYLVANIA PSYCHIATRIC INSTITUTION, Philadelphia; Samuel B. Horowitz; *Non-Electrolyte Permeability;* 2 years; $28,000

EDSEL B. FORD INSTITUTE FOR MEDICAL RESEARCH, Detroit, Mich.; Thomas P. Singer and Edna B. Kearney; *Mechanism of Mitochondrial Oxidations;* 2 years; $50,000

FUND FOR ADVANCEMENT OF EDUCATION AND RESEARCH IN THE UNIVERSITY OF KENTUCKY MEDICAL CENTER, Lexington; Richard S. Schweet; *Amino Acids to Protein;* 3 years; $60,000

HAHNEMANN MEDICAL COLLEGE AND HOSPITAL, Philadelphia, Pa.; Peter Oesper; *Molecular Weights and Enzyme-Substrate Dissociation Constants of Glycolytic Enzymes; The Preparation of Some New Substrates and Inhibitors;* 2 years; $17,000

HARVARD UNIVERSITY, Cambridge, Mass; Oleg Jardetzky; *Nuclear Magnetic Resonance Studies of Biologically Important Molecules;* 2 years; $90,000

Herman M. Kalckar; *Molecular Basis of Enzyme Synthesis and Activity;* 3 years; $140,000

John H. Law; *Bacterial Lipids;* 2 years; $25,000

Matthew S. Meselson; *Structural Basis of Genetic Recombination;* 3 years; $150,000

A. K. Solomon; *Permeability of Cellular Membranes;* 2 years; $70,000

George Wald; *Biology and Evolution of Vision;* 3 years; $84,000

James D. Watson; *Structure and Function of Bacterial Ribosomes;* 1 year; $30,000

HEBREW UNIVERSITY, Jerusalem, Israel; Michael Schramm; *Enzyme Secretion by Cell;* 2 years; $35,000

HUNTER COLLEGE, New York, N.Y; Richard C. Mawe; *Glucose Penetration in Human Red Blood Cell;* 3 years; $15,000

ILLINOIS INSTITUTE OF TECHNOLOGY, Chicago; Robert Filler; *Synthetic Polymers of Unnatural Amino Acids;* 2 years; $25,000

INDIANA UNIVERSITY FOUNDATION, Bloomington; Walter L. Meyer; *Synthetic Approaches to C–18 Functional Steroids;* 2 years; $21,000

JOHANN-WOLFGANG - GOETHE - UNIVERSITAT, Frankfurt-am-Main, West Germany; Erich Heinz; *Mechanism of Active Transport Across Cellular Membranes;* 2 years; $28,000

JOHNS HOPKINS UNIVERSITY, Baltimore, Md.; Howard M. Dintzis; *Crystalline Proteins;* 1 year; $29,000

Albert L. Lehninger; *Active Transport by Mitochondria;* 3 years; $80,000

W. D. McElroy; *Conversion of Chemical Energy into Light Energy by Biological Systems;* 3 years; $99,000

Gifford B. Pinchot; *Mechanisms of Oxidative Phosphorylation;* 3 years; $57,000

KAISER FOUNDATION RESEARCH INSTITUTE, Richmond, Calif.; Ilse Dorothea Raacke and Mary Belle Allen; *Protein Synthesis in Algae;* 2 years; $20,000

KYOTO UNIVERSITY, Yoshidamachi, Kyoto, Japan; Itaru Watanabe; *Transfer of Genetic Information in Bacterial DNA System;* 2 years; $30,000

LANGLEY PORTER NEUROPSYCHIATRIC INSTITUTE, San Francisco, Calif.; George L. Ellman; *Protein Changes in Brain Tissues;* 2 years; $20,000

MANHATTAN COLLEGE, New York, N.Y.; C. William Batt; *Purification and Kinetics of Esterases from Various Seeds;* 2 years; $10,000

MARINE BIOLOGICAL LABORATORY, Woods Hole, Mass.; Albert Szent-Gyorgyi; *Electronic Interactions Between Molecules;* 2 years; $80,000

J. Woodland Hastings; *Scientific Equipment for Physiology and Biochemistry;* 1 year; $65,000

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge; Vernon M. Ingram; *Genetic Control of Protein Structure and Its Relation to Protein Synthesis;* 2 years; $65,000

Alexander Rich and John M. Buchanan; *Electron Spin Resonance Studies;* 1 year; $50,000

MELLON INSTITUTE, Pittsburgh, Pa.; Robert V. Rice; *Macromolecular Conformations;* 1 year; $9,000

MICHIGAN STATE UNIVERSITY, East Lansing; Willis A. Wood; *Synthesis of Enzyme Families;* 2 years; $25,000

MOUNT HOLYOKE COLLEGE, South Hadley, Mass.; Curtis G. Smith; *Control of RNA Synthesis;* 2 years; $10,000

MOUNT SINAI HOSPITAL, New York, N.Y.; J. D. Chanley and Harry Sobotka; *Steroid Compounds from Invertebrates;* 2 years; $32,000

NATIONAL ACADEMY OF SCIENCES-NATIONAL RESEARCH COUNCIL, Washington, D.C.; Frank L. Campbell; *Support of NAS–NRC Ad Hoc Committee on International Relations in Biophysics;* 1 year; $9,000

NEW YORK UNIVERSITY, New York; B. L. Horecker; *Enzyme Mechanisms in Carbohydrate Metabolism;* 3 years; $110,000

OKLAHOMA MEDICAL RESEARCH FOUNDATION, Oklahoma City; Ranwel Caputto; *Chemical Studies on Adenosine-Myonosine Dinucleotide;* 2 years; $25,000

OREGON STATE UNIVERSITY, Corvallis; Vernon H. Cheldelin; *Biosynthesis of Essential Metabolites;* 1 year; $7,000

Conrad T. O. Fong; *Chemical Aspects of Hormone-Receptor Interaction;* 2 years; $20,000

OSAKA UNIVERSITY, Osaka, Japan; Hiroshi Fujita; *Ultracentrifugal Method;* 2 years; $5,500

PASTEUR INSTITUTE, Paris, France; Charles W. Todd; *Chemistry of Antibody Proteins;* 2 years; $15,000

PENNSYLVANIA STATE UNIVERSITY, University Park; Greenville K. Strother; *Neural Photopigments in Vivo;* 2 years; $15,000

PRINCETON UNIVERSITY, Princeton, N.J.; Frank H. Johnson; *Biochemistry of Luminescent Systems;* 2 years; $38,000

Walter Kauzmann; *Protein Structure and Behavior;* 3 years; $160,000

RESEARCH FOUNDATION, OKLAHOMA STATE UNIVERSITY, Stillwater; George Gorin; *Tertiary Structure of Proteins;* 2 years; $24,000

RESEARCH FOUNDATION OF STATE UNIVERSITY OF NEW YORK, Albany; Sumner N. Levine, Oyster Bay; *Electrical Transport in Helical Molecules;* 2 years; $25,000

RETINA FOUNDATION, Boston, Mass.; John Gergely; *Biochemistry of Muscle Contraction;* 2 years; $50,000

ROCKEFELLER INSTITUTE, New York, N.Y.; Lucien G. Caro and George E. Palade; *Protein Synthesis and Intracellular Transport;* 1 year; $19,000

Daniel E. Koshland, Jr.; *Enzyme Structure and Function;* 2 years; $25,000

Gertrude E. Perlmann; *Structural Studies on Phosphoproteins;* 2 years; $30,000

Theodore Shedlovsky; *Function of Protons in Solutions;* 2 years; $24,000

RUTGERS, THE STATE UNIVERSITY, New Brunswick, N.J.; Frank F. Davis; *Low Molecular Weight Ribonucleic Acids from Yeast;* 2 years; $22,000

Ekkehard K. F. Bautz; *Fractionation and Characterization of Messenger RNA;* 1 year; $12,000

Michael Heidelberger; *Relations Between Chemical Constitution and Immunological Specificity;* 3 years; $75,000

David Pramer; *Concentration and Characterization of Nemin;* 2 years; $21,000

Walter W. Wainio; *Purification and Characterization of the Cytochromes Oxidase, b and c1 of Mammalian Heart Muscle;* 2 years; $20,000

ST. LOUIS UNIVERSITY, Mo.; Walter R. Schlesinger; *Macromolecular and Particulate Elements;* 2 years; $75,000

Audrey Stevens; *Ribonucleic Acid in Bacterial Extracts;* 2 years; $35,000

A. H. Weber; *Structure Determination of Virus Particles;* 1 year; $5,000

SMITH COLLEGE, Northampton, Mass.; Dorothy Wrinch; *Structure of Small Peptides and Peptide Fragments;* 2 years; $15,000

STANFORD UNIVERSITY, Stanford, Calif.; M. Weissbluth; *U-V and Mossbauer Studies in Macromolecules;* 2 years; $40,000

STATE UNIVERSITY OF IOWA, Iowa City; Charles A. Swenson; *Infrared Spectra of Biologically Important Compounds;* 2 years; $30,000

SYRACUSE UNIVERSITY, Syracuse, N.Y.; Roger O. Eckert; *Excitation-Response Coupling in Bioluminescent Cells;* 2 years; $25,000

UNIVERSITY OF ARIZONA, Tucson; John A. Rupley; *Studies on Lysozyme;* 2 years; $35,000

UNIVERSITY OF CALIFORNIA, Berkeley; Frederick H. Carpenter; *Chemistry of Proteins;* 3 years; $54,000

James Cason; *Non-Antibiotic Metabolic Products of Molds;* 2 years; $20,000

Charles A. Dekker; *Structural Studies on Nucleic Acids;* 1 year; $5,000

Robert I. Macey; *Permeability of Biological Membranes to Non-Electrolytes;* 2 years; $30,000

Lester Packer; *Function of Sub-Cellular Membranes;* 2 years; $45,000

Martin D. Kamen, La Jolla; *Biochemistry of Haematin Compounds in Photosynthetic Bacteria;* 3 years; $140,000

Stanley L. Miller, La Jolla; *Synthesis of Organic Compounds;* 2 years; $28,000

Andrew A. Benson, Los Angeles; *Radiochemical Studies in Lipid Biochemistry;* 1 year; $19,000

Fritiof S. Sjostrand, Los Angeles; *Enzymatic Activities Connected with Certain Cytoplasmic Systems;* 2 years; $100,000

Warren D. Kumler, San Francisco; *Nuclear Magnetic Resonance Spectroscopy;* 1 year; $25,000

Manuel F. Morales and Shizuo Watanabe, San Francisco; *Molecular Aspects of Muscle Function;* 3 years; $120,000

Harold Tarver and Richard A. Fineberg, San Francisco; *Structure and Biosynthesis of Ferritin and Apoferritin*; 2 years; $35,000

UNIVERSITY OF DELAWARE, Newark; Don Dennis; *Substrate Substituted Cellulose Resins for Enzyme Purification;* 2 years; $14,000

UNIVERSITY OF FLORIDA, Gainesville; James L. Nation; *Study of Purine Catabolism in Insects;* 2 years; $16,000

UNIVERSITY OF HAWAII, Honolulu; Kerry T. Yasunobu; *Mode of Action of Chymopapain and Chymobromelain;* 2 years; $25,000

UNIVERSITY OF ILLINOIS, Urbana; Govindjee Eugene Rabinowitch; *Photochemical Processes;* 2 years; $50,000

L. P. Hager; *Biological Halogenation Mechanisms;* 3 years; $90,000

A. C. Ivy, Chicago; *Determination of Histamine;* 1 year; $1,000

J. Emerson Kempf, Chicago; *Protein Synthesis in Viral Infection;* 2 years; $20,000

Alfred Nisonoff; *Structural Studies of Antibodies;* 2 years; $75,000

N. Sueoka; *DNA Replication;* 3 years; $45,000

Elizabeth Thorogood; *Legume Nodule Hemoproteins;* 1 year; $2,000

UNIVERSITY OF KANSAS, Lawrence; Philip Newmark; *Nucleic Acid, Protein and Virus Synthesis;* 2 years; $35,000

UNIVERSITY OF LOUISVILLE, Louisville, Ky.; Peter K. Knoefel; *Intermolecular Bonding in a Biological Transport System;* 1 year; $6,500

Paul G. LeFevre; *Mechanism of Carrier-Mediated Transport of Sugars Through Cell Membranes;* 3 years; $100,000

UNIVERSITY OF MAINE, Orono; George R. Pettit; *Alkaloid and Triterpene Components of the Labiatae;* 2 years; $20,000

UNIVERSITY OF MARYLAND, College Park; Arthur J. Emery, Jr., Baltimore; *Protein Biosynthesis;* 2 years; $15,000

Edward J. Herbst, Baltimore; *Molecular Form and Function of Spermine in Animal Tissues;* 2 years; $20,000

UNIVERSITY OF MICHIGAN, Ann Arbor; Philipp Gerhardt; *Membrane Ultrastructure in Microorganisms;* 1 year; $45,000

Philipp Gerhardt; *Membrane Ultrastructure in Microorganisms;* 2 years; $18,000

UNIVERSITY OF MINNESOTA, Minneapolis; D. R. Briggs; *Chemical and Physical Properties and Structures of Proteins;* 2 years; $10,000

Victor Lorber; *Ion Fluxes in Heart Muscle;* 2 years; $20,000

Rufus Lumry; *Kinetic Studies of Enzyme Mechanisms by High-Speed Methods;* 2 years; $26,000

C. J. Watson and Colm C. O'hEocha; *Structural Studies of the Phycobilins;* 1 year; $10,000

UNIVERSITY OF MISSOURI, Columbia; Charles W. Gehrke; *The Quantitative Determination of Amino Acids by Gas Chromatography;* 2 years; $16,000

UNIVERSITY OF NEBRASKA, Lincoln; John H. Pazur; *Thymidine Diphosphate Hexoses and the Synthesis of Carbohydrates;* 2 years; $30,000

UNIVERSITY OF NORTH CAROLINA, Chapel Hill; Ralph Penniall; *ATP of Rat Liver Mitochondria Responsive to 2,4-DNP;* 2 years; $25,000

Claude Piantadosi; *Chemistry and Metabolism and Plasmalogens;* 2 years; $18,000

UNIVERSITY OF OREGON, Eugene; Sidney A. Bernhard; *Molecular Structure and Function;* 2 years; $115,000

F. J. Reithel; *Reversible Association of Proteins and the Relation to Enzymic Activity;* 3 years; $100,000

UNIVERSITY OF THE PACIFIC, Stockton, Calif.; Howard K. Zimmerman; *Fundamental Chemistry of Aminosugars;* 1 year; $11,000

Howard K. Zimmerman; *Synthesis of New Aminosugars;* 2 years; $30,000

UNIVERSITY OF PENNSYLVANIA, Philadelphia; Mildred Cohn; *Mechanisms of Phosphorylation and Phosphate Transfer Reactions;* 3 years; $90,000

Georg Czerlinski; *Temperature Jump Studies;* 2 years; $50,000

David L. Drabkin; *Hemin Chromoproteins;* 2 years; $25,000

Fred Karush; *The Study of the Exchangeable Hydrogen of Proteins with Tritium;* 2 years; $24,000

Abraham M. Shanes; *A Physiocochemical Approach to Natural Membranes;* 2 years; $30,000

UNIVERSITY OF PITTSBURGH, Pa.; Klaus Hofmann: *Relation Between Structure and Biological Activity of Synthetic Polypeptides;* 3 years; $55,000

Max A. Lauffer; *Formation of Virus Particles;* 2 years; $30,000

Walter S. Vincent; *Deoxyribonucleic Acid-Like Ribonucleic Acid;* 2 years; $50,000

UNIVERSITY OF SOUTH FLORIDA, Tampa; Frank E. Friedl; *Growth and Nutrition of an Axenic Snail;* 2 years; $17,200

UNIVERSITY OF TENNESSEE, Knoxville; Alkis J. Sophianopoulos; *Thermodynamics of Reversible Structural Changes in Proteins;* 1 year; $25,000

UNIVERSITY OF UPPSALA, Uppsala, Sweden; Arne Tiselius; *Methods for the Separation of Particles and Macromolecules in Biological Systems;* 3 years; $120,000

UNIVERSITY OF UTAH, Salt Lake City; John D. Spikes; *The Physical-Chemical Properties of Tendon and Other Mechanical Tissues in Animals;* 2 years; $20,000

UNIVERSITY OF VERMONT, Burlington; Thomas B. Tomasi; *Relation of Rheumatoid Factors to 19S Antibodies;* 2 years; $4,000
Robert C. Woodworth; *Structure of the Specific Binding Sites;* 2 years; $16,000

UNIVERSITY OF VIRGINIA, Charlottesville; R. Bruce Martin; *Ligand Field and Charge Transfer Spectra;* 2 years; $20,000

UNIVERSITY OF WASHINGTON, Seattle; Milton P. Gordon; *Modification of Tobacco Mosaic Virus;* 2 years; $50,000
Donald J. Hanahan; *Complex Lipids;* 3 years; $40,000
Robert F. Labbe; *Enzymatic Mechanism of Iron-Protoporphyrin Chelation;* 3 years; $40,000

UNIVERSITY OF WISCONSIN, Madison; Julius Adler; *Biochemistry of Virus Production;* 2 years; $23,000
Philip P. Cohen; *Biochemistry of Urea Biosynthesis;* 2 years; $35,000
Stephen A. Kuby, *Glucose 6-Phosphate Dehydrogenase;* 2 years; $55,000
Henry A. Lardy; *Energy Transfer Reactions;* 3 years; $160,000
F. M. Strong; *Chemistry and Metabolism of Substances;* 3 years; $54,000
George C. Webster; *Enzymatic Synthesis of Protein;* 2 years; $19,000

WASHINGTON UNIVERSITY, St. Louis, Mo.; Luis Glaser; *The Synthesis and Metabolism of Thymidine Diphosphate Rhamnose;* 2 years; $25,000
Roger G. Hart; *Observation of Particles;* 2 years; $15,000
Jack L. Strominger; *Structure and Biosynthesis of Bacterial Cell Walls* 3 years; $90,000
Tung-Yue Wang; *Proteins and Nucleic Acids of Cell Nucleus;* 2 years; $25,000

UNIVERSITY OF ROME, Rome, Italy; Wyman, Jeffries; *Relation Between Structure and Function in the Hemoglobins, Myoglobins, and Related Substances;* 2 years; $45,000

YALE UNIVERSITY, New Haven, Conn.; Henry G. Mautner; *Analogous Oxygen, Sulfur, and Selenium Compounds;* 2 years; $30,000

YESHIVA UNIVERSITY, New York, N.Y.; Nathar W. Penn; *Nature and Role of the Mitochondrial Acceptor Fraction in Protein Metabolism;* 1 year; $2,000
N. W. Penn; *RNA Synthesis in the Liver Mitochondrial Fraction;* 1 year; $20,000
Maurice M. Rapport; *The Chemical Structure and Immunochemical Properties of Lipid Haptens;* 2 years; $40,000
Jonathan B. Wittenberg; *Oxygen Transport; Retia Mirabilia;* 3 years; $55,000

PHYSICS

ADELPHI COLLEGE, Garden City, N. Y.; Henry Brysk; *Theory of Scattering;* 2 years; $12,000
Melvin Schwartz; *Canonical Formulation of Electrodynamics;* 2 years; $12,000

AMERICAN INSTITUTE OF PHYSICS, New York, N.Y.; Elmer Hutchisson; *The Development of Physics Research Opportunities in Small Colleges;* 1 year; $36,100

AMERICAN UNIVERSITY OF BEIRUT, Beirut, Lebanon; Frans Bruin; *Paramagnetic Resonance of Free Radicals at Weak Magnetic Fields;* 2 months; $7,800

ANTIOCH COLLEGE, Yellow Springs, Ohio; Robert E. Warner; *Proton Reactions at 18 Mev;* 3 years; $30,400

ARIZONA STATE UNIVERSITY, Tempe; Arnold G. Meister and Jerome M. Dowling; *Infrared Spectra of Polyatomic Molecules;* 1 year; $19,000

BOSTON UNIVERSITY, Mass.; Edward C. Booth; *Nuclear Resonance Scattering of Bremsstrahlung;* 2 years; $25,700
Wolfgang Franzen; *Optical Pumping and Optical Coherence;* 2 years; $40,000

BOWDOIN COLLEGE, Brunswick, Maine; Myron A. Jeppesen; *Thin Solid Films;* 2 years; $20,400

BRANDEIS UNIVERSITY, Waltham, Mass.; Stephan Berko; *Positron, Electron and Phonon Interaction Experiments;* 2 years; $43,500
Edgar Lipworth and Milton Baker; *High Resolution Atomic Beam Study of Rare Earths;* 2 years; $66,000

BRIGHAM YOUNG UNIVERSITY, Provo, Utah; John H. Gardner; *Gyromagnetic Ratio of the Free Electron;* 2 years; $22,800

BROWN UNIVERSITY, Providence R.I.; H. E. Farnsworth; *Chemical Reactions at Atomically-Clean Surfaces;* 2 years; $57,600
Howard A. Snyder; *Quantized Vortex Lines in Liquid Helium;* 2 years; $43,300

CALIFORNIA INSTITUTE OF TECHNOLOGY, Pasadena; John R. Pellam; *Low Temperature Physics;* 2 years; $144,400
Jesse W. M. DuMond, *An Inhomogeneous Field Magnetic Spectrometer;* 3 years; $108,300

CARLETON COLLEGE, Northfield, Minn.; Robert Kolenkow; *Beam-Beam Atomic Collisions at Thermal Velocities;* 3 years; $18,200

CARNEGIE INSTITUTE OF TECHNOLOGY, Pittsburgh, Pa.; Sergio DeBenedetti; *Solid State Properties Using Radioactive Techniques;* 2 years; $41,000
S. A. Friedberg; *Low Temperature Magnetic Measurements on Hydrated Salts of Metals;* 2 years; $39,500
George W. Hinman; *Extranuclear Effects on Angular Correlation of Gamma Rays;* 2 years; $39,600
J. M. Radcliffe; *Solid State Theory;* 1 year; $14,300
Robert T. Schumacher; *Magnetic Resonance Studies in Solids;* 2 years; $42,500

CITY COLLEGE, New York, N.Y.; Harry Lustig; *Nuclear Reaction Data and Theory of the Mossbauer Effect;* 2 years; $19,000

COLBY COLLEGE, Waterville, Maine; Dennison Bancroft; *Velocity of Sound in Gases;* 3 years; $19,300

COLUMBIA UNIVERSITY, New York, N.Y.; Lawrence C. Krisher; *Molecular Properties Utilizing Microwave and Maser Beam Spectrometers;* 2 years; $53,000

Jack Steinberger and Melvin Schwartz; *Precision Film Reader for Bubble Chamber Analysis;* 1 year; $35,000

CORNELL UNIVERSITY, Ithaca, N.Y.; Alan J. Bearden; *Mossbauer Investigations of Liquid Helium;* 2 years; $38,900

Giuseppe Cocconi and Jay Orear; *Particle Interactions at Ultra Relativistic Energies;* 2 years; $318,400

David M. Lee; *Helium Solutions at Low Temperatures;* 2 years; $29,100

DARTMOUTH COLLEGE, Hanover, N.H.; William T. Doyle; *Magnetic and Optical Properties of Color Centers in Ionic Crystals;* 2 years; $29,700

DUKE UNIVERSITY, Durham, N.C.; L. C. Biedenharn and Eugene Greuling; *Theoretical Nuclear Physics;* 2 years; $38,000

Horst Meyer, *Thermal and Magnetic Properties at Low Temperatures;* 2 years; $56,800

EMORY UNIVERSITY, Atlanta, Ga.; James W. Simmons; *Electron Spin Resonance;* 1 year; $28,000

FLORIDA STATE UNIVERSITY, Tallahassee; Joseph E. Lannutti; *Elementary Particle Physics Using Bubble Chamber Methods;* 2 years; $87,100

FORDHAM UNIVERSITY, New York, N.Y.; Alfons Weber; *High-Resolution Raman Spectroscopy of Gases;* 2 years; $31,400

GEORGIA INSTITUTE OF TECHNOLOGY, Atlanta; R. Martin Ahrens; *Heisenberg's Non-Linear Field Theory;* 2 years; $17,200

Joseph Ford; *Ergodicity and the Approach to Equilibrium;* 2 years; $18,000

J. Q. Williams and T. L. Weatherly; *Molecular Constants by Microwave Spectroscopy;* 2 years; $26,400

HARVARD UNIVERSITY, Cambridge, Mass.; Francis M. Pipkin; *Dynamic Nuclear Orientation;* 3 years; $142,500

HARVEY MUDD COLLEGE, Claremont, Calif.; Graydon D. Bell; *Oscillator Strengths for Heavy Elements;* 3 years; $51,600

HOWARD UNIVERSITY, Washington, D.C.; Herman Branson; *Magnetic Susceptibilities of Solidified Aqueous Solutions at Low Temperatures;* 1 year; $6,900

ILLINOIS INSTITUTE OF TECHNOLOGY, Chicago; Forrest F. Cleveland; *Spectra of Polyatomic Molecules;* 3 years; $44,400

INDIANA UNIVERSITY FOUNDATION, Bloomington; H. J. Martin; *Elementary Particle Interactions Using Bubble Chamber Techniques;* 2 years; $133,900

JOHNS HOPKINS UNIVERSITY, Baltimore, Md.; Edwin R. Fitzgerald; *Mechanical Resonance Dispersion in Solids at Audiofrequencies;* 1 year; $21,900

Aihud Pevsner; *Bubble Chamber Studies of Elementary Particles;* 2 years; $108,000

KENT STATE UNIVERSITY, Kent, Ohio; J. W. McGrath and Anthony A. Silvidi; *Resonance Studies in Two-Proton Systems;* 2 years; $50,300

LEHIGH UNIVERSITY, Bethlehem, Pa.; Raymond J. Emrich; *Shock Tube Wall-Gas Interactions;* 2 years; $31,300

LONG BEACH STATE COLLEGE FOUNDATION, Long Beach, Calif.; George L. Appleton; *Lattice Thermal Conductivity of Two Mixed Crystal Systems;* 2 Years; $22,500

MANCHESTER COLLEGE, North Manchester, Ind.; Charles S. Morris and L. Dwight Farringer; *Gamma Ray Spectroscopy;* 3 years; $26,600

MARQUETTE UNIVERSITY, Milwaukee, Wis.; Arthur G. Barkow; *Elementary Particle Reactions in Nuclear Emulsions;* 2 years; $21,800

Kiuck Lee; *Pear-Shaped Nuclear Deformation;* 2 years; $18,100

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge; Bruno B. Rossi; *Cosmic Ray Showers;* 2 years; $176,700

C. G. Shull; *Neutron Diffraction and Neutron Physics;* 2 years; $215,800

MICHIGAN COLLEGE OF MINING & TECHNOLOGY, Houghton; Rolland O. Keeling, Jr.; *Dielectric Study of Hydrated Nitrates;* 1 year; $22,800

MICHIGAN STATE UNIVERSITY, East Lansing; Joseph Ballam; *High Energy Interactions;* 2 years; $132,700

Frank J. Blatt, M. Garber and P. A. Schroeder; *Electronic Properties of Metals and Alloys;* 2 years; $93,800

Henry G. Blosser; *Construction of a 40-Mev Cyclotron;* 3 years; $700,000

Herbert H. Bolotin and William H. Kelly; *Nuclear Spectroscopy;* 2 years; $34,100

MIDWESTERN UNIVERSITIES RESEARCH ASSOCIATION, Madison, Wis.; William D. Walker, University of Wisconsin; *Bubble Chamber Development;* 1 year; $232,600

MONTANA STATE UNIVERSITY, Missoula; Mark J. Jakobson; *Photo-Neutron Cross Sections;* 2 years; $27,500

NEW MEXICO STATE UNIVERSITY, University Park; Robert E. McDaniel; *Heavy Nuclei in Primary Cosmic Rays;* 1 year; $4,800

NEW YORK UNIVERSITY, New York; Kurt Haller, Harry Nickle and Smio Tani; *Dynamical Aspects of Quantum Field Theory;* 2 years; $48,500

NORTHEASTERN UNIVERSITY, Boston, Mass.; Marvin H. Friedman; *Statistical Mechanics of Quantum Gases and Liquids;* 2 years; $19,100

Bertram J. Malenka; *High-Energy Collision Phenomena and Related Processes by Approximate Methods;* 2 years; $20,400

Bruno Zumino; *Elementary Particle Theory;* 2 years; $70,200

NORTHWESTERN UNIVERSITY, Evanston, Ill.; Laurie M. Brown; *Field Theory and High Energy Physics;* 7 months; $10,600

Richard H. Capps; *Field Theory and High Energy Physics;* 2 years; $43,900

Jules A. Marcus; *Galvanomagnetic Effects of Metals at Low Temperatures;* 2 years; $59,100

Edson R. Peck; *Precision Measurements in Spectroscopy;* 1 year; $11,900

OHIO STATE UNIVERSITY, Columbus; J. C. Harris; *Acquisition of a 5.5 Mev Van de Graaff Accelerator;* 2 years; $449,200

Harald H. Nielsen; *Molecular Spectroscopy and Infrared Studies;* 2 years; $57,600

PENNSYLVANIA STATE UNIVERSITY, University Park; Ferdinand G. Brickwedde and

Ralph G. Ascah; *Low Temperature Thermometry;* 6 months; $9,100

Erwin W. Müller; *Electric-Field-Induced Reactions at Metal Surfaces;* 2 years; $63,800

D. H. Rank; *Construction of a Spectroscope Absorption Tube;* 1 year; $25,000

POLYTECHNIC INSTITUTE OF BROOKLYN, Brooklyn, N.Y.; Akira Isihara; *Statistical Mechanics of Interacting Systems;* 2 years; $23,400

PORTLAND STATE COLLEGE, Portland, Oreg.; Laird C. Brodie; *Oscillatory Magnetic Properties of Impure Bismuth;* 2 years; $17,600

PRINCETON UNIVERSITY, Princeton, N.J.; Walker Bleakney and Lincoln G. Smith; *High Resolution Mass Spectroscopy;* 3 years; $352,100

R. H. Dicke; *Gravitational Phenomena and General Relativity;* 2 years; $210,000

Allen G. Shenstone; *Atomic Spectra;* 2 years; $24,000

PURDUE RESEARCH FOUNDATION, Lafayette, Ind.; Kenneth L. Andrew; *High Precision Spectroscopy;* 2 years; $39,200

R. W. Stanley; *Precision Spectroscopy with Atomic Beams;* 2 years; $21,600

RENSSELAER POLYTECHNIC INSTITUTE, Troy, N.Y.; J. P. Davidson; *Nuclear Octupole Moments in Relation to the Collective Model;* 2 years; $19,500

Hillard B. Huntington; *Theoretical Problems in Metal Physics;* 1 year; $12,200

E. John Winhold; *Fast Neutron-Induced Nuclear Reactions;* 2 years; $23,900

RESEARCH FOUNDATION, OKLAHOMA STATE UNIVERSITY, Stillwater; William J. Leivo; *Resonance and Magnetoresistance in Solids;* 2 years; $30,000

RUTGERS, THE STATE UNIVERSITY, New Brunswick, N.J.; Elihu Abrahams and Peter R. Weiss; *Theoretical Solid State Physics;* 2 years; $75,000

Richard J. Plano; *High Energy Elementary Particle Physics;* 2 years; $132,800

Gerald M. Rothberg and N. Koller; *Solid State Mossbauer Studies;* 2 years; $49,900

ST. JOHN'S UNIVERSITY, Jamaica, N.Y.; Melvin Ferentz; *Adaptation of Computers to Formal Algebraic Calculations in Theoretical Physics;* 2 years; $23,700

SEATTLE PACIFIC COLLEGE INSTITUTE FOR RESEARCH, Seattle, Wash.; Donald D. Kerlee, Roger H. Anderson, Robert C. Hughson, and Ora Karl Krienke; *Nuclear Emulsion Studies of Elementary Particles;* 2 years; $30,000

STANFORD UNIVERSITY, Stanford, Calif.; William M. Fairbank; *Quantum Effects in Liquid and Solid Helium and Superconductors;* 3 years; $147,500

George E. Pake; *Specific Heats and Magnetic Anomalies in Paramagnetic Organic Crystals;* 2 years; $39,300

STATE UNIVERSITY OF IOWA, Iowa City; J. A. Van Allen; *Lithium-Induced Nuclear Reactions;* 3 months; $43,000

SYRACUSE UNIVERSITY RESEARCH INSTITUTE, N.Y.; Richard L. Arnowitt; *Theory of Elementary Particles of Gravitation;* 2 years; $28,600

H. W. Berry; *Energy Distribution of Electrons Ejected in Ionizing Collisions;* 2 years; $20,400

Erich M. Harth and Jack Leitner; *Bubble Chamber Investigations of Strange Particle Interactions;* 3 years; $89,600

John W. Trischka; *Possible Difference in the Electric Charges of the Electron and Proton;* 2 years; $26,500

Peter Fong, Utica; *Theory of Nuclear Fission;* 2 years; $8,900

TUFTS UNIVERSITY, Medford, Mass.; Kathryn A. McCarthy; *Thermal Conductivity of Alkali Halide Crystals;* 2 years; $65,200

UNIVERSITY OF ARIZONA, Tucson; John A. Leavitt; *Scattering Cross Sections and Intermolecular Potentials;* 2½ years; $36,000

UNIVERSITY OF ARKANSAS, Fayetteville; Stephen M. Day; *Spin Lattice Relaxation Times;* 2 years; $33,500

R. H. Hughes; *Spectroscopic Studies with Ion Beams;* 3 years; $45,600

Otto H. Zinke; *Expansion of a Gas Bubble;* 2 years; $18,000

UNIVERSITY OF CALIFORNIA, Berkeley; Charles Kittel; *Theoretical Solid State Physics and Magnetism;* 4 years; $294,100

John G. Phillips and Sumner P. Davis; *Analyses of Molecular Spectra;* 3 years; $120,000

Walter M. Elsasser, La Jolla; *Mechanics and Statistics of Molecular Helices;* 17 months; $20,500

John M. Goodkind, La Jolla; *Exchange Interaction in Helium Three;* 2 years; $33,100

David S. Saxon, Los Angeles; *Theory of Nuclei and Fundamental Particles;* 2 years; $170,000

Carl M. York, Jr., Los Angeles; *High Energy Elementary Particle Experiments;* 2 years; $123,400

Tara P. Das, Riverside; *Theory of Electron Interactions with Nuclear Moments in Solids;* 2 years; $55,300

A. W. Lawson, Robert R. Hewitt, Donald McCollum, and Glen Everett, Riverside; *Fermi Surfaces in Solids;* 3 years; $117,500

UNIVERSITY OF CHICAGO, Chicago, Ill.; Russell J. Donnelly; *The Physics of Fluids;* 2 years; $75,400

Clayton F. Giese; *Cross Sections for Reaction Collisions;* 2 years; $39,600

Roger H. Hildebrand and S. Courtenay Wright; *Elementary Particle Research Using Bubble Chamber Methods;* 2 years; $205,000

Mark G. Inghram; *Chemical Physics by Mass Spectroscopy;* 2 years; $179,300

Masatoshi Koshiba and Riccardo Levi-Setti; *Emulsion-Block Investigation of Cosmic Rays;* 1 year; $84,000

William Lichten; *Fine Structure Studies of Atoms and Molecules;* 30 months; $30,600

Michael G. Priestley; *Electronic Band Structure of Metals;* 2 years; $41,000

UNIVERSITY OF COLORADO, Boulder; Albert A. Bartlett; *Beta-Ray Spectroscopy;* 8 months; $18,200

B. W. Downs and Franz Mohling; *Theory of Nucleon Interactions and Nuclear Structure;* 2 years; $27,000

George Salzman and Freda Salzman; *Field Theory and High Energy Processes;* 29 months; $51,700

Walter H. Tanttila; *Liquid and Gaseous Atomic Phenomena;* 1 year; $14,100

UNIVERSITY OF DAYTON, Dayton, Ohio; F. Bueche; *Molecular Motion of Glass Forming Substances;* 2 years; $25,200

UNIVERSITY OF GEORGIA, Athens; John H. Henkel; *Thermal Conductivity Calculations;* 2 years; $14,900

Malcolm F. Steuer; *Neutron Polarization Studies;* 2 years; $30,000

UNIVERSITY OF ILLINOIS, Urbana; W. Dale Compton; *Color Centers in the Alkali Halides;* 2 years; $41,100

Robert J. Maurer; *Electrical Properties of Ionic Crystals;* 2 years; $11,100

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Burlyn E. Michel; *Control of Soil Moisture During Plant Growth;* 2 years; $2,700

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Robert F. Thorne; *Vascular Plants of Iowa*; 6 months; $4,500

STATE UNIVERSITY OF NEW YORK COLLEGE OF AGRICULTURE AT CORNELL, Ithaca, N.Y.; William L. Brown, Jr.; *Reclassification of the Ants (Formicidae)*; 2 years; $15,800

STEPHEN F. AUSTIN STATE COLLEGE, Nacogdoches, Tex.; Walter H. Lewis; *Cytotaxonomic Study of African Hedyotideae;* 3 years; $24,000

SOUTHERN UNIVERSITY AND AGRICULTURAL AND MECHANICAL COLLEGE, Baton Rouge, La.; Leon R. Roddy; *The Spider Family Clubionidae;* 2 years; $9,700

TEXAS AGRICULTURAL EXPERIMENT STATION, College Station; Frank W. Gould; *Biosystematic Studies in the Genus Bouteloua;* 1 year; $12,000

TULANE UNIVERSITY, New Orleans, La.; George Henry Penn; *Systematics of Dwarf Crawfishes, Genus Cambarellus;* 1 year; $22,200

Alfred E. Smalley; *Freshwater Decapods of Costa Rica;* 3 years; $9,800

Royal D. Suttkus; *Collection of Fishes from Mexico and Central America;* 6 months; $1,000

UNIVERSIDAD DE LOS ANDES, Bogota, Colombia; Alice S. Hunter; *The Drosophilidae (Fruit Flies) of Colombia;* 2 years; $16,100

U.S. SMITHSONIAN INSTITUTE, Washington, D.C.; J. F. Gates Clarke; *South Asian Microlepidoptera, Particularly the Philippine Series;* 2 years; $21,200

G. Arthur Cooper; *Permian Brachiopods of Glass Mountains, Texas;* 2 years; $32,600

Richard S. Cowan; *Taxonomy of the Genus Swartzia;* 1 year; $1,700

Jose Cuatrecasas; *Phanerogams of Colombia;* 2 years; $33,700

Carl J. Drake; *Monographic Studies of the Family Tingidae;* 2 years; $7,500

F. A. McClure; *Taxonomy of the Bamboos: Redefinition of the Genera;* $800

F. A. McClure; *Taxonomy of Bamboos;* 2 years; $41,000

William L. Stern; *Tertiary Forests of the Tonosi-Santiago Basin of Panama;* 2 years; $22,500

Mildred S. Wilson; *Systematics and Distribution of North American Calanoid and Harpacticoid Copepoda;* 5 years; $21,300

John J. Wurdack; *Paramo Flora of Northeastern Peru;* 1 year; $10,800

UNIVERSITY OF ARIZONA, Tucson; Howard K. Gloyd; *The Genus Agkistrodon and Related Groups of Crotalid Snakes;* 1 year; $9,000

Gerhard O. W. Kremp; *Modern and Fossil Fern Spores;* 2 years; $23,800

UNIVERSITY OF BUFFALO, Buffalo, N.Y.; Carl Gans; *Functional Morphology of Squamate Reptilia;* 2 years; $32,000

UNIVERSITY OF CALIFORNIA, Berkeley; Paul D. Hurd, Jr.; *Carpenter Bees of the World;* 3 years; $18,900

E. Gorton Linsley; *Monographic Study of the North American Cerambycidae;* 3 years; $38,300

George F. Papenfuss; *Index of Scientific Names of Algae;* 2 years; $16,500

Ray F. Smith, Paul D. Hurd, Jr., and J. Wyatt Durham; *Paleontological Studies of Tertiary Insect Bearing Amber;* 2 years; $23,700

Johannes Proskauer; *Biosystematic Studies in Onthocerotales;* 3 years; $20,400

Howard L. McKenzie, Davis; *Systematics of Scale Insects (Coccidae)*; 2 years; $29,700

G. Ledyard Stebbins, Davis; *Phylogeny of Galium Multiflorum Complex in Western North America;* 6 months; $2,300

John N. Belkin, Los Angeles; *Systematics and Phylogeny of Mosquitoes;* 2 years; $19,600

Henry J. Thompson, Los Angeles; *Systematics of the Genus Mentzelia (Loasaccae)*; 2 years; $14,200

P. H. Timberlake, Riverside; *A Revision of Bees of the Genus Perdita;* 2 years; $5,600

UNIVERSITY OF CHICAGO, Ill.; Alfred E. Emerson; *Taxonomy, Geographical Distribution Ecology, Social Behavior, and Evolution, of Termites;* 3 years; $56,400

Everett C. Olson; *Upper Permian Vertebrates of Oklahoma;* 3 years; $34,900

UNIVERSITY OF COLORADO, Boulder; Walter Auffenberg; *Evolution of Fossil Tortoises;* 1 year; $7,000

Hugo G. Rodeck; *Systematic Botanical Collections;* 1 year; $15,000

UNIVERSITY OF CONNECTICUT, Storrs; Ralph M. Wetzel and Lowell L. Getz; *Zoogeography of New England Small Mammals;* 2 years; $22,500

UNIVERSITY OF FLORIDA, Gainesville; Pierce Brodkorb; *Fossil Birds;* 2 years; $19,700

Minter J. Westfall, Jr.; *Systematic Studies of North American Zygoptera;* 3 years; $19,800

UNIVERSITY OF GEORGIA, Athens; Charles W. James; *The Taxonomic Status of Erigeron Pusillus Nutt;* 2 years; $4,200

Robert A. Norris; *Comparative Study of Blood Groups in Passerine Birds;* 2 years; $6,300

UNIVERSITY OF ILLINOIS, Urbana; Robert S. Bader; *Variability and Evolution of Dental and Osteometric Traits in Rodents;* 2 years; $18,500

Donald F. Hoffmeister; *Mammals of Southwestern United States and Northern Mexico;* 2 years; $20,400

R. L. Langenheim, Jr.; *Tertiary Corals of Chiapas, Mexico;* 2 years; $20,300

June R. P. Phillips Ross; *Fossil Cryptostome and Trepostome Bryozoa in Middle Ordovician Through Middle Silurian in the Central States;* 2 years; $21,600

UNIVERSITY OF KANSAS, Lawrence; Kathleen Doering and Rynichi Matsuda; *Insect Morphology;* 2 years; $32,000

E. Raymond Hall; *Systematics of Recent Bears (Subgenus Ursus);* 2 years; $15,000

Raymond C. Jackson; *Biosystematic Investigations in Haplopappus;* 3 years; $26,500

Charles D. Michener and Robert R. Sokal; *Methods of Numerical Taxonomy;* 3 years; $21,700

Robert R. Sokal; *Principles of Numerical Taxonomy;* 1 year; $5,500

Rufus H. Thompson; *Life History and Cytogenetics of Species of Families of Green Algae;* 2 years; $17,500

UNIVERSITY OF KANSAS CITY, Kansas City, Mo.; William W. Milstead; *Studies on the Evolution of Box Turtles;* 2 years; $5,000

UNIVERSITY OF LOUISVILLE, Lousiville, Ky.; Arland T. Hotchkiss; *A Cytotaxonomic Study of the Characeae;* 3 years; $32,200

UNIVERSITY OF MAINE, Orono; G. E. Gates; *Revision of the Classification of Earthworms;* 2 years; $16,900

UNIVERSITY OF MARYLAND, College Park; Robert A. Paterson; *Lacustrine Fungi;* 3 years; $8,800

UNIVERSITY OF MASSACHUSETTS, Amherst; Howard E. Bigelow and Margaret E. Barr Bigelow; *Agaricales and Sphaeriales in Northeastern United States;* 3 years; $17,800

Emil F. Guba; *Fungus Genera Monochaetia and Pestalotia;* 1 year; $1,000

UNIVERSITY OF MIAMI, Coral Gables, Fla.; C. Richard Robins; *Larvae and Juveniles of Western Atlantic Flying Fishes (Exocoetidae);* 2 years; $19,000

Gilbert L. Voss; *Amphiurid Brittlestars of the Western Atlantic;* 3 years; $29,800

UNIVERSITY OF MICHIGAN, Ann Arbor; Chester A. Arnold; *Silicified Plants in Western North America;* 1 year; $18,000

Claude W. Hibbard; *Pleistocene Faunas of the Plains Region;* 2 years; $24,200

Rogers McVaugh; *Flood-Plain Rain Forest of Northern Colombia;* 1 year; $1,600

William R. Murchie, Flint; *Systematics of the Oligochaete Genus Diplocardia;* 3 years; $14,500

Alexander H. Smith; *Manual of Fleshy Basidiomycetes of the Western United States;* 3 years; $41,000

F. K. Sparrow; *Studies on the Fungus Genus Physoderma (Phycomycetes);* 3 years; $24,200

Henry van der Schalie; *Systematics and Host-Parasite Relationships of Mollusks in Japan and Taiwan;* 2 years; $13,900

UNIVERSITY OF MINNESOTA, Minneapolis; Richard E. Norris; *Morphological and Cytological Studies on Red Algae;* 1 year; $7,000

UNIVERSITY OF MISSOURI, Columbia; Billy G. Crumbe: *Structural Variation in Secondary Xylem of Herbaceous Dicotyledons;* 2 years; $13,000

Raymond E. Peck; *Late Cretaceous and Tertiary Charophyta of North America;* 2 years; $6,600

UNIVERSITY OF NEBRASKA, Lincoln; Thomas B. Thorson; *The Fluid Compartments of Vertebrates;* 2 years; $12,300

UNIVERSITY OF NORTH CAROLINA, Chapel Hill; William E. Fahy, Morehead City, and William A. Lund, Jr., Cumana, Venezuela; *Shore Fishes in the Vicinity of Cumana, Venezuela;* 1 year; $1,300

Ben W. Smith, Raleigh; *Cytogenetics of Speciation in Pinus;* 2 years; $24,200

UNIVERSITY OF NOTRE DAME, Notre Dame, Ind.; Joseph A. Tihen; *Lower Pliocene Herpetofauna;* 2 years; $16,500

UNIVERSITY OF OKLAHOMA RESEARCH INSTITUTE, Norman; L. R. Wilson and George J. Goodman; *Morphological Study of Pollen of Oklahoma and Vicinity;* 2 years; $19,900

UNIVERSITY OF THE PACIFIC, Stockton, Calif.; Joel W. Hedgpeth, Dillon Beach; *Pycnogonida Collected from the Ross Sea;* 1 year; $6,100

UNIVERSITY OF SAN FRANCISCO, Calif.; Edward L. Kessel; *The Platypezidae of Western North America;* 2 years; $14,000

UNIVERSITY OF SOUTHERN CALIFORNIA, Los Angeles; John S. Garth; *Revision of Hermit Crabs of the Pacific American Coast;* 2 years; $19,200

Robert J. Menzies and John L. Mohr; *Abyssal Isopod Crustacea;* 6 months; $9,100

Olga Hartman; *Marine Annelids of the Japanese Archipelago;* 1 year; $7,500

UNIVERSITY OF TEXAS, Austin; Harold C. Bold; *Phycological Studies of Texas Soils;* 2 years; $23,700

Robert K. Selander; *Behavior and Ecology in Avian Speciation;* 2 years; $43,900

UNIVERSITY OF TORONTO, Toronto, Canada; Glenn B. Wiggins; *Larvae of North American Caddisflies;* 3 years; $13,400

UNIVERSITY OF TULSA, Tulsa, Okla.; Harriet G. Barclay; *Systematics of the Paramos of South America;* 1 year; $5,000

Albert P. Blair and Hague L. Lindsay, Jr.; *Taxonomic Studies on Plethodon Ouachitae and P. Caddoensis;* 2 months; $800.

UNIVERSITY OF UTAH, Salt Lake City; George F. Edmunds, Jr.; *Higher Classification of Ephemeroptera,* 2 years; $32,000

Frederick R. Evans; *Ciliates of Great Salt Lake and Brackish Water Ponds;* 2 years; $12,700

UNIVERSITY OF VERMONT, Burlington; Ross T. Bell; *Ingestive and Digestive Organs of Carabid Beetles;* 1 year; $7,000

UNIVERSITY OF WASHINGTON, Seattle; Paul L. Illg; *Systematics of the Marine Symbiotic Cyclopoida;* 3 years; $26,700

Alan J. Kohn; *Mollusks of the Family Conidae;* 2 years; $15,000

Elva Lawton: *Moss Flora of the Pacific Northwest;* 2 years; $20,400

John Liston and Rita B. Colwell; *Classification and Taxonomy of Gram-negative, Asporogenous, Rod-like, Marine Bacilli;* 2 years; $24,000

UNIVERSITY OF WISCONSIN, Madison; Hugh H. Iltis; *Cytotaxonomical Problems in Flora of the Upper Midwest;* 2 years; $12,200

Hugh B. Iltis; *Biosystematics of Peruvian-Bolivian Species of Solanum;* 3 years; $20,000

John W. Thomson; *American Arctic Lichens;* 3 years; $16,500

John W. Baxter, Milwaukee; *Rust Fungi of Mexico and Southwestern United States;* 3 years; $16,200

VIRGINIA POLYTECHNIC INSTITUTE, Blacksburg; Robert Kral; *Taxonomic Revision of Fimbristylis in North America;* 3 years; $21,500

WASHINGTON STATE UNIVERSITY, Pullman; Marion Ownbey; *Species Problem in Tragopogon;* 2 years; $32,900

Charles Gardner Shaw; *Taxonomic Studies of the Peronosporaceae;* 2 years; $17,500

WASHINGTON UNIVERSITY, St. Louis, Mo.; Robert E. Woodson; *Biometric Studies of Butterfly Weed (Asclepias Tuberosa);* 1 year; $4,800

WESTERN ILLINOIS UNIVERSITY, Macomb; Everett F. Morris; *Genera of the Stilbellaceae;* 1 year; $4,300

YALE UNIVERSITY, New Haven, Conn.; A. Lee McAlester; *Type Species of Paleozoic Nuculoid Pelecypod Genera;* 3 years; $12,500

John H. Ostrum; *Paleontology and Stratigraphy of Lower Cretaceous Deposits of Bighorn Basin Region;* 1 year; $14,000

Satyu Yamaguti, Beltsville, Md.; *Systema Helminthum;* 3 months; $1,750

ZOOLOGICAL SOCIETY OF PHILADELPHIA, PA.; Roger Conant; *The Water Snakes, Genus Natrix, of Mexico;* 1 year; $4,000

GENERAL BIOLOGY

AMERICAN INSTITUTE OF BIOLOGICAL SCIENCES, Washington, D.C.; John R. Olive; *American Tables Committee for the Naples Zoological Station;* 1 year; $6,050

ARCTIC INSTITUTE OF NORTH AMERICA, Washington, D.C.; Spencer Apollonio; *Biological, Physical and Chemical Oceanographic Research at Devon Island;* 1 year; $22,900

John C. Reed, Montreal, Canada; *Facilities and Operating Support for Arctic Oceanographic Research;* 1 year; $44,900

BERMUDA BIOLOGICAL STATION FOR RESEARCH, INC., St. George's West, Bermuda; William H. Sutcliffe, Jr.; *Expanded Marine Biological Studies of the Sargasso Sea;* 1 year; $30,720

GULF COAST RESEARCH LABORATORY, Ocean Springs, Miss.; Gordon Gunter; *Summer Research in the Gulf Coast Research Laboratory;* 2 years; $31,700

HARVARD UNIVERSITY, Cambridge, Mass.; Reed C. Collins; *A Program in Evolutionary Biology;* 3 years; $157,900

HIGHLANDS BIOLOGICAL STATION, INC., Highlands, N.C.; Thelma Howell; *Summer Research at Highlands Biological Station;* 1 year; $8,500

MARINE BIOLOGICAL LABORATORY, Woods Hole, Mass.; Philip B. Armstrong; *High Resolution Electron Microscope for Ultrastructure Studies;* 1 year; $35,400

NEW YORK STATE VETERINARY COLLEGE, CORNELL UNIVERSITY, Ithaca, N.Y.; John H. Whitlock; *Disease Within an Ecosystem;* 3 years; $114,900

ROSCOE B. JACKSON MEMORIAL LABORATORY, Bar Harbor, Maine; Earl L. Green; *Data-Processing Unit for Biological Research;* 5 years; $126,200

UNIVERSITY OF CALIFORNIA, Berkeley; William A. Jensen; *Electron Microscope and Accessories for Fine Structure Studies with Plant Materials;* 1 year; $45,000

UNIVERSITY OF COLORADO, Boulder; C. G. Mackenzie, Denver; *Electron Microscope for Studies on the Relationship of Biochemical Function to Fine Structure of Cells;* 1 year; $45,500

UNIVERSITY OF KANSAS, Lawrence; David Paretsky and Christopher P. Sword; *Electron Microscope for Fine Structure Studies on Biological Materials;* 1 year; $38,600

UNIVERSITY OF MIAMI, Coral Gables, Fla.; C. P. Idyll and F. G. Walton Smith, Miami; *Support of Research Activities of Visiting Investigators;* 2 years; $30,000

UNIVERSITY OF OKLAHOMA, Norman; Carl D. Riggs; *Summer Research at The University of Oklahoma Biological Station;* 3 years; $21,000

UNIVERSITY OF VIRGINIA, Charlottesville; James L. Riopel; *Summer Research Activities at the Mountain Lake Biological Station;* 3 years; $34,000

UNIVERSITY OF WASHINGTON, Seattle; Robert L. Fernald; *Graduate Student Research at Friday Harbor Laboratories;* 3 years; $92,000

WOODS HOLE OCEANOGRAPHIC INSTITUTE, Woods Hole, Mass.; John H. Ryther; *U.S. Program in Biology for the International Indian Ocean Expedition;* 3 years; $450,000

YESHIVA UNIVERSITY, New York, N.Y.; Alfred Gilman and Henry D. Lauson; *Equipment for Interdepartmental Machine Shop;* 1 year; $9,800

BIOLOGICAL AND MEDICAL SCIENCE FACILITIES

ALBERT EINSTEIN MEDICAL CENTER, Philadelphia, Pa.; L. A. Cohen; *Construction of a Laboratory for the Study of Body Orientation and Motor Coordination;* 2 years; $35,000

ARCTIC INSTITUTE OF NORTH AMERICA, Washington, D.C.; Spencer Apollonio; *Facilities and Operating Support for Oceanographic Research;* 1 year; $44,900

CALIFORNIA INSTITUTE OF TECHNOLOGY, Pasadena; E. B. Lewis; *Maintenance of a Collection of Mutant Types of Drosophila Melanogaster;* 5 years; $68,300

COLUMBIA UNIVERSITY, New York, N.Y.; Paul R. Burkholder, Palisades; *Research Laboratory for Marine Biology;* 2 years; $100,000

L. C. Dunn and D. Bennett; *Renovation and Completion of Animal Genetics Laboratories at Nevis Biological Station;* 1 year; $10,700

COMMUNICATION RESEARCH INSTITUTE, St. Thomas, Virgin Islands; John C. Lilly; *Construction of a Communications Research Laboratory;* 1 year; $10,200

DARTMOUTH COLLEGE, Hanover, N.H.; George B. Saul; *Establishment of a Mormoniella Vitripennis Stock Center;* 4 years; $37,000

DUKE UNIVERSITY, Durham, N.C.; C. G. Bookhout; *Cooperative Research and Research Training Program in Biological Oceanography;* $327,000

MARINE BIOLOGICAL LABORATORY, Woods Hole, Mass.; Philip B. Armstrong; *Improved Methods of Collecting Living Marine Forms;* 1 year; $25,000

NAPLES ZOOLOGICAL STATION, Naples, Italy; Peter Dohrn; *Operation of Research Facilities at the Naples Zoological Station;* 5 years; $175,000

ROSCOE B. JACKSON MEMORIAL LABORATORY, Bar Harbor, Maine; Margaret C. Green and Joan Staats; *Maintenance of a Mouse Mutant Stocks Center;* 5 years; $139,700

UNIVERSITY OF CALIFORNIA, Berkeley; P. F. Scholander and F. N. Spiess, La Jolla; *Construction and Operation of Biological Laboratory Ship and Associated Shore Facility;* 3 years; $923,000

C. F. Kelly and A. H. Smith, Davis; *Construction of Facilities for Studies of Chronic Acceleration Effects;* 3 years; $59,000

UNIVERSITY OF COLORADO, Boulder; John W. Marr; *Construction of New Laboratory Building at Science Lodge;* 2 years; $60,000

UNIVERSITY OF FLORIDA, Gainesville; E. Lowe Pierce; *Construction and Equipping of a 32-Foot Motor Launch for Marine Biological Research;* 1 year; $11,100

UNIVERSITY OF MIAMI, Coral Gables, Fla.; E. F. Corcoran, Miami; *Construction of a Radioisotope Storage and Handling Facility;* 1 year; $2,850

F. G. Walton, Miami; *Boat Operations for Biological Research;* 2 years; $39,800.

Warren J. Wisby, Miami; *Construction of a Laboratory for Behavior and Environmental Studies of Marine Animals;* 2 years; $200,000

UNIVERSITY OF MICHIGAN, Ann Arbor; Theodore H. Hubbell; *Facility for Research in Animal Biosystematics;* 5 years; $1,000,000

UNIVERSITY OF OREGON, Eugene; R. R. Huestis; *Maintenance of a Mutant Peromyscus Colony;* 2 years; $19,100

J. Arnold Shotwell; *Study of Environment and Evolution of Mammalian Communities;* 2 years; $88,000

UNIVERSITY OF SOUTHERN CALIFORNIA, Los Angeles; Leslie A. Chambers; *Ship Operations for Biological Oceanographic Research;* 3 years; $200,000

UNIVERSITY OF TENNESSEE, Knoxville; R. C. von Borstel; *Maintenance of a Habrobracon Juglandis Stock Center;* 2 years; $21,400

UNIVERSITY OF VIRGINIA, Charlottesville; James L. Riopel: *Renovation and Improvement of Facilities at the Mountain Lake Biological Station;* 2 years; $25,000

UNIVERSITY OF WASHINGTON, Seattle; Robert L. Fernald; *Expansion and Modernization of Research Facilities of the Friday Harbor Marine Laboratories;* 2 years; $25,000

WALLA WALLA COLLEGE, College Place, Wash.; Harold G. Coffin; *A Collecting and Laboratory Vessel for Biological Research;* 1 year; $8,000

WASHINGTON STATE UNIVERSITY, Pullman; Orlin Biddulph; *Construction of a Controlled Environment Irradiation Facility;* 2 years; $141,000

WOODS HOLE OCEANOGRAPHIC INSTITUTE, Woods Hole, Mass.; Paul M. Fye; *Construction of a Laboratory for Research in Marine Sciences;* 3 years; $2,000,000

Bostwick H. Ketchum; *Ship Operation Costs for Basic Biological Oceanographic Research;* 1 year; $150,000

WORCESTER FOUNDATION FOR EXPERIMENTAL BIOLOGY, INC., Shrewsbury, Mass.; Ralph Dorfman; *Construction of a Building Extension for a Special Equipment Center;* 3 years; $330,000

MATHEMATICAL, PHYSICAL, AND ENGINEERING SCIENCE FACILITIES

COLUMBIA UNIVERSITY, New York, N.Y.; Ralph S. Halford; *Establishment of a Computing Center;* 1 year; $100,000

CORNELL UNIVERSITY, Ithaca, N.Y.; Boyce D. McDaniel; *Electron Accelerator Studies at 3 Mev.;* 1 year; $109,600

JOHNS HOPKINS UNIVERSITY, Baltimore, Md.; Donald W. Pritchard; *Construction of a New Oceanographic Shore Facility;* 1 year; $650,000

KANSAS STATE UNIVERSITY, Manhattan; William R. Kimel; *Modification of Kansas State University TRIGA Mark II Reactor for Research;* 1 year; $108,285

William R. Kimel; *Modification of Nuclear Reactor;* 1 year; $26,600

NEW YORK UNIVERSITY, New York; Harold K. Work; *Land Base for Oceanographic Vessel;* 1 year; $25,000

OREGON STATE UNIVERSITY, Corvallis; Wayne V. Burt; *Construction of an Oceanographic Research Laboratory;* 1 year; $500,000

STANFORD UNIVERSITY, Stanford, Calif.; Walter E. Meyerhof; *Acquisition of a Multi-*

Stage Van de Graaff Accelerator; 3 years; $1,299,700

STATE UNIVERSITY OF IOWA, Iowa City; J. A. Van Allen; *Acquisition of a 5.5 Mev Van de Graaff Accelerator;* 2 years; $641,100

TEXAS AGRICULTURAL AND MECHANICAL RESEARCH FOUNDATION, College Station; Hugh J. McLellan; *Acquisition, Conversion and Outfitting of a 180 Foot Vessel for Oceanographic Research;* 1 year; $875,000

TUSKEGEE INSTITUTE, Tuskegee Institute, Ala.; Z. W. Dybczak; *Establishment of a Computing Center;* 1 year; $20,000

UNIVERSITY OF CALIFORNIA, Berkeley; Jeffery Frautschy, La Jolla; *Construction of an Experimental Laboratory Building;* 2 years; $350,000

Nello Pace; *Basic Research Facilities at the White Mountain Research Station;* 2 years; $60,000

UNIVERSITY OF CHICAGO, Ill.; Samuel K. Allison; *Acquisition of a 4 Mev Van de Graaff Accelerator;* 2 years; $296,700

UNIVERSITY OF FLORIDA, Gainesville; J. Wayne Reitz; *Expansion of Computing Center;* 1 year; $200,000

UNIVERSITY OF HAWAII, Honolulu; Robert W. Hiatt; *Construct and Equip an Institute of Geophysics;* 2 years; $2,700,000

UNIVERSITY OF MICHIGAN, Ann Arbor; David C. Chandler; *Conversion of Motor Vessel RANGER II for Oceanographic Research;* 1 year; $147,500

David C. Chandler; *Construction of a 49-foot Research Vessel;* 1 year; $85,900

UNIVERSITY OF PITTSBURGH, Pittsburgh, Pa.; B. L. Cohen; *Acquisition of a Three Stage Tandem Van de Graaff Accelerator;* 3 years; $977,600

UNIVERSITY OF WASHINGTON, Seattle; Ronald Geballe; *Acquisition of a Tandem Van de Graaff Accelerator;* 3 years; $1,240,000

WASHINGTON UNIVERSITY, St. Louis, Mo.; Carl Tolman; *Expansion of Computing Center;* 1 year; $250,000

WOODS HOLE OCEANOGRAPHIC INSTITUTE, Woods Hole, Mass.; Paul M. Fye; *Design and Construction of an Oceanographic Research Vessel;* 1 year; $82,400

CONTINUED ANTARCTIC RESEARCH

AMERICAN GEOGRAPHICAL SOCIETY, New York, N.Y.; William Briesemeister; *Revision of the Map of Antarctica, New Edition 1964;* 2 years; $13,100

William Briesemeister; *Preparation of a New Map of Antarctica;* 1 year; $9,800

ARCTIC INSTITUTE OF NORTH AMERICA, Washington, D.C.; Brian P. Sandford; *Aurora and Airglow Data Reduction;* 1 year; $11,151

Robert C. Faylor; *Chief Scientist, U.S. Antarctic Research Program;* 1 year; $3,835

Norman J. Oliver; *Aurora and Airglow Research Program, 1962–63;* 21 months; $161,200

Norman J. Oliver; *Aurora and Airglow at Eights Station, 1962–63;* 2 years; $27,300

BARTOL RESEARCH FOUNDATION, FRANKLIN INSTITUTE, Philadelphia, Pa.; Martin A. Pomerantz; *Shipboard Cosmic Ray Station;* 2 years; $42,460

Martin A. Pomerantz; *Time Variations of Primary Cosmic Radiation Near the South Geomagnetic Pole (McMurdo);* 1 year; $92,800

BERNICE P. BISHOP MUSEUM, Honolulu, Hawaii; J. Linsley Gressitt; *Entomological Research in Antarctic Regions, with Emphasis on Natural Dispersal;* 2 years; $31,920

J. Linsley Gressitt; *Entomological Research in Antarctic Regions, with Emphasis on Natural Dispersal;* 2 years; $49,000

BOSTON COLLEGE, Chestnut Hill, Mass.; James J. Devlin; *Continuation of Patrol Spectrograph Data Reduction;* 1 year; $59,800

BOWLING GREEN STATE UNIVERSITY, Bowling Green, Ohio; Charles C. Rich; *Glacial Geology and Geomorphology of the Darwin and Carlyon Glaciers Area;* 18 months; $9,100

CALIFORNIA INSTITUTE OF TECHNOLOGY, Pasadena; Heinz A. Lowenstam; *A Biogeochemical Study of the Skeletal Carbonates of the Benthic Organisms in the Antarctic Seas;* 1 year; $2,400

COLUMBIA UNIVERSITY, New York, N.Y.; Paul R. Burkholder, Palisades; *Microbiological Investigations in Antarctica;* 1 year; $34,585

Maurice Ewing, Palisades; *Systematic Oceanographic Survey in the Drake Passage and in the Antillean Sea (Scotia Sea);* 42 months; $264,460

Jack Oliver, Palisades; *Continued Conduct of Station Seismology Program—1962;* 1 year; $1,770

FLORIDA STATE UNIVERSITY, Tallahassee; H. G. Goodell, D. S. Gorsline and J. K. Osmond; *Analysis of Oceanic Bottom Sediments from Operation Deep Freeze;* 1 year; $15,924

J. K. Osmond, H. G. Goodell and D. S. Gorsline; *Marine Geologic Field Work in the South Antilles Basin and Associated Areas;* 1 year; $33,420

GEORGE WASHINGTON UNIVERSITY, Washington, D.C.; William M. Smith; *Antarctic Scientific Personnel Project;* 1 year; $12,840

HARVARD UNIVERSITY, Cambridge, Mass.; I. Mackenzie Lamb; *Botanical Survey in West Antarctica;* 1 year; $3,850

JOHNS HOPKINS UNIVERSITY, Baltimore, Md.; W. J. L. Sladen and W. L. N. Tickell; *The Comparative Behavior and Ecology of the Albatrosses of the Genus Diomedea;* 1 year; $8,880

William J. L. Sladen; *Behavior and Ecology of the Wandering Albatross;* 3 years; $65,400

William J. L. Sladen and Carl R. Eklund; *USARP Bird-banding Program, 1962–63;* 1 year; $16,300

NATIONAL ACADEMY OF SCIENCES-NATIONAL RESEARCH COUNCIL, Washington, D.C.; G. D. Meid; *1962 Meeting of the Scientific Committee on Antarctic Research (SCAR);* 1 year; $10,900

Ross C. Peavey; *Continued Support of Activities of the Committee on Polar Research;* 1 year; $69,900

OHIO STATE UNIVERSITY RESEARCH FOUNDATION, Columbus; William L. Boyd; *Ecological Survey of Antarctic Bacteria;* 1 year; $15,200

Colin Bull; *Analysis of Antarctic Thermal, Gravity, Glaciological and Paleomagnetic Data;* 18 months; $18,500

Paul C. Dalrymple; *Analysis of Antarctic Micrometeorological Data;* 1 year; $7,902

George A. Doumani and Samuel B. Treves; *Geology of the Mt. Weaver Area (Queen Maud Mts.);* 32 months; $50,800

R. B. Forrest; *Ice Surface Movements on the Rockefeller Plateau;* 18 months; $34,700

Richard P. Goldthwait; *Continued Support of the Institute of Polar Studies, 1961–62;* 1 year; $28,200

Kenji Kojima; *Analysis of Density Profiles of the Firn and Ice in Antarctica During the IGY–IGC 1959 Program;* 1 year; $14,905

Madison E. Pryor; *Ecological Survey of Soil Arthropods in Relation to Microenvironment, Mirny Station, Antarctica;* 30 months; $43,387

E. D. Rudolph; *Ecological and Floristic Investigations of Antarctica Lichens;* 1 year; $16,676

E. D. Rudolph; *Ecology and Floristic Investigations of Antarctic Lichens;* 2 years; $21,400

L. D. Taylor; *Traverse Glaciology (1962–63);* 18 months; $20,500

Samuel B. Treves; *Petrography of Marguerite Bay Area, Palmer Peninsula, Antarctica;* 1 year; $5,878

Samuel B. Treves and Arthur Mirsky; *Petrography of the Mt. Gran Area, Antarctica;* 1 year; $3,250

RUTGERS, THE STATE UNIVERSITY, New Brunswick, N.J.; J. C. F. Tedrow; *Pedologic Processes in Antarctica;* 1 year; $27,500

STANFORD UNIVERSITY, Stanford, Calif.; R. A. Helliwell, A. M. Peterson and O. G. Villard, Jr.; *Radio-Science Research Aboard the USNS ELTANIN;* 1 year; $212,510

R. A. Helliwell; *Study of Geomagnetic Conjugate to the ELTANIN'S* Course in *1962;* 1 year; $57,600

R. A. Helliwell; *A Land VLF Traverse Conjugate to the ELTANIN'S Course in 1962;* 1 year; $57,600

R. A. Helliwell; *VLF Phenomena in Antarctica, 9162–63;* 1 year; $100,200

R. A. Helliwell; *Radio Science at Eights Station, Antarctica;* 2 years; $245,000

R. A. Helliwell; *Geomagnetic Latitude Control of VLF Phenomena;* 1 year; $23,900

Donald E. Wohlschlag; *Continuing Ecological and Physiological Studies of McMurdo Sound Marine Animals;* 4 months; $6,100

Donald E. Wohlschlag; *Ecological and Physiological Studies of McMurdo Sound Marine Animals;* 2 years; $51.600

TEXAS AGRICULTURAL AND MECHANICAL RESEARCH FOUNDATION, College Station; Sayed Z. El-Sayed; *Primary Productivity in Drake Passage (Southern Ocean);* 1 year; $26,200

Donald W. Hood; *Calcium Carbonate Saturation Level of the Ocean from Latitudes of North America to Antarctica;* 1 year; $18,700

Dale F. Leipper and Luis Capurro; *Surface and Deep Current Measurements in the Drake Passage (Southern Ocean);* 1 year; $28,300

TEXAS TECHNOLOGICAL COLLEGE, Lubbock; F. Alton Wade; *Geology of the Shackleton Glacier Area, Queen Maud Range;* 2 years; $41,500

TUFTS UNIVERSITY, Medford, Mass.; Robert L. Nichols; *Geomorphological Field Project in the Wright, Victoria, and Gran Mountain Dry Valleys;* 9 months; $14,400

U.S. ARMY COLD REGIONS RESEARCH & ENGINEERING LABORATORY, Wilmette, Ill.; James A. Bender; *Analysis of Deep Ice Cores From Greenland and Antarctica;* 1 year; $30,000

U.S. DEPARTMENT OF COMMERCE, COAST & GEODETIC SURVEY, Washington, D.C.; H. Arnold Karo; *Training of Chilean Antarctic Magnetic Observer;* 6 months; $2,675

H. Arnold Karo; *Antarctic Seismological Observatories, 1962–63;* 20 months; $11,000

H. Arnold Karo; *Station and Traverse Magnetic Observations, 1962–63;* 20 months; $133,800

U.S. DEPARTMENT OF COMMERCE, NATIONAL BUREAU OF STANDARDS, Washington, D.C.; F. W. Brown, Boulder, Colo.; *Study of Ionospheric Absorption at Mirny Base, Antarctica, Using Cosmic Noise Method;* 2 years; $10,600

F. W. Brown, Boulder, Colo; *Study of Radio Noise Aboard the Ship to be Used as a Floating Antarctic Research Station;* $8,000

F. W. Brown, Boulder, Colo; *Radio Noise Measurements—Floating Antarctic Research Station;* 2 years; $71,850

F. W. Brown, Boulder, Colo.; *High Latitude Studies of the Ionosphere at Magnetically Conjugate Points;* 1 year; $100,000

F. W. Brown, Boulder, Colo.; *Antarctic Ionospheric Soundings Program, 1962–63;* 2 years; $150,600

C. Gordon Little, Boulder, Colo.; *High Latitude Ionosphere at Magnetically Conjugate Points;* 1 year; $100,200

J. William Wright, Boulder, Colo.; *Antarctic Ionosphere Studies;* 1 year; $34,000

U.S. DEPARTMENT OF COMMERCE, WEATHER BUREAU, Washington, D.C.; F. W. Reichelderfer; *Antarctic Meteorological Research Program—1961;* $70,000

F. W. Reichelderfer; *Antarctic Meteorological Research Program;* 2 years; $377,840

F. W. Reichelderfer; *Antarctic Field Operations;* 4 years; $142,640

F. W. Reichelderfer; *Antarctic Meteorological Research Aboard the ELTANIN;* 2 *years;* $93,390

F. W. Reichelderfer; *A Combined Aircraft and Satellite Ice and Albedo Survey Over Antarctic Waters;* 1 year; $26,613

F. W. Reichelderfer; *Meteorological Research Program in Antarctica, 1962–63;* 37 months; $332,200

U.S. DEPARTMENT OF DEFENSE, NAVY HYDROGRAPHIC OFFICE, Washington, D.C.; E. C. Stephan; *Shipboard Marine Geophysical Studies in the Antarctic and Subantarctic;* 1 year; $90,080

E. C. Stephan; *Ship-based Oceanography in the Antarctic and Subantarctic;* 1 year; $61,500

U.S. DEPARTMENT OF THE INTERIOR, BUREAU OF MINES, Washington, D.C.; Marling J. Ankeny; *Investigation of Methods and Conditions of Mineral Exploration and Evaluation of Mineral Potential in Isolated Areas Such as Antarctica;* 1 year; $3,825

U.S. DEPARTMENT OF THE INTERIOR, GEOLOGICAL SURVEY, Washington, D.C.; Thomas B. Nolan; *Plastic Relief Antarctic Map;* 1 year; $11,000

Thomas B. Nolan; *Program for Antarctic Mapping Operations;* $88,000

Thomas B. Nolan; *Geology of the Pensacola Mountains;* 18 months; $59,600

Thomas B. Nolan, *Antarctic Mapping Operations, 1962–63;* 1 year; $121,400

U.S. DEPARTMENT OF THE INTERIOR, OFFICE OF GEOGRAPHY, Washington, D.C.; Meredith F. Burrill; *Standard Geographic Nomenclature in Antarctica for United States Use;* 1 year; $12,400

UNIVERSITY OF ALASKA, College; C. T. Elvey; *Shipboard Installation and Operation of a Riometer and Photometer in the Antarctic Oceans;* 1 year; $38,612

Robert B. Forbes; *Petrology of the Volcanic Rocks of Ross Island;* 18 months; $18,100

Keith B. Mather; *Conjugate Ionospheric Phenomena (USNS Eltanin);* 1 year; $1,800

UNIVERSITY OF ARIZONA, Tucson; Lucy M. Cranwell; *Palynology of Antarctica;* 3 years; $27,100

UNIVERSITY OF CALIFORNIA, Berkeley; George M. Briggs; *Nutrition and Ecology of Antarctic Micrometazoa (Fresh-Water);* 1 year; $34,027

Charles R. Goldman, Davis; *Studies on Basic Energy Sources and Pathways in Antarctic Ponds and Lakes;* $1,100

Charles R. Goldman, Davis; *Basic Energy Sources and Pathways in Antarctic Ponds and Lakes;* 1 year; $19,800

UNIVERSITY OF SOUTHERN CALIFORNIA, Los Angeles; John L. Mohr and Leslie A. Chambers; *Biological Oceanology in the Antarctic Seas;* 1 year; $108,450

UNIVERSITY OF KANSAS, Lawrence; Kenneth B. Armitage and Ernest E. Angino; *A Limnological and Geochemical Investigation of Lakes Bonney and Vanda, Antarctica;* 18 months; $18,352

UNIVERSITY OF MARYLAND, College Park; S. F. Singer; *Cosmic Ray Monitoring at Hallett Station, Antarctica;* 1 year; $18,000

UNIVERSITY OF MICHIGAN, Ann Arbor; James H. Zumberge; *Ross Ice Shelf Studies;* 1 year; $5,000

James H. Zumberge; *Ross Ice Shelf Studies, 1962–63;* 1 year; $70,100

UNIVERSITY OF MINNESOTA, Minneapolis; Campbell Craddock; *Geology of the Ellsworth Mountains;* 1 year; $70,600

UNIVERSITY OF MISSOURI, Columbia; W. D. Keller; *Glacial Milk and Rock Flour from Antarctic Glaciers;* 1 year; $14,684

UNIVERSITY OF TEXAS, Austin; Thomas G. Barnes, El Paso; *Meteorological Rocket Probes of the Upper Atmosphere in the Antarctic;* 2 years; $124,940

UNIVERSITY OF WISCONSIN, Madison; Robert F. Black; *Patterned Ground in Antarctica;* 1 year; $32,900

Robert H. Dott, Jr.; *Stratigraphy and Sedimentology of the Antarctic Peninsula and Southern Chile;* 1 year; $28,400

John T. Emlen, Jr., and Richard L. Penney; *Orientation Mechanisms and Related Behavior in the Adelie Penguin;* 1 year; $19,800

Richard Lee Penney; *The Behavior of the Adelie Penguin;* 1 year; $3,618

Robert A. Ragotzkie; *Physical Limnology of Antarctic Lakes;* 1 year; $25,200

George P. Woollard, Charles R. Bentley and Mario Giovinetto; *Antarctic Traverse Program;* 1 year; $122,435

G. P. Woollard; *Gravity and Magnetic Studies in the Waters Adjacent to Antarctica;* 1 year; $23,032

G. P. Woollard and R. A. Schmidt; *Microscopic Extraterrestrial Particles in the Antarctic Ice Cap;* 1 year; $37,190

G. P. Woollard and C. R. Bentley; *Continuation of Antarctic Traverse Program, 1962–63;* 1 year; $204,300

VIRGINIA FISHERIES LABORATORY, Gloucester Point, Va.; William J. Hargis, Jr.; *Parasites of Antarctic Vertebrates and Invertebrates;* 38 months; $21,100

APPENDIX D

Other than Basic Research Grants

EDUCATION IN THE SCIENCES

ACADEMIC YEAR INSTITUTES FOR COLLEGE TEACHERS

CORNELL UNIVERSITY, Ithaca, N.Y.; C. L. Comar; 11 months; $50,700

UNIVERSITY OF MINNESOTA, Minneapolis; Will M. Myers, St. Paul; 10 months; $46,300

ACADEMIC YEAR INSTITUTES FOR JUNIOR COLLEGE TEACHERS

UNIVERSITY OF THE PACIFIC, Stockton, Calif.; Emerson G. Cobb; 10 months; $101,000

ACADEMIC YEAR INSTITUTES FOR SECONDARY SCHOOL AND COLLEGE TEACHERS

HARVARD UNIVERSITY, Cambridge, Mass.; Victor Guillemin, Jr.; $2,470
Victor Guillemin; 1 year; $318,500

LOUISIANA STATE UNIVERSITY, Baton Rouge; Houston T. Karnes; 11 months; $282,800

OHIO STATE UNIVERSITY, Columbus; John S. Richardson; 11 months; $289,900

OKLAHOMA STATE UNIVERSITY, Stillwater; James H. Zant; 14 months; $236,105

OREGON STATE UNIVERSITY, Corvallis; Stanley E. Williamson; 11 months; $294,910

SYRACUSE UNIVERSITY, Syracuse, N.Y.; Alfred T. Collette; 14 months; $287,000
Alfred T. Collette; 11 months; $6,200

UNIVERSITY OF COLORADO, Boulder; John M. Cleveland; 11 months; $302,900

UNIVERSITY OF ILLINOIS, Urbana; Joseph Landin; 1 year; $310,800

UNIVERSITY OF MICHIGAN, Ann Arbor; Alfred M. Elliott; 11 months; $284,000

UNIVERSITY OF TEXAS, Austin; Robert N Little; 1 year; $263,400

ACADEMIC YEAR INSTITUTES FOR SECONDARY SCHOOL TEACHERS

AGRICULTURAL AND MECHANICAL COLLEGE OF TEXAS, College Station; J. G. Potter; 11 months; $189,600

AGRICULTURAL AND TECHNICAL COLLEGE OF NORTH CAROLINA, Greensboro; Gerald A. Edwards; 9 months; $121,275

ARIZONA STATE UNIVERSITY, Tempe; Alan T. Wager; 11 months; $278,800

ATLANTA UNIVERSITY, Atlanta, Ga.; K. A. Huggins; 11 months; $266,800

BOSTON COLLEGE, Chestnut Hill, Mass.; Stanley J. Bezuszka; 10 months; $235,500

BOWDOIN COLLEGE, Brunswick, Maine; Reinhard L. Korgen; $2,900

BOWLING GREEN STATE UNIVERSITY, Bowling Green, Ohio, Bruce R. Vogeli; 11 months; $199,100

BROWN UNIVERSITY, Providence, R.I.; Elmer R. Smith; 11 months; $275,700

CORNELL UNIVERSITY, Ithaca, N.Y.; Damon Boynton; 1 year; $251,400

FISK UNIVERSITY, Nashville, Tenn.; Myron B. Towns; 9 months; $113,900

ILLINOIS INSTITUTE OF TECHNOLOGY, Chicago; L. R. Wilcox; 1 year; $103,800

KANSAS STATE TEACHERS COLLEGE, Emporia; Ted F. Andrews; 1 year; $207,800

MICHIGAN STATE UNIVERSITY, East Lansing; John M. Mason: 11 months: $271,500

NEW MEXICO HIGHLANDS UNIVERSITY, Las Vegas; E. Gerald Meyer; 11 months; $287,600

PENNSYLVANIA STATE UNIVERSITY. University Park; William H. Powers; 10 months; $189,864

RUTGERS, THE STATE UNIVERSITY; New Brunswick, N.J.; Robert E. Bryan; 11 months; $193,740

SAN DIEGO STATE COLLEGE FOUNDATION, San Diego, Calif.; Gerald A. Becker; 11 months; $167,500

SAN JOSE STATE COLLEGE FOUNDATION, San Jose, Calif.; Leonard Feldman; 10 months; $140,875

STANFORD UNIVERSITY, Stanford, Calif.; Harold M. Bacon; 9 months; $286,300

STATE COLLEGE OF IOWA, Cedar Falls; Robert A. Rogers; 11 months; $301,110

STATE UNIVERSITY OF SOUTH DAKOTA, Vermillion; Charles M. Vaughn; 11 months; $303,400

TEMPLE UNIVERSITY, Philadelphia, Pa.; E. L. Offenbacher; 11 months; $167,900

TEXAS WOMAN'S UNIVERSITY, Denton; Dixie Young; 11 months; $63,400

UNIVERSITY OF DETROIT, Mich.; Lyle E. Mehlenbacher; 11 months; $146,200

UNIVERSITY OF GEORGIA, Athens; Jonathan J. Westfall; 10 months; $280,900

UNIVERSITY OF HAWAII, Honolulu; Michael M. Frodyma; 9 months; $110,400

UNIVERSITY OF MISSISSIPPI, University; Noel A. Childress; 10 months; $189,400

UNIVERSITY OF NEW MEXICO, Albuquerque; Wilson H. Ivins; 1 year; $280,900

UNIVERSITY OF NORTH CAROLINA, Chapel Hill; E. C. Markham; 10 months, $299,800

UNIVERSITY OF NORTH DAKOTA, Grand Forks; J. Donald Henderson; 11 months; $254,300

UNIVERSITY OF NOTRE DAME, Notre Dame, Ind.; Arnold E. Ross; 11 months, $258,600

UNIVERSITY OF PENNSYLVANIA, Philadelphia; J. F. Hazel; 11 months; $271,200

UNIVERSITY OF PUERTO RICO, Rio Piedras; Mariano Garcia; 10 months; $133,900

UNIVERSITY OF SOUTH CAROLINA, Columbia; W. L. Williams; 1 year; $192,000

UNIVERSITY OF TENNESSEE, Knoxville; James A. Cooley; 1 year; $147,600

UNIVERSITY OF UTAH, Salt Lake City; Thomas J. Parmley; 11 months; $261,000

UNIVERSITY OF VIRGINIA, Charlottesville; James W. Cole, Jr.; 11 months; $277,941

UNIVERSITY OF WISCONSIN, Madison; Henry Van Engen; 1 year; $74,700

WASHINGTON UNIVERSITY, St. Louis, Mo.; E. U. Condon; 14 months; $280,200

WESLEYAN UNIVERSITY, Middletown, Conn.; Joseph S. Daltry; 1 year; $83,700

WEST VIRGINIA UNIVERSITY, Morgantown; James B. Hickman; 10 months; $167,000

ADVANCED SCIENCE SEMINARS

AGRICULTURAL AND MECHANICAL COLLEGE OF TEXAS, College Station; B. C. Moore; 6 weeks; $34,950

AMERICAN PHYTOPATHOLOGICAL SOCIETY, Yonkers, N.Y.; William B. Hewitt, University of California, Davis; 1 week; $620

AMERICAN SOCIETY OF ZOOLOGISTS, Urbana, Ill.; Curt Stern, University of California; 1 week; $5,060

BERMUDA BIOLOGICAL STATION FOR RESEARCH, INC., St. George's West, Bermuda; Keith E. Chave, Lehigh University; 6 weeks; $8,200

BRANDEIS UNIVERSITY, Waltham, Mass.; Saul Barshay; 6 weeks; $42,420

CARNEGIE INSTITUTE OF TECHNOLOGY, Pittsburgh, Pa.; Alan J. Perlis; $5,620

FLORIDA STATE UNIVERSITY, Tallahassee; Charles R. Storey, Jr.; 8 weeks; $38,470

HARVARD UNIVERSITY, Cambridge, Mass.; William Liller; 11 weeks; $15,170

ILLINOIS INSTITUTE OF TECHNOLOGY, Chicago; Richard S. Hartenberg, Northwestern University; 8 weeks; $38,700

NATIONAL ACADEMY OF SCIENCES-NATIONAL RESEARCH COUNCIL, Washington, D.C.; D. L. Blackstone, Jr., University of Wyoming; 16 months; $50,000

NEW YORK STATE COLLEGE OF AGRICULTURE, CORNELL UNIVERSITY, Ithaca, N.Y.; W. F. Mai; 5 weeks; $25,240

PENNSYLVANIA STATE UNIVERSITY, University Park; G. W. Brindley; 2 weeks; $8,555

PRINCETON UNIVERSITY, Princeton, N.J.; Melvin B. Gottlieb; 6 weeks; $48,000

RESEARCH FOUNDATION OF STATE UNIVERSITY OF NEW YORK, Albany; Hardy L. Shirley, Syracuse; 10 months; $19,875

UNIVERSITY OF COLORADO, Boulder; Wesley E. Brittin; 16 months; $53,710

UNIVERSITY OF DENVER, Denver, Colo.; William M. Mueller; Colorado Seminary; 8 weeks; $40,545

UNIVERSITY OF FLORIDA, Gainesville; Per-Olov Lowdin; 9 months; $4,000
Robert E. Uhrig; 8 weeks; $35,990

UNIVERSITY OF HOUSTON, Houston, Tex.; Elliott I. Organick; 8 weeks; $42,690

UNIVERSITY OF KANSAS, Lawrence; E. R. Hall; 12 weeks; $2,000
G. Baley Price; 8 weeks; $39,380

UNIVERSITY OF MARYLAND, College Park; Hugh D. Sisler; 6 weeks; $56,190

UNIVERSITY OF NORTH CAROLINA, Chapel Hill; John W. Carr III; 1 year; $3,000

UNIVERSITY OF OLAHOMA RESEARCH INSTITUTE, Norman; William E. Bittle; 8 weeks; $7,355

UNIVERSITY OF OREGON, Eugene; A. F. Moursund; 8 weeks; $40,450

UNIVERSITY OF ROCHESTER, Rochester, N.Y.; Leonard Gillman; 8 weeks; $40,200

UNIVERSITY OF SOUTHERN CALIFORNIA, Los Angeles; Jay M. Savage; 8 weeks; $41,690

UNIVERSITY OF TEXAS, Austin; Howard T. Odum, Port Aransas; 2 months; $9,000

VIRGINIA POLYTECHNIC INSTITUTE, Blacksburg; James B. Eades, Jr.; $7,500
C. I. Rich; 4 weeks; $40,160

WOODS HOLE OCEANOGRAPHIC INSTITUTE, Woods Hole, Mass.; Melvin E. Stern; 3 months; $30,500

YALE UNIVERSITY, New Haven, Conn.; Dirk Brouwer; 6 weeks; $46,930
Talbot H. Waterman; 14 weeks; $20,360

COORDINATED SUMMER AND IN-SERVICE INSTITUTES

ADELPHI COLLEGE, Garden City, N.Y.; H. A. Robinson; 11 months; $111,310
Donald Solitar; 11 months; $72,200

BOSTON COLLEGE, Chestnut Hill, Mass.; Stanley J. Bezuszka; 10 months; $74,120

BOWLING GREEN STATE UNIVERSITY, Bowling Green, Ohio; Bruce R. Vogeli; 1 year; $65,270

EAST TEXAS STATE COLLEGE, Commerce; Charles S. Rohrer; 1 year; $93,220

FLORIDA STATE UNIVERSITY, Tallahassee; J. Stanley Marshall; 11 months; $123,580

FORDHAM UNIVERSITY, New York, N. Y.; Charles J. Lewis; 10 months; $72,640

HOWARD PAYNE COLLEGE, Brownwood, Tex.; Leonard R. Daniel; 11 months; $56,350

MONTCLAIR STATE COLLEGE, Upper Montclair, N.J.; Max A. Sobel; 1 year; $86,830

NORTH TEXAS STATE UNIVERSITY, Denton; Robert C. Sherman; 11 months; $91,550

UNIVERSITY OF ALABAMA, University; Julian D. Mancill; 1 year; $160,740

UNIVERSITY OF BUFFALO, Buffalo, N.Y.; Harriet F. Montague; 10 months; $54,680

UNIVERSITY OF DETROIT, Detroit, Mich.; Everette L. Henderson; 11 months; $65,720
Lyle E. Mehlenbacher, 1 year; $62,950

UNIVERSITY OF MARYLAND, College Park; James A. Hummel and Richard A. Good; 11 months; $52,690

UNIVERSITY OF NEW HAMPSHIRE, Durham; Shepley L. Ross; 11 months; $89,180

UNIVERSITY OF PUERTO RICO, Mayaguez; Virgilio Biaggi, Jr.; 11 months; $46,430

UNIVERSITY OF SANTA CLARA, Santa Clara, Calif.; Gerald L. Alexanderson and Irving Sussman; 11 months; $79,300

UNIVERSITY OF TOLEDO, Toledo, Ohio; Archie N. Solberg; 11 months; $74,150

WAYNE STATE UNIVERSITY, Detroit, Mich.; Karl W. Folley; 1 year; $76,080

WESTERN KENTUCKY STATE COLLEGE, Bowling Green; Ward C. Sumpter; 11 months; $93,680

WESTERN MICHIGAN UNIVERSITY, Kalamazoo; James H. Powell, 11 months; $78,560

WORCESTER POLYTECHNIC INSTITUTE, Worcester, Mass., Richard F. Morton; 11 months; $96,650

COOPERATIVE COLLEGE-SCHOOL SCIENCE PROGRAM

CARNEGIE INSTITUTE OF TECHNOLOGY, Pittsburgh, Pa.; E. M. Williams; 32 weeks; $29,-975

CHAPMAN COLLEGE, Orange, Calif.; Peter Coad; 9 weeks; $7,945
Peter Coad; 39 weeks; $5,695

CLARKSON COLLEGE OF TECHNOLOGY, Potsdam, N.Y.; Robert D. Larsson; 10 weeks; $1,400

COLGATE UNIVERSITY, Hamilton, N.Y.; Robert E. Todd; 6 weeks; $19,650

COLUMBIA UNIVERSITY, New York, N.Y.; Donald Barr; 28 weeks; $45,000

CORNELL UNIVERSITY, Ithaca, N.Y.; Philip G. Johnson; 18 months; $4,500
Philip G. Johnson; 25 weeks; $22,890

EAST TEXAS STATE COLLEGE, Commerce, Tex.; William W. Taylor; 35 weeks; $7,215

FAIRMONT STATE COLLEGE, Fairmont, W. Va.; James A. LaRue, 34 weeks; $10,730

LOUISIANA STATE UNIVERSITY, Baton Rouge, La.; Harry J. Bennett; 5 weeks; $22,725

LOYOLA UNIVERSITY OF LOS ANGELES, Los Angeles, Calif.; Clarence J. Wallen; 30 weeks; $5,490

MANHATTAN COLLEGE, New York, N.Y.; C. Leonard O'Connor; 30 weeks; $12,310

MILLARD FILLMORE RESEARCH INSTITUTE, Buffalo, N.Y.; Elemer R. Gabrieli; 8 weeks; $1,375

NATIONAL CHILDREN'S CARDIAC HOSPITAL, Miami, Fla.; Milton S. Saslaw; 32 weeks; $11,625

NEW ENGLAND COLLEGE, Henniker, N.H.; Harold C. Downes; 20 weeks; $4,600

NEW YORK UNIVERSITY, New York; Alfred Perlmutter; 6 weeks; $18,220

NORTH DAKOTA STATE UNIVERSITY, Fargo; Donald Schwartz; 36 weeks; $2,260

NORTHEAST MISSOURI STATE TEACHERS COLLEGE, Kirksville; Dean A. Rosebery; 9 weeks; $18,600

OKLAHOMA STATE UNIVERSITY, Stillwater; Robert C. Fite; 8 weeks; $27,500

ST. CLOUD STATE COLLEGE, St. Cloud, Minn.; Philip Youngner; 5 weeks; $25,165

ST. JOHN'S UNIVERSITY, Jamaica, N.Y.; Vincent E. Smith; 34 weeks; $13,515

UNIVERSITY OF BUFFALO, Buffalo, N.Y.; Joseph G. Hoffman; 46 weeks; $28,190

UNIVERSITY OF MIAMI, Coral Gables, Fla.; Herman Meyer; 32 weeks; $9,915

UNIVERSITY OF NORTH CAROLINA, Chapel Hill; W. A. Reid, Raleigh; 6 weeks; $22,-945

UNIVERSITY OF PITTSBURGH, Pittsburgh, Pa.; John R. Jablonski; 52 weeks; $32,735

UNIVERSITY OF PUERTO RICO, Rio Piedras; Mariano Garcia; 36 weeks; $5,660

UNIVERSITY OF RHODE ISLAND, Kingston; James E. Casey; 22 weeks; $12,405

UNIVERSITY OF VIRGINIA, Charlottesville; A. R. Kuhlthau; 8 weeks; $8,275
Bart van't Riet; 4 months; $16,372

VIRGINIA STATE COLLEGE, Petersburg; Paul L. Brown, Norfolk; 6 weeks; $17,550

WALDEMAR MEDICAL RESEARCH FOUNDATION, Port Washington, N.Y.; Norman Molomut; 16 weeks; $9,560
Norman Molomut; 8 weeks; $22,110

WESTERN MICHIGAN UNIVERSITY, Kalamazoo; George G. Mallinson; 30 weeks; $7,370

WEST VIRGINIA WESLEYAN COLLEGE, Buckhannon; John C. Wright; 5 weeks; $19,100

COURSE CONTENT STUDIES AND DEVELOPMENT

AMERICAN ANTHROPOLOGICAL ASSOCIATION, Washington, D.C.; Malcolm Collier, University of Chicago: *A Project for the Development of the Educational Potential of Anthropology in the High Schools;* 2 years; $59,950

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, Washington, D.C.; John R. Mayor; *The Development of Science Teaching Materials for the Elementary and Junior High School Grades;* 8 months; $125,000
William P. Viall; *Regional Conferences of School Administrators of New Science Curricula;* 1 year; $106,800

AMERICAN ASSOCIATION OF PHYSICS TEACHERS, Greencastle, Ind.; Malcolm Correll; *Review Conference on The Commission on College Physics;* 1 year; $21,665

AMERICAN INSTITUTE OF BIOLOGICAL SCIENCES, Washington, D.C.; H. Bentley Glass; *Secondary-School Program of The Biological Sciences Curriculum Study;* 1 year; $2,022,600

AMERICAN SOCIETY FOR ENGINEERING EDUCATION, Newark, N.J.; Joseph A. Pask, University of California; *A Study of Objective Criteria in Ceramic Engineering Education;* 1 year; $29,000

BRYN MAWR COLLEGE, Bryn Mawr, Pa.; Walter C. Michels; *Commission on College Physics;* 1 year; $125,900

CARLETON COLLEGE, Northfield, Minn.; Kenneth O. May; *Experimental Pregraduate Training Program in Mathematics;* 4 years; $28,750

CASE INSTITUTE OF TECHNOLOGY, Cleveland, Ohio; James B. Reswick; *Development of Dynamics Course Using Analog Computers;* 1 year; $30,000

CLARKSON COLLEGE OF TECHNOLOGY, Potsdam, N.Y.; Hilbert Schenck, Jr.; *Development of Apparatus and Instructional Methods for an "Interdisciplinary Laboratory to Teach Experimentation in Engineering";* 1 year; $19,090

COLUMBIA UNIVERSITY, New York, N.Y.; Howard Levi; *Development of a New Course in Analysis for College Freshmen;* 10 months; $9,090
Howard Levi; *Development of a New Course in Analysis for College Freshmen;* $3,510

CORNELL UNIVERSITY, Ithaca, N.Y.; R. J. Walker; *Experimental Teaching Program in Algebra;* 1 year; $13,660

EDUCATIONAL SERVICES INC., Watertown, Mass.; Paul F. Chenea, Purdue University; *The Central Office Activities of the Commission on Engineering Education;* 1 year; $87,300

Uri Haber-Schaim; *Extension of the Physical Science Study Committee Physics Course for Use in Colleges and Junior Colleges;* 1 year; $141,000

Philip Morrison, Cornell University; *Elementary School Science Curriculum Project;* 1 year; $298,200

Campbell L. Searle, Massachusetts Institute of Technology; *Semiconductor Electronics Education Committee;* 1 year; $126,800

Jerrold R. Zacharias; *Development of Alternate Battery of PSSC Tests;* 18 months; $60,150

Jerrold R. Zacharias, Massachusetts Institute of Technology; *The Accumulation and Analysis of Feedback for the PSSC Course;* 1 year; $40,500

FORDHAM UNIVERSITY, New York, N.Y.; Charles J. Lewis; *Development of a New Set of Courses in Mathematics and Physics;* 2 years; $25,260

HARVEY MUDD COLLEGE, Claremont, Calif.; Joseph B. Platt; *Engineering Course Experimentation;* 1 year; $32,660

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge; Kurt S. Lion; *Development Program for a Laboratory Course in Instrumentation;* 1 year; $27,680

MATHEMATICAL ASSOCIATION OF AMERICA, Buffalo, N.Y.; R. C. Buck, University of Wisconsin; *Committee on the Undergraduate Program in Mathematics;* 2 years; $126,500

MICHIGAN STATE UNIVERSITY, East Lansing; Robert G. Hoopes; *Undergraduate Science for the Non-Science Major;* 9 months; $28,630

MINNESOTA ACADEMY OF SCIENCE, Austin; Paul C. Rosenbloom; *Study of Secondary-School Mathematics Curricula;* 2 years; $187,730

NATIONAL ACADEMY OF SCIENCES-NATIONAL RESEARCH COUNCIL, Washington, D.C.; H. Burr Steinbach; *Committee on Educational Policies in Agriculture;* 3 years; $90,000

NATIONAL COUNCIL OF TEACHERS OF MATHEMATICS, Washington, D.C.; Frank B. Allen, Lyons Township High School, La Grange, Ill.; *Regional Conferences of School Supervisors of the New Curriculum in Mathematics;* 1 year; $8,490

NEW MEXICO STATE UNIVERSITY, University Park; Ralph Crouch; *Development of Course in the Number System for Elementary School Teachers;* 16 mos; $34,060

PURDUE UNIVERSITY, Lafayette, Ind.; Raymond Cohen; *Development of Prototype Equipment for a Modern Undergraduate Mechanical Engineering Measurement Laboratory;* 18 months; $27,610

P. W. McFadden; *Development of Prototype Equipment for a Typical Undergraduate Heat and Mass Transfer Laboratory;* 1 year; $18,330

STANFORD UNIVERSITY, Stanford, Calif.; E. G. Begle; *The School Mathematics Study Group;* 2 years; $1,216,880

STATE COLLEGE OF IOWA, Cedar Falls; E. Glenadine Gibb; *Development of Teacher Training Materials in Mathematics;* 10 months; $5,000

TULANE UNIVERSITY, New Orleans, La.; A. D. Wallace; *Development of New Undergraduate Courses in Mathematics;* 1 year; $25,760

UNIVERSITY OF CALIFORNIA, Berkeley; David G. Mandelbaum; *Educational Resources in Anthropology Project;* $13,840

George C. Pimentel; *Chemical Education Material Study;* 22 months; $961,110

Robert C. Stebbins; *Elementary-School Science Project;* 2 years; $169,560

UNIVERSITY OF ILLINOIS, Urbana; J. Myron Atkin and Stanley P. Wyatt, Jr.; *Elementary-School Science Course Content Improvement Project;* 3 years; $319,300

Max Beberman; *University of Illinois Committee on School Mathematics;* 1 year $385,820

H. A. Laitinen; *Development of Modern Undergraduate Analytical Chemistry Course;* 3 years; $43,130

UNIVERSITY OF KANSAS, Lawrence; G. Baley Price; *Development of Courses on Probability, Matrices, and Calculus;* 2 years; $71,600

UNIVERSITY OF MARYLAND, College Park; John R. Mayor; *Development of a New Course in Mathematics for Prospective Elementary School Teachers;* 3 years; $65,710

UNIVERSITY OF MICHIGAN, Ann Arbor; H. R. Crane; *Two Conferences on Curricula for Undergraduate Majors in Physics;* 1 year; $24,100

E. Wendell Hewson; *Development of a Course in Computer Applications in the Atmospheric Sciences;* 26 months; $42,100

UNIVERSITY OF PENNSYLVANIA, Philadelphia; Charles C. Price; *Commission for College Chemistry;* 2 years; $48,220

UNIVERSITY OF WICHITA, Wichita, Kans.; Robert Schrag; *Development of an Undergraduate Course in Field and Flow Systems;* 15 months; $15,350

WEBSTER COLLEGE, Webster Groves, Mo.: Robert B. Davis; *Development of Materials for Elementary Mathematics;* 1 year; $43,360

DEVELOPMENTAL PROGRAM

AMERICAN ASTRONOMICAL SOCIETY, Princeton, N.J.; Frank K. Edmondson; *Conference on Graduate Education in Astronomy;* 2 days; $12,390

REED COLLEGE, Portland, Oreg.; Arthur F. Scott; *Summer Program in Inorganic Chemistry;* 8 weeks; $55,900

UNIVERSITY OF OKLAHOMA, Norman; Walter J. Saucier; *Training Program in Meteorology;* 3 years; $43,680

FOREIGN PARTICIPATION

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, Washington, D.C.; John Mayor; 1 year; $70,000

AMERICAN ASTRONOMICAL SOCIETY, Princeton, N.J.; Thornton Page; 3 years; $86,625

AMERICAN INSTITUTE OF BIOLOGICAL SCIENCES, Washington, D.C.; Hiden T. Cox; 30 months; $101,020

SYRACUSE UNIVERSITY, Syracuse, N.Y.; Alfred T. Collette; 10 weeks; $12,100

IN-SERVICE INSTITUTE FOR ELEMENTARY SCHOOL TEACHERS

AMERICAN MUSEUM OF NATURAL HISTORY, New York, N.Y.; Franklyn M. Branley; 4 months; $2,980

ALAMEDA COUNTY STATE COLLEGE AUXILIARY ENTERPRISES, INC., Hayward, Calif.; John D. Hancock; 9 months; $7,430

BUCKNELL UNIVERSITY, Lewisburg, Pa.; Lester Kieft; 9 months $6,250

CALVIN COLLEGE, Grand Rapids, Mich.; Carl J. Sinke; 9 months; $3,940

COLORADO COLLEGE, Colorado Springs; Richard G. Beidleman; 9 months; $5,080

DOMINICAN COLLEGE OF SAN RAFAEL, San Rafael, Calif.; *Mary Augusta*; 8 *months*; $4,460

FLORIDA STATE UNIVERSITY, Tallahassee; Eugene D. Nichols; 8 months; $7,090

FONTBONNE COLLEGE, St. Louis, Mo.; Mary Teresine Lewis; 8 months; $4,600

GENERAL EXTENSION DIVISION, OREGON STATE SYSTEM OF HIGHER EDUCATION, Portland; J. Richard Byrne, Portland State College; 9 months; $4,430

HUMBOLDT STATE COLLEGE FOUNDATION, Arcata, Calif.; Orval M. Klose; 9 months; $7,230

INDIANA STATE COLLEGE, Terre Haute; John C. Hook; 9 months, $6,520

KANSAS STATE TEACHERS COLLEGE, Emporia; Ted F. Andrews; 9 months; $8,150

NORTHEAST MISSOURI STATE TEACHERS COLLEGE, Kirksville; Dean A. Rosebery; 9 months; $5,830

NORTHEASTERN UNIVERSITY, Boston, Mass.; Benjamin C. Friedrich; 9 months; $7,090

OKLAHOMA STATE UNIVERSITY, Stillwater; Claude W. Gatewood; 9 *months*; $6,490

OREGON COLLEGE OF EDUCATION, Monmouth; Ernie L. Cummins; 9 months; $5,250

RESEARCH FOUNDATION OF STATE UNIVERSITY OF NEW YORK, Albany; Emery L. Will, Oneonta; 9 months; $5,400

RHODE ISLAND COLLEGE, Providence; Renato E. Leonelli; 9 months; $5,600

SACRAMENTO STATE COLLEGE FOUNDATION, Sacramento, Calif.; H. Stewart Moredock; 9 months; $6,060

ST. AUGUSTINE'S COLLEGE, Raleigh, N.C.; Prezell R. Robinson; 9 months; $5,930

ST. MARY'S COLLEGE OF CALIFORNIA, St. Mary's College; T. Brendan; 9 months; $4,790

ST. PAUL'S COLLEGE, Lawrenceville, Va.; M. Boyd Jones; 9 *months*; $4,800

SAN FERNANDO VALLEY STATE COLLEGE FOUNDATION, Northridge, Calif.; Marion Bickford; 9 months; $8,440

SAN JOSE STATE COLLEGE FOUNDATION, San Jose, Calif.; W. H. Myers; 9 months; $6,240

SOUTHEASTERN STATE COLLEGE, Durant, Okla.; Leslie A. Dwight; 9 months; $6,300

STATE COLLEGE OF IOWA, Cedar Falls; E. Glenadine Gibb; $765

STATE UNIVERSITY OF IOWA, Iowa City; T. R. Porter; 7 months; $6,340

STATE UNIVERSITY OF SOUTH DAKOTA, Vermillion; Theodore L. Reid; 9 months; $13,210

TEMPLE UNIVERSITY, Philadelphia, Pa.; Herman C. Kranzer; 10 months; $6,030

UNIVERSITY OF AKRON, Akron, Ohio; Alfred H. Johnson; 9 months; $5,780

UNIVERSITY OF ARIZONA, Tucson; Arthur H. Steinbrenner; 9 months; $5,500

UNIVERSITY OF CALIFORNIA, Berkeley; Clifford Bell, Los Angeles; 8 months; $6,650

UNIVERSITY OF COLORADO, Boulder; James R. Wailes; 8 months; $5,820

UNIVERSITY OF DETROIT, Detroit, Mich.; Lyle E. Mehlenbacher; 9 months; $6,170

UNIVERSITY OF PUERTO RICO, Rio Piedras; Mariano Garcia; 9 months; $5,880

VIRGINIA STATE COLLEGE, Petersburg; Richard H. Dunn; 9 months; $6,190

IN-SERVICE INSTITUTE FOR JUNIOR HIGH SCHOOL TEACHERS

KNOX COLLEGE, Galesburg, Ill.; Rothwell Stephens; 9 months; $9,000

MANCHESTER COLLEGE, North Manchester, Ind.; Harry R. Weimer; 8 months; $9,850

RICKER COLLEGE, Houlton, Maine; Robert B. Maxwell; 9 months; $9,300

UNIVERSITY OF WISCONSIN, Madison; Louis F. McAuley; 7 months; $41,340

IN-SERVICE INSTITUTE FOR SECONDARY AND ELEMENTARY SCHOOL TEACHERS

MILES COLLEGE, Birmingham, Ala.; James S. Sutton; 9 months; $8,730

UNIVERSITY OF FLORIDA, Gainesville; Kenneth P. Kidd; 10 months; $14,520

UNIVERSITY OF HAWAII, Honolulu; Michael M. Frodyma; 9 months; $11,720

Michael M. Frodyma; 8 *months*; $17,340

IN-SERVICE INSTITUTE FOR SECONDARY SCHOOL TEACHERS

AGRICULTURE AND MECHANICAL COLLEGE OF TEXAS, College Station; Edmund C. Klipple; 9 months; $5,890

Melvin C. Schroeder; 9 months; $9,530

AGRICULTURAL AND TECHNICAL COLLEGE OF NORTH CAROLINA, Greensboro; George C. Royal, Jr.; 9 *months*; $9,130

ALAMEDA COUNTY STATE COLLEGE AUXILIARY ENTERPRISES, INC., Hayward, Calif.; C. T. Purvis; 9 months; $6,790

ALBANY STATE COLLEGE, Albany, Ga.; William E. Johnson, Jr.; 9 months; $17,870

ALBERTUS MAGNUS COLLEGE, New Haven, Conn.; Florence D. Jacobson; 8 months; $14,850

ALBRIGHT COLLEGE, Reading, Pa.; Richard J. Kohlmeyer; 9 months; $6,250

ALLEGHENY COLLEGE, Meadville, Pa.; Richard L. Brown; 6 months; $3,600

ALVERNO COLLEGE, Milwaukee, Wis.; M. Providencia; 9 months; $4,170

AMERICAN UNIVERSITY, Washington, D.C.; Leo Schubert; 9 months; $2,460
Leo Schubert; 9 months; $22,830

ANDREWS UNIVERSITY, Berrien Springs, Mich.; Harold T. Jones; 8 months; $400

ANTIOCH COLLEGE, Yellow Springs, Ohio; James F. Corwin; 10 months; $9,280

ARIZONA STATE UNIVERSITY, Tempe; Ernest E. Snyder; 9 months; $12,180
Alan T. Wager; 9 months; $6,940

ARKANSAS STATE TEACHERS COLLEGE, Conway; Neal D. Buffaloe; 9 months; $7,330
O. L. Hughes; 9 months; $7,000

AUSTIN PEAY STATE COLLEGE, Clarksville, Tenn.; Haskell C. Phillips; 9 months; $9,110

BALDWIN-WALLACE COLLEGE, Berea, Ohio; Dean L. Robb; 9 months; $5,990

BEMIDJI STATE COLLEGE, Bemidji, Minn.; W. Richard Slinkman; $520
W. Richard Slinkman; 9 months; $17,130

BISHOP COLLEGE, Dallas, Tex.; V. N. Athavale; 9 months; $16,660

BOSTON COLLEGE, Chestnut Hill, Mass.; William G. Guindon; 9 months; $5,950
William G. Guindon; 9 months; $1,630

BOWLING GREEN STATE UNIVERSITY, Bowling Green, Ohio; W. H. Hall; 9 months; $13,130

BROOKLYN COLLEGE, Brooklyn, N.Y.; Meyer Jordan; 9 months; $6,870

BROWN UNIVERSITY, Providence, R.I.; Charles B. MacKay; 9 months; $6,220
Charles B. MacKay; 9 months; $7,200

BUCKNELL UNIVERSITY, Lewisburg, Pa.; William K. Smith; 9 months; $5,820

BUTLER UNIVERSITY, Indianapolis, Ind.; Harry E. Crull; 9 months; $12,520

CALIFORNIA STATE COLLEGE, California, Pa.; A. H. Anderson; 9 months; $14,250

CALVIN COLLEGE, Grand Rapids, Mich.; Carl J. Sinke; 9 months; $7,570

CATHOLIC UNIVERSITY OF PUERTO RICO, Ponce, P.R.; Joseph Frohnhoefer; 10 months; $8,820

CENTRAL MICHIGAN UNIVERSITY, Mount Pleasant; Malcolm H. Filson; 10 months; $10,290
Wilbur Waggoner; 9 months; $22,560

CENTRAL STATE COLLEGE, Edmond, Okla.; Earl C. Rice; 9 months; $10,550

CITY COLLEGE, New York, N.Y.; Sherburne F. Barber; 9 months; $7,430
Alexander Joseph; 9 months; $9,800
Chester B. Kremer; 9 months; $11,380
W. I. Pearman; $780

CLEMSON COLLEGE, Clemson, S.C.; J. Harvey Hobson; 9 months; $10,070

COLLEGE OF THE HOLY CROSS, Worcester, Mass.; John W. Flavin; 8 months; $6,200
Robert B. MacDonnell; 8 months; $6,390
Vincent O. McBrien; 8 months; $6,760

COLLEGE OF IDAHO, Caldwell; Boyd H. Henry; 9 months; $9,690

COLORADO SCHOOL OF MINES, Golden; James L. Hall; 9 months; $7,730

COLORADO STATE COLLEGE, Greeley; Albert J. Hendricks, Jr.; 8 months; $9,830

CONNECTICUT COLLEGE, New London; Alice T. Schafer; 8 months; $5,230

DARTMOUTH COLLEGE, Hanover, N.H.; Charles J. Lyon; 5 months; $1,320
Charles J. Lyon; 7 months; $7,500

DEPAUL UNIVERSITY, Chicago, Ill.; Willis B. Caton; 9 months; $13,920

DOMINICAN COLLEGE OF SAN RAFAEL, San Rafael, Calif.; Mary Augusta; 8 months; $15,930

DRAKE UNIVERSITY, Des Moines, Iowa; Earle L. Canfield; 9 months; $15,870

DREW UNIVERSITY, Madison, N.J.; Robert K. Zuck; 5 months; $4,990

EARLHAM COLLEGE, Richmond, Indiana; Roland F. Smith; 9 months; $1,590
Roland F. Smith; 9 months; $6,020

EAST TEXAS STATE COLLEGE, Commerce; Arthur M. Pullen; 9 months; $6,820

EASTERN NAZARENE COLLEGE, Wollaston, Mass.; W. Lloyd Taylor; 9 months; $13,470

EMORY AND HENRY COLLEGE, Emory, Va.; George M. Speed; 9 months; $5,830

EMORY UNIVERSITY, Atlanta, Ga.; Charles T. Lester; 7 months; $13,990

FAIRFIELD UNIVERSITY, Fairfield, Conn.; John A. Barone; 9 months; $12,220

FAIRLEIGH DICKINSON UNIVERSITY, Rutherford, N.J.; Harold Weinberger; 8 months; $9,600
Delores E. Keller, Teaneck; 8 months; $9,720

FENN COLLEGE, Cleveland, Ohio; Walter R. Van Voorhis; 8 months; $11,060

FLORIDA STATE UNIVERSITY, Tallahassee; J. Stanley Marshall; 15 months; $12,560
J. Stanley Marshall; 10 months; $18,310
J. Stanley Marshall; 10 months; $8,520

FORT HAYS KANSAS STATE COLLEGE, Hays; W. Toalson; 9 months; $7,700

FRANKLIN & MARSHALL COLLEGE, Lancaster, Pa.; John H. Moss; 9 months; $9,620

FRESNO STATE COLLEGE FOUNDATION, Fresno, Calif.; Fred A. Scott; 9 months; $7,590

GENERAL EXTENSION DIVISION, OREGON STATE SYSTEM OF HIGHER EDUCATION, Portland; J. Richard Byrne, Portland State College; 8 months; $4,840

GEORGE WASHINGTON UNIVERSITY, Washington, D.C.; Charles R. Naeser; 9 months; $4,500

GEORGETOWN UNIVERSITY, Washington, D.C.; Matthew P. Thekaekara; 9 months; $10,150

GEORGIA SOUTHERN COLLEGE, Statesboro; Burton J. Bogitsh; 9 months; $6,540

GLASSBORO STATE COLLEGE, Glassboro, N.J.; Warren G. Roome; 9 months; $13,680
Murl C. Shawver; 9 months; $8,390

HAMPTON INSTITUTE, Hampton, Va.; Victor H. Fields; 8 months; $13,590

HOBART & WILLIAM SMITH COLLEGES, Geneva, N.Y.; Robert L. Beinert; 8 months; $550
Robert L. Beinert; 8 months; $5,100

HOLY NAMES COLLEGE, Spokane, Wash.; M. Eugene Gautereaux; 7 months; $12,700

HUMBOLDT STATE COLLEGE FOUNDATION, Arcata, Calif.; Henry S. Tropp; 9 months; $8,550

IDAHO ACADEMY OF SCIENCE, Boise; J. B. Spulnik, Boise Junior College; 9 months; $5,160

Merle R. Fisher, Ricks College; 9 months; $31,770

ILLINOIS INSTITUTE OF TECHNOLOGY, Chicago; Haim Reingold; 9 months; $78,650

IMMACULATE HEART COLLEGE, Los Angeles, Calif.; Eugene T. Spain; 8 months; $5,570

INCARNATE WORD COLLEGE, San Antonio, Tex.; Sister Joseph Marie; 9 months; $11,050

INTER AMERICAN UNIVERSITY OF PUERTO RICO, San German, Puerto Rico; Ismael Velez; 8 months; $18,290

IONA COLLEGE, New Rochelle, N.Y.; George S. Pappas; 9 months; $8,030

JACKSONVILLE STATE COLLEGE, Jacksonville, Ala.; Newbern W. Bush; 9 months; $7,850

KANSAS STATE COLLEGE of Pittsburg; R. G. Smith; 9 months; $18,500

R. G. Smith; 9 months; $9,700

KANSAS STATE TEACHERS COLLEGE, Emporia; Ted F. Andrews; 9 months; $25,590

KENT STATE UNIVERSITY, Kent, Ohio; Kenneth B. Cummins; 9 months; $8,390

KNOX COLLEGE, Galesburg, Ill.; Paul Shepard; 8 months; $7,390

KNOXVILLE COLLEGE, Knoxville, Tenn.; Robert H. Harvey; 8 months; $11,880

LAFAYETTE COLLEGE, Easton, Pa.; B. E. Rhoades; 9 months; $5,780

LAKE FOREST COLLEGE, Lake Forest, Ill.; John W. Coutts; 9 months; $7,870

LE MOYNE COLLEGE, Memphis, Tenn.; W. W. Gibson; 9 months; $14,450

LEWIS & CLARK COLLEGE, Portland, Oreg.; Elvy L. Fredrickson; 9 months; $5,370

LONG BEACH STATE COLLEGE FOUNDATION, Long Beach, Calif.; John J. Baird; 9 months; $11,750

LOUISIANA STATE UNIVERSITY, Baton Rouge; Dennis M. Nead, New Orleans; 8 months; $10,430

LOYOLA UNIVERSITY, New Orleans, La.; F. A. Benedetto; 9 months; $8,040

H. R. Jolley; 9 months; $9,700

John F. Keller; 9 months; $13,600

MADISON COLLEGE, Harrisonburg, Va.; J. Emmert Ikenberry; 9 months; $5,610

MANHATTAN COLLEGE, New York, N.Y.; Arthur B. Kemper; 8 months; $9,940

Luke V. Titone; 9 months; $11,670

B. Alfred Welch; 9 months; $11,500

MARQUETTE UNIVERSITY, Milwaukee, Wis.; Arthur G. Barkow; 8 months; $6,050

Miriam E. Connellan; 9 months; $4,110

MARYLHURST COLLEGE, Marylhurst, Oreg.; Sister M. Loretta Ann; 8 months; $5,500

MCNEESE STATE COLLEGE, Lake Charles, La.; S. M. Spencer; 9 months; $9,930

MEMPHIS STATE UNIVERSITY, Memphis, Tenn.; R. W. Johnson; 9 months; $5,320

F. B. Schirmer, Jr.; 9 months; $8,740

MIDDLE TENNESSEE STATE COLLEGE, Murfreesboro; J. Eldred Wiser; 9 months; $6,320

MILLERSVILLE STATE COLLEGE, Millersville, Pa.; William B. McIlwaine; 9 months; $6,960

MISSISSIPPI COLLEGE, Clinton; Archie H. Germany; 9 months; $15,740

MISSISSIPPI SOUTHERN COLLEGE, Hattiesburg; Virginia Felder; 9 months; $10,820

MISSISSIPPI STATE UNIVERSITY, State College; R. D. Boswell, Jr.; 9 months; $9,620

MONTANA STATE UNIVERSITY, Missoula; James W. Gebhart; $1,200

MOREHEAD STATE COLLEGE, Morehead, Ky.; William B. Owsley; 9 months; $7,620

MOUNT MERCY COLLEGE, Pittsburgh, Pa.; Sister M. Michael; 8 months; $6,060

William A. Uricchio; 8 months; $6,760

MUNICIPAL UNIVERSITY OF OMAHA, Omaha, Nebr.; Merle E. Brooks; 9 months; $27,930

MURRAY STATE COLLEGE FOUNDATION, Murray, Ky.; Alfred M. Wolfson; 9 months; $6,370

NEBRASKA WESLEYAN UNIVERSITY, Lincoln; Walter R. French, Jr.; 9 months; $7,840

NEWARK COLLEGE OF ENGINEERING RESEARCH FOUNDATION, Newark, N.J.; Herbert Barkan; 9 months; $9,220

John Bishop; 9 months; $4,430

Paul O. Hoffmann; 9 months; $7,910

NEW YORK STATE SOCIETY FOR MEDICAL RESEARCH, INC., New York; Albert S. Kuperman, Cornell University Medical College; 9 months; $8,450.

NEW YORK UNIVERSITY, New York; Morris Kline; 9 months; $9,630

Elwood J. Winters; 8 months; $16,250

NORTH CAROLINA COLLEGE at Durham; William H. Robinson; 9 months; $18,350

NORTH DAKOTA STATE UNIVERSITY, Fargo; Joel W. Broberg; 9 months; $23,390

NORTHEAST LOUISIANA STATE COLLEGE, Monroe; Daniel E. Dupree; 9 months; $12,070

NORTHEAST MISSOURI STATE TEACHERS COLLEGE, Kirksville; Dean A. Rosebery; 9 months; $16,310

NORTHERN MICHIGAN COLLEGE, Marquette; W. James Merry; 8 months; $10,300

NORTHLAND COLLEGE, Ashland, Wis.; Louis J. Kolonko; 9 months, $14,640

NORTHWESTERN STATE COLLEGE, Alva, Okla.; Joe W. Melton; 9 months; $6,370

NORTHWESTERN UNIVERSITY, Evanston, Ill.; E. H. C. Hildebrandt; 9 months; $11,520

NORWICH UNIVERSITY, Northfield, Vt.; Edward A. Race; 8 months; $3,700

OHIO STATE UNIVERSITY, Columbus; William R. Riley; 9 months; $10,370

OHIO UNIVERSITY, Athens; W. T. Fishback; 8 months; $5,080

OREGON STATE UNIVERSITY, Corvallis; Fred W. Decker; 9 months; $5,460

Albert R. Poole; 9 months; $3,920

PACE COLLEGE, New York, N.Y.; Edward Ritter; 9 months; $14,150

PENNSYLVANIA STATE UNIVERSITY, University Park; William H. Powers; 10 months; $41,540

PRAIRIE VIEW AGRICULTURAL & MECHANICAL COLLEGE, Prairie View, Tex.; E. E. O'Banion; 9 months; $18,410

PURDUE UNIVERSITY, Lafayette, Ind.; C. J. Goodnight; 9 months; $31,330

M. Wiles Keller; 9 months; $41,940

REED COLLEGE, Portland, Oreg.; Arthur F. Scott; 9 months; $16,070

RESEARCH FOUNDATION OF STATE UNIVERSITY OF NEW YORK, Albany; Daniel W. Snader, Fredonia; 9 months; $11,470

RESEARCH FOUNDATION OF THE UNIVERSITY OF TOLEDO, Toledo, Ohio; Archie N. Solberg; 9 months; $1,550

RHODE ISLAND COLLEGE, Providence; Stanley M. Trail; 9 months; $7,810

ROCKFORD COLLEGE, Rockford, Ill.; John A. Schumaker; 9 months; $6,300

ROCKHURST COLLEGE, Kansas City, Mo.; William C. Doyle; 9 months; $7,850

RUTGERS, THE STATE UNIVERSITY, New Brunswick, N.J.; Orhan H. Alisbah, Camden; 9 months; $9,400

Westervelt Griffin; 9 months; $5,850

SACRAMENTO STATE COLLEGE FOUNDATION, Sacramento, Calif.; Stanley P. Hughart; 9 months; $20,810

ST. AUGUSTINE'S COLLEGE, Raleigh, N.C.; Jeffery Gipson; 8 months; $5,440

ST. CLOUD STATE COLLEGE, St. Cloud, Minn.; Harold Hopkins; 9 months; $5,420

ST. FRANCIS COLLEGE, Loretto, Pa.; Lawrence V. Pion; 8 months; $5,080

ST. JOSEPH'S COLLEGE, West Hartford, Conn.; Maria Clare Markham; 9 months; $15,280

ST. LOUIS UNIVERSITY, St. Louis, Mo.; John J. Andrews; 9 months; $7,650

ST. MARTIN'S COLLEGE, Olympia, Wash.; John Raymond; 8 months; $6,810

ST. PETER'S COLLEGE, Jersey City, N.J.; Perry Y. Jackson; 9 months; $7,610

Francis A. Varrichio; 9 months; $8,330

SAN DIEGO STATE COLLEGE FOUNDATION, San Diego, Calif.; Donald I. Eidemiller; 10 months; $12,200

Margaret F. Willerding; 9 months; $24,510

SAN JOSE STATE COLLEGE FOUNDATION, San Jose, Calif.; Robert E. Arnal; 9 months; $6,260

Max Kramer; 9 months; $18,530

Laurence E. Wilson; 9 months; $12,650

SARAH LAWRENCE COLLEGE, Bronxville, N.Y.; Edward J. Cogan; 8 months; $23,730

SHORTER COLLEGE, Rome, Ga.; James S. Lee; 9 months; $13,510

SOUTH CAROLINA STATE COLLEGE, Orangeburg; George W. Hunter; 9 months; $30,480

SOUTHEASTERN STATE COLLEGE, Durant, Okla.; Leslie A. Dwight; 9 months; $3,780

Ernest Sturch, Jr.; 9 months; $5,600

SOUTHERN METHODIST UNIVERSITY, Dallas, Tex.; Joe P. Harris, Jr.; 9 months; $8,170

SOUTHWESTERN AT MEMPHIS, Memphis, Tenn.; Jack U. Russell; 9 months; $8,540

Arlo I. Smith; 9 months; $7,140

STATE COLLEGE AT SALEM, Salem, Mass.; Thomas I. Ryan; 8 months; $11,960

STATE UNIVERSITY OF IOWA, IOWA CITY; Robert E. Yager; 8 months; $16,090

STATE UNIVERSITY OF SOUTH DAKOTA, Vermillion; Theodore L. Reid; 9 months; $27,510

STETSON UNIVERSITY, De Land, Fla.; Gene W. Medlin; 9 months; $2,980

STEVENS INSTITUTE OF TECHNOLOGY, Hoboken, N.J.; Robert H. Seavy; 9 months; $14,180

STONEHILL COLLEGE, North Easton, Mass.; Thomas E. Lockary; 8 months; $10,120

TALLADEGA COLLEGE, Talladega, Ala.; Cohen T. Simpson; 7 months; $2,000

Cohen T. Simpson; 7 months; $12,030

TEACHERS COLLEGE, COLUMBIA UNIVERSITY, New York, N.Y.; Howard F. Fehr; 9 months; $12,400

TEMPLE UNIVERSITY, Philadelphia, Pa.; Leonard Muldawer; 9 months; $20,030

TENNESSEE AGRICULTURAL & INDUSTRIAL STATE UNIVERSITY, Nashville; William N. Jackson; 9 months; $18,040

TEXAS WOMAN'S UNIVERSITY, Denton, Tex.; Harold T. Baker; 9 months; $6,060

Harlan C. Miller; 9 months; $6,680

TRENTON STATE COLLEGE, Trenton, N.J.; Victor L. Crowell; 10 months; $9,240

UNION COLLEGE & UNIVERSITY, Schenectady, N.Y.; C. W. Graves; 9 months; $17,400

UNIVERSITY OF AKRON, Akron, Ohio; Mabel W. Riedinger; 9 months; $1,010

Mabel M. Riedinger; 9 months; $8,600

UNIVERSITY OF ARIZONA, Tucson; Robert W. Hoshaw; 9 months; $11,340

John W. Robson; 9 months; $3,140

Arthur H. Steinbrenner; 9 months; $7,900

UNIVERSITY OF ARKANSAS, Fayetteville; William R. Orton; 9 months; $32,850

UNIVERSITY OF BUFFALO, Buffalo, N.Y.; Edith R. Schneckenburger; 9 months; $6,000

Stephen S. Winter; 9 months; $17,170

UNIVERSITY OF CALIFORNIA, Berkeley; Clifford Bell, Los Angeles; 8 months; $32,210

UNIVERSITY OF CHATTANOOGA, Chattanooga, Tenn.; Kenneth A. Fry; 9 months; $13,630

Robert L. Wilson; 9 months; $7,010

UNIVERSITY OF CINCINNATI, Cincinnati, Ohio; I. A. Barnett; 9 months; $19,030

UNIVERSITY OF COLORADO, Boulder; Burton W. Jones; 9 months; $10,030

UNIVERSITY OF CONNECTICUT, Storrs; David J. Blick; 9 months; $16,630

UNIVERSITY OF DELAWARE, Newark; J. J. Groot; 9 months; $5,870

UNIVERSITY OF FLORIDA, Gainesville; Kenneth P. Kidd; 10 months; $29,070

G. Ray Noggle; 10 months; $29,170

UNIVERSITY OF GEORGIA, Athens; Charles L. Koelsche; 9 months; $16,130

UNIVERSITY OF HAWAII, Honolulu; Jimmie B. Smith; 6 months; $8,440

UNIVERSITY OF KANSAS, Lawrence; William M. Balfour; 9 months; $9,060

UNIVERSITY OF LOUISVILLE, Louisville, Ky.; W. H. Spragens; 9 months; $5,420

Bruce B. Vance; 9 months; $5,740

UNIVERSITY OF MARYLAND, College Park; Robert Detenbeck; 9 months; $20,770

UNIVERSITY OF MIAMI, Coral Gables, Fla.; Andrew F. Sobczyk; 9 months; $25,250

UNIVERSITY OF MICHIGAN, Ann Arbor; Charles Brumfiel; 9 months; $15,440

UNIVERSITY OF NEVADA, Reno; E. M. Beesley; 10 months; $19,360

UNIVERSITY OF NEW MEXICO, Albuquerque; Merle Mitchell; 9 months; $5,360

UNIVERSITY OF NORTH CAROLINA, Chapel Hill; William A. White; 9 months; $9,050
Hollis J. Rogers, Greensboro; 9 months; $22,820
H. V. Park, Raleigh; 9 months; $7,520

UNIVERSITY OF NORTH DAKOTA, Grand Forks; Paul B. Kannowski; 9 months; $14,310

UNIVERSITY OF OKLAHOMA, Norman; Richard V. Andree; 9 months; $31,630
Harold V. Huneke; 10 months; $9,780

UNIVERSITY OF OREGON, Eugene; A. F. Moursund; 8 months; $6,450

UNIVERSITY OF PENNSYLVANIA, Philadelphia; J. F. Hazel; 10 months; $12,980

UNIVERSITY OF PITTSBURGH, Pittsburgh, Pa.; Peter Gray; 8 months; $7,780

UNIVERSITY OF PUERTO RICO, Mayaguez; Virgilio Biaggi, Jr.; 9 months; $11,790
Augusto Bobonis; 9 months; $14,970
Harold Heatwole; 9 months; $9,930
J. C. Knipp; 8 months; $9,060

UNIVERSITY OF REDLANDS, Redlands, Calif.; Paul R. Gleason; 8 months; $11,270

UNIVERSITY OF ROCHESTER, Rochester, N.Y.; John J. Montean; 9 months; $32,100

UNIVERSITY OF SAN FRANCISCO, San Francisco, Calif.; Edward J. Farrell; 10 months; $10,070

UNIVERSITY OF SCRANTON, Scranton, Pa.; Joseph A. Rock; 9 months; $18,210

UNIVERSITY OF SOUTHERN CALIFORNIA, Los Angeles; John W. Reith; 10 months; $2,360
Paul A. White; 9 months; $21,960

UNIVERSITY OF SOUTHWESTERN LOUISIANA, Lafayette; James R. Oliver; 9 months; $18,100
James R. Oliver; 9 months; $12,650
James R. Oliver; 9 months; $12,960

UNIVERSITY OF TEXAS, Austin, E. J. Knapp, El Paso; 9 months; $5,560

UNIVERSITY OF UTAH, Salt Lake City; James H. Wolfe; 9 months; $7,650

UNIVERSITY OF VIRGINIA, Charlottesville; James W. Cole, Jr.; 9 months; $21,100
James W. Cole, Jr.; 9 months; $6,980
William C. Lowry; 9 months; $11,100

UNIVERSITY OF WASHINGTON, Seattle; Roy Dubisch; 9 months; $8,510
Arthur D. Welander; $750

UNIVERSITY OF WYOMING, Laramie; W. Norman Smith; 9 months; $7,510

UTAH STATE UNIVERSITY, Logan; McRay Cloward, Cedar City; 8 months; $8,660
Marden Broadbent, Provo; 8 months; $6,760

VILLANOVA UNIVERSITY, Villanova, Pa.; J. Bernard Hubbert; 9 months; $14,270

VIRGINIA STATE COLLEGE, Petersburg; Richard H. Dunn; 9 months; $7,790
Richard H. Dunn; 9 months; $18,000

WAKE FOREST COLLEGE, Winston-Salem, N.C.; Ben M. Seelbinder; 9 months; $6,880

WAYNE STATE UNIVERSITY, Detroit, Mich.; William V. Mayer; 8 months; $9,080

WEST CHESTER STATE COLLEGE, West Chester, Pa.; Albert E. Filano; 10 months; $6,750

WEST VIRGINIA UNIVERSITY, Morgantown; I. Dee Peters; 9 months; $34,470

WESTERN MICHIGAN UNIVERSITY, Kalamazoo; George G. Mallinson; 9 months; $12,800

WILLIAM JEWELL COLLEGE, Liberty, Mo.; Wallace A. Hilton; 9 months; $11,530

XAVIER UNIVERSITY, New Orleans, La.; Sister Miriam Francis; 9 months; $7,960
Sister M. Veronica; 9 months: $7,390

YESHIVA UNIVERSITY, New York, N.Y.; Abe Gelbart; 9 months; $82,750
William Zlot; 9 months; $5,640

YOUNGSTOWN UNIVERSITY, Youngstown, Ohio; Bernard J. Yozwiak; 9 months; $5,820

PUBLIC UNDERSTANDING OF SCIENCE

AMERICAN INSTITUTE OF PHYSICS, New York, N.Y.; Elmer Hutchisson; *Seminars for Science Writers;* 14 months; $15,530
Elmer Hutchisson; *Seminars for Science Writers;* 1 month; $34,140

CITY COLLEGE, New York, N.Y.; Mina Rees; *Planning of a New Educational Television Series;* 1 year; $10,000

COUNCIL FOR THE ADVANCEMENT OF SCIENCE WRITING, INC., New York, N.Y.; Pierre C. Fraley; *A Science Seminar for Magazine Editors;* 3 days; $5,605

EDUCATIONAL TESTING SERVICE, Princeton, N.J.; John S. Hollister; *Nationwide Educational Television Science Film Program;* 2 years; $30,300

NEW YORK UNIVERSITY, New York; Hillier Krieghbaum; *Program to Train Science News Reporters;* 2 weeks; $14,740

STATE OF WISCONSIN BOARD OF REGENTS OF STATE COLLEGES, Madison; Harry F. Bangsberg; *Science Seminar for Mass Communications Personnel;* 4 days; $3,990

TULANE UNIVERSITY, New Orleans, La.; Quentin Ault; *Science News Seminar for Selected Southern Newspaper Editors;* 5 months; $7,237

UNIVERSITY OF CALIFORNIA, Berkeley; A. Hunter Dupree; *History of Science in the Federal Government, 1940–1960;* 3 years; $177,560

UNIVERSITY OF MICHIGAN, Ann Arbor; Charles W. Wixom; *Conference on Science in the Press;* 2 days; $17,990

RESEARCH PARTICIPATION FOR COLLEGE TEACHERS PROGRAM

BRANDEIS UNIVERSITY, Waltham, Mass.; Myron Rosenblum; 12 weeks; $11,110

CASE INSTITUTE OF TECHNOLOGY, Cleveland, Ohio; J. Reid Shelton; 11 months; $18,750

FLORIDA STATE UNIVERSITY, Tallahassee; Barron B. Scarborough; 11 months; $21,110
Leland Shanor; 8 weeks; $14,000

HOWARD UNIVERSITY, Washington, D.C.; Joseph B. Morris; 10 weeks; $16,960

INDIANA UNIVERSITY, Bloomington; Harry G. Day; 8 weeks; $10,600
John B. Patton; 8 weeks; $6,500

IOWA STATE UNIVERSITY, Ames; Paul F. Romberg; 9 weeks; $10,830

KANSAS STATE UNIVERSITY, Manhattan; Jack L. Lambert; 9 months; $3,620

LOUISIANA STATE UNIVERSITY, Baton Rouge; Robert V. Nauman; 10 weeks; $24,355
Vincent E. Parker; 9 weeks; $15,310

NEW MEXICO HIGHLANDS UNIVERSITY, Las Vegas; James P. Zietlow 1 year; $30,530

NORTH DAKOTA STATE UNIVERSITY, Fargo; J. A. Callenbach; 11 months; $10,240

OHIO STATE UNIVERSITY, Columbus; F. E. Deatherage; 1 year; $17,480

OKLAHOMA STATE UNIVERSITY RESEARCH FOUNDATION, Stillwater; Marvin T. Edmison; 10 weeks; $7,745
Glenn W. Todd; 1 year; $13,320

OREGON STATE UNIVERSITY, Corvallis; W. H. Slabaugh; 8 weeks; $29,770

PENNSYLVANIA STATE UNIVERSITY, University Park; William M. Lepley; 10 weeks; $14,430
M. J. Montjar; 9 weeks; $9,900

PURDUE UNIVERSITY, Lafayette, Ind.; Kirk L. Athow; 12 weeks; $10,470
M. X. Zarrow; 1 year; $23,980

ROSWELL PARK MEMORIAL INSTITUTE, Buffalo, N.Y.; Edwin A. Mirand; 13 weeks; $17,530

STANFORD UNIVERSITY, Stanford, Calif.; Willis W. Harman; 12 weeks; $26,330

STATE UNIVERSITY OF SOUTH DAKOTA, Vermillion; George P. Scott; 11 months; $4,210

SYRACUSE UNIVERSITY, Syracuse, N.Y.; James A. Luker; 12 weeks; $8,330

TUFTS UNIVERSITY, Medford, Mass.; M. Kent Wilson; 8 weeks; $14,940

UNIVERSITY OF BUFFALO, Buffalo, N.Y.; Howard Tieckelmann; $2,310

UNIVERSITY OF CALIFORNIA, Berkeley; Richard Fulrath; 1 year; $23,135

UNIVERSITY OF COLORADO, Boulder; Albert A. Bartlett; 10 weeks; $17,040
Bert M. Tolbert; 10 weeks, $23,250

UNIVERSITY OF FLORIDA, Gainesville; Stanley S. Ballard; 1 year; $11,300
Wallace S. Brey, Jr.; 1 year; $15,460

UNIVERSITY OF GEORGIA, Athens; William J. Payne; 10 weeks; $9,890

UNIVERSITY OF ILLINOIS, Urbana; C. Ladd Prosser; 8 weeks; $14,300

UNIVERSITY OF KANSAS, Lawrence; C. A. Vanderwerf; 11 weeks; $30,740

UNIVERSITY OF MARYLAND, College Park; John S. Toll; 10 weeks; $22,590

UNIVERSITY OF MASSACHUSETTS, Amherst; Edward L. Davis; 11 months; $6,875

UNIVERSITY OF MISSISSIPPI, University; Russell W. Maatman; 1 year; $16,980

UNIVERSITY OF NEBRASKA, Lincoln; John W. Weymouth; 1 year; $17,150

UNIVERSITY OF NORTH CAROLINA, Chapel Hill; Homer C. Folks, Raleigh; 1 year; $31,160
T. Ewald Maki, Raleigh; 10 weeks; $4,000

UNIVERSITY OF NORTH DAKOTA, Grand Forks; H. E. Ederstrom; 8 weeks; $2,810

UNIVERSITY OF OKLAHOMA, Norman; Richard V. Andree; 1 year; $51,500
Alfred J. Weinheimer; 11 months; $21,330

UNIVERSITY OF ROCHESTER, Rochester, N.Y.; Stanley R. Glasser; 8 weeks; $16,280

UNIVERSITY OF SOUTHERN CALIFORNIA, Los Angeles; Walter E. Martin; 10 weeks; $15,280

UNIVERSITY OF TENNESSEE, Knoxville; William E. Bull; 11 weeks; $25,100

UNIVERSITY OF VIRGINIA, Charlottesville; Bart Van't Riet; 1 year; $13,410

UNIVERSITY OF WISCONSIN, Madison; Robert W. Finley; 11 months; $17,785

UTAH STATE UNIVERSITY, Logan; H. B. Peterson; 12 weeks; $14,960

VIRGINIA INSTITUTE OF MARINE SCIENCE, Gloucester Point; Robert S. Bailey; 1 year; $33,180

WESTERN RESERVE UNIVERSITY, Cleveland, Ohio; Gerald E. Tauber; 1 year; $11,020

RESEARCH PARTICIPATION FOR HIGH SCHOOL TEACHERS PROGRAM

BOYCE THOMPSON INSTITUTE FOR PLANT RESEARCH, INC., Yonkers, N.Y.; Lawrence P. Miller; 8 weeks; $12,430

CARNEGIE INSTITUTE OF TECHNOLOGY, Pittsburgh, Pa.; B. R. Teare, Jr.; 8 weeks; $27,015

CITY COLLEGE, New York, N.Y.; Chester B. Kremer; 11 months; $17,950

CLARK UNIVERSITY, Worcester, Mass.; Roy S. Anderson; 1 year; $4,720

CLARKSON COLLEGE OF TECHNOLOGY, Potsdam, N.Y.; Theodore Renzema; 9 weeks; $15,080

COLLEGE OF WOOSTER, Wooster, Ohio; John D. Reinheimer; 11 months; $8,140

COLORADO STATE UNIVERSITY RESEARCH FOUNDATION, Fort Collins; Merle G. Payne; 1 year; $18,200

CORNELL UNIVERSITY, Ithaca, N.Y.; Phillip G. Johnson; 11 months; $33,120

DARTMOUTH COLLEGE, Hanover, N.H.; Thomas E. Kurtz; 8 weeks; $11,060

GEORGE WASHINGTON CARVER FOUNDATION, TUSKEGEE INSTITUTE, Ala.; Clarence T. Mason; 8 weeks; $9,780

GEORGE WASHINGTON UNIVERSITY, Washington, D.C.; R. B. Stevens; 1 year; $3,330

ILLINOIS INSTITUTE OF TECHNOLOGY, Chicago; Sidney I. Miller; 1 year; $15,580

INDIANA UNIVERSITY, Bloomington; L. S. McClung; 11 months; $8,960

IOWA STATE UNIVERSITY, Ames; Paul Romberg; 9 weeks; $24,740

KANSAS STATE TEACHERS COLLEGE, Emporia; Ted F. Andrews; 1 year; $21,450

MONTANA STATE UNIVERSITY, Missoula; Paul H. Baldwin; 8 weeks; $7,060

NEW MEXICO HIGHLANDS UNIVERSITY, Las Vegas; E. Gerald Meyer; 1 year; $16,800

NORTH DAKOTA STATE UNIVERSITY, Fargo; J. A. Callenbach; 11 months; $17,110

NORTH TEXAS STATE UNIVERSITY, Denton; Robert C. Sherman; 1 year; $13,490

PRAIRIE VIEW AGRICULTURAL AND MECHANICAL COLLEGE, Prairie View, Tex.; E. E. O'Banion; 1 year; $12,340

RENSSELAER POLYTECHNIC INSTITUTE, Troy, N.Y.; Robert L. Strong; 8 weeks; $20,130

RESEARCH FOUNDATION OF STATE UNIVERSITY OF NEW YORK, Albany; Edwin C. Jahn, Syracuse; 10 weeks; $8,050

ST. JOHN'S UNIVERSITY, Jamaica, N.Y.; Paul T. Medici; 8 weeks; $17,810

STANFORD UNIVERSITY, Stanford, Calif.; O. Cutler Shepard; 11 months; $10,820

STATE UNIVERSITY OF SOUTH DAKOTA, Vermillion; George P. Scott; 11 months; $18,720

TENNESSEE AGRICULTURAL AND INDUSTRIAL STATE UNIVERSITY, Nashville; Samuel von Winbush; 8 weeks; $7,060

U.S. NAVY ELECTRONICS LABORATORY, San Diego, Calif.; Robert W. Young; 62 weeks; $8,500

UNIVERSITY OF ARIZONA, Tucson; Jefferson C. Davis; 11 months; $15,360

UNIVERSITY OF BUFFALO, Buffalo, N.Y.; How-Tieckelmann; 11 months; $11,430

UNIVERSITY OF CALIFORNIA, Berkeley; Fred E. Dickinson; 11 months; $39,150

Robert L. Thornton; 10 weeks; $47,880

Richard A. Bernhard, Davis; 8 weeks; $9,660

UNIVERSITY OF DELAWARE, Newark; James C. Kakavas; 8 weeks; $11,630

UNIVERSITY OF GEORGIA, Athens; Robert A. McRorie; 10 weeks; $22,070

UNIVERSITY OF HAWAII, Honolulu; Harry Zeitlin; 10 weeks; $10,870

UNIVERSITY OF MASSACHUSETTS, Amherst; Edward L. Davis; 11 months; $5,720

UNIVERSITY OF MISSISSIPPI, University; Barton Milligan; 1 year; $11,440

UNIVERSITY OF NORTH CAROLINA, Chapel Hill; Robert M. Pinkerton, Raleigh; 1 year; $7,710

UNIVERSITY OF NORTH DAKOTA, Grand Forks, Francis A. Jacobs; 8 weeks; $3,920

UNIVERSITY OF OKLAHOMA, Norman; Horace Hoffman; 11 months; $12,230

Carl D. Riggs; 11 months; $14,760

UNIVERSITY OF THE PACIFIC, Stockton, Calif.; Joel W. Hedgpeth; Dillon Beach; 1 year; $13,420

UNIVERSITY OF RHODE ISLAND, Kingston; Eugene C. Winslow; 8 weeks; $6,320

UNIVERSITY OF ROCHESTER, Rochester, N.Y.; John J. Montean; 11 months; $23,350

UNIVERSITY OF SOUTHERN CALIFORNIA, Los Angeles; Charles S. Copeland; 4 months; $2,780

UNIVERSITY OF VERMONT, Burlington; Howard M. Smith, Jr.; 11 months; $11,760

UNIVERSITY OF VIRGINIA, Charlottesville; Jacques Rappaport; 8 weeks; $8,020

UNIVERSITY OF WISCONSIN, Madison; Donald H. Bucklin; 11 months; $48,970

WAYNE STATE UNIVERSITY, Detroit, Mich.; George H. Schenk; 8 weeks; $10,320

SCIENTIFIC MANPOWER STUDIES

AMERICAN UNIVERSITY, Washington, D.C.; Ernest S. Griffith; *Current Role of the Sino-Soviet Bloc in the Development of the Scientific and Engineering Manpower Resources of Other Countries;* 2 months; $1,725

ENGINEERS JOINT COUNCIL, New York, N.Y.; Carl Frey; *Analysis of 1962 Salary and Other Professional Earnings of Engineering Faculty Members;* 7 months; $10,870

FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, Washington, D.C.; Milton O. Lee; *Tabulation and Analysis of Ph. D. Dissertations in the Basic Medical Sciences;* 8 months; $9,258

MIDDLE EAST INSTITUTE, Washington, D.C.; Fahim I. Qubain; *The Employment and Training of Scientists and Engineers in the Middle East;* 1 year; $17,595

NATIONAL ACADEMY OF SCIENCES-NATIONAL RESEARCH COUNCIL, Washington, D.C.; M. H. Trytten; *Continuation of Revision of Study on Soviet Professional Manpower;* 3 months; $1,584

NATIONAL MERIT SCHOLARSHIP CORPORATION, Evanston, Ill.; John L. Holland; *Study of Institutional Characteristics Related to College Productivity;* 1 year; $25,185

NATIONAL OPINION RESEARCH CENTER, Chicago, Ill.; Peter H. Rossi; *Development of A Study Plan for Post Enumeration Census Study;* $3,538

NATIONAL SCIENCE TEACHERS ASSOCIATION, Washington, D.C.; Robert H. Carleton; *1961–62 Registry of High School Science and Mathematics Teachers;* 1 year; $36,800

Robert H. Carleton; *1962–63 Registry of High School Science and Mathematics Teachers;* 1 year; $42,550

SETON HALL UNIVERSITY, South Orange, N.J.; John B. Tsu; *Employment and Utilization of Communist China's Scientists and Engineers, 1950–1962;* 7 months; $7,000

U.S. DEPARTMENT OF COMMERCE, BUREAU OF THE CENSUS, Washington, D.C.; Richard M. Scammon; *Post-Censual Survey of Professional and Technical Manpower;* 18 months; $290,000

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, OFFICE OF EDUCATION, Washington, D.C.; E. Glenn Featherston; *1960–61 Survey of Federal Funds for Science Education;* 9 months; $13,405

Ralph M. Flynt; *Survey of Offerings and Enrollments in Nonpublic Secondary Schools;* 18 months; $19,710

Francis A. J. Ianni; *Study of the 1961 Graduating Classes of American Undergraduate Colleges;* 6 months; $5,000

Virgil Walker; *Sources of Financial Support of Graduate Students;* 6 months; $22,224

U.S. DEPARTMENT OF LABOR, BUREAU OF LABOR STATISTICS, Washington, D.C.; Ewan Clague; *Development of Long-Range Estimates of Demand for Scientific and Technical Personnel;* 1 year; $49,700

Ewan Clague; *A Pilot Study of the Quality of Responses to Surveys of Scientific and Technical Personnel in Industry;* 7 months; $16,000

UNIVERSITY OF MARYLAND, College Park; Dudley Dillard; *Evaluation of Utilization of Women as a Manpower Resource in the Soviet Union;* 2 months; $1,725

UNIVERSITY OF WISCONSIN, Madison; Gerald G. Somers; *The Labor Market Behavior of Scientists and Engineers in Jet and Missiles Production;* 1 year; $15,295

SEMINAR ON MODERN SCIENCE AND MATHEMATICS IN SECONDARY SCHOOLS, NIGERIA

EARLHAM COLLEGE, Richmond, Ind.; Laurence E. Strong; 4 months; $8,565

EDUCATIONAL SERVICES INC., Watertown, Mass.; Uri Haber-Schaim; 4 months; $11,420

STANFORD UNIVERSITY, Stanford, Calif.; Edward G. Begle; 4 months; $9,000

SPECIAL CONFERENCES AND SYMPOSIA

EDUCATIONAL SERVICES INC., Watertown, Mass.; Jerrold R. Zacharias; *One-Week Training Conference for the Summer Institute Staffs Dealing with the Physics Course Prepared by the Physical Science Study Committee;* 1 week; $14,700

SPECIAL FIELD INSTITUTES

COLORADO STATE UNIVERSITY RESEARCH FOUNDATION, Fort Collins; Herbert Riehl; *The Atmosphere and the Water Cycle;* 11 weeks; $9,520

HOWARD UNIVERSITY, Washington, D.C.; Evon Z. Vogt; *Field Institute in Anthropology;* 3 months; $15,075

UNIVERSITY OF CALIFORNIA, Berkeley; Arno P. Schniewind; *Conference on the Mechanical Behavior of Wood;* 6 days; $15,485

UNIVERSITY OF KANSAS, Lawrence; Charles D. Michener; *Entomological Field Course in Mexico and Central America;* 3 months; $3,100

UNIVERSITY OF MICHIGAN, Ann Arbor; Paul F. Zweifel; *Conference in Neutron Physics;* 7 days; $8,990

VIRGINIA POLYTECHNIC INSTITUTE, Blacksburg; James B. Eades, Jr.; *A Conference on Lunar Exploration;* 5 days; $36,995

WASHINGTON STATE UNIVERSITY, Pullman; William W. Elmendorf; *Field School in Ethnography;* 4 months; $2,045

STATE ACADEMIES OF SCIENCE PROGRAM

ACADEMY OF SCIENCE OF ST. LOUIS, St. Louis, Mo.; Donn P. Brazier; 20 months; $13,545

ALABAMA ACADEMY OF SCIENCE, Montevallo; Ruric E. Wheeler, Howard College; 20 months; $8,200

ARIZONA ACADEMY OF SCIENCE, Phoenix; Chester R. Leathers, Arizona State University; 18 months; $17,580

ARKANSAS ACADEMY OF SCIENCE, Russellville; John W. Keesee, University of Arkansas; 17 months; $6,810

CHICAGO ACADEMY OF SCIENCES, Chicago, Ill.; William J. Beecher; 17 months; $10,315

COLORADO-WYOMING ACADEMY OF SCIENCE, Colorado Springs, Colo.; Richard G. Beidleman, Colorado College; 17 months; $3,935

FLORIDA ACADEMY OF SCIENCES, Winter Park; Paul A. Vestal, Rollins College; 16 months; $14,000

FRANKLIN INSTITUTE, Philadelphia, Pa.; Robert W. Neathery; 15 months; $3,795

GEORGIA ACADEMY OF SCIENCE, Chamblee; William H. Jones, Emory University; 11 months; $8,510

HAWAIIAN ACADEMY OF SCIENCE, Honolulu; Albert B. Carr, University of Hawaii; 18 months; $4,220

Paul C. Ekern, University of Hawaii; 18 months; $2,900

Wallace G. Sanford, University of Hawaii; 18 months; $19,205

IDAHO ACADEMY OF SCIENCE, Boise; Verl G. Garrard, University of Idaho; 18 months; $14,205

INDIANA ACADEMY OF SCIENCE, Notre Dame; Howard H. Michaud, Purdue University; 18 months; $17,150

IOWA ACADEMY OF SCIENCE, INC., Iowa City; T. R. Porter, State University of Iowa; 18 months; $21,040

KANSAS ACADEMY OF SCIENCE, Hays; John Breukelman, Kansas State Teachers College; 18 months; $7,800

Margaret B. Parker, Kansas State College; 19 months; $22,160

LOUISIANA STATE UNIVERSITY, Baton Rouge; Harry J. Bennett; 17 months; $20,255

Harry J. Bennett; 17 months; $6,010

MARYLAND ACADEMY OF SCIENCES, Baltimore; Nigel O'C. Wolff; 1 year; $12,980

Nigel O'C. Wolff; 1 year; $2,630

Nigel O'C. Wolff; 18 months; $2,740

MICHIGAN ACADEMY OF SCIENCE, ARTS, AND LETTERS, East Lansing; Wayne Taylor, Michigan State University; 18 months; $20,900

MINNESOTA ACADEMY OF SCIENCE, Austin; Walter O. Lundberg, University of Minnesota; 20 months; $8,050

Walter O. Lundberg, University of Minnesota; 20 months; $6,325

MISSISSIPPI ACADEMY OF SCIENCES, INC., State College; Clyde Q. Sheely, Mississippi State University; 18 months; $35,455

MONTANA ACADEMY OF SCIENCES, Missoula; John P. Robinson; 18 months; $8,755

MUSEUM OF ART, SCIENCE, AND INDUSTRY, Bridgeport, Conn.; Earle W. Newton; 18 months; $9,845

NEBRASKA ACADEMY OF SCIENCES, INC., Omaha; James A. Rutledge, University of Nebraska; 18 months; $13,920

NEW MEXICO ACADEMY OF SCIENCE, Albuquerque; J. D. Hopperton, New Mexico Institute of Mining and Technology; 21 months; $9,785

NORTH CAROLINA ACADEMY OF SCIENCE, Durham; Herbert E. Speece, North Carolina State College; 20 months; $10,975

NORTHERN NEW ENGLAND ACADEMY OF SCIENCE, Durham, N.H.; Allen L. King, Dartmouth College; 19 months; $13,500

Howard I. Wagner, State Department of Education; 20 months; $4,000

OHIO ACADEMY OF SCIENCE, Columbus; Gerald Acker, Bowling Green State University; 20 months; $7,735

William A. Manuel, Ohio Wesleyan University; 18 months; $23,000

OKLAHOMA ACADEMY OF SCIENCE, Stillwater; Robert C. Fite, Oklahoma State University; 20 months; $7,870

J. Teague Self, University of Oklahoma; 20 months; $21,310

OREGON ACADEMY OF SCIENCE, Portland; John T. Van Bruggen, University of Oregon Medical School; 14 months; $7,880

PENNSYLVANIA ACADEMY OF SCIENCE, Easton; Charles L. Bikle, Milton Hershey School; 15 months; $9,005

SOUTH DAKOTA ACADEMY OF SCIENCE, Vermillion; T. Van Bruggen, State University of South Dakota; 18 months; $5,810

T. Van Bruggen, State University of South Dakota; 18 months; $1,935

T. Van Bruggen, State University of South Dakota; 18 months; $9,780

T. Van Bruggen, State University of South Dakota; 18 months; $3,740

Tennessee Academy of Science, Nashville; Myron S. McCay, University of Chattanooga; 19 months; $13,325

Albert L. Myers, Carson-Newman College; 18 months; $3,570

W. Roger Rusk, University of Tennessee; 18 months; $12,100

Texas Academy of Science, Galveston; Addison E. Lee, University of Texas; 18 months; $19,365

Charles LaMotte, Agricultural and Mechanical College of Texas; 20 months; $10,610

University of Puerto Rico, Rio Piedras; Herminio Lugo; 18 months; $25,070

Utah Academy of Sciences, Arts, and Letters, Logan; Orson Whitney Young, Weber College; 18 months; $14,720

Washington Academy of Sciences, Washington, D.C.; John K. Taylor, National Bureau of Standards; 1 year; $5,550

John K. Taylor, National Bureau of Standards; 1 year; $2,500

John K. Taylor, National Bureau of Standards; 18 months; $10,550

West Virginia Academy of Science, Morgantown; Arthur B. Gould, West Virginia Wesleyan College; 17 months; $5,850

Wisconsin Academy of Sciences, Arts, and Letters, Beloit; Jack R. Arndt, University of Wisconsin; 18 months; $7,175

SUMMER CONFERENCE FOR COLLEGE TEACHERS

American University, Washington, D.C.; Matthew F. Norton; 14 days; $16,600

Case Institute of Technology, Cleveland, Ohio; Gordon M. Barrow; 19 days; $15,200

Colorado School of Mines, Golden; Robert J. Weimer; 27 days; $24,900

Colorado State University Research Foundation, Fort Collins; Ferdinand Baer; 20 days; $16,900

Donald R. Wood; 19 days; $14,100

Dartmouth College. Hanover, N.H.; Daniel Rosenthal, University of California; 10 days; $11,900

Fairmont State College, Fairmont, W. Va.; John W. Hogarty; 25 days; $19,000

General Extension Division, Oregon System of Higher Education, Portland; Robert W. Rempfer, Portland State College; 20 days; $11,400

Georgetown University, Washington, D.C.; Matthew P. Thekaekara; 24 days; $21,000

Institute of Paper Chemistry, Appleton, Wis.; Elwood O. Dillingham; 12 days; $14,100

Lehigh University, Bethlehem, Pa.; Everett Pitcher; 19 days; $18,000

Marquette University., Milwaukee, Wis., John E. Kelley; 20 days; $12,400

Michigan College of Mining and Technology, Houghton; James M. Neilson; 15 days; $16,900

Montclair State College, Upper Montclair, N.J.; Anthony J. Pettofrezzo; 12 days; $11,000

Ohio State University, Columbus; Daryle H. Busch; 12 days; $13.200

Oklahoma State University, Stillwater; L. Wayne Johnson; 14 days; $16,800

Pennsylvania State University, University Park; William H. Powers; 27 days; $7,100

Princeton University, Princeton, N.J.; A. J. Maruca; 19 days; $17,900

Rutgers, The State University, New Brunswick, N.J.; Richard F. Gabriel; 20 days; $18,200

Tufts University, Medford, Mass.; M. Kent Wilson; 13 days; $13,800

University of Arizona, Tucson; Donald L. Webb; 19 days; $15,300

University of California, Berkeley; Clifford Bell, Los Angeles; 26 days; $18,900

Daniel Rosenthal, Los Angeles; 10 days; $11,200

University of Florida, Gainesville; Wallace S. Brey, Jr.; 12 days; $13,680

University of Louisville, Louisville, Ky.; Daniel F. Jackson; 21 days; $19,100

University of Miami, Coral Gables, Fla.; E. F. Low, Jr.; 26 days; $14,800

University of Michigan, Ann Arbor; Phillip S. Jones; 26 days; $21,600

University of North Carolina, Chapel Hill; C. Ritchie Bell; 19 days; $14,700

University of Southern California, Los Angeles; Robert D. Vold; 16 days; $15,200

University of Southwestern Louisiana, Lafayette; James R. Oliver; 27 days; $17,400

University of Utah, Salt Lake City; Eugene E. Kohlbecker; 26 days; $19,200

Vanderbilt University, Nashville, Tenn.; B. F. Bryant and James R. Wesson; 26 days; $17,300

Washington State University, Pullman; Sidney G. Hacker; 26 days; $19,800

Charles Gardner Shaw; 12 days; $14,800

Wayne State University, Detroit, Mich.; Willard H. Parsons; 20 days; $20,400

SUMMER INSTITUTES FOR COLLEGE TEACHERS

Agricultural and Mechanical College of Texas, College Station; J. H. Caddess; 15 weeks; $51,300

Robert G. Cochran; 6 weeks; $18,100

American University, Washington, D.C.; Leo Schubert; 6 weeks; $49,250

Arizona State University, Tempe; Gordon L. Bender; 6 weeks; $40,500

Auburn University, Auburn, Ala.; Ernest Williams; 10½ weeks; $31,700

Beloit College, Beloit, Wis.; S. C. Hayward; 6 weeks; $33,000

R. Ronald Palmer; 6 weeks; $30,200

Bowdoin College, Brunswick, Maine; Dan E. Christie; 6 weeks; $51,100

Bucknell University, Lewisburg, Pa.; Charles H. Coder, Jr.; 6 weeks; $40,500

Colorado State University, Fort Collins; John H. Nath; 8 weeks; $33,600

Duke University, Durham, N.C.; Harold J. Humm; 5 weeks; $15,375

Emory University, Atlanta, Ga.; William H. Jones; 9 weeks; $43,300

FISK UNIVERSITY, Nashville, Tenn.; Nelson Fuson; 6 weeks; $23,400

FORT HAYS KANSAS STATE COLLEGE, Hays, Kans.; Harold S. Choguill; 8 weeks; $30,200

GEORGIA INSTITUTE OF TECHNOLOGY, Atlanta; James A. Stanfield; 6 weeks; $35,050

HARVARD UNIVERSITY, Cambridge, Mass.; Thomas S. Parsons, University of Toronto; 6 weeks; $47,400

ILLINOIS INSTITUTE OF TECHNOLOGY, Chicago; Peter Chiarulli; 8 weeks; $41,100

IOWA STATE UNIVERSITY, Ames; Glenn Murphy; 6 weeks; $43,900
  Glenn Murphy; 6 weeks; $21,400
  Bernard Vinograde; 6 weeks; $33,150

LOUISIANA STATE UNIVERSITY, Baton Rouge; Harry D. Richardson; 9 weeks; $26,600

MICHIGAN COLLEGE OF MINING AND TECHNOLOGY, Houghton; Kenneth M. McMillin; 10 weeks; $35,600

NORTHWESTERN UNIVERSITY, Evanston, Ill.; Edward J. Taaffe; 6 weeks; $31,050

OAK RIDGE INSTITUTE, Oak Ridge, N.C.; Ralph T. Overman; 6 weeks; $17,600
  Ralph T. Overman; 7 weeks; $16,900
  Ralph T. Overman; 8 weeks; $19,200

OKLAHOMA STATE UNIVERSITY, Stillwater; Carl E. Marshall; 9 weeks; $64,450
  Jan J. Tuma; 9 weeks; $61,347

OREGON STATE UNIVERSITY, Corvallis; A. V. Logan; 6 weeks; $34,750

PURDUE UNIVERSITY, Lafayette, Ind.; John E. Christian; 6 weeks; $14,500

RUTGERS, THE STATE UNIVERSITY, New Brunswick, N.J.; Joshua Barlaz; 8 weeks; $46,900

STATE UNIVERSITY OF IOWA, Iowa City; Don Lewis; 8 weeks; $63,800

STEVENS INSTITUTE OF TECHNOLOGY, Hoboken, N.J.; Robert H. Seavy; 6 weeks; $33,700

SYRACUSE UNIVERSITY, Syracuse, N.Y.; M. W. Jennison; 6 weeks; $14,500

TULANE UNIVERSITY, New Orleans, La.; John K. Hampton, Jr.; 8 weeks; $19,200

UNIVERSITY OF ARIZONA, Tucson; M. R. Bottaccini; 8 weeks; $36,100

UNIVERSITY OF CALIFORNIA, Berkeley; George Jura; 8 weeks; $23,700
  Duane F. Marble, University of Pennsylvania; 8 weeks; $49,600
  Robert F. Murphy; 6 weeks; $32,200
  Peter K. Henrici, Los Angeles; 8 weeks; $70,100

UNIVERSITY OF COLORADO, Boulder; James Chinn; 10 weeks; $56,100
  Alec J. Kelso; 10 weeks; $65,700
  G. B. Williams, University of Michigan; 8 weeks; $55,100

UNIVERSITY OF GEORGIA, Athens; John Jewett; 10 weeks; $30,750

UNIVERSITY OF HOUSTON, Houston, Tex.; Herbert H. Curry; 8 weeks; $51,300

UNIVERSITY OF ILLINOIS, Urbana; Jerry S. Dobrovolny; 8 weeks; $52,600
  Joseph Landin; 12 weeks; $77,515

UNIVERSITY OF KANSAS, Lawrence; Arnold A. Strassenburg; 8 weeks; $37,400

UNIVERSITY OF MISSISSIPPI, University; William A. Wilbanks; 11 weeks; $47,500

UNIVERSITY OF NORTH CAROLINA, Chapel Hill; H. D. Crockford; 6 weeks; $38,100

UNIVERSITY OF NOTRE DAME, Notre Dame, Ind.; Harry C. Saxe; 7 weeks; $38,500

UNIVERSITY OF OKLAHOMA, Norman; H. E. Hoffman; 8 weeks; $22,800

UNIVERSITY OF OREGON, Eugene; Richard W. Castenholz; 8 weeks; $34,500

UNIVERSITY OF THE PACIFIC, Stockton, Calif.; Emerson G. Cobb; 5 weeks; $16,100

UNIVERSITY OF SOUTHWESTERN LOUISIANA, Lafayette; James R. Oliver; 9 weeks; $21,100

UNIVERSITY OF WASHINGTON, Seattle; Roy Dubisch; 6 weeks; $43,700

VANDERBILT UNIVERSITY, Nashville, Tenn.; R. B. Channell; 6 weeks; $61,300

WASHINGTON STATE UNIVERSITY, Pullman; Harry Stern; 8 weeks; $24,000

WORCESTER POLYTECHNIC INSTITUTE, Worcester, Mass.; Glen A. Richardson; 8 weeks; $55,800

SUMMER INSTITUTES FOR SECONDARY SCHOOL AND COLLEGE TEACHERS

INDIANA UNIVERSITY, Bloomington; L. S. McClung; 4 weeks; $28,900

MISSISSIPPI STATE UNIVERSITY, State College; Clyde Q. Sheely; 11 weeks; $138,200

MONTANA STATE COLLEGE, Bozeman; L. O. Binder; 5 weeks; $55,000

PHILADELPHIA COLLEGE OF PHARMACY AND SCIENCE, Pa.; Arthur Osol; 6 weeks; $28,800

TUSKEGEE INSTITUTE, Tuskegee Institute, Ala.; B. D. Mayberry; 8 weeks; $19,000

UNIVERSITY OF ILLINOIS, Urbana; Peter Yankwich; 8 weeks; $47,000

UNIVERSITY OF KANSAS, Lawrence; Russell N. Bradt; 8 weeks; $98,800

UNIVERSITY OF OKLAHOMA, Norman; Richard V. Andree; 9 weeks; $84,675
  H. E. Hoffman; 8 weeks; $46,400

UNIVERSITY OF WASHINGTON, Seattle; Arthur D. Welander; 8 weeks; $38,000

SUMMER INSTITUTES FOR SECONDARY SCHOOL TEACHERS

AGRICULTURAL AND MECHANICAL COLLEGE OF TEXAS, College Station; E. B. Middleton; 12 weeks; $72,700
  Melvin C. Schroeder; 12 weeks; $63,600
  Albert Collier, Galveston; 4 weeks; $22,900

AGRICULTURAL AND TECHNICAL COLLEGE OF NORTH CAROLINA, Greensboro; Gerald A. Edwards; 6 weeks; $59,150
  Artis P. Graves; 9 weeks; $69,300

ALABAMA AGRICULTURAL AND MECHANICAL COLLEGE, Normal; Vandon E. White; 10 weeks; $48,300

ALABAMA COLLEGE, Montevallo; Paul C. Bailey; 10 weeks; $96,900

ALAMEDA COUNTY STATE COLLEGE, Heyward, Calif.; C. T. Purvis; 8 weeks; $50,200

ALBANY STATE COLLEGE, Albany, Ga.; Alexander A. Hall, Sr.; 6 weeks; $49,800

ALFRED UNIVERSITY, Alfred, N.Y.; E. Gordon Ogden; 6 weeks; $57,500

ALLEGHENY COLLEGE, Meadville, Pa.; Gerald S. Reisner; 7 weeks; $67,200

AMERICAN UNIVERSITY, Washington, D.C.; Leo Schubert; 7 weeks; $58,700

ANTIOCH COLLEGE, Yellow Springs, Ohio; James F. Corwin; 8 weeks; $94,400

ARIZONA STATE UNIVERSITY, Tempe; John N. Aronson; 8 weeks; $40,500
Valentine Galasyn; 8 weeks; $71,200
Lehi T. Smith; 7 weeks; $49,900

ARKANSAS STATE COLLEGE, State College; W. W. Nedrow; 5 weeks; $35,700

ATLANTA UNIVERSITY, Atlanta, Ga.; K. A. Huggins; 9 weeks; $64,700

AUBURN UNIVERSITY, Auburn, Ala.; Ernest Williams; 10½ weeks; $60,100
Ernest Williams; 10½ weeks; $79,300

BALDWIN-WALLACE COLLEGE, Berea, Ohio; Dean L. Robb; 6 weeks; $40,000

BALL STATE TEACHERS COLLEGE, Muncie, Ind.; Jerry J. Nisbet; 10 weeks; $75,300

BAYLOR UNIVERSITY, Waco, Tex.; Bryce C. Brown; 8 weeks; $77,000

BIRMINGHAM-SOUTHERN COLLEGE, Birmingham, Ala.; Hoyt M. Kaylor; 8 weeks; $76,600

BOARD OF REGENTS OF WISCONSIN STATE COLLEGES, Madison; Eugene R. McPhee; 4 weeks; $32,800
Eugene R. McPhee; 6 weeks; $47,800

BOSTON COLLEGE, Chestnut Hill, Mass.; Walter J. Fimian, Jr.; 6 weeks; $13,600
William G. Guindon; 6 weeks; $30,700

BOSTON UNIVERSITY, Boston, Mass.; J. D. Barton, Jr.; 6 weeks; $41,300

BOWDOIN COLLEGE, Brunswick, Maine; Alton H. Gustafson; 6 weeks; $37,700
Samuel E. Kammerling; 6 weeks; $38,600
Reinhard L. Korgen; 6 weeks; $60,600
Noel C. Little; 6 weeks; $14,500

BOWLING GREEN STATE UNIVERSITY, Bowling Green, Ohio; Bruce R. Vogeli; 5 weeks; $41,400

BRADLEY UNIVERSITY, Peoria, Ill.; A. Wayne McGaughey; 6 weeks; $42,200

BRIGHAM YOUNG UNIVERSITY, Provo, Utah; Lane A. Compton; 9 weeks; $8,900

BROOKLYN COLLEGE, Brooklyn, N.Y.; Meyer Jordon; 6 weeks; $35,500

BROWN UNIVERSITY, Providence, R.I.; Leallyn B. Clapp; 6 weeks; $44,750
Elmer R. Smith; 6 weeks; $59,500

BUCKNELL UNIVERSITY, Lewisburg, Pa.; Lester Kieft; 6 weeks; $66,500

CAPITAL UNIVERSITY, Columbus, Ohio; Carl F. Sievert; 6 weeks; $36,800

CARLETON COLLEGE, Northfield, Minn.; Duncan Stewart; 6 weeks; $48,000
Kenneth W. Wegner; 6 weeks; $52,400

CASE INSTITUTE OF TECHNOLOGY, Cleveland, Ohio; Paul E. Guenther; 7 weeks; $60,800

CATHOLIC UNIVERSITY OF AMERICA, Washington, D.C.; Raymond W. Moller; 6 weeks; $52,300

CATHOLIC UNIVERSITY OF PUERTO RICO, Santa Maria, Ponce; Joseph Frohnhoefer; 6 weeks; $22,200

CENTRAL MICHIGAN UNIVERSITY, Mount Pleasant; Malcolm H. Filson; 8 weeks; $35,300
Carl A. Scheel; 8 weeks; $41,400
Lester H. Serier; 8 weeks; $75,500

CENTRAL MISSOURI STATE COLLEGE, Warrensburg; Sam P. Hewitt; 10 weeks; $90,300

CENTRAL STATE COLLEGE, Wilberforce, Ohio; Bernard H. Johnson; 8 weeks; $33,500

CHICAGO PARK DISTRICT, Ill.; Donald W. Rogers; 4 weeks; $31,900

CITY COLLEGE, New York, N.Y.; Chester B. Kremer; 6 weeks; $49,900

CLARK UNIVERSITY, Worcester, Mass.; John S. Stubbe; 6 weeks; $39,800

CLARKSON COLLEGE OF TECHNOLOGY, Potsdam, N.Y.; F. Gordon Lindsey; 8 weeks; $96,000

CLEMSON COLLEGE, Clemson, S.C.; Floyd I. Brownley, Jr.; 6 weeks; $56,800

COLBY COLLEGE, Waterville, Maine; Evans B. Reid; 6 weeks; $81,700

COLGATE UNIVERSITY, Hamilton, N.Y.; Carl W. Munshower; 6 weeks; $49,600
Oran B. Stanley; 6 weeks; $60,300

COLLEGE OF THE HOLY CROSS, Worcester, Mass.; Robert B. MacDonnell; 6 weeks; $57,800
Vincent O. McBrien; 6 weeks; $55,200

COLLEGE OF ST. THOMAS, St. Paul, Minn.; Martin Allen; 6 weeks; $46,600

COLLEGE OF WILLIAM AND MARY, Williamsburg, Va.; Melvin A. Pittman; 8 weeks; $119,000

COLORADO COLLEGE, Colorado Springs; Richard G. Beidleman; 8 weeks; $42,500
Richard G. Beidleman; 8 weeks; $88,600
Lester A. Michel, 6 weeks; $40,300

COLORADO SCHOOL OF MINES, Golden; James L. Hall; 6 weeks; $46,000

COLORADO STATE COLLEGE, Greeley; Bert O. Thomas; 8 weeks; $66,700

COLORADO STATE UNIVERSITY, Fort Collins; Edward B. Reed; 8 weeks; $53,800

COLORADO STATE UNIVERSITY RESEARCH FOUNDATION, Fort Collins; William D. Derbyshire; 8 weeks; $40,100

COLUMBIA UNIVERSITY, New York, N.Y.; Daniel A. Greenberg; 6 weeks; $70,900

CONVERSE COLLEGE, Spartanburg, S. C.; Walter James Wyatt; 8 weeks; $77,600

CORNELL UNIVERSITY, Ithaca, N.Y.; R. William Shaw; 7 weeks; $71,200

DENISON UNIVERSITY, Granville, Ohio; Robert A. Roberts; 6 weeks; $46,000

DEPAUW UNIVERSITY, Greencastle, Ind.; Clinton B. Gass; 6 weeks; $46,400

DILLARD UNIVERSITY, New Orleans, La.; Clifford R. Bryan; 6 weeks; $29,500
Jan Hamer; 6 weeks; $29,400

DRAKE UNIVERSITY, Des Moines, Iowa; B. E. Gillam; 8 weeks; $59,100
Leland P. Johnson; 9 weeks; $71,100

DREW UNIVERSITY, Madison, N.J.; Bernard Greenspan; 6 weeks; $44,300

DUKE UNIVERSITY, Durham, N.C.; Thomas D. Reynolds; 9 weeks; $136,575

EARLHAM COLLEGE, Richmond, Ind.; Murvel R. Garner; 6 weeks; $26,900

EAST CAROLINA COLLEGE, Greenville, N.C.; Frank W. Eller; 6 weeks; $41,900

EASTERN ILLINOIS UNIVERSITY, Charleston; Weldon N. Baker; 8 weeks; $76,500

EASTERN MICHIGAN UNIVERSITY, Ypsilanti; James M. Barnes; 6 weeks; $63,000

EASTERN NEW MEXICO UNIVERSITY, Portales; Ruth B. Thomas; 8 weeks; $79,300

EMORY UNIVERSITY, Atlanta, Ga.; Trevor Evans; 7 weeks; $49,100

FISK UNIVERSITY, Nashville, Tenn.; James R. Lawson; 8 weeks; $82,800

FLORIDA STATE UNIVERSITY, Tallahassee; Sherwood M. Reichard; 8 weeks; $19,000
James E. Snover; 8 weeks; $39,900

FORDHAM UNIVERSITY, New York, N.Y.; Frederick L. Canavan; 6 weeks; $48,000

FORT HAYS KANSAS STATE COLLEGE, Hays; W. Toalson; 9 weeks; $56,000

FRANKLIN AND MARSHALL COLLEGE, Lancaster, Pa.; Marvin E. Kauffman; 6 weeks; $33,650
Donald W. Western; 6 weeks; $40,300

GENERAL EXTENSION DIVISION, OREGON STATE SYSTEM OF HIGHER EDUCATION, Portland; J. Richard Byrne, Portland State College; 8 weeks; $38,400

GEORGE PEABODY COLLEGE FOR TEACHERS, Nashville, Tenn.; H. Craig Sipe; 10 weeks; $78,800
H. Craig Sipe; 10 weeks; $129,000

GEORGETOWN UNIVERSITY, Washington, D.C.; Malcolm W. Oliphant; 8 weeks; $51,600
Charles L. Koelsche; 10 weeks; $71,200
T. H. Whitehead; 10 weeks; $79,000

GRAMBLING COLLEGE, Grambling, La.; Archie L. Lacey, Hunter College; 8 weeks; $51,500

HAMILTON COLLEGE, Clinton, N.Y.; Brewster H. Gere; 6 weeks; $52,100

HAMPTON INSTITUTE, Hampton, Va.; Victor H. Fields; 8 weeks; $58,000

HOPE COLLEGE, Holland, Mich.; Jay E. Folkert; 6 weeks; $43,200
Curtis A. Rogers; 6 weeks; $42,500

HOWARD UNIVERSITY, Washington, D.C.; Marie C. Taylor; 8 weeks; $51,700

HUSTON-TILLOTSON COLLEGE, Austin, Tex.; J. H. Morton; 6 weeks; $50,400

ILLINOIS WESLEYAN UNIVERSITY, Bloomington; Wayne W. Wantland; 8 weeks; $71,800

INDIANA UNIVERSITY FOUNDATION, Bloomington; John B. Droste; 6 weeks; $36,700
Virgil H. Heniser, Howe High School, Indianapolis; 4 weeks; $27,400
George K. Neumann; 8 weeks; $46,300
T. G. Perry; 6 weeks; $34,200
Frederic C. Schmidt; 8 weeks; $52,700
Marie S. Wilcox, T. C. Howe High School, Indianapolis; 6 weeks; $53,200

INTER AMERICAN UNIVERSITY OF PUERTO RICO, San German; Ismael Velez; 5 weeks; $35,200

IOWA STATE UNIVERSITY, Ames; Orlando C. Kreider; 6 weeks; $81,100
Leo A. Thomas; 6 weeks; $20,800

JOHNS HOPKINS UNIVERSITY, Baltimore, Md.; William Kelso Morrill, Sr.; 6 weeks; $64,500

JUNIATA COLLEGE, Huntingdon, Pa.; David M. Hercules; 6 weeks; $40,300

KANSAS STATE COLLEGE of Pittsburg; R. G. Smith; 8 weeks; $76,700

KANSAS STATE TEACHERS COLLEGE, Emporia; Otto M. Smith; 12 weeks; $223,000

KANSAS STATE UNIVERSITY, Manhattan; J. R. Chelikowsky; 8 weeks; $55,200
Leonard E. Fuller; 8 weeks; $60,500

KENT STATE UNIVERSITY, Kent, Ohio; Kenneth B. Cummins; 8 weeks; $65,400

KENTUCKY RESEARCH FOUNDATION, Lexington; John M. Carpenter; 8 weeks; $91,300

KENYON COLLEGE, Gambier, Ohio; J. M. Pappenhagen; 6 weeks; $47,170

KNOX COLLEGE, Galesburg, Ill.; Herbert Priestley; 8 weeks; $67,500
Rothwell Stephens; 6 weeks; $49,800

LAFAYETTE COLLEGE, Easton, Pa.; Charles W. Saalfrank; 6 weeks; $24,100

LEHIGH UNIVERSITY, Bethlehem, Pa.; Clarance A. Shook; 6 weeks; $48,100

LONG BEACH STATE COLLEGE FOUNDATION, Long Beach, Calif.; M. Dale Arvey; 6 weeks; $28,000

LOUISIANA POLYTECHNIC INSTITUTE, Ruston; Donald L. Fernholz; 9 weeks; $52,500

LOUISIANA STATE UNIVERSITY, Baton Rouge; Benjamin E. Mitchell; 9 weeks; $58,300
Robert V. Nauman; 9 weeks; $58,200
Hulen B. Williams; 9 weeks; $92,200

MACALESTER COLLEGE, St. Paul, Minn.; Russell B. Hastings; 8 weeks; $72,600

UNIVERSITY OF MAINE, Orono; S. H. Kimball; 6 weeks; $48,200

MARQUETTE UNIVERSITY, Milwaukee, Wis.; Raymond A. Bournique; 8 weeks; $53,900
L. J. Heider; 6 weeks; $35,500

MARSHALL FOUNDATION, INC., Huntington, W. Va.; Donald C. Martin; 10 weeks; $73,000

MEMPHIS STATE UNIVERSITY, Memphis, Tenn.; J. W. Fox; 8 weeks; $77,200
H. S. Kaltenborn; 8 weeks; $43,300

MIAMI UNIVERSITY, Oxford, Ohio; L. Warren Nelson; 6 weeks; $63,600
Bruce V. Weidner; 8 weeks; $97,100

MICHIGAN STATE UNIVERSITY, East Lansing; Sherwood K. Haynes; 11 weeks; $61,350
Jack B. Kinsinger; 6 weeks; $46,750
T. Wayne Porter; 11 weeks; $65,200
John Wagner; 11 weeks; $83,000

MIDDLE TENNESSEE STATE COLLEGE, Murfreesboro; J. Eldred Wiser; 11 weeks; $103,300

MILLERSVILLE STATE COLLEGE, Millersville, Pa.; William B. McIlwaine; 6 weeks; $30,400

MISSISSIPPI SOUTHERN COLLEGE, Hattiesburg; John H. Allen; 9 weeks; $87,000
B. O. VanHook; 9 weeks; $57,700

MONTANA STATE COLLEGE, Bozeman; L. O. Binder; 10 weeks; $44,900
William B. Cook; 6 weeks; $39,800
William G. Walter; 5 weeks; $27,600

MONTANA STATE UNIVERSITY, Missoula; Gordon B. Castle; 8 weeks; $14,900
James W. Gebhart; 10 weeks; $78,400
William M. Myers; 10 weeks; $76,000

MORGAN STATE COLLEGE, Baltimore, Md.; Thomas P. Fraser; 6 weeks; $63,000

MURRAY STATE COLLEGE FOUNDATION, Murray, Ky.; Walter E. Blackburn; 8 weeks; $63,800

NEBRASKA WESLEYAN UNIVERSITY, Lincoln; Walter R. French, Jr.; 8 weeks; $67,400

NEW MEXICO HIGHLANDS UNIVERSITY, Las Vegas; R. A. Deering; 7 weeks; $37,800
Galen W. Ewing; 4 weeks; $34,200
Clarence G. Struckwisch; 10 weeks; $89,100

NEW MEXICO STATE UNIVERSITY, University Park; E. L. Cleveland; 8 weeks; $51,300

NORTH CAROLINA COLLEGE at Durham; William H. Robinson; 6 weeks; $77,900

NORTH DAKOTA STATE UNIVERSITY, Fargo; F. L. Minnear; 8 weeks; $94,000

NORTHEAST LOUISIANA STATE COLLEGE, Monroe; William K. Easley; 9 weeks; $57,900
B. Earl Prince; 9 weeks; $42,200

NORTHEAST MISSOURI STATE TEACHERS COLLEGE, Kirksville; Dean A. Rosebery; 8 weeks; $74,900

NORTHERN MICHIGAN COLLEGE, Marquette; Holmes Boynton; 8 weeks; $43,100
Roy E. Heath; 8 weeks; $48,700

NORTHWESTERN STATE COLLEGE OF LOUISIANA, Natchitoches; James A. Noel; 9 weeks; $64,500

NORTHWESTERN UNIVERSITY, Evanston, Ill.; E. H. C. Hildebrandt; 8 weeks; $75,800

OAK RIDGE INSTITUTE OF NUCLEAR STUDIES, INC., Oak Ridge, Tenn.; W. W. Grigorieff; 8 weeks; $33,200
Ralph T. Overman; 4 weeks; $6,100

OBERLIN COLLEGE, Oberlin, Ohio; E. P. Vance; 8 weeks; $122,100

OHIO STATE UNIVERSITY, Columbus, Ohio; Robert C. Fisher; 8 weeks; $91,300
A. B. Garrett; 6 weeks; $49,750
John S. Richardson; 8 weeks; $77,800
Edmund M. Spieker; 10 weeks; $42,400

OHIO UNIVERSITY FUND, INC., Athens; Lawrence P. Eblin; 6 weeks; $60,700

OHIO WESLEYAN UNIVERSITY, Delaware; Arthur C. Breyer; 8 weeks; $52,100
William D. Stull; 8 weeks; $81,700

OKLAHOMA BAPTIST UNIVERSITY, Shawnee; Jack O. Purdue; 8 weeks; $51,300

OKLAHOMA STATE UNIVERSITY, Stillwater; L. Herbert Bruneau; 9 weeks; $73,800
James H. Zant; 8 weeks; $67,600

OREGON STATE UNIVERSITY, Corvallis; Albert R. Poole; 8 weeks; $64,500
Stanley E. Williamson; 8 weeks; $65,500

PENNSYLVANIA STATE UNIVERSITY, University Park; William H. Powers; 6 weeks; $107,100

PRATT INSTITUTE, Brooklyn, N.Y.; John Michael O'Gorman; 6 weeks; $40,400

PRINCETON UNIVERSITY, Princeton, N.J.; A. J. Maruca; 7 weeks; $54,200

PURDUE UNIVERSITY, Lafayette, Ind.; D. A. Davenport; 8 weeks; $64,900
M. Wiles Keller; 8 weeks; $68,200
J. D. Novak; 8 weeks; $68,800
I. Walerstein; 8 weeks; $46,000
I. Walerstein; 8 weeks; $44,300

RANDOLPH-MACON WOMAN'S COLLEGE, Lynchburg, Va.; Helen L. Whidden; 6 weeks; $61,000

REED COLLEGE, Portland, Oreg.; Frederick A. Courts; 8 weeks; $41,400
John Leadley; 8 weeks; $95,700
Arthur H. Livermore; 6 weeks; $43,000

RENSSELAER POLYTECHNIC INSTITUTE, Troy, N.Y.; A. A. K. Booth; 8 weeks; $145,800

RESEARCH FOUNDATION OF STATE UNIVERSITY OF NEW YORK, Albany; M. Ira Dubins, Oneonta; 8 weeks; $51,900
Alexander G. Major, Potsdam; 6 weeks; $64,300

RUTGERS, THE STATE UNIVERSITY, New Brunswick, N.J.; Joshua Barlaz; 6 weeks; $55,700
Richard K. Olsson; 6 weeks; $41,100
Paul G. Pearson; 6 weeks; $43,500
Robert L. Sells; 7 weeks; $54,800

SACRAMENTO STATE COLLEGE FOUNDATION, Sacramento, Calif.; Carl E. Ludwig; 6 weeks; $60,800
Siegfried Nussenbaum; 6 weeks; $39,800

ST. AUGUSTINE'S COLLEGE, Raleigh, N.C.; Jeffrey Gipson; 6 weeks; $50,400

ST. CLOUD STATE COLLEGE, St. Cloud, Minn.; Harold Hopkins; 5 weeks; $48,800

ST. LOUIS UNIVERSITY, St. Louis, Mo.; Francis Regan; 6 weeks; $48,300
Arthur G. Rouse; 6 weeks; $23,600

ST. MARY'S COLLEGE, Winona, Minn.; L. George; 8 weeks; $19,000

SAN DIEGO STATE COLLEGE FOUNDATION, San Diego, Calif.; Allen M. Bassett; 8 weeks; $37,600
Clifford E. Smith; 9 weeks; $58,750

SAN JOSE STATE COLLEGE CORPORATION, San Jose, Calif.; Leonard I. Holder; 6 weeks; $38,500
W. H. Myers; 6 weeks; $57,100

SARAH LAWRENCE COLLEGE, Bronxville, N.Y.; Edward J. Cogan; 6 weeks; $34,800

SEATTLE UNIVERSITY, Seattle, Wash.; Ernest Bertin; 8 weeks; $75,100

SETON HILL COLLEGE, Greensburg, Pa.; Sister Mary Thaddeus; 6 weeks; $43,200

SIMMONS COLLEGE, Boston, Mass.; Philip M. Richardson; 6 weeks; $24,600
John A. Timm; 6 weeks; $24,400

SOUTH CAROLINA STATE COLLEGE, Orangeburg; George W. Hunter; 8 weeks; $78,800

SOUTH DAKOTA SCHOOL OF MINES AND TECHNOLOGY, Rapid City; Howard C. Peterson; 8 weeks; $128,800

SOUTH DAKOTA STATE COLLEGE, Brookings; Kenneth E. Howard; 8 weeks; $80,300

SOUTHEASTERN LOUISIANA COLLEGE, Hammond; Robert W. Kelly; 9 weeks; $64,700

SOUTHEASTERN STATE COLLEGE, Durant, Okla.; Leslie A. Dwight; 8 weeks; $72,300

SOUTHERN ILLINOIS UNIVERSITY, Carbondale; Morton R. Kenner; 8 weeks; $62,300
I. L. Shechmeister; 8 weeks; $62,100

SOUTHERN METHODIST UNIVERSITY, Dallas, Tex.; Joe P. Harris, Jr.; 6 weeks; $31,000
Joe P. Harris, Jr.; 8 weeks; $39,500

SOUTHERN UNIVERSITY AND AGRICULTURAL AND MECHANICAL COLLEGE, Baton Rouge, La.; Rogers J. Newman; 8 weeks; $36,600
Spaulding M. Ruffin; 8 weeks; $36,500
Lee B. Stephens; 8 weeks; $59,500

SOUTHWESTERN STATE COLLEGE, Weatherford, Okla.; Earl A. Reynolds; 8 weeks; $50,700

STANFORD UNIVERSITY, Stanford, Calif.; Harold M. Bacon; 6 weeks; $52,400

STATE COLLEGE OF IOWA, Cedar Falls; Irvin H. Brune; 8 weeks; $59,800
Dorothy C. Matala; 8 weeks; $62,700

State University of South Dakota, Vermillion; M. M. Hasse; 8 weeks; $77,900
Robert L. Stevenson; 8 weeks; $65,900

Stephen F. Austin State College, Nacogdoches, Tex.; E. L. Miller; 6 weeks; $30,400

Stevens Institute of Technology, Hoboken, N.J.; Robert H. Seavy; 6 weeks; $64,700

Syracuse University, Syracuse, N.Y.; John G. Burdick; 6 weeks; $51,150
Robert B. Davis; 6 weeks; $51,700
William R. Frederickson; 6 weeks; $62,500

Teachers College, Columbia University, New York, N.Y.; Howard F. Fehr; 6 weeks; $40,300
Frederick L. Fitzpatrick; 6½ weeks; $30,300

Temple University, Philadelphia, Pa.; John M. Mickelson; 9 weeks; $48,700
Elmer L. Offenbacher; 9 weeks; $88,200

Tennessee Agricultural and Industrial State University, Nashville; Rutherford H. Adkins; 8 weeks; $50,400

Texas Christian University, Fort Worth; John W. Forsyth; 6 weeks; $92,200

Texas College of Arts and Industries, Kingsville; James M. Robinson, Jr.; 6 weeks; $29,100

Texas Southern University, Houston; Robert J. Terry; 12 weeks; $94,200

Texas Technological College, Lubbock; Earl D. Camp; 9 weeks; $86,700
Charles L. Riggs; 9 weeks; $66,700

Texas Woman's University, Denton; Harold T. Baker; 9 weeks; $21,300
Harlan C. Miller; 6 weeks; $39,200

Thiel College, Greenville, Pa.; Bela G. Kolossvary; 6 weeks; $50,800

Tufts University, Medford, Mass.; M. Kent Wilson; 6 weeks; $44,400

Tulane University, New Orleans, La.; Gail S. Young; 9 weeks; $75,800

Tuskegee Institute, Tuskegee Institute, Ala.; Lawrence F. Koons; 8 weeks; $58,300

Union College & University, Schenectady, N.Y.; D. K. Baker; 8 weeks; $130,800

University of Alaska, College; William R. Cashen; 8 weeks; $70,000

University of Arizona, Tucson; Millard G. Seeley; 8 weeks; $65,500
Arthur H. Steinbrenner; 8 weeks; $63,900

University of Arkansas, Fayetteville; William R. Orton; 6 weeks; $48,400
Leo J. Paulissen; 6 weeks; $59,600

University of California, Berkeley; Gideon T. James; 8 weeks; $62,700
Lola S. Kelly; 8 weeks; $28,500
Mario Menesini; 8 weeks; $64,400
Roderick B. Park; 6 weeks; $39,550
Clifford Bell, Los Angeles; 6 weeks; $33,200
Robert L. Pecsok, Los Angeles; 6 weeks; $30,850
Norman A. Watson, Los Angeles; 6 weeks; $29,200
William H. Meyer, Santa Barbara; 6 weeks; $49,800

University of Cincinnati, Ohio; H. David Lipsich; 6 weeks; $51,800

University of Colorado, Boulder; John M. Cleveland; 8 weeks; "54,000
John R. Clopton; 8 weeks; $113,700
Leon W. Rutland, Jr.; 8 weeks; $40,900

University of Connecticut, Storrs; David J. Blick; 6 weeks; $59,700

University of Dayton, Dayton, Ohio; K. C. Schraut; 6 weeks; $40,300

University of Delaware, Newark; John A. Brown; 6 weeks; $29,800

University of Florida, Gainesville; N. Eldred Bingham; 8 weeks; $50,800
H. H. Sisler; 8 weeks; $63,100

University of Hawaii, Honolulu; Sidney C. Hsiao; 6 weeks; $15,800
Harry Zeitlin; 6 weeks; $67,900

University of Idaho, Moscow; William F. Barr; 8 weeks; $26,800
Edgar H. Grahn; 8 weeks; $97,200
Hans Sagan; 8 weeks; $43,400

University of Illinois, Urbana; Max Beberman; 6 weeks; $220,450
Haim Reingold; 8 weeks; $105,800

University of Kansas, Lawrence; Edward I. Shaw; 8 weeks; $19,000

University of Maryland, College Park; Joshua R. C. Brown; 7 weeks; $85,600

University of Minnesota, Minneapolis; William H. Marshall; 5 weeks; $20,400
Paul R. O'Connor; 6 weeks; $40,500
Frank Verbrugge; 10 weeks; $114,650
Blanchard O. Krogstad, Duluth; 5 weeks; $26,500
Francis A. Spurrell, St. Paul; 6 weeks; $14,500

University of Mississippi, University; Noel A. Childress; 11 weeks; $115,400

University of Missouri, Columbia; Robert F. Brooks; 8 weeks; $60,000
Paul B. Burcham; 8 weeks; $51,000
Wesley J. Dale; 8 weeks; $64,900
Harold Q. Fuller; 8 weeks; $96,500

University of Nebraska, Lincoln; Wendell L. Gauger; 8 weeks; $90,900
Walter E. Mientka; 8 weeks; $52,100

University of Nevada, Reno; R. N. Thompson; 6 weeks; $47,800

University of New Hampshire, Durham; Harold A. Iddles; 8 weeks; $79,300

University of New Mexico, Albuquerque; Frank C. Gentry; 8 weeks; $65,200
Loren D. Potter; 9 weeks; $21,500

University of North Carolina, Chapel Hill; Edward A. Cameron; 6 weeks; $91,900
Roy L. Ingram; 6 weeks; $38,800
Joseph W. Straley; 6 weeks; $33,310

University of North Dakota, Grand Forks; J. Donald Henderson; 8 weeks; $80,600

University of Notre Dame, Notre Dame, Ind.; Emil T. Hofman; 7 weeks; $73,100
Arnold E. Ross; 7 weeks; $152,600

University of Oklahoma, Norman; H. E. Hoffman; 8 weeks; $38,700
H. E. Hoffman; 4 weeks; $40,300
H. E. Hoffman; 9 weeks; $64,700
H. E. Hoffman; 9 weeks; $64,900

University of Oregon, Corvallis; A. F. Moursund; 8 weeks; $65,400
Arnold L. Soderwall; 8 weeks; $35,000

University of Pennsylvania, Philadelphia; J. F. Hazel; 6 weeks; $80,600

University of Pittsburgh, Pa.; John C. Knipp; 6 weeks; $31,800

UNIVERSITY OF PORTLAND, Portland, Oreg.; C. W. Bonhorst; 6 weeks; $34,900

UNIVERSITY OF PUERTO RICO, Rio Piedras; Augusto Bobonis; 8 weeks; $95,200
Juan D. Curet; 7 weeks; $70,225
Mariano Garcia; 7 weeks; $60,575

UNIVERSITY OF REDLANDS, Redlands, Calif.; Reinhold J. Krantz; 9 weeks; $57,175

UNIVERSITY OF RHODE ISLAND, Kingston; William E. Werner; 6 weeks; $43,000

UNIVERSITY OF ROCHESTER, Rochester, N.Y.; John J. Montean; 6 weeks; $40,000
John J. Montean; 6 weeks; $39,000

UNIVERSITY OF THE SOUTH, Sewanee, Tenn.; H. Malcolm Owen; 8 weeks; $60,700

UNIVERSITY OF SOUTH CAROLINA, Columbia; W. L. Williams; 8 weeks; $85,400

UNIVERSITY OF SOUTHERN CALIFORNIA, Los Angeles; Paul A. White; 6 weeks; $43,300

UNIVERSITY OF SOUTHWESTERN LOUISIANA, Lafayette; James R. Oliver; 9 weeks; $53,800
James R. Oliver; 9 weeks; $54,900
James R. Oliver; 9 weeks; $57,400

UNIVERSITY OF TENNESSEE, Knoxville; Edgar D. Eaves; 8 weeks; $62,500

UNIVERSITY OF TEXAS, Austin; Addison E. Lee; 9 weeks; $117,075

UNIVERSITY OF UTAH, Salt Lake City; Robert Anderson; 8 weeks; $36,900
E. Allan Davis; 7 weeks; $65,400
Thomas J. Parmley; 8 weeks; $70,000
Robert C. Pendleton; 8 weeks; $18,800

UNIVERSITY OF VERMONT, Burlington; N. James Schoomaker; 7 weeks; $67,000
Nelson L. Walbridge; 8 weeks; $65,100

UNIVERSITY OF VIRGINIA, Charlottesville; James W. Cole, Jr.; 8 weeks; $74,378
William C. Lowry; 8 weeks; $40,700

UNIVERSITY OF WASHINGTON, Seattle; Richard H. Fleming; 9 weeks; $47,500
L. A. Sanderman; 8 weeks; $52,400

UNIVERSITY OF WISCONSIN, Madison; Robert A. Jaggard, Milwaukee; 8 weeks; $62,700

UNIVERSITY OF WYOMING, Laramie; Carl A. Cinnamon; 8 weeks; $20,400
Samuel W. Harding; 10 weeks; $99,900
W. Norman Smith; 5 weeks; $49,000

UTAH STATE UNIVERSITY, Logan; Merrill H. Gunnell; 10 weeks; $81,500
Neville C. Hunsaker; 10 weeks; $79,700

VALPARAISO UNIVERSITY, Valparaiso, Ind.; Arthur E. Hallerberg; 7 weeks; $40,900

VASSAR COLLEGE, Poughkeepsie, N.Y.; John H. Johnsen; 6 weeks; $37,700

VILLANOVA UNIVERSITY, Villanova, Pa.; J. Bernard Hubbert; 6 weeks; $44,700

VIRGINIA STATE COLLEGE, Petersburg; Richard H. Dunn; 8 weeks; $111,800

WAKE FOREST COLLEGE, Winston-Salem, N.C.; John W. Nowell; 6 weeks; $58,700
George P. Williams, Jr.; 6 weeks; $24,325

WASHINGTON STATE UNIVERSITY, Pullman; Alfred B. Butler; 8 weeks; $92,500
Sidney G. Hacker; 8 weeks; $64,300

WAYNE STATE UNIVERSITY, Detroit, Mich.; Walter Chavin; 8 weeks; $19,000
John T. Sanford; 8 weeks; $64,900

WESLEYAN UNIVERSITY, Middletown, Conn.; Joseph S. Daltry; 6 weeks; $99,000

WEST VIRGINIA UNIVERSITY, Morgantown; James B. Hickman; 10 weeks; $95,600

WEST VIRGINIA WESLEYAN COLLEGE, Buckhannon; John C. Wright; 6 weeks; $59,200

WESTERN ILLINOIS UNIVERSITY, Macomb; Arnold Wendt; 6 weeks; $31,400

WESTERN MARYLAND COLLEGE, Westminster; Harwell P. Sturdivant; 6 weeks; $38,600

WESTERN RESERVE UNIVERSITY, Cleveland, Ohio; William M. Heston; 11 weeks; $130,000

WESTERN WASHINGTON STATE COLLEGE, Bellingham; James S. Martin; 8 weeks; $45,400
Sheldon T. Rio; 9 weeks; $59,700

WILLAMETTE UNIVERSITY, Salem, Oreg.; Paul M. Duell; 6 weeks; $47,700

WISCONSIN STATE COLLEGE, River Falls; Richard J. Delorit; 4 weeks; $40,600

WITTENBERG UNIVERSITY, Springfield, Ohio; Everett H. Bush; 8 weeks; $45,500

YALE UNIVERSITY, New Haven, Conn.; Stuart R. Brinkley; 6 weeks; $86,000

SUMMER INSTITUTES FOR ELEMENTARY SCHOOL PERSONNEL

ARIZONA STATE UNIVERSITY, Tempe; Theodore W. Munch; 6 weeks; $32,800

BELOIT COLLEGE, Beloit, Wis.; Edwin F. Wilde; 6 weeks; $29,300

BIRMINGHAM-SOUTHERN COLLEGE, Birmingham, Ala.; Hoyt M. Kaylor; 8 weeks; $37,700

DEPAUW UNIVERSITY, Greencastle, Ind.; Clinton B. Gass; 6 weeks; $25,500

EASTERN MICHIGAN UNIVERSITY, Ypsilanti; Albert W. Brown; 6 weeks; $34,500

HOWARD COLLEGE, Birmingham, Ala.; R. E. Wheeler; 6 weeks; $32,100

NEW MEXICO STATE UNIVERSITY, University Park; Darrell S. Willey; 6 weeks; $32,200

NORTHERN ILLINOIS UNIVERSITY, DeKalb; Frederick W. *Rolf*; 8 weeks; $46,300

NORTHERN MICHIGAN COLLEGE, Marquette; Henry S. Heimonen; 6 weeks; $31,900

PRAIRIE VIEW AGRICULTURAL AND MECHANICAL COLLEGE; Prairie View, Tex.; Israel E. Glover; 6 weeks; $27,700

RUTGERS, THE STATE UNIVERSITY, New Brunswick, N.J.; Guido Weigend; 6 weeks; $36,200

SAN JOSE STATE COLLEGE FOUNDATION, San Jose, Calif.; John L. Marks; 6 weeks; $34,000

SOUTHEASTERN STATE COLLEGE, Durant, Okla.; Leslie A. Dwight; 4 weeks; $21,000

STATE TEACHERS COLLEGE, Minot, N. Dak.; Cyril C. Moore; 8 weeks; $36,300

UNIVERSITY OF BUFFALO, Buffalo, N.Y.; Stephen S. Winter; 6 weeks; $32,100

UNIVERSITY OF GEORGIA, Athens; Charles L. Koelsche; 10 weeks; $36,300

UNIVERSITY OF MARYLAND, College Park; John R. Mayor; 6 weeks; $32,800

UNIVERSITY OF NORTH DAKOTA, Grand Forks; Bernt L. Wills; 8 weeks; $42,200

UNIVERSITY OF OREGON, Eugene; James C. Stovall; 8 weeks; $42,400

UNIVERSITY OF UTAH, Salt Lake City; L. Edwin Hirschi; 8 weeks; $36,500

WEBSTER COLLEGE, Webster Groves, Mo.; Robert B. Davis, Syracuse University; 6 weeks; $30,300

SUMMER SCIENCE TRAINING PROGRAM FOR SECONDARY SCHOOL STUDENTS

AGRICULTURAL AND MECHANICAL COLLEGE OF TEXAS, College Station; Melvin Eisner; 6 weeks; $9,400
William S. McCulley; 6 weeks; $8,650
John J. Sperry; 6 weeks; $5,760

ALBERT EINSTEIN MEDICAL CENTER, Philadelphia, Pa.; Samuel J. Ajl; 8 weeks; $4,780

AMERICAN MUSEUM-HAYDEN PLANETARIUM, New York, N.Y.; Franklyn M. Branley; 4 weeks; $8,260

AMERICAN UNIVERSITY, Washington, D.C.; Leo Schubert; 9 weeks; $6,050

APPALACHIAN STATE TEACHERS COLLEGE, Boone, N.C.; F. Ray Derrick; 5 weeks; $16,290

ARIZONA STATE COLLEGE, Flagstaff; J. Harvey Butchart; 5 weeks; $7,560

ASSUMPTION COLLEGE, Worcester, Mass.; Alfons J. van der Linden; 6 weeks; $16,460

AUBURN UNIVERSITY, Auburn, Ala.; Joseph T. Hood; 8 weeks; $8,960

AUGSBURG COLLEGE AND THEOLOGICAL SEMINARY, Minneapolis, Minn.; Courtland L. Agre; 6 weeks; $10,130

BENNETT COLLEGE, Greensboro, N.C.; J. Henry Sayles; 6 weeks; $28,150

BOWLING GREEN STATE UNIVERSITY, Bowling Green, Ohio; W. H. Hall; 7 weeks; $7,000

BOYCE THOMPSON INSTITUTE FOR PLANT RESEARCH, INC., Yonkers, N.Y.; Lawrence P. Miller; 6 weeks; $6,100

BRANDEIS UNIVERSITY, Waltham, Mass.; Philip A. St. John; 6 weeks; $3,580

BROWN UNIVERSITY, Providence, R.I.; Charles B. MacKay; 6 weeks; $24,960

BUCKNELL UNIVERSITY, Lewisburg, Pa.; Lester Kieft; 6 weeks; $9,910

BUTLER UNIVERSITY, Indianapolis, Ind.; William H. Bessey; 7 weeks; $7,360

CAPE HAZE MARINE LABORATORY, Sarasota, Fla.; Eugenie Clark; 8 weeks; $2,240

CARNEGIE INSTITUTE OF TECHNOLOGY, Pittsburgh, Pa.; Edward R. Schatz; 9 weeks; $8,790

CASE INSTITUTE OF TECHNOLOGY, Cleveland, Ohio; L. J. Green; 7 weeks; $6,070

CITY COLLEGE, New York, N.Y.; Chester B. Kremer; 6 weeks; $13,970

CLARKSON COLLEGE OF TECHNOLOGY, Potsdam, N.Y.; Harry S. Bingham; 8 weeks; $24,700

CLARK UNIVERSITY, Worcester, Mass.; Roy S. Anderson; 10 weeks; $1,340

COLLEGE OF THE HOLY NAMES, Oakland, Calif.; Sister Mary Baptista; 6 weeks; $11,990

COLORADO COLLEGE, Colorado Springs; Richard G. Beidleman; 8 weeks; $13,410

COLORADO SCHOOL OF MINES, Golden; James L. Hall; 6 weeks; $14,715

COMMITTEE FOR ADVANCED SCIENCE TRAINING, Los Angeles, Calif.; Harry Sobel; 10 weeks; $8,520

CORNELL UNIVERSITY, Ithaca, N.Y.; Philip G. Johnson; 7 weeks; $4,960

DENISON UNIVERSITY, Granville, Ohio; Robert W. Alrutz; 8 weeks; $10,310

DEPAUL UNIVERSITY, Chicago, Ill.; John R. Cortelyou; 8 weeks; $2,330

EMORY & HENRY COLLEGE, Emory, Va.; Marius Blesi; 5 weeks; $12,760

EMORY UNIVERSITY, Atlanta, Ga.; James C. Lester; 5 weeks; $26,170

FLORIDA STATE UNIVERSITY, Tallahassee; Robert Kalin; 6 weeks; $11,000

GENERAL EXTENSION DIVISION, OREGON STATE SYSTEM OF HIGHER EDUCATION, Portland; Robert L. Broussard; 8 weeks; $11,420

GEORGETOWN UNIVERSITY, Washington, D.C.; Lawrence S. Lilienfield; 9 weeks; $7,500

GRAMBLING COLLEGE, Grambling, La.; Emile C. Fonsworth; 8 weeks; $18,650

GRINNELL COLLEGE, Grinnell, Iowa; Neil D. Kent; 7 weeks; $20,750

HIRAM COLLEGE, Hiram, Ohio; Edward B. Rosser; 6 weeks; $13,140

HOWARD UNIVERSITY, Washington, D.C.; Herman Branson; 8 weeks; $17,250

HUMBOLDT STATE COLLEGE FOUNDATION, Arcata, Calif.; John E. Butler; 6 weeks; $17,870

HUNTER COLLEGE, New York, N.Y.; Melvin S. Schwartz; 6 weeks; $7,460
Henry D. Thompson; 5 weeks; $4,820

ILLINOIS INSTITUTE OF TECHNOLOGY, Chicago; Haim Reingold; 36 weeks; $18,720

INDIANA UNIVERSITY, Bloomington; Paul Klinge; 8 weeks; $24,120
John B. Patton; 10 weeks; $2,200

INTER AMERICAN UNIVERSITY OF PUERTO RICO, San German; Ismael Velez; 5 weeks; $11,930
Ismael Velez; 3 weeks; $5,780

JACKSON STATE COLLEGE, Jackson, Miss.; Benjamin H. McLemore; 8 weeks; $14,300

KANSAS STATE TEACHERS COLLEGE, Emporia; Otto M. Smith; 6 weeks; $14,780

KENTUCKY STATE COLLEGE, Frankfort; Lloyd E. Alexander; 8 weeks; $15,810

LEHIGH UNIVERSITY, Bethlehem, Pa.; Albert Wilansky; 6 weeks; $7,020

LEMOYNE COLLEGE, Memphis, Tenn.; W. W. Gibson; 6 weeks; $9,860

LIVINGSTON STATE COLLEGE, Livingston, Ala.; Lillian C. Manley; 6 weeks; $5,230

LOUISIANA POLYTECHNIC INSTITUTE, Ruston; William R. Higgs; 9 weeks; $15,920

LOUISIANA STATE UNIVERSITY, Baton Rouge; John F. Christman; 9 weeks; $24,340

LOYOLA UNIVERSITY, Chicago, Ill.; Thomas E. Malone; 8 weeks; $9,930

MANCHESTER COLLEGE, North Manchester, Ind.; Harry R. Weimer; 8 weeks; $9,380

MANHATTAN COLLEGE, New York, N.Y.; C. Leonard O'Connor; 6 weeks; $11,550

MICHIGAN STATE UNIVERSITY, East Lansing; M. Isobel Blyth; 6 weeks; $23,810

Mississippi State University, State College; Clyde Q. Sheely; 4 weeks; $19,620

Morgan State College, Baltimore Md.; John W. King; 6 weeks; $20,020

Morris Brown College, Atlanta, Ga.; James H. Penn; 8 weeks; $17,250

Murray State College Foundation, Murray, Ky.; W. E. Blackburn; 8 weeks; $23,520

Newark College of Engineering Research Foundation, Newark, N.J.; Joseph M. Fitzgerald; 6 weeks; $5,300

New Mexico Highlands University, Las Vegas; Lora M. Shields; 6 weeks; $15,000

North Carolina College at Durham; James S. Lee; 7 weeks; $20,000

North Dakota State University, Fargo; J. A. Callenbach; 10 weeks; $1,670

Donald Schwartz; 8 weeks; $2,090

Northeastern University, Boston, Mass.; Charles M. Goolsby; 6 weeks; $19,550

Northern Michigan College, Marquette; John P. Farrell; 6 weeks; $14,150

Northwestern State College of Louisiana, Natchitoches; Richard E. Garth; 9 weeks; $7,430

Northwestern University, Evanston, Ill.; F. G. Seulberger; 5 weeks; $28,070

Ohio State University, Columbus; Paul T. Yarrington; 9 weeks; $17,300

Ohio Wesleyan University, Delaware; Thomas S. Oey; 10 weeks; $1,970

Oklahoma State University, Stillwater; L. F. Sheerar; 6 weeks; $15,300

Oregon State University, Corvallis; R. E. Gaskell; 7 weeks; $21,560

John F. Tatom; 6 weeks; $12,930

Pennsylvania State University, University Park; Richard D. Schein; 8 weeks; $2,000

Prairie View Agricultural and Mechanical College, Prairie View, Tex.; Israel E. Glover; 6 weeks; $7,780

E. E. O'Banion; 6 weeks; $8,220

Purdue University, Lafayette, Ind.; Richard C. Dodson; 8 weeks; $20,210

Rollins College, Winter Park, Fla.; Bruce B. Wavell; 6 weeks; $7,620

Roscoe B. Jackson Memorial Laboratory, Bar Harbor, Maine; John L. Fuller; 10 weeks; $15,720

Roswell Park Memorial Institute, Buffalo, N.Y.; Edwin Mirand; 9 weeks; $18,945

St. Louis University, St. Louis, Mo.; John J. Andrews; 4 weeks; $5,680

San Diego State College Foundation, San Diego, Calif.; Edmund I. Deaton; 6 weeks; $8,640

San Fernando Valley State College Foundation, Northridge, Calif.; Lorence G. Collins; 6 weeks; $7,740

San Jose State College Foundation, San Jose, Calif; Benjamin F. Naylor; 6 weeks; $14,350

South Dakota State College, Brookings; Stanley Sundet; 6 weeks; $7,920

Southeastern State College, Durant, Okla.; Leslie Dwight; 6 weeks; $6,700

Southern Illinois University, Carbondale; Howard G. Applegate; 6 weeks; $600

George H. Gass; 8 weeks; $19,690

Southern Methodist University, Dallas, Tex; Frank J. Palas; 6 weeks; $8,910

Southern State College, Magnolia, Ark.; John J. Chapman; 6 weeks; $5,350

State University of Iowa, Iowa City; Robert E. Yager; 8 weeks; $29,370

State University of South Dakota, Vermillion; Wayne W. Gutzman; 6 weeks; $10,450

Syracuse University, Syracuse, N.Y.; Alfred T. Collette; 6 weeks; $16,270

Temple University, Philadelphia, Pa.; Walter S. Lawton; 6 weeks; $9,270

Texas College, Tyler; Sekender A. Khan; 6 weeks; $8,310

Tougaloo Southern Christian College, Tougaloo, Miss.; A. A. Branch; 6 weeks; $17,310

Tufts University, Medford, Mass.; William Stergios, Braintree; 10 weeks; $25,550

University of Alaska, College; William S. Wilson; 6 weeks; $17,900

University of Arizona, Tucson; Thomas L. Martin, Jr.; 6 weeks; $17,050

John W. Robson; 10 weeks; $7,230

University of Bridgeport, Bridgeport, Conn.; Earle M. Bigsbee; 7 weeks; $25,000

University of Buffalo, Buffalo, N.Y.; Harriet F. Montague; 6 weeks; $3,370

University of California, Berkeley; Howard A. Shugart; 9 weeks; $26,640

Frantisek Wolf; 6 weeks; $9,000

Norris W. Rakestraw, La Jolla; 9 weeks; $7,990

Clifford Bell, Los Angeles; 6 weeks; $9,740

University of Florida, Gainesville; Luther A. Arnold; 8 weeks; $12,290

University of Georgia, Athens; C. T. Clark; 6 weeks; $10,650

University of Hawaii, Honolulu; Toshio Murashige; 7 weeks; $18,960

University of Houston, Houston, Tex.; John C. Allred; 6 weeks; $17,570

University of Illinois, Urbana; Jerry S. Dobrovolny; 6 weeks; $13,090

F. A. Kummerow; 8 weeks; $3,890

University of Maryland, College Park; James C. Armstrong; 13 weeks; $6,690

University of Miami, Coral Gables, Fla.; Herman Meyer; 6 weeks; $8,900

University of Michigan, Ann Arbor; Leigh C. Anderson; 6 weeks; $20,380

University of Mississippi, University; Samuel F. Clark; 6 weeks; $13,970

Paul G. Hahn; 6 weeks; $8,630

University of Missouri, Columbia; Charles R. Remington, Jr., Rolla; 7 weeks; $12,250

University of Nevada, Reno; Wendell A. Mordy; 7 weeks; $23,525

University of North Carolina, Chapel Hill; Samuel B. Knight; 6 weeks; $22,410

Hollis J. Rogers, Greensboro; 5 weeks; $10,470

University of North Dakota, Grand Forks; Paul B. Kannowski; 8 weeks; $14,270

University of Notre Dame, Notre Dame, Ind.; Arnold E. Ross; 7 weeks; $24,370

University of Oklahoma, Norman; H. E. Hoffman; 8 weeks; $25,500

UNIVERSITY OF PUERTO RICO, Rio Piedras; Francisco Garriga; 6 weeks; $9,300

Eddie Ortiz; 6 weeks; $11,720

UNIVERSITY OF RHODE ISLAND, Kingston; James W. Cobble; 6 weeks; $4,990

UNIVERSITY OF SOUTHWESTERN LOUISIANA, Lafayette; James R. Oliver; 9 weeks; $12,940

UNIVERSITY OF TENNESSEE, Knoxville; J. H. Wood; 6 weeks; $10,310

UNIVERSITY OF TEXAS, Austin; H. J. Ettlinger; 6 weeks; $5,970

William C. Gardiner, Jr.; 6 weeks; $8,980

Irwin Spear; 7 weeks; $11,240

Murray M. Copeland, Houston; 8 weeks; $3,390

UNIVERSITY OF WISCONSIN, Madison; George W. Sledge; 6 weeks; $16,320

VARIETY CHILDREN'S RESEARCH FOUNDATION, Miami, Fla.; M. Michael Sigel; 12 weeks; $2,610

VASSAR COLLEGE, Poughkeepsie, N.Y.; Joseph F. Mucci; 5 weeks; $5,800

VETERANS ADMINISTRATION HOSPITAL, Albuquerque, N. Mex.; L. Louise Leonard; 8 weeks; $500

VIRGINIA UNION UNIVERSITY, Richmond; Walter O. Bradley; 6 weeks; $12,350

WESLEYAN UNIVERSITY, Middletown, Conn.; Ernest Stabler; 6 weeks; $20,000

Lamar Washington, Massachusetts Institute of Technology, Boston; 8 weeks; $45,340

WEST VIRGINIA UNIVERSITY, Morgantown; O. J. Burger; 5 weeks; $4,550

WESTERN ILLINOIS UNIVERSITY, Macomb; Eugene Pergament; 8 weeks; $4,380

WESTERN KENTUCKY STATE COLLEGE, Bowling Green; Tate C. Page; 8 weeks; $22,720

WESTERN MICHIGAN UNIVERSITY, Kalamazoo; George C. Mallinson; 6 weeks; $13,520

WESTERN STATE COLLEGE OF COLORADO, Gunnison; Aubrey W. Lawrence; 6 weeks; $8,550

WHITWORTH COLLEGE, Spokane, Wash.; Hugh W. Johnston; 8 weeks; $9,990

WILEY COLLEGE, Marshall, Tex.; Rufus L. McGee; 6 weeks; $5,950

WORCESTER FOUNDATION FOR EXPERIMENTAL BIOLOGY, Shrewsbury, Mass.; Frederick R. Avis; 9 weeks; $20,020

YESHIVA UNIVERSITY, New York, N.Y.; Moses D. Tendler; 9 weeks; $12,950

William Zlot; 8 weeks; $6,480

SUPPLEMENTARY STUDENT SCIENCE PROJECTS

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, Washington, D.C.; Dael Wolfle; *Holiday Lectures for Selected High School Students*; 2 years; $127,360

COUNCIL OF CHIEF STATE SCHOOL OFFICERS, Washington, D.C.; Edgar Fuller; *Revision of the Purchase Guide*; 2 years; $45,090

DARTMOUTH COLLEGE, Hanover, N.H.; William P. Davis, Jr.; *Summer Science Program for Talented High School Students and Selected Secondary School Teachers*; 6 weeks; $36,080

NATIONAL ACADEMY OF SCIENCES-NATIONAL RESEARCH COUNCIL, Washington, D.C.; J. B. Rosser; *Printing and Distribution of Copies of a Pamphlet Entitled "Careers in Mathematics"*; $4,000

Richard C. Vetter; *Booklet on Oceanography entitled "Turn to the Sea"*; 14 months; $5,770

NATIONAL SCIENCE TEACHERS ASSOCIATION, Washington, D.C.; Robert H. Carleton; *Supplementary Student Science Project*; 2 weeks; $9,195

SCIENCE SERVICE, INC., Washington, D.C.; Karl Frank; *Supplementary Student Science Project*; 16 months; $45,090

SUPPLEMENTARY TEACHING AIDS

ADELPHI COLLEGE, Garden City, N.Y.; Richard M. Klein; *Fish Experiments for Undergraduate Instruction in Learning and Motivation*; 1 year; $5,420

AMERICAN PSYCHOLOGICAL ASSOCIATION, Washington, D.C.; John G. Darley and Robert B. Hudson; *Film Series in Psychology*; 1 year; $187,770

BOSTON COLLEGE, Chestnut Hill, Mass.; Stanley J. Bezuszka; *Development of Formal Deductive and Symbolic Logic Training and Teaching Equipment*; 1 year; $10,120

CARLETON COLLEGE, Northfield, Minn.; William A. Butler, Robert J. Kolenkow and Robert A. Reitz; *Demonstration of Properties of Light With an Optical Maser*; 1 year; $3,535

CARNEGIE INSTITUTE OF TECHNOLOGY, Pittsburgh, Pa.; Walton Forstall; *Development of Take-Home Kits for Experimentation in Engineering*; 1 year; $15,525

Milton C. Shaw; *Development of Analog Experiments and Apparatus for Studying the Plastic Flow Characteristics of Materials*; 1 year; $13,800

CATHOLIC UNIVERSITY, Washington, D.C.; A. J. Durelli; *Development of Laboratory Equipment for Experimental Stress Analysis Demonstrations*; 2 years; $20,870

COLORADO STATE UNIVERSITY, Fort Collins; John J. Faris; *Development of a Microwave Spectroscopy Experiment for Undergraduates*; 9 months; $1,480

COLUMBIA UNIVERSITY, New York, N.Y.; H. Dean Baker; *Development of Energy Conversion Devices*; 1 year; $39,070

Allan M. Sachs; *Development of a Spark Chamber*; 1 year; $7,990

EDUCATIONAL SERVICES, INC., Watertown, Mass.; Ascher H. Shapiro, Massachusetts Institute of Technology; *Motion Pictures to Improve Instruction in Fluid Dynamics*; 1 year; $324,000

Jerrold R. Zacharias, Massachusetts Institute of Technology; *Testing and Evaluation of the Extended PSSC Films for Television and Classroom Use*; 6 months; $13,058

Jerrold R. Zacharias; *Production of Additional Films for the PSSC Course*; 6 months; $112,850

Jerrold R. Zacharias and James S. Strickland; *The Production of Films of Demonstration and Laboratory Experiments for College and University Physics Courses*; 1 year; $238,900

Jerrold R. Zacharias, Massachusetts Institute of Technology; *Production of PSSC Films*; 1 year; $149,845

FLORIDA STATE UNIVERSITY, Tallahassee; Guenter Schwarz; *Experiments and Demonstrations for the Three Semester General Physics Course;* 2 years; $27,600

GEORGIA INSTITUTE OF TECHNOLOGY, Atlanta; M. R. Carstens; *Development of Equipment for the Study of Unsteady Flow in a Pipe;* 1 year; $7,520

HARVARD UNIVERSITY, Cambridge, Mass.; Louis F. Fieser; *Development of Low-Cost Skeletal Models of Molecules;* 1 year; $17,250

Eugene G. Rochow; *Development of Equipment for Demonstrating Magnetic Susceptibility and Absorption/Emission Spectra;* 1 year; $11,860

HUNTER COLLEGE, New York, N.Y.; Dorothy N. Naiman; *Development of a Model of the Human Brain for Individual Student Production and Use;* 1 year; $2,350

INDIANA UNIVERSITY FOUNDATION, Bloomington; Clarence M. Flaten; *Production of Developmental Anatomy Films;* 1 year; $31,500

IOWA STATE UNIVERSITY, Ames; Paul F. Romberg; *Preparation of Educational Motion Pictures in the Plant Sciences;* 15 months; $89,500

JOHNS HOPKINS UNIVERSITY, Baltimore, Md.; Donald W. Benson; *Development of a Manikin for Teaching Endotracheal Intubation;* 1 year; $4,490

H. E. Hoelscher; *"Invisible" Fixed and Fluidized Beds for Laboratory Demonstration and Study;* 1 year; $11,860

KENYON COLLEGE, Gambier, Ohio; Franklin Miller, Jr.; *The Production of a Series of Short Teaching-Aid Film in Physics;* 6 months; $44,640

MANHATTAN COLLEGE, New York, N.Y.; C. Albert Welsh; *Development of Apparatus for Automatic Plotting of Phase, Gain, and Root Locus from Pole-Zero Constellations;* 2 years; $9,530

NATIONAL ACADEMY OF SCIENCES-NATIONAL RESEARCH COUNCIL, Washington, D.C.; Richard C. Vetter; *Filmstrips in Oceanography;* 18 months; $44,120

NEW MEXICO HIGHLANDS UNIVERSITY, Las Vegas; Galen W. Ewing; *Equipment Development for College and University Courses in Instrumental Methods in Chemical Analysis, Physical Chemistry, and Related Fields;* 2 years; $13,110

PRINCETON UNIVERSITY, Princeton, N.J.; Hubert N. Alyea; *Development of Tested Overhead Projection Series of Experiments;* 1 year; $29,850

REED COLLEGE, Portland, Oreg.; Frederick D. Tabbutt; *Development of Equipment and Experiments for Teaching Instrumental Analysis;* 8 months; $5,935

RENSSELAER POLYTECHNIC INSTITUTE, Troy, N.Y.; E. John Winhold; *Versatile Nuclear Coincidence Apparatus for Undergraduate Use;* 1 year; $12,150

RESEARCH FOUNDATION OF STATE UNIVERSITY OF NEW YORK, Albany; William M. Harlow, Syracuse; *A Motion Picture on the Mechanism of Moisture Movement in Wood;* 9 months; $2,300

UNION COLLEGE & UNIVERSITY, Schenectady, N.Y.; J. Modrey; *Development of Micro-Pneumatic Breadboard;* 3 months $5,635

UNIVERSITY OF ARKANSAS, Fayetteville; Denys O. Akhurst; *Development of Lecture Demonstration Equipment for Courses in the Theory of Electromagnetic Fields and Waves;* 2 years; $16,060

UNIVERSITY OF CALIFORNIA, Berkeley; John E. Dorn, Earl R. Parker and Jack Washburn; *Development of Lecture Demonstration Equipment for Materials Science Course for Engineers;* 1 year; $14,030

Robert F. Heizer; *Preparation of a Sound-Color Film on the Olmec Site in Mexico;* 1 year; $23,110

E. F. King and R. C. Mackey; *Development of Solid-State Pulse-Code Modulation System for Laboratory Study and Demonstration;* 2 years; $21,505

Robert Macey and Lester Packer; *Development of Equipment for Monitoring Physiological Parameters in the Student Laboratory;* 2 years; $31,330

Frank A. Pitelka; *The Production of a Sound-Color Film on Predator-Prey Relationships;* 6 months; $6,600

Norman N. Goldstein, Jr., Sir Francis Drake High School, San Anselmo; *Development of Instruments for the Study of Physiological Phenomena in Advanced Secondary Biology;* 1 year; $25,145

UNIVERSITY OF COLORADO, Boulder; Malcolm Correll and Albert A. Bartlett; *Development of Student Apparatus for Measuring Relativistic Change of Mass and Momentum Spectra of Electrons from Beta Ray Sources;* 1 year; $14,180

UNIVERSITY OF DELAWARE, Newark; Carl N. Shuster, Jr.; *Development and Adaptation of Plastic-Embedding Techniques to Aid Students in the Three-Dimensional Visualization of Animal Anatomy;* 18 months; $8,900

UNIVERSITY OF ILLINOIS, Urbana; William L. Everitt; *A Conference on Motion Pictures for Instruction in Electrical Engineering;* 1 year; $23,750

UNIVERSITY OF KANSAS, Lawrence; Kenneth E. Rose; *Development of Demonstrations by Microscopy as Teaching Aids in the Science of Solids;* 2 years; $15,110

UNIVERSITY OF MIAMI, Coral Gables, Fla.; Thorne Shipley, Bascom Palmer Eye Institute, Miami; *Development of Student Laboratory Equipment in Visual Sciences;* 3 years; $19,670

UNIVERSITY OF MICHIGAN, Ann Arbor; Joseph E. Shigley; *Development of Laboratory Equipment for Teaching Dynamic Analysis;* 1 year; $4,590

UNIVERSITY OF MINNESOTA, Minneapolis; Donald E. Olson; *Development of the Use of Semiconductor Particle Detectors in Magnetic Deflection Beta Particle Spectrometers;* 1 year; $1,460

UNIVERSITY OF MISSOURI, Columbia; John F. Lamb and James R. Tudor; *Development of Experimental Equipments for Showing Forces Exerted on Current Carrying Conductors in Magnetic Fields Near Iron Surfaces;* 15 months; $29,980

UNIVERSITY OF NEW MEXICO, Albuquerque; Richard K. Moore; *Development of Kit-Style Digital Computers for Construction and Use by the Students at the High School Level;* 1 year; $17,650

UNIVERSITY OF ROCHESTER, Rochester, N.Y.; Robert E. Hopkins and M. Parker Givens;

Interference Studies With the Optical Maser; 1 year; $8,870

H. B. Voelcker, Jr.; *Development of Apparatus and Experiments for a Modern Communications Laboratory;* 2 years; $50,200

UNIVERSITY OF TEXAS, Austin; W. C. Gardiner, Jr.; *Development of a Nuclear Magnetic Resonance Spectrometer for Instructional Purposes;* 2 years; $4,025

UNIVERSITY OF UTAH, Salt Lake City; Edward M. Eyring; *Development of a Pressure-Jump Apparatus to Illustrate Relaxation Methods of Measuring Rates of Rapid Reactions in Solution;* 1 year; $4,730

VANDERBILT UNIVERSITY, Nashville, Tenn.; Karl B. Schnelle, Jr.; *Development of Equipment to Illustrate Mass Transfer and Reactor Dynamics and the Dynamic Testing of Chemical Process Systems;* 15 months; $11,790

WALDEMAR MEDICAL RESEARCH FOUNDATION, INC., Port Washington, N.Y.; Norman Molomut; *Design and Development of Individual Kits for Student Use in High School Biology and Chemistry Laboratory;* 2 years; $10,410

WASHINGTON STATE UNIVERSITY, Pullman; Charles F. Morrison, Jr.; *Development of a General Utility Analytical Chemical Instrument;* 1 year; $8,090

WESTERN RESERVE UNIVERSITY, Cleveland, Ohio; Ralph H. Petrucci; *Development of Three Dimensional Models in Phase Rule Studies;* 2 years; $10,030

YESHIVA UNIVERSITY, New York, N.Y.; Roman Vishniac; *Living Biology, Film Series;* 21 months; $143,050

SUPPLEMENTARY TRAINING FOR TEACHERS

AMERICAN SOCIETY FOR ENGINEERING EDUCATION, Newark, N.J.; Lloyd Berg, Montana State College; *Supplementary Training for Science Teachers Program Entitled "Summer School for Chemical Engineering Teachers";* 6 days; $22,040

BELOIT COLLEGE, Beloit, Wis.; Edward C. Fuller; *Teaching a Course Combining Introductory Chemistry and Physics;* 3 months; $10,380

CORNELL UNIVERSITY, Ithaca, N.Y.; Lyman G. Parratt; *Project Conference in Relativity in College Physics;* 3 weeks; $52,770

DUKE UNIVERSITY, Durham, N.C.; J. J. Gergen; *Experimental Program in the Retraining of Armed Service Officers for Teaching Mathematics;* $11,300

FISK UNIVERSITY, Nashville, Tenn.; Nelson Fuson; *Thirteenth Annual Fisk University Infrared Spectroscopy Institute;* 11 days; $9,170

MATHEMATICAL ASSOCIATION OF AMERICA, Buffalo, N.Y.; Cletus O. Oakley, Haverford College; *Program of Visiting Lectures to Secondary Schools;* 2 years; $100,000

MICHIGAN STATE UNIVERSITY, East Lansing; Wayne Taylor; *Supplementary Training for Science Teachers Program;* 4 weeks; $21,200

NEW YORK STATE SOCIETY FOR MEDICAL RESEARCH, New York, N.Y.; Harold A. Levey, State University of New York: *Supplementary Training for Science Teachers Program Entitled "Modern Aspects of Biology: Laboratory Experiments in Physiology";* 6 weeks; $17,875

NORTHWESTERN UNIVERSITY, Evanston, Ill.; Ronald R. Novales; *A Study of Lens Regeneration in the Eyes of Salamanders;* 2 years; $2,860

RENSSELAER POLYTECHNIC INSTITUTE, Troy, N.Y.; Stephen E. Wiberley; *Summer Institute in Instrumental Methods of Analysis;* 8 weeks; $22,170

STANFORD UNIVERSITY, Stanford, Calif.; Lawrence Blinks, Pacific Grove; *Supplementary Training for Science Teachers Program;* 10 weeks; $23,680

TAU BETA PI ASSOCIATION, INC., Knoxville, Tenn.; Robert H. Nagel; *A Compilation of Financial Aid for Graduate Study in Engineering;* 1 year; $2,000

UNIVERSITY OF COLORADO, Boulder; James R. Wailes; *Summer Institute for Science Supervisors;* 3 weeks; $14,940

UNIVERSITY OF DAYTON, Dayton, Ohio; Carl I. Michaelis; *Supplementary Training for Science Teachers Program;* 11 months; $3,020

UNIVERSITY OF MIAMI, Coral Gables, Fla.; Carl H. Oppenheimer, Miami; *Supplementary Training for Science Teachers Program in Marine Microbiology;* 6 weeks; $15,910

UNIVERSITY OF NEBRASKA, Lincoln; Harold G. Beenken; *The Role of Bio-Medical Enginering in Universities and Hospitals;* 5 months; $7,970

UNIVERSITY OF SOUTH FLORIDA, Tampa; T. C. Helvey; *Second Southeastern Conference on Aero-Space Sciences for High School Physics Teachers;* 13 days; $16,270

UNIVERSITY OF TEXAS, Austin; Harold J. Plass, Jr.; *Development of Teachers of Engineering Mechanics;* 1 year; $16,700

WELLESLEY COLLEGE, Wellesley, Mass.; Delaphine G. R. Wyckoff; *Intensive Study Session for High School Teachers of Biology;* 10 days; $8.620

WESTERN ILLINOIS UNIVERSITY, Macomb; Eugene Pergament; *Summer Science Training Program for Secondary School Students;* $400

SUPPLEMENTARY TRAINING FOR UNDERGRADUATES

ASSOCIATED COLLEGE OF THE MIDWEST, Chicago, Ill.; Blair Stewart; *Supplementary Training for Undergraduates;* 3½ years; $46,830

TRAVELING SCIENCE LIBRARIES

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, Washington, D.C.; Hilary J. Deason; *Traveling Elementary School Science Library;* 18 months; $86,900

OAK RIDGE INSTITUTE OF NUCLEAR STUDIES, INC., Oak Ridge Tenn.; W. W. Grigorieff; *Special Institute for Future Science Teachers;* 1 year; $10,800

UNDERGRADUATE RESEARCH PARTICIPATION

AMERICAN MUSEUM OF NATURAL HISTORY, New York, N.Y.; Evelyn Shaw; $1,957

CARNEGIE INSTITUTE OF TECHNOLOGY, Pittsburgh, Pa.; Everard M. Williams; $14,625

Clark University, Worcester, Mass.; Gerson Kegeles; $6,785

Lafayette College, Easton, Pa.; William F. Hart; $690

Michigan State University, East Lansing; Erwin J. Benne; $9,050

Oberlin College, Oberlin, Ohio; Norman C. Craig; $690

Ohio Wesleyan University, Delaware; Arthur C. Breyer; $5,645

Western Reserve University, Cleveland, Ohio; Gerald Tauber; $4,760

UNDERGRADUATE INSTRUCTIONAL SCIENTIFIC EQUIPMENT PROGRAM

Agricultural and Mechanical College of Texas, College Station; David W. Rosberg; 2 years; $19,140

Alabama Agricultural and Mechanical College, Normal; Mildred S. Robertson; 2 years; $18,380

Alabama College, Montevallo; Daniel R. McMillan; 2 years; $24,550

Alameda County State College Foundation, Hayward, Calif.; Thomas H. Southard; 2 years; $25,000

Albertus Magnus College, New Haven, Conn.; Dorothea Rudnick; 2 years; $4,500

Albion College, Albion, Mich.; William J. Gilbert; 2 years; $5,440

Alverno College, Milwaukee, Wis.; M. Bernarda Handrup; 2 years; $1,000

American University, Washington, D.C.; A. B. Chaet; 2 years; $21,940

Amherst College, Amherst, Mass.; Bruce B. Benson; 2 years; $14,130

Antioch College, Yellow Springs, Ohio; C. Vernon Cannon; 2 years; $12,800

Arizona State University, Tempe; George C. Beakley; 2 years; $12,600
  Alan T. Wager; 2 years; $24,990

Augsburg College and Theological Seminary, Minneapolis, Minn.; Courtland L. Agre; 2 years; $5,840

Augustana College, Rock Island, Ill.; E. R. Erickson; 2 years; $9,570

Augustana College, Sioux Falls, S.D.; Robert Roy Kintner; 2 years; $3,000

Bard College, Annandale-on-Hudson, N.Y.; Henry Kritzler; 2 years; $3,780

Barnard College, Columbia University, New York, N.Y.; Edward J. King; 2 years; $7,560

Bellarmine College, Louisville, Ky.; Richard W. Sames; 2 years; $12,800

Bethany College, Bethany, W. Va.; John Daniel Draper; 2 years; $9,950

Birmingham-Southern College, Birmingham, Ala.; Thomas J. Carrington; 2 years; $3,250

Boston University, Boston, Mass.; Lowell V. Coulter; 2 years; $18,030

Bowdoin College, Brunswick, Maine; Noel C. Little; 2 years; $5,000

Brooklyn College, Brooklyn, N.Y.; George Gibson; 2 years; $2,770
  Carroll W. Grant; 2 years; $7,830
  B. Kurrelmeyer; 2 years; $1,470
  Wilbur G. Valentine; 2 years; $3,220

Brown University, Providence, R.I.; George L. Church; 2 years; $11,730
  M. V. Edds, Jr.; 2 years; $24,590

Bryn Mawr College, Bryn Mawr, Pa.; Ernst Berliner; 2 years; $12,340

Bucknell University, Lewisburg, Pa.; Roy C. Tasker; 2 years; $24,740

Butler University, Indianapolis, Ind.; Keith M. Seymour; 2 years; $3,000

California Institute of Technology, Pasadena; Ward Whaling; 2 years; $13,490

Carleton College, Northfield, Minn.; Kenneth O. May; 2 years; $23,150

Carnegie Institute of Technology, Pittsburgh, Pa.; Robert B. Carlin; 2 years; $25,000
  Emerson M. Pugh; 2 years; $24,920

Case Institute of Technology, Cleveland, Ohio; R. H. Thomas; 2 years; $24,950
  R. H. Thomas; 2 years; $24,930

City College, New York, N.Y., Leonard P. Sayles; 2 years; $24,890
  Henry Semat; 2 years; $16,550
  Henry Semat; 2 years; $24,680

Clark University, Worcester, Mass., Gerson Kegeles; 2 years; $8,310

Coker College, Hartsville, S.C.; Joseph B. Harris; 2 years; $3,960

Colby College, Waterville, Maine; Evans B. Reid; 2 years; $5,310

College of the Holy Cross, Worcester, Mass.; John W. Flavin; 2 years; $8,200

College of Idaho, Caldwell, Lyle M. Stanford; 2 years; $4,930

College of Mount St. Vincent, New York, N.Y.; Thomas F. Shea; 2 years; $10,830

College of William and Mary, Williamsburg, Va.; Mitchell A. Byrd; 2 years; $10,000

Colorado College, Colorado Springs; Wilbur H. Wright; 2 years; $24,500

Colorado School of Mines, Golden; L. W. LeRoy; 2 years; $790

Colorado State University Research Foundation, Fort Collins; Louis R. Weber; 2 years; $18,000

Columbia University, New York, N.Y.; Charles O. Beckmann; 2 years; $12,080
  Guy S. Longobardo; 2 years; $24,780

Cooper Union, New York, N.Y.; William C. Shapiro; 2 years; $21,430

Cornell College, Mount Vernon, Iowa; Earl Scott; 2 years; $6,700

Cornell University, Ithaca, N.Y.; R. B. Reeves; 2 years; $12,160
  H. A. Scheraga; 2 years; $24,950
  A. M. Srb; 2 years; $17,500

Dartmouth College, Hanover, N.H.; Robert W. Decker; 2 years; $10,230
  William T. Doyle; 2 years; $12,000
  Miles V. Hayes; 2 years; $10,000

Denison University, Granville, Ohio; Paul T. Mountjoy; 2 years; $10,560

DePaul University, Chicago, Ill., Edwin J. Schillinger; 2 years; $12,100

DePauw University, Greencastle, Ind.; Clinton Gass; 2 years; $19,480
  John A. Ricketts; 2 years; $6,200

Doane College, Crete, Nebr.; Robert C. Makosky; 2 years; $4,880

Drew University, Madison, N.J.; Donald A. Scott; 2 years; $11,900

Drexel Institute of Technology, Philadelphia, Pa.; Narindra Nath Puri; 2 years; $25,000

Drury College, Springfield, Mo.; Lora Bond; 2 years; $5,570

Duke University, Durham, N.C.; J. H. Saylor; 2 years; $7,490
Walter J. Seeley; 2 years; $3,820
Karl E. Zener; 2 years; $12,260

Duquesne University, Pittsburgh, Pa.; Kurt C. Schreiber; 2 years; $4,510

Earlham College, Richmond, Ind.; Carrolle A. Markle; 2 years; $6,040

East Central State College, Ada, Okla.; Oscar L. Parker; 2 years; $9,330

Eastern Illinois University, Charleston; Glenn Q. Lefler; 2 years; $5,000

Eastern Michigan University, Ypsilanti; Albert W. Brown; 2 years; $19,640

Elmira College, Elmira, N.Y.; Richard R. Bond; 2 years; $24,380

Emory University, Atlanta, Ga.; R. A. Day, Jr., 2 years; $25,000

Fairfield University, Fairfield, Conn.; Robert E. Varnerin; 2 years; $21,890

Florida State University, Tallahassee; Leland Shanor; 2 years; $24,790

Fisk University, Nashville, Tenn.; Irvin W. Elliott; 2 years; $9,480

George Washington University, Washington, D.C.; Russell B. Stevens; 2 years; $5,170

Georgetown University, Washington, D.C.; William T. Taylor; 2 years; $25,000

Georgia Istitute of Techology, Atlanta; J. P. Vidosic; 2 years; $25,000

Goucher College, Baltimore, Md.; Dorothy L. Bernstein; 2 years; $20,500

Hamline University, St. Paul, Minn.; Kent H. Bracewell; 2 years; $2,500

Hampden-Sydney College, Hampden-Sydney, Va.; G. Tyler Miller, Jr.; 2 years; $9,970

Hanover College, Hanover, Ind.; Richard L. Conklin; 2 years; $2,210

Harvard University, Cambridge, Mass.; R. W. Hickman; 2 years; $20,050
Alan V. Jopling; 2 years; $3,780
Ronald E. Vanelli; 2 years; $17,850

Harvey Mudd College, Claremont, Calif.; Warren E. Wilson; 2 years; $25,000

Hastings College, Hastings, Nebr.; Clyde C. Sachtleben; 2 years; $4,760

Haverford College, Haverford, Pa.; Fay Ajzenberg-Selove; 2 years; $10,090

Hofstra College, Hempstead, N.Y.; Harold E. Clearman; 2 years; $6,130

Hood College, Frederick, Md.; Jane D. McCarrell; 2 years; $5,000

Howard University, Washington, D.C.; Moddie D. Taylor; 2 years; $24,790

Hunter College, New York, N.Y.; Jewell Hughes Bushey; 2 years; $20,350

Illinois Institute of Technology, Chicago; Leslie R. Hedrick; 2 years; $6,180

Illinois State Normal University, Normal; R. E. Dilks; 2 years; $10,000

Indiana University, Bloomington, John B. Patton; 2 years; $25,000

Iowa State University, Ames; Oscar E. Tauber; 2 years; $10,440

John Carroll University, Cleveland, Ohio; Richard J. Gaul; 2 years; $13,930

Kansas State University, Manhattan; Ralph G. Nevins; 2 years; $13,130

Kansas Wesleyan University, Salina; Charles B. Creager; 2 years; $6,500

King's College, Wilkes-Barre, Pa.; Jay A. Young; 2 years; $12,000

Knox College, Galesburg, Ill.; Leland Harris; 2 years; $25,000

Lake Forest College, Lake Forest, Ill.; Harald C. Jensen; 2 years; $23,000

Lawrence College, Appleton, Wis.; Olga A. Smith; 2 years; $10,720

Lebanon Valley College, Annville, Pa.; Howard A. Neidig; 2 years; $7,200

Lehigh University, Bethlehem, Pa.; George R. Jenkins; 2 years; $24,420

LeMoyne College, Memphis, Tenn.; W. W. Gibson; 2 years; $9,330

Loras College, Dubuque, Iowa; Donald R. Hutchinson; 2 years; $4,210

Los angeles State College, Los Angeles, Calif.; Harry C. Coffin; 2 years; $6,020

Louisiana State University, Baton Rouge; Hulen B. Williams; 2 years; $24,710
Donald G. Davis, New Orleans; 2 years; $13,720

Loyola University, Chicago, Ill.; Walter Peters; 2 years; $12,500

Luther College, Decorah, Iowa; David T. Nelson; 2 years; $13,690

Macalester College, St. Paul, Minn.; C. H. Shiflett; 2 years; $22,290

Manchester College, North Manchester, Ind.; Harry R. Weimer; 2 years; $2,550

Manhattan College, New York, N.Y.; C. Albert Welsh; 2 years; $15,000

Marquette University, Milwaukee, Wis.; Arthur C. Moeller; 2 years; $25,000

Massachusetts Institute of Technology, Cambridge; Charles L. Miller; 2 years; $24,700
H. G. Stever; 2 years; $24,920

Merrimack College, North Andover, Mass.; Charles O. Ahonen; 2 years; $11,410

Michigan College of Mining & Technology, Houghton; Marriott W. Bredekamp; 2 years; $2,830

Michigan State University, East Lansing; Herman E. Koenig; 2 years; $24,080

Millsaps College, Jackson, Miss.; J. B. Price; 2 years; $6,160

Mississippi Southern College, Hattiesburg; J. Fred Walker; 2 years; $12,500

Mississippi State University, State College; E. Irl Howell; 2 years; $24,770

Monmouth College, Monmouth, Ill.; Garrett W. Thiessen; 2 years; $6,000

Montana State College, Bozeman; Irving E. Dayton; 2 years; $25,000

Montana State University, Missoula; Arthur E. Livingston; 2 years; $22,640
John M. Stewart; 2 years; $2,990

MOREHOUSE COLLEGE, Atlanta, Ga.; James H. Birnie; 2 years; $22,950

MORGAN STATE COLLEGE, Baltimore, Md.; George H. Spaulding; 2 years; $10,370

MOUNT HOLYOKE COLLEGE, South Hadley, Mass.; Anna J. Harrison; 2 years; $20,800

MUSKINGUM COLLEGE, New Concord, Ohio; Simon J. Vellenga; 2 years; $8,650

NEBRASKA WESLEYAN UNIVERSITY, Lincoln; Walter R. French, Jr.; 2 years; $25,000

NEW MEXICO HIGHLANDS UNIVERSITY, Las Vegas; R. A. Deering; 2 years; $21,240

NEW MEXICO STATE UNIVERSITY, University Park; Marlowe G. Anderson; 2 years; $25,000

NEW YORK UNIVERSITY, New York; Lawrence A. Bornstein; 2 years; $25,000

NORTH DAKOTA STATE UNIVERSITYY, Fargo; Earl A. Helgeson; 2 years; $5,150

NORTH GEORGIA COLLEGE, Dahlonega; J. C. Simms; 2 years; $2,500

NORTHEASTERN UNIVERSITY, Boston, Mass.; M. W. Essigmann; 2 years; $25,000
Reginald G. Lacount; 2 years; $24,840

NORTHERN ILLINOIS UNIVERSITY, De Kalb; Michael J. Joncich; 2 years; $10,000

NORTHWESTERN STATE COLLEGE, Natchitoches, La.; George H. Ware; 2 years; $7,210

NORTHWESTERN UNIVERSITY, Evanston, Ill.; William A. Hunt; 2 years; $13,930
Allen S. Hussey; 2 years; $25,000

OBERLIN COLLEGE, Oberlin, Ohio; Carl E. Howe; 2 years; $16,290
Ralph H. Turner; 2 years; $12,380

OHIO STATE UNIVERSITY, Columbus; Alfred B. Garrett; 2 years; $24,770
Roy F. Reeves; 2 years; $24,990

OHIO WESLEYAN UNIVERSITY, Delaware; Roy G. Bossert; 2 years; $8,570
Elwood B. Shirling; 2 years; $9,620

OKLAHOMA BAPTIST UNIVERSITY, Shawnee; J. O. Purdue; 2 years; $5,520

OKLAHOMA STATE UNIVERSITY, Stillwater; Paul A. McCollum; 2 years; $24,940

OREGON STATE UNIVERSITY, Corvallis; Donald G. Humphrey; 2 years; $9,940
E. A. Yunker; 2 years; $21,740

OTTAWA UNIVERSITY, Ottawa, Kans.; W. D. Bemmels; 2 years; $2,030

OTTERBEIN COLLEGE, Westerville, Ohio; Paul Matthews; 2 years; $4,000

PACIFIC LUTHERAN UNIVERSITY, Tacoma, Wash.; Charles D. Anderson; 2 years; $13,070

PACIFIC UNION COLLEGE, Angwin, Calif.; A. V. Winn; 2 years; $17,510

PENNSYLVANIA STATE UNIVERSITY, University Park; William M. Lepley; 2 years; $6,100
Richard G. Stoner; 2 years; $25,000

POLYTECHNIC INSTITUTE OF BROOKLYN, Brooklyn, N.Y.; J.J. Dropkin; 2 years; $21,870

POMONA COLLEGE, Claremont, Calif.; R. Nelson Smith; 2 years; $25,000

PORTLAND STATE COLLEGE, Portland, Oreg.; Mark Gurevitch; 2 years; $25,000

PRESBYTERIAN COLLEGE, Clinton, S.C.; K. N. Carter; 2 years; $5,680

PRINCETON UNIVERSITY, Princeton, N.J.; Walter Kauzmann; 2 years; $3,440

PURDUE UNIVERSITY, Lafayette, Ind.; Raymond Cohen; 2 years; $25,000
J. R. Eaton; 2 years; $25,000
J. C. Rogler; 2 years; $24,970
I. Walerstein; 2 years; $22,800

RANDOLPH-MACON COLLEGE, Ashland, Va.; Bruce V. English; 2 years; $7,440

RANDOLPH-MACON WOMAN'S COLLEGE, Lynchburg, Va.; A. Marquerite Risley; 2 years; $2,470

REED COLLEGE, Portland, Oreg.; William L. Parker; 2 years; $24,730

RENSSELAER POLYTECHNIC INSTITUTE, Troy, N.Y.; P. M. DeRusso; 2 years; $5,990
H. B. Huntington; 2 years; $24,350
Stephen E. Wiberley, 2 years; $24,820

ROLLINS COLLEGE, Winter Park, Fla.; Herbert E. Hellwege; 2 years; $23,160

ROSE POLYTECHNIC INSTITUTE, Terre Haute, Ind.; Charles C. Rogers; 2 years; $22,830

ROSEMONT COLLEGE, Rosemont, Pa.; Mary Colman Wall; 2 years; $5,450

RUTGERS, THE STATE UNIVERSITY, New Brunswick, N.J.; Donald J. Lewis; 2 years; $24,650
Leslie A. Stauber; 2 years; $4,880
Philip A. Vaughan; 2 years; $15,000

ST. JOSEPH'S COLLEGE, Philadelphia, Pa.; John S. O'Conor; 2 years; $25,000

ST. LAWRENCE UNIVERSITY, Canton, N.Y.; Edward N. Warner; 2 years; $21,500

ST. LOUIS UNIVERSITY, St. Louis, Mo.; Lyman J. Wood; 2 years; $25,000

ST. MARY'S COLLEGE, Winona, Minn.; Donald R. Morgan; 2 years; $6,830

ST. MARY'S UNIVERSITY OF SAN ANTONIO, San Antonio, Tex.; William J. Hamm; 2 years; $3,490

ST. NORBERT COLLEGE, West De Pere, Wis.; Lawrence L. Motiff; 2 years; $3,350

ST. OLAF COLLEGE, Northfield, Minn.; Peter E. Fossum; 2 years; $9,000

SHIMER COLLEGE, Mount Carroll, Ill.; J. Bennet Olson; 2 years; $20,630

SIMPSON COLLEGE, Indianola, Iowa; Jack L. Carter; 2 years; $9,210

SKIDMORE COLLEGE, Saratoga Springs, N.Y.; Edwin M. Moseley; 2 years; $22,820

SOUTHERN METHODIST UNIVERSITY, Dallas, Tex.; Howard J. Henry; 2 years; $24,590
John A. Savage; 2 years; $24,970

SOUTHWESTERN AT MEMPHIS, Memphis, Tenn.; M. Foster Moose; 2 years; $12,000

STANFORD UNIVERSITY, Stanford, Calif.; L. I. Schiff; 2 years; $15,000
D. A. Skoog; 2 years; $19,860
John K. Vennard, 2 years; $6,350

STATE UNIVERSITY OF IOWA, Iowa City; Ralph L. Shriner; 2 years; $16,180

STATE UNIVERSITY OF SOUTH DAKOTA, Vermillion; Charles M. Vaughn; 2 years; $15,220

STEPHEN F. AUSTIN STATE COLLEGE, Nacogdoches, Tex.; J. Herndon Burr, Jr.; 2 years; $15,000

STEVENS INSTITUTE OF TECHNOLOGY, Hoboken, N.J.; James H. Potter; 2 years; $25,000

Stillman College, Tuscaloosa, Ala.; William H. Venable, Jr.; 2 years; $4,000

Swarthmore College, Swarthmore, Pa.; Gilbert P. Haight, Jr.; 2 years; $9,550.

Syracuse University, Syracuse, N.Y.; Marshall W. Jennison; 2 years; $21,410
Frederick G. Sherman; 2 years; $24,230
Bernard D. Wood; 2 years; $21,690

Taylor University, Upland, Ind.; Elmer Nussbaum; 2 years; $6,970

Thiel College, Greenville, Pa.; Walter H. Puterbaugh; 2 years; $1,900

Tufts University, Medford, Mass.; Ashley S. Campbell; 2 years; $13,360
M. Kent Wilson; 2 years; $7,320

Tulane University, New Orleans, La.; Hans B. Jonassen; 2 years; $22,560

Tusculum College, Greenville, Tenn.; Arnold Van Pelt; 2 years; $4,550

Tuskegee Institute, Tuskegee, Ala.; Z. W. Dybezak; 2 years; $25,000

Union College and University, Schenectady, N.Y.; Harold E. Way; 2 years; $15,000

University of Alabama, University; Willard F. Gray; 2 years; $25,000

University of Arizona, Tucson; John W. Harshbarger; 2 years; $24,460

University of Arkansas, Fayetteville; Thomas B. Jefferson; 2 years; $2,050
Samuel Siegel; 2 years; $5,800

University of California, Berkeley; S. F. Cook; 2 years; $9,000
Morgan Harris; 2 years; $13,230
E. R. Hardwick, Los Angeles; 2 years; $8,540
Austin H. Riesen, Riverside; 2 years; $12,700
J. W. Cotton, Santa Barbara; 2 years; $4,790

University of Cincinnati, Cincinnati, Ohio; William A. Spoor; 2 years; $25,000

University of Colorado, Boulder; Malcolm Correll; 2 years; $20,910
Frank Kreith; 2 years; $25,000

University of Connecticut, Storrs; H. G. Hewitt; 2 years; $24,580

University of Dayton, Dayton, Ohio; Leonard Mann; 2 years; $5,000

University of Delaware, Newark; James P. Hartnett; 2 years; $25,000
G. Fred Somers; 2 years; $24,710

University of Georgia, Athens; Vernon J. Hurst; 2 years; $12,390

University of Hawaii, Honolulu; James C. Gilbert; 2 years; $20,790
Paul J. Scheuer; 2 years; $25,000

University of Houston, Houston, Tex.; Sara E. Huggins; 2 years; $11,270
W. E. Wentworth; 2 years; $8,270

University of Illinois, Urbana; G. M. Almy; 2 years; $25,000
H. A. Laitinen; 2 years; $25,000

University of Kansas, Lawrence; David Paretsky; 2 years; $11,360
Frederick E. Samson, Jr.; 2 years; $22,650

University of Kentucky, Lexington; Lyle R. Dawson; 2 years; $24,690

University of Maine, Orono; John W. Beamesderfer; 2 years; $24,830
Clarence E. Bennett; 2 years; $13,880
B. R. Speicher; 2 years; $9,530

University of Maryland, College Park; U. Van Wijk; 2 years; $6,250

University of Massachusetts, Amherst; Lawrence M. Bartlett; 2 years; $25,000

University of Michigan, Ann Arbor; Leigh C. Anderson; 2 years; $8,980
K. L. Jones; 2 years; $5,240
Thomas D. Rowe; 2 years; $25,000
G. J. Van Wylen; 2 years; $23,310
Edward L. Walker; 2 years; $17,910

University of Minnesota, Minneapolis; Stanley Bruckenstein; 2 years; $17,170
Alfred O. C. Nier; 2 years; $23,570
Robert E. Sloan; 2 years; $24,460
Armas W. Tamminen, Duluth; 2 years; $4,400

University of Missouri, Columbia; Clinton H. Conaway; 2 years; $12,240
Louis V. Holroyd; 2 years; $20,580
Harold Q. Fuller, Rolla; 2 years; $25,000

University of Nebraska, Lincoln; Russell C. Nelson; 2 years; $13,580

University of Nevada, Reno; Paul F. Secord; 2 years; $10,660

University of New Hampshire, Durham; R. E. Houston, Jr.; 2 years; $13,840

University of New Mexico, Albuquerque; Ruben D. Kelly; 2 years; $24,070

University of North Carolina, Chapel Hill; H. D. Crockford; 2 years; $23,990
Edmund Berkeley, Greensboro; 2 years; $7,600
Raymond L. Murray, Raleigh; 2 years; $25,000

University of North Dakota, Grand Forks; George C. Wheeler; 2 years; $10,000

University of Notre Dame, Notre Dame, Ind.; Clyde H. Hoffman; 2 years; $10,560
Frederick D. Rossini; 2 years; $6,650

University of Oklahoma, Norman; Howard W. Larsh; 2 years; $25,000
C. A. Plint; 2 years; $8,120

University of Oregon, Eugene; F. J. Reithel; 2 years; $12,940

University of Pennsylvania, Philadelphia; Charles C. Price; 2 years; $12,650

University of Pittsburgh, Pittsburgh, Pa.; T. H. Dunkelberger; 2 years; $25,000

University of Puerto Rico, Rio Piedras; Gustavo Candelas; 2 years; $24,610

University of Puerto Rico, Mayaguez; J. Maldonado Capriles; 2 years; $2,830

University of Redlands, Redlands, Calif.; Charles D. Howell; 2 years; $21,720

University of Rochester, Rochester, N.Y.; M. F. Kaplon; 2 years; $24,340
Winston D. Walters; 2 years; $10,560

University of St. Thomas, Houston, Tex.; George H. Dubay; 2 years; $10,000

University of Santa Clara, Santa Clara, Calif.; John B. Drahmann; 2 years; $4,960

University of Scranton, Scranton, Pa.; Joseph P. Harper; 2 years; $21,580

University of South Carolina, Columbia; B. L. Baker; 2 years; $15,860

University of Southern California, Los Angeles; Thomas Clements; 2 years; $20,440
John R. Holmes; 2 years; $24,940

UNIVERSITY OF TENNESSEE, Knoxville; A. D. Melaven; 2 years; $24,850

UNIVERSITY OF TEXAS, Austin; William W. Hagerty; 2 years; $21,860

UNIVERSITY OF TOLEDO, Toledo, Ohio; Robert A. Chipman; 2 years; $25,000

UNIVERSITY OF UTAH, Salt Lake City; Grant R. Fowles; 2 years; $14,920
L. Dale Harris; 2 years; $17,220
Don M. Rees; 2 years; $23,840

UNIVERSITY OF VERMONT, Burlington; Clinton D. Cook; 2 years; $24,240
Paul A. Moody; 2 years; $24,590

UNIVERSITY OF VIRGINIA, Charlottesville; Dietrich Bodenstein; 2 years; $24,990
John P. Raney; 2 years; $11,500

UNIVERSITY OF WASHINGTON, Seattle; Frank J. Seiler; 2 years; $24,220

UNIVERSITY OF WICHITA, Wichita, Kans.; Alvin Sarachek; 2 years; $4,100

UNIVERSITY OF WISCONSIN, Madison; R. J. Altpeter; 2 years; $25,000
Donald H. Bucklin; 2 years; $24,830
William C. Frazier; 2 years; $23,840

UNIVERSITY OF WYOMING, Laramie; L. Floyd Clarke; 2 years; $24,730

VANDERBILT UNIVERSITY, Nashville, Tenn.; Robert T. Lagemann; 2 years; $7,020

VASSAR COLLEGE, Poughkeepsie, N.Y.; R. E. Alley, Jr.; 2 years; $8,250

VILLA MADONNA COLLEGE, Covington, Ky.; Wallace F. Humphreys; 2 years; $4,360

VIRGINIA POLYTECHNIC INSTITUTE, Blacksburg; Fred W. Bull; 2 years; $19,880
James A. Jacobs; 2 years; $8,000
Robert C. Krug; 2 years; $7,450

VIRGINIA STATE COLLEGE, Petersburg; John T. Blue, Jr., Norfolk; 2 years; $4,900

WAKE FOREST COLLEGE, Winston-Salem, N.C.; John W. Sawyer; 2 years; $25,000

WASHINGTON STATE UNIVERSITY, Pullman; B. Roger Ray; 2 years; $13,840

WASHINGTON UNIVERSITY, St. Louis, Mo.; Richard A. Dammkoehler; 2 years; $22,430
Viktor Hamburger; 2 years; $5,540

WAYNE STATE UNIVERSITY, Detroit, Mich.; William V. Mayer; 2 years; $20,850

WELLS COLLEGE, Aurora, N.Y.; Robert L. Gering; 2 years; $12,500

WESLEYAN UNIVERSITY, Middletown, Conn.; Vincent W. Cochrane; 2 years; $19,940

WEST VIRGINIA UNIVERSITY, Morgantown; C. D. Thomas; 2 years; $4,130

WEST VIRGINIA WESLEYAN COLLEGE, Buckhannon; John C. Wright; 2 years; $10,160

WESTERN MICHIGAN UNIVERSITY, Kalamazoo; Walter G. Marburger; 2 years; $12,490

WESTERN RESERVE UNIVERSITY, Cleveland, Ohio; Howard A. Schneiderman; 2 years; $24,470

WHEELING COLLEGE, Wheeling, W. Va.; Joseph A. Duke; 2 years; $12,000

WHITMAN COLLEGE, Walla Walla, Wash.; Arthur G. Rempel; 2 years; $24,950

WILKES COLLEGE, Wilkes-Barre, Pa.; Charles B. Reif; 2 years; $1,400

WILLAMETTE UNIVERSITY, Salem, Oreg.; Robert L. Purbrick; 2 years; $5,100

WILLIAM MARSH RICE UNIVERSITY, Houston, Tex., John A. S. Adams; 2 years; $17,000

WILLIAMS COLLEGE, Williamstown, Mass.; Richard O. Rouse, Jr.; 2 years; $8,550

WISCONSIN STATE COLLEGE, La Crosse; Milford A. Cowley; 2 years; $5,370

WISCONSIN STATE COLLEGE, Stevens Point; Monica E. Bainter; 2 years; $4,950

WISCONSIN STATE COLLEGE, Superior; Phillip R. Brieske; 2 years; $4,950

WISCONSIN STATE COLLEGE, Whitewater; Rudolph Prucha; 2 years; $4,400

YALE UNIVERSITY, New Haven, Conn.; Horace D. Taft; 2 years; $21,680

UNDERGRADUATE SCIENCE EDUCATION PROGRAM

AGRICULTURAL & MECHANICAL COLLEGE OF TEXAS, College Station; M. E. Bloodworth; 1 year; $7,735
John P. German; 9 months; $680
Harriott O. Kunkel; 23 months; $11,155
R. W. Mitchell; 3 months; $5,935

AGRICULTURAL & TECHNICAL COLLEGE OF NORTH CAROLINA, Greensboro; Donald A. Edwards; 1 year; $4,310
Gladys W. Royal; 11 months; $10,505

ALABAMA COLLEGE, Montevallo; Paul C. Bailey; 1 year; $11,600

ALFRED UNIVERSITY, Alfred, N.Y.; Robert M. Campbell; 3 months; $6,350

ALLEGHENY COLLEGE, Meadville, Pa.; Georgiana W. Scovil; 1 year; $4,890

ALMA COLLEGE, Alma, Mich.; Arlan L. Edgar; 1 year; $6,965

AMHERST COLLEGE, Amherst, Mass.; Robert H. Koch; 2 months; $1,135

ANTIOCH COLLEGE, Yellow Springs, Ohio; James S. Corwin; 1 year; $11,960

ARLINGTON STATE COLLEGE, Arlington, Tex.; Rayford L. Hoyle; 1 year; $10,005
C. L. McNulty, Jr.; 3 months; $2,240

ASSOCIATED UNIVERSITIES, INC., New York, N.Y.; John W. Findlay, National Radio Astronomy Observatory, Green Bank, W. Va.; 3 months; $7,300

AUBURN UNIVERSITY, Auburn, Ala.; W. S. Bailey; 1 year; $4,580
Howard Carr; 3 months; $4,305
William G. Sherling, Jr.; 1 year; $10,150

BARNARD COLLEGE, COLUMBIA UNIVERSITY, New York, N.Y.; Lucena J. Barth; 9 months; $2,345
Emma Dietz Stecher; 4 months; $3,910

BAYLOR UNIVERSITY, Waco, Tex.; Bryce C. Brown; 1 year; $6,785

BELLARMINE COLLEGE, Louisville, Ky.; John M. Daly; 3 months; $3,425

BOSTON COLLEGE, Chestnut Hill, Mass.; William Guindon; 3 months; $3,220

BOWDOIN COLLEGE, Brunswick, Maine; Charles E. Huntington; 35 months; $16,735
Myron A. Jeppesen; 1 year; $3,450
Reinhard L. Korgen; 1 year; $5,405

BOWLING GREEN STATE UNIVERSITY, Bowling Green, Ohio; W. H. Hall; 1 year; $4,320
Charles C. Rich; 9 months; $620

BRANDEIS UNIVERSITY, Waltham, Mass.; Milton R. Baker; 1 year; $3,680
David A. Buchsbaum; 3 months; $2,070
Paul S. Dorain; 23 months; $9,705

BROOKLYN COLLEGE, Brooklyn, N.Y.; Meyer Jordan; 1 year; $12,880

BROWN UNIVERSITY, Providence, R.I.; John A. Dillon, Jr.; 11 months; $3,625
Thomas A. Mutch; 3 months; $2,610
John F. Neumer; 3 months; $10,430
Harold Schlosberg; 1 year; $11,685

BRYN MAWR COLLEGE, Bryn Mawr, Pa.; Ernst Berliner; 5 months; $8,280

BUCKNELL UNIVERSITY, Lewisburg, Pa.; Richard P. Nickelsen; 2 months; $750
Meldrum B. Winstead; 3 months; $6,175

BUREAU OF RESEARCH IN NEUROLOGY & PSYCHIATRY, Princeton, N.J.; DeWitt H. Smith; 1 year; $11,880
Arthur Sohler; 3 months; $2,130

CANISIUS COLLEGE, Buffalo, N.Y.; Herman A. Szymanski; 3 months; $5,980

CARDINAL STRITCH COLLEGE, Milwaukee, Wis.; Sister Mary John Baptist; 9 months; $1,665

CARLETON COLLEGE, Northfield, Minn.; Frank C. Miller; 2 months; $1,795
Robert A. Reitz; 2 months; $3,115

CARNEGIE INSTITUTE OF TECHNOLOGY, Pittsburgh, Pa.; Richard H. Lambert; 3 months; $5,060
R. T. Schmacher; 3 months; $4,015

CARROLL COLLEGE, Waukesha, Wis.; Richard Eugene Bayer; 23 months; $12,015

CASE INSTITUTE OF TECHNOLOGY, Cleveland, Ohio; Robert C. Weast; 1 year; $45,125

CATHOLIC UNIVERSITY, Washington, D.C.; George E. McDuffie, Jr.; 3 months; $4,500

CHRISTIAN BROTHERS COLLEGE, Memphis, Tenn.; Edward Doody; 1 year; $2,550

CITY COLLEGE, New York, N.Y.; Bennington P. Gill; 9 months; $6,095
Mansour Javid; 1 year; $8,685

CLARK UNIVERSITY, Worcester, Mass.; Vernon Ahmadjian; 1 year; $9,315
Roy S. Anderson; 1 year; $2,990

CLARKSON COLLEGE OF TECHNOLOGY, Potsdam, N.Y.; Charles A. Howe; 1 year; $8,680
Thomas J. Ward; 1 year; $6,785

COLBY COLLEGE, Waterville, Maine; James L. Fozard; 9 months; $2,590
Charles F. Hickox, Jr.; 1 year; $1,950

COLGATE UNIVERSITY, Hamilton, N.Y.; Raymond J. Myers; 1 year; $13,535

COLLEGE OF THE HOLY CROSS, Worcester, Mass.; Ram Sarup; 1 year; $6,900

COLLEGE OF MOUNT ST. VINCENT, New York, N.Y.; Marguerite M. Caso; 9 months; $3,300

COLORADO COLLEGE, Colorado Springs; Robert Z. Brown; 11 months; $4,435
Milton K. Snyder; 1 year; $5,060

COLORADO STATE UNIVERSITY, Fort Collins; Ralph Baker; 5 months; $6,970
Edwin W. Mogren; 1 year; $5,320
Summner M. Morrison; 23 months; $17,065
Harry E. Troxell; 1 year; $5,685

CORNELL COLLEGE, Mount Vernon, Iowa; Eugene E. Hinman; 11 months; $1,145
T. Edwin Rogers; 9 months; $1,095

CORNELL UNIVERSITY, Ithaca, N.Y.; N. C. Brady; 1 year; $10,880
David H. Geske; 5 months; $30,820
R. F. Holland; 1 year; $7,040
George C. Kent; 5 months; $14,710

DARTMOUTH COLLEGE, Hanover, N.H.; William P. Davis; 23 months; $19,045

DEPAUL UNIVERSITY, Chicago, Ill.; Robert C. Miller; 23 months; $15,805

DILLARD UNIVERSITY, New Orleans, La.; J. Hamer; 1 year; $9,315

DREXEL INSTITUTE OF TECHNOLOGY, Philadelphia, Pa.; Francis K. Davis, Jr.; 9 months; $2,380

DRURY COLLEGE, Springfield, Mo.; Jorge L. Padron; 1 year; $5,020

DUKE UNIVERSITY, Durham, N.C.; Jack W. Brehm; 1 year; $5,060
Earl I. Brown, II; 1 year; $8,995
Edward C. Horn; 1 year; $3,970

FAIRFIELD UNIVERSITY, Fairfield, Conn.; John E. Klimas, Jr.; 1 year; $995

FAIRLEIGH DICKINSON UNIVERSITY, Rutherford, N.J.; Harold Weinberger; 3 months; $5,925

FISK UNIVERSITY, Nashville, Tenn.; I. Wesley Elliott; 11 months; $7,995
James R. Lawson; 1 year; $5,735

FLORIDA SOUTHERN COLLEGE, Lakeland; Margaret L. Gilbert; 1 year; $14,640

FLORIDA STATE UNIVERSITY, Tallahassee; Grover L. Rogers; 11 months; $4,280

FORDHAM UNIVERSITY New York, N.Y.; Henry F. DeBaggis; 11 months; $12,160
Joseph F. Mulligan; 3 months; $9,600
Clarence C. Schubert; 1 year; $9,250

FRANKLIN & MARSHALL COLLEGE, Lancaster, Pa.; Frank D. Enck; 1 year; $5,370
Fred H. Suydam; 8 months; $17,250
Donald W. Western; 14 months; $6,030

FREDERIC BURK FOUNDATION FOR EDUCATION, San Francisco, Calif.; Eva F. Estermann; 11 months; $840

FURMAN UNIVERSITY, Greenville, S.C.; Donald G. Kubler; 1 year; $6,385

GENEVA COLLEGE, Beaver Falls, Pa.; Roy M. Adams; 1 year; $8,000

GEORGE WASHINGTON UNIVERSITY, Washington, D.C.; Russell B. Stevens; 35 months; $6,035
Richard D. Walk; 1 year; $7,000

GEORGIA INSTITUTE OF TECHNOLOGY, Atlanta; Edwin J. Scheibner; 1 year; $4,080

GRINNELL COLLEGE, Grinnell, Iowa; Givens L. Thornton; 11 months; $8,720

HAMPDEN-SYDNEY COLLEGE, Hampden-Sydney, Va.; G. Tyler Miller, Jr.; 3 months; $4,775

HARVARD UNIVERSITY, Cambridge, Mass.; I. Bernard Cohen; 11 months; $22,130

HARVARD UNIVERSITY, Cambridge, Mass.; George W. Goethals; 1 year; $19,160
Jesse F. Scott; 5 months; $42,550
Frank H. Westheimer; 3 months; $41,360
Stephen Williams; 3 months; $12,995

HARVEY MUDD COLLEGE, Claremont, Calif.; Robert C. James; 1 year; $6,530

HAVERFORD COLLEGE, Haverford, Pa.; Louis C. Green; 14 months; $1,775

HOWARD PAYNE COLLEGE, Brownwood, Tex.; Chris S. Jordon; 1 year; $915

ILLINOIS INSTITUTE OF TECHNOLOGY, Chicago; Peter Chiarulli; 3 months; $3,380
Leonard I. Grossweiner; 23 months; $20,265

Ralph M. Krause; 1 year; $11,000

IMMACULATE HEART COLLEGE, Los Angeles, Calif.; Agnes A. Green; 3 months; $6,900
M. Gerald Shea; 1 year; $5,230

INDIANA UNIVERSITY, Bloomington; H. W. Hofstetter; 2 months; $2,580
Paul Klinge; 11 months; $2,920
Paul Klinge; 11 months; $6,185
V. J. Shiner, Jr.; 22 months; $31,740
Judson Mead; 1 year; $5,805

IOWA STATE UNIVERSITY, Ames; T. A. Bancroft; 1 year; $8,000
Kenneth D. Carlander; 1 year; $9,090
Paul A. Hartman; 1 year; $8,565
George G. Karas; 1 year; $3,925
Don C. Norton; 1 year; $7,530
Peter A. Peterson; 3 months; $3,255
Malcolm A. Rougvie; 1 year; $11,030
Glen A. Russell; 35 months; $37,820

JACKSON STATE COLLEGE, Jackson, Miss.; Benjamin H. McLemore; 1 year; $5,250

JOHNS HOPKINS UNIVERSITY, Baltimore, Md.; Walter S. Koski; 3 months; $5,870

JUNIATA COLLEGE, Huntingdon, Pa.; David M. Hercules; 1 year; $10,730

KANSAS STATE COLLEGE OF PITTSBURG; Joe M. Walker; 11 months; $9,225

KANSAS STATE UNIVERSITY, Manhattan; M. F. Hansen; 3 months; $4,125
Franz Samelson; 4 months; $11,250

KANSAS WESLEYAN UNIVERSITY, Salina; Charles B. Creager; 11 months; $3,750

KENTUCKY RESEARCH FOUNDATION, Lexington; Jacob R. Meadow; 1 year; $12,855

KING COLLEGE, Bristol, Tenn.; Roy H. Bailey; 1 year; $5,115

KING'S COLLEGE, Wilkes-Barre, Pa.; James J. Sheehan; 3 months; $3,675

LAKE FOREST COLLEGE, Lake Forest, Ill.; Charles D. Louch; 3 months; $2,415

LEBANON VALLEY COLLEGE, Annville, Pa.; Karl L. Lockwood; 3 months; $9,515

LEHIGH UNIVERSITY, Bethlehem, Pa.; Jerome Daen; 1 year; $21,310
Everett Pitcher; 1 year; $13,455

LORAS COLLEGE, Dubuque, Iowa; George N. Schulte; 1 year; $6,020

LOS ANGELES STATE COLLEGE FOUNDATION, Los Angeles, Calif.; Richard T. Keys; 1 year; $10,580

LOUISIANA POLYTECHNIC INSTITUTE, Ruston; John J. McDow; 11 months; $2,755

LOUISIANA STATE UNIVERSITY, Baton Rouge; George C. Kent, Jr.; 14 months; $9,370
Grover E. Murray; 5 months; $14,190
Vincent E. Parker; 5 months; $14,640

LOYOLA UNIVERSITY, Chicago, Ill.; Robert B. Reisel; 9 months; $4,645

LOYOLA UNIVERSITY, New Orleans, La.; F. A. Benedetto; 34 months; $34,155

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge; Arthur C. Cope; 1 year; $28,150

MCMURRAY COLLEGE, Abilene, Tex.; Virgil E. Bottom; 11 months; $3,000

MICHIGAN COLLEGE OF MINING & TECHNOLOGY, Houghton; M. E. Volin; 1 year; $5,600

MICHIGAN STATE UNIVERSITY, East Lansing; John W. Andresen; 1 year; $7,270
John R. Shaver; 1 year; $20,125

MICHIGAN STATE UNIVERSITY, East Lansing; Paul Tomboulian; 9 months; $1,785

MISSISSIPPI STATE UNIVERSITY, State College; Lyell C. Behr; 1 year; $11,240
Charles B. Cliett; 2 years; $21,545
Leslie L. Ellis; 1 year; $7,450

MOREHOUSE COLLEGE, Atlanta, Ga.; James H. Birnie; 27 months; $11,190

MORGAN STATE COLLEGE, Baltimore, Md.; Clarence F. Stephens; 1 year; $6,555

MOUNT HOLYOKE COLLEGE, South Hadley, Mass.; Grace E. Bates; 9 months; $2,150
Kathryn M. Eschenberg; 3 months; $7,230
Edwin S. Weaver; 6 months; $20,285

MOUNT ST. MARY'S COLLEGE, Los Angeles, Calif.; Hallie F. Bundy; 5 months; $6,670

MOUNT ST. SCHOLASTICA COLLEGE, Atchison, Kans.; Helen Sullivan; 9 months; $1,895

MUSKINGUM COLLEGE, New Concord, Ohio; Wilmer K. Fife; 1 year; $3,195

NEW MEXICO INSTITUTE OF MINING & TECHNOLOGY, Socorro; William Hume; 1 year; $8,250

NEW MEXICO STATE UNIVERSITY, University Park; James E. Weiss; 1 year; $20,350

NEW YORK STATE DEPARTMENT OF HEALTH, Albany; Ray K. Brown; 3 months; $4,340

NEW YORK UNIVERSITY, New York; Joseph D. Gettler; 1 year; $19,285
Leonard Yarmus; 5 months; $12,510

NORFOLK COLLEGE OF WILLIAM & MARY, Norfolk, Va.; Jacques S. Zaneveld; 1 year; $5,690

NORTH CENTRAL COLLEGE, Naperville, Ill.; Mary Anice Seybold; 11 months; $2,480

NORTH DAKOTA STATE UNIVERSITY, Fargo; John A. Callenbach; 1 year; $20,315
Donald Schwartz; 1 year; $4,210

NORTH TEXAS STATE UNIVERSITY, Denton; Robert C. Sherman; 1 year; $25,900

NORTHEASTERN UNIVERSITY, Boston, Mass.; Robert A. Shepard; 3 months; $3,190
Ralph A. Troupe; 3 months; $4,835

NORTHERN ILLINOIS UNIVERSITY, DeKalb; Sidney Mittler; 23 months; $25,500

NORTHWESTERN STATE COLLEGE OF LOUISIANA, Natchitoches; Alan H. Crosby; 11 months; $3,500
Richard E. Garth; 20 months; $14,600

NORTHWESTERN UNIVERSITY, Evanston, Ill.; Richard C. Bowers; 3 months; $15,075
Robert W. Hull; 1 year; $13,765

OBERLIN COLLEGE, Oberlin, Ohio; Fred Foreman; 11 months; $2,200
L. E. Steiner; 35 months; $51,000
Robert Weinstock; 2 months; $1,885

OHIO STATE UNIVERSITY, Columbus; Frank L. Himes; 1 year; $3,165
Lloyd M. Parks; 23 months; $29,670

OHIO WESLEYAN UNIVERSITY, Delaware; Robert W. Long; 20 months; $2,195

OKLAHOMA STATE UNIVERSITY, Stillwater; Marlowe D. Thorne; 1 year; $14,315
John W. West; 1 year; $5,865
Leon H. Zalkow; 1 year; $7,890

OREGON STATE UNIVERSITY, Corvallis; Fred W. Decker; 1 year; $7,100
J. R. Dilworth; 23 months; $18,935

E. C. Gilbert; 5 months; $18,865
Glenn W. Holcomb; 9 months; $4,130
Leo A. Sciuchetti; 1 year; $8,910
Roy A. Young; 8 months; $24,840

PACIFIC LUTHERAN COLLEGE, Tacoma, Wash.; Charles D. Anderson; 1 year; $7,650

PENNSYLVANIA STATE UNIVERSITY, University Park; Walter I. Goldburg; 1 year; $7,640
Harold J. Read; 3 months; $7,245
Robert W. Stone; 1 year; $7,130
William O. Williamson; 3 months; $1,150

POLYTECHNIC INSTITUTE OF BROOKLYN, Brooklyn, N.Y.; Ernest I. Becker; 3 years; $42,415
John J. Dropkin; 23 months; $37,760
Jules P. Russell; 1 year; $31,010

POMONA COLLEGE, Claremont, Calif.; William D. Andrus; 1 year; $39,035

PRINCETON UNIVERSITY, Princeton, N.J.; John G. Danielson; 3 months; $28,610

PURDUE UNIVERSITY, Lafayette Ind.; Durward L. Allen; 1 year; $6,975
Glenn B. Bergeson; 1 year; $7,600
Gustav E. Cwalina; 1 year; $5,535
George W. Hughes; 1 year; $23,190
F. H. Wilt; 1 year; $50,875

QUEENS COLLEGE, Flushing, N.Y.; Gregory Razran; 1 year; $5,865

REED COLLEGE, Portland, Oreg.; Frederick D. Tabbutt; 1 year; $12,605

RENSSELAER POLYTECHNIC INSTITUTE, Troy, N.Y.; Stephen E. Wiberley; 3 months; $5,605

RESEARCH FOUNDATION OF STATE UNIVERSITY OF NEW YORK, Albany; Hugh E. Hunter, Binghamton; 11 months; $7,255
Noel Simmons, Buffalo; 3 months; $5,265
William T. Snyder, Oyster Bay; 1 year; $12,250
Edward C. Jahn, Syracuse; 3 months; $7,830
Ralph T. King, Syracuse; 3 months; $4,265

RIPON COLLEGE, Ripon, Wis.; Jack W. Powers; 1 year; $4,160

ROLLINS COLLEGE, Winter Park, Fla.; John S. Ross; 23 months; $4,715

ROSEMONT COLLEGE, Rosemont, Pa.; Mary Colman Wall; 23 months; $7,650

ROSWELL PARK MEMORIAL INSTITUTE, Buffalo, N.Y.; Edwin A. Mirand; 3 months; $23,000

RUTGERS, THE STATE UNIVERSITY, New Brunswick, N.J.; James B. Durand, Camden; 9 months; $635
Donald G. Forgays; 23 months; $17,375
Bernard W. Koft; 2 months; $1,915

SAVANNAH STATE COLLEGE, Savannah, Ga.; Charles Pratt; 1 year; $3,200

ST. LAWRENCE UNIVERSITY, Canton, N.Y.; Gilbert E. Moos; 8 months; $2,185
Charles H. Stauffer; 9 months; $1,440

ST. MARY'S COLLEGE, Winona, Minn.; H. Charles; 23 months; $15,480
H. Philip Hogan; 23 months; $5,000

ST. OLAF COLLEGE, Northfield, Minn.; Paul R. Burton; 3 months; $3,605
John C. Marshall; 1 year; $7,765
Thomas Rossing; 9 months; $1,840

SAN DIEGO STATE COLLEGE FOUNDATION, San Diego, Calif.; Burt Nelson; 1 year; $5,050
Merle B. Turner; 1 year; $8,625
Harold Walba; 1 year; $21,475

SAN JOSE COLLEGE FOUNDATION, San Jose, Calif.; Lloyd Van Alten; 23 months; $23,385

SEATTLE PACIFIC COLLEGE, Seattle, Wash.; Donald D. Kerlee; 3 months; $4,255

SETON HALL UNIVERSITY, South Orange, N.J.; Alfred V. Celiano; 11 months; $16,915

SMITH COLLEGE, Northampton, Mass.; Milton D. Soffer; 3 months; $6,385

SOUTH DAKOTA SCHOOL OF MINES AND TECHNOLOGY, Rapid City; George Rapp, Jr.; 3 months; $1,550

SOUTH DAKOTA STATE COLLEGE, Brookings; Lawrence O. Fine; 3 months; $2,000
John Tanaka; 1 year; $2,700

SOUTHERN ILLINOIS UNIVERSITY, Carbondale; William C. Ashby; 11 months; $6,555

SOUTHERN OREGON COLLEGE, Ashland; Franklin W. Sturges; 1 year; $10,510

SPRING HILL COLLEGE, Mobile, Ala.; Walter J. Rhein; 2 months; $4,035

STANFORD UNIVERSITY, Stanford, Calif.; William R. Dickinson; 11 months; $4,890
O. Cutler Shepard; 18 months; $11,420

STATE UNIVERSITY OF IOWA, Iowa City; James O. Osburn; 1 year; $7,240
Milton E. Rosenbaum; 3 months; $5,405

STATE UNIVERSITY OF NEW YORK COLLEGE OF CERAMICS, ALFRED UNIVERSITY, Alfred; Charles E. Greene; 1 year; $6,500

STATE UNIVERSITY OF SOUTH DAKOTA, Vermillion; Roger T. Davis; 1 year; $7,475
Theodore L. Reid; 2 months; $4,440

STEPHEN F. AUSTIN STATE COLLEGE, Nacogdoches, Tex.; W. I. Layton; 9 months; $745

STEVENS INSTITUTE OF TECHNOLOGY, Hoboken, N.J.; Henry Polowy; 1 year; $7,665
Rolf Weil; 1 year; $5,405

SYRACUSE UNIVERSITY, Syracuse, N.Y.; Darshan S. Dosanjh; 1 year; $7,705
Paul W. Gilbert; 1 year; $9,895
Wilbur R. LePage; 13 months; $8,475
James A. Luker; 1 year; $13,150
Wallace R. McAllister; 1 year; $7,000
William M. Merrill; 1 year; $6,850
Henry E. Wirth; 23 months; $30,980

TENNESSEE WESLEYAN COLLEGE, Athens; Carl Honaker; 1 year; $3,280

TEXAS SOUTHERN UNIVERSITY, Houston; Robert J. Terry; 3 months; $18,445

TEXAS WOMAN'S UNIVERSITY, Denton; William L. Mecay; 3 years; $5,080

THIEL COLLEGE, Greenville, Pa.; Kenneth G. Wood; 1 year; $2,935

TRINITY COLLEGE, Hartford, Conn.; Austin C. Herschberger; 1 year; $4,760

TRINITY COLLEGE, Washington, D.C.; Marie Therese Dimond; 3 months; $3,400

TULANE UNIVERSITY, New Orleans, La.; Hans B. Jonassen; 1 year; $8,735
Vera T. Kanareff; 9 months; $405

UNION COLLEGE AND UNIVERSITY, Schenectady, N.Y.; R. Rappaport; 23 months; $14,260

UNIVERSITY OF ALABAMA, University; Margaret Green; 3 months; $5,175

UNIVERSITY OF ALASKA, College; Allan H. Mick; 3 months; $6,975

UNIVERSITY OF ARIZONA, Tucson; Henry Freiser; 1 year; $7,130

UNIVERSITY OF ARKANSAS, Fayetteville; D. O. Akhurst; 1 year; $4,970
Lowell F. Bailey; 1 year; $5,695
Glen T. Clayton; 1 year; $14,030
Arthur Fry; 2 years; $35,880
George E. Templeton; 3 months; $1,505

UNIVERSITY OF BUFFALO, Buffalo, N.Y.; Frank R. Olson; 9 months; $7,600

UNIVERSITY OF CALIFORNIA, Berkeley; Howell V. Daly; 11 months; $13,760
Donald M. Reynolds, Davis; 1 year; $9,315
Edward C. Carterette, Los Angeles; 11 months; $17,525
Daniel Kivelson, Los Angeles; 35 months; $57,385
Malcolm F. Smiley, Riverside; 1 year; $8,365

UNIVERSITY OF CHICAGO, Chicago, Ill.; Dorothea Starbuck Miller; 1 year; $17,220
Theodore Schaefer, Jr.; 11 months; $12,050

UNIVERSITY OF COLORADO, Boulder; Donald G. Burkhard; 1 year; $18,460
Frank Kreith; 3 months; $20,470
John W. Marr; 35 months; $30,965
Burnett Meyer; 9 months; $2,945

UNIVERSITY OF DELAWARE, Newark; Charles B. Cooper; 2 months; $780
Charles B. Cooper; 11 months; $2,770

UNIVERSITY OF GEORGIA, Athens; J. Clyde Driggers; 1 year; $10,090
John H. Henkel; 5 months; $31,325
Robert A. McRorie; 1 year; $15,420
R. Barclay McGhee; 3 months; $6,910

UNIVERSITY OF IDAHO, Moscow; Malcolm M. Renfrew; 11 months; $6,195
Malcolm M. Renfrew; 23 months; $9,415

UNIVERSITY OF ILLINOIS, Urbana; D. E. Alexander; 3 months; $695
Morton W. Weir; 11 months; $23,205

UNIVERSITY OF KANSAS, Lawrence; Ray P. Cuzzort; 1 year; $7,020
Harold F. Rosson; 3 months; $5,520
Frederick E. Samson, Jr.; 1 year; $30,090
Edward E. Smissman; 1 year; $15,640
Arnold A. Strassenburg; 1 year; $5,425

UNIVERSITY OF KANSAS CITY, Kansas City, Mo.; Frank Millich; 3 months; $11,985

UNIVERSITY OF LOUISVILLE, Louisville, Ky.; Calvin A. Lang; 3 months; $8,590
Kevin T. Potts; 1 year; $6,035

UNIVERSITY OF MARYLAND, College Park; John W. Brace; 11 months; $5,095
Joshua R. C. Brown; 1 year; $5,860
Gilbert Gordon; 1 year; $11,270

UNIVERSITY OF MASSACHUSETTS, Amherst; John A. Chandler; 3 months; $7,935
Phillips R. Jones; 23 months; $6,670
D. S. Van Fleet; 1 year; $10,235

UNIVERSITY OF MIAMI, Coral Gables, Fla.; Samuel P. Myers, Miami; 6 months; $9,975

UNIVERSITY OF MICHIGAN, Ann Arbor; Kenneth L. Jones; 2 months; $5,050
Jack E. McLaughlin; 2 months; $17,045
Orren C. Mohler, 3 months; $3,220
Robert C. Taylor; 1 year; $10,925
Russell T. Woodburne; 11 months; $6,210

UNIVERSITY OF MINNESOTA Minneapolis; James C. Nichol; 1 year; $7,360
George W. Preckshot; 26 months; $31,445

UNIVERSITY OF MISSISSIPPI, University; Virgil M. Benson; 23 months; $29,495

UNIVERSITY OF MISSOURI, Columbia; Harold Q. Fuller, Rolla; 1 year; $6,545
Mack M. Jones; 1 year; $6,435

UNIVERSITY OF NEBRASKA, Lincoln; G. A. Gallup; 11 months; $11,590
J. A. Fagerstrom; 3 months; $2,290

UNIVERSITY OF NEVADA, Reno; Kenneth C. Kemp; 1 year; $4,570
Paul F. Secord; 1 year; $8,065

UNIVERSITY OF NEW HAMPSHIRE, Durham; M. Evans Munroe; 1 year; $14,560
Robert Lyle; 3 months; $4,025

UNIVERSITY OF NEW MEXICO, Albuquerque; James R. Barton; 1 year; $8,370

UNIVERSITY OF NORTH CAROLINA, Chapel Hill; James C. Kellett, Jr.; 1 year; $3,675
E. O. Beal, Raleigh; 9 months; $1,840
Paul H. Harvey, Raleigh; 5 months; $21,045
T. E .Maki, Raleigh; 1 year; $6,040
Richard L. Simpson, Raleigh; 3 months; $12,125
Richard L. Simpson; 1 year; $4,000
Alfred J. Stamm, Raleigh; 1 year; $4,140
Ralph C. Swann, Raleigh; 3 months; $8,425

UNIVERSITY OF NORTH DAKOTA, Grand Forks; Benjamin De Boer; 1 year; $4,000
Robert Rosenthal; 3 months; $2,070

UNIVERSITY OF NOTRE DAME, Notre Dame, Ind.; Kenneth R. Lauer; 1 year; $5,830
E. A. Peretti; 1 year; $3,470

UNIVERSITY OF OKLAHOMA, Norman; Robert D. Burns; 35 months; $60,200
Alfred J. Weinheimer; 1 year; $10,550

UNIVERSITY OF OREGON, Eugene; A. F. Moursund; 35 months; $26,560
Kenneth Polk; 35 months; $34,640
Harry A. Shoemaker; 23 months; $36,040

UNIVERSITY OF PENNSYLVANIA, Philadelphia; George E. Schweigert; 11 months; $6,800

UNIVERSITY OF PITTSBURGH, Pittsburgh, Pa.; A. F. Frederickson; 1 year; $6,955

UNIVERSITY OF PORTLAND, Portland, Oreg.; Ambrose J. Wheeler; 9 months; $9,290

UNIVERSITY OF PUERTO RICO, Mayaguez; Justo Hernandez Mora; 1 year; $2,990
Noemi G. Martinez Nadal; 9 months; $3,105

UNIVERSITY OF REDLANDS, Redlands, Calif.; Reinhold J. Krantz; 1 year; $8,950

UNIVERSITY OF RHODE ISLAND, Kingston; Charles Polk; 1 year; $8,390

UNIVERSITY OF ROCHESTER, Rochester, N.Y.; S. D. S. Spragg; 23 months; $13,050

UNIVERSITY OF SAN FRANCISCO, San Francisco, Calif; William Maroney; 1 year; $4,780

UNIVERSITY OF SANTA CLARA, Santa Clara, Calif.; Abraham P. Hillman; 34 months; $26,700

UNIVERSITY OF SCRANTON, Scranton, Pa.; Martin D. Appleton; 3 months; $6,500

UNIVERSITY OF THE SOUTH, Sewanee, Tenn.; William T. Allen; 3 months; $1,980
David B. Camp; 3 months; $3,350
Stephen Puckette; 3 months; $5,775

UNIVERSITY OF SOUTH CAROLINA, Columbia; O. D. Bonner; 35 months; $14,490
E. Fontelle Thompson, Jr.; 3 months; $7,045

Eugene C. Woodward, Jr.; 23 months; $7,475

UNIVERSITY OF SOUTH FLORIDA, Tampa; Jack E. Fernandez; 1 year; $16,295

UNIVERSITY OF SOUTHWESTERN LOUISIANA, Lafayette; James R. Oliver; 1 year; $4,410

UNIVERSITY OF TENNESSEE, Knoxville; Newell S. Bowman; 3 months; $11,670
B. J. Demott; 1 year; $4,140
Arthur W. Jones; 11 months; $4,715
Alvin H. Nielsen; 1 year; $5,865
Fred H. Norris; 1 year; $6,385
Seldon D. Feurt, Memphis; 1 year; $5,895
William E. Jefferson, Jr., Memphis; 3 months; $6,555

UNIVERSITY OF TEXAS, Austin; Arwin A. Dougal; 1 year; $5,405
Frank N. Edmonds, Jr.; 2 months; $1,555
M. C. Huffstutler, Jr.; 1 year; $5,455

UNIVERSITY OF UTAH, Salt Lake City; M. Duane Brown; 35 months; $20,290
Don M. Rees; 1 year; $4,180

UNIVERSITY OF VERMONT, Burlington; Clinton D. Cook; 3 months; $7,015
Albert D. Crowell; 1 year; $3,450
Bennett B. Murdock, Jr.; 23 months; $14,830

UNIVERSITY OF WASHINGTON, Seattle; Nathan A. Hall; 1 year; $5,740
William B. Woolf; 11 months; $21,125

UNIVERSITY OF WISCONSIN, Madison; Robert H. Dott, Jr.; 1 year; $3,825
Harry L. Madison; 11 months; $11,355
Harry P. Sharp; 1 year; $15,035

UNIVERSITY OF WYOMING, Laramie; Brainerd Mears, Jr.; 3 months; $2,600

URSULINE COLLEGE, Louisville, Ky.; M. Angelica Seibert; 22 months; $5,890

UTAH STATE UNIVERSITY, Logan; DuWayne L. Goodwin; 1 year; $6,095
Allen W. Stokes; 3 months; $3,910

VANDERBILT UNIVERSITY, Nashville, Tenn.; James J. Friauf; 2 months; $9,320
William H. Rowan; 1 year; $5,175
W. Dennis Threadgill; 1 year; $4,600

VILLA MADONNA COLLEGE, Covington, Ky.; James E. Cantrill; 1 year; $4,335
John F. Schuler; 1 year; $4,945

VILLANOVA UNIVERSITY, Villanova, Pa.; R. E. White; 1 year; $4,570

VIRGINIA POLYTECHNIC INSTITUTE, Blacksburg; C. E. Howes; 1 year; $2,700
Robert C. Krug; 5 months; $6,440
George W. Litton; 23 months; $1,725

VIRGINIA STATE COLLEGE, Petersburg; Bernard R. Woodson, Jr.; 1 year; $5,100

WABASH COLLEGE, Crawfordsville, Ind.; Robert L. Henry; 3 months; $1,400

WASHINGTON AND LEE UNIVERSITY, Lexington, Va.; J. Thomas Ratchford; 9 months; $2,260

WASHINGTON STATE UNIVERSITY, Pullman; Richard A. Parker; 23 months; $12,190

WASHINGTON UNIVERSITY, St. Louis, Mo.; Norton H. Nickerson; 1 year; $3,820

WAYNE STATE UNIVERSITY, Detroit, Mich.; Harold E. Bailey; 1 year; $2,445
Henry V. Bohm; 1 year; $11,900

WELLESLEY COLLEGE, Wellesley, Mass.; Jean V. Crawford; 2 months; $7,115

WESLEYAN UNIVERSITY, Middletown, Conn.; G. Philip Johnson; 34 months; $49,785
Joe Webb Peoples; 1 year; $4,610

WEST VIRGINIA UNIVERSITY, Morgantown; Horace L. Barnett; 1 year; $7,130
Jack D. Graybeal; 3 months; $9,715
Jerome F. Parmer; 1 year; $8,190

WESTERN MICHIGAN UNIVERSITY, Kalamazoo; Lillian H. Meyer; 11 months; $8,300
Paul Rood; 11 months; $3,670

WESTERN RESERVE UNIVERSITY, Cleveland, Ohio; Howard A. Schneiderman; 1 year; $10,750

WILKES COLLEGE, Wilkes-Barre, Pa.; Francis J. Michelini; 13 months; $12,335

WILLAMETTE UNIVERSITY, Salem, Oreg.; Robert L. Purbrick; 1 year; $4,945

WILLIAM JEWELL COLLEGE, Liberty, Mo.; Wallace A. Hilton; 9 months; $1,440

WILLIAMS COLLEGE, Williamstown, Mass.; Thomas C. McGill; 3 months; $2,300

WILMINGTON COLLEGE, Wilmington, Ohio; Harry H. Johnston; 3 months; $1,890

WORCESTER POLYTECHNIC INSTITUTE, Worcester, Mass.; Wilmer L. Kranich; 1 year; $12,280
Allan E. Parker; 8 months; $32,775
Donald W. Zwiep; 3 months; $4,310

XAVIER UNIVERSITY, Cincinnati, Ohio; Harvey A. Dube; 1 year; $8,690
John B. Hart; 3 months; $2,430

YALE UNIVERSITY, New Haven, Conn.; Nuel D. Belnap, Jr.; 5 months; $7,935
E. J. Boell; 23 months; $23,575
John P. Chesick; 35 months; $77,400
John E. Sanders; 23 months; $31,500
John G. Skalnik; 1 year; $6,440

YESHIVA UNIVERSITY, New York, N.Y.; Phyllis H. Cahn; 23 months; $3,110
Harry E. Rauch; 1 year; $5,460

VISITING SCIENTISTS TO SECONDARY SCHOOLS PROGRAM

AMERICAN CHEMICAL SOCIETY, Washington, D.C.; Donald J. Cook, De Pauw University; 32 months; $24,300

AMERICAN INSTITUTE OF BIOLOGICAL SCIENCES, Washington, D.C.; Hiden T. Cox; 30 month; $63,540

MATHEMATICAL ASSOCIATION OF AMERICA, Buffalo, N.Y.; Cletus O. Oakley, Haverford College; 1 year; $12,000

VISITING SCIENTISTS TO COLLEGES PROGRAM

AMERICAN ANTHROPOLOGICAL ASSOCIATION, Washington, D.C.; Leslie A. White; 30 months; $20,855

AMERICAN ASTRONOMICAL SOCIETY, Princeton, N.J.; Franklyn M. Branley; 32 months; $23,675

AMERICAN INSTITUTE OF BIOLOGICAL SCIENCES, Washington, D.C.; Hiden T. Cox; 30 months; $97,500

AMERICAN INSTITUTE OF PHYSICS, New York, N.Y.; Elmer Hutchisson; 31 months; $25,715

AMERICAN METEOROLOGICAL SOCIETY, Boston, Mass.; Kenneth C. Spengler; 32 months; $33,350

AMERICAN SOCIETY FOR ENGINEERING EDUCATION, Urbana, Illinois; W. Leighton Collins; 31 months; $24,700

MATHEMATICAL ASSOCIATION OF AMERICA, INC., Buffalo, N.Y.; Robert A. Rosenbaum; 33 months; $50,000

ECONOMIC AND STATISTICAL STUDIES

U.S. DEPARTMENT OF COMMERCE, BUREAU OF THE CENSUS, Washington, D.C.; Maxwell R. Conklin; *Survey of Funds for Performance and Financing of Research and Development in Industrial Firms During 1961;* $95,000

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, OFFICE OF EDUCATION, Washington, D.C.; Virgil R. Walker; *National Science Foundation Survey of Manpower in Colleges and Universities, Academic Year 1961;* 1 year; $18,000

U.S. DEPARTMENT OF LABOR, BUREAU OF LABOR STATISTICS, Washington, D.C.; Ewan Clague; *Cost Index Applicable to Research and Development Budgets;* $17,000

INSTITUTIONAL PROGRAMS

GRADUATE-LEVEL RESEARCH FACILITIES

ADELPHI COLLEGE, Garden City, N.Y.; A. M. Vogel; *Construction of a Laboratory for Research in Chemistry;* 1 year; $5,900

AGRICULTURAL & MECHANICAL COLLEGE OF TEXAS, College Station; Dale F. Leipper; *Expansion and Renovation of Research Facilities in the Department of Oceanography and Meteorology;* 1 year; $25,000

A. M. Sorensen, Jr.; *Laboratory Facilities for Research in the Physiology of Reproduction Section;* 1 year; $30,000

BRANDEIS UNIVERSITY, Waltham, Mass.; Edgar H. Brown, Jr.; *Construction of Research Facilities in a Mathematics Building;* 2 years; $166,000

Harold P. Klein; *Construction of New Research Facilities in Department of Biology;* 3 years; $771,900

S. S. Schweber; *Construction of Physics Research Facilities in New Physics Building;* 2 years; $500,000

BROWN UNIVERSITY, Providence, R.I.; Joseph F. Bunnett; *Construction of an Addition to and Alterations in an Existing Building to Provide Research Facilities in Department of Chemistry;* 1 year; $70,000

Paul F. Maeder; *Completion of Research Space in the New Engineering Laboratory;* 1 year; $67,100

Maimon Nasatir; *Renovation of the Plant Physiology Laboratory;* 1 year; $10,100

R. A. Yund; *Remodeling Space for a Mineralogical Research Laboratory;* 1 year; $1,950

BRYN MAWR COLLEGE, Bryn Mawr, Pa.; Walter C. Michels; *Expansion of Research Facilities for the Departments of Physics, Mathematics, Geology, and Chemistry;* 1 year; $150,000

CALIFORNIA INSTITUTE OF TECHNOLOGY, Pasadena; F. C. Lindvall; *Graduate Research Portion of a New Computing and Electrical Sciences Laboratories Building;* 2½ years; $842,000

Robert P. Sharp; *Laboratory Research Facilities for Paleoecology, Paleontology, and Related Aspects of Isotope Geochemistry;* 1 year; $15,550

CARNEGIE INSTITUTE OF TECHNOLOGY, Pittsburgh, Pa.; L. A. Finzi and A. G. Milnes; *Renovation of Research Facilities in the Field of Cryogenic Electronics;* 1 year; $5,800

CASE INSTITUTE OF TECHNOLOGY, Cleveland, Ohio; S. W. McCuskey; *Expansion of Astronomy Research Facilities at the Warner and Swasey Observatory;* 1 year; $67,200

CLARK UNIVERSITY, Worcester, Mass.; R. S. Anderson; *Renovation of Space for Physics Research Laboratories;* 1 year; $21,400

COLUMBIA UNIVERSITY, New York, N.Y.; C. O. Beckman; *Renovation of Chemical Research Laboratories;* 1 year; $133,000

Richard Christie; *Remodeling Space for Research Facilities in Social Psychology;* 1 year; $19,200

S. Eilenberg; *Remodeling of Research Facilities for the Department of Mathematics;* 1 year; $60,000

Maurice Ewing, Palisades; *Construction of a Research Laboratory Building at the Lamont Geological Observatory;* 2 years; $250,000

Harry Grundfest; *Remodeling Space for Electrophysiology Laboratory;* 1 year; $15,000

CORNELL UNIVERSITY, Ithaca, N.Y.; William Lambert and Leo Meltzer; *Remodeling Laboratory Facilities for Research in Experimental Social Psychology;* 1 year; $9,300

F. A. Long; *Conversion of Two Rooms into Modern Chemistry Research Laboratories;* 1 year; $18,000

M. L. Nichols; *Renovation of the Ventilating System in Chemistry Department;* 1 year; $12,000

L. G. Parratt; *Construction of Research Facilities in a New Physical Sciences Building;* 2 years; $270,000

A. F. Ross; *Completion and Furnishing of Virology-Nematology Research Laboratory,* 1 year; $64,500

DUKE UNIVERSITY, Durham, N.C.; Karl E. Zener and John C. McKinney; *Expansion and Renovation of Research Facilities in Department of Psychology and Department of Sociology and Anthropology;* 3 years; $462,700

EMORY UNIVERSITY, Atlanta, Ga.; C. G. Goodchild; *Renovation of Research Laboratories in the Department of Biology;* 1 year; $5,300

FORDHAM UNIVERSITY, New York, N.Y.; E. J. Moriconi; *Refurbishment and Renovation of Space into a Physical Chemistry Research Laboratory;* 1 year; $7,800

GEORGETOWN UNIVERSITY, Washington, D.C.; John C. Rose; *Construction of New and Renovation of Existing Laboratory Facilities in Department of Physiology and Biophysics;* 1 year; $31,200

Matthew P. Thekaekara; *Fixed Equipment for Research Facility in Physics;* 1 year; $24,700

GEORGIA INSTITUTE OF TECHNOLOGY, Atlanta; H. V. Grubb; *Construction of Laboratory Facilities in a New Chemical Engineering-Ceramic Engineering Building;* 2 years; $150,000

HARVARD UNIVERSITY, Cambridge, Mass.; Francis Birch; *Construction of a New Lab-*

oratory for Research in Experimental Geology; 2 years; $200,000

F. Karl Willenbrock; *Construction of New Engineering Laboratory;* 2 years; $225,000

Robert W. White and Edwin B. Newman; *Construction of Research Facilities for Departments of Psychology and Social Relations in New Behavioral Sciences Building;* 3 years; $1,400,000

ILLINOIS STATE NORMAL UNIVERSITY, Normal; R. O. Rilett; *Construction of Research Facilities for the Department of Biological Sciences;* 2 years; $180,000

INDIANA UNIVERSITY, Bloomington; Lyle V. Beck; *Remodeling of a Room for a Research Laboratory for Pharmacology;* 1 year; $4,000

J. A. Franklin; *Construction of a Research Wing for the Chemistry Building;* 2 years; $150,000

M. M. Rhoades; *Laboratory Facilities for Research in the Department of Botany;* 1 year; $1,100

T. M. Sonneborn; *Remodeling Facilities for Research in Zoology;* 1 year; $2,300

IOWA STATE UNIVERSITY, Ames; R. S. Allen; *Research Facilities for Department of Biochemistry-Biophysics in New Chemistry Building Addition;* 3 years; $217,500

Floyd Andre; *Construction of Research Facilities in a New Animal Industries Building;* 3 years; $50,000

T. A. Bancroft; *Expansion, Modernization, and Renovation of Mathematical Statistics Research Facilities;* 1 year; $4,300

G. A. Russell; *Research Facilities for Department of Chemistry in New Chemistry Building Addition;* 3 years; $400,000

KANSAS STATE UNIVERSITY, Manhattan, A. B. Cardwell; *Construction of Laboratories for Research in Physics;* 2 years; $200,000

Milton E. Raville; *Construction of a Research Laboratory in the Department of Applied Mechanics;* 1 year; $4,000

KENT STATE UNIVERSITY, Kent, Ohio; Vincent Gallicchio; *Renovation of Laboratory Facilities in the Life Sciences Research Center;* 1 year; $15,600

LOUISIANA STATE UNIVERSITY, Baton Rouge; C. S. McCleskey; *Expansion of Research Laboratories for Bacteriology;* 1 year; $8,000

Hulen B. Williams; *Completion of Facilities for Research in the Department of Chemistry;* 1 year; $4,900

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge; Arthur C. Cope; *Remodeling Facilities for Analytical and Physical Chemistry Research;* 18 months; $60,000

John W. Irvine, Jr.; *Remodeling and Refurnishing Research Facilities in Nuclear and Inorganic Chemistry Laboratories;* 1 year; $228,500

T. J. Thompson and N. C. Rasmussen; *Renovation and Expansion of Laboratory Facilities for Nuclear Energy Research;* 1 year; $139,700

Kenneth R. Wadleigh; *Development of a New Interdisciplinary Engineering Laboratory;* 1 year; $80,000

MICHIGAN STATE UNIVERSITY, East Lansing; Donald M. Johnson; *Renovation of a Building into a Research Laboratory in Psychology;* 2 years; $300,000

J. D. Ryder; *Construction of Research Facilities in Engineering Science;* 1 year; $250,000

MONTANA STATE COLLEGE, Bozeman; D. J. Reed; *Construction of Facilities for Research in New Chemistry Building;* 1 year; $25,000

NEW YORK UNIVERSITY, New York; Stuart W. Cook; *Alteration of Space for Research Facilities in Physiological Psychology and Animal Behavior;* 1 year; $41,000

James J. Stoker; *Relocation and Expansion of the Research Facilities of the Institute of Mathematical Sciences—Phase I;* 1 year; $192,400

NORTH DAKOTA STATE UNIVERSITY, Fargo; J. A. Callenbach; *Construction of Controlled Environment Facilities for Research in the Natural Sciences;* 1 year; $15,000

A. B. Schooler; *New Laboratory Facilities for Cytogentic Research;* 1 year; $1,600

NORTHWESTERN UNIVERSITY, Evanston, Ill.; Robert W. Hull and William T. Doyle; *Renovation of Laboratory Facilities in the Department of Biological Science;* 1 year; $14,600

Allen S. Hussey; *New Laboratory Facilities for Research in Chemistry (Biochemistry)*; 2 years; $88,800

OHIO STATE UNIVERSITY, Columbus; Mars G. Fontana; *New Facilities for Research in Metal Physics and Physical Chemistry of Metals;* 2 years; $194,375

Wilfrid R. Foster; *Construction of Facilities for Research in Mineralogy, Crystallography, and Geochemistry;* 1½ years; $55,000

Q. Van Winkle; *Conversion of Space into a Laboratory for Surface Chemistry Research;* 1 year; $6,700

OHIO UNIVERSITY, Athens; D. R. Clippinger; *Conversion of Space to Research Facilities for Physics and Chemistry;* 1 year; $10,000

OKLAHOMA STATE UNIVERSITY, Stillwater; J. H. Boggs; *Renovation of Mechanical Engineering Research Laboratories;* 1 year; $12,000

Louis E. Hawkins; *Controlled Environment Facility for Plant Science Research;* 1 year; $95,000

L. M. Henderson; *Construction of Research Laboratories in Biochemistry Portion of Chemistry-Physics Building;* 3 years; $150,000

OREGON STATE UNIVERSITY, Corvallis; Vernon H. Cheldelin; *Fixed Equipment for the New Science Research Institute Building;* 2 years; $37,000

Milo Popovich; *Construction of Research Laboratories in Fields Related to Radiation Science;* 2 years; $200,000

PENNSYLVANIA STATE UNIVERSITY, University Park; J. G. Aston and J. J. Fritz; *Construction of Laboratory Facilities for Low Temperature High Magnetic Field Research;* 1 year; $31,000

Arthur H. Brayfield; *Renovation of a Facility for Research in Physiological and Comparative Psychology;* 1 year; $8,900

R. H. Jahns; *Construction of an Earth Sciences Addition to the Mineral Sciences Building;* 2½ years; $600,000

F. W. Lampe; *Conversion of Basement Area into Facilities for Research in Chemistry;* 1 year; $50,000

H. B. Sprague, J. E. Livingston, and R. E. Larson; *Research Facilities at the Plant Science Research Center;* 1 year; $50,000

J. M. Warren; *Construction of a Laboratory for Psychobiological Research;* 2 years; $154,100

A. H. Waynick; *Construction of a New Wing and Radio Astronomy Laboratory for the Electrical Engineering Department;* 2 years; $227,800

POLYTECHNIC INSTITUTE OF BROOKLYN, Brooklyn, N.Y.; C. G. Overberger; *Renovation and Expansion of Research Facilities in the Chemistry Department;* 1½ years; $53,700

PRINCETON UNIVERSITY, Princeton, N.J.; D. F. Hornig; *Construction of a New Chemistry Research Laboratory;* 2 years; $500,000

William P. Jacobs; *Controlled Environment Rooms and Chambers for Biological Research;* 1 year; $3,300

Ernest Glen Wever; *Construction of Auditory Research Laboratories;* 2 years; $96,700

PROVIDENCE COLLEGE, Providence, R.I.; Frederick C. Hickey; *Construction of Facilities in Medical Research Laboratory;* 1 year; $32,400

PURDUE UNIVERSITY, Lafayette, Ind.; H. Y. Fan; *Remodeling of Laboratory Facilities for Research in Solid State Physics;* 1 year; $15,000

J. V. Osmun: *Controlled Environment Facility for Research in Entomology;* 1 year; $3,600

J. R. Shay; *Renovation and Partial Furnishing of Botanical Sciences Laboratories;* 1 year; $46,100

RENSSELAER POLYTECHNIC INSTITUTE, Troy, N.Y.; Ronald J. Baskin; *Construction of Facilities for Research in Nerve and Muscle Physiology;* 1 year; $5,000

William R. Clough; *Renovation of Laboratory Facilities for Research on High Temperature and Refractory Metals;* 1 year; $1,500

Donald S. Miller; *Remodeling of Facilities for Geochemistry Research Laboratory;* 1 year; $2,600

Robert L. Schiffman and Emmericus C. W. A. Geuze; *Modernization of the Winslow Laboratories for Soil Mechanics Research;* 1 year; $13,200

RUTGERS, THE STATE UNIVERSITY, New Brunswick, N.J.; F. Kenneth Berrien; *Renovation of Facilities for Research in the Department of Psychology;* 1 year; $13,700

John H. Koenig; *Construction of Ceramic Research Facilities in the New College of Engineering Building;* 1 year; $50,000

Morgan Upton and Kenneth Haun; *Construction of a Psychopharmacology Laboratory;* 1 year; $22,000

Peter A. Van der Meulen; *Construction of Additional Research Facilities in Laboratory of School of Chemistry;* 2 years; $200,000

ST. JOHN'S UNIVERSITY, Jamaica, N.Y.; F. C. Chang; *Renovation of Space for Nuclear Research Laboratory;* 1 year; $5,500

ST. LOUIS UNIVERSITY, St. Louis, Mo.; Kenneth H. Adams; *Construction of Research Laboratories in the Department of Chemistry;* 2 years; $300,000

Alfred H. Weber; *Construction of Research Laboratories in the Department of Physics;* 2 years; $223,000

STANFORD UNIVERSITY, Stanford, Calif.; David Gilbarg; *Renovation of Space to House Mathematics Department and Mathematics Laboratory;* 2 years; $250,000

A. Kent Christensen; *Remodeling Laboratory Facilities for Research Utilizing Electron Miscroscopy;* 1 year; $50,000

Joseph M. Pettit; *Remodeling and Renovation of Laboratory Buildings for Research in Engineering Mechanics;* 1 year; $100,000

J. M. Pettit; *Remodeling of Research Laboratories in Materials Science and Chemical Engineering;* 2 years; $125,000

Patrick C. Suppes; *Renovation of Laboratory Facilities in the Institute for Mathematical Studies in the Social Sciences;* 1 year; $12,500

STATE UNIVERSITY OF IOWA, Iowa City; Jerry J. Kollros; *Construction of Zoology Building Research Addition;* 3 years; $352,100

STATE UNIVERSITY OF NEW YORK COLLEGE OF CERAMICS AT ALFRED UNIVERSITY, Alfred, N.Y.; W. G. Lawrence; *Construction of Research Facilities for College of Ceramics;* 1 year; $11,000

STATE UNIVERSITY OF NEW YORK COLLEGE OF FORESTRY AT SYRACUSE UNIVERSITY, Syracuse, N.Y.; Ralph T. King; *Rehabilitation of the Soil Invertebrate Fauna Laboratory in the Department of Forest Zoology;* 1 year; $5,700

SYRACUSE UNIVERSITY, Syracuse, N.Y.; William M. Merrill; *Renovation and Modernization of Research Laboratories in the Department of Geology;* 1 year; $25,000

Frederick G. Sherman; *Renovation and Expansion of Natural Sciences Research Library;* 1 year; $38,100

G. A. Wiley; *Renovation and Expansion of Organic Chemistry Research Laboratory Space;* 1 year; $20,500

Henry E. Wirth; *Renovation of Research Facilities in the Department of Chemistry;* 1 year; $11,900

TEMPLE UNIVERSITY, Philadelphia, Pa.; Mann-Chiang Niu; *Renovation of Research Facilities in Embryology Laboratories;* 1 year; $23,100

Earl H. Spaulding; *Conversion of Unfinished Space to a Laboratory for Graduate Research and Training in Microbiology;* 2 years; $63,700

TUFTS UNIVERSITY, Medford, Mass.; B. F. Stearns and Kathryn A. McCarthy; *Expansion of Laboratory Facilities for Research in Physics;* 1 year; $9,000

TULANE UNIVERSITY, New Orleans, La.; Ralph M. Rotty; *Construction of Research Facilities for Mechanical Engineering Department;* 1 year; $29,500

UNIVERSITY OF ALASKA, College; K. M. Rae; *Construction of Research Facilities for the Institute of Marine Science;* 2 years; $100,000

Wallace H. Fuller; *Graduate Research Facilities in Agricultural Chemistry and Soils;* 1 year; $48,000

George A. Gries; *Renovation and Furnishing of Research Facilities in the Department of Plant Pathology;* 2 years; $30,000

UNIVERSITY OF ARIZONA, Tucson; William H. Brown; *Renovation and Furnishing of Research Facilities for the Department of Dairy Science;* 2 years; $7,100

Laurence A. Carruth; *Renovation and Furnishing of Research Facilities for Department of Entomology;* 2 years; $33,000

Archie J. Deutscham, Jr.; *Construction of Laboratory Facilities in New Plant; Science Building for Research in Agricultural Biochemistry;* 1 year; $10,000

Henry Freiser; *Remodeling of Facilities for Research in the Department of Chemistry;* 1½ years; $100,000

D. F. McAlister; *Renovation and Furnishing of Research Facilities for Department of Agronomy;* 2 years; $20,000

Terah L. Smiley; *Completion of Laboratory Facilities for Paleontological Research;* 1 year; $15,500

UNIVERSITY OF ARKANSAS, Fayetteville; Robert C. Holland, Little Rock; *Remodeling of Space for Laboratory Facilities in the Department of Anatomy;* 1 year; $6,600

UNIVERSITY OF CALIFORNIA, Berkeley; Ralph Emerson; *Remodeling Rooms for Research in Life Sciences Building;* 1 year; $16,000

A. C. Helmholz; *Remodeling of Space to Provide Research Facilities in the Department of Physics;* 1 year; $144,500

Leonard Machlis; *Renovation of Life Sciences Building;* 2 years; $225,600

Joseph A. Pask; *Alteration and Rehabilitation of Facilities for Research in the Department of Mineral Technology;* 1 year; $127,500

Milton A. Miller, Davis; *Renovation of Laboratory Facilities in the Department of Zoology;* 1 year; $41,500

Leonard L. Morris and J. E. Knott, Davis; *Controlled Temperature Facilities for Research in Plant Physiology;* 3 years; $200,000

Walter Kohn, San Diego; *Construction of Facilities for Research in Physics—Proposed Building C;* 2 years; $300,000

Walter Munk, San Diego; *Construction of an Atmospheric Research Laboratory at La Jolla;* 2 years; $276,000

UNIVERSITY OF CHICAGO, Chicago, Ill.; Herbert L. Anderson; *Laboratory Extensions for Physics Research in Enrico Fermi Institute for Nuclear Studies;* 1 year; $79,400

UNIVERSITY OF CINCINNATI, Cincinnati, Ohio; William F. Jenks; *Renovation of Laboratory Facilities for Research in Geology;* 1 year; $20,000

D. A. Wells; *Renovation of Facilities for Research in Physics;* 1 year; $4,800

UNIVERSITY OF CONNECTICUT, Storrs; Hugh Clark; *Remodeling of Research Facilities for the Department of Genetics;* 1 year; $35,900

UNIVERSITY OF DELAWARE, Newark; John T. Lanzetta and G. Fred Somers; *Construction of an Extension to and Renovation of Existing Laboratory Facilities in Departments of Biological Sciences and Psychology;* 3 years; $300,000

UNIVERSITY OF DENVER, Denver, Colo.; W. M. Mueller; *Construction of an Annex for Metallurgical Research;* 1 year; $51,500

UNIVERSITY OF FLORIDA, Gainesville; A. D. Conger; *Construction of Facilities for Radiation Biology Research;* 1 year; $6,000

George K. Davis; *Construction of a Nuclear Science Building;* 2 years; $350,000

Frederick N. Rhines; *Renovation of Laboratory Facilities for Research in Metallurgical Engineering;* 1 year; $15,000

UNIVERSITY OF GEORGIA, Athens; C. W. Kuhn, Griffin; *Construction of Laboratory Facilities for Virus Research and a Greenhouse;* 1 year; $21,700

Robert A. McRorie; *Expansion of Facilities for Research in Biochemistry;* 1 year; $27,100

John H. Owen; *Construction of Facilities for Research in Plant Pathology and Plant Breeding;* 1 year; $12,500

A. W. Scott; *Laboratory Facilities for Research in Chemistry;* 1 year; $20,000

UNIVERSITY OF IDAHO, Moscow; E. W. Tisdale; *Renovation of Laboratory Facilities in College of Forestry;* 1 year; $6,700

UNIVERSITY OF ILLINOIS, Urbana; George A. Deschamps; *Construction of a Laboratory for Research in Antennas and Electromagnetic Theory;* 1 year; $110,000

L. Goldstein; *Construction of Additional Laboratory Facilities for Research in Gaseous Electronics;* 1 year; $60,000

David Gottlieb; *Renovation and Equipping Laboratory Facilities for Research in Physiology and Biochemistry;* 1 year; $10,600

H. O. Halvorson; *Research Facility for the School of Life Sciences;* 1 year; $170,000

H. O. Halvorson; *Construction of a Life Sciences Research Laboratory;* 4 years; $1,600,000

J. B. Kitzmiller and H. O. Halvorson; *Remodeling a Laboratory for Research in Zoology;* 1 year; $9,300

J. B. Kitzmiller and Wilson N. Stewart; *Extension of Natural History Building to Provide Research Facilities for Zoology and Botany;* 1 year; $15,600

A. V. Nalbandov; *Remodeling of Research Space in Animal Genetics Laboratory;* 1 year; $14,800

A. H. Taub; *The Extension of the Digital Computer Laboratory Building;* 1 year; $188,900

UNIVERSITY OF KANSAS, Lawrence; L. B. Srinath and K. H. Lenzen; *Construction of New Research Laboratories for the Department of Engineering Mechanics;* 1 year; $70,000

UNIVERSITY OF MAINE, Orono; Bruce R. Poulton; *Construction of Graduate Nutrition Laboratory Facilities;* 1 year; $7,000

UNIVERSITY OF MARYLAND, College Park; Raymond N. Doetsch and Michael J. Pelczar; *Renovation and Expansion of Research Laboratories in Microbiology;* 2 years; $81,600

John S. Toll; *Expansion of Physics Research Laboratory Facilities;* 2 years; $850,000

Charles E. White; *Renovation and Modification of Research Facilities in the Department of Chemistry;* 1 year; $18,300

UNIVERSITY OF MICHIGAN, Ann Arbor; Leigh C. Anderson; *Renovation and Construction of Research Laboratories in the Department of Chemistry;* 1 year; $22,900

Kenneth L. Jones; *Renovation and Construction of Research Laboratories in the Department of Botany;* 1 year; $77,400

Kenneth L. Jones; *Renovation and Construction of Faculty and Graduate Research Laboratories in the Department of Botany;* 1 year; $99,100

E. Lowell Kelly; *Remodeling and Extension of Research Laboratories in the Department of Psychology;* 1 year; $60,000

Rensis Likert; *Construction of a Research Facility for the Institute for Social Research;* 3 years; $200,000

UNIVERSITY OF MINNESOTA, Minneapolis; Perry L. Blackshear, Jr.; *Renovation of and Additions to Research Facilities in the Combustion Laboratory;* 1 year; $13,200

Preston E. Cloud, Jr., *Renovation and Extension of Geological Research Laboratories;* 1 year; $87,000

Nelson T. Spratt; *Remodeling of Space for Research in the Department of Zoology;* 1 year; $7,100

Frederick M. Swain; *Remodeling Research Facilities in the Micropaleontology Laboratory;* 1 year; $4,100

H. E. Wright, Jr., Robert E. Sloan and William C. Phinney; *Remodeling Laboratories for Research in Earth Sciences;* 1 year; $12,000

UNIVERSITY OF MISSOURI, Columbia; Wayne H. Decker; *Remodeling Laboratory Facilities for Research in Atmospheric Sciences;* 1 year; $2,000

UNIVERSITY OF NEBRASKA, Lincoln; F. G. Teubner; *Renovation of Space for Research Facilities in Plant Physiology and Biochemistry;* 1 year; $7,150

Edward J. Zimmerman; *Construction of a Physics Research Building;* 2 years; $600,000

UNIVERSITY OF NEW HAMPSHIRE, Durham; Robert E. Lyle; *Renovation of Research Laboratories in the Department of Chemistry;* 1 year; $25,450

UNIVERSITY OF NEW MEXICO, Albuquerque; James S. Findley; *Renovation and Research Facilities for a Laboratory in the Department of Biology;* 1 year; $8,500

Marvin L. Riedesel; *Facilities for Physiology Research Laboratories;* 1 year; $3,000

UNIVERSITY OF NORTH CAROLINA, Chapel Hill; H. F. Robinson, Raleigh; *Construction of New Biological Sciences Research Facilities;* 3 years; $216,700

UNIVERSITY OF NORTH DAKOTA, Grand Forks; G. C. Wheeler; *Expansion of Research Facilities in the Biology Laboratories;* 1 year; $25,000

UNIVERSITY OF OKLAHOMA, Norman; G. W. Murphy; *Renovation of Facilities for Chemistry Research;* 1 year; $14,500

UNIVERSITY OF PENNSYLVANIA, Philadelphia; Frank Bradshaw Wood; *Extension of Research Facilities of the Astronomy Department in Physical Sciences Building;* 2½ years; $160,000

Robert R. Bush; *Construction of a Psychological Research Laboratory;* 2 years; $400,000

UNIVERSITY OF PITTSBURGH, Pittsburgh, Pa.; N. Lewis Buck; *Renovation of Research Facilities in the Mechanical Engineering Department;* 1 year; $10,000

Peter Gray; *Adaptation and Renovation of Research Laboratories in the Natural Sciences;* 1 year; $31,600

Ernst Knobil; *Remodeling Research Facilities for the Department of Physiology;* 2 years; $72,000

T. W. Sze; *Completion of Research Facilities in the Electrical Engineering Department;* 1 year; $5,350

UNIVERSITY OF RHODE ISLAND, Kingston; Niels Rorholm; *Construction of a Computer Laboratory;* 1 year; $72,000

UNIVERSITY OF ROCHESTER, Rochester, N.Y.; J. Edward Hoffmeister; *Renovation of Facilities for Research in Petrology and Paleontology;* 1 year; $5,550

E. Roy John; *Renovation and New Construction of Facilities for the Center for Brain Research;* 2 years; $211,150

Edwin O. Wiig; *Renovation of Laboratories for Research in Organic Chemistry;* 1 year; $14,500

UNIVERSITY OF SAN FRANCISCO, San Francisco, Calif.; Arthur Furst; *Research Facilities for Institute of Chemical Biology in New Science Center;* 2 years; $50,000

UNIVERSITY OF SOUTH CAROLINA, Columbia; R. D. Edge; *Construction of New Physics Research Laboratory;* 1 year; $21,000

J. T. Penney; *Laboratory Facilities for a New Life Sciences Building;* 1 year; $15,200

UNIVERSITY OF SOUTHERN CALIFORNIA, Los Angeles; Milton C. Kloetzel; *Construction of New Research Facility for Chemistry Department;* 2 years; $116,000

Anthony D. Lazzaro; *Remodeling of a Building for a Computer Center;* 1 year; $42,300

UNIVERSITY OF TENNESSEE, Knoxville; Floyd W. Dunn, Memphis; *Remodeling Laboratory Facilities for Research in Biochemistry and Microbiology;* 1 year; $8,000

UNIVERSITY OF TEXAS, Austin; W. W. Hagerty; *Construction of Research Laboratories in Engineering Materials-Science;* 2 years; $200,000

B. B. Kinsey; *Construction of New Laboratories for Research in Nuclear Physics;* 2 years; $300,000

Howard T. Odum, Port Aransas; *Research Facilities at the Institute of Marine Science;* 1 year; $17,100

UNIVERSITY OF UTAH, Salt Lake City; Thomas J. Parmley; *Graduate Facilities for Physics Department;* 1 year; $62,000

UNIVERSITY OF VERMONT, Burlington; Clinton D. Cook; *Renovation of Chemistry Research Facilities;* 1 year; $45,000

UNIVERSITY OF VIRGINIA, Charlottesville; James W. Cole, Jr.; *Construction of a New Building for Expansion of Research Facilities in Department of Chemistry;* 3 years; $500,000

UNIVERSITY OF WASHINGTON, Seattle; Arthur Martin; *Construction of Facilities for Graduate Research in Biology in the New University of Washington Museum;* 1 year; $8,100

Earl C. Roberts; *Construction of a Materials Engineering Laboratory;* 2 years; $100,000

David R. M. Scott; *Construction of a New Forest Science Building;* 3 years; $100,000

R. B. Walker; *Renovation of Laboratory Facilities for Research in Plant Physiology;* 1 year; $53,700

UNIVERSITY OF WISCONSIN, Madison; W. J. Brogden; *Research Facilities in a New Psychology Building;* 2 years; $350,000

W. R. Marshall, Jr., W. K. Neill, and W. S. Cottingham; *Construction of New Research*

Facilities in College of Engineering; 2 years; $300,000

Harold R. Wolfe; *Construction of a Zoology Research Laboratory;* 1 year; $368,500

UNIVERSITY OF WYOMING, Laramie; Victor A. Ryan; *Laboratory Facilities for Radiochemistry Research;* 1 year; $3,100

UTAH STATE UNIVERSITY, Logan; Melvin C. Cannon; *Remodeling of Chemistry Department Research Facilities and Construction of an Adjoining Chemical Storage;* 18 months; $100,000

T. W. Daniel; *Construction of Controlled Environment Facilities in the Department of Forest Management;* 1 year; $25,000

Vaughn E. Hansen; *Construction of New Facilities in Water Research Laboratory;* 2 years; $200,000

VANDERBILT UNIVERSITY, Nashville, Tenn.; Louis J. Bircher and Robert T. Lagemann; *Construction of a New Physical Science Center (Step I—Chemistry and Physics);* 2 years; $700,000

Karl B. Schnelle, Jr.; *Renovation of Laboratory Facilities in the Chemical Engineering Department;* 1 year; $6,000

VIRGINIA POLYTECHNIC INSTITUTE, Blacksburg; D. H. Pletta; *Construction of a Research Laboratory in Engineering Mechanics;* 1 year; $53,200

WAKE FOREST COLLEGE, Winston-Salem, N.C.; Charles S. Black and Thomas J. Turner; *Adaptation and Equipping Facilities for Research in Chemistry and Physics;* 1 year; $20,000

WASHINGTON STATE UNIVERSITY, Pullman; C. M. Stevens; *Laboratory Facilities for Research in the New Chemistry Building;* 1 year; $20,000

WASHINGTON UNIVERSITY, St. Louis, Mo.; E. U. Condon; *Construction of the Arthur Holly Compton Research Laboratory of Physics;* 2 years; $300,000

Viktor Hamburger; *Remodeling of Research Facilities in Zoology Department;* 1 year; $7,200

WAYNE STATE UNIVERSITY, Detroit, Mich.; W. V. Mayer; *Fixed Equipment for Life Sciences Research Center;* 1 year; $30,000

Calvin L. Stevens; *Laboratory Renovation for Nuclear Magnetic Resonance Research;* 1 year; $4,250

WEST VIRGINIA UNIVERSITY, Morgantown; Walter R. Lewis; *Research Facilities for a New Biochemistry Laboratory;* 2 years; $13,000

Charles D. Thomas; *Renovation of Research Facilities in the Department of Physics;* 1 year; $6,000

WESTERN RESERVE UNIVERSITY, Cleveland, Ohio; William M. Heston; *Modernization of Graduate Biological Research Laboratory;* 2 years; $160,000

W. M. Heston; *Construction of Chemical Research Laboratories, Science Center Phase I;* 2 years; $250,000

YALE UNIVERSITY, New Haven, Conn.; Dirk Brouwer; *Rehabilitation of Laboratory Facilities at Yale Observatory Bethany Station;* 1 year; $26,100

INSTITUTIONAL GRANTS FOR SCIENCE

AGRICULTURAL AND MECHANICAL COLLEGE OF TEXAS, College Station; $16,866

ADELPHI COLLEGE, Garden City, N.Y.; $6,140

AGRICULTURAL AND TECHNICAL COLLEGE OF NORTH CAROLINA, Greensboro; $5,330

ALAMEDA COUNTY STATE COLLEGE, Hayward, Calif.; $5,005

ALBION COLLEGE, Albion, Mich.; $5,150

ALFRED UNIVERSITY, Alfred, N.Y.; $5,825

AMERICAN UNIVERSITY, Washington, D.C.; $6,040

AMHERST COLLEGE, Amherst, Mass.; $9,975

ANTIOCH COLLEGE, Yellow Springs, Ohio; $5,495

ARIZONA STATE UNIVERSITY, Tempe; $8,120

ATLANTIC UNION COLLEGE, South Lancaster, Mass.; $5,180

AUBURN UNIVERSITY, Auburn, Ala.; $5,710

AUGSBURG COLLEGE AND THEOLOGICAL SEMINARY, Minneapolis, Minn.; $3,200

AUSTIN COLLEGE, Sherman, Tex.; $3,800

BAYLOR UNIVERSITY, Waco, Tex.; $5,515

BEREA COLLEGE, Berea, Ky.; $5,000

BOSTON COLLEGE, Chestnut Hill, Mass.; $5,880

BOSTON UNIVERSITY, Boston, Mass.; $12,970

BOWDOIN COLLEGE, Brunswick, Maine; $5,255

BRANDEIS UNIVERSITY, Waltham, Mass.; $33,740

BRIGHAM YOUNG UNIVERSITY, Provo, Utah; $11,033

BROOKLYN COLLEGE, Brooklyn, N.Y.; $6,935

BROWN UNIVERSITY, Providence, R.I.; $33,323

BRYN MAWR COLLEGE, Bryn Mawr, Pa.; $6,755

BUTLER UNIVERSITY, Indianapolis, Ind.; $5,310

CALIFORNIA INSTITUTE OF TECHNOLOGY, Pasadena; $46,267

CANISIUS COLLEGE, Buffalo, N.Y.; $1,700

CARLETON COLLEGE, Northfield, Minn.; $6,095

CARNEGIE INSTITUTE OF TECHNOLOGY, Pittsburgh, Pa.; $22,173

CASE INSTITUTE OF TECHNOLOGY, Cleveland, Ohio; $16,530

CATHOLIC UNIVERSITY, Washington, D.C.; $9,440

CENTRAL STATE COLLEGE, Wilberforce, Ohio; $1,700

COLLEGE OF CHARLESTON, Charleston, S.C.; $4,400

CITY COLLEGE, New York, N.Y.; $6,230

CLARK UNIVERSITY, Worcester, Mass.; $5,801

CLEMSON COLLEGE, Clemson, S.C.; $5,175

COE COLLEGE, Cedar Rapids, Iowa; $5,150

COLBY COLLEGE, Waterville, Maine; $5,120

COLGATE UNIVERSITY, Hamilton, N.Y.; $5,980

COLORADO COLLEGE, Colorado Springs; $5,400

COLORADO SCHOOL OF MINES, Golden; $6,290

COLUMBIA UNIVERSITY, New York, N.Y.; $50,000

COLORADO STATE UNIVERSITY, Fort Collins; $15,225

CONNECTICUT COLLEGE, New London; $2,500
CORNELL COLLEGE, Mount Vernon, Iowa; $4,500
CORNELL UNIVERSITY, Ithaca, N.Y.; $50,000
CREIGHTON UNIVERSITY, Omaha, Nebr.; $2,000
DARTMOUTH COLLEGE, Hanover, N.H.; $32,924
DENISON UNIVERSITY, Granville, Ohio; $3,150
DEPAUL UNIVERSITY, Chicago, Ill.; $5,505
DEPAUW UNIVERSITY, Greencastle, Ind.; $1,200
DICKINSON COLLEGE, Carlisle, Pa.; $5,570
DREXEL INSTITUTE OF TECHNOLOGY, Philadelphia, Pa.; $5,025
DUKE UNIVERSITY, Durham, N.C.; $32,415
DUMBARTON COLLEGE OF HOLY CROSS, Washington, D.C.; $2,400
DUQUESNE UNIVERSITY, Pittsburgh, Pa.; $6,253
EARLHAM COLLEGE, Richmond, Ind.; $6,600
ELMIRA COLLEGE, Elmira, N.Y.; $5,005
EMORY UNIVERSITY, Atlanta, Ga.; $8,168
ENDOWMENT AND RESEARCH FOUNDATION at Montana State College, Bozeman; $6,695
EVANSVILLE COLLEGE, Evansville, Ind.; $5,165
FLORIDA PRESBYTERIAN COLLEGE, St. Petersburg; $5,385
FLORIDA STATE UNIVERSITY, Tallahassee; $17,914
FORDHAM UNIVERSITY, New York, N.Y.; $6,184
FRANKLIN AND MARSHALL COLLEGE, Lancaster, Pa.; $7,090
FREDERIC BURK FOUNDATION FOR EDUCATION, San Francisco, Calif.; $6,460
FURMAN UNIVERSITY, Greenville, S.C.; $4,600
GALLAUDET COLLEGE, Washington, D.C.; $5,200
GEORGE WASHINGTON UNIVERSITY, Washington, D.C.; $8,840
GEORGETOWN UNIVERSITY, Washington, D.C.; $6,580
GEORGIA INSTITUTE OF TECHNOLOGY, Atlanta; $19,605
GOSHEN COLLEGE, Goshen, Ind.; $2,900
GOUCHER COLLEGE, Baltimore, Md.; $6,770
GRINNELL COLLEGE, Grinnell, Iowa; $6,685
HAHNEMANN MEDICAL COLLEGE AND HOSPITAL, Philadelphia, Pa.; $7,151
HAMILTON COLLEGE, Clinton, N.Y.; $5,065
HARVARD UNIVERSITY, Cambridge, Mass.; $50,000
HARVEY MUDD COLLEGE, Claremont, Calif.; $5,300
HAVERFORD COLLEGE, Haverford, Pa.; $6,460
HOLLINS COLLEGE, Hollins College, Va.; $5,115
HOWARD UNIVERSITY, Washington, D.C.; $8,229
IDAHO STATE COLLEGE, Pocatello; $5,625
ILLINOIS INSTITUTE OF TECHNOLOGY, Chicago; $12,355
ILLINOIS STATE NORMAL UNIVERSITY, Normal; $5,100
ILLINOIS WESLEYAN UNIVERSITY, Bloomington; $3,900
INDIANA UNIVERSITY, Bloomington; $31,941
IOWA STATE UNIVERSITY, Ames; $22,322
JEFFERSON MEDICAL COLLEGE OF PHILADELPHIA, Philadelphia, Pa.; $4,000
JOHNS HOPKINS UNIVERSITY, Baltimore, Md.; $48,331
KANSAS STATE TEACHERS COLLEGE, Emporia; $5,705
KANSAS STATE UNIVERSITY, Manhattan; $11,075
KENT STATE UNIVERSITY, Kent, Ohio; $6,155
KENTUCKY RESEARCH FOUNDATION, Lexington; $14,305
KENYON COLLEGE, Gambier, Ohio; $5,065
LAFAYETTE COLLEGE, Easton, Pa.; $5,178
LAMAR STATE COLLEGE OF TECHNOLOGY, Beaumont, Tex.; $5,022
LAWRENCE COLLEGE, Appleton, Wis.; $5,955
LEHIGH UNIVERSITY, Bethlehem, Pa.; $11,900
LEMOYNE COLLEGE, Syracuse, N.Y.; $1,800
LINCOLN UNIVERSITY, Jefferson City, Mo.; $3,400
LINFIELD RESEARCH INSTITUTE, McMinnville, Oreg.; $6,160
LOMA LINDA UNIVERSITY, Loma Linda, Calif.; $5,044
LONG BEACH STATE COLLEGE FOUNDATION, Long Beach, Calif.; $6,880
LONGWOOD COLLEGE, Farmville, Va.; $5,155
LOS ANGELES STATE COLLEGE, Los Angeles, Calif.; $6,645
LOUISIANA STATE UNIVERSITY, Baton Rouge, $13,676
LOYOLA UNIVERSITY, Chicago, Ill.; $5,675
LOYOLA UNIVERSITY, New Orleans, La.; $5,080
LUBBOCK CHRISTIAN COLLEGE, Lubbock, Tex.; $5,010
MACALESTER COLLEGE, St. Paul, Minn.; $3,825
MANCHESTER COLLEGE, North Manchester, Ind.; $5,380
MANHATTAN COLLEGE, New York, N.Y.; $6,340
MANKATO STATE COLLEGE FOUNDATION, INC., Mankato, Minn.; $2,400
MARQUETTE UNIVERSITY, Milwaukee, Wis.; $11,220
MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge; $50,000
MEDICAL COLLEGE OF VIRGINIA, Richmond; $5,550
MIAMI UNIVERSITY, Oxford, Ohio; $5,920
MICHIGAN STATE UNIVERSITY, East Lansing; $32,318
MIDDLEBURY COLLEGE, Middlebury, Vt.; $5,100
MILLS COLLEGE, Oakland, Calif.; $5,190
MISSISSIPPI STATE UNIVERSITY, State College; $5,100
MONTANA STATE UNIVERSITY, Missoula; $7,826

Mount Holyoke College, South Hadley, Mass.; $6,515

Muhlenberg College, Allentown, Pa.; $3,200

Nebraska State Teachers College, Chadron; $5,100

New Mexico Institute of Mining and Technology, Socorro; $7,925

New Mexico State University, University Park; $7,470

College of New Rochelle, New Rochelle, N.Y.; $400

New York University, New York; $42,027

Norfolk College of William and Mary, Norfolk, Va.; $5,060

North Dakota State University, Fargo; $6,745

North Georgia College, Dahlonega; $5,175

Northeastern University, Boston, Mass.; $8,225

Northern Illinois University, De Kalb; $5,030

Northwest Nazarene College, Nampa, Idaho; $5,935

Northwestern University, Evanston, Ill.; $36,376

Oberlin College, Oberlin, Ohio; $6,495

Occidental College, Los Angeles, Calif.; $5,085

Ohio State University, Columbus; $38,741

Ohio University, Athens; $5,980

Ohio Wesleyan University, Delaware; $6,945

Oklahoma State University, Stillwater; $11,565

Orange County State College Foundation, Fullerton, Calif.; $5,120

Oregon State University, Corvallis; $33,706

Pan American College, Edinburg, Tex.; $5,050

Pennsylvania State University, University Park; $42,299

Pfeiffer College, Misenheimer, N.C.; $5,300

Polytechnic Institute of Brooklyn, Brooklyn, N.Y.; $9,889

Pomona College, Claremont, Calif.; $6,955

Portland State College, Portland, Oreg.; $5,670

Princeton, University, Princeton, N.J.; $50,000

Principia College, Elsah, Ill.; $5,363

Purdue Research Foundation, Lafayette, Ind.; $48,645

Reed College, Portland, Oreg.; $7,414

Rensselaer Polytechnic Institute, Troy, N.Y.; $19,215

Research Foundation of State University of New York, Albany; $18,171

Rockefeller Institute, New York, N.Y.; $14,008

Rollins College, Winter Park,Fla.; $5,250

Roosevelt University, Chicago, Ill.; $5,225

Rose Polytechnic Institute, Terre Haute, Ind.; $5,600

Rutgers, The State University, New Brunswick, N.J.; $27,710

Sacramento State College Foundation, Sacramento, Calif.; $5,305

St. Bonaventure University, St. Bonaventure, N.Y.; $4,500

St. John's University, Jamaica, N.Y.; $5,350

St. Lawrence University, Canton, N.Y.; $5,400

St. Louis University, St. Louis, Mo.,; $9,080

St. Mary's College, Winona, Minn.; $4,000

St. Mary's College of California, St. Mary's College; $4,500

St. Mary's University of San Antonio, San Antonio, Tex.; $5,250

St. Olaf College, Northfield, Minn.; $5,295

St. Peter's College, Jersey City, N.J.; $3,400

San Diego State College Foundation, San Diego, Calif.; $9,345

San Fernando Valley State College Foundation, Northridge, Calif.; $6,280

San Jose State College Foundation, San Jose, Calif.; $5,850

Seattle Pacific College Institute for Research, Seattle, Wash.; $3,500

Smith College, Northampton, Mass.; $7,828

South Dakota State College, Brookings; $5,755

Southern Illinois University, Carbondale; $13,208

Southern Methodist University, Dallas, Tex.; $6,980

Southern Missionary College, Collegedale, Tenn.; $6,250

Stanford University, Stanford, Calif.; $50,000

State University of Iowa, Iowa City; $14,740

State University of South Dakota, Vermillion; $6,180

Stephen F. Austin State College, Nacogdoches, Tex.; $5,125

Stevens Institute of Technology, Hoboken, N.J.; $7,923

Swarthmore College, Swarthmore, Pa.; $6,945

Syracuse University, Syracuse, N.Y.; $21,160

Temple University, Philadelphia, Pa.; $9,525

Texas Christian University, Fort Worth; $5,010

Texas Southern University, Houston; $5,300

Texas Technological College, Lubbock; $6,091

Texas Woman's University, Denton; $3,625

Thiel College, Greenville, Pa.; $4,700

Trinity College, Hartford, Conn.; $5,020

Tufts University, Medford, Mass.; $10,270

Tulane University, New Orleans, La.; $21,943

Union College & University, Schenectady, N.Y.; $4,000

UNIVERSITY OF AKRON, Akron, Ohio; $6,080
UNIVERSITY OF ALABAMA, University; $6,255
UNIVERSITY OF ALASKA, College; $24,492
UNIVERSITY OF ARIZONA, Tucson; $38,141
UNIVERSITY OF ARKANSAS, Fayetteville; $8,389
UNIVERSITY OF BUFFALO, Buffalo, N.Y.; $11,040
UNIVERSITY OF CALIFORNIA, Berkeley; $50,000
UNIVERSITY OF CALIFORNIA, Davis; $23,080
UNIVERSITY OF CALIFORNIA, Los Angeles; $50,000
UNIVERSITY OF CALIFORNIA, Riverside; $14,335
UNIVERSITY OF CALIFORNIA, San Diego; $50,000
UNIVERSITY OF CALIFORNIA, San Francisco; $11,033
UNIVERSITY OF CALIFORNIA, Santa Barbara; $7,893
UNIVERSITY OF CHICAGO, Chicago, Ill.; $50,000
UNIVERSITY OF CINCINNATI, Cincinnati, Ohio; $8,775
UNIVERSITY OF COLORADO, Boulder; $27,826
UNIVERSITY OF CONNECTICUT, Storrs; $9,108
UNIVERSITY OF DAYTON, Dayton, Ohio; $5,740
UNIVERSITY OF DELAWARE, Newark; $10,936
UNIVERSITY OF DENVER RESEARCH INSTITUTE, Denver, Colo.; $6,755
UNIVERSITY OF FLORIDA, Gainesville; $29,523
UNIVERSITY OF GEORGIA, Athens; $17,020
UNIVERSITY OF HAWAII, Honolulu; $15,190
UNIVERSITY OF HOUSTON, Houston, Tex.; $9,333
UNIVERSITY OF IDAHO, Moscow; $7,053
UNIVERSITY OF ILLINOIS, Urbana; $50,000
UNIVERSITY OF KANSAS, Lawrence; $27,822
UNIVERSITY OF KANSAS CITY, Kansas City, Mo.; $5,140
UNIVERSITY OF LOUISVILLE, Louisville, Ky.; $11,825
UNIVERSITY OF MAINE, Orono; $6,520
UNIVERSITY OF MARYLAND, College Park; $16,826
UNIVERSITY OF MASSACHUSETTS, Amherst; $11,825
UNIVERSITY OF MIAMI, Coral Gables, Fla.; $18,198
UNIVERSITY OF MICHIGAN, Ann Arbor; $50,000
UNIVERSITY OF MINNESOTA, Minneapolis; $50,000
UNIVERSITY OF MISSISSIPPI, University; $6,255
UNIVERSITY OF MISSOURI, Columbia; $19,254
UNIVERSITY OF NEBRASKA, Lincoln; $14,364
UNIVERSITY OF NEVADA, Reno; $8,655
UNIVERSITY OF NEW HAMPSHIRE, Durham; $6,550
UNIVERSITY OF NEW MEXICO, Albuquerque; $10,430
UNIVERSITY OF NORTH CAROLINA, Chapel Hill; $18,093
UNIVERSITY OF NORTH CAROLINA, Raleigh; $16,980
UNIVERSITY OF NORTH DAKOTA, Grand Forks; $8,330
UNIVERSITY OF NOTRE DAME, Notre Dame, Ind.; $17,000
UNIVERSITY OF OKLAHOMA RESEARCH INSTITUTE, Norman; $23,148
UNIVERSITY OF OREGON, Eugene; $30,910
UNIVERSITY OF THE PACIFIC, Stockton, Calif.; $6,615
UNIVERSITY OF PENNSYLVANIA, Philadelphia; $50,000
UNIVERSITY OF PITTSBURG, Pittsburgh, Pa.; $26,980
UNIVERSITY OF PORTLAND, Portland, Oreg.; $3,100
UNIVERSITY OF PUERTO RICO, Rio Piedras; $5,130
UNIVERSITY OF PUGET SOUND RESEARCH INSTITUTE, Tacoma, Wash.; $5,040
UNIVERSITY OF RHODE ISLAND, Kingston; $9,730
UNIVERSITY OF ROCHESTER, Rochester, N.Y.; $22,848
UNIVERSITY OF SAN FRANCISCO, San Francisco, Calif.; $5,680
UNIVERSITY OF SOUTH CAROLINA, Columbia; $8,100
UNIVERSITY OF SOUTH FLORIDA, Tampa; $5,160
UNIVERSITY OF SOUTHERN CALIFORNIA, Los Angeles; $30,513
UNIVERSITY OF SOUTHWESTERN LOUISIANA, Lafayette; $5,700
UNIVERSITY OF TENNESSEE, Knoxville; $16,520
UNIVERSITY OF TEXAS, Austin; $49,742
UNIVERSITY OF TULSA, Tulsa, Okla.; $800
UNIVERSITY OF UTAH, Salt Lake City; $19,000
UNIVERSITY OF VERMONT, Burlington; $8,205
UNIVERSITY OF VIRGINIA, Charlottesville; $10,694
UNIVERSITY OF WASHINGTON, Seattle; $50,000
UNIVERSITY OF WICHITA, Wichita, Kans.; $5,271
UNIVERSITY OF WISCONSIN, Madison; $50,000
UNIVERSITY OF WYOMING, Laramie; $5,080
UTAH STATE UNIVERSITY, Logan; $7,455
VALPARAISO UNIVERSITY, Valparaiso, Ind.; $5,510
VANDERBILT UNIVERSITY, Nashville, Tenn.; $16,395
VASSAR COLLEGE, Poughkeepsie, N.Y.; $5,485
VILLANOVA UNIVERSITY, Villanova, Pa.; $5,705
VIRGINIA POLYTECHNIC INSTITUTE, Blacksburg; $8,925
WABASH COLLEGE, Crawfordsville, Ind.; $5,135
WARNER PACIFIC COLLEGE, Portland, Oreg.; $5,110
WASHINGTON & LEE UNIVERSITY, Lexington, Va.; $5,135
WASHINGTON STATE UNIVERSITY, Pullman; $18,011

WASHINGTON UNIVERSITY, St. Louis, Mo.; $28,983

WAYNE STATE UNIVERSITY, Detroit, Mich.; $15,134

WELLESLEY COLLEGE, Wellesley, Mass.; $2,700

WELLS COLLEGE, Aurora, N.Y.; $2,600

WESLEYAN UNIVERSITY, Middletown, Conn.; $8,685

WESTERN ILLINOIS UNIVERSITY, Macomb; $4,700

WESTERN RESERVE UNIVERSITY, Cleveland, Ohio; $20,576

WESTERN WASHINGTON STATE COLLEGE, Bellingham; $5,100

WEST VIRGINIA UNIVERSITY, Morgantown; $9,717

WHITMAN COLLEGE, Walla Walla, Wash.; $4,966

WHITWORTH COLLEGE, Spokane, Wash.; $5,855

WILKES COLLEGE, Wilkes-Barre, Pa.; $5,063

WILLIAMETTE UNIVERSITY, Salem, Oreg.; $5,100

COLLEGE OF WILLIAM & MARY, Williamsburg, Va.; $5,815

WILLIAM MARSH RICE UNIVERSITY, Houston, Tex.; $12,454

WILLIAMS COLLEGE, Willamstown, Mass.; $5,460

WILSON COLLEGE, Chambersburg, Pa.; $5,360

WINONA STATE COLLEGE, Winona, Minn.; $4,950

WINTHROP COLLEGE, Rock Hill, S.S.; $1,000

WITTENBERG UNIVERSITY, Springfield, Ohio; $5,025

WOFFORD COLLEGE, Spartanburg, S.C.; $4,300

WOMAN'S MEDICAL COLLEGE OF PENNSYLVANIA, Philadelphia; $5,060

WORCESTER POLYTECHNIC INSTITUTE, Worcester, Mass.; $5,140

YALE UNIVERSITY, New Haven, Conn.; $50,000

YESHIVA UNIVERSITY, New York, N.Y.; $19,308

INTERNATIONAL SCIENCE ACTIVITIES

AFRICAN-AMERICAN INSTITUTE, New York, N.Y.; Donald W. Wyatt; *Travel of Foreign Participants in Summer Institutes, 1962;* 5 months; $7,770

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, Washington, D.C.; Hans Nussbaum; *Administration of Panels in Assistance to the U.S.-Japan Committee on Scientific Cooperation;* 1 year; $25,000

Dael Wolfle; *A Compilation of Arid Lands Research Report, and U.S. Participation in the UNESCO Conference on Arid Lands in Latin America;* 18 months; $40,000

AMERICAN FRIENDS OF THE MIDDLE EAST, INC., Washington, D.C.; Virgil C. Crippin; *Travel of Foreign Participants in Summer Institutes, 1962;* 5 months; $1,600

ASIA FOUNDATION, San Francisco, Calif.; Edith Coliver; *Travel of Foreign Participants in Summer Institutes, 1962;* 5 months; $13,250

CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE, Paris, France; J. Coulomb; *Participation of U.S. Scientists in C.N.R.S.-Sponsored Scientific Workshops;* 1 year; $20,000

COMISION NACIONAL DE ENERGIA ATOMICA, Buenos Aires, Argentina; Jorge A. Sabato; *Study of the Influence of the Substructures of Polygonization Occurring in the Gamma-Beta Transformation on the Creep Resistance of Uranium-Chromium Alloys;* 1 year; $12,000

LA PLATA NATIONAL UNIVERSITY, La Plata, Argentina; Rafael Grinfeld; *Spectroscopy of Light Molecules;* 2 years; $36,300

NATIONAL ACADEMY OF SCIENCES-NATIONAL RESEARCH COUNCIL, Washington, D.C.; Wallace W. Atwood, Jr.; *Exchange of Scientists Between the U.S. and U.S.S.R.;* $45,675

W. M. Todd; *Interim Support of the Office of the Foreign Secretary;* 3 months; $23,800

ORGANIZATION OF AMERICAN STATES, Washington, D.C.; Jesse D. Perkinson, Jr.; *Regional Seminar for Latin America on Educational Problems of Nuclear Energy;* 6 months; $7,000

PAN AMERICAN UNION, Washington, D.C.; Jesse D. Perkinson, Jr.; *Travel of Foreign Participants in Summer Institutes, 1961;* 5 months; $5,000

Jesse D. Perkinson, Jr.; *Inter-American Program for Improvement of Science Education;* 1 year; $32,500

STANFORD UNIVERSITY, Stanford, Calif.; O. Cutler Shepard; *Point Defects in Crystalline Solids and Their Role in Phenomena Involving Atomic Mobility;* 2 years; $95,200

U.S.-SOUTH AFRICA LEADER EXCHANGE PROGRAM, INC., Philadelphia, Pa.; Frank S. Loescher; *Travel of Foreign Participants in Summer Institutes, 1962;* 5 months; $3,270

UNIVERSIDAD NACIONAL AUTONOMA DE MEXICO, Mexico, D. F. Mexico; Marcos Moshinsky; *Participation of United States Scientists in the Latin American School of Physics;* 6 months; $7,500

UNIVERSITY OF CALIFORNIA, Berkeley, Calif.; Robert L. Thornton, Livermore; *Theory of Elementary Particles;* 9 months; $4,400

SCIENCE EDUCATIONAL DEVELOPMENT GRANTS

HAROLD BLOOM; Colorado School of Mines; 10 weeks; $1,375

SYDNEY S. BREESE, JR.; Plum Island Animal Disease Laboratory; 20 weeks; $1,862

WILLIAM B. COOK; 26 weeks; $2,557

BERNARD D. CULLITY; University of Notre Dame; 26 weeks; $2,484

FRED W. DECKER; Oregon State University; 12 weeks; $1,734

JOHN G. FOX; Carnegie Institute of Technology; 26 weeks; $2,385

SAMUEL B. GUSS; Pennsylvania State University; 23 weeks; $2,984

WILLIAM F. HORNYAK; University of Maryland; 26 weeks; $2,447

DANIEL J. JONES; University of Utah; 13 weeks; $1,759

ARNULF MUAN; Pennsylvania State University; 26 weeks; $2,486

WILLIAM P. STEPHEN; Oregon State University; 12 weeks; $1,738

LAURENCE E. STRONG; Earlham College; 26 weeks; $2,398

CARL R. WISCHMEYER; William Marsh Rice University; 8 weeks; $1,299

CARL R. ZIMMER; Arizona State University; 15 weeks; $1,719

GRANTS TO ATTEND NATO ADVANCED INSTITUTES

CLARENCE G. GOLUEKE; University of California; $875

ROBERT M. KOCH; University of Nebraska; $725

WILLIAM J. OSWALD; University of California; $875

ROBERT M. PORTER; New Mexico State University; $410

ALLAN R. ROBINSON; Harvard University; $450

FELIX M. H. VILLARS; Massachusetts Institute of Technology; $470

SCIENCE EXHIBITS

UNIVERSITY OF WASHINGTON, Seattle; Otto N. Larsen; *An Assessment of the United States Science Exhibit, Century-21 Exposition;* 18 months; $75,060

SCIENCE RESOURCES PLANNING

NATIONAL ACADEMY OF SCIENCES-NATIONAL RESEARCH COUNCIL, Washington, D.C.; G. B. Kistiakowsky; *Special Studies of Research Needs;* 6 months; $25,025

DISSEMINATION OF SCIENTIFIC INFORMATION

DOCUMENTATION RESEARCH

AMERICAN INSTITUTE OF BIOLOGICAL SCIENCES, Washington, D.C.; Charles W. Shilling; *Study of Communication Channels in Biology;* 9 months; $25,300

ASSOCIATION OF SPECIAL LIBRARIES AND INFORMATION BUREAUX, London, England; Cyril W. Cleverdon, Cranfield; *In Investigation into the Performance Characteristics of Indexing Techniques;* 2 years; $61,000

CAMBRIDGE LANGUAGE RESEARCH UNIT, Cambridge, England; Roger M. Needham; *New Techniques for Classification: The Theory of Clumps;* 1 year; $17,500

ENGINEERS JOINT COUNCIL, New York, N.Y.; L. K. Wheelock; *Study of Engineering Terminology and Relationships Among Engineering Terms;* 1 year; $43,955

HARVARD UNIVERSITY, Cambridge, Mass.; Anthony G. Oettinger; *Research on Automatic Translation and Mathematical Linguistics;* 1 year; $160,160

LEHIGH UNIVERSITY, Bethlehem, Pa.; Donald J. Hillman; *Study of Theories and Models of Information Storage and Retrieval;* 2 years; $6,600

MASSACHUSSETS INSTITUTE OF TECHNOLOGY, Cambridge; Victor H. Yngve; *Basic Research on Language Problems in Mechanical Translation;* 18 months; $225,000

William N. Locke and Myer M. Kessler, Lexington; *Technical Information System;* 1 year; $46,000

NATIONAL BIOCHEMICAL RESEARCH FOUNDATION, New York, N.Y.; Robert S. Ledley; *New Coordinate Indexing Method for Bound Book Form Bibliographies;* 6 months; $6,218

NATIONAL BIOMEDICAL RESEARCH FOUNDATION, Silver Spring, Md.; Robert S. Ledley; *New Coordinate Indexing Method for Bound Book Form Bibliographies;* 3 months; $600

OHIO STATE UNIVERSITY RESEARCH FOUNDATION, Columbus; William S-Y Wang; *Research on Syntactic Analysis;* 2 years; $40,000

U.S. DEPARTMENT OF COMMERCE, NATIONAL BUREAU OF STANDARDS, Washington, D.C.; Samuel N. Alexander; *Research Information Center and Advisory Service on Information Processing;* 9 months; $75,000

Robert D. Elbourn; *Research in Picture Processing Operations;* 1 year; $73,000

UNIVERSITY OF PENNSYLVANIA, Philadelphia; Zellig S. Harris; *Continued Support of Research on Linguistic Transformations for Information Retrieval;* 2 years; $346,000

UNIVERSITY OF TEXAS, Austin; Winfred P. Lehmann; *Development of a Linguistic Computer System;* 1 year; $95,000

UNIVERSITY OF WASHINGTON, Seattle; Erwin Reifler; *A Chinese-English Mechanical Translation Project for Research in the Lexicographical and Structural Problems of the Chinese Language;* 4 months; $1,000

WESTERN RESERVE UNIVERSITY, Cleveland, Ohio; Allen Kent; *Test Program for Evaluating Procedures for the Exploitation of Literature of Interest to Metallurgists;* 6 months; $10,169

Allen Kent and Jessica Melton; *Automatic Processing of Metallurgical Abstracts for the Purpose of Information Retrieval;* 1 year; $54,000

FOREIGN SCIENCE INFORMATION

ACTA METALLURGICA, Schnectady, N.Y.; John H. Hollomon; *An English Edition of the Russian Abstract Journal-Metallurgy;* 1 year; $17,224

John H. Hollomon; *The Translation and Publication of the 1959 Issues of The Physics of Metals and Metallography, and the Journal of Abstracts-Metallurgy, Parts A and B;* 1 year; $13,850

John H. Hollomon; *Translation and Publication of the 1961 Issues of Two Russian Journals: The Physics of Metals and Metallography, and Abstracts-Metallurgy, Part A;* 1 year; $51,356

John H. Hollomon; *Translation and Publication of the 1961 Issues of Three Russian Journals: Metallurg, MiTOM, and Ogneupory;* 1 year; $47,600

John H. Hollomon; *Translation and Publication of the 1960 Issues of the Russian Journal of Abstracts-Metallurgy, Part B;* 1 year; $47,667

John H. Hollomon; *Translation and Publication of the 1961 Issues of the Russian Journal of Abstracts-Metallurgy, Part B;* 1 year; $47,767

AMERICAN CHEMICAL SOCIETY, Washington, D.C.; Richard H. Belknap; *A Survey to Determine Need for English Translations of Russian Scientific Journals;* 1 year; $1,914

American Council of Learned Societies, New York, N.Y.; Gordon B. Turner; *ACLS–OTS Translations Distribution Program;* 1 year; $19,636

American Geographical Society, New York, N.Y.; Charles B. Hitchcock; *Translation and Publication of Soviet Geography: Review and Translation, for Calendar Year 1962;* 1 year; $22,478

American Geographical Union, Washington, D.C.; Waldo E. Smith; *Acquisition and Evaluation of Geophysics Material from Iron Curtain Countries in Asia and Europe;* 1 year; $24,680

Waldo E. Smith; *Translation and Publication of the 1961 Issues of the Russian Journal, Geodesy and Cartography;* 1 year; $24,680

Waldo E. Smith; *Translation and Publication of the Trudy of The Hydrophysical Institute of the Sea and The Marine Sciences Articles in Doklady of The Academy of Sciences of the USSR;* 1 year; $16,000

Waldo E. Smith; *Translation and Publication of The 1962 Issues of Izvestiya, Geophysics Series;* 1 year; $53,670

Waldo E. Smith; *Translation and Publication of the 1962 Issues of the Russian Journal, Geodesy and Cartography;* 1 year; $14,450

Waldo E. Smith; *Translation and Publication of the 1961, and One-half of the 1962 Issues of the Russian Journal, Geomagnetism and Aeronomy;* 18 months; $32,880

Waldo E. Smith; *Translation and Publication of an English Edition of Selected Soviet Hydrologic Papers;* 1 year; $19,235

American Institute of Biological Sciences, Washington, D.C.; Francis C. Harwood; *Translation and Publication of the 1961 Issues of the Russian Journal, Entomological Review;* 1 year; $27,187

Francis C. Harwood; *Translation and Publication of the 1961 Issues of Four Russian Journals: Doklady-Biological Sciences; Doklady-Botanical Sciences; Microbiology; and Plant Physiology;* 1 year; $106,699

Francis C. Harwood; *Translation and Publication of the 1961 Issues of the Russian Journal, Doklady—Biochemistry Section;* 1 year; $12,810

Francis C. Harwood; *Translation and Publication of the 1961 Issues of the Russian Journal, Soviet Soil Sciences and the Inclusion of Doklady—Soil Sciences Section;* 1 year; $53,648

Charles W. Shilling; *Translation and Publication of Three Russian Biological Monographs;* 1 year; $24,248

American Institute of Chemical Engineers, New York, N.Y.; F. J. Van Antwerpen; *Translation and Publication of an International Chemical Engineering Quarterly Journal;* 1 year; $56,622

American Institute of Electrical Engineers, New York, N.Y.; N. S. Hibshman; *Translation and Publication of the Remaining 1961 Issues of Three Russian Journals: Radio Engineering; Radio Engineering and Electronics; and Telecommunications;* 9 months; $86,250

American Institute of Physics, New York, N.Y.; Elmer Hutchisson; *Dissemination of the Japanese Journal of Applied Physics in the United States;* 2 years; $14,950

Wallace Waterfall; *Translation and Publication of the 1961 Issues of Eight Russian Journals: Acoustics; Astronomy; Technical Physics; Solid State Physics; Jetp; Uspekhi; Crystallography; and Physics Section; Doklady;* 1 year; $196,550

American Mathematical Society, Providence, R.I.; Gordon L. Walker; *Provide Russian and Related Mathematical Literature for Abstracting and Research Libraries;* 1 year; $28,647

Gordon L. Walker; *Translation and Publication of the 1960 and 1961 Issues of the Chinese Journal, Acta Mathematica Sinica;* 1 year; $29,270

Gordon L. Walker; *Translation and Publication of the 1961 Issues of the Russian Journal, Soviet Mathematics—Doklady;* 1 year; $37,746

Gordon L. Walker; *Program for Selected Translations of Mathematical Research Articles from the Russian and Other Languages;* 1 year; $54,105

American Philosophical Association, Princeton, N.J.; Rose Rand; *Translation and Critique of Selected Works of Leading Polish Logicians;* 1 year; $8,100

American Rocket Society Inc., New York, N.Y.; James J. Harford; *Selected Translations of Russian Material in The Field of Astronautics;* 1 year; $56,770

American Society of Mechanical Engineers, New York, N.Y.; Jos. Sansone; *Translation and Publication of Volume 26, 1962 Journal of Applied Mathematics and Mechanics (PMM)*; 1 year; $30,800

Arctic Institute of North America, Washington, D.C.; Henry N. Michael, Temple University; *Translation and Publication of Anthropology of the North: Translations from Russian Sources;* 1 year; $37,612

Bernice P. Bishop Museum, Honolulu, Hawaii; Edwin H. Bryan, Jr.; *Pacific Science Information Center;* 1 year; $17,405

Brown University, Providence, R.I.; Robert T. Beyer; *Critical Study and Review of Current Work in Ultrasound and Its Physical Applications in Soviet, Satellite, and Western European Laboratories;* 1 year; $6,100

Center for Applied Linguistics of the Modern Language Association, Washington, D.C.; Harvey Sobelman; *Investigation of the Nature and Problems of Information Services in Linguistics and Related Fields;* 1 year; $8,885

Columbia University, New York, N.Y.; Vladimir Slamecka; *Study of the Resources of Scientific Information in Czechoslovakia and the German Democratic Republic;* 3 months; $3,624

Engineers Joint Council, New York, N.Y.; L. K. Wheelock; *Preparation and Publication of a Pilot Study on the Availability of Foreign Engineering Literature in the United States;* 1 year; $38,050

Geochemical Society, La Jolla, Calif.; Earl Ingerson, University of Texas; *Translation and Publication of the 1960 Issues of the Russian Journal,* Geochemistry; 1 year; $2,250

Earl Ingerson, University of Texas; *Continued Support of an English Edition of the Russian Journal,* Geochemistry; 18 months; $2,470

Earl Ingerson, University of Texas; *Translation and Publication of the 1961 Issues of the Russian Journal,* Geochemistry; 1 year; $28,000

INDIANA UNIVERSITY FOUNDATION, Bloomington; Thomas A. Sebeok; *Preparation and Publication of a Volume on* Current Trends in Russian and East European Linguistics; 2 years; $14,950

Thomas A. Sebeok; *Standing Committee on the Dissemination of Russian and East European Linguistic Literature;* 1 year; $1,380

INSTRUMENT SOCIETY OF AMERICA, Pittsburgh, Pa.; William H. Kushnick; *Translation and Publication of the 1961 Issues of Russian Journals:* Automation and Remote Control; Industrial Laboratory; Instruments and Experimental Techniques; *and* Measurement Techniques; 1 year; $127,500

William H. Kushnick; *Translation and Publication of the 1962 Issues of Four Russian Journals:* Automation and Remote Control; Industrial Laboratory; Instruments and Experimental Techniques; *and* Measurement Techniques; 1 year; $112,775

JAPAN DOCUMENTATION SOCIETY, Tokyo, Japan; Haruo Ootuka; *Revision and Updating of the Kerr Report "Science Information Services in Japan";* 59 weeks; $2,101

LEHIGH UNIVERSITY, Bethlehem, Pa.; Josef Brozek; *Appraisal of Contemporary Russian and East European Information in Psychology and Related Areas;* 3 years; $29,875

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge; William N. Locke; *Acquisitions and Servicing of Current Communist Chinese Serials;* 1 year; $23,425

MIDWEST INTER-LIBRARY CENTER, Chicago, Ill.; Gordon R. Williams; *Operation of the Scientific Journals Center;* 1 year; $907

Gordon R. Williams; *Partial Support of Operation of the Scientific Journals Center;* 8 months; $44,303

NATIONAL ACADEMY OF SCIENCES-NATIONAL RESEARCH COUNCIL, Washington, D.C.; A. Establier; *Expansion and Improvement of Directories of Scientific Institutions and Scientists in Latin America*; 2 years; $27,014

Lawrence Krader, American University; *Preparation and Publication of a New Edition of the International Directory of Anthropologists;* 15 months; $20,270

Robert C. Stephenson; *Translation and Publication of the 1961 Issues of Two Russian Journals;* Doklady *and* Izvestiya—Geology Series; 1 year; $69,454

Robert C. Stephenson; *Translation and Publication of the* International Geology Review, *Volume IV, 1962, and* Soviet Geology *1961 Volume Year;* 1 year; $75,176

NATIONAL DIET LIBRARY OF JAPAN, Tokyo; Takao Suzuki; *Translation and Printing of the Japanese Periodicals Index, Natural Sciences Section;* 1 year; $21,116

OPTICAL SOCIETY OF AMERICA, Washington, D.C.; Mary E. Warga; *Translation and Editing of the 1962 Issues of the Russian Journal,* Optics and Spectroscopy; 1 year; $17,250

PAN AMERICAN UNION, Washington, D.C.; Jesse D. Perkinson, Jr.; *Comprehensive Study of the Status of the Publication of Scientific and Technical Journals in Latin America;* 1 year; $15,520

SOCIETY FOR INDUSTRIAL AND APPLIED MATHEMATICS, Philadelphia, Pa.; I. E. Block; *Translation and Publication of the 1961 Issues of the Russian Journal,* Theory of Probability and Its Applications; 1 year; $2,589

SYRACUSE UNIVERSITY RESEARCH INSTITUTE, Syracuse, N.Y.; Warren B. Walsh; *User Study of Translated Soviet Scientific Journals;* 1 year; $19,320

UNION OF INTERNATIONAL ASSOCIATIONS, Brussels, Belgium; G. P. Speeckaert; *Compilation and Publications of (1) A Monthly Current List and (2) An Annual Bibliography of International Conference Proceedings;* 1 year; $9,825

U.S. DEPARTMENT OF AGRICULTURE LIBRARY, Washington, D.C.; Foster E. Mohrhardt; *Study of the Availability and Utilization of Oriental Scientific Publications in the USDA Library;* 1 year; $26,700

U.S. DEPARTMENT OF COMMERCE, BUREAU OF THE CENSUS, Washington, D.C.; Frederick A. Leedy; *Bibliography of Social Science Periodicals and Monographs Published in Selected Difficult Languages;* $2,407

Frederick A. Leedy; *Preparation and Publication of a Bibliographic Survey of Social Science Literature Published in Communist Bloc and Other Difficult Languages;* 1 year; $52,000

U.S. DEPARTMENT OF COMMERCE, OFFICE OF TECHNICAL SERVICES, Washington, D.C.; John C. Green; *Support of The Translation Center in Delft;* $9,500

John C. Green; *Operational Phase of the P.L. 480 Translation Program;* 1 year; $33,625

U.S. DEPARTMENT OF COMMERCE, WEATHER BUREAU, Washington, D.C.; F. W. Reichelderfer; *Editorial Services for AGU's Project of Translating Soviet Hydrologic Literature;* 1 year; $5,100

U.S. LIBRARY OF CONGRESS, Washington, D.C.; Henry J. Dubester; *User and Value Study of the Monthly Index of Russian Accessions;* 6 months; $21,560

Robert H. Land; *Preparation and Publication of a Guide to International Information Facilities in Science, Technology, Medicine, and Agriculture;* 1 year; $16,153

Robert H. Land; *Publication of Part I of A Monthly World List of Future International Meetings;* 1 year; $18,500

John Sherrod; *Preparation and Publication of an Analytical Survey and Bibliography of Directories in the Sciences Throughout the World;* 1 year; $29,189

Rudolph Smits; *Publication of the Monthly Index of Russian Accessions;* 1 year; $66,000

Rudolph Smits; *Publication of the Monthly Index of Russian Accessions;* 1 year; $199,100

UNIVERSITY OF CHICAGO, Chicago Ill.; Bert F. Hoselitz; *Study of Pertinent Literature on Japanese and Chinese Economic History During the Last 250 Years;* 1 year; $9,982

UNIVERSITY OF CHICAGO PRESS, Chicago, Ill.; Anders Richter; *Translation of the M. G. Levin and L. P. Potapov Book, Narody-Siberi;* 1 year; $9,300

UNIVERSITY OF HOUSTON, Houston, Tex.; Royal E. Collins; *Evaluation and Compilation of a Bibliography of Oriental Literature on Filtration and Fluid Flow Through Porous Materials;* 6 months; $7,400

UNIVERSITY OF WISCONSIN, Madison; G. P. Woollard; *Translation Program of Polar and Geophysical Literature and Publication of the Soviet Antarctic Information Bulletin in English;* 1 year; $54,281

GENERAL

ASSOCIATION OF RESEARCH LIBRARIES, Princeton, N.J.; William S. Dix; *Partial Support for the Establishment of a Full-Time Secretariat;* 2 years; $58,350

GEORGIA INSTITUTE OF TECHNOLOGY, Atlanta; Dorothy M. Crosland; *Programs for Training Personnel for Scientific and Technical Libraries;* 6 months; $28,348

UNIVERSITY OF NORTH CAROLINA, Chapel Hill; Jerrold Orne; *Microfilming of Agricultural and Manufacturing Census Records of Fifteen Southern States for the Years 1850, 1860, 1870, and 1880;* 2 years; $15,677

WEST VIRGINIA UNIVERSITY, Morgantown; Michael M. Reynolds; *Investigation of the Potential Use of the Resources of a Large Academic Library by the Smaller Academic Libraries and the Libraries of Industrial Organizations Within the Distinct Region;* 1 year; $5,060

RESEARCH DATA AND INFORMATION

AMERICAN SOCIETY FOR METALS, Metals Park, Ohio; Robert D. Freeman; *Partial Support of the Information Searching Service of the American Society for Metals;* 3 months; $35,900

CARNEGIE LIBRARY OF PITTSBURGH, Pittsburgh, Pa.; Ralph Munn; *Establishment and Operation of a Regional Reference Center for Unclassified U.S. Government Scientific and Technical Reports;* 1 year; $12,635

Ralph Munn; *Establishment and Operation of a Regional Reference Center for Unclassified U.S. Government Scientific and Technical Reports;* $1,895

COLUMBIA UNIVERSITY, New York, N.Y.; Richard H. Logsdon; *Establishment and Operation of a Regional Reference Center for Unclassified U.S. Government Scientific and Technical Reports;* 1 year; $17,334

ENGINEERING SOCIETIES LIBRARY, New York, N.Y.; Stephen J. Kline; *An Experimental Film Service on Flow Visualization Research Data;* 5 years; $9,700

JOHN CRERAR LIBRARY, Chicago, Ill; Herman H. Henkle; *Establishment and Operation of a Regional Reference Center for Unclassified U. S. Government Scientific and Technical Reports;* 1 year; $11,671

LINDA HALL LIBRARY, Kansas City, Mo.; Joseph C. Shipman; *Establishment and Operation of a Regional Reference Center for Unclassified U.S. Government Scientific and Technical Reports;* 1 year; $6,400

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge; William N. Locke; *Establishment and Operation of a Regional Reference Center for Unclassified U.S. Government Scientific and Technical Reports;* 1 year; $13,541

NATIONAL ACADEMY OF SCIENCES-NATIONAL RESEARCH COUNCIL, Washington, D.C.; Charles H. Stauffer, St. Lawrence University; *The Compilation and Systematization of Information on Chemical Kinetics;* 2 years; $4,895

Guy Waddington; *The Office of Critical Tables;* 2 years; $205,000

SOUTHERN METHODIST UNIVERSITY, Dallas, Tex.; Robert M. Trent; *Establishment and Operation of a Regional Reference Center for Unclassified U.S. Government Scientific and Technical Reports;* 1 year; $13,793

U.S. DEPARTMENT OF COMMERCE, OFFICE OF TECHNICAL SERVICES, Washington, D.C.; John C. Green; *Key Word Index to U.S. Government Technical Reports;* 1 year; $64,600

U.S. LIBRARY OF CONGRESS, Washington, D.C.; L. Quincy Mumford; *Regional Reference Center for Unclassified U.S. Government Scientific and Technical Reports;* 1 year; $1,000

U.S. SMITHSONIAN INSTITUTION, Washington, D.C.; Monroe E. Freeman; *Partial Support for the Annual Operating Expenses of the Science Information Exchange;* 1 year; $125,000

UNIVERSITY OF CALIFORNIA, Berkeley; Donald Coney; *Establishment and Operation of a Regional Reference Center for Unclassified U.S. Government Scientific and Technical Reports;* 1 year; $11,115

Robert Vosper, Los Angeles; *Establishment and Operation of a Regional Reference Center for Unclassified U.S. Government Scientific and Technical Reports;* 1 year; $17,741

UNIVERSITY OF COLORADO, Boulder; Ralph E. Ellsworth; *Establishment and Operation of a Regional Reference Center for Unclassified U.S. Government Scientific and Technical Reports;* 1 year; $17,015

UNIVERSITY OF WASHINGTON, Seattle; Marion A. Milczewski; *Establishment and Operation of a Regional Reference Center for Unclassified U.S. Government Scientific and Technical Reports;* 1 year; $12,877

SCIENTIFIC PUBLICATIONS

ACTA METALLURGICA, Schenectady, N.Y.; W. R. Hibbard; *Translation and Publication of the 1962 Issues of the Russian* Journal of Abstracts-Metallurgy, Part A and Part B; 1 year; $69,000

AMERICAN ASTRONOMICAL SOCIETY, Princeton, N.J.; Lyman Spitzer, Jr.; *Emergency Support for the* Astronomical Journal; 2 years; $18,500

AMERICAN CHEMICAL SOCIETY, Washington, D.C.; Richard H. Belknap; *Support to Bring Annual Subject and Formula Indexes to* Chemical Abstracts *Up to Date;* 1 year; $190,000

AMERICAN GEOGRAPHICAL SOCIETY, New York, N.Y.; Charles B. Hitchcock; *Publication of Soviet Geography: Accomplishments and Tasks;* 3 years; $9,075

A. W. Kuchler, University of Kansas; *Publication of A Colored Map of the Natural Vegetation of the United States of America;* 2 years; $47,123

Wilfrid Webster; *Preparation and Publication of Three Volumes of a Serial Atlas of the Marine Environment;* 1 year; $47,660

AMERICAN GEOPHYSICAL UNION, Washington, D.C.; Waldo E. Smith; *Support for Publication of the Proceedings of the Matthew Fontaine Maury Memorial Symposium on Antarctic Research;* 6 months; $10,682

Waldo E. Smith and A. Nelson Sayre; *Emergency Publication Support for the IG Bulletin;* 1 year; $37,500

AMERICAN INSTITUTE OF BIOLOGICAL SCIENCES, Washington, D.C.; Hiden T. Cox; *Experimental Publication of a Scientific Journal in Microform;* 18 months; $8,724

Hiden T. Cox; *Participation of Ten Editors of Latin American Biological Journals in the 1962 Conference of Biological Editors;* 8 months; $14,651

Frank Fremont-Smith; *Publication of Proceedings of the First Conference on Marine Biology;* 1 year; $18,272

John R. Olive; *Biological Sciences Communication Project;* 1 year; $128,850

Charles W. Shilling; *Survey of Scientific Research as Acknowledged in 100 Selected Biological Journals;* 6 months; $2,324

AMERICAN INSTITUTE OF THE HISTORY OF PHARMACY, Madison, Wis.; Sami K. Hamarneh, U.S. National Museum, and Glenn Sonnedecker; *Support for Publication of the Monograph, A Pharmaceutical View of Abulcasis al-Zahrawi;* 1 year; $1,380

AMERICAN INSTITUTE OF PHYSICS, New York, N.Y.; Elmer Hutchisson; *Publication Support of a New Journal, Applied Optics;* 3 years; $44,625

Elmer Hutchisson; *Applied Physics Letters;* 6 months; $23,635

AMERICAN MATHEMATICAL SOCIETY, Providence, R.I.; Gordon L. Walker; *Publication of Mathematical Reviews;* 6 months; $266,000

Gordon L. Walker; *Development of the Use of Photon for the Composition of Mathematical Reviews;* 2 years; $114,000

AMERICAN METEOROLOGICAL SOCIETY, Boston, Mass.; Malcolm Rigby; *Partial Support of Expansion of Meteorological and Geoastrophysical Abstracts;* 1 year; $98,900

AMERICAN ROCKET SOCIETY, New York, N.Y.; Irwin Hersey; *Partial Publication Support for the American Rocket Society Journal;* 18 months; $32,300

AMERICAN SOCIETY OF ICHTHYOLOGISTS AND HERPETOLOGISTS, Philadelphia, Pa.; William J. Riemer, Florida State Museum; *Preparation and Publication of a Catalogue of American Amphibians and Reptiles;* 2 years; $20,725

AMERICAN SOCIETY OF LIMNOLOGY AND OCEANOGRAPHY, INC., Ann Arbor, Mich.; George H. Lauff; *Partial Publication Support for Limnology in North America;* 1 year; $7,000

BERNICE P. BISHOP MUSEUM, Honolulu, Hawaii; Alexander Spoehr; *Support of Publications Resulting from the Tenth Pacific Science Congress;* 2 years; $34,050

Alexander Spoehr; *Five Monographs in Anthropology, Archaeology, Invertebrate Zoology, and Botany;* 2 years; $26,675

BIOLOGICAL ABSTRACTS, INC., Philadelphia, Pa.; G. Miles Conrad; *Continued Expansion of Coverage of Biological Abstracts;* 1 year; $218,000

CHEMICAL ABSTRACTS SERVICE, Columbus, Ohio; G. Malcolm Dyson; *Development and Initiation of a Mechanized File of Chemical Information;* 1 year; $156,500

CHICAGO NATURAL HISTORY MUSEUM, Ill.; Robert F. Inger; *Partial Publication Support of The Fresh-water Fishes of North Borneo;* 1 year; $4,100

COMBUSTION INSTITUTE, Pittsburgh, Pa.; Bernard Lewis; *Publication of the Ninth International Combustion Symposium Proceedings;* 1 year; $12,000

CORNELL UNIVERSITY, Ithaca, N.Y.; Martha Stahr Carpenter; *Bibliography of Natural Radio Emission from Astronomical Sources;* 1 year; $23,000

DIVISION OF PLANT INDUSTRY, STATE OF FLORIDA, DEPARTMENT OF AGRICULTURE, Gainesville; Charles P. Kimball; *Partial Support for the Preparation and Publication of Lepidoptera of Florida;* 1 year; $4,000

EARTHQUAKE ENGINEERING RESEARCH INSTITUTE, Pasadena, Calif.; George W. Housner; *Publication of a Scientific Report on the Chilean Earthquakes of 1960;* 1 year; $7,020

ENGINEERING INDEX, INC., New York, N.Y.; Carolyn Flanagan; *Partial Support of Expansion and Modernization of Engineering Index;* 1 year; $90,000

DUKE UNIVERSITY, Durham, N.C.; Harold E. Robinson; *Publication of Generic Revisions of North American Brachytheciaceae;* 1 year; $900

FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, Washington, D.C.; Milton O. Lee; *Partial Support for the Office of Biological Handbooks;* 2 years; $40,000

FEDERATION INTERNATIONALE DE DOCUMENTATION, Paris, France; J. E. Humblet; *Support of the Federation Internationale de Documentation;* 2 years; $5,900

FLORIDA STATE UNIVERSITY, Tallahassee; Ruth Schornherst Breen; *An Illustrated Manual of the Mosses of Florida;* 1 year; $2,500

HARVARD UNIVERSITY, Cambridge, Mass.; I. Mackenzie Lamb; *Publication of Index Nominum Lichenum Annis 1934–1960 Vulgatorum;* 1 year; $15,500

Thomas J. Wilson; *Partial Support of Final Preparation and Republication of Collected Experimental Papers by Percy W. Bridgman;* 1 year; $34,810

HUMAN RELATIONS AREA FILES, INC., New Haven, Conn.; Clellan S. Ford; *Preparation and Publication of a Comprehensive Ethnographic Bibliography of South America;* 18 months; $16,800

INDIANA UNIVERSITY FOUNDATION, Bloomington; Frank J. Welcher; *Preparation of Two Monographs on the Use of Organic Analytical Reagents;* 3 years; $4,000

INSTITUTE OF THE AEROSPACE SCIENCES, New York, N.Y.; Robert R. Dexter; *Reduction of Backlog and Expansion of Coverage of the Journal of the Aerospace Sciences;* 2 years; $85,600

S. Paul Johnston; *Continued Support of International Aerospace Abstracts;* 1 year; $50,600

S. Paul Johnston; *Support of the Preparation and Publication of the 1962 Annual Index of the International Aerospace Abstracts;* 1 year; $39,000

INSTITUTE OF MALACOLOGY, Ann Arbor, Mich.; John B. Burch; *Establishment of a New International Journal Malacologia;* 3 years; $11,037

INTERNATIONAL COUNCIL OF SCIENTIFIC UNIONS, Paris, France; G. A. Boutry; *Continued Partial Support of the International Abstracting Board;* 1 year; $7,500

INTERNATIONAL UNION OF PHYSIOLOGICAL SCIENCES, Rochester, N.Y.; Wallace O. Fenn, University of Rochester; *Partial Support for Publications of the XII International Congress of Physiological Sciences;* 1 year; $12,880

IOWA STATE UNIVERSITY PRESS, Ames; Paul L. Errington; *Partial Support for Publication of Muskrat Populations;* 1 year; $6,127

NATIONAL ACADEMY OF SCIENCES, NATIONAL RESEARCH COUNCIL, Washington, D.C.; Hugh Odishaw; *Emergency Publication Support for the IGY Bulletin;* 1 year; $36,-144

Robert C. Stephenson; *Continued Support for the Publication of GeoScience Abstracts;* 2 years; $57,000

NATIONAL FEDERATION OF SCIENCE ABSTRACTING & INDEXING SERVICES, Washington, D.C.; Raymond A. Jensen; *Partial Support of the Federation Secretariat;* 5 months; $13,000

Raymond A. Jensen; *Study to Develop a National Plan and Program Defining the Current and Future Role of the Scientific Abstracting, Indexing, and Reviewing Services of the U.S.;* 18 months; $184,000

NEW YORK BOTANICAL GARDEN, New York; Otto Degener; *Publication Support for Flora Hawaiiensis, Book VI;* 1 year; $6,000

E. H. Fulling; *Publication of Classification of Natural Communities by R. H. Whittaker;* 1 year; $1,700

Rudolf M. Schuster, University of Massachusetts; *Publication Support for a Monograph, The Hepaticae and Anthocerotae of Eastern North America;* 2 years; $13,936

OPERATIONS RESEARCH SOCIETY OF AMERICA, Ann Arbor, Mich.; Herbert P. Galliher; *Partial Support for Establishing International Abstracts in Operations Research;* 2 years; $24,000

PALEONTOLOGICAL SOCIETY, Ithaca, N.Y.; Claude Albritton; *Partial Publication Support for the Journal of Paleontology;* 4 years; $4,795

PENNSYLVANIA STATE UNIVERSITY, University Park; William Spackman; *Continued Support for the Compilation and Publication of Catalog of Fossil Spores and Pollen;* 2 years; $33,500

PRINCETON UNIVERSITY, Princeton, N.J.; John W. Tukey; *Experimentation with a Citation Index for Statistical Methodology;* 2 years; $30,000

SCOTT POLAR RESEARCH INSTITUTE, Cambridge, England; Hilda Richardson; *Partial Support of the Journal of Glaciology;* 1 year; $7,000

SOUTHERN STATE COLLEGE, Magnolia, Ark.; George E. Fay; *Partial Publication Support of A Bibliography of Fossil Man, Parts I and II;* 1 year; $1,000

SOUTHWESTERN ASSOCIATION OF NATURALISTS, Durant, Okla; Donald W. Tinkle; *The Southwestern Naturalist;* 3 years; $3,725

TENTH NATIONAL CLAY CONFERENCE, Austin, Texas; Earl Ingerson; *Partial Support of Cumulative Index to Proceedings of the Clay Minerals Conference;* 1 year; $750

TEXAS RESEARCH FOUNDATION, Renner; Donovan S. Correll; *Publication Support for the Monograph The Potato and Its Wild Relatives;* 1 year; $19,115

U.S. LIBRARY OF CONGRESS, Washington, D.C.; L. Quincy Mumford; *Compilation of a Bibliography of Foreign Abstracting and Indexing Services;* 3 months; $3,360

UNIVERSITY OF CALIFORNIA, Berkeley; John N. Belkin, Los Angeles; *Mosquitoes of the South Pacific;* 6 months; $7,354

UNIVERSITY OF CALIFORNIA PRESS, Berkeley; Ernest Callenbach and August Fruge; *Partial Publication Support of Ludwig Boltzmann's Lectures on Gas Theory;* 1 year; $3,508

UNIVERSITY OF COLORADO, Boulder; Robert E. Gregg; *Publication Support for the Monograph, Ants of Colorado, With Reference to Their Ecology, Taxonomy, and Geographic Distribution;* 1 year; $8,500

UNIVERSITY OF MIAMI, Coral Gables, Fla.; F. G. Walton Smith and Donald P. de Sylva, Miami; *Support of the Publication of The Systematics and Life History of the Great Barracuda, Sphyraena Barracuda (Walbaum)*; 6 months; $3,600

UNIVERSITY OF MINNESOTA, Minneapolis; W. J. Luyten; *Publication Support for General Catalogue of the Bruce Proper Motion Survey;* 1 year; $12,175

UNIVERSITY OF NORTH CAROLINA, Chapel Hill; Theodore B. Mitchell, Raleigh; *Publication of Bees of the Eastern United States, Part 2;* 1 year; $6,000

UNIVERSITY OF PENNSYLVANIA, Philadelphia; Frank B. Wood; *Support for the Compilation and Publication of a Fourth Edition of A Finding List for Observers of Eclipsing Variables;* 1 year; $9,400

UNIVERSITY OF PITTSBURGH, Pa.; Adolf Grunbaum; *Publication Support for a Volume of Major Papers on Key Issues in the Philosophy of Science;* 1 year; $6,000

UNIVERSITY OF RHODE ISLAND, Kingston; Richard D. Wood; *Publication of the Monograph A Manual and Revision of Characeae;* 2 years; $12,169

UNIVERSITY OF TENNESSEE, Knoxville; L. R. Hesler and Alexander H. Smith, University of Michigan; *Partial Support of Publication of a Monograph North American Species of Hygrophorus;* 1 year; $8,680

UNIVERSITY OF TEXAS, Austin; G. de Vaucouleurs; *Reference Catalogue of Bright Galaxies;* 1 year; $1,840

UNIVERSITY OF TOLEDO, Ohio; Wilhelm Eitel; *Completion of the Manuscript for a New Edition of The Physical Chemistry of the Silicates;* 1 year; $6,100

UNIVERSITY OF WISCONSIN, Madison; Marshall Clagett; *Partial Support of Publication* *of Archimedes in the Middle Ages, Volume I, The Arabo-Latin Tradition;* 1 year; $5,000

WAYNE STATE UNIVERSITY, Detroit, Mich.; S. K. Gangwere; *Partial Support of Publication of Monograph Food Selection in Orthoptera;* 1 year; $800

WESLEYAN UNIVERSITY, Middletown, Conn.; Thornton Page; *Publication of the Proceedings of the Conference on Instability of Systems of Galaxies;* 6 months; $6,000

CONFERENCES

AGRICULTURAL & MECHANICAL COLLEGE OF TEXAS, College Station; Richard E. Wainerdi; *Modern Trends in Activation Analysis;* 1 year; $2,300

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, Washington, D.C.; Graham DuShane; *The Problems of Transliteration from the Cyrillic to the Latin Alphabet;* 2 months; $2,400

AMERICAN AUTOMATIC CONTROL COUNCIL, Whippany, N.J.; Harold Chestnut; *Workshop on Automatic Control Research;* 6 months; $5,120

AMERICAN CHEMICAL SOCIETY, Washington, D.C.; Arthur E. Heming; *Active Sites of Enzymes and Molecular Biology of Collagen;* 1 year; $2,500

AMERICAN FOUNDATION FOR THE BLIND, INC., New York, N.Y.; M. Robert Barnett; *International Congress on Technology and Blindness;* 1 year; $20,000

AMERICAN INSTITUTE OF BIOLOGICAL SCIENCES, Washington, D.C.; Frank Fremont-Smith; *Second Conference on Marine Biology;* 1 year; $15,000

John R. Olive; *8th International Congress for Microbiology;* 1 year; $9,600

AMERICAN MATHEMATICAL SOCIETY, Providence, R.I.; Gordon L. Walker; *Symposium on High-Speed Computing and Mathematical Research;* 18 months; $8,000

AMERICAN PSYCHOLOGICAL ASSOCIATION, Washington, D.C.; John G. Darley; *Support of the XVII International Congress of Psychology;* 2 years; $36,000

AMERICAN ROCKET SOCIETY, INC., New York, N.Y.; James J. Harford; *Support of the XIIth International Astronautical Congress;* 1 year; $5,000

AMERICAN SOCIETY FOR HORTICULTURAL SCIENCE, Gainesville, Fla.; Quentin B. Zielinski, Oregon State University; *Fruit Breeding Symposium;* 1 year; $1,200

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, New York, N.Y.; Eric F. Lype; *Second Symposium on Thermophysical Properties;* 1 year; $9,500

A. C. Mueller; *International Heat Transfer Conference;* 1 year; $15,000

AMERICAN SOCIETY OF ZOOLOGISTS, Urbana, Ill.; C. Ladd Prosser; *Six Annual Regional Conferences in Comparative Endocrinology;* 1 year; $6,900

AMERICAN UNIVERSITY, Washington, D.C.; Lawrence Krader; *Conference on International Information Services in the Social Sciences;* 6 months; $2,571

BROWN UNIVERSITY, Providence, R.I.; John Ross; *International Conference on Irreversible Thermodynamics;* 1 year; $7,100

CARNEGIE INSTITUTE OF WASHINGTON, Washington, D.C.; Merle A. Tuve; *Working Conference in Peru on Equatorial Aeronomy;* 1 year; $12,500

CENTER FOR ADVANCED STUDY IN THE BEHAVIORAL SCIENCES, Stanford, Calif.; Jerry Hirsch, University of Illinois; *Research Conference on Behavior Genetics;* 1 year; $18,000

COLORADO STATE UNIVERSITY RESEARCH FOUNDATION, Fort Collins; Gestur Johnson; *Biochemistry of Plant Phenolic Substances;* 1 year; $6,000

COMBUSTION INSTITUTE, Pittsburgh, Pa.; Bernard Lewis; *Ninth International Combustion Symposium;* 1 year; $25,000

CORNELL UNIVERSITY, Ithaca, N.Y.; R. H. Wasserman; *Transfer of Calcium and Strontium Across Biological Membranes (with emphasis on Gastrointestinal Absorption);* 1 year $4,000

FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, Washington, D.C.; Milton O. Lee; *Conference on the Manpower Requirements of Biomedical Research and Teaching;* 1 year; $9,300

Stanford Moore; *Planning Committee Meetings for the VIth International Congress of Biochemistry;* 1 year; $10,000

FOUNDATION FOR INSTRUMENTATION EDUCATION AND RESEARCH, New York, N.Y.; Lloyd E. Slater; *Symposium on the Impact of Systems Engineering Education and Research;* 1 year; $5,700

GALESBURG STATE RESEARCH HOSPITAL, Galesburg, Ill.; Harold E. Himwich; *Conference on Developing Brain and Biogenic Amines;* 1 year; $5,500

GORDON RESEARCH CONFERENCES, INC., Kingston, R.I.; W. George Parks, University of Rhode Island; *Structure and Function of Multilayer Systems in Cells;* 1 year; $4,500

Cyrus Levinthal, Massachusetts Institute of Technology and Leon A. Heppel, National Institutes of Health; *Conference on Nucleic Acids and Proteins;* 4 months; $3,500

HARVARD UNIVERSITY, Cambridge, Mass.; H. B. Whittington; *Evolution and Phylogeny of Crustacea;* 1 year; $4,400

HISTOCHEMICAL SOCIETY, Chicago, Ill.; William L. Doyle; *Histochemistry and Extra-Cellular Substances;* 1 year; $800

INDIANA UNIVERSITY FOUNDATION, Bloomington; *Thomas A. Sebeok;* Meeting of the *Committee of the Dissemination of Linguistic Literature;* 1 year; $2,300

INSTITUTE OF RADIO ENGINEERS, New York, N.Y.; George Birnbaum; *International Conference on Precision Electromagnetic Measurements;* 1 year; $7,425

LONG ISLAND BIOLOGICAL ASSOCIATION, Cold Spring Harbor, N.Y.; Arthur Chovnick; *Cold Spring Harbor Symposium on Quantitative Biology;* 1 year; $7,000

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge; Thomas T. Sandel; *Research Conference in Computer Techniques for Biological Scientists;* 1 year; $16,000

METALLURGICAL SOCIETY OF AIME, New York, N.Y.; J. Stuart Smart, Jr.; *Symposium on High Purity Iron and Its Dilute Solid Solutions;* 1 year; $650

J. Stuart Smart, Jr.; *Symposium on Effect of Surface and Environment on Strength;* 1 year; $4,040

J. S. Smart, Jr.; *Research Symposia of AIME Annual Meeting;* 6 months; $4,400

MINERALOGICAL SOCIETY OF AMERICA, University Park, Pa.; Elburt F. Osborn; *Support of International Mineralogical Association Meeting;* 1 year; $25,400

MISSOURI BOTANICAL GARDEN, St. Louis; Fritz W. Went; *Symposium on Quantitative Systematics;* 1 year; $1,900

NATIONAL ACADEMY OF SCIENCES-NATIONAL RESEARCH COUNCIL, Washington, D.C.; John S. Coleman; *Conference on Advances in Nuclear Geophysics;* 1 year; $12,000

Robert M. Dillon; *First American Conference on Frozen Ground;* 1 year; $5,000

Linn Hoover; *Tenth Annual Conference on Clays and Clay Minerals;* 1 year; $4,000

Linn Hoover; *Conference on Recovery of Pleistocene Fossils;* 1 year; $5,000

Hugh Odishaw; *Third International Space Science Symposium and COSPAR Plenary Meeting;* 1 year; $26,000

Andre C. Simonpietri; *Ad Hoc Meeting on Mineral Industry Education;* 6 months; $4,625

H. Burr Steinbach; *Symposium on Plant Pathogens in Soil;* 1 year; $13,400

H. Burr Steinbach; *Symposium on Plant Pathogens in Soil;* 1 year; $13,300

M. H. Trytten; *12th Meeting of Nobel Laureates at Lindau;* 3 months; $2,650

J. W. Williams; University of Wisconsin; *Sedimentation Analysis;* 1 year; $12,000

NEW MEXICO STATE UNIVERSITY, University Park; Elbert A. Walker; *Conference on Abelian Groups;* 6 months; $9,000

NEW YORK UNIVERSITY, New York; John M. Converse and Blair O. Rogers; *Support of the Fifth Tissue Transplantation Conference;* 1 year; $7,350

OHIO STATE UNIVERSITY, Columbus; Richard A. Tybout; *Conference on Factors in Technological Research and Development;* 1 year; $2,000

OREGON STATE UNIVERSITY, Corvallis; Roy A. Young; *Wilt Disease Conference;* 1 year; $3,200

PALEONTOLOGICAL SOCIETY, New York, N.Y.; Norman D. Newell; *Symposium on the Principles of Paleoecology;* 1 year; $2,420

PAN AMERICAN UNION, Washington, D.C.; Anthony Leeds; *Seminar in Social Structure of Latin America;* 6 months; $10,100

PATENT OFFICE SOCIETY, Washington, D.C.; Harold Pfeffer; *International Patent Office Workshop on Information Retrieval;* 3 months; $15,000

PENNSYLVANIA STATE UNIVERSITY, University Park; Rustum Roy; *Conference on Crystal Synthesis and Structure in Solid State Research;* 1 year; $1,700

J. M. Warren; *The Prefrontal Cortex and Behavior;* 1 year; $6,400

PROTEIN FOUNDATION, INC., Jamaica Plain. Mass.; Robert B. Pennell; *Annual Scientific Meetings of Protein Foundation;* 1 year; $500

PURDUE UNIVERSITY, Lafayette, Ind.; R. L. Stucky; *Inter-University Seminar Series in Quantitative Economics;* 3 years; $34,700

RESEARCH FOUNDATION OF STATE UNIVERSITY OF NEW YORK, Albany; Martynas Ycas, Syracuse; *Conference on Biological Coding by Macromolecules;* 1 year; $6,800

RETINA FOUNDATION, Boston, Mass.; J. Gergely; *Conference on Biochemistry of Muscle Contraction;* 1 year; $20,000

RUTGERS, THE STATE UNIVERSITY, New Brunswick, N.J.; Vernon Bryson, Henry J. Vogel, and J. Oliver Lampen; *Symposium on Informational Macromolecules;* 1 year; $14,300

James W. Green; *Conference on The Applications of Fundamental Biology to the Needs of Man;* 1 year; $900

STANFORD UNIVERSITY, Stanford, Calif.; Howard H. Pattee; *Third International Symposium on X-ray Optics and X-ray Microanalysis;* 1 year; $5,895

UNIVERSITY COLLEGE OF THE WEST INDIES, Andrew, Jamaica, British West Indies; John W. Purseglove; *Neotropical Botany Conference;* 1 year; $9,600

UNIVERSITY OF BUFFALO, Buffalo, N.Y.; James F. Danielli; *Conference on Amplification Techniques in Cell Biology;* 1 year; $3,700

UNIVERSITY OF CALIFORNIA, Berkeley; Mary A. B. Brazier, Los Angeles; *Research Conference in Computer Techniques for Biological Scientists;* 1 year; $17,600

Robert Hayes and Robert Vosper; *Information Systems Workshop: The Designer's Responsibility and His Methodology;* 1 year; $21,000

E. P. Popov; *World Conference on Shell Structures;* 1 year; $4,800

H. W. Magoun, Los Angeles; *Second Conference on Brain and Behavior: The Internal Environment and Alimentary Behavior;* 1 year; $28,400

H. W. Magoun and C. D. O'Malley, Los Angeles; *Symposium on Neurophysiology;* 1 year; $3,500

UNIVERSITY OF COLORADO, Boulder; R. Grant Athay; *Symposium on Magnetic Fields in the Solar System;* 6 months; $420

UNIVERSITY OF CONNECTICUT, Storrs; Robert C. Cleverdon; *Conference on Pleuropneumonia-like Organisms;* 1 year; $5,000

Heinz Herrmann; *Perspectives in Developmental Genetics;* 1 year; $3,850

UNIVERSITY OF COSTA RICA, San Jose; John L. De Abate; *Second Latin American Congress of Microbiology;* 1 year; $2,500

UNIVERSITY OF KANSAS, Lawrence; Charles A. Leone; *Conference on Taxonomic Biochemistry, Physiology and Serology;* 18 months; $17,800

UNIVERSITY OF MAINE, Orono; Ralph E. Armington; *International Symposium on Electric Contact Theory;* 1 year; $4,400

UNIVERSITY OF MINNESOTA, Minneapolis; Eugene P. Pfleider; *Fifth Rock Mechanics Symposium;* 1 year; $2,500

UNIVERSITY OF NOTRE DAME, Notre Dame, Ind.; Arnold E. Ross; *Mathematical Models in the Physical Sciences;* 6 months; $9,000

UNIVERSITY OF SOUTHERN CALIFORNIA, Los Angeles; Jay M. Savage; *Conference on Problems in Education and Research in Tropical Biology;* 6 months; $9,575

UNIVERSITY OF TEXAS Austin; *Felix L. Haas*, Houston; *Conceptual Advances in Immunology and Oncology;* 1 year; $15,640

UNIVERSITY OF UPPSALA, Uppsala, Sweden; Per-Olov Lowdin; *International Summer Institute in Quantum Chemistry;* 1 year; $9,000

UNIVERSITY OF VIRGINIA, Charlottesville; Morris E. Rose; *Eastern Conference on Theoretical Physics;* 1 year; $2,500

WAYNE STATE UNIVERSITY, Detroit, Mich.; Harry H. Josselson; *Conference on Mechanical Translation Syntax Analysis and Programming;* 4 days; $5,500

WENNER-GREN FOUNDATION FOR ANTHROPOLOGICAL RESEARCH, INC., New York, N.Y.; Dell H. Hymes, University of California; *The Use of the Computer in Anthropology;* 1 year; $3,800

WILLIAM MARSH RICE UNIVERSITY, Houston, Tex.; Allen C. Enders; *Symposium on the Subject of Delayed Implantation;* 1 year; $8,000

YALE UNIVERSITY, New Haven, Conn.; Richard C. Barker; *Workshop on the Physics of Flux Reversal in Magnetic Materials;* 1 year; $3,000

Mead LeRoy Jensen; *Biogeochemistry of Sulfur Isotopes;* 1 year; $10,000

INTERNATIONAL TRAVEL

First Argentine Conference on Earthquake Engineering, San Juan, Argentina; April 16 to April 21, 1962:

- Glen V. Berg; University of Michigan; $670

First European Malacological Congress, London, England; September 17 to September 22, 1962:

- R. Tucker Abbott; Academy of Natural Sciences of Philadelphia; $507
- John B. Burch; University of Michigan; $528
- Melbourne R. Carriker; U.S. Bureau of Commercial Fisheries; $482
- Robert Robertson; Academy of Natural Sciences of Philadelphia; $507
- Dwight W. Taylor; U.S. Geological Survey; $517
- Henry van der Schalie; University of Michigan; $528

First International Conference on Paramagnetic Resonance, Jerusalem, Israel; July 16 to July 20, 1962:

- George Benedek; Massachusetts Institute of Technology; $875
- Nicholaas Bloembergen; Harvard University; $900
- Joseph I. Budnick; Fordham University; $900
- Joseph Eisinger; Bell Telephone Laboratories; $900
- Robert Englman; Massachusetts Institute of Technology; $900
- George Feher; University of California; $1,175
- Sven R. Hartmann; University of California; $1,175
- Walter Hauser; Northeastern University; $900
- Arnold Honig; Syracuse University; $925
- Alvin Kiel; Johns Hopkins University; $925
- Daniel Kivelson; University of California; $1,175
- George F. Koster; Massachusetts Institute of Technology; $900
- Edgar Lipworth; Brandeis University; $900
- G. W. Ludwig; General Electric Research Laboratory; $900
- Joaquin M. Luttinger; Columbia University; $900
- S. A. Marshall; Armour Research Foundation; $960
- Raymond L. Orbach; Harvard University; $900
- Marshall S. Sparks; Stanford University; $1,175
- Harvey J. Stapleton; University of Illinois; $1,025
- John E. Wertz; University of Minnesota; $1,000

First International Congress on Chemical Machinery, Engineering, and Automation, Brno, Czechoslovakia; September 2 to September 9, 1962:

- Donald F. Othmer; Polytechnic Institute of Brooklyn; $629
- Joe Mauk Smith; University of California; $900

First Meeting, International Ship Structural Congress, Glasgow, Scotland; September 19 to September 21, 1961:

- Edward V. Lewis; Stevens Institute of Technology; $425

Second Annual West African Languages Congress, Dakar, Senegal; April 12 to April 17, 1962:

- William J. Samarin; Hartford Seminary Foundation; $740
- Hans Wolff; Michigan State University; $775

Second Conference on Nonlinear Vibrations, Warsaw, Poland; September 18 to September 21, 1962:

- R. M. Rosenberg; University of California; $982

Second European Congress of Microcirculation, Pavia, Italy; September 1962:

- Stanley E. Charm; Massachusetts Institute of Technology; $700

Second International Conference on Stress Analysis, Paris, France; April 10 to April 14, 1962:

- M. M. Frocht; Illinois Institute of Technology; $596
- Peter K. Stein; Arizona State University; $807

Second International Congress of Radiation Research, Harrogate, Yorkshire, England; August 5 to August 11, 1962:

- National Academy of Sciences, National Research Council, Washington, D.C.; $15,000

Second International Symposium on Continuous Culture of Microorganisms, Prague, Czechoslovakia; June 18 to June 23, 1962:

- Richard I. Mateles; Massachusetts Institute of Technology; $600
- Erling J. Ordal; University of Washington; $850

Second International Symposium on the Chemistry of Natural Products; Prague, Czechoslovakia; August 27 to September 2, 1962:

- Roger Adams; University of Illinois; $700

Ajay K. Bose; Stevens Institute of Technology; $400
Werner Herz; Florida State University; $750
Richard K. Hill; Princeton University; $600
Maurice Shamma; Pennsylvania State University; $640
Milton D. Soffer; Smith College; $625
D. M. S. Wheeler; University of Nebraska; $750
Emil H. White; Johns Hopkins University; $625

Second Latin American Congress of Microbiology, San Jose, Costa Rica; December 10 to December 17, 1961:
Eugene H. Cota-Robles; University of California; $341
Philipp Gerhardt; University of Michigan; $449
Franklin Sogandares-Bernal; Tulane University; $270
Kenneth F. Wertman; University of Arizona; $512

2d Latin American Congress of Zoology, Sao Paulo, Brazil; July 1962:
James A. Peters; San Fernando Valley State College; $700

Second Symposium on Antibiotics in Agriculture, Leicestershire, England; April 2 to April 6, 1962:
Robert N. Goodman; University of Missouri; $625

Second Symposium on Photoelectronic Image Devices as Aids to Scientific Observation, London, England; September 5 to September 8, 1961:
W. A. Hiltner; University of Chicago; $688
Merle F. Walker; University of California; $850

Third Caribbean Geological Conference, Kingston, Jamaica; April 2 to April 11, 1962:
James I. Jones; University of Miami; $200

Third Congress, European Federation of Chemical Engineering, London, England; June 20 to June 26, 1962:
Harry G. Drickamer; University of Illinois; $600
Irving Fatt; University of California; $717
Andrew W. Jenike; University of Utah; $707
Rustum Roy; Pennsylvania State University; $524

Third Congress, International Council of the Aeronautical Sciences, Stockholm, Sweden; August 27 to September 1, 1962:
E. V. Laitone; University of California; $860

Third International Symposium on Rarefied Gas Dynamics, Paris, France; June 26 to June 30, 1962:
Raymond L. Chuan; University of Southern California; $816
Donald R. Willis; Princeton University; $526
Henry Wise; Stanford Research Institute; $806

Third Meeting of the Standing Committee on Hydrogeologic Maps, Paris, France; March 3 to March 12, 1962:
Philip E. LaMoreaux; Alabama State Oil and Gas Board; $700

Fourth International Congress on Acoustics, Copenhagen, Denmark; August 21 to August 28, 1962:
John F. Corso; Pennsylvania State University; $600
Ladislav Dolansky; Northeastern University; $575
Herbert A. Erf; Acoustical Society of America; $600
Karl F. Herzfeld; Catholic University; $600
Egon A. Hiedemann; Michigan State University; $600
William F. Hughes; Carnegie Institute of Technology; $650
Edgar A. Kraut; University of California; $825
Robert B. Lindsay; Brown University; $600
Douglas F. Muster; University of Houston; $765
Wayne Rudmose; Southern Methodist University; $480
Thomas D. Sachs; University of Vermont; $600
Robert A. Walkling; Harvard University; $550

Fourth International Congress on Acoustics, Copenhagen, Denmark; Speech Communication Seminar, Stockholm, Sweden; and Information Theory Symposium, Brussels, Belgium; August and September 1962:
Edward C. Carterette; University of California; $980

4th International Symposium on Gas Chromatography, Hamburg, Germany; June 13 to June 16, 1962:
Warren W. Brandt; Kansas State University; $700
Richard S. Juvet, Jr.; University of Illinois; $650

4th International Symposium on Nutrient Absorption by Plants, Pisa and Florence, Italy; April 9 to April 14, 1962:
Harold Bradford Tukey; Michigan State University; $1,100

Fifth European Symposium on Fruit Tree Viruses, Bologna, Italy; June 1 to June 8, 1962:
Harvey K. Wagnon; State of California Dept. of Agriculture; $900

Fifth International Conference on Ionization Phenomena in Gases, Munich, Germany; August 28 to September 1, 1961:
Zohrab A. Kaprielian; University of Southern California; $825
Martin Lessen; University of Rochester; $610
Charles H. Papas; California Institute of Technology; $825

Fifth Pan American Congress of Endocrinology, Lima, Peru; October 15 to October 21, 1961:
Endocrine Society; $6,500

Sixth Congress, International Association on Quaternary Research, Warsaw, Poland; September 2 to September 7, 1961:
Robert Julius Drake; University of British Columbia; $900
Estella B. Leopold; U.S. Geological Survey; $795
Louis Lamy Ray; U.S. Department of the Interior; $650

Sixth Congress of the International Commission for Optics, Munich, Germany; August 19 to August 26, 1962:

- Stanley S. Ballard; University of Florida; $640
- H. Richard Blackwell; Ohio State University; $640
- Glenn A. Fry; Ohio State University; $640
- M. Parker Givens; University of Rochester; $610
- Jay Stuart Haft; Seton Hall College of Medicine; $570
- Leo M. Hurvich; New York University; $570
- Gerald H. Jacobs; Indiana University; $650
- Kenneth N. Ogle; Mayo Clinic and Mayo Foundation; $700
- David Z. Robinson; Office of Science Advisor; $600
- Thorne Shipley; Bascom Palmer Eye Institute; $720
- George W. Stroke; Massachusetts Institute of Technology; $560
- Mary E. Warga; Optical Society of America; $600

Sixth International Congress in Audiology, Leyden, The Netherlands; September 5 to September 8, 1962:

- Leo G. Doerfler; University of Pittsburgh; $580

VIth International Congress of Prehistoric and Protohistoric Sciences, Rome, Italy; August 29 to September 3, 1962:

- James B. Griffin; University of Michigan; $690
- Kenneth Honea; University of Texas; $800
- Hallam L. Movius, Jr.; Harvard University; $200
- Wilhelm G. Solheim, II; University of Hawaii; $1,125
- Fred Wendorf; Museum of New Mexico; $115
- H. M. Wormington; Denver Museum of Natural History; $810

Sixth International Congress on High Speed Photography, Scheveningen, Netherlands; September 17 to September 22, 1962:

- Weston B. Farrand; Stanford Research Institute; $830

Sixth Study Week on Traffic Engineering, Salzburg, Austria; September 10 to September 16, 1962:

- Donald S. Berry; Northwestern University; $714

7th International Conference on Coordination Chemistry, Stockholm, Sweden; June 25 to June 29, 1962:

- John C. Bailar, Jr.; University of Illinois; $625
- Carl H. Brubaker, Jr.; Michigan State University; $650
- Daryle H. Busch; Ohio State University; $675
- Richard L. Carlin; Brown University; $620
- Bodie E. Douglas; University of Pittsburgh; $660
- Quintus Fernando; University of Arizona; $865
- Gilbert Gordon; University of Maryland; $645
- Harry B. Gray; Columbia University; $615
- Randall E. Hamm; University of Utah; $850
- Lindsay Helmholz; Washington University; $725
- J. L. Hoard; Cornell University; $650
- David N. Hume; Massachusetts Institute of Technology; $600
- Milton Kerker; Clarkson College of Technology; $675
- Stanley Kirschner; Wayne State University; $650
- Arthur E. Martell; Illinois Institute of Technology; $700
- Theron S. Piper; University of Illinois; $700
- Joel Selbin; Louisiana State University; $775
- Robert Carl Stoufer; University of Florida; $615
- Benson Ross Sundheim; New York University; $615
- R. Stuart Tobias; University of Minnesota; $725
- Wayne K. Wilmarth; University of Southern California; $615

Seventh International Conference on Cosmic Rays and the Earth Storm, Kyoto, Japan; September 4 to September 15, 1961:

- Herbert S. Bridge; Massachusetts Institute of Technology; $1,150
- T. Neil Davis; Geophysical Institute; $750
- T. Gold; Cornell University; $1,200
- Paul J. Kellogg; University of Minnesota; $850
- Mukul R. Kundu; University of Michigan; $1,500
- Robert S. Leonard; Geophysical Institute; $750

7th Plenary Session of Comite Europeen Du Beton, Luxembourg, Luxembourg; April 27 to May 1, 1962:

- Phil M. Ferguson; University of Texas; $540

8th International Ceramic Congress, Copenhagen, Denmark; May 21 to May 26, 1962:

- Jesse D. Walton, Jr.; Georgia Institute of Technology; $660

Eighth International Conference on Low Temperature Physics, London, England; September 16 to September 22, 1962:

- Henry V. Bohm; Wayne State University; $575
- David H. Douglass, Jr.; Massachusetts Institue of Technology; $605
- John M. Goodkind; University of California; $830
- Leo P. Kadanoff; University of Illinois; $625
- K. Luszczynski; Washington University; $630
- Bernd T. Matthias; University of California; $830
- Hans Meissner; Stevens Institute of Technology; $510
- Robert H. Romer; Amherst College; $535
- San Fu Tuan; Brown University; $605
- Harold Weinstock; Cornell University; $490

Eighth International Meeting of the Institute of Management Sciences, Brussels, Belgium; August 23 to August 26, 1961:

- Miles W. Martin, Jr.; Case Institute of Technology; $652

Eighth Latin American Congress on Chemistry, Buenos Aires, Argentina; September 16 to September 22, 1962:
- Ronald Breslow; Columbia University; $660
- Malcolm Dole; Northwestern University, $735

Ninth Congress, International Association for Hydraulic Research, Belgrade, Yugoslavia; September 3 to September 7, 1961:
- Chesley J. Posey; University of Iowa; $775

9th Plenary Meeting, International Organization for Standardization, Technical Committee 46 (Documentation), Paris, France; June 25 to June 27, 1962:
- Henry J. Dubester; Library of Congress; $971
- Robert E. Kingery; New York Public Library; $943
- Jerrold Orne; University of North Carolina; $1,067

Eleventh International Astrophysical Symposium, Liege, Belgium; July 9 to July 11, 1962:
- Wendell C. DeMarcus; University of Kentucky; $715
- A. M. J. Gehrels; University of Arizona; $825
- Paul W. Hodge; University of California; $830
- Gerard P. Kuiper; University of Arizona; $825
- Barbara M. Middlehurst; University of Arizona; $825
- Morton S. Roberts; Harvard University; $582
- Gerhard F. Schilling; RAND Corporation; $830
- Alex G. Smith; University of Florida; $750
- Harlan J. Smith; Yale University; $600
- Rupert Wildt; Yale University; $650

Eleventh International Conference on High Energy Physics, Geneva, Switzerland; July 4 to July 11, 1962:
- Guiseppe Cocconi; Cornell University; $610
- Tsung-Dao Lee; Institute for Advanced Study; $575
- Julian S. Schwinger; Harvard University; $575
- John S. Toll; University of Maryland; $600
- Chen Ning Yang; Institute for Advanced Study; $575

12th Congress of Logopedics and Phoniatrics, Padua, Italy; August 29 to September 4, 1962:
- John W. Black; Ohio State University; $730
- Jon Eisenson; Queens College; $910
- Harry Hollien; University of Wichita; $790
- Wendell Johnson; University of Iowa; $730
- M. D. Steer; Purdue University; $700
- Ronald W. Wendahl; Baylor University College of Medicine; $750

12th World's Poultry Congress, Sydney, Australia; August 10 to August 18, 1962:
- R. A. Bankowski; University of California; $1,000
- Hardy M. Edwards, Jr.; University of Georgia; $1,300
- A. M. Guhl; Kansas State University; $1,000
- Morley R. Kare; University of North Carolina; $1,300
- Emilio C. Mora; Auburn University; $1,300

Thirteenth International Committee of Electrochemical Thermodynamics and Kinetics, Rome, Italy; September 24 to September 29, 1962:
- John O'M. Bockris; University of Pennsylvania; $641
- A. Anthony Toprac; University of Texas; $680

XVth Annual Congress of the International Science Film Assoc., Rabat, Morocco; September 16 to September 27, 1961:
- Robert E. Green; National Academy of Sciences-National Research Council; $1,073
- Roman Vishniac; Yeshiva University; $1,039
- Willard Webb; Library of Congress; $1,073

15th Assembly, International Institute of Welding, Oslo, Norway; June 25 to June 30, 1962:
- Robert D. Stout; Lehigh University; $526

XVI International Horticultural Congress, Brussels, Belgium; August 31 to September 8, 1962:
- American Society for Horticultural Science; Gainesville, Fla.; $15,000

17th Symposium of the Society for Experimental Biology, Edinburgh, Scotland; September 3 to September 8, 1962:
- John Tyler Bonner; Princeton University; $550
- James H. Leech; University of Texas; $700

XXII International Congress of Physiological Sciences, Leiden, The Netherlands; September 11 to September 17, 1962:
- National Academy of Sciences-National Research Council; $25,200

Twenty-Fifth Anniversary Symposium, British Glaciological Society, Cambridge, England; January 5 to January 7, 1962:
- Charles R. Bentley; University of Wisconsin; $480
- Edward R. LaChapelle; University of Washington; $660

Twenty-Seventh Conference of the International Federation for Documentation, London, England; September 12 to September 15, 1961:
- Alexander M. Moore; Parke, Davis and Co.; $525

33rd Session, International Statistical Institute, Paris, France; August 28 to September 7, 1961:
- Herbert Robbins; Columbia University; $550

49th Annual Meeting of International Council for Exploration of the Sea, Copenhagen, Denmark: October 2 to October 11, 1961:
- Dayton E. Carritt; Woods Hole Oceanographic Institute; $419

50th Anniversary Meeting of Palaontologische Gesellschaft, Tubingen, Germany and 3rd International Meeting of Neurobiologists, Kiel, Germany; September 1962:
- Tilly Edinger; Harvard University; $620

1961 International Colloquy for Methodology of Sciences, Warsaw, Poland; September 18 to September 23, 1961:
- Roderick M. Chisholm; Brown University; $675
- William K. Estes; Stanford University; $750
- Patrick Suppes; Stanford University; $955

1962 International Semiconductor Conference, Exeter, England; July 16 to July 20, 1962:
- Elias Burstein; University of Pennsylvania; $525
- Arthur G. Milnes; Carnegie Institute of Technology; $200
- James C. Phillips; University of Chicago; $600

Annual Meeting of the International Federation of Library Associations, Edinburgh, Scotland; September 3 to September 7, 1961; and Twenty-Seventh Conference of the International Federation for Documentation, London, England; September 8 to September 14, 1961:
- Eugene B. Jackson; General Motors Corporation; $528

British Mathematics Colloquium, Southampton, England; April 10 to April 14, 1962:
- Raoul Bott; Harvard University; $500

Caribbean Division of the American Phytopathological Society, Guatemala; June 17 to June 23, 1962:
- Frederick L. Wellman; University of Puerto Rico; $350

Chemical Society, Anniversary Meetings, Sheffield, England; April 3 to April 5, 1962:
- Henry Eyring; University of Utah; $800

Classification and Human Evolution, Burg-Wartenstein, Austria; July 8 to July 21, 1962:
- Wenner-Gren Foundation for Anthropological Research; $4,000

Collegium Internationale Neuro-Psycho Pharmacologicum, Munich, Germany; International Meeting on Phenothiazine Metabolism, Paris, France; Conference on Development and Structure of the Brain, Amsterdam, The Netherlands; International Congress of Physiological Sciences, Leyden, The Netherlands; and International Brain Research Organization Meeting, Paris, France; September 1962:
- Heinrich Waelsch; Columbia University; $720

Colloquium of Sint Jans Hospitaal Brugge—Belgium, Protides of Biological Fluids, Brugge, Belgium; May 3 to May 6, 1962:
- Elliot S. Vesell; Rockefeller Institute; $530

Colloquium of the Commission on the Arid Zone, Athens, Greece; September 1962:
- Andrew W. Wilson; University of Arizona; $1,000

Colloquium on Foundations of Mathematics, Mathematical Machines, and Their Applications, Budapest, Hungary; September 11 to September 15, 1962:
- Robert B. Lees; University of Illinois; $900

Colloquium on Non-Linear Vibrations (IUTAM), Kiev, U.S.S.R.; September 12 to September 26, 1961:
- Iain Finnie; University of California; $1,025
- Robert E. Roberson; $1,025
- R. M. Rosenberg; University of California; $1,050

Colloquium on Soil Fauna, Soil Micro-organisms and Their Relationships, Oosterbeek, Netherlands; September 10 to September 16, 1962:
- Kurt K. Bohnsack; San Diego State College; $800
- Reinhold Mankau; University of California; $863

Colloquium on Topology, Aarhus, Denmark; August 1 to August 10, 1962:
- Donald W. Kahn; Columbia University; $450

Components Committee of IFAC and Conference on Modern Methods of Calculation and Industrial Automation, Paris, France; May 25 to June 1, 1962:
- J. Lowen Shearer; Massachusetts Institute of Technology; $517

Conference of Human Genetics, Rome, Italy; September 7 to September 12, 1961:
- Jay L. Lush; Iowa State University; $1,200

Conference on Differential Equations and Their Applications, Prague, Czechoslovakia; September 5 to September 11, 1962:
- Jack K. Hale; Research Institute for Advanced Study; $600

Conference on Environmental Control of Plant Growth, Canberra, Australia; August 25 to August 31, 1962:
- James Bonner; California Institute of Technology; $1,050
- Joost A. Businger; University of Washington; $1,000
- Robert M. Hagan; University of California; $400
- Karl C. Hamner; University of California; $1,050
- Harry R. Highkin; San Fernando Valley State College; $1,050
- Paul J. Kramer; Duke University; $1,400
- Anton Lang; California Institute of Technology; $1,050
- J. Levitt; University of Missouri; $1,000
- M. B. Russell; University of Illinois; $1,300
- F. C. Steward; Cornell University; $1,400
- Champ B. Tanner; University of Wisconsin; $1,300

Conference on Linguistic Theory and Structural Grammar of German, Berlin, Germany; January 20 to January 26, 1962:
- Robert B. Lees; University of Illinois; $600

Conference on Nuclear Structure and Superconductivity, Neuchatel, Switzerland; July 12 to July 16, 1962:
- Hans Frauenfelder; University of Illinois; $675
- J. Robert Schrieffer; University of Illinois; $805

Conference on Partial Differential Equations, Prague, Czechoslovakia; September 5 to September 11, 1962:
- Louis Nirenberg; New York University; $750

Conference on Repair from Genetic Radiation Damage and Differential Radiosensitivity in Germ Cells, Leiden, Netherlands; August 16 to August 19, 1962:
Helen Gay; Carnegie Institute of Washington; $525

Conference on The Impact of Physical Metallurgy on Technology, Buenos Aires, Argentina; April 2 to April 7, 1962:
William Marsh Baldwin, Jr.; Case Institute of Technology; $690
Bruce Chalmers; Harvard University; $640
John P. Howe; Cornell University; $650
Robert Maddin; University of Pennsylvania; $600
Cyril Stanley Smith; Massachusetts Institute of Technology; $640
Morris Tanenbaum; Bell Telephone Laboratories; $620

Conference on the Ionosphere, London, England; July 2 to July 6, 1962:
Erwin R. Schmerling; Pennsylvania State University; $625
Derek A. Tidman; University of Maryland; $646

Conference on the Present Status and Future Prospects of Television and Motion Pictures as Media for Medical Education, Milan, Italy; April 25 to April 27, 1962:
Council on Medical Television of the Institute for the Advancement of Medical Communication; $4,382

Conference on the Theory of Elasticity and Plasticity, Warsaw, Poland; September 2 to September 13, 1962:
Edward Saibel; Rensselaer Polytechnic Institute; $822

Conferences with Representatives of Japanese Scientific Societies, Tokyo and Hokkaido, Japan; July 1 to July 5, 1962:
John R. Olive; American Institute of Biological Sciences; $1,172

Crystal Plasticity and Radiation Damage, Gottingen, Germany; October 9 to October 13, 1961:
Doris Wilsdorf; University of Pennsylvania; $600

Cultural Development of the Maya, Burg-Wartenstein, Austria; September 6 to September 13, 1962:
Wenner-Gren Foundation for Anthropological Research; $3,500

Delivering Lectures on the Integration of Partial Differential Equations, Paris, France; August 28 to September 14, 1961:
Joaquin B. Diaz; University of Maryland; $575

Determining the Extent of Japanese Publications in Astronautics and Rocketry, Tokyo, Japan; March 12 to April 15, 1962:
Irwin Hersey; American Rocket Society; $1,639

Economic Development of Agriculture in Soviet Bloc Countries, Budapest, Hungary; Warsaw, Poland and Moscow, Russia; July and August 1962:
Earl O. Heady; Iowa State University; $1,900

European Symposium on Fresh Water from the Sea, Athens, Greece; May 31 to June 3, 1962:
Donald A. Cowan; University of Dallas; $910
George A. Jeffrey; University of Pittsburgh; $800

EUSEC Meeting on Engineering Education, London, England; June 25 to June 30, 1962:
W. Leighton Collins; University of Illinois; $930
Newman A. Hall; Yale University; $820
Ralph A. Morgen; Stevens Institute of Technology; $810
Glenn Murphy; Iowa State University; $960

Executive Committee, International Institute of Refrigeration, Paris, France; November 20 to November 22, 1961:
Richard C. Jordan; University of Minnesota; $525

Faraday Society Discussion on the Structure of Ionic Melts, Liverpool, England; September 5 to September 7, 1961:
Ole J. Kleppa; University of Chicago; $565

Florence Symposium on the Renaissance and Modern Science, Florence, Italy; June 20 to June 25, 1962:
U.S. National Committee for the International Union for the History and Philosophy of Science; $493

General Assembly of the Division of the Logic, Methodology, and the Philosophy of Science and the Colloquim on Non-Aristotelian Logics, Helsinki, Finland; August 1962:
U.S. National Committee for the International Union for History and Philosophy of Science; $3,500

IAMAP Ad Hoc Committee on Interaction Sea and Atmosphere, Marseilles, France; September 3 to September 5, 1961:
Robert G. Fleagle; University of Washington; $950

Informal Conference on Photochemistry, Brussels, Belgium; June 18 to June 22, 1962:
Kyle D. Bayes; University of California; $825

Information Theory Symposium, Brussels, Belgium; September 3 to September 7, 1962:
Richard C. Atkinson; Stanford University; $820
David J. Braverman; California Institute of Technology; $806
George L. Gerstein; Massachusetts Institute of Technology; $520

Inter-American Conference on Mathematical Education, Bogotá, Colombia; December 4 to December 9, 1961:
Sanborn C. Brown; Massachusetts Institute of Technology; $500

Inter-American Cosmic Ray Symposium, La Paz, Bolivia; July 17 to July 27, 1962:
Kenneth Greisen; Cornell University; $600
Serge A. Korff; New York University; $600
John Linsley; Massachusetts Institute of Technology; $650

Inter-American Seminar on Educational Travel (IAESTE), Bogotá, Colombia; January 21 to January 25, 1962:
Josef Wischeidt, Jr.; Engineers Joint Council; $300

Intergovernmental Oceanographic Commission Conference, Paris, France; October 19 to October 27, 1961:
Robert L. Fisher; University of California; $794

International Association of Scientific Hydrology, Athens, Greece; October 12 to October 21, 1961:
John W. Harshbarger; University of Arizona; $1,050

International Colloquium on Information in Biology, Royaumont, France; Summer 1962:
Peter Lengvel; New York University; $1,000

International Colloquium on Insect Pathology and Microbial Control, Paris, France; October 16 to October 20, 1962:
Edward A. Steinhaus; University of California; $1,000

International Colloquium on Mutilingualism in Africa, Brazzaville, Congo Republic; July 17 to July 21, 1962:
Frederic G. Cassidy; University of Wisconsin; $1,025
David DeCamp; University of Texas; $1,105

International Committee on Coal Petrology, Liege, Belgium; September 4 to September 16, 1962
Robert M. Kosanke; Illinois State Geological Survey; $750
William Spackman; Pennsylvania State University; $650

International Conference, Le Reve et Les Societies Humaines, Paris, France; June 18 to June 23, 1962:
Dorothy W. Eggan; $610

International Conference on Crystal Lattice Defects, Kyoto, Japan; September 7 to September 12, 1962:
W. J. Fredericks; Stanford Research Institute; $710
John J. Gilman; Brown University; $1,000
Walter J. Moore; Indiana University; $780
Erwin W. Mueller; Pennsylvania State University; $1,100
Henry M. Otte; RIAS, Inc.; $1,105
Allen B. Scott; Oregon State University; $885
Roman Smoluchowski; Princeton University; $1,025
Robb M. Thomson; University of Illinois; $990
George D. Watkins; General Electric Research Laboratory; $600
Sigmund Weissmann; Rutgers, The State University; $1,125
George P. Williams, Jr.; Wake Forest College; $550
Heinz G. F. Wilsdorf; Franklin Institute Laboratories; $1,125

International Conference on Direct Interactions and Nuclear Reaction Mechanisms, Padua, Italy; September 3 to September 8, 1962:
Charles W. Drake, Jr.; Yale University; $635
Richard M. Drisko; University of Pittsburgh; $640
R. W. Fink; Marquette University; $700
A. E. Glassgold; University of California; $850
David Halliday; University of Pittsburgh; $395
Harry D. Holmgren; University of Maryland; $650
Jerry B. Marion; University of Maryland; $650
Louis A. Rayburn; University of Georgia; $705
Rogers C. Ritter; University of Virginia; $670
William W. True; University of California; $850
Robert M. Williamson; Michigan State University, Oakland; $685

International Conference on Gas Discharges and Electricity Supply Industry, Leatherhead, England; May 7 to May 11, 1962:
John B. Thomas; Princeton University; $486

International Conference on Heating, Ventilating and Air Conditioning, London, England: September 27 to October 4, 1961:
Tony C. Min; Auburn University; $600

International Conference on Machine Translation of Languages and Applied Language Analysis, Teddington, England; September 5 to September 8, 1961:
Seymour B. Chatman; University of California; $1,135

International Conference on Machine Translation of Languages and Applied Language Analysis, Teddington, England; September 5 to September 8, 1961; and Visit Groups Engaged in Mechanical Translation Research in the Soviet Union, Moscow, Russia; September 9 to September 30, 1961:
Kenneth E. Harper; University of California; $1,492

International Conference on Magnetism and Crystallography, Kyoto, Japan; September 25 to September 30, 1961:
Benjamin C. Frazer; Brookhaven National Laboratory; $550
James A. Ibers; $550

International Conference on Microwave Measurement Techniques, London, England; September 6 to September 8, 1961:
Charles Susskind; University of California; $754

International Conference on Relativity and Gravitation, Warsaw, Poland; July 25 to July 31, 1962:
Peter G. Bergmann; Syracuse University; $710
S. Chandrasekhar; University of Chicago; $765
Arthur B. Kamor; Syracuse University; $710

International Conference on Scientific Information in the Field of Crystallography and Solid State Physics, Nishinomiya, Japan; October 3 to October 4, 1961:
Wilbur C. Bigelow; University of Michigan; $1,561
J. D. H. Donnay; Johns Hopkins University; $1,525

International Congress of Electroencephalography, Rome, Italy; September 7 to September 16, 1961:
Gian Emilio Chatrian; University Hosp.; $800
Dominick P. Purpura; Columbia University; $800

International Congress of Electroencephalography, Rome, Italy; September 7 to September 10, 1961; and International Congress of Neurology, Rome, Italy; September 11 to September 15, 1961:
Reginald G. Bickford; Mayo Foundation; $1,000

International Congress of Mathematicians, Stockholm, Sweden; August 15 to August 22, 1962:
Howard Franklin Fehr; Teachers College, Columbia University; $626
Mariano Garcia; University of Puerto Rico; $750
Burton W. Jones; University of Colorado; $701
John G. Kemeny; Dartmouth College; $442
Kenneth O. May; Carleton College; $725
Edwin E. Moise; Harvard University; $604
Fazlollah M. Reza; Syracuse University; $646
National Academy of Sciences-National Research Council; $75,000
Patrick Suppes; Stanford University; $835
Albert W. Tucker; Princeton University; $624

International Congress of Neuropathology, Munich, Germany; September 4 to September 7, 1961; and International Congress of Electroencephalography, Rome, Italy; September 7 to September 13, 1961:
A. Earl Walker; Johns Hopkins University; $800

International Council of Scientific Unions, Abstracting Board Meeting, Paris, France; July 11 to July 14, 1962:
Raymond A. Jensen; National Federation of Science Abstracting and Indexing Service; $979

International Course for Geodetic Distance Measurements, Munich, West Germany; September 4 to September 12, 1961:
Milton O. Schmidt; University of Illinois; $650

International Electrotechnical Commission, Baden-Baden, Germany; September 10 to September 15, 1962:
Robert O. Fehr; Cornell University; $630

International Federation of Information Processing Congress, Munich, Germany; August 27 to September 1, 1962:
Allen Kent; Western Reserve University; $739
Philip J. Stone, III; Harvard University; $967

International Instrumentation Conference, Geneva, Switzerland; July 16 to July 18, 1962:
Richard J. Plano; Rutgers, The State University; $575

International Machine Tool Design and Research Conference, Birmingham, England; September 24 to September 28, 1962:
Alfred O. Schmidt; Marquette University; $615

International Mathematical Summer Center on Eigenvalues, Chieti, Italy; August 1 to August 10, 1962:
Alexander Weinstein; University of Maryland; $600

International Ophthalmic Optical Congress, Berlin, Germany; May 28 to June 2, 1962:
Meredith W. Morgan; University of California; $900
Henry W. Hofstetter; Indiana University; $705
Alfred A. Rosenbloom, Jr., Illinois College of Optometry; $665

International Radiocarbon Conference, Cambridge, England; July 22 to July 28, 1962:
Wallace S. Broecker; Columbia University; $486
Paul E. Damon; University of Arizona; $765
Richard Flint; Yale University; $520
Edwin A. Olson; Whitworth College; $823
Meyer Rubin; U.S. Geological Survey; $520

International Road Federation, Fourth World Meeting, Madrid, Spain; October 14 to October 20, 1962:
Paul J. Claffey; Catholic University; $557

International Symposium in Honor of Roger Boscovich, Dubrovnik, Yugoslavia; October 6 to October 11, 1961:
Churchill Eisenhart; National Bureau of Standards; $705
L. Pearce Williams; Cornell University; $730
Harry Woolf; Johns Hopkins University; $180

International Symposium on Analytical Chemistry, Birmingham, England; April 9 to April 12, 1962:
Philip J. Elving; University of Michigan; $550
Louis Gordon; Case Institute of Technology; $550
Philip W. West; Louisiana State University; $650

International Symposium on Carbohydrate Chemistry, Birmingham, England; July 16 to July 20, 1962:
Melville L. Wolfrom; Ohio State University; $550

International Symposium on Color Centers in Alkali Halides, Stuttgart, Germany; August 21 to August 24, 1962:
W. Dale Compton; University of Illinois; $700
Robert J. Friauf; University of Kansas; $575
Ronald Fuchs; Iowa State University; $660
Albert Gold; University of Illinois; $625

International Symposium on Enzymic Activity of the Central Nervous System, Goteborg, Sweden; June 17 to June 21, 1962:
Claude F. Baxter; City of Hope Medical Center; $1,000
Doris H. Clouet; New York State Research Institute; $500
Pierre M. Dreyfus; Massachusetts General Hospital; $750

International Symposium on Equatorial Aeronomy, Huaychulo, Peru; September 18 to September 26, 1962:
Joseph Kaplan; University of California; $700

International Symposium on Growth and Development of Archegoniate Plants, London, England; April 5 to April 6, 1962:

Max Ward; Glenville State College; $570

International Symposium on History of Neurology, Varenna, Italy; August 29 to September 1, 1961; International Brain Research Organization, Paris, France; September 3 to September 5, 1961; Fifth International Congress of EEG and Clinical Neurophysiology, Rome, Italy; September 7 to September 13, 1961; and International Colloquium on Mechanisms of Sensory-Motor Integration, Pisa, Italy; September 18 to September 22, 1961:

H. W. Magoun; University of California; $800

International Symposium on Inorganic Polymers, Nottingham, England; July 18 to July 21, 1961:

John C. Bailar, Jr.; University of Illinois; $100

International Symposium on Molecular Structure and Spectroscopy, Tokyo, Japan; September 10 to September 15, 1962;

A. C. Albrecht; Cornell University; $1,125
George D. Blyholder; University of Arkansas; $1,075
Columba Curran: University of Notre Dame; $1,000
Joseph de Heer; University of Colorado; $1,000
David M. Dennison: University of Michigan; $1,125
William H. Fletcher; University of Tennessee; $1,175
Arthur A. Frost; Northwestern University; $1,090
Theodore D. Goldfarb; State University of New York; $1,125
H. S. Gutowsky; University of Illinois; $1,100
George R. Harrison; Massachusetts Institute of Technology; $1,150
Dudley R. Herschbach; University of California; $860
Samuel Krimm; University of Michigan; $1,125
Victor W. Laurie; Stanford University; $860
Bruno Linder; Florida State University; $1,225
Richard C. Lord; Massachusetts Institute of Technology; $1,150
Sean P. McGlynn; Louisiana State University; $1,085
Foil A. Miller; Mellon Institute; $1,-100
Kazuo Nakamoto; Illinois Institute of Technology; $1,090
Chester T. O'Konski; University of California; $1,125
Willis B. Person; State University of Iowa; $1,100
Paul N. Schatz; University of Virginia; $750
Richard H. Schwendeman; Michigan State University; $1,020
Robert C. Taylor; University of Michigan; $750
E. Bright Wilson, Jr.; Harvard University; $1,150
M. Kent Wilson; Tufts University; $1,-150
Carl E. Wulfman; University of the Pacific; $860

International Symposium on Relay Systems Theory and Finite Automata, Moscow, Russia; September 24 to October 2, 1962:

E. J. McCluskey, Jr.; Princeton University; $800

International Symposium on Soil-Plant-Atmosphere Water Relations and the Symposium on Environmental Control of Plant Growth and Micrometeorology, Canberra and Melbourne, Australia; August 22 to September 5, 1962:

Sterling A. Taylor; Utah State University; $950
Frederick P. Zscheile, Jr.; University of California; $1,050

International Symposium on Stratospheric and Mesospheric Circulation, West Berlin, Germany; August 20 to August 31, 1962:

Werner Schwerdtfeger; University of Wisconsin; $700

International Symposium on the Application of Automatic Control in Prosthetics Design, Opatija, Yugoslavia; August 27 to September 1, 1962:

James B. Reswick; Case Institute of Technology; $675

International Symposium on the Dynamics of Satellites, Paris, France; May 28 to May 31, 1962:

Robert M. L. Baker, Jr.; University of California; $805
Samuel Herrick; University of California; $525

International Symposium on the Organic Chemistry of Natural Products, Brussels, Belgium; June 12 to June 15, 1962:

Nelson J. Leonard; University of Illinois; $625
Gloria G. Lyle; University of New Hampshire; $550
Harry H. Wasserman; Yale University; $550

International Symposium on Volcanology, Tokyo, Japan; May 9 to May 19, 1962:

Roy A. Bailey; U.S. Department of the Interior; $1,100
Robert W. Decker; Dartmouth College; $1,100
Armand J. Eardley; University of Utah; $775
Robert B. Forbes; University of Alaska; $750
Irving Friedman; U.S. Department of the Interior; $1,100
John J. Naughton; University of Hawaii; $625
E. F. Osborn; Pennsylvania State University; $1,100
Willard H. Parsons; Wayne State University; $1,100
Donald William Peterson; U.S. Geological Survey; $800
J. F. Schairer; Carnegie Institute of Washington; $1,100
Harry W. Smedes; U.S. Department of the Interior; $1,100
David Robert Wones; U.S. Department of the Interior; $1,100
Hatten S. Yoder, Jr.; Carnegie Institute of Washington; $1,100

International Symposium on Wood Destruction by Fungi, Berlin, Germany; May 21 to May 31, 1962:

Arthur B. Anderson; University of California; $850

International Union of Forest Research Organizations, Vienna, Austria; September 9 to September 22, 1961:
M. Victor Bilan; Stephen F. Austin State College; $1,200

Joint Meetings of the Regional Science Association and the Commission on Methods of Economic Regionalization of the International Geographical Union, Hague, Netherlands; September 4 to September 9, 1961:
Edward L. Ullman; Washington University; $630

Mediterranean Regional Field Mission in Seismology and Earthquake Engineering, Rome, Italy; March to May 1962:
Ray William Clough; University of California; $1,500
Dariel Linehan; Weston Observatory; $3,100

Meeting for the Study and Comparison of Droplet Collectors, Clermont-Ferrand, France; November 6 to November 11, 1961:
Paul B. MacCready, Jr.; Atmospheric Research Group; $1,200

Meeting of Experts in the Field of Metal Forming, Paris, France; November 9 to November 10, 1961:
E. G. Thomsen; University of California; $950

Meeting of the Bureau of the International Scientific Film Association, Paris, France; February 21 to February 25, 1962:
Randall McVay Whaley; Wayne State University; $1,011

Meeting of the Commission on Ancient Maps of the International Geographical Union, Florence, Italy; October 23 to October 25, 1961:
George Kish; University of Michigan; $550

Meeting of the Commission on National Atlases of the International Geographical Union, Budapest, Hungary; September 7 to September 10, 1962:
Carleton P. Barnes; U.S. Department of Agriculture; $675

Meeting of the High Polymer Research Group, Moretonhampstead, Devon, England; May 14 to May 18, 1962:
Michael Szwarc; State University College of Forestry at Syracuse University; $500

Meeting of the Institute of Mathematical Statistics, Dublin, Ireland; September 3 to September 7, 1962:
Albert H. Bowker; Stanford Uinversity, $750
Gerald J. Lieberman; Stanford University; $750
Ingram Olkin; Stanford University; $750

Meeting of the Society for the Study of Human Biology, London, England; November 17 to November 19, 1961:
Bertram S. Kraus; University of Washington; $665

Meeting of the Working Group for the Upper Mantle Project, Paris, France; March 19 to March 25, 1962:
R. P. Meyer; University of Wisconsin; $700

Meeting on Geomorphology and Land Use Mapping, Athens, Greece; September 15 to September 25. 1962:
Richard F. Logan; University of California; $1,150

Meetings to Discuss Exchange of Scientific Information Between Brazil and the United States, with Particular Reference to a Possible Survey of Brazilian Scientific Information Activities, Rio de Janeiro and Sao Paulo, Brazil; August 20 to September 30, 1961:
Ronald Hilton; Stanford University; $1,242

NATO Advanced Study Institute: Asymptotic Distribution, Breukelen, Netherlands; August 1 to August 11, 1962:
Henry M. Schaerf; Washington University; $640

NATO Advanced Study Institute: Automatic Translation of Languages, Venice, Italy; July 15 to July 31, 1962:
Victoria A. Fromkin; University of California; $730
Sheila A. Greibach; Harvard University; $620
Amelia Janiotis; Wayne State University; $150
Harry H. Josselson; Wayne State University; $150
Richard L. Venezky; Cornell University; $460

NATO Advanced Study Institute: Combinatorial Methods in Probability Theory and Algebraic Topology, Aarhus, Denmark; August 1 to August 10, 1962:
Edgar Reich; University of Minnesota; $530

NATO Advanced Study Institute: Dispersion and Absorption of Sound by Molecular Processes, Varenna, Italy; August 6 to August 18, 1962:
Warren P. Mason; Bell Telephone Laboratories; $470
C. Leonard O'Connor; Manhattan College; $610

NATO Advanced Study Institute: Elementary Particles, Varenna, Italy; July 23 to August 4, 1962:
Rafe A. Burnstein; University of Maryland; $630
George Gidal; University of California; $850

NATO Advanced Study Institute: Evaluation of Stars, Varenna, Italy; August 20 to September 1, 1962:
Marshal H. Wrubel; Indiana University; $530

NATO Advanced Study Institute: Excitations in Semi-conductors: Polarons and Excitons, St. Andrews, Fife, Scotland; July 30 to August 18, 1962:
Donald H. Kobe; Ohio State University; $520
William H. Taylor, II; Princeton University; $430
George Whitfield; University of Illinois; $450

NATO Advanced Study Institute: Excitations in Semi-conductors; Polarons and Excitons, St. Andrews, Scotland; June 25 to June 30, 1962; and NATO Advanced Study Institute: Many-body Problems and High Energy Physics, Cargese, Corsica; July 30 to August 18, 1962:
David Pines; University of Illinois; $470

NATO Advanced Study Institute; Geophysics, Les Houches, France; July 2 to August 25, 1962:
- Barbara W. Abraham; Radcliffe College; $300

NATO Advanced Study Institute: Group Theoretical Methods and Concepts in the Theory of Elementary Particles, Istanbul, Turkey; July 16 to August 4, 1962:
- Sidney Coleman; Harvard University; $770
- Kenneth Nordtvedt, Jr.; Stanford University; $1,060

NATO Advanced Study Institute: Imperfections in Solids, Rhodes, Greece; July 2 to July 20, 1962:
- Ronald L. Odle; University of Illinois; $860

NATO Advanced Study Institute: International Conference on Elementary Particles, Bergen, Norway; May 28 to June 15, 1962:
- William C. Ramsay; University of California; $810
- Valentine L. Telegdi; University of Chicago; $480
- Sam B. Treiman; Princeton University; $430

NATO Advanced Study Institute: Many-body Problems and High Energy Physics, Cargese, Corsica; July 1 to July 10, 1962:
- John Bardeen; University of Illinois; $480

NATO Advanced Study Institute: North-Atlantic Biotae and Their History, Reykjavik, Iceland; July 12 to July 25, 1962:
- Margaret B. Davis; University of Michigan; $440
- Alton M. Harvill, Jr.; Murray State College; $490
- Bruce C. Heezen; Columbia University; $280
- Knut J. Norstog; Wittenberg University; $460

NATO Advanced Study Institute on Feldspars, Oslo, Norway; June 20 to June 30, 1962:
- Bruce E. Brown; University of Wisconsin; $480
- Philip M. Orville; Cornell University; $450
- David B. Slemmons; University of Nevada; $630

NATO Advanced Study Institute: Plasma Theory, Varenna, Italy; July 9 to July 21, 1962:
- Harold P. Furth; University of California; $670
- Nicholas A. Krall; John Jay Hopkins Laboratory for Pure and Applied Science; $860
- Bruce B. Robinson; University of California; $860
- Peter A. Sturrock; Stanford University; $680

NATO Advanced Study Institute: Radio-Astronomy, Manchester, England; June 26 to July 7, 1962:
- John R. Dickel; University of Michigan; $560
- Edward J. Fremouw; University of Alaska; $800

NATO Advanced Study Institute: Scientific Photography, Liege, Belgium; September 10 to September 22, 1962:
- Jack Fajer; Brandeis University; $540
- Michael M. Mizianty; Lehigh University; $550
- Felix Viro; Photo and Repro Group of GAF; $560

NATO Advanced Study Institute: Solid State Physics, Ghent, Belgium; July 23 to August 2, 1962:
- Norman N. Axelrod; University of Delaware; $540
- W. Beall Fowler; Argonne National Laboratory; $600
- Kay K. Kanazawa; University of Illinois; $640
- Howard K. Rockstad; University of Illinois; $650

NATO Advanced Study Institute: Space Exploration and the Solar System, Varenna, Italy; June 4 to June 16, 1962:
- Giovanni Lanza; Northeastern University; $590
- Victor H. Regener; University of New Mexico; $800
- Howard L. Weisberg; Brandeis University; $590

NATO Advanced Study Institute: Stellar Evolution, Varenna, Italy; August 20 to September 1, 1962:
- Maurice M. Shapiro; U.S. Naval Research Laboratory; $490

NATO Advanced Study Institute: Stratospheric and Mesospheric Circulation, West Berlin, Germany; August 20 to August 31, 1962:
- *Julius London; University of Colorado*; $580

NATO Advanced Study Institute: Study of Upper Atmosphere Phenomena by Satellites and Radio Astronomical Methods, Corfu, Greece; June 18 to July 2, 1962:
- Hilde Kallmann-Bijl; University of California; $780
- James W. Warwick; University of Colorado; $750

NATO International Spring School of Physics: Cybernetics of Neural Processes, Naples, Italy; April 26 to May 13, 1962:
- Robert W. Doty; University of Rochester; $500
- Celeste Faye McCollough; Oberlin College; $670
- George W. Zopf, Jr.; University of Illinois; $520

OECD Seminar on Research Management, Copenhagen, Denmark; September 25 to September 29, 1961:
- Schrade Radtke; American Zinc Association, Lead Industries Association; $917

OECD Seminar on The Reform of the Teaching of Biology, La Tour de Peilz, Switzerland; September 4 to September 14, 1962:
- Tracy M. Sonneborn; Indiana University; $890

Organic Chemistry Study Group, Caen, France; September 5 to September 12, 1962;
- Gilbert Stork; Columbia University; $580

Organic Geochemistry Group, Milan, Italy; September 10 to September 12, 1962:
- Egon T. Degens; California Institute of Technology; $900
- Peter H. Given; Pennsylvania State University; $515

Bartholomew Nagy; Fordham University; $600
Carl H. Oppenheimer; University of Miami; $750

Pugwash Conference, London, England; September 3 to September 7, 1962:
Robert B. Brode; University of California; $775

Pyridoxal Symposium, IUB; Rome, Italy; October 1962:
American Society of Biological Chemists, Inc.; $12,300

Regional Conference of Southeast Asian Geographers, Kuala Lumpar, Malaya; April 2 to April 23, 1962:
Joseph Earle Spencer; University of California; $1,100
M. Gordon Wolman; Johns Hopkins University; $1,800

Research Institute in Group Theory, Oberwolfach, Germany; October 9 to October 14, 1961:
Donald Gordon Higman; University of Michigan; $450
Daniel R. Hughes; University of Michigan; $600

Research Vessel Forum, Tokyo, Japan; September 18 to September 30, 1961:
Wayne V. Burt; Oregon State University; $800

The Rutherford Jubilee International Conference, Manchester, England; September 4 to September 8, 1961:
Harry D. Holmgren; University of Maryland; $600

Seminar on Latin American Area Seismology and Earthquake Engineering, Santiago, Chile; December 5 to December 12, 1961:
Perry Byerly; University of California; $1,500
Jack E. Oliver; Columbia University, Palisades; $1,350

Seminar on Theoretical Physics, Trieste, Italy; July 16 to August 25, 1962:
James S. Ball; University of California; $700
Nina Byers; University of California; $800

Series of Lectures at Academy of Science of USSR and Visit Laboratories in the Soviet Union; October 1 to October 22, 1962:
Joseph Martin; Pennsylvania State University; $830

Solid State Colloquium, Rio de Janeiro, Brazil; August 1 to August 20, 1962:
Walter J. Moore; Indiana University; $700

Solvay Congress, Brussels, Belgium; October 9 to October 14, 1961:
Richard P. Feynman; California Institute of Technology; $800
Julian Schwinger; Harvard University; $525

Some Aspects of Electrochemistry, New Delhi, India; October 6 to October 7, 1961:
Raymond M. Fuoss; Yale University; $1,175

Soviet-American Exchange of Scientists and Travel to Meetings in U.S.S.R., Italy and Hungary:
University of California; $7,500

Symposium in Commemoration of the Fiftieth Anniversary of the Discovery of X-ray Diffraction and of Crystal Structure Analysis, Munich, Germany; July 25 to July 27, 1962:
Charles W. Burnham; Carnegie Institute of Washington; $610
Gunnar Kullerud; Carnegie Institute of Washington; $610
Martin E. Straumanis; Missouri School of Mines and Metallurgy; $580

Symposium of Spectroscopists, Bombay, India and Indian Science Congress, Cuttack, India; December 20, 1961 to January 20, 1962:
Robert S. Mulliken; University of Chicago; $2,000

Symposium on Arborviruses, Rio de Janeiro, Brazil; September 11 to September 14, 1961:
William L. Pond; New England Institute for Medical Research; $950

Symposium on Biological Organization at Cellular and Supra-Cellular Levels, Varenna, Italy; September 24 to September 27, 1962:
Renato Dulbecco; California Institute of Technology; $900
James C. King; Columbia University; $600
A. A. Moscona; University of Chicago; $700
David L. Nanney; University of Illinois; $800

Symposium on Brain Oedema, Vienna, Austria; Organizational Meeting to Plan the Next International Electroencephalography Congress, Wassenaar, The Netherlands; International Physiology Congress, Leiden, The Netherlands; Symposium on Neurochemical Regulators of Brain Activity, Paris, France; and Symposium on the History of the Brain, Munster, Germany; August and September 1962:
Mary A. B. Brazier; University of California Medical Center; $1,200

Symposium on Cavitation, Sendai, Japan; September 2 to September 7, 1962:
John P. Breslin; Stevens Institute of Technology; $291

Symposium on Cell Growth and Cell Division, Liege, Belgium; May 19 to May 24, 1962:
Seymour Gelfant; Syracuse University; $600
Lester Goldstein; University of Pennsylvania; $550
Henry I. Hirshfield; New York University; $550
Thomas W. James; University of California; $800
Daniel Mazia; University of California; $835
D. M. Prescott; Oak Ridge National Laboratory; $600
Herbert Stern; University of Illinois; $650
Hewson Swift; University of Chicago; $600
J. Herbert Taylor; Columbia University; $550

Symposium on Cellular Basis and Aetiology of Late Somatic Effects of Ionizing Radiation, London, England; March 27 to March 30, 1962:
George W. Casarett; University of Rochester; $800
Jacob Furth; Columbia University; $500
Hermann Lisco; Argonne National Laboratory; $600

Hermann Joseph Muller; Indiana University; $500

Symposium on Chemoreceptors, Stockholm, Sweden; September 3 to September 5, 1962:
- Robert M. Benjamin; University of Wisconsin; $200
- A. J. de Lorenzo; Johns Hopkins University; $650
- Vincent G. Dethier; University of Pennsylvania; $630
- Robert P. Erickson; Duke University; $690
- David R. Evans; Johns Hopkins University; $650
- Irving Y. Fishman; Grinnell College; $790
- Robert C. Gesteland; Massachusetts Institute of Technology; $610
- Bruce P. Halpern; State University of New York; $650
- Morley R. Kare; North Carolina State College; $690
- Maxwell M. Mozell; State University of New York; $650
- Ross Maris Pangborn; University of California; $860

Symposium on Climatic Change, Rome, Italy; October 2 to October 7, 1961:
- Jacob Bjerknes; University of California; $1,025

Symposium on Clusters and Stellar Evolution, Greenwich, England; August 7 to August 10, 1962:
- Robert R. Brownlee; University of California; $783
- Olin J. Eggen; California Institute of Technology; $790
- Louis G. Henyey; University of California; $850
- George H. Herbig; University of California; $850
- Ivan R. King; University of California; $550
- Martin Schwarzschild; Princeton University; $500
- Allan R. Sandage; Mt. Wilson, Palomar Observatory; $850
- Merle F. Walker; University of California; $850

Symposium on Continental Erosion, Bari, Italy; October 1 to October 6, 1962:
- Lucien M. Brush, Jr.; State University of Iowa; $850

Symposium on Crack Propagation, Cranfield, England; September 25 to September 29, 1961:
- James P. Romualdi; Carnegie Institute of Technology; $540
- Max L. Williams, Jr.; California Institute of Technology; $755

Symposium on Electromagnetic Theory and Antennas, Copenhagen, Denmark; June 25 to June 30, 1962:
- B. A. Auld; Stanford University; $794
- Sidney Borowitz; New York University; $562
- Dimitri S. Bugnolo; Columbia University; $562
- Donald A. Darling; University of Michigan; $621
- Georges A. Deschamps; University of Illinois; $666
- Hideya Gamo; IBM Corporation; $562
- J. Mayo Greenberg; Rensselaer Polytechnic Institute; $584
- Albert E. Heins; University of Michigan; $621
- Edward C. Jordan; University of Illinois; $666
- Samuel N. Karp; New York University; $575
- Irvin W. Kay; New York University; $325
- Nicholas D. Kazarinoff; University of Michigan; $621
- Ronold W. P. King; Harvard University; $553
- Nathan Marcuvitz; Polytechnic Institute of Brooklyn; $562
- Arthur A. Oliner; Polytechnic Institute of Brooklyn; $562
- Martin A. Plonus; Northwestern University; $562
- Charles C. Rogers; Rose Polytechnic Institute; $672
- V. H. Rumsey; University of California; $794
- Emil Wolf; University of Rochester; $600

Symposium on Engineering Aspects of Environmental Control, Melbourne, Australia; August 31 to September 5, 1962;
- S. H. Cameron; University of California; $1,050

Symposium on Functional Anatomy of the Cardiovascular System, London, England; November 28 to November 29, 1962;
- Donald F. M. Bunce, II; Tulane University School of Medicine; $840

Symposium on General Topology and Its Relations to Modern Analysis and Algebra, Prague, Czechoslovakia; September 1 to September 8, 1961:
- R. D. Anderson; Louisiana State University; $725
- John L. Kelley; University of California; $875
- Barry Mazur; Harvard University; $650

Symposium on Ground Water in Arid Regions, Athens, Greece; October 12 to October 20, 1961:
- George B. Maxey; Illinois State Geological Survey; $900
- David K. Todd; University of California; $750

Symposium on Ignimbrites and Hyaloclastites, Catania, Sicily, Italy; September 15 to September 24, 1961:
- Earl F. Cook; University of Idaho; $825
- Charles J. Vitaliano; Indiana University; $800

Seminar on Immune Tolerance Towards Specific Antigens and Its Implication in Relation to Present Theories of Antibody Synthesis, Royaumont, France; June 24 to June 28, 1962:
- Richard T. Smith; University of Florida; $650
- William O. Weigle; Scripps Clinic & Research Foundation; $800
- Harold R. Wolfe; University of Wisconsin; $720

Symposium on Insect Polymorphism, London, England; September 20 to September 25, 1961:
- Theodosius Dobzhansky; Columbia University; $800

Symposium on Ionospheric Soundings in the IGY/IGC, Nice, France; December 11 to December 16, 1961:
Erwin R. Schmerling; Pennsylvania State University; $650

Symposium on Mammalian Tissue Culture and Cytology, Sao Paulo, and Symposium on Radiobiology, Rio de Janeiro, Brazil; October 1962:
Harry Eagle; Yeshiva University; $950
L. D. Hamilton; Sloan-Kettering Institute for Cancer Research; $630
David A. Hungerford; Institute for Cancer Research; $800
Henry S. Kaplan; Stanford University; $775
Paul S. Moorhead; Wistar Institute; $700
Susumu Ohno; City of Hope Medical Center; $900
Jack Schultz; Institute for Cancer Research; $950

Symposium on Mechanisms of Immunological Tolerance, Prague, Czechoslovakia, November 8 to November 10, 1961;
John M. Converse; New York University; $145
Nathan Kaliss; Roscoe B. Jackson Memorial Laboratory; $555
Andrew A. Kandutsch; Roscoe B. Jackson Memorial Laboratory; $145
Carlos Martinez; University of Minnesota; $605
Ray D. Owen; California Institute of Technology; $665
Philip Y. Paterson; New York University; $450
Richmond T. Prehn; University of Washington; $645
Paul S. Russell; Columbia University; $145
Eli Sercarz; Harvard University; $470
Richard T. Smith; University of Florida; $585
Chandler A. Stetson; New York University; $470
Paul Terasaki; University of California; $725

Symposium on Non-Linear Oscillations, Kiev, U.S.S.R.; September 12 to September 18, 1961:
Henry A. Antosiewicz; University of Southern California; $1,200
Earl A. Coddington; University of California; $1,075
Stephen P. Diliberto; University of California; $1,075
Jack K. Hale; Martin Company; $950
Solomon Lefschetz; Martin Company; $950
Warren S. Loud; University of Minnesota; $1,000
Lawrence Markus; University of Minnesota; $525
Stephen Smale; University of California; $1,050
Wolfgang R. Wasow; University of Wisconsin; $975

Symposium on Optimizing and Self-Adaptive Systems Theory, Rome, Italy; April 26 to April 28, 1962:
Rudolf F. Drenick; Polytechnic Institute of Brooklyn; $140
Yao Tzu Li; Massachusetts Institute of Technology; $160
John G. Truxal; Polytechnic Institute of Brooklyn; $140

Symposium on Radiobiology, Rio de Janeiro, Brazil, and Symposium on Tissue Culture and Cytology, Sao Paulo, Brazil; October 22 to October 31, 1962:
Stanley M. Gartler; University of Washington; $900

Symposium on Repair From Genetic Radiation Damage and Differential Radiosensitivity in Germ Cells, Leiden, Holland; August 16 to August 19, 1962:
H. Bentley Glass; Johns Hopkins University; $600
Philip T. Ives; Amherst College; $600
Liane Brauch Russell; Oak Ridge National Laboratory; $700
William Lawson Russell; Oak Ridge National Laboratory; $700

Symposium on Second Order Effects in Elasticity, Plasticity and Hydrodynamics, Haifa, Israel; April 22 to April 27, 1962:
William P. Graebel; University of Michigan; $920
Paul Lieber; University of California; $1,150
Daniel Rosenthal; University of California; $877

Symposium on Space Communication Research, Paris, France; September 18 to September 22, 1961:
Arthur H. Waynick; Pennsylvania State University; $565

Symposium on Speciation in the Sea, Plymouth, England; September 27 to September 29, 1961:
Edward C. Raney; Cornell University; $726

Symposium on the Cycle and the Isotopic Composition of Atmospheric Gases, Utrecht, The Netherlands; August 8 to August 14, 1962:
Richard D. Cadle; Stanford Research Institute; $900

Symposium on the Durability of Concrete, Prague, Czechoslovakia; August 1 to August 6, 1961:
Merit P. White; University of Massachusetts; $615

Symposium on the Physiological Effect of High Altitude, Interlaken, Switzerland; September 18 to September 21, 1962:
Robert W. Elsner; University of California; $500
George A. Feigen; Stanford University; $1,100

Symposium on the Primates, London, England; April 12 to April 14, 1962:
Richard John Andrew; Yale University; $500
Neil C. Tappen; Tulane University School of Medicine; $630

Symposium on the Primates, London, England; Symposium Primatologicum, Giessen, Germany; To Study Primate Collections, Copenhagen, Stockholm, London, Munich and Leiden; April 1962:
George Emil Erikson; Harvard Medical School; $700

Symposium on the Programming and Utilization of Research Reactors, Vienna, Austria; October 16 to October 20, 1961:
Robert G. Cochran; Agricultural and Mechanical College of Texas; $795

Henry J. Gomberg; University of Michigan; $642
Glenn Murphy; Iowa State University; $728
Leonard Reiffel; Armour Research Foundation; $674
Forrest J. Remick; Pennsylvania State University; $685
Theos J. Thompson; Massachusetts Institute of Technology; $572

Symposium on the Research of Influence of Psychotropic Drugs on Higher Nervous Functions, Prague, Czechoslovakia; October 31 to November 3, 1961:
Bernard Lawrence Busfield, Jr.; Massachusetts Mental Health Center; $910
C. B. Ferster; Indiana University School of Medicine; $1,260
James Olds; University of Michigan; $1,000
Murray Sidman; Walter Reed Army Institute of Research; $690

Symposium on the Structure of Natural Products, Rio de Janeiro, Brazil; November 6 to November 10, 1961:
Ernest Wenkert; University of California; $800

Symposium on the Variations of Existing Glaciers, Obergurgl, Austria; September 10 to September 18, 1962:
Kermit B. Bengtson; University of Washington; $900
Richard P. Goldthwait; Ohio State University; $690
G. William Holmes; U.S. Geological Survey; $650
Troy L. Pewe; University of Alaska; $950

Symposium on Theoretical Interpretations of Upper Atmosphere Emissions, Paris, France; June 25 to June 29, 1962:
John C. Brandt; University of California; $1,100
Sydney Chapman; High Altitude Observatory; $71
Kenneth C. Clark; University of Washington; $199
Thomas M. Donahue; University of Pittsburgh; $700
Paul J. Kellogg; University of Minnesota; $822
Reginald E. Newell; Massachusetts Institute of Technology; $95
John F. Noxon; Harvard University; $620
Manfred H. Rees; University of Colorado; $850
Walter Roth; Armour Research Foundation of Illinois Institute of Technology; $625
Brian P. Sandford; Arctic Institute of North America; $625
Takao Tohmatsu; National Bureau of Standards; $850
Robert A. Young; Stanford Research Institute; $900

Symposium on Theoretical Organic Chemistry; Leningrad, U.S.S.R.; December 12 to December 15, 1961:
William von Eggers Doering; Yale University; $747
John D. Roberts; California Institute of Technology; $747
R. B. Woodward; Harvard University; $693

Symposium on Tissue Transplantation Problems, Santiago, Chile; August 30 to September 2, 1961:
Milton N. Goldstein; Roswell Park Memorial Institute; $1,000

Symposium on Topology and Its Methods in Other Mathematical Disciplines, Prague, Czechoslovakia; September 1 to September 9, 1961; and Symposium on Scientific Research and Development in a Modern Industrial Economy, Dusseldorf, Germany; September 27 to October 3, 1961:
Richard Courant; New York University; $850

Symposium on Zooplankton Production, Copenhagen, Denmark; October 8 to October 10, 1961:
Karl Banse; University of Washington; $1,136
W. T. Edmondson; University of Washington; $1,136
Charles S. Yentsch; Woods Hole Oceanographic Institute; $851

Technical Committee 24—Electric and Magnetic Magnitudes and Units of IEC, Bucharest, Roumania; June 28 to July 3, 1962:
Carl C. Chambers; University of Pennsylvania; $740

To Deliver a Series of Lectures in Poland; June 1962:
Jerzy R. Moszynski; Case Institute of Technology; $720

To Determine the Scientific and Engineering Aspects of Corrosion Work, U.S.S.R.; Summer 1962:
National Association of Corrosion Engineers; $6,500

To Discuss the Photochemistry of Condensed Systems with Foreign Experts in France, U.S.S.R., Sweden, Holland, and England; March 20 to June 16, 1962:
Robert Livingston; University of Minnesota; $900

To Engage in Research in Social Psychology, The Netherlands, West Germany, France, and Italy; March and May 1962:
Theodore R. Sarbin; University of California; $400

To Perform Research in Soil Mechanics and Visit Research Centers, Denmark, Finland, Sweden, Germany, and Switzerland; June 1962 to January 1963:
James N. Luthin; University of California; $790

Translation Program of the American Geological Institute, Leningrad, and Moscow, U.S.S.R.; September 1 to December 31, 1961:
Herbert E. Hawkes; University of California; $1,573

Translation Project of the Arctic Institute of North America, Moscow, Leningrad, Irkutsk, and Yakutsk, U.S.S.R.; June 15 to July 7, 1962:
Henry N. Michael; Temple University; $2,415

UNESCO Seminar on Physical and Natural Sciences, Gauting/Munchen, West Germany; May 11 to May 16, 1962:
Watson Davis; Science Service; $600

United Nations Conference on New Sources of Energy, Rome, Italy; August 21 to August 31, 1961:
Harry E. Thomason; Office of the Chief Signal Officer; $900

U.S. Participation in UNESCO Latin American Regional Field Mission in Seismology and Earthquake Engineering, Santiago, Chile; October 1961 to December 1961:
Daniel Lineham; Weston Observatory; $1,500

Use of the Computer in Anthropology, Burg-Wartenstein, Austria; June 20 to June 29, 1962:
Wenner-Gren Foundation for Anthropological Research; $3,500

Visiting Protein Chemistry Laboratories in Copenhagen, Denmark; Moscow, Leningrad, and Kiev, U.S.S.R.; and Prague, Czechoslovakia; 1962:
Charlotte Green Schellman; University of Oregon; $1,200

Visiting the Czechoslovak Academy of Science, Prague, Czechoslovakia; October 15 to October 22, 1961:
Herman Pines; Northwestern University; $700

Visits to European and Scandinavian Laboratories; September, 1962:
James B. Lackey; University of Florida; $240

World Federation of Neurology, Como, Italy; August 29 to September 6, 1961; International Electroencephalography Congress, Rome, Italy; September 7 to September 13, 1961; and International Colloquium on Mechanisms of Sensory-Motor Integration, Pisa, Italy; September 18 to September 22, 1961:
Mary A. B. Brazier; University of California; $800

APPENDIX E

Fellowship Awards Offered

National Science Foundation Fellowship Awards, by Program and Field, Fiscal Year 1962

Field	Graduate	Cooperative graduate	Graduate teaching assistants	Postdoctoral	Senior postdoctoral	Science faculty	Secondary school teachers	Total
Life Sciences:								
Agriculture	5	6	3	2	1	5	0	22
Anthropology	32	9	14	9	2	4	0	70
Biochemistry	57	21	7	15	5	2	2	109
Biophysics	40	7	0	8	2	1	1	59
Botany	33	20	45	8	2	4	15	127
General Biology	37	19	22	4	3	8	51	144
Genetics	24	12	9	4	7	3	1	60
Medical Sciences	1	4	5	5	2	2	----------	19
Microbiology	13	7	14	8	3	4	4	53
Pathology	1	0	0	1	1	0	----------	3
Physiology	32	21	23	7	5	3	----------	91
Psychology	69	55	52	13	1	6	2	198
Zoology	59	30	67	7	0	8	18	189
Subtotal	403	211	261	91	34	50	94	1,144
Physical Sciences:								
Astronomy	17	6	1	1	1	1	0	27
Chemistry	257	202	172	50	13	40	30	764
Earth Sciences	87	26	61	10	8	6	4	202
Engineering	288	287	85	21	8	118	----------	807
Mathematics	294	211	143	17	5	67	152	889
Meteorology	4	3	1	0	0	1	----------	9
Oceanography	5	1	5	0	0	1	----------	12
Physics	330	220	95	47	15	31	17	755
General Science	----------	----------	----------	----------	----------	0	3	3
Subtotal	1,282	956	563	146	50	265	206	3,468
Social Sciences:								
Economics	37	16	20	2	1	4	----------	80
Geography	3	1	1	0	0	0	----------	5
History and Philosophy of Science	20	8	4	2	2	6	----------	42
Sociology	12	6	16	3	3	0	----------	40
Social Sciences, other	4	2	3	1	2	0	----------	12
Subtotal	76	33	44	8	8	10	----------	179
Total	1,761	1,200	868	245	92	325	300	4,791

Names, Residences, and Fields of Study of Individuals Offered National Science Foundation Fellowships

ALABAMA

Graduate

FORD, RALPH M., Tuscaloosa, Mathematics
GOLDMAN, STEVEN M., Mobile, Economics
GUNTER, THOMAS E., Tuscumbia, Physics
JOHNSON, JOSEPH A., Mobile, Biochemistry
NEWTON, VICTOR J., Mobile, Physics
NICHOLS, HERBERT W., Bessemer, Botany
ROBERTS, DENNIS L., Jr., Montgomery, Physics
ROGERS, CHARLES L., Birmingham, Engineering
ROSSINI, FREDERICK A., Mobile, Physics
SCHWARTZKOPF, GARY W., Mobile, Genetics
SHOUP, GEORGE D., Mobile, Biology
SMITH, DONALD R., Sylacauga, Mathematics
SMITH, STEPHEN R., Fayette, Physics
STERNGLANZ, ROLF, Birmingham, Chemistry
STURGES, WILTON, III, Dothan, Oceanography
WEIL, ROMAN L., Jr., Montgomery, Economics

Cooperative Graduate

COGGINS, JAMES L., Brundidge, Engineering
COULTER, PHILIP W., Phenix City, Physics
DICKSON, SAMUEL A., Jr., Tuscaloosa, Physics
GARRETT, WILLIAM R., Warrior, Physics
ISSOS, JAMES N., Birmingham, Mathematics
MARSHALL, JAMES L., Decatur, Chemistry
PATTERSON, LOYD T., Rainsville, Microbiology

SCOTT, JOHN W., Jr., Montevallo, Psychology
SWEET, RICHARD F., Mobile, Physics

Summer Fellowships for Graduate Teaching Assistants

BAUM, LAWRENCE S., Birmingham, Physiology
GILBERT, EURELL M., Grove Oak, Biology
ISSOS, JAMES N., Birmingham, Mathematics
MATHEWS, COLLIS W., Montgomery Chemistry
SPARKS, DAVID L., Tuscaloosa, Psychology
STRICKLAND, SAM M., Birmingham, Mathematics
VAN CLEAVE, ALBERT R., Jr., Wadley, Mathematics
WATSON, JAMES R., Jr., Anniston, Botany
YARBROUGH, RUPERT H., Tuscaloosa, Mathematics

Postdoctoral

BURGESS, EDWARD M., Birmingham, Chemistry
POSNER, MICHAEL I., Fort McClellan, Psychology

Science Faculty

COX, JULIUS G., Auburn, Engineering
HICKS, THOMAS I., Birmingham, Physics
KERN, EDWARD E., Jr., Auburn, Economics
SWINSON, WELDON F., Auburn, Engineering

Summer Fellowships for Secondary School Teachers

LONG, PAULINE K., Birmingham, Zoology
OLIVER, M. ROBERT, Sr., Birmingham, Zoology
PETERMAN, WILLIE S., Birmingham, Mathematics
STOREY, JESSIE, Birmingham, Mathematics
YOUNG, ALFRED F., Montgomery, Chemistry

ALASKA

Graduate

LENT, PETER C., College, Biology

Cooperative Graduate

SPOONER, ROBERT S., College, Zoology

Science Faculty

BORK, ALFRED M., College, Physics

ARIZONA

Graduate

BRYANT, DONALD G., Warren, Earth Sciences
DOLE, JIM W., Phoenix, Biology
GRANT, ROBERT B., Tempe, Genetics
HALPERN, MARTIN B., Tucson, Physics
KREISLER, MICHAEL N., Pompton Lakes, Physics
LANGE, ROBERT V., Phoenix, Physics
LOVEDAY, DOUGLAS F., Tucson, Economics
OJAKANGAS, RICHARD W., Phoenix, Earth Sciences
WILLIS, BYRON H., Winslow, Engineering
YOUNG, JON N., Florence, Anthropology

Cooperative Graduate

ABRAHAM, FARID F., Phoenix, Physics
COLLINS, DONALD J., Tucson, Engineering
LINDHOLM, FRED A., Tucson, Engineering
MICKLE, DAVID G., Jr., Tucson, Earth Sciences
PHILLIPS, JAMES L., Globe, Psychology
THOMPSON, SAMUEL R., III, Tucson, Mathematics

Summer Fellowships for Graduate Teaching Assistants

MITCHELL, HENRY A., Tucson, Zoology
NOYES, ROY B., Tucson, Engineering
SPAHN, ROBERT J., Phoenix, Physics

Science Faculty

EDWARDS, WARREN C., Tucson, Mathematics
SLOANE, RICHARD L., Tucson, Engineering

Summer Fellowships for Secondary School Teachers

ARMSTRONG, ROBERT L., Casa Grande, Mathematics
GILBERT, CHARLES R., Superior, Biology
RICKERT, FRANCIS B., Tucson, Botany
TORGERSON, KENNETH J., Tucson, Botany

ARKANSAS

Graduate

BROWN, ROBERT M., Little Rock, Physics
GRAMLICH, JIM V., Charleston, Botany
MANION, JERALD M., Beebe, Chemistry
MCCARTNEY, ALLEN P., Fort Smith, Anthropology
PARCHMAN, LONNIE G., Brinkley, Genetics

Cooperative Graduate

AYRES, JAMES T., Eldorado, Chemistry
BIGGS, FRANK, Pea Ridge, Physics
COMBS, GEORGE D., Fayetteville, Engineering
ELLIOTT, DAVID R., Jonesboro, Chemistry
HARPER, GOIN N., Little Rock, Engineering
HULTSMAN, ST. CLAIR L., Little Rock, Physics
ISGRIG, FREDERICK A., Little Rock, Psychology
PARKER, M. WAYNE, Rolla, Engineering
SPARKS, BRYAN, Fayetteville, Chemistry
STRICKLAND, WILLIAM T., Little Rock, Engineering
WEATHERFORD, WENDELL L., Newport, Physics

Summer Fellowships for Graduate Teaching Assistants

FOSTER, MELVIN V., Malvern, Mathematics
HALL, GENE R., Fayetteville, Mathematics
HARPER, GOIN N., Little Rock, Engineering
MACE, KENNETH D., West Fork, Physiology
RUSSELL, CHARLES D., Lake Village, Chemistry

Summer Fellowships for Secondary School Teachers

ATHERTON, RUTH C., Fayetteville, Mathematics
CRUM, MARIAN E., Bergman, Mathematics
ROBINSON, ARTIE B., Wilmar, Biology

CALIFORNIA

Graduate

AGOSTON, MAX K., Atherton, Mathematics
AHUMADA, ALBERT J., JR., Stanford, Psychology
ALONZO, GERALD J., Mount View, Engineering
ANDERSON, BARRY F., Redwood City, Psychology
ANKENBRANDT, CHARLES, Oakland, Physics
ANKENBRANDT, MARGUERI, Oakland, Physics
ANSPAUGH, LYNN R., Berkeley, Biophysics
BACHER, ANDREW D., Pasadena, Astronomy
BARNES, LYNNE R., Los Angeles, Mathematics
BATZLI, GEORGE O., Oakland, Biology
BAUER, ANDREW B., Long Beach, Engineering
BENNETT, LARRY E., San Diego, Chemistry
BLACK, NEVILLE A., Santa Monica, Engineering
BLANDFORD, ROBERT R., Pasadena, Oceanography
BLETHEN, SANDRA L., Oakland, Biochemistry
BLUE, JAMES L., Pasadena, Physics
BOGAS, EDGAR N., Palo Alto, Mathematics
BORGMAN, LEON E., Los Angeles, Mathematics
BOYD, ROBERT G., Riverside, Physics
BRADLEY, GERALD L., Tulare, Mathematics
BRONZAN, JOHN B., Los Angeles, Physics
BROOKS, JOHN E., Pasadena, Biology
BROWN, JEROME R., Hillsborough, Physics
BROWN, LAWRENCE D., Beverly Hills, Mathematics
BUCKLEY, FLETCHER J., Santa Clara, Engineering
BURNETT, DONALD S., El Cerrito, Chemistry
BUTLER, BEVERLY J., San Luis Obispo, Zoology
CAMBERN, MICHAEL J., Oakland, Mathematics
CARLTON, TERRY S., Berkeley, Chemistry
CASTOR, JOHN I., Fresno, Astronomy
CHAPMAN, ROBERT G., JR., Southgate, Engineering
CHRISTENSEN, DOUGLAS, Oildale, Engineering
CLARK, ALAN R., San Jose, Physics
CLAUSER, MILTON J., Rolling Hills, Physics
COLLINS, FRANK G., El Cerrito, Engineering
COMSTOCK, CRAIG, Monterey, Mathematics
COOPER, JAMES A., East Palo Alto, Engineering
COUTTS, STEPHEN M., San Diego, Biochemistry
CRAPO, LAWRENCE M., Porterville, Chemistry
CRAWFORD, THOMAS J., Vista, Psychology
DALRYMPLE, GARY B., Berkeley, Earth Sciences
DALTON, EDWARD K., Riverside, Physics
DAVIS, GARY A., San Diego, Psychology
DAVIS, LARY V., Berkeley, Zoology
DAVIS, THOMAS J., Fresno, Earth Sciences
DEWITT, WALTER G., III, Oakland, Chemistry
DICK, GEORGE J., Winton, Physics
DONOR, JOHN E., Monterey Park, Mathematics
ELLIS, DAVID J., Whittier, Chemistry
ENGLEMAN, E. MARK, Davis, Botany
FICKES, GARRY N., Oakland, Chemistry
FLATTE, STANLEY M., Los Angeles, Physics
FRANKEL, RICHARD B., Berkeley, Chemistry
GAMELIN, THEODORE W., Berkeley, Mathematics
GETZINGER, RICHARD W., Berkeley, Engineering
GIANCOLI, DOUGLAS C., Berkeley, Physics
GINSBERG, EDWARD S., Palo Alto, Physics
GODDARD, WILLIAM A., El Centro, Engineering
GRIFFIN, WILLIAM L., San Gabriel, Earth Sciences
GRIFFITH, HAYES O., Laverne, Chemistry
GROMME, CHARLES S., Oakland, Earth Sciences
GROVE, ANDREW S., Berkeley, Engineering
GRZESIK, JAN A., Inglewood, Physics
GUNN, JAMES E., Pasadena, Astronomy
GUNSTREAM, STANLEY E., Altadena, Biology
HALL, DONALD E., Palo Alto, Physics
HARRIS, DAVID O., Berkeley, Chemistry
HAYMAKER, RICHARD W., Washington, Physics
HECHLER, STEPHEN H., San Leandro, Mathematics
HENDRICKS, TARRAH J., La Jolla, Physics
HERM, RONALD R., Berkeley, Chemistry
HESS, RICHARD I., Los Angeles, Physics
HESSE, ROBERT H., Concord, Chemistry
HILL, JANE H., Los Angeles, Anthropology
HORNELL, JAMES M., Manhattan Beach, Mathematics
HOROWITZ, JOEL L., Pasadena, Physics
HOWARD, JEAN E., Berkeley, Biochemistry
HUFBAUER, KARL G., Del Mar, History and Philosophy of Science
HUGHES, EVAN E., JR., Los Angeles, Physics
HULD, BENT, Monrovia, Physics
JAECKEL, LOUIS A., Pacoima, Mathematics
JANZEN, DANIEL H., Albany, Zoology
JENSEN, LIN C., Walnut Creek, Mathematics
JOHNSON, RODNEY W., Santa Rosa, Mathematics
JOSEPHSON, NORA S., Riverside, Physics
KARIG, DANIEL E., Pasadena, Earth Sciences
KASPER, JEROME V., Oakland, Chemistry
KEEFFE, JAMES R., Dinuba, Chemistry
KING, JACK L., Antioch, Genetics
KONRAD, MICHAEL W., Berkeley, Biophysics
KRIEGER, STEPHAN J., Berkeley, Physics
KULA, RICHARD J., San Gabriel, Chemistry
KUNTZ, IRWIN D., JR., Berkeley, Chemistry
LARSON, EDWIN E., Big Bear Lake, Earth Sciences
LAWRENCE, JOHN F., Oakland, Zoology
LETOURNEAU, JOHN J., Berkeley, Mathematics
LEWIS, RICHARD A., Stanford, Engineering
LIGHTNER, DAVID A., Bakersfield, Chemistry
LINSON, LEWIS M., Oakland, Physics
LORDEN, GARY A., Los Angeles, Mathematics
MACINTYRE, FERREN, Carpinteria, Chemistry
MACOMBER, JAMES D., Marysville, Chemistry
MADIX, ROBERT J., Berkeley, Engineering
MANDELL, RICHARD L., Rosemead, Engineering
MARGOSIAN, PAUL M., San Diego, Engineering
MARKOWITZ, ETAN, Los Angeles, Genetics
MARSHALL, GARLAND R., Pasadena, Physiollogy
MASTERS, GILBERT M., Los Angeles, Engineering
MAURER, CHARLES J., Stockton, Engineering
MCCLOSKEY, DAVID J., Pasadena, Engineering
MCDOWELL, EDWARD R., Pasadena, Engineering
MCKEEMAN, WILLIAM M., Stanford, Mathematics
MERZ, MARTIN D., Wasco, Engineering
MILLER, EDWARD S., Berkeley, Physics
MILLS, DOUGLAS L., Berkeley, Physics
MILLSTEIN, JERRY, Berkeley, Physics
MOBERLY, WALTER R., Riverside, Biology
MONTI, STEPHEN A., San Rafael, Chemistry
MOORE, CHARLES B., Albany, Chemistry
MORRIS, WILLIAM G., Oakland, Engineering

MOYNIHAN, CORNELIUS T., San Jose, Chemistry
MUNSON, JOHN H., Burbank, Physics
MUROV, STEVEN L., Redwood City, Chemistry
MUSGROVE, PHILIP A., Tarzana, Mathematics
NELSON, KEITH B., Berkeley, Zoology
NEWMEYER, JOHN A., Los Angeles, Physics
NIETO, MICHAEL M., Los Angeles, Physics
NILL, KENNETH W., Oceanside, Engineering
NOBLE, DONALD C., Stanford, Earth Sciences
NOLFI, GEORGE J., Jr., North Hollywood, Chemistry
NORDTVEDT, KENNETH L., Woodside, Physics
O'CONNELL, JOHN P., Los Angeles, Engineering
OGLESBY, LARRY C., Atascadero, Zoology
OLSON, RICHARD G., Walnut Creek, Physics
OMURA, JIMMY K., San Francisco; Engineering
PALMITER, MICHAEL T., Alhambra, Mathematics
PARKINSON, MICHAEL T., San Francisco, Physics
PEARSON, GERALD A., Manhattan Beach, Chemistry
PHILLIPS, LORNA M., Berkeley, Zoology
PIBURN, MICHAEL D., Sacramento, Earth Sciences
PIERSON, Sr. MARY B., Belmont, Physiology
QUINN, DANIEL J., San Jose, Physics
REGAS, JAMES L., San Lorenzo, Astronomy
REIN, ALAN R., Mill Valley, Microbiology
RICHIE, KENNETH E., Los Angeles, Physics
RONY, PETER R., Berkeley, Engineering
ROOS, LESLIE L., Jr., San Francisco, Psychology
ROOT, RICHARD B., Albany, Biology
ROSS, ROBERT T., San Marino, Chemistry
RUBIN, MERRY M., Berkeley, Biophysics
RUSHFORTH, CRAIG K., Stanford, Engineering
SAEGEBARTH, ELLEN I., Berkeley, Chemistry
SCHLAUG, ROBERT N., Berkeley, Engineering
SCHROT, SR. MARIE S., Los Angeles, Mathematics
SCUDDER, HENRY J., III, Albany, Engineering
SHEFF, JEFFREY S., Los Angeles, Psychology
SILVERSTONE, HARRIS J., Pasadena, Chemistry
SMITH, DAVID H., Alhambra, Sociology
SMITH, JAMES G., Culver City, Earth Sciences
SMOLLER, CAROLYN G., Berkeley, Zoology
SPECHT, WALTER A., Jr., Pasadena, Engineering
STEA, DAVID, Stanford, Psychology
STEINGOLD, HAROLD, Santa Monica, Engineering
SUELZLE, LARRY R., San Bruno, Physics
SUMNER, PETER R., Sierra Madre, Chemistry
TAYLOR, ROBERT W., Torrance, Mathematics
TELLER, DAVID C., Albany, Biochemistry
TELLER, DAVIDA Y., Albany, Psychology
THOE, DALE W., Stanford, Mathematics
THOMAS, DONALD, Morgan Hill, Chemistry
TOSCHI, CATHERINE A., San Francisco, Zoology
TRIBE, LAURENCE H., San Francisco, Mathematics
TURNER, GEORGE D., Berkeley, Earth Sciences
VANTILL, HOWARD J., Ripon, Physics
VIALE, RICHARD O., Sacramento, Biophysics
VICTOR, JUDITH C., Los Angeles, History and Philosophy of Science
VIDAVER, WILLIAM E., Pacific Grove, Physiology
WASHBURN, SHERWOOD, Berkeley, Mathematics
WATTERS, GARY Z., Mountain View, Engineering
WEIR, WILLIAM D., Arcadia, Chemistry
WEMPLE, QUINCY A., Jr., Poway, Botany
WERSEL, ORTWIN A., Los Angeles, Chemistry
WILLEMSEN, ELEANOR W., Palo Alto, Psychology
WILLIAMS, ROBERT E., Ontario, Astronomy
WILSON, WALTER D., Berkeley, Engineering
WOLF, JOSEPH A., Jr., Los Angeles, Engineering
WOLVERTON, FRANKLIN B., Pasadena, Physics
WOOD, LOWELL L., Jr., Simi, Chemistry
WRIGHT, ROBERT D., El Segundo, Botany
YURA, HAROLD T., Los Angeles, Physics
ZACHER, ALBERT R., Fresno, Physics
ZAVORTINK, THOMAS J., Los Angeles, Botany
ZUPP, RICHARD R., Stanford, Engineering
ZWICKY, ARNOLD M., Jr., Santa Maria, Social Sciences

Cooperative Graduate

ADAMS, WILLIAM W., Los Angeles, Mathematics
ANDERSON, DONALD W., Van Nuys, Mathematics
ARTHUR, JAMES A., Lotus, Genetics
BERICK, ALAN C., Ocean Park, Physics
BIEDERMAN, MARGUERITE A., Los Angeles, Physiology
BLACET, PHILIP M., Stanford, Earth Sciences
BRAUN, DONALD E., Fresno, Chemistry
BROOKES, JOHN A., Glendale, Microbiology
BROWN, ROBERT C., San Diego, Oceanography
BROWN, STEPHEN L., Palo Alto, Physics
BUCHHOLZ, JERRY R., Albany, Chemistry
CARTER, BENJAMIN P., Berkeley, Mathematics
CERESETO, SHIRLEY, Anaheim, Sociology
COCIVERA, MICHAEL, LOS ANGELES, Chemistry
COLE, RONALD S., Riverside, Chemistry
CONREY, KATHLEEN, St. Helena, Medical Sciences
COOL, TERRILL A., Pasadena, Engineering
COTTRELL, CALVERT B., Menlo Park, Anthropology
COVER, THOMAS M., San Bernardino, Engineering
CROW, STEVEN C., Arcadia, Engineering
DASHEN, ROGER F., Redding, Physics
DAVIDSON, JON R., Palo Alto, Psychology
DAVIS, STEPHEN L., Oakland, Biophysics
DEGASTON, ALEXIS N., Los Angeles, Physics
DELANY, JAMES E., San Diego, Mathematics
DENHARDT, DAVID T., Pasadena, Biophysics
EMERSON, WILLIAM R., Los Angeles, Mathematics
FITTS, AMELIA, Los Angeles, Sociology
FOSKET, DONALD E., Burbank, Botany
FOSTER, LORRAINE L., Pasadena, Mathematics
FRITSCH, FREDERICK N., Berkeley, Mathematics
FRITSCHE, ALBERT E., El Segundo, Earth Sciences
GEDDES, ROBERT N., Los Angeles, Engineering
GOULD, HARVEY A., Walnut Creek, Physics
GRANT, ALVA D., Claremont, Botany
GRAY, AUGUSTINE H., Jr., San Gabriel, Engineering
GRAY, LISA O., Hermosa Beach, Psychology
GROSS, FLETCHER I., La Canada, Mathematics

HALEY, KENNETH W., Oakland, Engineering
HARTRY, ARLENE L., Los Angeles, Psychology
HOLMQUIST, WALTER R., Pasadena, Biochemistry
HOPKINS, RICHARD L., Long Beach, Engineering
HORTON, FENN C., Jr., Covina, Economics
HOSLEY, EDWARD H., Glendale, Anthropology
HYGH, EARL H., Riverside, Physics
IVASKA, JOSEPH P., Jr., Santa Monica, Engineering
JANTSCHER, GERALD R., Fontana, Economics
JEWETT, ROBERT I., Venice, Mathematics
JOHNSON, ROBERT P., San Diego, Mathematics
KALB, AARON J., Davis, Chemistry
KENNEDY, ROBERT P., La Canada, Engineering
KLEIN, STANLEY A., Ontario, Physics
KRUSE, ROBERT L., Pasadena, Mathematics
LAMPTON, MICHAEL L., Santa Monica, Physics
LARRABEE, RICHARD B., Sacramento, Biochemistry
LUMING, MAX, San Diego, Physics
MACLAUGHLIN, DOUGLAS E., Berkeley, Physics
MARSHALL, LEE A., Rialto; Zoology
MATTHEWS, JOHN W., Inglewood, Engineering
MCCLAIN, JAMES W., El Cerrito; Engineering
MCLAUGHLIN, THOMAS G., Los Angeles, Mathematics
MIKA, THOMAS S., Orinda, Engineering
MILLER, DARLIS A., Pico Rivera, Anthropology
MOCHIZUKI, HORACE Y., Madera, Mathematics
MOCK, WILLIAM L., Santa Ana, Chemistry
NEARING, JAMES C., Inglewood, Physics
NIES, RICHARD C., Glendale, Psychology
NOVELLO, JOSEPH, Stanford, Mathematics
OLMSTED, JOHN D., Riverside, Biology
OSGOOD, CHARLES F., Berkeley, Mathematics
REYHNER, THEODORE A., Chico, Engineering
RICHARDS, WILLIAM R., Atascadero, Chemistry
RIDER, DANIEL G., Santa Ana, Mathematics
ROBINSON, NORMAN O., JR., San Pedro, Engineering
ROCK, PETER A., Berkeley, Chemistry
RODRIGUEZ, SERGIO E., West Covina, Engineering
ROHRER, RONALD A., Berkeley, Engineering
RUPLEY, WILLIAM H., Orinda, Mathematics
SCHIMBOR, RICHARD F., Walnut Creek, Chemistry
SCHNEIDER, RONALD A., Menlo Park, Chemistry
SHERWOOD, ARNOLD I., San Diego, Physics
SHIPSEY, EDWARD J., Chico, Chemistry
SILVERSTONE, DAVID E., Los Angeles, Mathematics
SLOBIN, STEPHEN D., San Marino, Engineering
SOOHOO, KEITH M., Los Angeles, Engineering
SOULE, MICHAEL E., Los Altos Hill, Biology
SPAID, FRANK W., Altadena, Engineering
STEVENS, CALVIN H., Los Angeles, Earth Sciences
STUPIN, WALTER J., Montebello, Engineering
TAMMARU, IVO, Los Angeles, Physics
TAYLOR, JAMES G., Reseda, Engineering
THOMAS, SALLY H., Los Angeles, Mathematics
TUCKER, VANCE A., Los Angeles, Biology
ULRICH, BRUCE T., El Cerrito, Physics
WATERS, ANNETTE J., Compton, Botany
WEINER, ROBERT M., Los Angeles, Engineering
WEISS, CARL D., Claremont, Engineering
WELSH, LAWRENCE B., Berkeley, Physics
WENGER, DANIEL L., Los Angeles, Physics
WILLIAMS, BROWN F., Riverside, Physics
WILLOUGHBY, ERNEST J., Santa Monica, Zoology
WILT, JOHN R., Los Angeles, Chemistry
WINN, WILLIAM P., Arcadia, Physics
WITT, GERALD L., Berkeley, Physics
YALE, IRL K., Berkeley, Mathematics
YARUS, MICHAEL J., Pasadena, Biophysics
ZELVER, JACK S., Berkeley, Mathematics

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ADAMSON, DAVID S., El Segundo, Engineering
ALTMAN, STUART H., Los Angeles, Economics
BEUS, STANLEY S., Los Angeles, Earth Sciences
BIEDERMAN, MARGUERITE A., Los Angeles, Physiology
BUSH, C. ALLEN, Berkeley, Chemistry
CASS, THOMAS R., Berkeley, Engineering
CLAYTON, JUDITH A., Los Angeles, Zoology
COCCHIARELLA, NINO B., Los Angeles, History and Philosophy of Science
DEWITT, HUGH H., Stanford, Zoology
DIAZ, ARTHUR F., Calexico, Chemistry
DISKIN, MARTIN, Santa Monica, Anthropology
ENGLEMAN, E. MARK, Davis, Botany
ERNST, RICHARD L., Berkeley, Economics
EVANS, KENNETH J., Riverside, Zoology
FISCHER, LAWRENCE J., San Francisco, Chemistry
GHENT, EDWARD D., Berkeley, Earth Sciences
GORDON, DUDLEY C., II, Los Angeles, Sociology
HAMERSKI, JULIAN J., Stockton, Chemistry
HENDRICKS, MARVALEE M., Santa Ana, Zoology
HOLLISTER, LINCOLN S., Pasadena, Earth Sciences
HOLMES, ROBERT E., Castro Valley, Chemistry
HOPPER, JON D., Los Angeles, Mathematics
KELLER, BONNIE B., Berkeley, Anthropology
KIEFER, BARRY I., Berkeley, Zoology
KURBIN, DAVID C., Beverly Hills, History and Philosophy of Science
LANG, BRUCE Z., Central Valley, Zoology
LAWRENCE, JOHN F., Oakland, Zoology
LEONS, MADELINE B., Los Angeles, Anthropology
MARK, ALBYN K., Palo Alto, Anthropology
MCCLANAHAN, LONNIE L., Riverside, Zoology
NIES, RICHARD C., Glendale, Psychology
NOWER, LEON, Palo Alto, Mathematics
OGLESBY, LARRY C., Atascadero, Zoology
OWYANG, RAYMOND, Palo Alto, Chemistry
PARKER, ROBERT A., San Gabriel, Astronomy
PARKINSON, MICHAEL T., San Francisco, Physics
PEPIN, ROBERT O., Berkeley, Physics
REINMAN, FRED M., Los Angeles, Anthropology
RIPKA, WILLIAM C., Long Beach, Chemistry
ROBERTSON, LEWIS C., Los Angeles, Mathematics
ROHNER, RONALD P., Stanford, Anthropology

ROSE, MARY E., Madera, Biology
RUSSO, BERNARD, Los Angeles, Mathematics
SALTIEL, JACK, North Hollywood, Chemistry
SCHEIBE, KARL E., Berkeley, Psychology
SCHMID, STUART G., Santa Monica, Economics
SCHULMAN, GARY I., Palo Alto, Sociology
SINGLETON, ROBERT E., Pasadena, Mathematics
SUTTLES, GERALD D., Hollywood, Sociology
SWEET, HAROLD A., Pasadena, Zoology
TROUTMAN, JOHN L., Mount View, Mathematics
TYLER, STEPHEN A., Palo Alto, Anthropology
VANHECKE, GERALD R., Rosemead, Chemistry
VERMEER, DONALD E., Berkeley, Earth Sciences
WARD, CHARLES D., Artesia, Psychology
WARD, DAVID M., Stanford, Engineering
WARNER, KENNETH K., Bakersfield, Mathematics
WARSHAW, MYRON, Berkeley, Chemistry
WEBER, GERALD I., Los Angeles, Economics
WIGGINS, NANCY A., Portola Valley, Psychology
WILKES, HILBERT G., Jr., North Hollywood, Botany
WILLIAMS, GENE R., Davis, Botany
WRIGHT, HOWARD O., Berkeley, Zoology

Postdoctoral

BAKER, BILLY R., Palo Alto, Engineering
BATES, DAVID M., Los Angeles, Botany
BLOOMFIELD, VICTOR A., Cotati, Chemistry
BOULWARE, DAVID G., Lafayette, Physics
BRONSON, WANDA C., Berkeley, Psychology
BROWN, MELANCTHON S., Stanford, Chemistry
DESILVA, ALAN W., Berkeley, Physics
EISENBERG, JOHN F., Berkeley, Zoology
EVLETH, EARL M. Jr., Fullerton, Chemistry
FARIS, JESSE E., Davis, Economics
GRIFFITHS, ROBERT B., Stanford, Physics
HALES, ALFRED W., Pasadena, Mathematics
HONE, DANIEL W., San Francisco, Physics
KENNEDY, KENNETH A., Berkeley, Anthropology
KIETZMAN, MITCHELL L., Los Angeles, Psychology
LANDGREBE, JOHN A., San Francisco, Chemistry
LESLIE, CHARLES M., Claremont, Anthropology
MCNEILL, GLENN D., Sebastopol, Psychology
MEERON, EMMANUEL, Northridge, Physics
MICHEL, FRANCIS W., Palo Alto, Pathology
NEWMAN, WILLIAM A., Berkeley, Zoology
NIERLICH, DONALD P., Santa Monica, Microbiology
OSBORNE, PHILLIP W., Albany, Engineering
OUELLETTE, ROBERT J., Albany, Chemistry
PARKER, ROBERT A., San Gabriel, Astronomy
PETERSON, DONALD L., Fresno, Chemistry
RAMSAY, WILLIAM C., Los Angeles, Physics
RESNIKOFF, HOWARD L., Berkeley, Mathematics
STERNLICHT, HIMAN, Pasadena, Chemistry
TOCHER, JAMES L., Albany, Engineering
WAINWRIGHT, STEPHEN A., Berkeley, Zoology
WATTENBURG, WILLARD H., Berkeley, Engineering
WEIL, JON D., Davis, Genetics
WILCOX, BENJAMIN A., Barstow, Engineering

Senior Postdoctoral

BARNES, CHARLES A., Pasadena, Physics
CANN, HOWARD M., Palo Alto, Genetics
CHANG, CHEN CHUNG, Los Angeles, Mathematics
DOWS, DAVID A., Los Angeles, Chemistry
FOOSE, RICHARD M., Palo Alto, Earth Sciences
GOULD, EDWIN S., Palo Alto, Chemistry
GUMPERZ, JOHN J., Berkeley, Social Sciences
HUNGATE, ROBERT E., Davis, Microbiology
KUH, ERNEST S., Berkeley, Engineering
MAJOR, JACK, Davis, Botany
MORTIMER, ROBERT K., Berkeley, Genetics
MOTZKIN, THEODORE S., Los Angeles, Mathematics
MYSELS, KAROL J., Los Angeles, Chemistry
NOYES, HENRY P., Livermore, Physics
PINE, JEROME, Palo Alto, Physics
REGNERY, DAVID C., Palo Alto, Genetics
ZADEH, LOTFI A., Berkeley, Engineering

Science Faculty

ARMIN, L. CLAIR, Reedly, Zoology
BEEMAN, ROBERT D., Pomona, Biology
BELL, JAMES M., Pasadena, Engineering
BLOUNT, GEORGE H., Santa Barbara, Physics
BRONSON, GORDON W., Oakland, Psychology
BUSHNELL, LEONARD, San Jose, Engineering
CALLINAN, JOSEPH P., Los Angeles, Engineering
CAMPBELL, JAMES L., Van Nuys, Zoology
CARPELAN, LARS H., Riverside, Biology
CLARK, DAVID E., Fresno, Chemistry
COLES, GEORGE R., Jr., San Pablo, Anthropology
COOPER, GRANT S., Pomona, Chemistry
DANFORTH, CHARLES G., Glendale, Zoology
EUSTIS, ROBERT H., Palo Alto, Engineering
FRYER, EDWARD M., Claremont, Physics
GABRIEL, LESTER H., Berkeley, Engineering
HAWKINS, THEODORE M., Berkeley, Microbiology
HUANG, FRANCIS F., San Jose, Engineering
HURLEY, CARL R., Sacramento, Chemistry
KULJIAN, ERNEST S., Woodland Hills, Chemistry
LAY, L. CLARK, Fullerton, Mathematics
LINDBERG, LOIS H., San Jose, Microbiology
MCNEIL, ROBERT L., San Jose, Engineering
MERKEL, RUDOLPH B., Davis, Mathematics
MITCHELL, LLOYD J., Fullerton, Chemistry
NEHER, ROBERT T., La Verne, Botany
OGREN, JOHN R., San Luis Obispo, Physics
O'NEILL, THOMAS B., Ventura, Oceanography
PARTAIN, GERALD L., Arcata, Agricultural Sciences
PAULING, JOHN R., Jr., Berkeley, Engineering
PRATHER, RONALD E., Palo Alto, Mathematics
REISMAN, ARNOLD, Los Angeles, Physics
REYHNER, THEODORE O., Chico, Engineering
RIGGLE, EVERETT C., Chico, Mathematics

Summer Fellowships for Secondary School Teachers

BOVIE, RUSSELL C., Arcadia, Chemistry
CRANE, JULES M., Los Angeles, Biology
DINKEL, ROBERT E., Culver City, Mathematics
GAWLIK, SR. M. EVELYN, Sante Fe Springs, Microbiology
GOLDSTEIN, MO. MARIE L., Los Angeles, Mathematics
HOFFER, ALLAN R., Los Angeles, Mathematics
HOSHIZAKI, BARBARA J., Los Angeles, Botany
KENNEDY, BRO. HUGH, Fresno, Mathematics
KLANN, WALTER E., Lakeside, Mathematics
LACEY, SR. ANGELA M., Oakland, Mathematics

LANE, FREDERIC V., San Fernando, Mathematics
LA RUE, LEONARD G., Santa Maria, Mathematics
LEMMON, ROBERT D., Kerman, Earth Sciences
MELANDER, WAYNE A., San Bernardino, Zoology
MILLS, DAVID S., Union City, Mathematics
MITCHELL, ROBERT E., Riverside, Zoology
NOBLE, EDWIN F., Lakeside, Mathematics
NORTON, JERRY L., Montclair, Biology
O'MAHONEY, SR. DE LOURDES, Playa Delrey, Mathematics
PEASE, JACK G., San Jose, Mathematics
RHODES, LEE W., Santa Maria, Biology
ROHLFFS, SUSAN C., Pasadena, Mathematics
ROSSI, BRO. R. AUGUSTUS, Sacramento, Biochemistry
RUNION, HOWELL I., Stockton, Biology
SMITH, DEBOYD L., Norwalk, Biology
TAKASUGI, MITSUO, Los Angeles, Biology
TOVISSI, JOSEPH A., Fresno, Mathematics
URTON, JOHN T., Lafayette, Microbiology
WILSON, CHARLES O., Manhattan Beach, Zoology
WIRT, ELIOT, San Jose, Mathematics
ZWIJACZ, SR. M. AMANDETTE, Pomona, Mathematics

COLORADO

Graduate

BARTH, THEODORE J., Colorado Springs, Mathematics
BELL, JOSEPH C., Denver, Mathematics
CHAPPELL, WILLARD R., Boulder, Physics
DEWEY, C. FORBES, Jr., Pueblo, Engineering
GRAUE, DENNIS J., Wheat Ridge, Engineering
HAWLEY, CHARLES C., Lakewood, Earth Sciences
IRWIN, HENRY J., Denver, Anthropology
KJELDGAARD, EDWIN A., Brush, Chemistry
KRIEGER, HENRY A., Denver, Mathematics
LAMPHERE, LOUISE A., Denver, Anthropology
MCKINNIS, RALPH W., Boulder, Mathematics
MEENTS, MARIEL R., Colorado Springs, Chemistry
NAYLOR, RICHARD S., Denver, Earth Sciences
POWELL, ROBERT L., Boulder, Physics
REYNOLDS, MITCHELL W., Denver, Earth Sciences
SHIER, GEORGE D., Golden, Chemistry
SOWARDS, JACK W., Morrison, Engineering
STONE, GEORGE T., Cowdrey, Earth Sciences
YOUNG, CHAPMAN, III, Castle Rock, Earth Sciences
YOUNG, ELTON T., II, Denver, Biochemistry

Cooperative Graduate

BEM, DARYL J., Denver, Psychology
BERKELEY, PETER J., Jr., Boulder, Chemistry
BIONDINI, PATRICIA E., Colorado Springs, Genetics
BIRKY, CARL W., Jr., Fort Collins, Genetics
GUADAGNO, JAMES R., Boulder, Engineering
HILL, DANIEL A., Fort Collins, Physics
KEISER, VICTOR H., Jr., Boulder, Mathematics
MANNING, DEAN D., Grand Junction, Microbiology
ROBINSON, CLARENCE W., Jr., Pueblo, Engineering
RUSSELL, KENNETH C., Wellington, Engineering
TAUSSIG, MICHAEL K., Pueblo, Economics

Summer Fellowships for Graduate Teaching Assistants

CONNOR, JON J., Boulder, Earth Sciences
DEKOSTER, GENE R., Golden, Earth Sciences
DIEBOLD, FRANK E., Golden, Earth Sciences
GILLES, ALBERT P., Jr., Golden, Earth Sciences
HAY, ARTHUR J., Denver, Chemistry
HELMAN, WILLIAM P., Grand Junction, Chemistry
KLOPFENSTEIN, KENNETH F., Fort Collins, Mathematics
ORMES, JONATHAN F., Colorado Springs, Physics
PERRY, JAMES W., Boulder, Chemistry
PRATHER, THOMAS L., Boulder, Earth Sciences
ULRICH, GEORGE E., Boulder, Earth Sciences

Postdoctoral

CORNWALL, JOHN M., Denver, Physics
WEBB, GEORGE D., Denver, Physiology

Senior Postdoctoral

SALISBURY, FRANK B., Fort Collins, Physiology
WALKER, THEODORE R., Boulder, Earth Sciences

Science Faculty

AAS, WALLACE, Greeley, Physics
CAMPBELL, JOHN A., Fort Collins, Earth Sciences
CLEVELAND, JOHN M., Boulder, Astronomy
DANGELO, HENRY, Denver, Engineering
FLACK, JOHN E., Boulder, Engineering
GILMAN, THEODORE S., Boulder, Chemistry
KINDIG, NEAL B., Boulder, Engineering
LORD, PAUL A., Boulder, Engineering
WOLFF, ERNEST N., Fort Collins, Earth Sciences

Summer Fellowships for Secondary School Teachers

BREMMER, DALE A., Lakewood, Physics
KIENLEN, GEORGE F., Denver, Mathematics
THEIMER, WILLIAM C., Jr., Denver, Psychology
VAN DYKE, MARTIN, Denver, Chemistry

CONNECTICUT

Graduate

ACHENBACH, THOMAS M., Wethersfield, Psychology
ANDEEN, GERRY B., New Canaan, Engineering
BARTLES, BARBARA J., Bristol, Physics
BASSO, KEITH H., Weston, Anthropology
BERGER, TOBY, New Haven, Mathematics
BRITTON, JOHN P., Bloomfield, History and Philosophy of Science
DEFOREST, TABER, Jr., New London, Physics
EVANSON, JACOB T., New Haven, Psychology
FLYNN, GEORGE W., Jr., Hartford, Chemistry

FRIEDMAN, KENNETH A., New Haven, Physics
FULTON, WILLIAM E., Darien, Mathematics
GILMAN, PETER A., Storrs, Meteorology
JOHNSTON, JOAN E., Ansonia, Zoology
KENNEDY, STARRETT C., Guilford Engineering
KLEY, RONALD J., New Britain, Earth Sciences
LABINE, PATRICIA A., Somers, Biology
LASKER, BARRY M., West Hartford, Astronomy
MAGID, RONALD M., New Haven, Chemistry
MERMIN, JOEL L., New Haven, Mathematics
NEWSOM, GERALD H., New Fairfield, Astronomy
NORTH, DANIEL W., Wilton, Physics
OAKS, EMILY C., New Haven, Zoology
PENCZER, RUDOLF E., Fairfield, Physics
POMERANTZ, MARTIN, New Haven, Chemistry
PROKOSCH, ERIC, Old Greenwich, Anthropology
RUNNELS, LYNN K., New Haven, Chemistry
SHAMROTH, STEPHEN J., West Hartford, Engineering
SHIELDS, ROBERT M., Jr., Darien, Earth Sciences
SHULMAN, MARC J., Hartford, Biophysics
SMACKEY, BRUCE M., Bridgeport, Engineering
TOTH, LOUIS E., Easton, Engineering
TSCHINKEL, WALTER R., Hamden, Biochemistry
TURRO, NICHOLAS J., Jr., Middletown, Chemistry
VIMMERSTEDT, JOHN P., West Haven, Agricultural Sciences
WEHMANN, ALAN A., Darien, Physics

Cooperative Graduate

ANDERSON, JAMES E., West Hartford, Chemistry
BRANDT, RICHARD G., Bristol, Physics
BURRICK, STEPHEN, Jr., Stratford, Engineering
CARLSON, RAYMOND G., New Haven, Engineering
CRAMPTON, STUART B., Greenwich, Physics
CROSS, JOHN G., Litchfield, Economics
EHRENPREIS, CHARLES, New Haven, Mathematics
FREEDMAN, DANIEL Z., West Hartford, Physics
FROST, PAUL A., Warehouse Point, Engineering
HASELTON, JARED D., Westport, Earth Sciences
HINTZ, HAROLD L., Hamden, Chemistry
KERBER, ROBERT C., Wethersfield, Chemistry
KERMES, JANE A., Darien, Earth Sciences
LERMAN, STEVEN H., Hartford, Physics
MODELL, MICHAEL, New Haven, Engineering
MUELLER, JOHN J., Thomaston, Chemistry
NACHTIGALL, GUENTER W., Norwalk, Chemistry
NORTON, LEWIS M., Cheshire, Mathematics
SHRIER, ADAM L., New Haven, Engineering
SILVER, LEONARD S., Bridgeport, Mathematics
TURNER, WILLIAM R., Storrs, Chemistry
WINICUR, SANDRA, Storrs, Biochemistry

Summer Fellowships for Graduate Teaching Assistants

BRUALDI, RICHARD A., Ansoma, Mathematics
BRUMAGHIM, STANLEY H., Niantic, Psychology

CARLSON, ALBERT W., West Hartford, Engineering
CATHEY, WADE T. Jr., Branford, Engineering
GUETHS, JAMES E., Storrs, Physics
HART, NATHAN H., West Cornwall, Zoology
JONES, MAITLAND, Jr., New Haven, Chemistry
LANDRY, ROBERT J., Norwich, Physics
MUNNELLY, TERENCE I., Coventry, Chemistry
PRUSSIN, STANLEY G., Bridgeport, Chemistry
RUTTER, EDGAR A., Jr., West Haven, Mathematics
VEBER, DANIEL F., New Haven, Chemistry

Postdoctoral

ALBERS, ROBERT J., Storrs, Chemistry
BALDWIN, DAVID E., West Hartford, Physics
HANSEN, EDWARD C., New Haven, Earth Sciences
PETTIT, FREDERICK S., New Haven, Engineering

Senior Postdoctoral

BUETTNER-JANUSCH, JOHN, New Haven, Genetics
COURANT, HANS W. J., New Haven, Physics

Science Faculty

DAVIS, WENDELL, Storrs, Engineering
DOWDELL, RODGER B., Bridgeport, Engineering
FRITZ, ANITA D., Storrs, Mathematics
GLAZIER, LYNN R., Storrs, Chemistry
JACOBSON, FLORENCE D., New Haven, Mathematics
SEBERA, DONALD K., Middletown, Chemistry

Summer Fellowships for Secondary School Teachers

CAPPEL, EDWARD D., Wilton, Botany
CARCHIDI, REV. RUDOLPH V., Bridgeport, Mathematics
GREEN, REV. JOHN W., Fairfield, Mathematics

DELAWARE

Graduate

CORCORAN, HENRY, New Castle, Engineering
KING, MERRILL K., Claymont, Engineering
LORAND, JOHN P., Wilmington, Chemistry

Cooperative Graduate

GINN, ROBERT F., Newark, Engineering
HORDIS, CHARLES K., Wilmington, Chemistry
INNES, JOHN E., Newark, Chemistry

Summer Fellowships for Graduate Teaching Assistants

JENNINGS, DON R., Wilmington, Engineering
ZAISER, JAMES N., Newark, Engineering

Senior Postdoctoral

TODD, CHARLES W., Wilmington, Biochemistry

Summer Fellowships for Secondary School Teachers

DAVIS, WILLIAM H., Georgetown, Mathematics
EISENBISE, CHARLES E., Wilmington, Mathematics

DISTRICT OF COLUMBIA

Graduate

BARKER, ROBERT H., Chemistry
BELSLEY, DAVID A., Economics
CLAGUE, CHRISTOPHER K., Economics
DARLEY, JOHN M., Psychology
DESJARDINS, RICHARD L., Physics
EASTON, WILLIAM B., Mathematics
GRAY, CHARLES A., Engineering
HEIDRICH, ARNOST, Mathematics
LEIGH, EGBERT G., Jr., Biology
MACNAMARA, JOHN P., Zoology
MUCKENTHALER, FLORIAN, Zoology
MUNROE, MARIAN H., Botany
PARKER, REBECCA A., Physics
RICE, JERRY M., Biochemistry
SENTURIA, STEPHEN D., Physics
SHAW, LAWRENCE H., Economics
SHEPLEY, LAWRENCE C., Physics

Cooperative Graduate

BELLMER, SR. ELIZABETH H., Botany
GILMER, LUDWELL H., Engineering
HARKNESS, RICHARD L., Jr., Physics
HILL, HOWARD T., Engineering
JANNEY, GARETH M., Physics
KEELER, THOMAS L., Jr., Zoology
MARLOW, ADDICKS R., Physics
SCHNEPFE, MARIAN M., Chemistry
SOMMERFELDT, EDWARD E., Physics

Summer Fellowships for Graduate Teaching Assistants

MORTON, JEAN S., Botany
ROGERS, AILENE K., Botany

Postdoctoral

RAPOPORT, STANLEY I., Physiology
THOMPSON, ERIC D., Physics

Senior Postdoctoral

GLASSER, ROBERT G., Physics

Science Faculty

BRANSON, HERMAN R., Physics
TAYLOR, MODDIE D., Chemistry

Summer Fellowships for Secondary School Teachers

FURMAN, JACQUELYN G., Biology
ROBINSON, MELBA B., Botany

FLORIDA

Graduate

BURKHARDT, THEODORE W., Nokomis, Physics
COBB, JOHN I. III, Tallahassee, Mathematics
DAVIS, JON A., Jacksonville, Engineering
DRUMMOND, PETER C., Gainesville, Zoology
ECHOLS, RONALD J., Naples, Earth Sciences
FOGEL, JOSEPH S., Pompano Beach, Chemistry
GRESENS, RANDALL L., Tallahassee, Earth Sciences
GUNTER, KARLENE K., Fort Lauderdale, Physics
HARVEY, CHARLES M., Atlantic Beach, Mathematics
JONES, JANET G., Vero Beach, Chemistry
KORBLY, LETITIA J., Tampa, Mathematics
LAMBERT, JERRY R., Live Oak, Engineering
NEALY, DAVID L., Sarasota, Chemistry
PALKE, WILLIAM E., St. Petersburg, Chemistry
ROBERTS, CHARLES S., Miami, Physics
ROGERS, ARTHUR H., Jr., Lockhart, Physics
SCOTT, THEA B., Micanopy, Genetics
SMALL, KENNETH H., Gainesville, Social Sciences
STRASEN, STEPHEN M., Sarasota, Mathematics
WAGONER, JOHN B., Jacksonville, Mathematics
WILLIS, FREDERICK C., Punta Gorda, Mathematics
ZAME, ALAN, Coral Gables, Mathematics

Cooperative Graduate

ANDERSON, JOHN D., Jr., Orlando, Engineering
ASHFORD, NICHOLAS A., Tampa, Chemistry
CHANDLER, RICHARD E., Miami, Mathematics
CHASTAIN, CHARLES H., Lakeland, History and Philosophy of Science
LADO, FRED, Gainesville, Physics
LIEBERMAN, MICHAEL A., Miami, Engineering
MCKINLEY, MARVIN D., Gainesville, Engineering
MCLAURIN, WILLIAM A., Tallahassee, Psychology
PARKER, FRANK W., Clearwater, Physics
PARRISH, JAN T., Miami, Psychology
PLOWMAN, KENT M., Miami, Physiology
RAGOSTA, MARJORIE E., Gainesville, Psychology
ROGERS, JUDITH L., Clearwater, Botany
SCHAPIRO, HARRIETTE C., Miami, Biochemistry
SHAMPINE, LAWRENCE F., Ocala, Mathematics
SMITH, DOUGLAS B., Gainesville, Engineering
STARCK, WALTER A., II, Islamorada, Zoology
TEITELMAN, WARREN, Miami, Mathematics
ULDRICK, JOHN P., Gainesville, Engineering
UMAN, MYRON F., Tampa, Engineering
WELLS, JOHN C., Jr., Winter Haven, Physics

Summer Fellowships for Graduate Teaching Assistants

DERTKE, MAX C., Coconut Grove, Psychology
FIENNING, WILLIAM C., Miami, Mathematics
LANGSTON, STEPHEN L., Cross City, Mathematics
LEVAN, MARIJO O., Pensacola, Mathematics
MALABY, JOHN E., Miami, Psychology
MEYER, JAMES W., Coral Gables, Physics
PAULSON, DENNIS R., Miami, Zoology
PAYNE, STANLEY E., Tallahassee, Mathematics
RIVERS, WILLIAM J., III, Jacksonville, Engineering
SELDEN, JOHN, Coral Gables, Mathematics
VANZANT, HOWARD C., Gainesville, Engineering
YOUNG, DONALD D., Miami, Psychology

Postdoctoral

DAVIDSON, CHARLES N., Tallahassee, Chemistry
FOX, FREDERICK J., Jr., Clermont, Medical Sciences
MCMILLAN, DANIEL R., Jr., Tallahassee, Mathematics

SCHMERTMANN, JOHN H., Gainesville, Earth Sciences

Science Faculty

KOEFOD, PAUL E., Gainesville, Economics
OLSSON, CARL N., Gainesville, Physics

Summer Fellowships for Secondary School Teachers

ALLISON, ELIZABETH L., West Hollywood, Mathematics
COLLINS, ELIZABETH L., Opalocka, Mathematics
GREGORY, DOROTHY R., Coral Gables, Biology
HERNANDEZ, MERCEDES, Brandon, Chemistry
HICKMAN, RICHARD J., Tampa, General Science
REMINGTON, LLOYD D., St. Petersburg, Chemistry
SWEET, RAYMOND W., Sarasota, Mathematics
WHITTON, ETTA M., Tallahassee, Mathematics

GEORGIA

Graduate

ANDERSON, ALBERT S., Atlanta, Physics
ANDERSON, WYATT W., Brunswick Biophysics
BRAMBLETT, JERRY E., Smyrna, Mathematics
BURNHAM, DEBORAH, Atlanta, Genetics
CORNWELL, JOSEPH D., Conyers, Physics
DELANY, VINCENT M., Elberton, Physics
FLOYD, MIDDLETON B., Decatur, Chemistry
HUGHES, NANCY C., Decatur, Biology
JACKSON, LELAND B., Atlanta, Engineering
LOWE, JOHN T., La Grange, Chemistry
SHEATS, JOHN E., East Point, Chemistry
SIMMONS, HARRY D., Jr., Athens, Chemistry
SMALLWOOD, EVELYN S., Atlanta, Chemistry
TAYLOR, SANDRA D., Arlington, Botany
WOODS, ROBERT C., III, Atlanta, Chemistry
YEARGERS, EDWARD K., Atlanta, Biophysics

Cooperative Graduate

ADAMS, JERRY M., Upatoi, Biochemistry
ALEXANDER, MARGERY F., Macon, Phychology
BURDICK, ROBERT O., Decatur, Mathematics
BURNS, HARRIS, Jr., Decatur, Chemistry
DICKERSON, STEVE L., Commerce, Engineering
ENGLAND, WILLIAM T., Columbus, Mathematics
FREEMAN, THOMAS L., Dahlonega, Physics
GARONI, LINDA W., Decatur, Botany
HUNTER, RAYMOND E., Moultrie, Physics
JOHNSON, ELLIS L., Athens, Mathematics
MOSS, WILLIE M., Atlanta, Physiology
RUTLEDGE, RONALD M., Decatur, Chemistry

Summer Fellowships for Graduate Teaching Assistants

HARPER, JUDSON M., Decatur, Chemistry
JONES, SAMUEL B., Jr., Roswell, Botany
LEITER, DARRYL J., Atlanta, Physics
PITTMAN, CHATTY R., Whitehall, Mathematics
SHARP, HOMER F., Jr., Covington, Biology
SLOAN, BEN L., Athens, Zoology
SPANN, EMMETT B., McRae, Mathematics
WALTON, RALPH D., Claxton, Genetics
WESTERMANN, TED D., Decatur, Sociology
YOUNG, MARTHA W., Rockmart, Chemistry

Senior Postdoctoral

HUMPHRIES, ASA A., Jr., Atlanta, Biology

Science Faculty

BARFIELD, BOBBY F., Atlanta, Engineering
LYNCH, DARREL L., Collegeboro, Chemistry
RIVERS, PRINCE, Savannah, Chemistry
TALBOT, THOMAS F., Atlanta, Engineering

Summer Fellowships for Secondary School Teachers

EVANS, DOROTHY R., Moultrie, Biology
HANDLEY, HERBERT, Brunswick, Biochemistry
MCCORMACK, SR. M. JOHN J., Augusta, Chemistry

HAWAII

Graduate

DEMANCHE, SR. MARY S., Honolulu, Biology
HENDERSON, NANINE S., Honolulu, Zoology
SMITH, MYRA O., Honolulu, Psychology
WAT, EDWARD K., Honolulu, Chemistry

Cooperative Graduate

OKIISHI, THEODORE H., Honolulu, Engineering
TSUNODA, JOYCE S., Honolulu, Biochemistry

Summer Fellowships for Graduate Teaching Assistants

CLARK, WAYNE N., Honolulu, Zoology

Summer Fellowships for Secondary School Teachers

BURDICK, ROBERT S., Honolulu, Mathematics
KATO, TADAYUKI, Lihue, Botany

IDAHO

Graduate

BLOOMSBURG, GEORGE L., Moscow, Engineering
BOWMAN, WALLACE N., Dietrich, Earth Sciences
EVANS, DENNIS R., Alameda, Engineering
MACKI, JACK W., Mullan, Mathematics
METTER, DEAN E., Moscow, Zoology
PACK, RUSSELL T., Grace, Chemistry
SALTZER, JEROME H., Nampa, Engineering
STOUT, EDGAR L., Lewiston, Mathematics
TAYLOR, LANCE J., Montpelier, Mathematics
VERNER, JARED, Moscow, Zoology

Cooperative Graduate

BOBISUD, LARRY E., Midvale, Physics
HANKS, DAVID L., Tetonia, Botany
JENSEN, CARL A., Pocatello, Chemistry
OTTESON, OTTO H., St. Anthony, Physics
SOUTH, DAVID J., Malad, Engineering
VANORDEN, NAOLA, Idaho Falls, Chemistry
WALL, ROBERT G., Boise, Chemistry

Summer Fellowships for Graduate Teaching Assistants

JENSEN, RONALD P., Pocatello, Chemistry
KUNZ, PHILLIP R., Bern, Sociology
NELSON, DAVID L., Rexburg, Botany

Science Faculty

RAUNIO, ELMER K., Moscow, Chemistry
COREY, GILBERT L., Moscow, Engineering
WILLIAMS, THOMAS L., Pocatello, Mathematics

Summer Fellowships for Secondary School Teachers

ESHELMAN, CLARENCE W., Caldwell, Zoology

ILLINOIS

Graduate

ADLER, NORMAN T., Chicago, Psychology
AKEMANN, CHARLES A., Elgin, Mathematics
ALBERTS, BRUCE M., Highland Park, Biophysics
ALTMAN, LAWRENCE J., Chicago, Chemistry
ANDERSON, THOMAS F., Chicago, Earth Sciences
ARMSTRONG, DONN R., II, Downers Grove, Engineering
AUST, RICHARD B., Elmhurst, Engineering
BACON, PHILIP, Wheaton, Mathematics
BARTIZAL, JANICE S., Berwyn, Biochemistry
BORISY, GARY G., Chicago, Biophysics
BRANDT, KARL G., Park Forest, Chemistry
BROOKS, PHILIP R., Hazel Crest, Chemistry
BROWN, BARRY W., Riverside, Mathematics
BRUCH, LUDWIG W., Winnebago, Physiology
BURDICK, MORTON L., Chicago, Zoology
BURMEISTER, EDWIN D., Park Ridge, Economics
BURNHAM, WILLETS M., Jr., Highland Park, Psychology
BYRNE, ROBERT J., Chicago, Oceanography
CARLSON, WAYNE R., Rockford, Genetics
CARTER, JEAN E., Urbana, Anthropology
CHMURNY, WILLIAM W., Westchester, Anthropology
CLARKE, THOMAS A., Peoria, Biology
CONNOLLY, YVONNE I., Evanston, Biochemistry
COPPOLA, PATRICIA T., Greenville, Zoology
CRAIN, ROBERT L., Chicago, Sociology
CUMMINS, JAMES N., Carbondale, Botany
CUSHING, JAMES T., Chicago, Physics
DAVIS, MICHAEL M., Peoria, Astronomy
DAY, MAHLON M., Urbana, Mathematics
DOUGLAS, AARON J., Evanston, Economics
DYROFF, DAVID R., Dupo, Chemistry
EDIDIN, MICHAEL A., Chicago, Zoology
EDMUND, MARY D., Rock Island, Microbiology
ERNEST, ROBERT L., Hinsdale, Economics
FAHEY, ROBERT C., Chicago, Chemistry
FAIRBANKS, GRANT, Jr., Urbana, Biophysics
FELDMAN, ALBERT, Chicago, Physics
GAINES, ROBERT E., Champaign, Mathematics
GARLAND, JAMES W., Jr., Chicago, Physics
GARRETT, VIRGINIA W., Champaign, Mathematics
GATES, GREGORY E., Chicago, Engineering
GENTLE, KENNETH W., La Grange Park, Physics
GISLASON, ERIC A., Oak Park, Chemistry
GOLIN, STUART J., Chicago, Physics
GRAY, BRAYTON I., Chicago, Mathematics
GUSTAFSON, ROBERT D., Elmhurst, Engineering
HANOR, JEFFREY S., Arlington Heights, Earth Sciences
HARMON, CHARLES E., Mendota, Physiology
HEIMBERG, RICHARD W., Urbana, Engineering
HETTINGER, THOMAS P., Aurora, Biochemistry
HOFFMAN, BRIAN M., Chicago, Chemistry
HOWE, ROBERT K., Kewanee, Chemistry
HUNT, RICHARD L., Chicago, Chemistry
JOHNSON, ROBERT P., Urbana, Chemistry
JOSEPHSON, KEITH B., Wheaton, Mathematics
KAHANE, ROBERTA T., Urbana, Sociology
KAPCHE, ROBERT W., Chicago, Psychology
KEARNS, THOMAS J., Northbrook, Mathematics
KEATING, JAMES T., Chicago, Chemistry
KLANDERMAN, BRUCE H., Urbana, Chemistry
KOONZ, ROBERT A., Downers Grove, Chemistry
KRAMER, SHELDON J., Chicago, Engineering
KULIK, JAMES A., Chicago, Psychology
KUST, ROGER N., Villa Park, Chemistry
LAROI, GEORGE H., III, Winnetka, Biology
LAUGHLIN, PATRICK R., Chicago, Psychology
LEAVER, FRANKLIN A., Bellwood, Chemistry
LEDERER, CHARLES M., Chicago, Chemistry
LEWIS, GENE L., Urbana, Mathematics
LIEB, WILLIAM R., Downers Grove, Physics
LOHMAR, PHOEBE H., Galesburg, Biochemistry
MAIER, WILLIAM B., II, Chicago, Physics
MALVEN, PAUL V., Kingston, Physiology
MARCHILDON, MICHAEL B., West Frankfort, Biochemistry
MCDONNELL, ROBERT N., Park Ridge, Physics
MCNAMARA, JAMES N., Chicago, Mathematics
MCWHINNIE, DOLORES J., Oak Park, Biology
MIDDAUGH, RICHARD L., Urbana, Chemistry
MODLER, ROBERT F., Chicago, Chemistry
MORRISON, DAVID D., Danville, Astronomy
MULLIN, MICHAEL M., Mt. Carroll, Biology
MURPHY, SR. M. NADINE, Chicago, Botany
NANCE, JON R., Urbana, Physics
NELSEN, STEPHEN F., Chicago, Chemistry
NICO, WILLIAM R., Oglesby, Mathematics
OLCOTT, RICHARD J., Chicago, Chemistry
OLIN, JOHN G., Chicago, Engineering
PALMER, JON C., Galva, Chemistry
PARKMAN, MARGARET A., Chicago, Sociology
PEDERSEN, EDWARD A., Chicago, Mathematics
POWERS, RICHARD J., Oak Park, Physics
RAPPE, DONALD E., Chicago, Mathematics
RECTOR, DAVID L., Carbondale, Mathematics
REHM, RONALD G., Glen Ellyn, Mathematics
REICHENBACHER, PAUL H., Aurora, Chemistry
RIEDL, JOHN O., Jr., Evanston, Mathematics
RINDFLEISCH, THOMAS C., Glencoe, Physics
RUST, MILBERN J., Chicago, Mathematics
SCHMIDT, LANNY D., Zion, Chemistry
SERAUSKAS, ROBERT V., Chicago, Chemistry
SHEPARD, HARVEY K., Chicago Physics
SHULT, ERNEST E., Urbana, Mathematics
SIMS, LESLIE B., Urbana, Chemistry
SMITHSON, SCOTT B., Glenview, Earth Sciences
SNYDER, NANCY S., La Grange, Physics
STANCL, DONALD L., Berwyn, Mathematics
STEBBINGS, JAMES H., East St. Louis, Biology
STEPHEN, KEITH H., Lake Bluff, Chemistry
STEVENS, WILLIAM G., Urbana, Chemistry
STRUNK, JACQUELINE D., Evanston, Psychology
STUART, GARY M., Normal, Economics

SULLIVAN, MARILYN P., Evanston, Physics
SWEENEY, WILLIAM J., Oak Park, Mathematics
SWITZER, ROBERT L., Orangeville, Biochemistry
TREFIL, JAMES S., Berwyn, Physics
TULEEN, NEAL A., Oak Park, Genetics
UEBBING, JOHN J., Chicago, Engineering
VANDEVELDE, JOSEPH R., Chicago, Mathematics
VOLZ, RICHARD A., Chicago, Engineering
WALTER, THEODORE A., Elmwood Park, Chemistry
WARD, CHARLES E., Wilmette, Physics
WEBBER, JOHN A., Oak Park, Chemistry
WEISSLEDER, WOLFGANG, Chicago, Anthropology
WHITAKER, SIDNEY H., Granville, Earth Sciences
WILDE, GEORGE R., West Chicago, Engineering
WINDMILLER, LEE R., Skokie, Physics
WISSMILLER, JOHN C., Cooksville, Engineering
WOBUS, REINHARD A., Belleville, Earth Sciences
YOUNG, JOSEPH L., Northbrook, Psychology

Cooperative Graduate

AVNER, RICHARD A., Charleston, Psychology
BAER, WALTER S., Glencoe, Physics
BERNSTEIN, EDWARD L., Chicago, Engineering
BRADLEY, JEROME D., Fairmount, Engineering
BRYA, WILLIAM J., Chicago, Engineering
CHANG, JULIUS S., Morton Grove, Physics
CLINE, EDWARD T., JR., Downer's Grove, Mathematics
COATES, ROBERT M., Palatine, Chemistry
COHEN, LEONARD S., Urbana, Engineering
CRAIG, RICHARD A., Savoy, Physics
CROSLEY, PHILLIP B., Chicago, Engineering
CROWDER, ROBERT G., Evanston, Psychology
DOOLEN, GARY D., Riverside, Physics
FITZGERALD, THOMAS J., Hometown, Engineering
GASSNER, RONALD L., Des Plaines, Engineering
HAGGSTROM, GUS W., Urbana, Mathematics
HART, DAVID M., Franklin, Chemistry
HELFINSTINE, ROBERT A., Champaign, Engineering
HENRY, CHARLES H., Champaign, Physics
HILL, JAMES L., Champaign, Engineering
HOFF, RAYMOND E., Libertyville, Chemistry
HUNT, JUDITH A., Urbana, Psychology
IMHOF, VIOLET I., Urbana, Chemistry
INTERRANTE, LEONARD V., Urbana, Chemistry
ISRAEL, MARTIN H., Chicago, Physics
JOHNSON, KURT P., Evanston, Engineering
JONES, WALTER L., La Grange, Meteorology
KEENAN, WILLIAM M., Des Plaines, Economics
LANGBERG, GEORGE, Urbana, Mathematics
LELLINGER, DAVID B., Wheeling, Botany
LENZI, ERNEST V., Farmington, Engineering
LINN, ROBERT L., Urbana, Psychology
MANTHEY, WILLIAM J., Chicago, Physics
MARCUS, SHELDON H., Chicago, Chemistry
MATHEWS, WESLEY N., Jr., Champaign, Physics
MATTESON, HALSEY H., Des Plaines, Psychology
MILES, FRANK B., Urbana, Chemistry
MORTON, RICHARD A., Elmhurst, Biophysics
MURPHY, THOMAS A., Kewanee, Biochemistry
NEES, MONICA R., Harvey, Chemistry
NELSON, WAYNE, B., Chicago, Mathematics
NEWMARK, RICHARD A., Urbana, Chemistry
NUTTALL, RONALD L., Downer's Grove, Psychology
OLSON, JOHN B., Urbana, Zoology
O'NEILL, WILLIAM P., Urbana, Chemistry
OOMS, VANDOORN, La Grange, Economics
OPFER, JAMES E., Shobonier, Physics
ORZECH, CHESTER E., Jr., Chicago, Chemistry
PENNER, SIDNEY, Chicago, Mathematics
PETROVICH, JOHN P., Cicero, Chemistry
PFEIFER, ROBERT J., Peoria, Physics
REINERS, WILLIAM A., Oak Lawn, Biology
ROBBIN, JOEL W., Chicago, Mathematics
ROCHESTER, LEON S., Chicago, Physics
SAMPLE, STEVEN B., Urbana, Engineering
SCHROEDER, ROLF R., Chicago, Engineering
SHAW, PAUL V., Urbana, Engineering
SHERMAN, MALCOLM J., Chicago, Mathematics
SHOEMAKER, VAUGHAN H., Urbana, Physiology
SPICER, LARRY D., Urbana, Chemistry
STEBEN, JOHN D., Champaign, Physics
STEINHARDT, MARYDELL M., Urbana, Chemistry
STONG, ROBERT E., Chicago, Mathematics
STRUEVER, STUART M., Chicago, Anthropology
SWENDSEN, JOANNE R., Pekin, Mathematics
UNDERBRINK, ALAN G., Quincy, Botany
VEATCH, ROBERT M., Evanston, Medical Sciences
VILLAREJO, MERNA R., Chicago, Biochemistry
WAGNER, PETER J., Wilmette, Chemistry
WEINER, HOWARD J., Chicago, Mathematics
WILDE, CARROLL O., Lombard, Mathematics
WILSON, PAUL D., Chicago, Psychology
WININGS, JOHN W., Jr., Decatur, Engineering
WINTERBAUER, WILLIAM L., Fancy Prairie, Engineering

Summer Fellowships for Graduate Teaching Assistants

ANDERSON, JOHN F., Urbana, Zoology
AQUILA, LOUIS E., Chicago, Mathematics
BECK, LOUIS M., Chicago, Sociology
BINFORD, LAURENCE C., Glencoe, Zoology
BORNHOFEN, JOHN O., Des Plaines, Economics
BUCKSON, RODNEY L., Champaign, Chemistry
BURMEISTER, EDWIN D., Park Ridge, Economics
CALKINS, JAMES L., Joliet, Psychology
CHIAPETTA, RICHARD L., Chicago, Engineering
COOK, THOMAS T., Chicago, Physics
COUTLEE, ELLEN L., Bourbonnais, Zoology
CRONIN, JEREMIAH A., Chicago, Physics
DAVIS, HARVEY S., Lombard; Mathematics
DAVIS, ROBERT D., Evanston, Engineering
DEASON, JAMES R., Mount Vernon; Chemistry
DILLARD, GARY E., Ridgway, Botany
DYKE, BENNETT, Chicago, Anthropology
FEIGL, DOROTHY M., Chicago, Chemistry
FENNER, GLORIA J., Chicago, Anthropology
GAJEWSKI, JOSEPH J., Chicago, Chemistry
GARRETT, CHARLES K., Chicago, Chemistry
GREENLEAF, JOHN E., Springfield, Physiology
GUTMAN, DAVID, Champaign, Chemistry
HALLECK, DIANNE K., Park Forest, Botany
HART, DAVID M., Franklin, Chemistry
HOFFMAN, MICHAEL P., Hillsboro, Anthropology

HOPPE, STEPHEN G., Evanston, Engineering
HUNGERFORD, THOMAS W., Chicago, Mathematics
KAIN, MARGARET A., Champaign, Earth Sciences
KAPLAN, DONALD R., Evanston, Botany
KLEM, RUSSELL D., Chicago, Physics
KOPPMAN, JERRY W., Champaign, Psychology
KOSHEL, RICHARD D., Argo, Physics
LABACH, WILLIAM A., Urbana, Mathematics
LARSEN, RONALD J., Chicago, Mathematics
LARSON, CARL S., Urbana, Engineering
LEEMING, FRANK C., Chicago, Psychology
LEVIN, DONALD A., Champaign, Botany
LINDEROTH, JANET, Palos Park, Zoology
LUEBBEN, GERTRUDE E., Belleville, Zoology
McCOWEN, Sr. MARIE, Belleville, Chemistry
McCOY, VERL E., Jr., La Grange, Chemistry
McHALE, THOMAS J., Urbana, Psychology
McNAMARA, JAMES N., Chicago, Mathematics
MELNYK, ANDREW R., Dixon, Physics
MICHEJDA, CHRISTOPHER J., Chicago, Chemistry
MIDDAUGH, RICHARD L., Urbana, Chemistry
MIZUNO, ELMER T., Chicago, Engineering
OLMSTEAD, WILLIAM E., Wilmette, Engineering
OZMENT, JAMES E., Stonefort, Botany
PARKER, NANCY R., Antioch, Zoology
PEDERSEN, DARHL M., Urbana, Psychology
REAM, CATHERINE H., Chicago, Biology
REICHLE, DAVID E., Evanston, Biology
RODABAUGH, DAVID J., Chicago, Mathematics
ROSSNER, LAWRENCE F., Chicago, Physics
SABEL, CHARLES L., Chicago, Psychology
SCHMEAL, WALTER R., Chicago, Engineering
SCHNYDERS, HAROLD C., Evergreen Park, Chemistry
SCHWARTZ, CARROLL J., Harrisburg, Earth Sciences
SCOTT, WARNER C., Macomb, Physics
SELLMYER, DAVID J., Monee, Physics
SHAY, DENNIS J., Chicago, Physics
SLEEMAN, LYLE H., Jr., Oak Lawn, Earth Sciences
STETTLER, H. LOUIS, III, Chicago, Economics
STEVENSON, GERALD L., Salem, Engineering
STUEBEN, EDWIN F., Chicago, Mathematics
TANGORA, MARTIN C., Evanston, Mathematics
TEXTORIS, DANIEL A., Urbana, Earth Sciences
THEILMAN, WARD, Champaign, Economics
THULLEN, ROBERT J., Chicago, Botany
UNDERBRINK, ALAN G., Quincy, Botany
VITULLO, VICTOR P., Chicago, Chemistry
WALLER, THOMAS R., Elmwood Park, Earth Sciences
WEBB, LAWRENCE E., Clarendon Hill, Chemistry
WEINER, HOWARD J., Chicago, Mathematics
ZIMMERMAN, ROBERT C., Wilmette, Geography

Postdoctoral

AUVIL, PAUL R., Jr., Wayne, Physics
BARKER, ALLEN V., McLeansboro, Botany
CALNEK, EDWARD E., Skokie, Anthropology
CAPPS, RICHARD H., Evanston, Physics
DOVE, WILLIAM F. Jr., Oak Park, Biochemistry
DUDLEY, RICHARD M., Flossmoor, Mathematics
EDWARDS, HAROLD M., Champaign, Mathematics
GRINNELL, ALAN D., Carbondale, Physiology
HILL, ROBERT N., Evanston, Physics
HITTLE, CARL N., Champaign, Agricultural Sciences
KARAKASHIAN, STEPHEN J., Champaign, Biochemistry
KERMICLE, JERRY L., Dundas, Biochemistry
KNILL, RONALD J., Chicago, Mathematics
KRIECKHAUS, EDWARD E., Urbana, Psychology
MORRISON, JAMES D., Evanston, Chemistry
PALMER, ROBERT H., Chicago, Biochemistry
PEIKERT, ERNEST W., Skokie, Earth Sciences
SCHANFIELD, SALLY R., Chicago, Anthropology
TRAPP, CHARLES A., Chicago, Chemistry

Senior Postdoctoral

AXEL, PETER, Urbana, Physics
BLAU, PETER M., Chicago, Sociology
BLOSS, F. DONALD, Carbondale, Earth Sciences
DEMOSS, RALPH D., Urbana, Genetics
HANRATTY, THOMAS J., Urbana, Engineering
McQUOWN, NORMAN A., Chicago, Anthropology
REED, GEORGE W., Jr., Chicago, Earth Science
SIEGERT, ARNOLD J. F., Evanston, Physics
STEIN, ELIAS M., Chicago Mathematics
WATTENBERG, ALBERT, Urbana, Physics

Science Faculty

BARNARD, HERBERT M., Urbana, Engineering
CARSON, ARTHUR M., Danville, Engineering
DIEKHANS, HERBERT H., Urbana, Mathematics
ETHERTON, ROBERT C., Carbondale, Physics
GREENWOOD, GEORGE W., Urbana, Engineering
HOBBS, BILLY F., Kankakee, Mathematics
HOFFMAN, ALBERT A. Jr., Chicago, Engineering
RAGLAND, GEORGE C., DeKalb, Mathematics
RESNIKOFF, GEORGE J., Chicago, Engineering
ROBERTS, A. WAYNE, Cicero, Mathematics
SCHRAGE, SAMUEL, Urbana, Chemistry
SIERK, HERBERT A., Jacksonville, Botany
SILBER, JACK, Chicago, Mathematics
SMOOT, RONALD L., Urbana, Engineering
SPITZNAS, ROGER L., Rock Island, Earth Sciences
WOODRUFF, ARTHUR E., Chicago, History and Philosophy of Science
YANCEY, THOMAS A., Urbana, Mathematics

Summer Fellowships for Secondary School Teachers

BOYER, ELIZABETH L., Villa Park, Mathematics
COBLENTZ, DWIGHT O., Northbrook, Mathematics
CRANG, RICHARD E., Palestine, Botany
EISENHAUER, LEON D., Urbana, Botany
GALLAGHER, SR. M. BLANCHE, Chicago, Mathematics
GOULD, DEAN L., Des Plaines, Mathematics
GRADOLF, TED T., Chicago, Mathematics
HARSHBARGER, DEAN E., Hillside, Mathematics
LADD, NORMAN E., Des Plaines, Mathematics
LOY, JAMES L., Madison, Biology
MASON, HILDA K., Chicago, Mathematics
MESKIMEN, IRVING C., Champaign, Mathematics
MOSER, ELIZABETH F., Winnetka, Microbiology
NICHOLS, JOHN W., Chicago, Mathematics

RANDALL, KARL T., Hinsdale, Mathematics
SHERMAN, JOHN R., McNabb, Biology
WORTHINGTON, JACQUELINE, Springfield, Biology

INDIANA

Graduate

ANDERSON, GERALD H., Hobart, Economics
ANDRYSIAK, CARL D., South Bend, Engineering
ARNOLD, EDOUARD P., South Bend, Earth Sciences
BADGER, JERRY D., Indianapolis, Mathematics
BARRICK, BARBARA A., Indianapolis, Microbiology
BECHTEL, JON H., Goshen, Engineering
BEHRMAN, JERE R., Richmond, Physics
BEINEKE, LOWELL W., Decatur, Mathematics
CARLSON, LEE A., Valparaiso, Mathematics
COCANOWER, ALFRED B., Osceola, Engineering
COOPER, MICHAEL T., Evansville, Physics
CORY, ROBERT P., Fortville, Biochemistry
CUFFEY, ROGER J., Bloomington, Earth Sciences
CURTIS, MYRON D., Mt. Vernon, Chemistry
CUSHMAN, DAVID W., Indianapolis, Biochemistry
DANIEL, JAMES W., South Bend, Mathematics
DYGERT, STEPHEN L., Fort Wayne, Biochemistry
FAN, DAVID P., West Lafayette, Biophysics
FISCH, MICHAEL H., Indianapolis, Chemistry
KINDSCHI, PAUL D., Marion, Mathematics
LEBO, JERRY A., Winamac, Engineering
LIPPS, BENNIE J., Connersville, Engineering
MARTIN, EDWARD S., Terre Haute, Chemistry
McCOY, JOAN K., Gary, Microbiology
MENDELSON, JOAN R., Bloomington, Genetics
MENNINGA, CLARENCE, Lafayette, Chemistry
MIXON, WILLIAM W., Hammond, Physics
MOBLEY, DONALD I., Indianapolis, Physiology
MOYER, NORMAN E., South Bend, Physics
OEXMANN, DALE F., Vincennes, Mathematics
OMILIANOWSKI, DANIEL, East Chicago, Biochemistry
OSBORN, THOMAS A., Marion, Physics
OWENS, FRANK W;, South Bend, Mathematics
PETERS, PHILIP C., Chesterton, Physics
PURSLEY, STEPHAN A., Indianapolis, Engineering
RAIN, DON W., Laporte, Engineering
RANDALL, ALWYN D., Indianapolis, Mathematics
REA, DAVID R., Russiaville, Engineering
ROOT, FORREST K., Bedford, Earth Sciences
SANDERS, WILLIAM A. Oxford, Chemistry
SCANLON, THOMAS M., Jr., Indianapolis, History and Philosophy of Science
SHERWOOD, BRUCE A., West Lafayette, Physics
SHUMAN, DAVID L., Pendleton, Psychology
SKELTON, JERRY P., Elberfeld, Engineering
SPARKS, PHILLIP D., West Lafayette, Botany
STEADHAM, MICHAEL A., Indianapolis, Chemistry
THOREN, VICTOR E., Bloomington, History and Philosophy of Science
TRYON, EDWARD P., Terre Haute, Physics
WHITCOMB, ALBERT R., South Bend, Mathematics
WILLIAMS, RICHARD R., Anderson, Engineering
WRIGHT, GENE R., South Bend, Biochemistry

Cooperative Graduate

AKERS, RONALD L., New Albany, Sociology
CIESAR, JAMES A., Indianapolis, Engineering
COHEN, LAWRENCE B., Indianapolis, Physiology
COULTER, LAWRENCE J., Frankfort, Engineering
DEIWERT, GEORGE S., Indianapolis, Engineering
DILLING, ROGER L., North Manchester, Physics
ELLIS, ROBERT L., Richmond, Mathematics
FERGUSON, JOHN A., Fowler, Biochemistry
FRIDAY, JOHN R., West Lafayette, Engineering
GAUNT, JOHN T., Evansville, Engineering
ICE, MALCOLM W., Chrisney; Engineering
JORDAN, ROBERT E., La Porte, Anthropology
KEOGH, MICHAEL J., West Lafayette, Chemistry
LINDBERG, DAVID C., Bloomington, History and Philosophy of Science
LISTER, WINSTON C., Preble, Engineering
MADEY, THEODORE E., South Bend, Physics
MAUDLIN, CHARLES E., Jr., Lebanon, Mathematics
McKINNEY, NORRIS P., Sheridan, Other Social Sciences
MELLICHAMP, DUNCAN A., Jr., West Lafayette, Engineering
MEYER, HAROLD D., Indianapolis, Engineering
MOSBY, JAMES F., Indianapolis, Engineering
NORTH, JAMES C., West Lafayette, Physics
RAAB, JACOB L., Elkhart, Physiology
RORABACHER, DAVID B., West Lafayette, Chemistry
STAMBAUGH, ROBERT L., Marion, Chemistry
STONER, RONALD E., Lafayette, Physics
WALLACE, SR. M. JEAN, Notre Dame, Zoology
WELDON, NORMAN R., West Lafayette, Economics
WEST, THOMAS E., Fort Wayne, Engineering
WHEELER, JOSEPH D., West Lafayette, Engineering
WHITE, HENRY E., Jr., Lafayette, Mathematics
WILLIAMS, JUDITH A., Valparaiso, Biology

Summer Fellowships for Graduate Teaching Assistants

ALEXANIAN, MOORAD, Bloomington, Physics
BARNES, GERALD J., West Lafayette, Engineering
BRINER, ROBERT C., Speed, Chemistry
BUCHANAN, JOHN E., Lafayette, Mathematics
BURLINGTON, ROY F., West Lafayette, Zoology
CANTRELL, BRUCE K., Bloomington, Physics
CLELAND, CHARLES F., Bloomington, Botany
CURTIS, BENNIS H., West Lafayette, Mathematics
DAMON, CAROLYN E., West Lafayette, Biochemistry
DEAN, EDWIN R., South Bend, Economics
EIDSWICK, JOHN A., West Lafayette, Mathematics
GUERNSEY, ROBERT W., JR., Indianapolis, Physics
IREY, RICHARD K., West Lafayette, Engineering
JOHNSEN, KATHRYN P., West Lafayette, Sociology
JOHNSON, LOWELL B., West Lafayette, Botany
LEININGER, WILLIAM J., West Lafayette, Economics

LOE, ROBERT W., Columbia City, Biochemistry
MCDONALD, ALAN T., West Lafayette, Engineering
NASH, ALLAN J., West Lafayette, Psychology
NEAL, WILLIAM J., Princeton, Earth Sciences
PHILLIPS, RONALD L., Crawfordsville, Genetics
SANDERS, CHARLES E., Indianapolis, Engineering
SCHROEDER, LEE S., Bloomington, Physics
SERVIS, KENNETH L., Lafayette, Chemistry
SNOW, ALICE A., West Lafayette, Sociology
SPEJEWSKI, EUGENE H., East Chicago, Physics
STALON, CHARLES G., West Lafayette, Economics
WERNSMAN, EARL A., West Lafayette, Genetics

Postdoctoral

BLIEDEN, HARRY R., Michigan City, Physics
BOLLE, DONALD M., West Lafayette, Engineering
BROWN, MORRIS, Bremen, Chemistry
STOVE, JEANNE L., Newcastle, Microbiology

Senior Postdoctoral

HODES, MARION E., Bloomington, Pathology
MAHLER, HENRY R., Bloomington, Biochemistry
NEWTON, ROGER G., Bloomington, Physics
ZARROW, MEYER, X., Lafayette, Physiology

Science Faculty

CANTIN, ADELORD J., Jr., Terre Haute, Mathematics
FAULKNER, M. C., Sr., Fort Wayne, Microbiology
KEIM, WAYNE F., Lafayette, Genetics
KING, RAY J., Fort Wayne, Engineering
MARX, IMANUEL, Lafayette, Mathematics
OLIVE, GLORIA, Anderson, Mathematics
WARK, KENNETH, Jr., Lafayette, Engineering

Summer Fellowships for Secondary School Teachers

ELLIS, GARNET G., Jr., Valparaiso, Mathematics
KIMMEL, MORTON G., Windfall, Biology
MAIERS, WESLEY W., Valparaiso, Mathematics
MONRAD, CONRAD, Sr., Fort Wayne, Mathematics
ODAFFER, PHARES G., Muncie, Mathematics
PATTERSON, MAGDALENE R., Charlestown, Mathematics
PRIGGE, JEAN, Bloomington, Mathematics
ROBINSON, KENNETH S., Oakland City, Physics
SEDGWICK, LLOYD C., Greentown, Mathematics
WAGENBLAST, RONALD J., Hammond, Mathematics

IOWA

Graduate

BERGE, GLENN L., Decorah, Astronomy
BERGEMAN, THOMAS H., Fort Dodge, History and Philosophy of Science
BERRYHILL, JOHN R., Council Bluffs, Physics
BRUMBAUGH, JOHN A., Ames, Genetics
CHRISTNER, JAMES E., Wellman, Biochemistry
DAUGHERTY, JACK D., Ottumwa, Engineering
DEBOER, CHARLES D., Ledyard, Chemistry
HAENSEL, HUBERT D., Ames, Agricultural Sciences
HANSON, FRIDOLF A., Des Moines, Anthropology
HODSON, HAROLD H., Jr., Ames, Agricultural Sciences
JOHNSON, KENT E., Davenport, Earth Sciences
KIME, CHARLES R., Clinton, Engineering
KNOX, MARY K., Iowa City, Mathematics
LANDWEBER, PETER S., Iowa City, Mathematics
LILLEHOJ, EIVIND B., Ames, Botany
LOKENSGARD, JERROLD P., Marshalltown, Chemistry
MILLER, DON H., Cedar Rapids, Mathematics
MILLER, RICHARD K., Clarinda, Mathematics
NICOLSON, DAN H., Shenandoah, Botany
NORDSTROM, JOHN D., Williamsburg, Chemistry
PHILLIPS, DAVID T., Algona, Physics
RECTOR, GARY D., Perry, Engineering
SPECKER, WAYNE H., Des Moines, Engineering
STEFFENSON, DANIEL M., Indianola, Chemistry
THOMAS, BRUCE R., Guthrie Center, Physics
THORNTON, MELVIN C., Storm Lake, Mathematics

Cooperative Graduate

BIRCHMIER, BEVERLY J., Bloomfield, Engineering
CHRISTENSEN, SUSAN B., Burlington, Mathematics
CHRISTIANSEN, GERALD E., Remsen, Physics
CLAMPITT, PHILIP T., Des Moines, Biology
DUVEN, DENNIS J., Orange City, Engineering
EILERS, LAWRENCE J., Iowa City, Botany
GABRIELSON, JAMES E., Ames, Engineering
GOBEN, CHARLES A., Chariton, Engineering
GOODMAN, MAJOR M., Des Moines, Genetics
GURALNIK, GERALD S., Cedar Falls, Physics
HANSON, FRANK E., Jr., Hawarden, Physiology
HENDRICKSON, HOWARD T., Davenport, Engineering
HOWREY, EUGENE P., Fairfield, Economics
JOHNSON, ROBERT W., Marathon, Engineering
KNOTT, THOMAS F., Iowa City, Physics
KRISTIANSON, BRYANT N., Ogden, Engineering
KRUEMPEL, KENNETH C., Independence, Engineering
LUTH, WILLIAM C., Winterset, Earth Sciences
MARK, JOAN T., Orange City, History and Philosophy of Science
MCINTOSH, JAMES R., Keosauqua, Engineering
NORTHUP, LARRY L., Gray, Engineering
REMPE, JANICE E., Pella, Physiology
ROTHROCK, RICHARD B., Des Moines, Engineering
TENNANT, JERRY R., Burnside, Engineering
THYSELL, RICHARD V., Iowa City, Psychology
TROTT, CAROLYN M., Iowa City, Mathematics
WEAR, RICHARD R., Keokuk, Engineering

Summer Fellowships for Graduate Teaching Assistants

BOES, ARDEL J., Wall Lake, Mathematics
CASSIDY, JOHN J., Iowa City, Engineering

CRANE, ROGER L., Ames, Mathematics
CUNNING, JOE D., Mount Ayr, Engineering
FARLEY, ROGER D., Iowa City, Zoology
FUGATE, JOSEPH B., Coralville, Mathematics
JACOBSEN, GLENN D., Ottosen, Zoology
JOHNSEN, ALFRED W., Ames, Engineering
KEMPER, GENE A., Ames, Mathematics
LUTHER, NORMAN Y., Iowa City, Mathematics
MICHENER, MARGARET J., Iowa City, Botany
PAYTON, CHARLES E., Minburn, Earth Sciences
SMITH, PAUL E., Spirit Lake, Biology
WALTMANN, WILLIAM L., Cedar Falls, Mathematics
WHITE, EDWARD J., Grinnell, Engineering

Postdoctoral

KASPERBAUER, MICHAEL J., Manning, Botany
KLAPPER, GILBERT J., Iowa City, Earth Sciences
MARTIN, JOSEPH M., Keokuk, Mathematics
STUDIER, FREDERICK W., Waverly, Biophysics
SWIFT, TERRENCE J., Dubuque, Chemistry
THOMAS, DAVID L., Iowa City, Sociology

Senior Postdoctoral

FRENCH, DEXTER, Iowa City, Biochemistry

Science Faculty

DANOFSKY, RICHARD A., Iowa City, Engineering
LORENZ, PHILIP J., JR., Fayette, Physics
PILGRIM, DONALD H., Decorah, Mathematics
ROBINSON, RICHARD E., Ames, Physics
VAUGHAN, EDWIN M., Davenport, Physics

Summer Fellowships for Secondary School Teachers

DE WITTE, SR. M. THEOPHIL, Remsen, Biology
JENSEN, THOMAS E., Greene, Botany
KELLER, SR. M. KENNETH, Sioux City, Mathematics
McCOY, SR. M. BRIAN, Council Bluffs, Mathematics
POWELL, JOHN E., Correctonville, Mathematics
PROUSE, HOWARD L., Iowa City, Mathematics
WHITTENBAUGH, ROBERT C., Red Oak, Chemistry

KANSAS

Graduate

ANDERSON, JAMES A., Burden, Mathematics
BARRETT, BRUCE R., Kansas City, Physics
BERRY, WILLIAM H., Shawnee Mission, Mathematics
COON, CLIFFORD L., Lawrence, Chemistry
CORNELIUS, ARCHIE J., Manhattan, Engineering
CRAWFORD, BRUCE W., Leawood, Engineering
FEARING, HAROLD W., Lawrence, Physics
GARLAND, JOHN K., Lawrence, Chemistry
GERRIETS, CARL E., Clay Center, Mathematics
GUSTAVSON, DAVID B., Clay Center, Physics
HAYES, DENNIS E., Mission, Earth Sciences
HEIDER, KARL G., Lawrence, Anthropology
JOHNSON, GARY L., Osage City, Engineering
KEVAN, LARRY J., Shawnee Mission, Chemistry
KITTRELL, JAMES R., Arkansas City, Engineering
KOCH, RICHARD M., Haven, Mathematics
LESSOR, DELBERT L., Wakeeney, Physics
MANTEY, PATRICK E., Sharon Springs, Engineering
NELSON, CRAIG E., Mankato, Zoology
PANNBACKER, RICHARD G., Washington, Biochemistry
ROSS, HAROLD M., Shawnee Mission, Anthropology
RUPF, JOHN A., Wichita, Engineering
SIMMONS, GERALD M., Parsons, Engineering
SPENCER, JOHN B., Topeka, Chemistry
STRAHAN, ROBERT F., Pittsburg, History and Philosophy of Science
TEFFT, WAYNE E., Emporia, Physics
WALTERS, WILLIAM B., Highland, Chemistry
WIENS, ALVIN W., Hillsboro, Physiology
WILLIS, HAROLD L., Shawnee Mission, Zoology
WRAY, JERALD J., Norton, Physics
ZIMMERMAN, JOHN F., Lawrence, Chemistry

Cooperative Graduate

BEDENBENDER, JOHN W., Colony, Engineering
CHAPPELL, JOHN E., Jr., Topeka, Geography
DURBIN, JOHN R., Lawrence, Mathematics
GRIFFITH, SUSAN J., Shawnee Mission, Zoology
HARMS, VERNON L., Lawrence, Botany
HOBSON, ARTHUR S., Manhattan, Physics
HYSLOP, ROBERT S., Jr., Kansas City, Engineering
JOHNSON MILFORD A., Jr., Iola, Engineering
LEHMAN, JOHN W., McPherson, Chemistry
LONG, JOHN A., Winfield, Zoology
MAILEN, JAMES C., Wichita, Engineering
MERRITT, PHILIP N., Kansas City, Mathematics
POWER, BILLY J., Lawrence, Mathematics
REMPLE, ROBERT K., Lawrence, Mathematics
SMITH, DEAN L. Jr., Topeka, Engineering
STRAHM, NORMAN D., Wichita, Engineering
WEIDMAN, DONALD R., Kansas City, Mathematics

Summer Fellowships for Graduate Teaching Assistants

CHAPPELL, GILFORD A., Wichita, Chemistry
DURBIN, JOHN R., Lawrence, Mathematics
ENGLAND, JAMES W., Pittsburg, Mathematics
FELTS, KENNETH W., Dodge City, Sociology
FOGLE, BEVERLY D., Manhattan, Sociology
KAESLER, ROGER L., Lawrence, Oceanography
OSTLIND, DAN A., Manhattan, Zoology
SAUER, HARRY J., Jr., Manhattan, Engineering
SMITH, EDWIN B., Lawrence, Botany
STUTH, CHARLES J., Lawrence, Mathematics
TAYLOR, BERT A., Plainville, Mathematics
TRAIN, CARL T., Manhattan, Zoology
VAN DER VOORN, PETER C., Wichita, Chemistry
VAN SANT, JAN F., Lawrence, Earth Sciences
WALLER, RAY A., Manhattan, Mathematics
YORK, LEROY J., Garden City, Mathematics

Postdoctoral

APPEL, DAVID W., Lawrence, Engineering
ROHLF, FRANK J., Lawrence, Zoology
VIOLA, VICTOR E., Jr., Abilene, Chemistry

Senior Postdoctoral

SEARLES, SCOTT Jr., Manhattan, Chemistry

Science Faculty

COOK, EVERETT L., Wichita, Engineering
GLASS, WILLIAM A., Emporia, Physics
JONES, DON B., Lawrence, Engineering
RICE, JIMMY M., Lawrence, Mathematics
WATKINS, IVAN W., Hays, Physics

Summer Fellowships for Secondary School Teachers

HALL, DARRELL D., Kingman, Biology
HUNTER, LARRY O., Sedgwick, Mathematics
JOHNSON, HOWARD M., Lawrence, Mathematics
LOVE, HARRY S., Jr., Wichita, Botany
MARTIN, THOMAS W., Wichita, Mathematics
MERANDO, JIMMY G., Kingman, Mathematics
NATIONS, CLAUDE, Jr., Wichita, Biology
RAMSEY, JED, Jr., Minneapolis, Biology
ROTH, STANLEY D., Jr., Lawrence, Biology
WILSON, JAMES W., Emporia, Mathematics

KENTUCKY

Graduate

BAGBY, STEADMAN T., Jr., Lexington, Mathematics
BALDWIN, JON M., Covington, Chemistry
BURCKEL, ROBERT B., Louisville, Mathematics
DIERCKES, ALBERT C., Covington, Engineering
FANGMAN, WALTON L., Louisville, Physiology
KEISTER, WILLIAM P., Louisville, Engineering
MALONE, PHILIP G., Louisville, Earth Sciences
MARRS, JO R., Nicholasville, Chemistry
MITTENTHAL, JAY E., Louisville, Biophysics
SKILES, DURWARD D., Lexington, Physics
TAYLOR, WALTER F., Louisville, Mathematics
THOMAS, JESS B., Jr., Frankfort, Physics
WARFIELD, ROBERT B., Lexington, Mathematics
WELLS, BENJAMIN F., III, Lexington, Mathematics
WESTBROOK, THOMAS R., Louisville, Mathematics
WHITESIDES, GEORGE M., Anchorage, Chemistry

Cooperative Graduate

BEINEKE, THOMAS A., Fort Thomas, Chemistry
BEBLEKAMP, ELWYN R., Fort Thomas, Engineering
CANON, ARDATH B., Louisville, Chemistry
GORDON, PETER E., Louisville, Physics
HARBISON, KENNETH G., Louisville, Chemistry
HOHMAN, BENEDICT, Sr., Louisville, Chemistry
HORTON, ROBERT E., Mayfield, Chemistry
LEISURE, BOBBY G., Cromwell, Physics
LOGAN, MARY E., Lexington, Mathematics
LUCHETA, ROGER A., Louisville, Engineering
MONROE, BURT L., Jr., Anchorage, Zoology
OSBORNE, THOMAS L., Paducah, Engineering
REKER, JOSEPH R., Louisville, Engineering
RICHARDSON, MARY F., Barbourville, Chemistry
RODGERS, GEORGE C., Jr., Louisville, Chemistry
RUPARD, EVELYN F., Winchester, Mathematics
SCHWEITZER, JOHN W., Covington, Physics
SMITH, WILLIAM H., Louisville, Chemistry
WAUGH, MORGAN S., Louisville, Engineering

Summer Fellowships for Graduate Teaching Assistants

BEALS, RALPH E., Lexington, Economics
CAMPBELL, JOHN M., Hopkinsville, Zoology
DANIELS, JUDITH S., Covington, Microbiology
KING, JERRY P., Murray, Mathematics
LEISURE, BOBBY G., Cromwell, Physics
PFALTZGRAFF, JOHN A., Lexington, Mathematics
RODGERS, GEORGE C., Jr., Louisville, Chemistry
SECREST, IVAL W., Trinity, Mathematics
WALLACE, JAMES T., Maysville, Zoology
WEBER, EDWIN C., Louisville, Chemistry

Science Faculty

BARNES, ALBERT H., Louisville, Engineering
BREIGHNER, M. T., Sr., Louisville, Mathematics
MASON, HARRY L., Lexington, Engineering
ZUCKER, ROBERT D., Louisville, Engineering

Summer Fellowships for Secondary School Teachers

CAMERON, Sr. MARCELLA, Louisville, Mathematics
CULBERTSON, WILLIAM J., Salyersville, Mathematics
GRENNAN, PAUL M., Sr., Louisville, Mathematics
MACK, JOEL C., Lexington, Mathematics
WHITEHOUSE, Sr. CATHERINE S., Louisville, Chemistry

LOUISIANA

Graduate

BAZAR, DAVID M., Abbeville, Mathematics
BLANCHARD, PAUL A., II, New Orleans, Physics
CARROLL, KEITH J., New Iberia, Physics
CONWAY, EDWARD D., III, New Orleans, Mathematics
CONWAY, JOHN B., New Orleans, Mathematics
CRUMPLER, MARY G., New Orleans, Zoology
DUCHAMP, DAVID J., St. Martinville, Chemistry
EGGLER, DAVID H., New Orleans, Earth Sciences
FRICKEN, RAYMOND L., New Orleans, Physics
GRAHAM, LEWIS T., JR., Lafayette, Biochemistry
HODGESON, JIMMIE A., Baker, Chemistry
HOLDEMAN, LOUIS B., Baton Rouge, Physics
MCGEHEE, OSCAR C., Baton Rouge, Mathematics
MERRILL, SAMUEL, III, Bogalusa, Mathematics
PALERMO, LOUIS G., New Orleans, Engineering
STOESSELL, ALFRED L., Crowley, Physics
TEMPLE, DANIEL B., Ruston, Mathematics
THEALL, GARY E., Abbeville, Mathematics
THROWER, PAUL H., Shreveport, Mathematics

Cooperative Graduate

ALBRITTON, JOSEPH A., Baton Rouge, Engineering
BROOKS, ROBERT M., New Orleans, Mathematics
DEBRUEYS, LEE G., New Orleans, Engineering
DENBY, CLIFFORD L., Natchitoches, Physics
KIRBY, ALBERT C., Baton Rouge, Physiology
LAMBERT, HELEN H., Baton Rouge, Physiology
MASON, PERRY S., Baton Rouge, Chemistry
SCHORR, THOMAS S., New Orleans, Anthropology
SETTLES, RONALD D., Baton Rouge, Physics
THERIOT, EDWARD D., JR., Baton Rouge, Physics
WARD, PHYLLIS L., New Orleans, Anthropology
WEAVER, RICHARD H., New Orleans, Engineering
WISH, MYRON, New Orleans, Psychology

Summer Fellowships for Graduate Teaching Assistants

ALLEN, JOHN E., Jonesboro, Mathematics
BLACK, JOE B., New Orleans, Zoology
BREITENBACH, EUGENE A., Lafayette, Engineering
HAMILTON, JANET V., New Orleans, Chemistry
HARRISON, JOHN W., Sulphur, Physics
MARX, MORRIS L., Bogalusa, Mathematics
MOBBERLY, WILLIAM C., Jr., New Orleans, Physiology
WILLARD, THOMAS M., New Orleans, Chemistry
WISH, MYRON, New Orleans, Psychology

Postdoctoral

GRAHAM, EDWARD W., Natchitoches, Chemistry
GUTHRIE, ROBERT D., New Orleans, Chemistry

Senior Postdoctoral

KUPFER, DONALD H., Baton Rouge, Earth Sciences

Senior Faculty

ADLER, EDWARD S., Jr., Baton Rouge, Engineering
CLARK, ROY W., Baton Rouge, Chemistry
MANNING, THOMAS A., Jr., Baton Rouge, Engineering
VLIET, DANIEL H., New Orleans, Engineering
YANG, MYRON H., Baton Rouge, Engineering

Summer Fellowships for Secondary School Teachers

COLLIER, LOUIS M., Calhoun, General Science
MELTON, MARTHA C., Shreveport, Mathematics
PORTER, WILLIS B. JR., New Iberia, Mathematics
RUCKER, JOHN M., Lake Charles, Mathematics
STOTHART, JIMMY R., Coushatta, Zoology

MAINE

Graduate

BROWER, JOHN H., Augusta, Zoology
BURNS, STEPHEN H., Friendship, Engineering
MAGUE, JOEL T., Milbridge, Chemistry
MULLINS, NICHOLAS C., Eliot, Sociology
O'CONNOR, BRIAN R., Lewiston, Chemistry
SAMPSON, SCHUYLER S., Portland, Mathematics
TRAFTON, PAUL J., Southwest Harbor, Engineering

Cooperative Graduate

FURROW, STANLEY D., Bangor, Chemistry
GAGNON, JOHN R., Upper Frenchville, Engineering
LEVINSON, ELIZABETH J., Orono, Psychology
MCCOMBE, BRUCE D., Sanford, Physics
TOWNES, HARRY W., Auburn, Engineering

Summer Fellowships for Graduate Teaching Assistants

BOWMAR, JOHN M., Jr., Orono, Chemistry
BURNS, EDWARD R., Orono, Zoology
EDE, ALAN W., Bangor, Engineering

Science Faculty

MILNE, CHARLES M., Orono, Engineering

Summer Fellowships for Secondary School Teachers

BOURASSA, MO. CLOTILDE A., Waterville, Mathematics
MOTT, ROBERT R., Hebron, Mathematics

MARYLAND

Graduate

BLUM, EDWARD H., Silver Spring, Engineering
BOWMAN, CRAIG T., Rockville, Engineering
BROWN, STANLEY G., Kensington, Physics
CARBAUGH, DONOVAN C., Clear Spring, Engineering
CLEMENT, DAVID E., Baltimore, Psychology
CUMMINGS, FRANK E., Silver Spring, Chemistry
DOBSON, PETER N., Jr., Baltimore, Physics
DOWLING, ELIZABETH E., Silver Spring, Physics
DWYER, THOMAS F., Baltimore, Engineering
FENTRESS, JOHN C., Potomac, Biology
FISHER, GEORGE W., Suitland, Earth Sciences
FRIEDMAN, WILLIAM A., Silver Spring, Physics
HALL, BARBARA C., Baldwin, Social Sciences
HARWOOD, SALLIE A., Riverdale, Mathematics
HAUSER, MICHAEL G., Silver Spring, Physics
HEBB, MATHILDE J., Butler, Physics
HESS, MILTON S., Baltimore, Engineering
HOLLAND, NICHOLAS D., Chevy Chase, Physiology
HONN, JESSIE M., Baltimore, Phychology
HOROWITZ, JOSEPH, Silver Spring, Mathematics
HUGHES, ANTHONY C., Catonsville, Mathematics
JULIAN, CARL L., Hagerstown, Physics
KANTOR, PAUL B., Silver Spring, Physics

Knapp, Anthony W., Baltimore, Mathematics
Lloyd, Wayne B., Baltimore, Engineering
Melson, William G., East Riverdale, Earth Sciences
Olivier, Donald C., Bethesda, Mathematics
Owings, James C., Jr., Riderwood, Mathematics
Pittman, Michael E., College Park, Physics
Quarles, Richard H., Towson, Biochemistry
Rector, Charles W., Baltimore, Physics
Russey, William E., Baltimore, Chemistry
Singleterry, Ann M., Bethesda, Mathematics
Strathdee, John A., Army Chemical Center, Physics
Taylor, Howard M., III, Baltimore, Mathematics
Thomas, Charles G., Bethesda, Mathematics
Wells, Robert, Bethesda, Mathematics
Wing, Charles G., Baltimore, Oceanography
Wolf, Robert A., Chillum, Mathematics

Cooperative Graduate

Bradley, Hugh E., Towson, Engineering
Bursey, Maurice M., Baltimore, Chemistry
Corcoran, John P., Jr., Baltimore, History and Philosophy of Science
Dibella, Carlos A., Hyattsville, Engineering
Hartle, James B., Baltimore, Physics
Hertz, Kenneth J., Silver Spring, Mathematics
Julian, Glenn M., Hagerstown, Physics
Levin, Simon A., Baltimore, Mathematics
Lord, Peter H., Baltimore, Mathematics
McGroddy, James C., West Hyattsville, Physics
Olsson, Martin G., College Park, Physics
Poole, John T., College Park, Mathematics
Rice, James R., Frederick, Engineering
Roberts, William A., Silver Spring Psychology
Roush, Marvin L., Greenbelt, Physics
Russell, Robert A., Abell, Engineering
Silverman, Robert A., Takoma Park, Chemistry
Slifker, James F., Baltimore, Mathematics
Smith, William B., College Park, Engineering
Spector, Marshall, Baltimore, History and Philosophy of Science

Summer Fellowships for Graduate Teaching Assistants

Bowen, Zeddie P., Baltimore, Earth Sciences
Dougherty, Hugh J., Baltimore, Engineering
Hertel, George R., Baltimore, Chemistry
Kozakoff, Emily G., College Park, Mathematics
Moore, Lucius L., Jr., Baltimore, Medical Sciences
Roberts, William A., Silver Spring, Psychology
Rude, Sonia S., Hyattsville, Physiology
Solomon, Gene B., Baltimore, Zoology
Weintraub, Daniel J., Baltimore, Psychology
Whitten, David G., Baltimore, Chemistry

Postdoctoral

Brehm, John J., Jr., Silver Spring, Physics
Castellan, Gilbert W., Cheverly, Chemistry
Cohen, Maimon M., Hyattsville, Genetics
Lenchek, Allen M., College Park, Physics
Weinacht, Richard J., College Park, Mathematics

Science Faculty

Brown, Joshua R., College Park, Biophysics
Fields, Clarence J., Baltimore, Psychology

Summer Fellowships for Secondary School Teachers

Breedlove, Clarence H., Jr., Rockville, Chemistry
Poscover, Benjamin F., Towson, Biology
Sanford, Lewis R., Rockville, Chemistry
Thornton, Mary B., Baltimore, Mathematics

MASSACHUSETTS

Graduate

Albert, Richard H., Dorchester, Chemistry
Austin, Michael E., Weymouth, Engineering
Baker, Kirby A., Winchester, Mathematics
Berger, Edmond L., Salem, Physics
Bohmer, Harold, Jr., Amherst, Earth Sciences
Bovee, Barbara J., Needham, Psychology
Budnitz, Robert J., Pittsfield, Physics
Buffington, Andrew, East Walpole, Physics
Bush, Guy L., Cambridge, Zoology
Chase, Theodore, Jr., Dover, Biochemistry
Clarridge, Jill E., Lynnfield, Zoology
Coe, Robert S., Chatham, Earth Sciences
Coffey, John J., Watertown, Zoology
Cole, William C., Jr., Winthrop, Engineering
Collins, Edward J., Warrtown, History and Philosophy of Science
Conlon, Lawrence W., Boston, Mathematics
Covitz, Frank H., Malden, Chemistry
Davison, Gerald C., Brookline, Psychology
Dix, Michael W., Wayland, Physiology
Drinks, Janis, Newton Highland, Mathematics
Earle, Elizabeth D., Cambridge, Botany
Eikenberry, Eric F., Arlington, Biophysics
Evensen, David A., Gardner, Engineering
Fahey, Joseph R., Boston, Economics
Fedders, Peter A., Dover, Physics
Federer, Charles A., Belmont, Agricultural Sciences
Feldman, Paul A., Chelsea, Physics
Fetz, Eberhard E., Boston, Physics
Fuchs, Norman H., Boston, Physics
Fuglister, Frederick, Woods Hole, Mathematics
Gates, David F., Needham Heights, Economics
Gell, Jonathan M., Cambridge, Anthropology
Gerstmann, Joseph, Brighton, Engineering
Gintis, Herbert M., Cambridge, Mathematics
Godchaux, Walter, III, Cambridge, Biology
Guertin, Ralph F., Indian Orchard, Physics
Hammer, Lois R., Cambridge, Psychology
Harris, Grady W., Cambridge, Engineering
Hartwell, Leland H., Somerville, Biochemistry
Higgins, Richard J., Reading, Engineering
Hollins, Clinton G., North Andover, Engineering
Horn, Henry S., Cambridge, Biology
Hortmann, Alfred G., Cambridge. Chemistry

JOHNSON, KENNETH D., Pittsfield, Mathematics
JOHNSTON, GORDON S., Andover, Genetics
KALNAJS, AGRIS J., Newton Centre, Astronomy
KLEIMAN, STEVEN L., Marblehead, Mathematics
KRESGE, DAVID T., Framingham, Economics
LEARY, JOHN J., South Deerfield, Mathematics
LOCKSHIN, RICHARD A., Northampton, Physiology
LYNCH, THOMAS J., Quincy, Chemistry
MACLEOD, ELLIS G., Lexington, Zoology
MASTERS, STANLEY H., Winchester, Economics
MAURER, ROBERT E., Belmont, Engineering
MCCALL, GEORGE J., Cambridge, Psychology
MICHAELS, SR. ELIZABET, Boston, Mathematics.
MILLER, ALFRED E., Cambridge, History and Philosophy of Science
MOORE, PETER B., Brookline, Biophysics
MUTCHLER, GORDON S., Cambridge, Physics
NELSON, RALPH D., Jr., Westboro, Chemistry
NORTON, STEPHEN A., Westwood, Earth Sciences
OBERLANDER, HERBERT, Everett, Physiology
PAOLI, THOMAS L., New Bedford, Engineering
PARADIS, STEPHEN G., Cambridge, Engineering
PRINCE, JULIAN F., Newton, Mathematics
RALLS, KENNETH M., Cambridge, Engineering
RICHARDSON, JONATHAN, Harwich Port, Zoology
ROOT, STEPHEN C., Winchester, Engineering
ROTHKOPF, MICHAEL H., Newton, Economics
SAVIN, SAMUEL M., Newton Highland, Earth Sciences
SEGRE, GINO C., Cambridge, Physiology
SHNIDMAN, SUSAN R., Allston, Psychology
SINGER, HARVEY A., Newton Centre, Engineering
SMITH, ALLAN L., Boston, Chemistry
SOUTHARD, JOHN B., Cambridge, Earth Sciences
STUART, THOMAS W., III, Holliston, Chemistry
SULLIVAN, JEREMIAH D., Foxboro, Physiology
SULLIVAN, PAUL F., Natick, Physics
SUO, MIKIO, Watertown, Engineering
SWIGERT, ROGER D., Mattapan, Chemistry
THOMAS, LEE C., Austin, Engineering
WADE, DAVID C., Somerville, Engineering
WARNER, JONATHAN R., Boston, Biophysics
WEINER, ROBERT A., Cambridge, Physics
WEINER, STEPHEN D., West Newton, Physics
WEINSTEIN, HERBERT G., Swampscott, Engineering
WILKINSON, CHARLES K., Danvers, Mathematics
WOOD, BENJAMIN H., Jr., West Springfield, Engineering
YEGIAN, CHARLES D., Amherst, Biophysics

Cooperative Graduate

AHERN, MICHAEL F., East Braintree, Astronomy
BONVINI, GLADYS H., Boston, Biology
BURGIEL, JOSEPH C., Ware, Physics
CLARK, RALPH M., Jr., Amherst, Zoology
COLTHART, JAMES D., Whitinsville, Engineering
CONLEY, BRENDA S., Cambridge, Biology
CRABTREE, DOUGLAS E., Needham, Mathematics
DALBY, HENRY O., Jr., Brighton, Chemistry
FONTANA, ALAN F., Quincy, Psychology
FOX, HERBERT L., Hyde Park, Physics
GROCKI, JOHN J., Chicopee, Chemistry
HARRINGTON, THOMAS M., Dorchester, Mathematics
HASKINS, DAVID E., Arlington, Engineering
LOONEY, ROBERT E., Revere, Physics
MEISTER, BERNARD J., Maynard, Engineering
ORMISTON, ALLEN R., Bedford, Earth Sciences
PECK, NEWTON T., Waban, Mathematics
RHOADES, RICHARD G., Northampton, Engineering
SCHURZ, DANIEL R., Cambridge, Engineering
THARP, LESLIE H., Boston, Mathematics
THOMAE, IRVING H., Attleboro, Biophysics
TRASK, NEWELL J., Belmont, Earth Sciences
WARNER, FRANK W., III, Watertown, Mathematics
WEILBACHER, CAROL A., Chicopee, Earth Sciences
WHITE, DAVID P., Watertown, Engineering
YATES, ROBERT A., Southbridge, Engineering

Summit Fellowships for Graduate Teaching Assistants

BOUCHER, FRANCIS R., Taunton, Chemistry
BURKE, JAMES J., Jr., Northampton, Chemistry
BUSH, GUY L., Cambridge, Zoology
COHEN, EDWARD L., Brookline, Mathematics
DONOGHUE, JOHN T., Holyoke, Chemistry
DURICK, SANDRA J., Springfield, Botany
FOWELL, ELVIN M., Westwood, Botany
FREEDMAN, MARVIN I., Mattapan, Mathematics
GORDON, WALTER R., Salem, Earth Sciences
HENRY, NANCY E., Auburn, Chemistry
JETTER, KATHARINE B., Boston, Chemistry
JUTRAS, MICHEL W., Springfield, Agriculture
LIVINGSTON, ALBERT E., Arlington, Mathematics
LONGHI, RAYMOND, Plymouth, Chemistry
MACLEOD, ELLIS G., Lexington, Zoology
PHIPPS, ALAN M., Framingham, Chemistry
POWERS, EDWARD J., Pittsfield, Chemistry
RALLS, KATHERINE S., Cambridge, Physiology
REGIS, ANGELA J., Peabody, Microbiology
SAVAGE, DONALD T., Miller Falls, Economics
STARR, NORTON L., Watertown, Mathematics
WELCH, DEAN E., Salisbury, Chemistry
WHITMAN, WALTER W., Pittsfield, Mathematics
WYNNE, ALFRED M., Amherst, Chemistry

Postdoctoral

ABERNATHY, FREDERICK H., Cambridge, Engineering
BERMANT, HOWARD G., Arlington, Psychology
CARPENTER, CHARLES B., Melrose, Medical Sciences
FINK, RICHARD D., Brookline, Chemistry
GUILLEMIN, VICTOR W., Belmont, Mathematics
HENRY, GEORGE R., Pittsfield, Physics
KAY, PAUL D., Somerville, Anthropology
MANNIS, FRED, Cambridge, Physics
POWELL, JAMES L., Cambridge, Earth Sciences
RHODES, JOHN L., Brookline, Mathematics
SCHICK, FREDERIC J., Cambridge, History and Philosophy of Science
SEGRE, GINO C., Cambridge, Physics
SILVER, SIMON D., Watertown, Biophysics

VASQUEZ, ALPHONSE T., Braintree, Mathematics

Senior Postdoctoral

BROWN, EDGAR H., Jr., Waltham, Mathematics
GARRELS, ROBERT M., Cambridge, Earth Sciences
HELD, RICHARD M., Waltham, Psychology
HOLMES, FRANCIS W., Amherst, Botany
KANDEL, ERIC R., Boston, Physiology
LICHTIN, NORMAN N., Boston, Chemistry

Science Faculty

ARONS, ARNOLD B., Amherst, History and Philosophy of Science
BARR, MICHAEL D., Amherst, Mathematics
DEWEY, DANIEL G., Worcester, Mathematics
FEENEY, WALTER J., Chestnut Hill, Mathematics
KROPF, ALLEN, Amherst, Chemistry
MARCUS, JOSEPH S., Amherst, Engineering
MAWSON, JOSEPH C., Amherst, Agriculture
McCAULEY, RITA N., Boston, Biology
PARK, DAVID A., Williamstown, Physics
TESSMAN, JACK R., Medford, Physics
TRUESWELL, RICHARD W., Amherst, Engineering
WALTER, MARION I., Boston, Mathematics

Summer Fellowships for Secondary School Teachers

COLT, LEBARON C., Jr., Dedham, Botany
CONNOR, ROGER T., Boston, Mathematics
ECCLES, FRANK M., Andover, Mathematics
FAVORITE, WILLIAM F., Wilbraham, Mathematics
GATES, DAVID A., Orleans, Zoology
MARTIN, SR. M. ELIZABETH T., North Cambridge. Chemistry
SORENSEN, SR. M. INCARNATE, Attleboro, Chemistry

MICHIGAN

Graduate

ANDERSEN, CARL M., Richmond, Physics
ANDERSON, PETER G., Midland, Mathematics
ANGER, THOMAS E., Marysville, Economics
ARLINGHAUS, FRANCIS J., Detroit, Chemistry
BALL, RICHARD J., Owosso, Psychology
BECK, WILLIAM F., Lansing, Engineering
BIALLAS, MICHAEL J., Pontiac, Chemistry
BROOKS, ELAINE R., Fremont, Physiology
BROWN, VERNE R., Birmingham, Engineering
BUFF, CHARLES G., Sault Ste. Marie, Earth Sciences
COBURN, LEWIS A., Ann Arbor, Mathematics
DEIBERT, MAX C., St. Johns, Engineering
DEWITT, CALVIN B., Ann Arbor, Biology
FALICK, ARNOLD M., Detroit, Chemistry
FERRAR, JOSEPH C., Okemos, Mathematics
FLEURY, PAUL A., Detriot, Physics
FREEMAN, RICHARD D., Jr., Midland, Mathematics
GEORGE, JAMES P., Southfield, Physics
GILMAN, FREDERICK J., East Lansing, Physics
GUSSIN, GARY N., Detroit, Biophysics
GUYER, MELVIN J., Detroit, Psychology
HAAS, TERRY E., St. Johns, Chemistry
HAMILTON, SAMUEL T., Wayne, Engineering
HENDERSON, SUSAN W., Pleasant Ridge, Zoology
HINTON, FREDERICK L., Yale, Physics
HOGH, GOTTFRIED, Detroit, Zoology
HUBBARD, JOHN P., Ann Arbor, Zoology
JOKIPII, JACK R., Ironwood, Physics
KEANA, JOHN F., Benton Harbor, Chemistry
KELLY, ROBERT C., St. Joseph, Chemistry
KNUTSON, ROGER M., East Lansing, Botany
KURCZYNSKI, THADDEUS, Hamtramck, Anthropology
LILLYA, CLIFFORD P., Ann Arbor, Chemistry
LOWRY, GEORGE G., Midland, Chemistry
MAKI, DANIEL P., Negaunee, Mathematics
MASON, LARRY G., Wyandotte, Zoology
McILRATH, THOMAS J., East Lansing, Physics
MINTZ, LEIGH W., Ann Arbor, Earth Sciences
MURPHY, CHARLES L., Jr., East Lansing, Engineering
NOWLIN, JULIA M., Flint, Mathematics
OPASKAR, CARL G., Jr., Wayne, Physics
OPOKA, CAROLYN M., Wyandotte, Chemistry
OWENS, JAMES C., Grosse Pointe, Physics
PARIZEK, ROBERT J., Bay City, Engineering
PETRIE, TED E., Lansing, Mathematics
RUESINK, ALBERT W., Adrian, Botany
RUITER, EARL R., Grand Rapids, Engineering
SCULLEN, ROBERT S., Birmingham, Engineering
SILBAR, RICHARD R., Fenton, Physics
SLOBIN, DAN I., Detroit, Psychology
SLOVIC, STEWART P., Ann Arbor, Psychology
SMITH, JEROME A., Lansing Engineering
SPITZER, ROBERT H., Jr., Detroit, Engineering
TELLER, ANDREW S., Ann Arbor, Engineering
VEDEJS, EDWIN, Grand Rapids, Chemistry
VEECH, WILLIAM A., Pleasant Ridge, Mathematics
WASIUTYNSKI, CHRISTOP, Grosse Pointe, Mathematics
WEBSTER, DALE A., Wyandotte, Biochemistry
WHITE, LEE J., Merrill, Engineering
WINKLER, HERBERT H., Farmington, Medical Sciences
YORK, FRANKLYN W., Grand Rapids, Psychology
ZIER, ROBERT E., Detroit, Physics

Cooperative Graduate

ALLARD, MARVEL J., Grosse Pointe Woods, Psychology
ANDREWS, RONALD A., Pontiac, Physics
BEEBE, GEORGE W., East Lansing, Chemistry
BEIRNE, PATRICK D., Detroit, Chemistry
BLASS, WILLIAM E., East Lansing, Physics
BREDEWEG, CORWIN J., Dorr, Chemistry
BUEHLER, CHARLES A., East Lansing, Chemistry
CAPLE, RONALD, Ann Arbor, Chemistry
COHEN, MARSHALL M., Ann Arbor, Mathematics
COHN, JEAN W., Ann Arbor, Zoology
DEJONGH, DON C., Ann Arbor, Chemistry
DENTLER, SUSAN M., Hartford, Chemistry
EASTMAN, DEAN E., Iron River, Engineering
FORSYTH, JOHN J., Lansing, Engineering
GILLANDERS, JOHN D., Royal Oak, Physics
GOETZ, ELEANOR S., Blissfield, Economics
GRANFORS, WAYNE L., Battle Creek, Engineering
GRIFFITH, DEAN L., Kalamazoo, Chemistry
HAND, JAMES H., East Lansing, Chemistry

HARACZ, RICHARD D., Dearborn, Physics
HUBER, LEE M., Plymouth, Chemistry
JACKISCH, PHILIP F., Ann Arbor, Chemistry
JANOWITZ, MELVIN F., Detroit, Mathematics
JOHNSON, CALVIN K., East Lansing, Chemistry
KATZ, DARRYL, Detroit, Mathematics
KAZDAN, JERRY L., Oak Park, Mathematics
KNUDSEN, KAREL G., Gwinn, Psychology
LEPAGE, JAMES J., East Lansing, Physics
LOCKER, JOHN S., Detroit, Mathematics
LUCAS, ANNE H., Utica, Anthropology
LUEHRS, DEAN C., Lansing, Chemistry
LUNGERSHAUSEN, WALDEMAR, Detroit, Astronomy
MERRILL, DOROTHY, Mount Clemens, Physiology
METZLER, RICHARD C., Detroit, Mathematics
MOORE, EVERETT R., East Lansing, Physics
NUSSMANN, DAVID G., Ann Arbor, Earth Sciences
OSTERINK, LARRY M., Grand Rapids, Engineering
PATTERSON, BLAKE R., Royal Oak, Other Social Sciences
RANDALL, CHARLES M., East Lansing, Physics
SCHIEBEL, DOUGLAS R., Ann Arbor, Psychology
WARWICK, DONALD P., Rogers City, Psychology
WENTWORTH, RUPERT A., East Lansing, Chemistry
WILSON, CAROL A., Detroit, Biochemistry
WOLFF, CAROLE E., Lansing, Sociology
ZEMACH, RITA B., East Lansing, Mathematics

Summer Fellowships for Graduate Teaching Assistants

BERNSTEIN, STANLEY C., Ann Arbor, Chemistry
CALLAHAN, ANDREW C., Detroit, Physics
CHASE, RONALD B., Grand Rapids, Earth Sciences
COHEN, JOEL M., Detroit, Psychology
COHN, JEAN W., Ann Arbor, Zoology
COOPER, WILLIAM E., Ann Arbor, Biology
CORBETT, ROBERT G., Benton Harbor, Earth Sciences
CORNWELL, PAUL R., Ann Arbor, Psychology
DALVERNY, MARIUS A., East Lansing, Physics
DENTLER, SUSAN M., Hartford, Chemistry
DOYLE, CHARLOTTE L., Lakeland, Psychology
ERBISCH, FREDERIC H., Ypsilanti, Botany
EVANS, AUSTIN M., Ann Arbor, Botany
FANSELOW, JOHN L., Kalamazoo, Physics
FELDMAN, KENNETH A., Bay City, Psychology
FREDERICK, JOHN J., Glennie, Botany
GORDON, LEONARD, Detroit, Sociology
HENDERSON, SUSAN W., Pleasant Ridge, Zoology
HILL, RONALD A., East Lansing, Physics
HUBBARD, JOHN P., Ann Arbor, Zoology
HUFF, WARREN D., Plymouth, Earth Sciences
ISTOCK, CONRAD A., Grosse Point Wood, Zoology
JANOWITZ, MELVIN F., Detroit, Mathematics
KOWALSKI, HENRY C., Detroit, Engineering
LONG, MARY J., Big Rapids, Microbiology
LOVELL, EDWARD G., Detroit, Engineering
MACHIELE, DELWYN E., Zeeland, Chemistry
MASSEY, WALTER E., Detroit, Physics
METZLER, RICHARD C., Detroit, Mathematics
MYLES, EDWARD L., East Lansing, Other Social Sciences
PAPE, PETER G., Deckerville, Chemistry
RAMSEY, JAMES H., Detroit, Mathematics
ROBINSON, MARY J., Fenton, Microbiology
ROBINSON, PAUL T., Saginaw, Earth Sciences
ROSENFELD, ROBERT L., Jackson, Engineering
SCHREINER, ERIK A., Detroit, Mathematics
SILBIGER, FRANCENE F., Detroit, Psychology
TAYLOR, GERALD D., Ann Arbor, Mathematics
VIAN, RICHARD W., Ann Arbor, Earth Sciences
ZENK, WILLIAM E., Battle Creek, Engineering

Postdoctoral

DEBLER, WALTER R., Detroit, Engineering
KAPLAN, RACHEL, Ann Arbor, Psychology
MARQUIS, ROBERT E., Ann Arbor, Microbiology
MATWIYOFF, NICHOLAS A., Rogers City, Chemistry
SCHREIBER, DAVID S., Kalamazoo, Physics

Senior Postdoctoral

HART, HAROLD, East Lansing, Chemistry
KRIMM, SAMUEL, Ann Arbor, Biophysics
ROGERS, MAX T., East Lansing, Physics
RUDNER, RICHARD S., East Lansing, History and Philosophy of Science
STAGNER, ROSS, Detroit, Economics

Science Faculty

ALLEN, TERRENCE M., East Lansing, Psychology
BEEBE, ROBERT R., Houghton, Engineering
BOSSCHER, JAMES P., Grand Rapids, Engineering
CADDELL, ROBERT M., Ann Arbor, Engineering
DARDARIAN, JOHN B., Detroit, Chemistry
DURBETAKI, PANDELL, East Lansing, Engineering
EISLEY, JOE G., Ann Arbor, Engineering
ETTINGER, ROBERT C., Detroit, Physics
HEINSOHN, ROBERT J., East Lansing, Engineering
HURST, ELAINE H., Kalamazoo, Botany
LOYD, WILLIAM H., East Lansing, Engineering
LYTLE, ARCHIE K., III, Mt. Pleasant, Mathematics
MARTENS, HINRICH R., East Lansing, Engineering
MURANAKA, RICHARD G., Flint, Engineering
SACHS, HERBERT K., Detroit, Engineering
SPUHLER, JAMES N., Ann Arbor, Anthropology
TOPPETO, ALPHONSE A., Detroit, Engineering
TSE, FRANCIS S., East Lansing, Engineering
WELCH, HAROLD J., Ann Arbor, Engineering
WHEATON, ROLLAND Z., East Lansing, Engineering

Summer Fellowships for Secondary School Teachers

ALEXANDER, GEORGE W., Jackson, Biology
BEACH, WILLIAM E., Alpena, Mathematics
BERRY, STEPHEN D., Lincoln Park, Genetics
BIES, Sr. M. BONAVITA, Detroit, Chemistry
BOEVE, NORMAN G., Holland, Mathematics
BOONSTRA, PAUL H., Grand Rapids, Mathematics
FITZGERALD, Sr. MARIE J., Ecorse, Mathematics
HUBERS, WAYNE K., Kalamazoo, Mathematics
KANE, Mo. EVELYN E., Bloomfield Hills, Mathematics

KONTRICK, Sr. M. RAYMOND, Detroit, Zoology
PARNELL, WARREN A., Midland, Mathematics
RUDD, ROBERT F., Traverse City, Chemistry
SAVATSKY, GEORGE P., Dearborn, Mathematics
SIGNOR, CARL W., Jr., Highland Park, Chemistry
SNUFFER, LILA C., DeWitt, Mathematics
ZOET, CHARLES J., Livonia, Mathematics

MINNESOTA

Graduate

ANDERSON, ROBERT J., Minneapolis, Chemistry
ANDERSON, ROGER J., Minneapolis, Chemistry
ARNOLD, JOHN M., Minneapolis, Zoology
BAKER, GARY R., St. Paul, Botany
BENSON, RICHARD N., Minneapolis, Earth Sciences
BERG, KENNETH R., Minneapolis, Mathematics
BLACK, MARY B., Minneapolis, Anthropology
BUTLER, LARRY G., Minneapolis, Biochemistry
CANNER, MARTHA L., Minneapolis, Microbiology
DEUTSCHE, CRAIG W., Minneapolis, Chemistry
DONHOWE, JOHN M., Northfield, Physics
ECKLUND, STANLEY D., Minneapolis, Physics
FRISTEDT, BERT E., Hopkins, Mathematics
GRANZBERG, GARY R., St. Paul, Anthropology
HAJICEK, JAMES D., Minneapolis, Physics
HEUER, CHARLES V., Bertha, Mathematics
HUME, GARY W., Minneapolis, Anthropology
JAGLOWSKI, MARC A., St. Paul, Chemistry
JENSEN, TIMOTHY B., Minneapolis, Engineering
JOHNSON, LELAND G., Hadley, Physiology
JORDAN, MARY A., St. Paul, Boilogy
KAUL, ROBERT B., Owatonna, Botany
KLEIN, JEROME, Minneapolis, Agricultural Sciences
LOKEN, JAMES G., Minneapolis, Physics
LOKEN, MAXINE E., Ada, Anthropology
LOWRY, THOMAS H., Minneapolis, Chemistry
LUKE, JON C., Minneapolis, Mathematics
MILGRAM, RICHARD J., Minneapolis, Mathematics
NEWMAN, RILEY D., St. Paul, Physics
NIESSEN, CHARLES W., St. Paul, Engineering
RASMUSSEN, ROBERT A., Mankato, Biology
ROVAINEN, CARL M., Excelsior, Biology
RUSH, KENT R., Minneapolis, Chemistry
SAUER, RICHARD J., Walker, Biology
SCHLEINITZ, HENRY M., Duluth, Engineering
SELL, DARRELL D., Buffalo Lake, Physics
SOMERO, GEORGE N., Ely, Biology
SOMMER, DAVID C., St. Paul, Mathematics
STRYK, ROBERT A., St. Paul, Physics
SWANSON, STANLEY M., St. Paul, Physics
VENNIX, ALAN J., South St. Paul, Engineering
WALKER, JAMES F., Jr., Minneapolis, Physics
WOLFF, RICHARD J., St. Paul, Physics

Cooperative Graduate

ANSHUS, BYRON E., Minneapolis, Engineering
BERG, JOHN C., Hopkins, Engineering
BRAUN, CHARLES L., Minneapolis, Chemistry
BRODSKY, STANLEY J., St. Paul, Physics
BROMAN, ROBERT F., Aitkin, Chemistry
CHAMBERLIN, THOMAS A., St. Paul, Chemistry
EFRON, BRADLEY, St. Paul, Mathematics
EKROOT, CHARLES G., St. Paul, Engineering
ELSETH, GERALD D., New Folden, Zoology
EPPEN, GARY D., Austin, Engineering
FLEMING, DAVID P., Minneapolis, Engineering
GAUSTAD, JOHN E., Minneapolis, Astronomy
GAVIN, ROBERT M., Jr., Edina, Chemistry
GEIWITZ, PETER J., Minneota, Psychology
GILJE, JOHN W., St. Paul, Chemistry
GORDON, STANLEY L., Walnut Grove, Engineering
GROVE, LARRY C., Minneapolis, Mathematics
HANSON, GILBERT N., Minneapolis, Earth Sciences
JEWSBURY, WILBUR G., Mankato, Chemistry
KLINE, KENNETH A., Minneapolis, Engineering
KRECH, WARREN W., South Saint Paul, Engineering
LARDY, LAWRENCE J., Minneapolis, Mathematics
LEVINE, JAMES L., Minneapolis, Physics
MATHSEN, RONALD M., Oklee, Mathematics
NEALY, DAVID A., Adrian, Engineering
NEWMAN, NORMAN, St. Paul, Chemistry
PAYMAR, EUGENE M., St. Paul, Physics
PEARCE, JEFFREY, Minneapolis, Physics
PTASHNE, MARK S., Minneapolis, Biochemistry
RALEIGH, WILLIAM F., St. Paul, Engineering
RECK, GENE P., Minneapolis, Chemistry
SMITH, FRANKLIN C., Jr., St. Paul, Physics
SNUSTAD, DONALD P., Guthrie, Genetics
TORRANCE, KENNETH E., Minneapolis, Engineering
VANDERZIEL, JAN P., Minneapolis, Physics
VOSS, GORDON O., Minneapolis, Engineering
YOUNGERMAN, JOHN M., Fairmont, Engineering
ZIPOY, ROGER T., Minneapolis, Mathematics

Summer Fellowships for Graduate Teaching

BENNETT, JUDITH D., North Minneapolis, Sociology
BENSON, RICHARD N., Minneapolis, Earth Sciences
BENTLEY, JOSEPH C., Minneapolis, Phychology
BERG, KENNETH R., Minneapolis, Mathematics
BJORK, ROBERT A., Minnetonka Beach, Psychology
BREITER, THOMAS A., Lake Crystal, Mathematics
CHAMBERLIN, THOMAS A., St. Paul, Chemistry
COFFMAN, ROBERT E., Minneapolis, Chemistry
EHRLICH, ALLEN S., Minneapolis, Anthropology
FOSTER, JAMES K., Minneapolis, Mathematics
GAMOTA, GEORGE, Minneapolis, Physics
HANSON, DAVID S., St. Paul, Physics
HEMP, GENE W., Minneapolis, Engineering
HERZOG, JOHN O., Ulen, Mathematics
HEUER, CHARLES V., Bertha, Mathematics
JENSEN, CYNTHIA G., Minneapolis, Zoology
KARKLINS, OLGERTS L., Minneapolis, Earth Sciences
KUELBS, JAMES D., St. Paul, Mathematics
LARDY, LAWRENCE J., Minneapolis, Mathematics
LARSON, OMER R., Pencer, Zoology
MATHSEN, RONALD M., Oklee, Mathematics
McCOLM, CAROL A., Minneapolis, Biology

NELSON, WILFRED H., Minneapolis, Chemistry
NEWMAN, NORMAN, St. Paul, Chemistry
PATMAR, EUGENE M., St. Paul, Physics
POND, JUDSON S., Minneapolis, Chemistry
RECK, MARY K., Minneapolis, Chemistry
RUSSELL, DAVID L., St. Paul, Mathematics
SCHMID, WILLIAM D., Minneapolis, Biology
SCHWARTZ, GAYLORD P., Minneapolis, Mathematics
WEIBLEN, PAUL W., Minneapolis, Earth Sciences
WEINMANN, JOAN M., Granada, Chemistry
WOOD, JOHN B., Minneapolis, Mathematics
WOODBURY, GEORGE W. Jr., Minneapolis, Chemistry

Postdoctoral

ANGELICI, ROBERT J., Rochester, Chemistry
CRANDALL, EARLE E., Rochester, Physiology
OAKES, ROBERT J., Minneapolis, Physics

Senior Postdoctoral

BLAKE, GEORGE R., Minneapolis, Agriculture
GOODMAN, LAWRENCE E., Minneapolis, Engineering
KREEVOY, MAURICE M., Minneapolis, Chemistry
NEY, EDWARD P., Minneapolis, Physics
REYNOLDS, WARREN L., Minneapolis, Chemistry

Science Faculty

FINHOLT, ALBERT E., Northfield, Chemistry
GRUNDEMEIER, ERNEST W., Mankato, Chemistry
HOLUM, JOHN R., Minneapolis, Chemistry
LARSON, CURTIS L., Minneapolis, Engineering
MAY, KENNETH Q., Northfield, Engineering
OLSON, REUBEN M., Minneapolis, Engineering
RIEHL, SR. M. AGATHA, Duluth, Chemistry
SHERMOEN, RICHARD E., Dilworth, Mathematics
STIPE, CLAUDE E., St. Paul, Anthropology

Summer Fellowships for Secondary School Teachers

CALLAHAN, SR. VINCENT, M., Faribault, Mathematics
COOK, GORDON L., Albert Lea, Zoology
LEARY, ROGER D., Richfield, Mathematics
LUNCEFORD, MERLE W., Ely, Mathematics
O'BRIEN, PATRICK W., Shakopee, Mathematics
ROSANDICH, ROGER A., Virginia, Mathematics
VAN STEENVOORT, STANLEY, Karlstad, Mathematics
WILLIAMS, SR. JOYCE, Saint Cloud, Biology

MISSISSIPPI

Graduate

BALGORD, WILLIAM D., Jackson, Earth Sciences
CROUT, JERRY N., Clarksdale, Physics
DRANE, DOUGLAS O., Jackson, Engineering
MURRILL, PAUL W., Baton Rouge, Engineering
NAMKOONG, GENE, Gulfport, Genetics
PRIESTLEY, WILLIAM M., Rosedale, Mathematics
ROBERTS, JERRY P., Hattiesburg, Physics

Cooperative Graduate

BURNETT, JOSEPH C., JR., Meridian, Engineering
RILES, JOHN C., Sumrall, Engineering
WILEY, WILLIAM J., Cleveland, Physics

Summer Fellowships for Graduate Teaching Assistants

BRYANT, JOHN L., Tupelo, Mathematics
CAUSEY, WILLIAM M., Shelby, Mathematics
MOREAU, DAVID H., Natchez, Engineering
MORRIS, CLETUS E., Rienzi, Chemistry
ROSSO, SAMUEL W., Centreville, Botany
TATE, WILLIAM B., Newton, Chemistry

Postdoctoral

COOPER, WILLIAM S., III, Greenwood, Physics
DEUTSCH, JOHN L., Hattiesburg, Chemistry

Science Faculty

FITZGERALD, DONALD F., State College, Engineering

Summer Fellowships for Secondary School Teachers

ALEXANDER, MARY K., Laurel, Physics
GOODGAME, LUCILE H., Laurel, Mathematics
HULL, HENRY C., Cleveland, Mathematics
LEWIS, ROBERT L., Hattiesburg, Biology

MISSOURI

Graduate

ADAMS, DAVID B., Neosho, Psychology
ANDERSON, DAVID K., Joplin, Chemistry
DRDA, WAYNE J., St. Louis, Engineering
ECKERT, CHARLES A., St. Louis, Engineering
EDWARDS, DOYLE R., Bloomfield, Engineering
ELSON, ELLIOT L., Ladue, Biochemistry
FISCHER, FERDINAND J., Kansas City, Engineering
HERKSTROETER, WILLIAM, St. Louis, Chemistry
HOUK, RICHARD D., Springfield, Botany
JONES, ROBERT H., Webster Groves, Economics
KWENTUS, GERALD K., Kirkwood, Engineering
LAWRENCE, JOHN M., Bloomfield, Physiology
LINCK, ROBERT G., Kirkwood, Chemistry
MCLAUGHLIN, BARRY S., St. Louis, Psychology
MCMAHON, LEE E., St. Louis, Psychology
MUNCH, JOHN H., Webster Groves, Chemistry
MYERS, WAYNE W., St. Louis, Biochemistry
NORTHRIP, JOHN W., Springfield, Physics
PERLMAN, MELVIN L., Kansas City, Anthropology
PINCKERT, RICHARD E., St. Louis, Engineering
PLAVNICK, PAUL D., St. Louis, Engineering
RILES, JAMES B., St. Louis, Mathematics
ROEDER, JOHN L., Webster Groves, Physics
SHEN, JEROME L., University City, Chemistry
SMITH, DOUGLAS, St. Joseph, Earth Sciences
STONE, HAROLD S., Clayton, Engineering

Cooperative Graduate

BERGER, BERNARD W., St. Louis, Chemistry
BERRY, THOMAS E., St. Louis, Microbiology

BOUMAN, THOMAS D., Clayton, Chemistry
BRILL, ORVILLE L., Columbia, Physics
BROWN, LARRY N., Springfield, Zoology
BURTON, DONALD E., Kansas City, Physics
COOK, ROBERT A., University City, Mathematics
GREEN, LAWRENCE D., Thayer, Engineering
HANSS, ROBERT E., Clayton, Earth Sciences
HARRIS, PATRICK D., Lathrop, Engineering
JAMES, PHILIP B., Kansas City, Physics
KOLOPUS, JAMES L., Columbia, Physics
LATTA, THOMAS M., St. Louis, Chemistry
LICHT, PAUL, St. Louis, Physiology
MCCHESNEY, JAMES D., Hatfield, Chemistry
O'DELL, KENNETH D., Liberty, Physics
ROTTER, CARL A., St. Louis, Physics
SCHRAUTEMEIER, BERNARD, St. Louis, Physics
SNOW, JOEL A., St. Louis, Physics
STEINER, EUGENE F., Columbia, Mathematics
WAGANER, LESTER M., LaGrange, Engineering
WESTERMAN, WILLIAM J., Jr., St. Louis, Engineering
WOLCOTT, SR. DAMIEN, Normandy, Chemistry

Summer Fellowships for Graduate Teaching Assistants

BAST, Sr. EILEEN M., St. Louis, Physiology
BETZ, THOMAS W., St. Louis, Physiology
BOWERS, JOHN E., St. Louis, Chemistry
BROERMAN, JAMES G., St. Louis, Physics
BRUNING, WALTER H., St. Louis, Chemistry
BUCHERT, KENNETH P., Columbia, Engineering
BUNCH, DAVID W., Rolla, Engineering
CHOLEWINSKI, FRANK M., University City, Mathematics
COVERDALE, CHARLES E., Poyner, Chemistry
DAVIS, JEFFREY R., St. Louis, Mathematics
DIVEN, WARREN F., Afton, Chemistry
EHRHARDT, SHIRLEY A., Jefferson City, Chemistry
FARMER, LARRY E., Ash Grove, Engineering
FULLER, ROBERT G., Rolla, Physics
KOLOPUS, JAMES L., Columbia, Physics
KREILICK, ROBERT W., St. Louis, Chemistry
LEHNHOFF, TERRY F., Bridgeton, Engineering
MERSMANN, HARRY J., St. Louis, Physiology
THOMAS, HUGO F., Columbia, Earth Sciences
THOMAS, INGE S., Columbia, Earth Sciences
TOMBAUGH, JOSEPHINE W., Columbia, Psychology
TOMBAUGH, TOM N., Columbia, Psychology
WEILAND, JOAN M., St. Louis, Biology
WELLING, DAN J., St. Louis, Physics
WESTHOFF, DAVID D., St. Louis, Physiology
WILKE, FREDERICK W., Columbia, Mathematics
ZOBRIST, GEORGE W., Columbia, Engineering

Postdoctoral

KOLKER, HAROLD J., University City, Chemistry

Senior Postdoctoral

HIRSH, IRA J., St. Louis, Phychology

Science Faculty

HALL, THOMAS S., St. Louis, Biology
HARRIS, FRANKLIN D., Columbia, Engineering
LOVE, JOHN, Jr., Columbia, Engineering
MILES, JOHN B., Rolla, Engineering
PAGANO, SYLVESTER J., Rolla, Mathematics
SANGSTER, WILLIAM M., Columbia, Engineering
SMITH, JAMES G., Rolla, Physics
UTZ, WINFIELD R., Columbia, Mathematics

Summer Fellowships for Secondary School Teachers

BUSS, ROBERT R., St. Louis, Mathematics
CARPENTIER, MO. M. ADRIAN, St. Louis, Mathematics
FALK, Sr. M. MARCELLINE, St. Louis, Physics
KELLER, Sr. M. FREDERICK, St. Louis, Physics
ROBERSON, WILLIAM A., St. Charles, Physics
SKLOSS, ELMER R., Kirkwood, Mathematics

MONTANA

Graduate

BERGMAN, ROBERT K., Great Falls, Physiology
DOUGHERTY, RALPH C., Valier, Chemistry
HOOD, LEROY E., Great Falls, Biophysics
IHLER, GARRET M., Great Falls, Biochemistry
JONAS, ROBERT J., Bozeman, Zoology
PICTON, HAROLD D., Geyser, Zoology
VINCELETTE, RICHARD R., Billings, Earth Sciences

Cooperative Graduate

CONSIDINE, BARNEY M., Broadus, Mathematics
HOUSE, EDWIN W., Darby, Physiology
KUENZI, WILBUR D., Missoula, Earth Sciences
MOUNTAIN, RAYMOND D., Billings, Physics
SILVER, JACK H., Missoula, Mathematics
WILKINSON, THOMAS K., Billings, Engineering

Summer Fellowships for Graduate Teaching Assistants

BINGHAM, RALPH L., Missoula, Mathematics
CAMERON, DAVID G., Great Falls, Genetics
GARRIC, RICHARD K., Missoula, Botany
LAYMAN, WILBUR A., Bozeman, Chemistry
PUYEAR, ROBERT L., Missoula, Physiology

Postdoctoral

SWENSON, ROBERT J., Bozeman, Physics

Science Faculty

PERESSINI, EDWARD A., Great Falls, Mathematics
SMITH, HOWARD M., Dillon, Chemistry

Summer Fellowships for Secondary School Teachers

BINGHAM, RALPH L., Missoula, Mathematics

NEBRASKA

Graduate

CASSEL, DAVID G., Ainsworth, Physics
DORNHOFF, LARRY L., Heartwell, Mathematics
FRAHM, RICHARD R., Lyman, Genetics
KRIPKE, SAUL A., Omaha, Mathematics
LACINA, WILLIAM B., Omaha, Physics
NEUMANN, HERSCHEL, Lincoln, Physics
NOREM, PHILIP C., Omaha, Physics
SCHAFER, RONALD W., Tecumseh, Engineering

SPEIER, RICHARD H., Omaha, Biophysics
WILLIAMS, ROGER G., Johnstown, Chemistry
WRIGHT, BRADFORD L., Lincoln, Physics

Cooperative Graduate

ANDERSON, SONIA R., Omaha, Biochemistry
BARNES, AARON, Omaha, Physics
BLAZEK, DAN R., Omaha, Engineering
CHURCH, JAMES D., Lincoln, Mathematics
JIRSA, JAMES O., Milford, Engineering
RICKERS, FREDERICK R., Wayne, Mathematics
SCHUELER, DONALD G., Lincoln, Engineering
STONER, MARSHALL R., Kenesaw, Chemistry
SULLIVAN, GEORGE A., Lincoln, Physics

Summer Fellowships for Graduate Teaching Assistants

BEBERNES, JERROLD W., Lincoln, Mathematics
CALDWELL, MARILLYN J., Lincoln, Zoology
EDMAN, JAMES R., Lincoln, Chemistry
HERGENRADER, GARY L., Gering, Zoology
SLATTERY, CHARLES W., Lincoln, Chemistry
STONE, LARRIE E., Lincoln, Genetics

Postdoctoral

ASHIDA, SACHIO, Lincoln, Psychology

Science Faculty

ANDREWS, RICHARD V., Omaha, Physiology
JENSEN, BRUCE A., Lincoln, Mathematics
PERSHE, EDWARD R., Lincoln, Engineering

Summer Fellowships for Secondary School Teachers

ACKERSON, PAUL B., Omaha, Physics
LYNCH, Sr. M. REALINO, Lincoln, General Science

NEVADA

Graduate

LOVEJOY, EARL M., Reno, Earth Sciences
TING, IRWIN P., Reno, Botany

Summer Fellowships for Graduate Teaching Assistants

BLATT, HARVEY, Las Vegas, Earth Sciences

Postdoctoral

LEIFSON, OLAF S., Reno, Physics

Science Faculty

BRADLEY, WILLIAM G. JR., Reno, Zoology

Summer Fellowships for Secondary School Teachers

WOODBURY, WILLIS V., Reno, Biology

NEW HAMPSHIRE

Graduate

HUBBARD, LINCOLN B., Durham, Physics
OMALLEY, ROBERT E., JR., Somersworth, Mathematics
TAHK, FREDERICK C., Concord, Chemistry

Cooperative Graduate

GUYETTE, ANNA M., Durham, Psychology
PRINGLE, JAMES S., Laconia, Botany
RUTLEDGE, EDWARD F., Dublin, Psychology
TUTTLE, ELIZABETH R., Conway, Physics

Summer Fellowships for Graduate Teaching Assistants

CHERTOK, BENSON T., Laconia, Physics
FICKETT, FREDERICK R., Berlin, Physics

Science Faculty

ERMENC, JOSEPH J., Hanover, History and Philosophy of Science
KIMBALL, WILLIAM P., Hanover, Engineering
MENGE, JOHN A., Hanover, Economics

NEW JERSEY

Graduate

ALMGREN, BEVERLY S., Princeton, History and Philosophy of Science
ANAGNOSTAKIS, CHRISTO, Princeton, Mathematics
BINKLEY, ROGER W., Westfield, Chemistry
BLANCHARD, KENNETH R., Perth Amboy, Chemistry
CAREY, DAVID C., Montclair, Physics
CARROLL, GEORGE C., Plainfield, Botany
CASSIDY, PATRICK J., Atlantic Highlands, Chemistry
CHAGNON, SPENCER O., Trenton, Engineering
CHAIKEN, JAN M., Rahway, Physics
COBURN, STEPHEN P., Summit, Biochemistry
COHEN, JEFFREY M., Elizabeth, Engineering
COMIZZOLI, ROBERT B., Union City, Physics
CONRAD, PETER W., East Rutherford, Engineering
COOK, ROBERT M., Princeton, Sociology
CRAIG, JAMES R., Haddon Heights, Earth Sciences
DAPPOLITO, JOSEPH A., Morristown, Engineering
FAHRNEY, DAVID E., Fort Lee, Biochemistry
FORREST, HELEN F., Upper Montclair, Zoology
GEORGE, ALBERT R., Jr., Princeton, Engineering
GILL, HELEN K., West Englewood, Biochemistry
GRANOFF, BARRY, Jersey City, Mathematics
HAND, BRYCE M., Jersey City, Earth Sciences
HARTUNG, ROLF, Fairlawn, Zoology
HARVEY, ROBIN J., Rutherford, Physics
HEMMENDINGER, DAVID, Belvidere, Mathematics
HINNERS, NOEL W., Chatham, Earth Sciences
HOLZWARTH, GEORGE M., Westfield, Biophysics
HOOKE, ROGER L., Upper Montclair, Earth Sciences
KAYSER, BORIS J., Lakewood, Physics
KEENAN, EDWARD M., East Orange, Mathematics
KEENAN, WILLIAM A., Wayne, Engineering
KEVLES, DANIEL J., Princeton, History and Philosophy of Science
KLESKEN, DANIEL L., Trenton, Engineering
KREPS, RODNEY E., Princeton, Physics
KREUZER, LLOYD B., Princeton, Physics
LAMOLA, ANGELO A., Newark, Chemistry
LITTLE, LEWIS E., Wayne, Physics
LOLORDO, VINCENT M., Palisades Park, Psychology

LOVELAND, ROBERT E., Camden, Physiology
LOWENSTEIN, JOHN H., South Orange, Physics
MCANENY, COLIN C., Princeton, Earth Sciences
MCVAUGH, MICHAEL R., Princeton, History and Philosophy of Science
MERRILL, DEANE W., South Orange, Physics
MICHELSON, WILLIAM M., Trenton, Sociology
MOLLOW, BENJAMIN R., Union, Physics
MOORE, PAUL B., Ramsey, Earth Sciences
MORGAN, KENNETH, Fair Lawn, Anthropology
OKUN, LAWRENCE M., Somerville, Biophysics
OSLER, THOMAS J., Camden, Physics
PADAWER, GABRIEL E., Freehold, Engineering
PALMER, LLOYD G., Cresskill, Mathematics
PICARD, MEREDITH D., Princeton, Earth Sciences
PINSKY, MARK A., Haddonfield, Mathematics
RESCORLA, ROBERT A., Westfield, Psychology
ROBERTS, GEORGE W., East Orange, Engineering
ROGERS, JOSEPH E., Jr., Moorestown, Chemistry
SCHWARTZ, HILDA A., Woodridge, Chemistry
STRUZYNSKI, RAYMOND E., Jersey City, Physics
THIESSEN, HENRY A., Dumont, Physics
VEZZETTI, DAVID J., Hoboken, Physics
VILMS, JURI, Seabrook, Engineering
VINCZ, GLORIA A., Fords, Physiology
WAGONER, ROBERT V., Jr., West Englewood, Engineering
ZANONI, CARL A., Trenton, Physics

Cooperative Graduate

CALLAN, CURTIS G., Jr., Little Silver, Physics
CALLANAN, SR. JANE E., Convent Station, Chemistry
CHRISTENSON, JAMES H., Princeton, Physics
COHEN, JACK K., Newark, Mathematics
DEGROAT, WILLIAM C., Trenton, Medical Sciences
DENN, MORTON M., Paterson, Engineering
EGETH, HOWARD E., Irvington Psychology
EMPTAGE, MICHAEL R., North Bergen, Chemistry
FICHTER BARRY S., Clifton, Engineering
FISHER, CYNTHIA J., New Brunswick, Zoology
FROSCH, ROBERT P., Summit, Chemistry
HAGEN, MARY C., Palisade, Mathematics
HALPERN, GERALD M., Bayonne, Physics
HILL, DAVID B., Hoboken, Mathematics
JACOBS, MARK E., Atlantic City, Engineering
KASCIC, MICHAEL J., Jersey City, Mathematics
KENT, RAYMOND L., Lyndhurst, Engineering
KERSHAW, JUDITH E., Dumont, Biochemistry
KJELLGREN, JOHN, Wayne, Chemistry
LEAVENS, PETER B., Summit, Earth Sciences
LIPPINCOTT, EZRA P., Jr., Medford Lakes, Physics
MCKENZIE, ALEXANDER A., Hackensack, Mathematics
MCLEO, THOMAS J., Teaneck, Mathematics
MCTAGUE, JOHN P., Spring Lake, Chemistry
MENGES, LILLIAN M., North Brunswick, Psychology
MIKE, VALERIE, Fords, Mathematics
MOREHOUSE, ROGER L., Chatham, Physics
O'BRIEN, FRANCES D., Weehawken, Physics
OELHAF, ROBERT C., Leonia, Physics
PELIOS, ANGELO, North Plainfield, Mathematics
PLEVAN, ROBERT E., Ramsey, Engineering
POLAND, DOUGLAS C., Westfield, Chemistry
QUILLEN, DANIEL G., East Orange, Mathematics
RABINOWITZ, PAUL H., Hillside, Mathematics
RELLES, HOWARD M., Highland Park, Chemistry
RICHTER, GOTTFRIED P., Plainfield, Chemistry
RICHTERS, JOHN S., Mountain Lakes, Engineering
RUZISKA, PHILIP A., Union, Engineering
SHAPIRO, JOEL A., East Brunswick, Physics
SMOLOWITZ, LAWRENCE H., Morristown, Mathematics
SOLODAR, ARTHUR J., West Orange, Chemistry
STEIGLITZ, KENNETH, New York, Engineering
THEUER, RICHARD C., Cliffside Park, Biochemistry
WARD, RICHARD S., Sussex, Engineering
WESSELY, ROBERT M., New Brunswick, Physics
WINTERHALTER, DAVID R., Morris Plains, Engineering
WU, DANIEL F., Hoboken, Mathematics

Summer Fellowships for Graduate Teaching Assistants

BAGLIO, JOSEPH A., New Brunswick, Chemistry
BALDWIN, ROBERT E., Rahway, Physiology
BROWN, CLARENCE L., III, Merchantville, Mathematics
CREBBS, THOMAS C., Jr., New Brunswick, Zoology
DECICCO, BENEDICT T., Colonia, Microbiology
DEDOMINICIS, ALEX J., Union City, Chemistry
DENZER, GEORGE C., Jr., Livingston, Chemistry
DONOHUE, BARTHOLOMEW P., Lakehurst, Mathematics
FINCKE, NANCY C., Teaneck, Mathematics
FRAUENDORF, NORMA K., Roselle, Biology
GLENNON, THOMAS R., Trenton, Other Social Sciences
GORRES, BYRON T., Princeton, Chemistry
GRIFFEL, JACK, Passaic, Engineering
HAWKINS, ROBERT G., North Bergen, Economics
HECHT, JEFFREY K., West Orange, Chemistry
HESS, GEORGE G., Collingswood, Chemistry
LANDESBERG, JOSEPH M., Toms River, Engineering
LIEB, MURRAY I., Newark, Engineering
MEISEL, LAWRENCE V., Maplewood, Physics
MITCHELL, WILLIAM C., Lincoln Park, Physics
NAGLE, FREDERICK, Jr., Princeton, Earth Sciences
O'BRIEN, FRANCIS D., Weehawken, Physics
PARKER, GORDON M., Princeton, Chemistry
RICHARD, EMILY L., Westfield, Physiology
ROGOLSKY, MARVIN S., Passaic, Microbiology
ROSENWINKEL, EARL R., New Brunswick, Biology
ROSS, ROBERT E., Princeton, Chemistry
ROTH, LORRAINE L., New Brunswick, Psychology
SMITH, DAVID L., Westfield, Earth Sciences
SPRING, SUSAN W., Roselle, Microbiology
VILMS, JAAK, Seabrook, Mathematics

Postdoctoral

DINGLE, RICHARD D. H., Princeton, Biology
GOSSARD, ARTHUR C., Summit, Physics
GOULD, EDWIN, Short Hills, Biology
SCHORR, HERBERT, Princeton Junction, Engineering
WEBER, ROBERT J., Princeton, Psychology

Senior Postdoctoral

BONNER, JOHN T., Princeton, Biology
FISCHER, ALFRED G., Princeton, Earth Sciences
HALBERT, SEYMOUR P., Hillsdale, Medical Sciences
MORGAN, COUNCILMAN, Tenafly, Microbiology
REBHUN, LIONEL I., Princeton, Biophysics

Science Faculty

FANALE, LOUISA P., East Orange, Genetics
GRANT, JAMES J., Jr., Jersey City, Physics
JACOBS, WILLIAM P., Princeton, Physiology
MANOGUE, JOSEPH F., Hoboken, Mathematics
MELLOR, GEORGE L., Princeton, Mathematics
MULLIN, JOSEPH V., Audubon, Engineering
SLOOK, THOMAS H., Moorestown, Mathematics

Summer Fellowships for Secondary School Teachers

CARR, Sr. URSULA M., New Brunswick, Chemistry
DAUSCH, VERNON L., Millburn, Mathematics
GARLAND, Sr. M. HUGH, Jersey City, Mathematics
KOSOFSKY, LEON N., Newark, Chemistry
LEE, HOLMAN, JR., Bayville, Mathematics
SHRAGER, RICHARD I., Almonesson, Mathematics
SWANSON, CONSTANCE M., Hillsdale, Mathematics
TYSON, Sr. ELLEN C., Paterson, Chemistry
WATSON, Sr. M. DENNIS, Trenton, Mathematics

NEW MEXICO

Graduate

ATKINSON, RICHARD F., Albuquerque, Chemistry
BECKEDORFF, DAVID L., Sandia Base, Mathematics
O'DONNELL, JERRY F., Las Cruces, Chemistry
PROCTOR, ROBERT W., Santa Fe, Botany
ROEDER, DAVID W., Albuquerque, Mathematics
SHLAER, WILLIAM J., Los Alamos, Physics
THOMPSON, RICHARD S., Hobbs, Physics

Cooperative Graduate

BALL, RALPH W., Las Cruces, Mathematics
FERGIN, RICHARD K., Las Cruces, Engineering
JOHNSON, RICHARD E., University Park, Mathematics
PLETZER, DOUGLAS L., Las Cruces, Physics
PERKINS, WALTER G., Albuquerque, Chemistry
TALLEY, THURMAN L., Portales, Physics

Summer Fellowships for Graduate Teaching Assistants

CHRISTENSON, CHARLES O., Las Cruces, Mathematics
DURR, BEULAH P., Las Vegas, Microbiology
FERGIN, RICHARD K., Las Cruces, Engineering
GADDIS, JOSEPH L., Las Cruces, Engineering
GENNARO, ANTONIO L., Albuquerque, Zoology
HILLIARD, JANICE E., Las Vegas, Chemistry
JONES, DAVID A., Jr., Las Cruces, Chemistry
KEYES, CONRAD G., Jr., Roswell, Engineering
MITCHELL, ALFRED R., Las Cruces, Mathematics
MOIR, WILLIAM H., Las Cruces, Biology
NILES, DAVID M., Albuquerque, Zoology
NORTHRUP, CLYDE J., Jr., Albuquerque, Physics
TOBIAS, SUZANNE L., Albuquerque, Anthropology
WRIGHT, JOHN W., Jr., Albuquerque, Zoology
YELVERTON, JOHN T., Clovis, Physiology

Postdoctoral

DIEBOLD, ROBERT E., Los Lunas, Physics
SCHMITT, HARRISON H., Silver City, Earth Sciences

Science Faculty

COTTRELL, MARION M., Albuquerque, Engineering
VAUGHAN, RICHARD G., Albuquerque, Engineering

Summer Fellowships for Secondary School Teachers

BARKLEY, MARGARET C., Anthony, Biology
EACHUS, DOROTHY D., Roswell, Biology
MOSES, ANDREW D., Mountainair, Mathematics

NEW YORK

Graduate

AMATO, JAMES J., Richmond Hill, Physics
ANDERSEN, HANS C., Brooklyn, Chemistry
ANDERSON, ALFRED T., Jr., Garden City, Earth Sciences
ANTMAN, STUART S., Rockville Center, Engineering
ASH, WILLIAM W., Binghamton, Physics
AUSTER, RICHARD D., Brooklyn, Economics
BAKER, NANCY D., Brooklyn, Microbiology
BARASH, NAOMI E., Brooklyn, Physics
BARKIN, DAVID P., Great Neck, Economics
BATT, RUSSELL H., Jamestown, Chemistry
BAUM, WILLIAM M., New York, Psychology
BECK, BRENDA E., New York, Anthropology
BECKER, MARTIN, New York, Engineering
BERGER, ROBERT, Freeport, Engineering
BERTSCH, GEORGE F., West Hempstead, Physics
BICKART, PAUL H., Poughkeepsie, Chemistry
BIERON, JOSEPH F., Buffalo, Chemistry
BLOCK, ERIC, Forest Hills, Chemistry
BORDNER, CHARLES A., Jr., North Tonawanda, Physics
BOSSERT, JOHN M., Buffalo, Mathematics
BOYER, TIMOTHY H., Brooklyn, Physics
BRAU, CHARLES A., Garden City, Engineering
BRAUNSTEIN, STEPHEN S., Flushing, Engineering
BREGMAN, JACK M., Kew Gardens, Chemistry
BREGSTONE, EDWARD, Brooklyn, Engineering
BREINDEL, BARRY, New York, Engineering
BRENDEL, PHILIP J., Woodside, Engineering

BRODO, IRWIN M., Flushing, Botany
BRODY, BORUCH A., Brooklyn, History and Philosophy of Science
BRONFIN, BARRY R., Great Neck, Engineering
CALLAHAN, JAMES J., Poughkeepsie, Mathematics
BYRNE, SYLVIA A., Batavia, Zoology
CHIPMAN, DAVID M., Rego Park, Chemistry
CHUTJIAN, ARA, New York, Chemistry
COHEN, NATALIE S., Floral Park, Pathology
COLE, STEPHEN, Sunnyside, Sociology
COOK, STEPHEN A., Clarence, Mathematics
COON, DARRYL D., Bolton Landing, Physics
COOPERMAN, BARRY S., Flushing, Chemistry
CORNWELL, ROBERT G., Rochester, Physics
DALY, DANIEL F., Brooklyn, Physics
DANNENBERG, JOSEPH J., Brooklyn, Chemistry
DELSON, MARTIN G., Laurelton, Physics
DONNELLY, JOSEPH P., Brooklyn, Engineering
DORCHAK, THOMAS P., New York, Chemistry
DOSHAN, HAROLD D., Brooklyn, Chemistry
DRISCOLL, MICHAEL J., Buchanan, Engineering
DUSHMAN, MIRIAM B., New York, Microbiology
ECKHART, WALTER, Yonkers, Biophysics
EINBINDER, HERBERT M., Far Rockaway, Physics
EISENBERG, ROBERT S., New Rochelle, Biophysics
EISENSTEIN, BOB I., New York, Physics
FABER, JOAN R., Flushing, Microbiology
FALTZ, LEONARD M., Bronx, Mathematics
FEIN, BURTON I., Brooklyn, Mathematics
FELDER, RICHARD M., Long Island City, Engineering
FELDHUHN, ROBERT H., Brooklyn, Engineering
FELDMAN, RICHARD L., Brooklyn, Economics
FERBER, JOANNA M., Buffalo, Biochemistry
FERGUSON, ROLFE P., Clinton, Mathematics
FISHMAN, THELMA A., Brooklyn, Psychology
FOGARTY, JOHN C., Mt. Vernon, Mathematics
FRANK, MARION E., Flushing, Psychology
FREIFELD, CHARLES J., Flushing, Mathematics
FRIEDMAN, DAVID, Brooklyn, Mathematics
FRUCHTBAUM, HAROLD, Brooklyn, History and Philosophy of Science
GENTNER, DONALD R., Springville, Chemistry
GEOGHAN, ROBERT E., Brooklyn, Mathematics
GERBER, JUDITH F., Flushing, Psychology
GERBER, LEON E., Brooklyn, Mathematics
GEWIRTZ, STEPHEN J., Brooklyn, Mathematics
GILMORE, ROBERT, Long Island, Physics
GILSON, BRUCE R., New York, Chemistry
GINSBERG, RALPH B., New York, Sociology
GINSBERG, STEPHEN R., New York, Mathematics
GLAUBERMAN, GEORGE, Richmond Hill, Mathematics
GLAUBIGER, DANIEL L., Brooklyn, Chemistry
GOLDHABER, ALFRED S., Bayport, Physics
GOLDIN, KENNETH D., Staten Island, Economics
GOLDREICH, PETER M., Ithaca, Physics
GOODMAN, JOHN M., Ithaca, Physics
GORMAN, DONALD S., White Plains, Genetics
GRAPPEL, SARAH F., Brooklyn, Microbiology
GREEN, MICHAEL E., Brooklyn, Biochemistry
GREENBERG, HARRIET Z., New York, Sociology
GREIBACH, SHEILA A., New Rochelle, Mathematics
GROSSBERG, STEPHEN, Jackson Heights, Mathematics
GROSZ, JASON E., New York, Mathematics
HALL, ANDREW D., Bedford Hills, Engineering
HALPERIN, BERTRAND, Brooklyn, Physics
HAUPT, EDWARD J., Brooklyn, Psychology
HAVENDER, WILLIAM R., New York, Genetics
HECKEL, PHILIP H., Rochester, Earth Sciences
HENRICH, CHRISTOPHER, Buffalo, Physics
HERENDEEN, ROBERT A., Freeport, Physics
HERSHFIELD, DAVID C., New York, Economics
HICKS, NANCY E., Staten Island, Physics
HIGNEY, JAMES T., Brooklyn, Engineering
HIRSCH, ELI, Brooklyn, History and Philosophy of Science
HOLTZMAN, ERIC, Bronx, Zoology
HOLZSAGER, RICHARD A., New York, Mathematics
HUTCHINSON, DAVERA G., New York, Biology
HYMAN, EMILE, Flushing, Physics
ISAACS, IRVING M., Bronx, Mathematics
ITZKOWITZ, MARTIN S., Brooklyn, Chemistry
JAFFE, ARTHUR M., Pelham, Physics
JAYSON, JOEL S., Garden City South, Engineering
JOHNSON, ROBERT W., Franklin Square, Biology
JOHNSON, STANLEY L., Ithaca, Biochemistry
KADISH, ABRAHAM, Brooklyn, Mathematics
KAHN, DIANA, Flushing, Mathematics
KAHN, FREDERIC J., Brooklyn, Physics
KAHN, ROBERT E., Flushing, Engineering
KALLFELZ, FRANCIS A., Syracuse, Biophysics
KASTL, ALBERT J., Bronx, Psychology
KATCHER, ALAN M., Brooklyn, Engineering
KENDALL, ROBERT L., Rochester, Zoology
KENNEDY, HUGH P., New York, Physics
KENNISON, JOHN F., St. Albans, Mathematics
KERN, LEILA R., Brooklyn, Psychology
KERN, PETER L., Richmond Hill, Mathematics
KINDLMANN, PETER J., Astoria, Physics
KIRSCH, JOHN A., Oswego, Biology
KNAFF, DAVID B., New York, Chemistry
KNEUER, JOSEPH G., Syracuse, Engineering
KOHLER, WERNER E., Yonkers, Engineering
KRUBINER, ALAN M., Bronx, Chemistry
KUNREUTHER, HOWARD C., Great Neck, Economics
KURTZ, HAROLD C., Rockville Center, Mathematics
KUZMACK, ARNOLD M., Jackson Heights, Mathematics
LAMANTIA, CHARLES R., New York, Engineering
LAMPE, MARTIN, Brooklyn, Physics
LANDMAN, JOAN G., New York, Mathematics
LANDMAN, MAURICE A., Jamaica, Mathematics
LANFORD, OSCAR E., III, Fredonia, Physics
LEDERMAN, JEROME M., New York, Engineering
LEICHTLING, BEN H., New York, Biochemistry
LESK, ARTHUR M., Brooklyn, Biophysics
LEVINE, RHEA J., Brooklyn, Physiology
LEVINE, VICKI G., New York, Mathematics
LEVITCH, ROY N., Buffalo, Engineering
LEWIN, RUTH L., New York, Chemistry
LICARI, JOSEPH A., Mohawk, Engineering
LICHTENBAUM, STEPHEN, Brooklyn, Mathematics
LITT, FREDRIC A., New York, Chemistry
LOGEMANN, GEORGE W., New York, Mathematics
LUBKIN, SAUL, Brooklyn, Mathematics

Luks, Eugene M., Brooklyn, Mathematics
Malerba, Joseph F., New York, Chemistry
Maltz, Henry, Brooklyn, Chemistry
Maltz, Martin S., Brooklyn, Engineering
Mamangakis, Stanley E., Bronx, Mathematics
Manson, Steven T., Brooklyn, Physics
Marians, Carol S., New York, Mathematics
Marks, Peter, Forest Hills, Mathematics
Martinelli, Michael A., Brooklyn, Physics
Maskit, Bernard, New York, Mathematics
Masters, Millicent R., Flushing, Microbiology
McAloon, Kenneth W., Brooklyn, Mathematics
McAvoy, Thomas J., Neponsit, Engineering
McCarthy, Donald J., Brooklyn, Mathematics
McGowan, Jon G., Silver Creek, Engineering
McNamee, Peter C., Shrub Oak, Physics
Mead, George S., Waccabuc, Engineering
Meininghaus, Arlyn R., Lancaster, Chemistry
Memmott, Edmund A., Little Valley, Mathematics
Menahan, Lawrence A., Brooklyn, Biology
Miller, Bernard, Arverne, Engineering
Miller, Edward J., Rochester, Biophysics
Miller, John C., Lockport, Mathematics
Miller, Ralph E., New York, Economics
Miller, Robert E., New York, Physics
Mineka, John C., Ithaca, Mathematics
Moldover, Michael R., New York, Physics
Moore, David S., Middletown, Mathematics
Mopsik, Frederick I., Forest Hills, Chemistry
Moran, Paul R., Ithaca, Physics
Murray, Thomas E., New York, Physics
Mutter, Valerie A., Queens Village, Long Island, Physiology
Nemethy, Peter, New York, Physics
Neuringer, Allen J., Belle Harbor, Psychology
Newman, Fred M., Flushing, Physics
Newman, Gabrielle C., New York, Economics
Oatman, Barbara B., New York, Psychology
O'Brien, John A., Staten Island, Engineering
O'Connell, William J., Brooklyn, Physics
Orman, Judith A., Flushing, Mathematics
Orzech, Morris, Brooklyn, Mathematics
Parker, Kim H., North Chici, Engineering
Parker, William L., Clinton, Chemistry
Parnas, David L., Bronx, Engineering
Parsegian, Vozken A., Troy, Biophysics
Passman, Donald S., Bronx, Mathematics
Patsakos, George, Brooklyn, Physics
Paulson, Richard W., Queens Village, Oceanography
Perrin, Robert P., New York, Physics
Phillips, Anthony V., New York, Mathematics
Piech, Kenneth R., Eggertsville, Physics
Pirkle, William H., Rochester, Chemistry
Podoff, David, Brooklyn, Economics
Pollack, Helen S., Bronx, Psychology
Pollack, James B., Woodmere, Physics
Pomerance, Errol, Bronx, Mathematics
Porter, Judith D., Ithaca, Sociology
Potter, Thomas F., Nyack, Mathematics
Power, Leo J., Brooklyn, Engineering
Price, Barbara J., New York, Anthropology
Prill, David D., Buffalo, Mathematics
Radkowski, Alfred F., New York, Physics
Raleigh, Edward W., Ithaca, Chemistry
Rambas, Mark B., Brooklyn, Mathematics
Rapp, William V., New York City, Economics
Reich, Daniel, Brooklyn, Mathematics
Reiner, Albey, Brooklyn, Engineering
Reynolds, Bro. Joseph, Troy, Engineering
Richer, Ira, New York, Engineering
Ries, Lillian L., Beechhurst, Engineering
Robba, Arnold A., Mineola, Engineering
Rochkind, Mark M., Brooklyn, Chemistry
Rose, Richard M., Port Washington, Psychology
Rosen, Allan J., New York, Chemistry
Rosenthal, Peter M., Flushing, Mathematics
Roslow, Ilsa J., Brooklyn, Biophysics
Rosner, Jonathan L., Tuckahoe, Physics
Rosner, Judah L., Brooklyn, Genetics
Rossolimo, Alexandre, New York, Mathematics
Ruben, Murray A., Flushing, Engineering
Salthe, Stanley N., Brooklyn, Zoology
Sampson, Samuel F., Ithaca, Sociology
Samuels, Michael R., Brooklyn, Engineering
Sattinger, Stanley S., Jeffersonville, Engineering
Schulman, Jerome M., New Rochelle, Chemistry
Schultz, Sr. M. Richardi, New York City, Botany
Schwartz, Martin A., Wantagh, Chemistry
Schwartz, Richard E., Ithaca, Mathematics
Schwarz, John H., Glen Head, Physics
Schweitzer, Paul J., Elmont, Physics
Shapiro, Bert I., New York, Physiology
Sharp, David H., Buffalo, Physics
Shelupsky, David I., Brooklyn, Physics
Shore, Herbert B., Brooklyn, Physics
Shulman, Judith A., New York, Zoology
Sidney, Stuart J., White Plains, Mathematics
Socolow, Robert H., New York, Physics
Soland, Richard M., New York, Mathematics
Sondow, Jonathan D., Woodhaven, Mathematics
Soven, Paul, Brooklyn, Physics
Spielman, Albert I., Brooklyn, Physics
Spivak, Michael D., Jamaica, Mathematics
Steen, Lynn A., Staten Island, Mathematics
Steinfeld, Jeffry I., Flushing, Chemistry
Stenard, Charles E., Watertown, Mathematics
Stephens, Mo. M. Coeurd, Tarrytown, Biochemistry
Stevens, Guy V., Pearl River, Economics
Stoller, Gerald S., Brooklyn, Mathematics
Stollnitz, Fred, Forest Hills, Psychology
Susskind, Leonard, Bronx, Physics
Sussman, Richard, New York, Mathematics
Sutherland, William R., Scarsdale, Engineering
Sutton, Leon, Long Beach, Physics
Swanson, John A., Ithaca, Engineering
Tavel, Morton A., Brooklyn, Physics
Taylor, John H., Cambridge, Engineering
Teitelbaum, Claire A., Bronx, Psychology
Titterton, Paul J., Farmingdale, Physics
Venrick, Elizabeth L., New York, Biology
Vogel, Steven, Beacon, Zoology
Wagreich, Philip D., Flushing, Mathematics
Weber, Charles F., Mineola, Mathematics
Weinman, Robert W., Brooklyn, Physics
Weinstock, Barnet M., Brooklyn, Mathematics
Weisberger, William I., Scarsdale, Physics
Weiss, Benjamin, Bronx, Mathematics

WEISSGLASS, JULIAN, Staten Island, Mathematics
WESTGATE, CHARLES R., Binghamton, Engineering
WOJTASZEK, JOSEPH H., Rochester, Physics
WOLFE, RALPH G., Brooklyn, Engineering
WOLFOWITZ, LAURA M., Ithaca, Physiology
WRATTEN, CRAIG C., Snyder, Biochemistry
ZOELLER, JOHN F., Valley Stream, Engineering
ZWILLENBERG, MELVIN L., Brooklyn, Engineering

Cooperative Graduate

ADAMS, DONALD W., Poughkeepsie, Psychology
AGIN, NORMAN I., Brooklyn, Engineering
AGNEW, PALMER W., Ithaca, Physics
ANASTASIO, SALVATORE, Brooklyn, Mathematics
ARMINI, ANTHONY J., Brooklyn, Physics
BAGNATO, ROBERT A., Bronx, Mathematics
BAILYN, PAUL M., New York, Mathematics
BALCH, MICHAEL S., Brooklyn, Mathematics
BANK, JERRY M., Bronx, Mathematics
BANK, STEVEN B., Middle Village, Mathematics
BARATOFF, ALEXIS, Ithaca, Physics
BARRETT, JOHN L., Staten Island, Physics
BAUM, CARL E., Syracuse, Engineering
BENTSEN, IRVING O., Amenia, Mathematics
BERNE, BRUCE J., Brooklyn, Chemistry
BLOCH, NORMAN J., Rochester, Mathematics
BOLKER, ETHAN D., Brooklyn, Mathematics
BONNECAZE, ROGER H., Cambria Heights, Engineering
BROOKS, DAVID W., Brooklyn, Chemistry
BURNS, RICHARD H., Rye, Engineering
CAHILL, MARY C., Scarsdale, Psychology
CARLSON, ROBERT C., Ithaca, Engineering
CARROLL, HARVEY F., New York, Chemistry
CASTRO, BARRY, New York, Economics
COHEN, RONALD B., Brooklyn, Chemistry
COMSTOCK, GEORGE M., East Norwich, Physics
DAUM, WALTER, Yonkers, Mathematics
DEAN, DAVID E., Marion, Engineering
DENEUFVILLE, RICHARD L., Nyack, Engineering
DESSAU, RALPH, Far Rockaway, Chemistry
DIAMENT, PAUL, Brooklyn, Engineering
DICARLO, JAMES A., Buffalo, Physics
DIETZ, RUSSELL N., Wantagh, Engineering
DIPAOLA, ROBERT A., New Hyde Park, Long Island, Mathematics
DOLAN, JOSEPH F., Rochester, Astronomy
DONOVAN, DANIEL B., Allegany, Chemistry
DUGGAN, BROTHER EDWARD I., New Rochelle, Mathematics
EASTON, PAUL D., New York, Physics
EICKWORT, GEORGE C., Lynbrook, Zoology
EINSCHLAG, MICHAEL, Brooklyn, Physics
ERICKSON, NILS E., White Plains, Chemistry
FEINBERG, MELVYN J., New York, Chemistry
FEUER, ROBERT C., New York, Zoology
FRANCIS, WILLIAM P., Attica, Physics
FREUND, ISAAC, New York, Chemistry
FRIEDMAN, DAVID H., Long Beach, Engineering
FRIEDMAN, MORTON R., New York, Engineering
FULMER, RICHARD H., Manlius, Physics
GALANIDES, OTTO, Elmhurst, Psychology
GATELY, ADRIAN C., Lynbrook, Engineering
GELMAN, HARRY, New York, Physics
GERSTEN, JOEL I., Bronx, Physics
GLADSTONE, ROBERT J., East Meadow, Engineering
GLICKFELD, BARNETT W., New York, Mathematics
GLOVER, DIANA R., Rochester, Biochemistry
GOBLE, ROBERT L., Schenectady, Physics
GOETTLER, LLOYD A., Rockville Center, Engineering
GOLD, RONALD B., Brooklyn, Economics
GOLDMAN, MARTIN V., Flushing, Physics
GORDON, MYRA, Mount Vernon, Chemistry
GORMAN, GEORGE C., Scarsdale, Zoology
GREEN, PAUL S., New York, Mathematics
GROSSMAN, DAVID D., New York, Physics
GROTCH, HOWARD, Brooklyn, Physics
HANSER, FREDERICK A., Whitestone, Physics
HARRIS, LEE, B., Schenectady, Physics
HEIMLICH, BARRY N., Great Neck, Engineering
HERCHER, MICHAEL M., Rochester, Physics
HERZBERG, NORMAN P., Brooklyn, Mathematics
HOLLAND, MONTE W., DeKalb Junction, Physics
HOLMAN, ERIC W., New York, Psychology
HSIAO, THEODORE C., Forest Hills, Agriculture
HUBBARD, EDWARD W., Lewiston, Engineering
IVES, DAVID C., Binghamton, Engineering
JURINSKI, NEIL B., Buchanan, Chemistry
KAUFMAN, HOWARD, Saratoga Springs, Engineering
KAUFMAN, ROBERT P., Brooklyn, Mathematics
KELLER, KENNETH H., Brooklyn, Engineering
KERSHENBAUM, LESTER S., Far Rockaway, Engineering
KESSLER, DAVID S., Bethpage, Engineering
KING, JOHN S., Kenmore, Earth Sciences
KNOWLTON, FREDERICK F., Springville, Biology
KUBIS, JOSEPH J., Jackson Heights, Physics
LAMPORT, LESLIE B., New York, Mathematics
LANGWORTHY, HAROLD F., Harrison, Mathematics
LAPADULA, CHARLES A., New York, Engineering
LAZAR, GERALD, New York, Psychology
LEIST, LAWRENCE, New York, Engineering
LIEBERMAN, HENRY S., Brooklyn, Mathematics
LINTON, FRED E., New York, Mathematics
LIPNER, LEONARD D., Flushing, Mathematics
LIPSON, MELVIN A., Syracuse, Chemistry
LITOFSKY, BARRY, Brooklyn, Engineering
LOVELAND, DONALD W., Rochester, Mathematics
LOWENTHAL, FRANKLIN, New York, Mathematics
MACEK, JOSEPH H., Troy, Physics
MALAMY, MICHAEL H., Bronx, Microbiology
MAMMANO, NICHOLAS J., Brooklyn, Chemistry
MANASTER, ALFRED B., Ithaca, Mathematics
MATRICARDI, VICTOR R., Woodside, Engineering
MAZO, JAMES E., Syracuse, Physics
MCALPIN, JOHN H., New York, Mathematics
MCGIBNEY, DONALD J., Bronx, Physics
MCGRATH, JOHN B., Staten Island, Mathematics
MEER, MELVYN L., Brooklyn, Economics
MESKIN, STEPHEN A., Troy, Mathematics
MOSES, FRED, Brooklyn, Engineering
MOSS, ROBERT A., Flushing, Chemistry
MOTT, DAVID L., Rochester, Physics
MROWCA, JOSEPH J., New York, Chemistry
MUKAMAL, HAROLD, Woodmere, Chemistry

MULVEY, DENNIS M., Lockport, Chemistry
NACHAMKIN, JACK, Brooklyn, Physics
NECKERS, DOUGLAS C., Clymer, Chemistry
NOBLE, JULIAN V., Roslyn Heights, Physics
O'NEILL, BARBARA R., Glen Cove, Chemistry
OSHER, STANLEY J., Brooklyn, Mathematics
OSTON, STEVEN G., Bayside, Engineering
PAINE, DWIGHT M., Albion, Mathematics
PECORA, ROBERT, Brooklyn, Chemistry
PELTZMAN, SAM, Brooklyn, Economics
PENCHINA, CLAUDE M., New York, Physics
PERKOWITZ, SIDNEY, Brooklyn, Physics
PRUZAN, PETER M., Brooklyn, Mathematics
RACHLIN, HOWARD C., New York, Psychology
RAPPAPORT, STEPHEN S., Brooklyn, Engineering
RECHER, HARRY F., Roslyn Heights, Biology
REILLY, SR. MARGUERITE, Albany, Zoology
REISMAN, STANLEY S., Brooklyn, Engineering
RELYEA, DOUGLAS L., Poughkeepsie, Engineering
RHODES, PETER R., Clarence, Chemistry
RIFKIND, JOSEPH M., New York, Chemistry
ROSEMAN, JOSEPH J., New York, Mathematics
ROSENSTARK, JEANNETTE, Bronx, Mathematics
ROTHSTEIN, ARI L., Brooklyn, Mathematics
RUBENS, JEFFREY P., Brooklyn, Mathematics
SALINGER, RUDOLF M., Lynbrook, Chemistry
SAXE, BERNHARD D., Flushing, Chemistry
SCHAFFER, HENRY E., Yorktown Heights, Genetics
SCHER, HARVEY, Slocum Heights, Physics
SCHLOSSEL, RICHARD H., Brooklyn, Chemistry
SCHUELLER, KATHLEEN E., New Rochelle, Chemistry
SEIF, JOSEPH B., Brooklyn, Mathematics
SERVEDIO, FRANK J., New York, Mathematics
SHANNON, RICHARD T., New York, Mathematics
SHELBY, JANE, New York, History and Philosophy of Science
SHERRY, EDWIN J., New York, Mathematics
SILBEY, ROBERT J., Brooklyn, Chemistry
SILVERMAN, EDWARD D., Queens Village, Engineering
SIROVICH, CAROLE A., New York, Mathematics
SLIVKA, JOHN J., Lackawanna, Mathematics
SMITH, JOHN H., Ithaca, Mathematics
SMITH, RICHARD C., Keeseville, Physics
SMITH, ROBERT D., Brooklyn, Engineering
SNOW, WOLFE, Brooklyn, Mathematics
SNYGG, JOHN M., Oswego, Mathematics
SOLOMON, ALAN D., New York, Mathematics
SONSHINE, RICHARD M., Yonkers, Engineering
STEIN, SAMUEL H., Brooklyn, Chemistry
STERN, FREDERICK, New York, Mathematics
STEVENS, DONALD C., New York, Mathematics
SUNDERLAND, JOHN, Jackson Heights, Physics
SUTHERLAND, ARTHUR A., Jr., Jamaica, Engineering
SZABO, CORNELIUS A., Brooklyn, Engineering
TEICHLER, DORIS, Brooklyn, Genetics
THEIL, EDWARD H., Brooklyn, Mathematics
THORSEN, RICHARD S., Queens Village, Engineering
TROEH, FREDERICK R., Ithaca, Agriculture
TUEL, WILLIAM G., Jr., Tonawanda, Engineering
TURNER, ROBERT E., New York, Mathematics
VANWINKLE, JON, Schenectady, Engineering
VITALE, WILLIAM R., Brooklyn, Chemistry
WEINBAUM, SHELDON, Brooklyn, Engineering
WEINGOLD, HARRIS D., New York, Engineering
WEIS, ANTHONY F., Flushing, Engineering
WEISSTEIN, NAOMI, New York, Psychology
WELDON, EDWARD J., Tuckahoe, Engineering
WEST, ROGER K., Binghamton, Engineering
WHIMBEY, ARTHUR E., Jackson Heights, Psychology
WINN, MARTIN, Brooklyn, Chemistry
YORK, ROBERT L., Poughkeepsie, Sociology
ZEH, DALE W., Syracuse, Engineering
ZIMMERMAN, MICHAEL, Great Neck, Mathematics

Summer Fellowships for Graduate Teaching Assistants

ANTMAN, STUART S., Rockville Center, Engineering
BANK, STEVEN B., Middle Village, Mathematics
BASILE, DOMINICK V., Yonkers, Botany
BERNHARDT, ROBERTA S., Brooklyn, Zoology
BOOTH, HENDERSON D., Syracuse, Mathematics
BRANDENBURG, RICHARD G., Ithaca, Engineering
BRANDSTEIN, ALFRED G., Brooklyn, Mathematics
BUTTNER, PETER J., Rochester, Earth Sciences
BYRON, FREDERICK W., Jr., New York, Physics
CAMPOS, JOSEPH J., New York, Psychology
CARROLL, ROBERT W., Waterloo, Chemistry
CAVINESS, JAMES A., Ithaca, Psychology
COMSTOCK, GEORGE M., East Norwich, Physics
CONNING, ARTHUR M., Queens Village, Sociology
CORNER, MICHAEL A., New York, Zoology
DEGROOT, RODNEY C., Syracuse, Botany
DEVITO, CARL L., Lynbrook, Mathematics
DOLBIER, WILLIAM R., Jr., Ithaca, Chemistry
DOOLEY, PETER C., Ithaca, Economics
FALLON, THOMAS J., Brooklyn, Mathematics
FELDMANN, RICHARD W., Buffalo, History and Philosophy of Science
FERGUSON, JOHN C., Ithaca, Zoology
FRANCIS, GERALD P., Ithaca, Engineering
GARDNER, ALBERT H., Syracuse, Psychology
GIBSON, ROBERT H., New York, Chemistry
GOLDBERG, EDWARD L., New York, Chemistry
GOLDSTEIN, FRED T., Ithaca, Physics
GRANT, CLAIRE E., Millwood, Genetics
GROSSFIELD, BERNARD, New York, Engineering
GUILFOIL, JOHN D., Astoria, Economics
HARRIS, LEE B., Schnectady, Physics
HARTMANN, LILLIAN E., Yonkers, Physics
HERMAN, LINDA N., Long Beach, Engineering
JORDAN, WILLIAM M., Brooklyn, Earth Sciences
KAPLAN, BRENT, New Rochelle, Engineering
KATZ, MORRIS, Brooklyn, Physics
KELLY, DENNIS D., New York, Psychology
KESSLER, SEYMOUR, New York, Genetics
KING, JOHN S., Kenmore, Earth Sciences
KRIEGER, HAROLD, Lancaster, Engineering
KUCZKOWSKI, ROBERT L., Buffalo, Chemistry
LANG, FRANK T., Long Island City, Chemistry
LEFER, ALLAN M., Merrick, Physiology
LEIBOWITZ, GERALD M., New York, Mathematics
LEMMERMANN, WILLIAM G., New York, Engineering
LEONARD, JOEL I., Yonkers, Engineering

LESSIE, THOMAS G., College Point, Microbiology
LEVINE, LESLIE S., New York, Physics
LEVINE, RAYMOND H., Bronx, Chemistry
LEVY, PAUL F., Bronx, Chemistry
LOEB, CAROL A., Rockaway Park, Chemistry
LOWIN, AARON, New York City, Psychology
MACEK, JOSEPH H., Troy, Physics
MACK, STANLEY I., Syracuse, Mathematics
MACNISH, ROBERT D., Austerlitz, Earth Sciences
MAMMAND, NICHOLAS J., Brooklyn, Chemistry
MARSHALL, PATRICIA A., Whitestone, Chemistry
MARTIN, DAVID A., Syracuse, Economics
MATASSOV, GEORGE, Brooklyn, Physics
MAZO, JAMES E., Syracuse, Physics
METAS, NICK, Corona, Mathematics
MULDOON, JAMES F., New York, Engineering
MULLINS, ROBERT E., New York, Mathematics
NACHAMKIN, JACK, Brooklyn, Physics
NEWBERGER, STUART M., Brooklyn, Mathematics
O'BRIEN, THOMAS V., Syracuse, Mathematics
O'TREMBA, EDWARD D., Lackawanna, Chemistry
PEOPLES, JOHN, Jr., New York, Physics
PERUN, THOMAS J., Binghamton, Chemistry
POSTOW, ELLIOT, Flushing, Physics
RECHER, HARRY F., Roslyn Heights, Biology
RIEFFEL, MARC A., New York, Mathematics
RIESENFELD, JAMES, Bayside, Physics
RIGO, THOMAS, Buffalo, Mathematics
RITVO, CYNTHIA S., Buffalo, Mathematics
ROBINSON, DOUGLAS W., Lockport, Chemistry
ROMANELLI, MICHAEL G., Brooklyn, Chemistry
SAMPSON, SAMUEL F., Ithaca, Sociology
SCHER, HARVEY, Syracuse, Physics
SCHUELLER, KATHLEEN E., New Rochelle, Chemistry
SCHULTZ, GEORGE P., Ithaca, Sociology
SEGAL, ROBERT, New York, Mathematics
SEVKA, MARGARET E., Endicott, Zoology
SHAPIRO, HARVEY L., Forest Hills, Mathematics
SHEPARD, ALVAH R., Syracuse, Economics
SMITH, JOHN H., Ithaca, Mathematics
SMITH, PAUL J., Albany, Chemistry
STOUT, HELEN, Wellsville, Physiology
SULSKI, LEONARD C., Buffalo, Mathematics
TESORO, ALFRED W., Dobbs Ferry, Physics
THOMPSON, STEPHEN I., Cazenovia, Anthropology
TITLEBAUM, EDWARD L., Ithaca, Engineering
TURNER, MAUREEN B., New York, Mathematics
TZAGOLOFF, ALEXANDER A., New York, Biochemistry
VOSBURG, ALBERT C., Rochester, Mathematics
WABNIK, FRED S., East Meadow, Mathematics
WEISS, STANLEY J., New York, Psychology
WHITNEY, GEORGE C., Ithaca, Chemistry
WOLBERG, GERALD, New York, Microbiology
WOOD, ROBERT M., Scarsdale, Physics
ZWEIG, MARILYN B., Rochester, History and Philosophy of Science

Postdoctoral

BASS, HYMAN, New York, Mathematics
BECK, BERNARD, New York, Sociology
BOIKESS, ROBERT S., Brooklyn, Chemistry
CIVAN, MORTIMER M., New York, Biophysics
CURRIE, DOUGLAS G., Rochester, Physics
DONEFER, EUGENE, Brooklyn, Agricultural Sciences
FREED, JACK H., New York, Chemistry
FRIEDBERG, RICHARD M., New York, Physics
GOLDBERG, PAUL, Long Beach, Chemistry
HORWITZ, GERALD, Ithaca, Physics
KALANTAR, ALFRED H., Ithaca, Chemistry
KISCH, ALEXANDER L., New York, Microbiology
LEVINE, IRA N., Brooklyn, Chemistry
MENCHER, JOAN P., New York, Anthropology
OVERTON, DONALD A., Mechanicville, Psychology
RADINSKY, LEONARD B., Staten Island, Earth Sciences
SAVINI, CHARLES G., Port Wash, Engineering
SHAPIRO, HERMAN S., New York, Biochemistry
SIGNER, ETHAN R., New York, Biology
STREETER, SERENO S., New York, Earth Sciences
SUTTON, ROBERT G., Rochester, Earth Sciences
TOPPING, DAVID M., New York, Mathematics
WILLIAMS, STANLEY A., Troy, Physics
WORTIS, MICHAEL, New York, Physics

Senior Postdoctoral

BAUER, SIMON H., Ithaca, Chemistry
BIGELEISEN, JACOB, Bayport, Chemistry
DIMAGGIO, FRANK L., New York, Engineering
GUERLAC, HENRY E., New York, History and Philosophy of Science
LITTAUER, RAPHAEL M., Ithaca, Astronomy
SCHERAGA, HAROLD A., Ithaca, Chemistry
WALKER, ROBERT M., Delanson, Physics

Science Faculty

ALFIERI, GAETANO T., Brooklyn, Chemistry
ALLARD, SR. MARY J., Buffalo, Chemistry
BECHHOFER, ROBERT E., Ithaca, Mathematics
FAIRBANKS, DAVID I., Geneva, Engineering
FAZEKAS, GABRIEL A., Brooklyn, Mathematics
FERRAND, EDWARD F., New York, Chemistry
GALLAGHER, ORVOELL R., Saratoga Springs, Anthropology
KENYON, RICHARD A., Potsdam, Engineering
LANNI, ROBERT P., Albany, Physics
LEIDIG, ROBERT D., Potsdam, Mathematics
LOFT, JACOB, Brooklyn, Economics
MARSOCCI, VELIO A., Flushing, Engineering
MCMILLAN, JOHN H., Potsdam, Engineering
MCNAIR, ARTHUR J., Ithaca, Engineering
MILLER, RICHARD J., Potsdam, Mathematics
MODREY, JOSEPH, Syracuse, Engineering
OLER, JACQUELINE, New York, Mathematics
PRATT, ARDEN L., Buffalo, Chemistry
ROMMER, RICHARD J., New York, Meteorology
ROSE, FRANK E., Ithaca, Physics
SHANNON, FREDERICK D., Houghton, Chemistry
SHELLEY, JOSEPH F., Kings Point, Engineering
SIMON, KEITH S., New York, Mathematics
SIMPSON, ROBERT C., JR., Canton, Mathematics
SMITH, PATRICIA C., Ithaca, Mathematics
SMITH, RICHARD F., Albany, Chemistry
STRONG, ROBERT L., West Sand Lake, Chemistry
THOMPSON, WILLIAM P., Brooklyn, History and Philosophy of Science
WAHLGREN, HARDY L., Geneseo, Psychology

Summer Fellowships for Secondary School Teachers

AUERBACH, LOUIS, Elmhurst, Chemistry
BAYM, ISAAC, Brooklyn, Mathematics
BERGER, JEROME, Plainview, Biology
BROCKLEY, WARREN J., Albany, Chemistry
CHRISTOPHER, DAVID A., Half Hollow Hill, Chemistry
DOLKART, IRWIN, Brooklyn, Chemistry
DRISCOLL, REV. JOHN G., New York, Mathematics
ENGERT, RICHARD S., New Hyde Park, Mathematics
FRANKEL, BELLA R., New York, Physics
GOLDBERG, MARVIN W., Stony Brook, Chemistry
GOODWIN, SAMUEL W., Rochester, Physics
IZARD, JOHN E., Tonawanda, Earth Sciences
KOGLER, Sr. M. VIANNEY, Kenmore, Chemistry
LENNON, Sr. M. STANISLAUS, Rochester, Chemistry
MANNING, HARVEY, Oceanside, Biophysics
MAWN, JAMES C., New Rochelle, Biology
MCCABE, Sr. M. JOANNE, Ossining, Biology
MORIBER, GEORGE, Brooklyn, Chemistry
O'CONNOR, Rev. FRANCIS C., Brooklyn, Mathematics
PERCIACCANTE, VINCENT A., Brooklyn, Chemistry
PFEFFER, CHARLES A. Jr., Brooklyn, Mathematics
SIRKIN, LESLIE A., Mount Vernon, Earth Sciences
TANAKA, MASAKO N., Orangeburg, Biology

NORTH CAROLINA

Graduate

BARNHILL, MAURICE V., Wilmington, Physics
CAVINESS, BOBBY F., Asheboro, Mathematics
COLE, CARL P., Bryson City, Chemistry
COLE, JAMES L., Raleigh, Psychology
COLEMAN, JAMES R., Durham, Zoology
EVERETT, GROVER W. Jr., Greenville, Chemistry
GIBBS, HYATT M., North Wilkesboro, Physics
HARRIS, CONSTANCE M., Durham, Biochemistry
JONES, THOMAS L., Brevard, Engineering
KEPLER, CAROL R., Chapel Hill, Physiology
KESLER, STEPHEN E., Kings Mountain, Earth Sciences
KOWAL, NORMAN E., Durham, Botany
LATOUR, PIERRE R., Kinston, Engineering
MICHAEL, WILLIAM B., Bostic, Physics
MINK, LAWRENCE A., Raleigh, Physics
MOCK, MICHAEL S., Winston-Salem, Physics
RASH, FRED H., Lexington, Chemistry
ROBERTS, BRYAN W., Hillsboro, Chemistry
ROYALL, RICHARD M., Raleigh, Mathematics
SOOS, ZOLTAN G., Montreat, Chemistry

Cooperative Graduate

BLACK, STANLEY W., III., Charlotte, Economics
COCKE, WILLIAM J., Asheville, Physics
COLLINS, BARRY E., Raleigh, Psychology
COOKE, CHARLES F., Hildebran, Physics
COUCHELL, GUS P., Charlotte, Physics
DALTON, ROBERT E., Chapel Hill, Mathematics
FALLAW, WALLACE C., Hillsboro, Earth Sciences
HARRELSON, DWIGHT H., Cherryville, Chemistry
HART, ROBERT, Burnsville, Physics
KIMEL, JACOB D., Jr., Winston-Salem, Physics
NANZETTA, PHILIP N,, Winston-Salem, Mathematics
NEBEL, BERNARD, J., Durham, Physiology
PEARCE, ROBERT G., Henderson, Engineering
REYNOLDS, JOHN T., Durham, Physics
SAWYERS, JAMES R., Jr., Durham, Physics
SCHWARTZ, MAURICE E., Laurinburg, Chemistry
YOUNG, WARREN H., Jr., Burgaw, Engineering

Summer Fellowships for Graduate Teaching Assistants

AIUTO, RUSSELL, Chapel Hill, Botany
ARCHIE, JOSEPH P., Jr., Raleigh, Engineering
BOND, HAROLD A., Chapel Hill, Botany
CROWDER, JAMES U., Jr., Ashville, Engineering
FRAZIER, NANCY J., Lenoir, Botany
JACKSON, FABIAN B., Raleigh, Psychology
JESSNER, PETER H., Carrboro, Mathematics
NEBEL, BERNARD J., Durham, Physiology
PARNELL, JAMES F., Clayton, Biology
SHELLENBARGER, BETTY W., Chapel Hill, Chemistry
WHYBURN, CLIFTON T., Chapel Hill, Mathematics
WORSHAM, WALTER C., Chapel Hill, Chemistry

Postdoctoral

DAVIS, HOWARD T., Hendersonville, Chemistry

Senior Postdoctoral

LA BARRE, WESTON, Durham, Anthropology
SLIFKIN, LAWRENCE M., Chapel Hill, Physics

Science Faculty

BERNARD, RICHARD R., Davidson, Mathematics
BIGELOW, RICHARD H., Raleigh, Engineering
BUZZARD, GALE H., II, Durham, Engineering
HADER, ROBERT J., Raleigh, Mathematics
KNAPPENBERGER, HERBERT, Raleigh, Mathematics
MOLLESON, ANN L., Chapel Hill, Medical Sciences
MORROW, JOHN C., III, Chapel Hill, Chemistry
THOMAS, RICHARD J., Raleigh, Agriculture

Summer Fellowships for Secondary School Teachers

CREECH, ROGER L., Princeton, Mathematics
SNEAD, ROBERT E., Boone, Biology

NORTH DAKOTA

Graduate

HAMANN, WAYNE C., Dickinson, Engineering
HARSTAD, KENNETH G., Hillsboro, Engineering
LOOS, JAMES S., Grafton, Physics
SCHEIBE, PAUL O., Marion, Engineering
SPANDE, THOMAS F., Mayville, Chemistry
THOMPSON, DAVID A., Devils Lake, Engineering
UTGAARD, JOHN E., Minot, Earth Sciences

Cooperative Graduate

BOSCH, WILLIAM, Linton, Mathematics
CORNELL, CARL A., Bismarck, Engineering
DUNCAN, DAVID R., Fargo, Mathematics
LOKKEN, RONALD A., Valley City, Mathematics
THOMPSON, GARY G., Beach, Earth Sciences
WILLSON, GORDON B., Langdon, Mathematics

Summer Fellowships for Graduate Teaching Assistants

ANAGNOSTOU, TAKI J., Fargo, Chemistry
HANSON, MERLE E., Oakes, Engineering
HRUBY, VICTOR J., Valley City, Chemistry
PETTERSEN, JAMES C., Grand Forks, Zoology
ZIMMERMAN, DALLAS D., Fargo, Chemistry

Postdoctoral

MANN, JULIAN A., Jr., Rugby, Chemistry

Science Faculty

TILLY, LAURENCE J., Jamestown, Biology

Summer Fellowships for Secondary School Teachers

McDONALD, JOHN C., Fargo, Mathematics
THOMPSON, IRVING D., Devils Lake, Mathematics

OHIO

Graduate

ADMAN, RAYMOND L., Dayton, Biochemistry
ALONSO, JOSE R., Painesville, Physics
BARGER, JAMES E., Toledo, Engineering
BEAN, ANITA M., Yellow Springs, Genetics
BENEDICT, JAMES B., Cincinnati, Earth Sciences
BRABSON, BENNET B., Findlay, Physics
BRIGHT, MARY A., Lima, Mathematics
BUHL, ALBERT J., Columbus, Chemistry
CARLSON, KRISTIN R., Toledo, Psychology
CLEMENS, CHARLES H., Dayton, Mathematics
CLIFTON, H. EDWARD, Jefferson, Earth Sciences
COOPER, PAUL D., Worthington, Earth Sciences
COTTERMAN, REBECCA A., Dayton, Genetics
CRIM, DONALD E., Lakewood, Anthropology
DAVIS, LINDA A., Columbus, Microbiology
DAVIS, TERRY L., Worthington, Engineering
ELLIS, DAVID R., Rocky River, Engineering
ENTEMANN, ERIC A., Painesville, Chemistry
FARISON, JAMES B., McClure, Engineering
FLOMENHOFT, HUBERT I., Columbus, Engineering
FRIAR, JAMES L., Galion, Physics
GEIGER, DONALD R., Worthington, Botany
GINAVEN, ROBERT O., Akron, Physics
GLESER, LEON J., Cincinnati, Mathematics
GORDON, ROY G., Akron, Physics
GROW, JOHN A., Cincinnati, Earth Sciences
HEINZ, RICHARD M., Toledo, Physics
HEMPFLING, WALTER P., Cincinnati, Microbiology
HENNINGS, JOHN A., Swanton, Biochemistry
HORN, WILLIAM A., Cincinnati, Mathematics
HOWE, MARIAN, Wilberforce, Mathematics
IDEN, GEORGE R., Bloomingburg, Economics
JONES, ALLAN E., Columbus, Engineering
JORDAN, DAVID M., Columbus, Chemistry
KARCH, RICHARD R., Hudson, Mathematics
KOVAR, FREDERICK R., Cleveland, Physics
LEVY, RICHARD M., Cincinnati, Chemistry
LOELIGER, DAVID A., Wooster, Chemistry
MATESICH, SR. MARY A., Columbus, Chemistry
McBRIDE, JAMES M., Lima, Chemistry
MEYER, DAVID H., New Carlisle, Zoology
MILLER, DAVID L., Cincinnati, Chemistry
MILLER, PHILIP E., Cuyahoga Falls, Engineering
MOREY, PHILIP R., East Cleveland, Botany
MYERS, ALAN L., Cincinnati, Engineering
NELSON, FLOYD J., Steubenville, Engineering
NIECE, RONALD L., Lakeview, Genetics
NIEMAN, GEORGE C., Tipp City, Chemistry
NOBEL, PARK S., Solon, Physics
O'DONNELL, STEVE R., Steubenville, Engineering
PATCH, RICHARD W., Westerville, Engineering
PATTERSON, RICHARD R., Dayton, Mathematics
PIERRET, ROBERT F., Euclid, Physics
RAMALEY, JAMES F., Columbus, Mathematics
REBHOLZ, JOSEPH R., Cincinnati, Mathematics
RIX, JOHN R., North Ridgeville, Physics
RUSS, JAMES S., Canton, Physics
SCHROEER, DIETRICH, Enon, Physics
SEALER, DAVID A., Ashland, Engineering
SHAFER, DAVID M., Cincinnati, Mathematics
SHERRILL, THOMAS J., East Cleveland, Astronomy
SHUMATE, KENESAW S., Jackson, Engineering
SLONE, HASEL J., JR., Waverly, Physics
SMITH, DAVID R., West Carrollton, Physics
SPITZNAGEL, EDWARD L., Cincinnati, Mathematics
STIFFLER, PRICE E., Jr., Columbus, Mathematics
WHITNEY, THOMAS A., Toledo, Chemistry
WILSON, JOHN E., Celina, Biochemistry
YOUNG, PAUL R., St. Marys, Mathematics
ZARE, RICHARD N., University Heights, Chemistry

Cooperative Graduate

ANNAVEDDER, EDWIN K., Cincinnati, Mathematics
ARMOUR, JAMES C., Cincinnati, Engineering
BARNES, DENNIS W., Cuyahoga Falls, Chemistry
BARRETT, RICHARD E., Columbus, Engineering
BARTLETT, NOEL S., Lakewood, Mathematics
BIRKIMER, JOHN C., Parma Heights, Psychology
BLOOD, FRANK A., Jr., Cleveland, Physics
BLOUNT, JOHN F., Gahanna, Chemistry
BODMAN, SAMUEL W., III, Akron, Engineering
BRANNAN, JOHN R., Piqua, Physics
BROCKWAY, ALAN P., Cleveland Heights, Physiology
DAVIDSON, NEIL A., Cleveland Heights, Mathematics
DELVIGS, PETER, East Cleveland, Chemistry
DORIA, MICHAEL L., Cleveland, Engineering
DREYFUSS, PATRICIA M., Cuyahoga Falls, Chemistry
ELLISON, JAMES T., Cleveland, Mathematics
FENTIMAN, ALLISON F., Jr., Columbus, Chemistry

FISHER, E. MARCIA, North Jackson, Chemistry
FISHER, FARLEY, Painesville, Chemistry
FOX, CHARLES F., Springfield, Biochemistry
FREED, NORMAN, Cleveland, Physics
GIERE, RONALD N., Cleveland, History and Philosophy of Science
GIESY, DANIEL P., Columbus, Mathematics
GLAZMAN, JERRY S., Akron, Chemistry
GOETZ, RICHARD W., Cincinnati, Chemistry
GRISSEAU, COLLIN R., Dayton, Genetics
HAGENLOCKER, EDWARD E., Columbus, Physics
HARVILLE, DAVID A., New Milford, Agriculture
HAYNES, JULIAN F., Cleveland, Biology
HOOT, CHARLES G., Canton, Physics
HOSKINSON, DAVID K., Akron, Mathematics
JACOBS, GLORIA L., Cincinnati, Psychology
JOYCE, WILLIAM B., Hamilton, Physics
KAISER, FRITZ, Kent, Mathematics
KAMMANN, RICHARD A., Cincinnati, Psychology
KARIPIDES, ANASTAS G., Canton, Chemistry
KEEFER, ROBERT F., Columbus, Agriculture
KELSO, ANNE G., Euclid, Zoology
KLEMM, ROBERT D., Youngstown, Zoology
KLOSS, KENNETH E., Loudonville, Mathematics
KOMITSKY, FRANK, Jr., Columbus, Chemistry
KOPCZEWSKI, ROBERT F., Cleveland, Chemistry
LANDMAN, BETTE E., Columbus, Anthropology
LARSEN, EARL A., Millbury, Mathematics
LEETMAA, MAIA, Fremont, Mathematics
LEONARD, RALPH A., Cincinnati, Engineering
LEWIS, RAYMOND A., Xenia, Physics
LILIE, PAUL A., St. Mary's, Physics
LINDOW, DONALD F., Shaker Heights, Chemistry
LODISH, HARVEY F., University Heights, Biophysics
MACH, GEORGE W., Ottawa, Chemistry
MARKWORTH, ALAN J., Cleveland, Physics
MCCONNELL, JOHN L., Akron, Genetics
MENCIS, INARA, Ada, Chemistry
MIKOLAJ, PAUL G., Avon Lake, Engineering
NOE, JAMES L., Cincinnati, Chemistry
NOE, NORMAN H., Ada, Engineering
PEREIRA, CARLOS M., Cleveland, Physics
PINKAVA, DONALD J., Columbus, Botany
POLITZER, PETER A., Cleveland, Chemistry
PORTER, JAMES C., Cleveland Heights, Physics
RAQUET, CHARLES A., Cleveland, Physics
REICHERT, THOMAS A., Campbell, Chemistry
REPAS, PAUL E., Euclid, Engineering
ROBINSON, CAROL L., Columbus, Mathematics
SCHIFF, PAUL L., Jr., Columbus, Medical Sciences
SCHIMKE, JOEL T., Massillon, Engineering
SCHORMULLER, MARGARET L., Painesville, Chemistry
SCHROEDER, PAUL R., Cincinnati, Engineering
SECOY, DIANE M., Troy, Zoology
SMITH, JAMES A., Columbus, Chemistry
SMITH, TAYLOR J., Avon, Engineering
SNEIDER, THOMAS W., Fremont, Physiology
STEIN, CAROL B., Worthington, Biology
STRAUSS, AARON S., Cleveland, Mathematics
WENNER, BRUCE R., Canton, Mathematics
WILEY, DAVID S., Troy, Physics
WILLIAMS, LAWRENCE E., Youngstown, Physics
WILSON, ROBERT L., Jr., Delaware, Mathematics
ZAHURANEC, BERNARD J., Lorain, Biology
ZERLA, FREDERIC J., Dillonvale, Mathematics

Summer Fellowships for Graduate Teaching Assistants

ABBOTT, JAMES C., Columbus, Chemistry
BENSON, ANTHONY L., Akron, Earth Sciences
BEYER, HAROLD H., Cincinnati, Engineering
BIAGLOW, JOHN E., Cleveland, Biochemistry
BLOUNT, JOHN F., Gahanna, Chemistry
BOKER, HARRIET N., Worthington, Biology
BUSSMAN, DALE R., Columbus, Engineering
CARLSON, RICHARD S., Cincinnati, Chemistry
CASSADY, JOHN M., Cleveland, Chemistry
CLOW, SANDRA S., Dayton, Biology
COBURN, ROBERT A., Akron, Chemistry
CRAMER, MICHAEL B., Tipp City, Medical Sciences
DELVIGS, PETER, East Cleveland, Chemistry
DORENBUSCH, WILLIAM E., Middletown, Physics
FEIL, SUSAN E., Cuyahoga Falls, Chemistry
FISHER, E. MARCIA, North Jackson, Chemistry
FRANKART, JEANNE D., Springfield, Psychology
GIERE, RONALD N., Cleveland, Physics
GILGEN, ALBERT R., Mogadore, Psychology
GLIOZZI, JAMES, Kent, Earth Sciences
HANSON, HAROLD N., Cincinnati, Chemistry
HARMON, SHIRLEY A., Marietta, Microbiology
HARRIS, CHARLES A., Aurora, Psychology
KIMBLETON, STEPHEN R., Cleveland, Mathematics
KUNTZMAN, ANDREW J., Frankfort, Zoology
MACH, GEORGE W., Ottawa, Chemistry
MICHELMAN, JOHN S., Cincinnati, Chemistry
MILLER, KATHARYN L., Youngstown, Microbiology
MILLS, FRANK D., Shaker Heights, Chemistry
MOORHEAD, ELIZABETH G., Findlay, Chemistry
NINKE, WILLIAM H., Cleveland, Engineering
OSBORNE, ROBERT H., Akron, Earth Sciences
PIRON, ROBERT, Oberlin, Economics
ROSENTHAL, MICHAEL R., Youngstown, Chemistry
SAFKO, JOHN L., Columbus, Physics
SHERRY, DAVID L., Bellaire, Mathematics
SKAVARIL, RUSSELL V., Columbus, Genetics
SLONE, HASEL J., Jr., Waverly, Physics
STRAUSS, AARON S., Cleveland, Mathematics
STRIEDER, WILLIAM C., Cleveland, Chemistry
SWARTZEL, STEPHANIE O., Waynesville, Zoology
SZANISZLO, PAUL J., Medina, Botany
THOMAS, ROBERT E., Salineville, Zoology
TILLER, WILLIAM E., Athens, Physics
WILKINS, CORNELIUS K., Bedford, Chemistry
WILLIAMS, WILLIAM J., Rio Grande, Engineering
WISE, RAYMOND A., Lisbon, Physics
YOUNG, PAUL R., Saint Mary's, Mathematics
ZEPF, THOMAS H., Cincinnati, Physics

Postdoctoral

LEFKOWITZ, IRVING, Cleveland Heights, Engineering
POINAR, GEORGE O., Jr., Berea, Zoology
VANDENEYNDEN, CHARLES L., St. Bernard, Mathematics
WARNER, HUBER R., KENT, Biochemistry
WEICK, KARL E., Jr., Findlay, Psychology
YASUMURA, SEIICHI, Cincinnati, Physiology

Senior Postdoctoral

HAN, LIT S., Columbus, Engineering
HAYNES, ROBERT C. Jr., Cleveland, Medical Sciences
PINCUS, HOWARD J., Columbus, Earth Sciences
SAPIRSTEIN, LEO A., Columbus, Physiology

Science Faculty

BRUGGEMAN, THOMAS J., Cincinnati, Mathematics
CUSICK, CHARLES J., Cincinnati, Zoology
DETTMAN, JOHN W., Cleveland, Mathematics
EWING, DONALD J., Jr., Toledo, Engineering
FLINNER, JACK L., Springfield, Physics
HASELTON, GEORGE M., Columbus, Earth Sciences
HEATH, GEORGE L., Toledo, Engineering
HULING, RICHARD T., Athens, Zoology
LINDSTROM, WENDELL D., Gambier, Mathematics
MACHLUP, STEFAN, Cleveland, Physics
MAVRIGIAN, GUS, Youngstown, Mathematics
PETSCH, H. OTTO, Marietta, Mathematics
SCHMIDT, BERNHARD M., Dayton, Physics
SMITH, HOWARD E., Dayton, Engineering
YOUNG, DAVID F., Marietta, Zoology

Summer Fellowships for Secondary School Teachers

AUBELE, SR. M. BAPTISTA, Newark, Zoology
BALL, HAYWARD G., Carlisle, Zoology
BOWERS, ALLAN L., New Athens, Biology
BURNS, ROBERT L., Reynoldsburg, Biology
COLLINS, SR. M. PHOEBE, Warren, Chemistry
DUDROW, WILLIAM H., Columbus, Zoology
FULLERTON, JOHN C., Dayton, Botany
GERKEN, MARY E., Sylvania, Microbiology
GOODMAN, ROBERT C., Cleveland, Chemistry
HABIG, SR. M. WALBURGA, Cincinnati, Mathematics
HARBAUM, WILLIS H., Hamilton, Zoology
MCNEMAR, ROBERT E., Columbus, Physics
MEDVE, RICHARD J., Willoughby, Biology
STUDER, SR. M. VINCENTIA, Akron, Mathematics
WILSON, MARILYN A., Mansfield, Mathematics
YARIAN, RONALD A., South Euclid, Biology
ZWICK, EARL J., Akron, Mathematics

OKLAHOMA

Graduate

DAVIS, DICKIE D., Stillwater, Botany
FAUDREE, RALPH J., Atoka, Mathematics
FINLEYSON, BRUCE A., Tulsa, Engineering
FORD, HOLLAND C., Granite, Astronomy
GERLACH, CHARLES R., Guthrie, Engineering
GILBERT, M. CHARLES, Lawton, Earth Sciences
HURST, GERALD L., Jones, Chemistry
KELLY, SR. SUZANNE, Tulsa, History and Philosophy of Science
KIRMSE, DALE W., Alva, Engineering
LANE, NEAL F., Norman, Physics
LIPE, WILLIAM D., Bristow, Anthropology
MORAN, WILLIAM P., Tulsa, Physics
MURRAY, FREDERICK N., Tulsa, Earth Sciences
REINHARDT, WILLIAM N., Bartlesville, Mathematics
ROWLAND, JAMES R., Muldrow, Engineering
SCOUTEN, DONALD C., Medford, Engineering
SMITH, WARREN L., Norman, Zoology
SNEED, JOSEPH D., Tulsa, History and Philosophy of Science
TECH, JACK L., Oklahoma City, Astronomy
THACH, ROBERT E., Oklahoma City, Biochemistry
WOLFE, JAMES F., Norman, Engineering
WOOD, DAVID E., Seminole, Chemistry
ZAVODNY, ALFRED T., Redrock, Engineering

Cooperative Graduate

BLADE, RICHARD A., Bartlesville, Physics
BLANCETT, ALLEN L., Norman, Engineering
BOWIE, JOHN L., Oklahoma City, Engineering
COLE, JON K., Altus, Mathematics
GAMMON, BRUCE E., Cordell, Chemistry
GARDNER, RICHARD L., Logan, Biochemistry
GEPHARDT, DIANE W., Stillwater, Physiology
GILLILAND, HAROLD E., Oklahoma City, Engineering
LAKIN, JIMMIE G., Stillwater, Mathematics
MCCREARY, JAMES G., Norman, Engineering
MCKAY, DAVID S., Tulsa, Earth Sciences
MIHRAM, GEORGE A., Duncan, Mathematics
MORRIS, ROBERT J., Jr., Oklahoma City, History and Philosophy of Science
PIERCE, DONALD A., Enid, Engineering
PROCTOR, DAVID R., Wetumka, Mathematics
TAYLOR, DAN L., Blanchard, Engineering
YARBOROUGH, JEAN A., Enid, Chemistry

Summer Fellowships for Graduate Teaching Assistants

BANKS, DONALD J., Stillwater, Botany
CARTER, WILLIAM A., Stillwater, Zoology
DAVIS, KENNETH J., Lawton, Engineering
ELLIS, JERRY W., Stillwater, Chemistry
FROST, JACKIE G., McLoud, Earth Sciences
HARTMAN, ROBERT C., Bartlesville, Physics
HOPPER, FRED A., Jr., Norman, Zoology
REIDY, JAMES J., Tulsa, Physics
REIMER, ROLLIN D., Cheyenne, Zoology
SHIRLEY, BARBARA A., Norman, Physiology
SMITH, JAMES L., Stillwater, Mathematics

Postdoctoral

BOOTH, EDWARD J. R., Stillwater, Economics

Senior Postdoctoral

POWERS, JOHN E., Norman, Engineering

Science Faculty

ASSENZO, JOSEPH R., Norman, Medical Sciences
FAIRCHILD, JACK E., Norman, Engineering
GARTON, JAMES E., Stillwater, Engineering
LOWY, STANLEY H., Norman, Engineering
PAN, TING K., Norman, Mathematics
VIAVANT, WILLIAM J., Norman, Mathematics

Summer Fellowships for Secondary School Teachers

ADKINS, GENE R., Cement, Mathematics
BRADY, KENNETH R., Burneyville, Mathematics
DEMPSEY, IDA L., Norman, Zoology
DUNHAM, ROSALIE I., Tulsa, Mathematics
GELMERS, ANDREW L., Ponca City, Mathematics
SOOTER, JAMES E., Vinita, Mathematics
STONE, DOYLE R., Fort Gibson, Mathematics
WALLACE, MABEL E., Chickasha, Mathematics

OREGON

Graduate

ANDREWS, GEORGE E., Salem, Mathematics
ASHLEY, ROGER P., Portland, Earth Sciences
BIRD, KENNETH J., Grants Pass, Earth Sciences
BOGART, ELIZABETH A., Corvallis, Zoology
GERDING, ROBERT K., Portland, Physiology
GOOSMAN, DAVID R., Portland, Physics
JANKE, PETER K., Lebanon, Psychology
LADD, LARRY A., Portland, Physics
LAIRD, CHARLES D., Eugene, Genetics
LORENZEN, LEOLA C., Roseburg, Physiology
MACINTYRE, ROSS J., Yachats, Genetics
MOURSUND, ANNE L., Eugene, Chemistry
OGAN, EUGENE, Portland, Anthropology
OWEN, MICHAEL G., III, Albany, Anthropology
PETERSEN, WALTER A., Jr., Portland, Physiology
RINARD, GILBERT A., Newberg, Physiology
SALLEE, GEORGE T., Nyssa, Mathematics
SATHER, CLIFFORD A., Portland, Anthropology
SHORACK, GALEN R., Eugene, Mathematics
STARR, RONALD L., Woodburn, Psychology
THOMASON, STEVEN K., Albany, Mathematics
WILSON, JAMES D., The Dalles, Chemistry
WRIGHT, LINDA A., Ashland, Chemistry

Cooperative Graduate

ALEXANDER, GERALD C., Corvallis, Engineering
CALLIS, PATRIK R., Springfield, Chemistry
HOLMES, QUENTIN A., Eugene, Physics
HOUSLEY, ROBERT M., Portland, Physics
JACKSON, SHIRLEY L., Jr., Portland, Mathematics
MYERS, MICHAEL K., Portland, Engineering
PARKER, JERALD V., Portland, Physics
PATTON, JAMES V., Eugene, Chemistry
PAWLOWSKI, NORMAN E., Jacksonville, Chemistry
PEARSON, GARY A., Portland, Physics
PETERSEN, ROBERT J., Hillsboro, Chemistry
SORENSEN, FRANK C., Corvallis, Agriculture
WEST, NEIL E., Klamath Falls, Biology

Summer Fellowships for Graduate Teaching Assistants

BAARTZ, ARNE P., Eugene, Mathematics
CONNER, ROBERT L., Portland, Psychology
DAMKAER, DAVID M., Portland, Oceanography
GARRETT, ROBERT O., Eugene, Physics
HELZER, GARRY A., Portland, Mathematics
HILL, RICHARD S., Portland, Chemistry
JOHNSON, MICHAEL P., Eugene, Botany
LINDAHL, ROBERT J. Eugene, Mathematics
MADSEN, MILLARD C., Eugene, Psychology
RANDALL, WILLIAM J., Cottage Grove, Chemistry
TEMPERLEY, JUDITH K., Eugene, Physics

Science Faculty

BONHORST, CARL W., Portland, Biochemistry
BONNICKSEN, LEROY W., Corvallis, Engineering
CAMERON, H. RONALD, Corvallis, Genetics
DAY, JOHN A., McMinnville, Physics
LONG, VERNON L., Portland, Physics
MEYER, WALTER, Corvallis, Engineering

Summer Fellowships for Secondary School Teachers

HACKERT, ADELBERT F., Medford, Mathematics
HANSEN, PAUL C., Portland, Mathematics

PENNSYLVANIA

Graduate

ANDERSON, JAMES B., State College, Engineering
BAJURA, RICHARD A., Duquesne, Engineering
BARTEN, CAROLYN O., State College, Chemistry
BENNETT, ALAN J., Philadelphia, Physics
BENNETT, LEE C., Jr., Bryn Mawr, Earth Sciences
BEUSCH, JOHN U., Erie, Engineering
BICKING, LEWIS A., Phoenixville, Biophysics
BOARDMAN, CHARLES J., Pittsburgh, Engineering
BRANDT, RICHARD C., Swarthmore, Physics
BRENNER, DAEG S., Abington, Chemistry
BURNHAM, DAVID C., Pittsburgh, Physics
BURROUGHS, JOHN E., Jenkintown, Mathematics
CAPECCHI, MARIO R., Southhampton, Biophysics
CASSEL, WENDEL R., Linglestown, Engineering
CLARK, JOSEPH C., Glen Campbell, Earth Sciences
COLES, RICHARD W., Swarthmore, Zoology
CRAMER, KATHLEEN J., Saruer, Botany
CROSS, RICHARD J., Jr., Pittsburgh, Chemistry
DEMKO, GEORGE J., State College, Geography
DESANTO, JOHN A., Kingston, Physics
EDWARD, DALLAS C., Meadville, Zoology
EPLER, JAMES L., York, Genetics
FARKAS, EDWARD J., Media, Engineering
FEAIRHELLER, STEPHEN, Philadelphia, Chemistry
FETTER, ALEXANDER L., Philadelphia, Physics
FLEISCHER, LOIS M., Meadville, Biochemistry
FRANK, CHARLES R., Jr., Pittsburgh, Economics
FRANZ, GILBERT W., State College, Earth Sciences
FRASER, MALCOLM D., Pittsburgh, Engineering
GABRIELE, THOMAS L., York, Engineering
GASTON, CHARLES A., Lancaster, Engineering
GIGLIOTTI, ROBERT R., Pittsburgh, Economics
GIMPEL, JAMES F., Philadelphia, Engineering
GRAHAM, LAWRENCE D., Bradford, Engineering
GRAY, DONALD M., Milton, Biophysics
GREGORY, BOB L., Pittsburgh, Engineering
HARMAN, WILLIAM H., III, Philadelphia, Engineering
HEIGHTLEY, JOHN D., Johnstown, Engineering
HEIMER, MALCOLM L., Beech Creek, Engineering
HEISS, DAVID F., Doylestown, Earth Sciences
HICKEY, LEO J., Philadelphia, Earth Sciences
HOFER, CHARLES W., Duncannon, Physics
HOFFMAN, DONALD B., Jr., Allentown, Biophysics

HOLLAND, RICHARD W., Upper Darby, Engineering
HOROWITZ, DANIEL H., State College, Earth Sciences
HORSTMAN, CLIFFORD C., Sharpsville, Engineering
HOUGHTON, DAVID D., Media, Meteorology
HUBER, WILLIAM R., Johnstown, Engineering
HUMPHREYS, JAMES E., Erie, Mathematics
JEFFERYS, WILLIAM H., Radnor, Astronomy
JEROME, JOSEPH W., Philadelphia, Mathematics
KAISER, HENRY, Philadelphia, Engineering
KALME, CHARLES I., Philadelphia, Mathematics
KELLY, FRANCES J., Shamokin, Biology
KRALL, ALLAN M., State College, Mathematics
KRANTZ, DAVID H., Philadelphia, Psychology
LANGRETH, SUSAN G., Pittsburgh, Zoology
LARKIN, FRANCIS P., Middletown, Mathematics
LARSON, RICHARD G., Philadelphia, Mathematics
LAVINE, RICHARD B., Huntingdon Valley, Mathematics
LAWRENCE, PAUL J., Hazleton, Biochemistry
LEES, ROBERT J., Philadelphia, Engineering
LIPPARD, STEPHEN J., Pittsburgh, Chemistry
MARKLEY, F. LANDIS, Cheltenham, Physics
MARTIN, RICHARD K., Elizabethtown, History and Philosophy of Science
MAYER, RAYMOND A., JR., Philadelphia, Mathematics
McGRADY, SR. M. MERCY, Pittsburgh, Chemistry
McLEISTER, ELIZABETH, Pittsburgh, Chemistry
MIESEL, JOHN L., Erie, Chemistry
MIRMAK, EDWARD V., Lancaster, Mathematics
MOHR, SCOTT C., Warren, Biochemistry
MUNLEY, FRANCIS E., Archbald, Physics
NIEDRA, JANIS M., Beaver Falls, Engineering
NOBLE, ROBERT W., JR., Ardmore, Biophysics
NUNEMAKER, RODNEY D., Centerport, Physics
ORNSTON, LEO N., Horsham, Biochemistry
PASSELL, NICHOLAS, Pittsburgh, Mathematics
PIERCE, RUSSELL D., Homer City, Physics
RAUB, WILLIAM F., Nanticoke, Physiology
RAUCH, FRANCIS C., Philadelphia, Chemistry
REILLY, MATTHEW J., Pittsburgh, Engineering
RICE, ALAN W., Bridgeville, Engineering
ROVNYAK, JAMES L., Ford City, Mathematics
SCHICK, MICHAEL, Philadelphia, Physics
SHABAKER, ROBERT H., Media, Engineering
SHAFFER, OLIVIA C., Swarthmore, Psychology
SHANAHAN, PATRICIA A., Bethel Park, Psychology
SHARPLEY, WILLIAM K., State College, Engineering
SHIRK, JAMES S., Aliquippa, Chemistry
SILVERSTEIN, MARTIN L., Philadelphia, Mathematics
SIMPSON, LARRY P., Philadelphia, Biophysics
SKEATH, JAMES E., Williamsport, Mathematics
SNYDER, NOEL F., Swarthmore, Zoology
STANDISH, THOMAS A., Sewickley, Mathematics
STANKO, JOSEPH A., Wilkes-Barre, Chemistry
STANLEY, HARRY E., JR., West Chester, Biophysics
STETZ, ALBERT W., Millersburg, Physics
STOWELL, JOHN C., Erie, Chemistry
SUNA, ANDRIS, Broomall, Physics
SWITKES, LOUISE S., Pittsburgh, Biochemistry
TAPPERT, FREDERICK D., Philadelphia, Physics
TRAHANOVSKY, WALTER S., Conemaugh, Chemistry
WILLIAMSON, SAMUEL J., Sayre, Physics
WILLS, ESTHER V., Secane, Biochemistry
WILSON, GUSTAVUS E., JR., Philadelphia, Chemistry
WOLF, RICHARD A., Pittsburgh, Physics
WRIGHT, ARTHUR W., Broomall, Economics
YAROSH, EDWARD C., Baden, Biophysics
YODER, CLAUDE H., West Reading, Chemistry

Cooperative Graduate

ABRAMS, E. DAVID, Philadelphia, Engineering
BEALS, RICHARD W., Erie, Mathematics
BRADY, JAMES E., State College, Chemistry
BRUCE, CAROL A., Apollo, Botany
CALLAHAN, DANIEL L., Philadelphia, Mathematics
CAMPBELL, MARY K., Havertown, Chemistry
CAREY, FRANCIS A., Philadelphia, Chemistry
COHEN, GERSON H., Philadelphia, Chemistry
COOK, RAYMOND G., McKeesport, Engineering
CORSON, PETER B., Philadelphia, Engineering
DODGE, FRANKLIN T., Pittsburgh, Engineering
ERY, JOHN M., Mohnton, Chemistry
ENGLEHART, RICHARD W., Pittsburgh, Engineering
FORNEY, LEROY S., Harrisburg, Chemistry
FRANK, JANICE A., Grove City, Psychology
FRUIT, RICHARD E., Jr., Bloomsburg, Chemistry
GOFF, MILTON L., III, Villanova, Psychology
GOLDSTEIN, RICHARD, Philadelphia, Mathematics
GOROFF, IZA, R., Philadelphia, Physics
GRAF, VIRGIL A., Newtown Square, Psychology
GREENLEAF, FREDERICK P., Allentown, Mathematics
HANSON, KENNETH L., University Park, Engineering
HARBIN, GRACEMARIE E., Yeadon, Zoology
HEINDEL, NED D., Red Lion, Chemistry
HILL, DAVID G., Gibsonia, Physics
HODGE, CHARLES G., III, Havertown, Engineering
HOEHN, WILLIAM E., Jr., Carnegie, Economics
HOFFMAN, RICHARD B., Bethlehem, Physics
HOLMBERG, GARY L., Warren, Engineering
IFFT, EDWARD M., Butler, Physics
JEFFERS, PETER M., Myerstown, Chemistry
KEYNES, HARVEY B., Philadelphia, Mathematics
KLINGENER, DAVID J., Meadville, Zoology
KURLAND, JONATHAN J., Philadelphia, Chemistry
LANDRY, BARBARA J., St. Davids, Chemistry
LEES, JOSEPH K., Philadelphia, Physics
LEVIN, GERSON L., Philadelphia, Mathematics
LIPOWITZ, JONATHAN, Pittsburgh, Chemistry
LONDON, RALPH L., Pittsburgh, Mathematics
LUGAR, RICHARD C., Philadelphia, Chemistry
LUYBEN, WILLIAM L., Zieglerville, Engineering

MAGAN, JOHN R., Bethlehem, Physics
MASTASCUSA, EDWARD J., Pittsburgh, Engineering
MASTROCOLA, WILLIAM E., Clifton Heights, Mathematics
MICHAEL, KEITH W., State College, Chemistry
MISNER, JOHN, Pittsburgh, Mathematics
MULHERIN, DENIS M., Scranton, Physics
MYERS, JOEL N., Philadelphia, Meteorology
NAGLE, JOHN F., Girard, Physics
NAUMANN, DOROTHY C., Philadelphia, Zoology
NEWTON, JOHN W., Jr., Bethlehem, Engineering
NYSTROM, WILLIAM A., Emporium, Engineering
O'DONNELL, VINCENT F., Philadelphia, Physics
PARR, SIDDY S., Pittsburgh, Zoology
PFAHL, ROBERT C., Jr., Wayne, Engineering
PHILLIPS, ROGER C., Philadelphia, Biochemistry
PLATENIUS, PETER H., Bryn Mawr, Psychology
PRESCOTT, HENRY E., Jr., Prospect Park, Botany
ROSE, CHARLES M., Johnstown, Engineering
ROSENZWEIG, MICHAEL L., Philadelphia, Biology
ROSS, JAMES A., Drexel Hill, Physics
SAVARY, LOUIS M., Scranton, Mathematics
SCHACHER, MURRAY M., Philadelphia, Mathematics
SCHULTZ, STEPHEN R., Philadelphia, Biology
SHERMAN, RONALD, Philadelphia, Engineering
SHORE, SAMUEL D., McClure, Mathematics
STONE, SYLVIA L., State College, Microbiology
STRIEB, BERTRAM L., Philadelphia, Physics
SWIFT, ARTHUR R., Narberth, Physics
WASHBURN, ALAN R., Pittsburgh, Engineering
WEHRY, EARL L., Jr., Reading, Chemistry
WEIDNER, TERRY M., Emmaus, Botany
WHITNEY, MARIAN, Malvern, Chemistry
WINTER, HARRY C., State College, Biochemistry
YINGLING, RICHARD T., Hershey, Biophysics
ZAHRADNIK, RAYMOND L., Pittsburgh, Engineering
ZEISSE, CARL R., Narberth, Physics
ZIEGLER, JOANNA R., Lewisburg, Botany

Summer Fellowships for Graduate Teaching Assistants

ALLEN, CHARLES K., Pittsburgh, Psychology
ANGOTTI, RODNEY, Pittsburgh, Mathematics
BACHMAN, JERALD G., Philadelphia, Psychology
BEIDLEMAN, JAMES C., State College, Mathematics
BENTLEY, ROBERT D., Lancaster, Earth Sciences
BERMAN, BYRD L., Saint Davids, Earth Sciences
BETZ, JOHN V., Bala-Cynwyd, Microbiology
BRENNAN, JAMES F., Clarks Summit, Chemistry
BRENNER, GILBERT J., State College, Earth Sciences
BRIMHALL, JAMES E., Pittsburgh, Physics
BURTNER, ROGER L., Hershey, Earth Sciences
CIMA, JOSEPH A., State College, Mathematics
COLAIZZI, JOHN L., Pittsburgh, Chemistry
COLQUITT, LEROY, Pittsburgh, Physics
CRAMER, KATHLEEN J., Sarver, Botany
DAVISON, RAYMOND B., Pittsburgh, Chemistry
DERSARKISSIAN, MICHAEL, State College, Physics
ECKROTH, DAVID R., Orwigsburg, Chemistry
EISENBERG, MURRAY, Philadelphia, Mathematics
ENGLISH, SANDRA M., West Chester, Biology
ESHLEMAN, JUDITH N., Hershey, Physiology
ETTINGER, MURRAY J., Philadelphia, Medical Sciences
FARBER, PHILLIP A., Hunlock Creek, Zoology
FARRELL, JOHN J., Pittsburgh, Chemistry
GRAF, VIRGIL A., Newtown Square, Psychology
HAGER, THOMAS C., Bethlehem, Engineering
HART, RICHARD B., California, Chemistry
HEDDING, DALE P., Pittsburgh, Engineering
HELMS, MARY W., Bethlehem, Anthropology
HIERGEIST, FRANZ X., Pittsburgh, Mathematics
HOBBS, LEWIS M., Springfield, Physics
JANDA, RICHARD J., Huntingdon Valley, Earth Sciences
KIGGINS, TERENCE R., Pittsburgh, Engineering
KITTELBERGER, J. STEPHEN, Palmerton, Chemistry
KLEIN, RICHARD M., Elkins Park, Chemistry
LEVIN, JOEL M., Bala-Cynwyd, Physics
MAGILL, KENNETH D., State College, Mathematics
MCKEAN, JOEL M., Pittsburgh, Mathematics
MITCHELL, JAMES B., Ashley, Zoology
MOLIN, JO ANN, Mckeesport, Chemistry
MORITZ, ROGER H., Pittsburgh, Mathematics
MUNZINGER, JOHN S., Lansdale, Zoology
NATOWITZ, JOSEPH B., Pittsburgh, Chemistry
NAUMANN, DOROTHY C., Philadelphia, Zoology
PERRIN, CHARLES L., Pittsburgh, Chemistry
PROSPER, PETER A., Jr., Du Bois, Economics
RHEIN, RONALD R., Hamberg, Biology
RIFFE, WILLIAM J., Pittsburgh, Engineering
SCHLEH, EDWARD E., Williamsport, Earth Sciences
SHAW, ROBERT A., Verona, Engineering
SHORE, SAMUEL D., McClure, Mathematics
SIMKIN, THOMAS E., Wallingford, Earth Sciences
SKEATH, JAMES E., Williamsport, Mathematics
STUSNICK, ERIC, Edwardsville, Physics
SZEDON, JOHN R., Eighty Four, Engineering
TAYLOR, ROBERT C., Sheffield, Chemistry
TRYON, GAYLE R., Allison Park, Physiology
UHRICH, DAVID L., Pittsburgh, Physics
URBACH, FREDERICK L., Beaver Falls, Chemistry
WALLINE, ROBERT E., Pittsburgh, Chemistry
WERKHEISER, ARTHUR, H., Easton, Physics
YEAGER, SANDRA A., Sharon Hill, Chemistry

Postdoctoral

BRAUMAN, JOHN I., Pittsburgh, Chemistry
BUTTS, ROBERT E., Lewisburg, History and Philosophy of Science
CLOVIS, JAMES S., Waynesburg, Chemistry
HAUK, PETER, Pittsburgh, Chemistry
HOLLOWAY, LELAND E., JR., Philadelphia, Physics
HUDOCK, GEORGE A., Norristown, Genetics
KOHLER, FRITZ P., Straf Wayne, Medical Sciences
LIPSCHUTZ, MICHAEL E., Philadelphia, Chemistry

NORMAN, DONALD A., Philadelphia, Psychology
PARMENTER, CHARLES S., Philadelphia, Chemistry
PERRIN, CHARLES L., Pittsburgh, Chemistry
SIMMONS, VIOLET E., Philadelphia, Chemistry
STILES, PHILLIP J., Philadelphia, Physics
WHITE, RICHARD A., Philadelphia, Botany
WOLFSON, SIDNEY K., JR., Philadelphia, Medical Sciences

Senior Postdoctoral

ALEXANDER, LEROY E., Pittsburgh, Chemistry
ELLIS, ROBERT, Philadelphia, Mathematics
HOENIGSWALD, HENRY M., Philadelphia, Social Sciences
MANN, ALFRED K., Philadelphia, Physics
PAXTON, HAROLD W., Pittsburgh, Engineering
ROSENBERG, JEROME L., Pittsburgh, Chemistry
SANTER, MELVIN, Haverford, Genetics

Science Faculty

EARL, BOYD L., University Park, Mathematics
FEHNEL, EDWARD A., Swarthmore, Chemistry
FUKUSHIMA, TOSHIYUKI, Philadelphia, Engineering
HOERNER, GEORGE M., Jr., Easton, Engineering
KIMLIN, MARY J., University Park, Chemistry
KLINGER, LLOYD E., University Park, Engineering
LESTZ, SAMUEL S., University Park, Engineering
MEDLEY, HELEN I., Johnstown, Mathematics
PRINCE, PAUL A., California, Earth Sciences
PUTERBAUGH, WALTER H., Greenville, Chemistry
SCHLOSSNAGEL, JACK E., Grove City, Mathematics
SCHROEDER, MORRIS E., University Park, Engineering
SCHUSTER, JAMES J., Villanova, Engineering
SHELLGREN, MURRAY A., Pittsburgh, Biology
SLONAKER, ROBERT E., Jr., Lewisburg, Engineering
STELSON, THOMAS E., Pittsburgh, Engineering
SWORD, EDWARD C., Bethlehem, Engineering
UHL, VINCENT W., Philadelphia, Engineering
WILLEFORD, BENNETT R., Jr., Lewisburg, Chemistry

Summer Fellowships for Secondary School Teachers

BURMEISTER, CARL R., Coalport, Chemistry
DONNELLY, Bro. GERALD J., Philadelphia, Physics
DOUBET, Sr. M. MARK, Erie, Mathematics
DRUMM, JOHN H., New Kensington, Mathematics
DRUMMOND, Sr. THERESE, Philadelphia, Biology
DWYER, Bro. LESTER A., Chester, Physics
GORNEAU, ARNOLD J., Merion, Biology
HARRINGTON, Sr. QUENTIN, Ambridge, Physics
LEVIN, MILTON, Philadelphia, Mathematics
SHAAK, ROBERT S., West Lawn, Mathematics
SMELTZER, GLENN M., Derry, Mathematics

STAMPER, W. ROBERT, Wyncote, Biology
STEPHANOS, ROBERT C., Philadelphia, Psychology

PUERTO RICO

Graduate

STOLBERG, HAROLD J., Rio Piedras, Mathematics

Senior Postdoctoral

CALPOUZOS, LUCAS, Mayaguez, Botany

Science Faculty

ROBINSON, JACK H., Rio Piedras, Physics

Summer Fellowships for Secondary School Teachers

MALDONADO, CARMEN R., Guayama, Mathematics
MARRERO-ORTIZ, RAUL, Barranquitas, Mathematics
PEREZ-TIRADO, ANTONIO, Canovanas, Mathematics
VELEZ-PARADIS, AMALIA, Hato Rey, Mathematics

RHODE ISLAND

Graduate

CHASIN, LAWRENCE A., Providence, Biochemistry
DURST, RICHARD A., Newport, Chemistry
FINE, ARTHUR D., Providence, Engineering
HALL, DONALD E., Hope, Mathematics
KABAT, DAVID, Saunderstown, Biophysics
LUND, JUDITH N., East Providence, Botany
SHIMP, CHARLES P., Providence, Psychology
SUPLINSKAS, RAYMOND J., Providence, Chemistry

Cooperative Graduate

BOGER, ROBERT C., North Providence, Engineering
BROSHAR, WAYNE C., Providence, Physics
BUSBY, WILLIAM F., Jr., Pawtucket, Biochemistry
FLETCHER, RAYMOND C., Hope, Earth Sciences
HOWARD, ALAN, Providence, Mathematics
JAMES, JOHN T., Jr., Kingston, Mathematics
MARTINS, JOSEPH F., East Providence, Chemistry
WINICOUR, JEFFREY H., Providence, Physics

Summer Fellowships for Graduate Teaching Assistants

CROWLEY, DONALD J., Providence, Earth Sciences
DURST, RICHARD A., Newport, Chemistry
SCHWARTZ, BRIAN B., Providence, Physics
SPIRATOS, GEORGE A., Jamestown, Engineering

Postdoctoral

ARNOLD, ALLAN W., Narragansett, Botany

Senior Postdoctoral

FELDMAN, DAVID, Providence, Physics

Science Faculty

FITCHEN, FRANKLIN C., Kingston, Engineering
OLNEY, CHARLES E., Jr., Kingston, Biochemistry

Summer Fellowships for Secondary School Teachers

FLYNN, Sr. M. KIERAN, Riverside, Mathematics
HERBERT, MARCEL G., Harrisville, Mathematics
KEENAN, HARRY C., Warwick, Biology
MCGRATH, EILEEN P., Providence, Zoology

SOUTH CAROLINA

Graduate

ANSELMO, ROBERT A., Florence, Physics
ARRINGTON, CHARLES A., Clemson, Chemistry
CANTRELL, THOMAS S., Columbia, Chemistry
HEALD, LAWRENCE A., Hartsville, Engineering
KEELER, EMMETT B., Charleston, Mathematics
LIVERMAN, ROBERT B., Lexington, Economics
LUNNEY, DAVID C., Columbia, Chemistry
ROGERSON, NANCY C., Columbia, Physics
TEMPLE, ROBERT D., Mt. Pleasant, Chemistry
WYMAN, BOSTWICK F., Columbia, Mathematics

Cooperative Graduate

HEADLEY, WILLIAM E., Florence, Engineering
HENRY, WALTER C., Greenville, Physics
HUSA, DONALD L., Spartanburg, Engineering
JONES, JULIAN W., Jr., West Columbia, Engineering
PEASE, WALTER T., Sullivans Island, Engineering
RUSSELL, CHARLES B., Greenville, Mathematics
SHAND, JULIAN B., Jr., Columbia, Physics
WADE, DAVID T., Easley, Engineering
YOUNGBLOOD, JAMES E., Jr., Columbia, Physics

Summer Fellowships for Graduate Teaching Assistants

BEGG, JOHN, Columbia, Engineering
CROW, LOWELL T., Charleston Heights, Psychology
FOLEY, JOHN M., Anderson, Psychology
HAYNES, OLIN D., Seneca, Engineering
SMITH, RODERICK E., Columbia, Engineering
VAIL, OAKLEY R., Columbia, Chemistry
WALL, DONALD B., Columbia, Engineering

Science Faculty

DREW, LELAND O., Central, Engineering
KERN, DAVID M., Beaufort, Chemistry
MILLER, JOHN E., Clemson, Physics
SNELL, ABSALOM W., Clemson, Engineering
WAUGH, JOHN D., Columbia, Engineering

Summer Fellowships for Secondary School Teachers

HEYWARD, GRACE, Charleston, Biology

SOUTH DAKOTA

Graduate

BARTOSHUK, LINDA M., Aberdeen, Psychology
CAULKINS, DAVID D., Rapid City, Anthropology
FROEMKE, JON C., Sioux Falls, Mathematics
SCHUMAKER, LARRY L., Britton, Mathematics
WAGNER, RAYMOND L., Bristol, Engineering

Cooperative Graduate

EERNISSE, ERROL P., Rapid City, Engineering
HOWELL, DANIEL B., Volin, Chemistry
RAYMOND, LEE R., Watertown, Engineering
SANDVICK, PAUL E., Springfield, Chemistry
SCHNUTE, JON T., Hot Springs, Mathematics
ZISCHKE, DELORIS P., Canova, Zoology

Summer Fellowships for Graduate Teaching Assistants

THOMPSON, ROBERT D., Brookings, Medical Sciences

Science Faculty

HAMANN, DONALD D., Brookings, Engineering
SLADEK, LYLE V., Spearfish, Mathematics
WESTIN, FREDERICK C., Brookings, Agriculture.

Summer Fellowships for Secondary School Teachers

FOLLETTE, EVERETT L., Sturgis, Earth Sciences

TENNESSEE

Graduate

BACKSTROM, NEIL C., Nashville, Physics
BLOOMER, JAMES L., Knoxville, Chemistry
BOYLES, WILEY R., Maryville, Psychology
BURROWS, DIANE S., Johnson City, Mathematics
BUTLER, WILLIAM R., Lexington, Physics
DIETRICH, FRANK S., Memphis, Physics
ENGELBERG, DON P., Memphis, Physics
HAMM, ROBERT N., Ramer, Physics
IRVING, DAVID C., Oak Ridge, Physics
MANKIN, WILLIAM G., Memphis, Physics
MOULTON, MARGARET C., Nashville, Chemistry
PARKER, WESLEY A., Knoxville, Engineering
RITTENBERG, ALAN, Nashville, Physics
RITTER, ENLOE T., Memphis, Physics
STEWART, GILBERT W., Knoxville, Mathematics
THOMPSON, JAMES R., Memphis, Mathematics
WALPOLE, JAMES N., Brownsville, Engineering

Cooperative Graduate

CATHEY, WILLIAM N., Fayetteville, Physics
CHRISTY, JOHN H. JR., Nashville, Mathematics
COLLINS, JERRY C., Nashville, Engineering
FORESTER, DONALD W., Knoxville, Physics
HETZLER, MORRIS C., Oak Ridge, Physics
JONES, MARSHALL P., Memphis, Mathematics
MARTIN, WILLIAM J., Somerville, Engineering

McAlpn, James J., Memphis, Chemistry
Mischke, Richard E., Memphis, Physics
Norem, Walter E., Knoxville, Engineering
Switzer, Robert M. Jr., Kingsport, Mathematics
Thompson, Clifton C., Jr., Columbia, Chemistry
Thompson, William T., Chattanooga, Chemistry
Trentham, Jimmy N., Nashville, Zoology
Waller, J. Wayne, Johnson City, Engineering
Woody, Charles O., Jr., Somerville, Physiology

Summer Fellowships for Graduate Teaching Assistants

Bennett, Ralph B., Maryville, Mathematics
Boyles, Wiley R., Maryville, Psychology
Campbell, George M., Nashville, Chemistry
Campbell, Warren E., Knoxville, Chemistry
Cochran, George T., Knoxville, Chemistry
Davis, Kenneth J., Knoxville, Mathematics
Jones, William D., Nashville, Physics
Menzer, Frederick J., Jr., Memphis, Earth Sciences
North, Gerald R., Knoxville, Physics
Palmer, Ray A., McKenzie, Biology
Parsons, Timothy F., Nashville, Chemistry
Settle, Frank A., Jr., Knoxville, Chemistry
Taylor, Harry M., Memphis, Engineering
Wilson, Eric L., Nashville, Mathematics
Yates, Harris O., Nashville, Botany

Postdoctoral

Drewry, George E., Nashville, Zoology
Humphreys, Tom D., II, Arlington, Biology
McClure, Joseph A., Jr., Nashville, Physics

Science Faculty

Baker, William R., Jr., Nashville, Engineering
Newell, Paul H., Jr., Knoxville, Engineering
Pearsall, Samuel H., Nashville, Physics
Ray, David S., Knoxville, Mathematics
Ross, Bernard E., Nashville, Engineering
Wray, Mildred C., Nashville, Biology

Summer Fellowships for Secondary School Teachers

Laycock, Mary C., Oak Ridge, Mathematics
Medley, Raymond H., Jr., Nashville, Mathematics
Tuggle, Samuel P., Memphis, Mathematics

TEXAS

Graduate

Berglund, John F., Georgetown, Mathematics
Beynon, Eugene T., Jr., Corpus Christi, Engineering
Bird, Marjorie K., Sealy, Biochemistry
Blackmon, Maurice L., Beaumont, Physics
Blum, Fred A., Jr., Austin, Physics
Boudreau, Robert D., Bryan, Meteorology
Brice, David K., Sulphur Spring, Physics
Brooks, Sam R., Jr., Austin, Mathematics
Buffler, Richard T., Austin, Earth Sciences
Carmichael, J. W., Jr., Dimmitt, Chemistry
Carter, Lucian C., III, New Braunfels, Chemistry
Chester, Arthur N., Austin, Physics
Collier, Robert J., Fort Worth, Physiology
Cooke, James H., Denton, Physics
Coury, Glenn E., Houston, Engineering
Dougharty, Neil A., Jasper, Engineering
Doyle, Joseph C., Houston, Physics
Fisk, George A., Houston, Chemistry
Furey, William N., Jr., Mt. Pleasant Physics
Gibson, Benjamin F., Lufkin, Physics
Gilmartin, Michael C., Fort Worth, Mathematics
Grabiner, Sandy, Pharr, Mathematics
Greenhall, Charles A., Dallas, Physics
Guillory, John U., Jr., Houston, Physics
Hale, Leonard A., Austin, Engineering
Hall, Michael H., Waco, Mathematics
Heathcock, Clayton H., San Antonio, Chemistry
Higgins, Jack T., Wildorado, Mathematics
Hitt, John C., Houston, Psychology
Hodges, Carroll A., Austin, Earth Sciences
Johnson, Claiborne H., Dallas, Mathematics
King, Lyndell S., Lamesa, Engineering
Knezek, Bernard D., Seymour, Biology
Konen, Harry P., Houston, Mathematics
Lambert, Joseph B., San Antonio, Chemistry
Larmore, Lawrence L., Houston, Mathematics
Lesser, Herbert A., Fort Worth, Engineering
Levy, Charles M., Jr., Houston, Psychology
Logan, James B., Austin, Biochemistry
Lynch, Harry H., Dallas, Engineering
Manning, Gerald S., El Paso, Mathematics
Manning, Robert J., Dallas, Physics
McGehee, Richard V., Abilene, Earth Sciences
McGuire, Michael L., College Station, Engineering
Meckel, Lawrence D., Jr., Baytown, Earth Sciences
Moore, John O., Beaumont, Physics
Ortizdemontellano, B. E., San Antonio, Chemistry
Perkins, Priscilla C., San Antonio, Earth Sciences
Porter, John R., Austin, Physics
Prescott, Charles Y., Houston, Physics
Pusey, Walter C., III, Houston, Earth Sciences
Reichert, John D., Pasadena, Physics
Robinson, Lyndon H., Orange, Engineering
Sampson, Charles H., Houston, Mathematics
Vuillemin, Joseph J., Waco, Physics
Wagner, Charles A., Friona, Engineering
Warren, Robert H., Bellaire, Zoology
Wells, Raymond O., Jr., Dallas, Mathematics
West, Lynn P., Lamesa, Engineering

Cooperative Graduate

Abel, Bobby J., Hearne, Engineering
Ables, Paula R., Austin, Biochemistry
Alldredge, Gerald P., Dimmitt, Physics
Arterburn, David R., Amarillo, Mathematics
Candler, Daniel B., Dallas, Engineering
Cannon, Don L., Lubbock, Engineering
Collins, Carl B., Jr., San Antonio, Physics
Coon, Julian B., Pasadena, Physics
Cox, Elenor R., Houston, Botany
Eakin, Elnita F., Del Rio, Psychology

EMANUEL, VICTOR L., Houston, Botany
EVANS, SELBY H., Jr., Dallas, Psychology
FISHER, GARY D., Borger, Engineering
GEORGE, CHARLES F., Jr., Brownwood, Engineering
GRAY, ALFRED, Dallas, Mathematics
GROVES, MORTON D., Matador, Engineering
GUILLOT, DAVID G., Hitchcock, Chemistry
HAASE, DONALD J., Nixon, Engineering
HODGES, LAURENT, Houston, Physics
HUGHES, MICHAEL P., Houston, Chemistry
KOENIG, THOMAS W., Dallas, Chemistry
LADNER, SIDNEY J., Houston, Chemistry
LEWIS, HAROLD L., Houston, Microbiology
MCDONALD, EDWARD D., Bellaire, Mathematics
MCENTEE, WINNIE R., Dallas, Chemistry
MCQUEARY, CHARLES E., Gordon, Engineering
MOORE, GEORGE E., Bryan, Earth Sciences
MOSELEY, CHARLES G., Waco, Chemistry
O'CONNOR, JOEL L., Navasota, Mathematics
OTTMERS, DELBERT M., Jr., Austin, Engineering
PARR, JOSEPHUS O., III, San Antonio, Economics
PORTER, VERNON R., Dallas, Earth Sciences
RICHARDSON, RICHARD H., Mexia, Genetics
SCHLOSSER, JON A., Marble Falls, Physics
SCOTT, DONALD R., Houston, Chemistry
SPIVEY, JAMES E., Austin, Psychology
STANFORD, JOHN L., La Porte, Physics
STROUP, DOROTHY A., Dallas, Botany
TREADWELL, ROBERT W., San Marcos, Biology
VOET, DONALD H., Borger, Chemistry
WARNER, THEODORE B., Dallas, Chemistry
WHITE, ELNA H., Houston, Psychology
WICKER, FRANK W., San Antonio, Psychology
WILLIAMS, JOHN M., Houston, Engineering
WILSON, DAVID M., Phillips, Engineering
WOODWARD, JOE W., Beaumont, Engineering

Summer Fellowships for Graduate Teaching Assistants

CAPALONGAN, RODENE T., Fort Worth, Mathematics
COBLENTZ, VIRGINIA I., Fort Worth, Mathematics
COLEMAN, EUGENE A., Amherst, Genetics
CUDE, JOE E., San Marcos, Mathematics
DONALDSON, JACK S., Arlington, Physics
GRIFFIN, CHARLES F., Slaton, Physics
GUZZLE, TIMOTHY L., Fort Worth, Physics
HALL, JAMES W., Austin, Engineering
HARVILL, LEE L., Sinton, Earth Sciences
HEATHERLY, HENRY E., College Station, Mathematics
HOLCOMBE, TROY L., Abilene, Earth Sciences
JOHNSON, PAUL O., Houston, Physics
MARSHALL, SAMUEL W., III, Dallas, Physics
MCDOUGALL, LEE A., San Antonio, Chemistry
MCGOWEN, JOSEPH H., Abilene, Earth Sciences
MCNAUGHTON, SAMUEL J., Austin, Botany
PERRYMAN, JOHN K., Austin, Mathematics
PURRINGTON, ROBERT D., Lubbock, Physics
TUCKER, RICHARD L., Hereford, Engineering
WALLER, THOMAS H., Waco, Earth Sciences

Postdoctoral

BOROWITZ, JOSEPH L., San Antonio, Medical Sciences
BROCK, JAMES R., Austin, Engineering

Senior Postdoctoral

JOHNSTON, JOHN M., Austin, Biochemistry

Science Faculty

CONDRAY, BEN R., Marshall, Chemistry
DENTON, JESSE C., College Station, Engineering
FURLONG, RICHARD W., Austin, Engineering
GUTHRIE, RUFUS K., Denton, Microbiology
HARBER, ERNEST J., San Antonio, Botany
HAYNES, JOHN J., Arlington, Engineering
JACOBSON, MARCUS J., Houston, Engineering
MATTINGLY, GLEN E., Houston, Mathematics
NORRIS, WILLIAM E., Jr., San Marcos, Physiology
PINNELL, CHARLES, College Station, Engineering
RANDALL, JOHN D., College Station, Engineering
RHODES, ROBERT R., College Station, Agriculture
ROBINSON, CHARLES D., Austin, Mathematics
TATUM, FINLEY W., Dallas, Engineering
WOLLMAN, CONSTANCE E., San Antonio, Earth Sciences

Summer Fellowships for Secondary School Teachers

ANTHONY, JESSIE M., Houston, Biology
BASS, JOEL E., Houston, Physics
CRAWFORD, LOIS R., Dallas, Mathematics
DAUNIS, GERALDINE, Fort Worth, Mathematics
DYER, MARJORIE B., Houston, Mathematics
ESKUT, BILLIE L., Tyler, Physics
ESSIG, PAUL W., Fort Worth, Mathematics
GOODMAN, ESTHER R., Beaumont, Biology
HILL, MILDRED E., Lubbock, Mathematics
PFEIFFER, ALTA D., Galveston, Mathematics
RAGIN, JAMES F., Houston, Zoology
THOMAS, EDWARD A., Dickinson, Biology
WHITAKER, MARY T., Dallas, Biology

UTAH

Graduate

ANDERSON, NEAL W., Salt Lake City, Botany
BREWER, JOHN M., Salt Lake City, Biochemistry
BUNDERSON, CHARLES V., Ogden, Psychology
DORNY, CARL N., Provo, Engineering
FOLKMAN, JON H., Ogden, Mathematics
GRANT, SHELDON K., New Harmony, Earth Sciences
IVIE, EVAN L., Ogden, Engineering
JENSON, EVAN D., Bountiful, Chemistry
MOLER, CLEVE B., Salt Lake City, Mathematics
MURPHY, CAROL J., Logan, Anthropology
OLSEN, RICHARD K., Provo, Chemistry
PRICE, JOHN A., Salt Lake City, Anthropology
TAYLOR, VASCO R., Salt Lake City, Meteorology
TOLMAN, CHADWICK A., Salt Lake City, Chemistry
WARNER, CHARLES Y., Provo, Engineering
WOODBURY, ELROD T., Monroe, Engineering

Cooperative Graduate

AUSTIN, MARK C., Logan, Engineering
BOWMAN, LAWRENCE S., Salt Lake City, Engineering

FUSHIMI, FRED C., Salt Lake City, Chemistry
HALES, HUGH B., Salt Lake City, Engineering
JACOB, RICHARD J., Salt Lake City, Physics
JONES, MERRELL R., Cedar City, Physics
MINER, ELLIS D., JR., Provo, Physics
MORTENSEN, KAY S., Logan, Engineering
PARKER, JACK L., Springville, Physics
WORLTON, THOMAS G., Layton, Physics

Summer Fellowships for Graduate Teaching Assistants

BILLS, JAMES L., Salt Lake City, Chemistry
CASTELLION, ALAN W., Salt Lake City, Medical Sciences
CHRISTIAN, RAYMOND W., St. George, Earth Sciences
EDDY, RICHARD L., Salt Lake City, Meteorology
GOKEN, GAROLD L., Salt Lake City, Chemistry
GUYMON, ERVIN P., Blanding, Chemistry
HAVERTZ, DAVID S., Salt Lake City, Zoology
HOLMGREN, NOEL H., Logan, Botany
ISOM, KARL B., Salt Lake City, Engineering
JENSEN, GORDON E., North Salt Lake, Engineering
JOHNSON, HAROLD V., Springville, Earth Sciences
JONES, MERRELL R., Cedar City, Physics
LARSON, DONALD B., Brigham City, Physics
MERRILL, MARINER D., Price, Engineering
MILTON, ERNEST H., JR., Salt Lake City, Mathematics
MOGENSEN, HANS L., Price, Botany
PARKER, JACK L., Springville, Physics
PETERSEN, JAMES J., Salt Lake City, Zoology
RICH, ROYAL A., Logan, Physiology
SANDQUIST, GARY M., Salt Lake City, Engineering
TINGEY, GARTH L., Springville, Chemistry
WELCH, GARTH L., Salt Lake City, Chemistry
ZABRISKIE, WALTER E., Provo, Earth Sciences

Postdoctoral

BRADSHAW, JERALD S., Cedar City, Chemistry

Senior Postdoctoral

PERL, EDWARD R., Salt Lake City, Physiology

Science Faculty

BOYD, KEITH E., Salt Lake City, Engineering
ROBINSON, DONALD W., Provo, Mathematics
TURLEY, RICHARD E., Salt Lake City, Physics

Summer Fellowships for Secondary School Teachers

HARWARD, MAX R., Bountiful, Botany
HIGGINS, HAROLD G., Salt Lake City, Zoology

VERMONT

Graduate

ADLER, STEPHEN L., North Bennington, Physics
CASS, ALBERT H., Jr., Essex Junction, Biophysics
COLE, STEPHEN A., Jamaica, History and Philosophy of Science
DREW, DAVID C., Lyndonville, Physics
ELDREDGE, DOROTHY M., Springfield, Botany

Cooperative Graduate

DIVINE, THEODORE N., Dorset, Astronomy
ELDRED, CHARLES H., Burlington, Engineering

Postdoctoral

COOK, PHILIP W., Underhill, Botany

Senior Postdoctoral

MURDOCK, BENNET B., Jr., Burlington, Psychology

Science Faculty

GREGG, DONALD C., Burlington, Chemistry
PYPER, GORDON R., Northfield, Engineering

VIRGINIA

Graduate

ADELBERGER, ERIC G., Arlington, Physics
BOWEN, ELEANOR W., Petersburg, Zoology
BRACEY, GERALD W., Williamsburg, Psychology
COCKE, CHARLES L., JR., Roanoke, Physics
COOK, GERALD, Galax, Engineering
CULLUM, CLIFTON D., Jr., Blacksburg, Engineering
DUNN, FLOYD E., Falls Church, Physics
FAIRLEY, WILLIAM B., Afton, Economics
GARMON, LUCILLE B., Charlottesville, Chemistry
GARRICK, LINDA S., Hampton, Biochemistry
HILL, CHARLES W., Danville, Biochemistry
HUFFMAN, ARTHUR H., Blacksburg, Physics
JENSEN, DONALD F., Blacksburg, Engineering
KAISER, JOHN E., JR., Newport News, Engineering
KENK, VIDA C., Alexandria, Biology
LOUTZENHEISER, CARL B., Arlington, Engineering
LUNDQUIST, DAVID E., Hampton, Physics
MCCONNELL, ALAN, Alexandria, Mathematics
MILLER, PHILIP C., Falls Church, Biology
MINTZ, MICHAEL J., Arlington, Chemistry
MOSS, CALVIN E., Richmond, Physics
RENNINGER, GEORGE H., Fredericksburg, Physics
SHAKER, RICHARD J., Arlington, Mathematics
STEPHENS, FRANKLIN M., Arlington, Earth Sciences
ULLOM, STEPHEN V., Alexandria, Mathematics

Cooperative Graduate

CREAGER, JOAN G., Arlington, Zoology
DRUM, CHARLES M., Richmond, Physics
KERNELL, ROBERT L., Williamsburg, Physics
LENKERD, STINSON H., Norfolk, Mathematics
MCCLANAHAN, CHARLENE, Grundy, Genetics
SHENK, WILLIAM E., Arlington, Meteorology
SNOW, SAMUEL G., Hickory, Physics
SYDNOR, GILES G., III, Winchester, Engineering
TAYLOR, ALBION D., Arlington, Physics
VAUGHAN, LAWRENCE G., Arlington, Chemistry

WHYBURN, KENNETH G., Charlottesville, Mathematics

Summer Fellowships for Graduate Teaching Assistants

BERRY, JAMES W., Abingdon, Biology
BUNDY, SALLY R., Lebanon, Chemistry
FELL, PAUL E., Warrenton, Zoology
GREEN, ROGER H., Arlington, Biology
HALL, BARBARA A., Alexandria, Chemistry
ROWAN, LAWRENCE C., Charlottesville, Earth Sciences
SAYRE, NATALIE, Fort Defiance, Chemistry
STERN, DANIEL H., Richmond, Zoology
VAUGHAN, LAWRENCE G., Arlington, Chemistry

Postdoctoral

ADAMS, JOHN B., Charlottesville, Physics
HEINS, CONRAD F., Vienna, Chemistry

Senior Postdoctoral

LANE, MALCOLM D., Blacksburg, Biochemistry

Science Faculty

HUMPHREYS, M. GWENETH, Ashland, Mathematics
WALL, ARTHUR A., Charlottesville, Chemistry

Summer Fellowships for Secondary School Teachers

EANES, DOLORES D., Fieldale, Biology
LILLY, JACQUELYN R., Roanoke, Biology
MAYOCK, SR. MARIA, Norfolk, Mathematics
SCHEITER, BRO. ERIC P., Arlington, Physics
SCULLY, SR. MARCELLA, Petersburg, Biology
WISE, EDWARD S., Lynnhaven, Botany

WASHINGTON

Graduate

ALVORD, RICHARD P., Centralia, Earth Sciences
BEATTY, DAVID D., Blaine, Physiology
BRADEN, CHARLES B., Pullman, Mathematics
DENZEL, GEORGE E., Seattle, Mathematics
DORER, FRED H., Seattle, Chemistry
FARIS, WILLIAM G., Seattle, Mathematics
GERBRACHT, ROBERT J., Seattle, Physics
HARTILL, DONALD L., Chewelah, Physics
HEIPLE, CLINTON R., Seattle, Engineering
HEMPHILL, WILLIAM B., Seattle, Physics
HODGE, ROBERT W., Port Angeles, Social Sciences
HOPCROFT, JOHN E., Seattle, Engineering
KARLINSEY, KURTLEE J., Tacoma, Engineering
KLEIN, GERALD W., Seattle, Chemistry
KROON, JOHN D., Seattle, Mathematics
KUTTER, ELIZABETH M., Seattle, Biophysics
LAWLER, RONALD G., Seattle, Chemistry
LLOYD, CLIFF L., Colfax, Economics
PETERSON, EARL A., Sumner, Physics
PIERSON, STUART O., Seattle, History and Philosophy of Science
POOL, KARL H., Seattle, Chemistry
RUSTAD, NORMAN E., Poulsbo, Chemistry
SHARP, PAMELA R., Seattle, Biophysics
SMITH, CHRISTOPHER C., Seattle, Biology
STEIN, DONNA K., Longview, Psychology
SWANSON, DONALD A., Centralia, Earth Sciences
WILLIAMS, ROBERT H., Olympia, Astronomy

Cooperative Graduate

BENSTON, MARGARET L., Kelso, Chemistry
CAMPBELL, WARREN A., Seattle, Astronomy
EMERSON, HOWARD B., Spokane, Mathematics
HENDRICKSON, ALICE J., Seattle, Psychology
KIRBY, CHARLES L., Chelan, Chemistry
MORTON, MARTIN L., Pullman, Physiology
NYGREN, DAVID R., Bellevue, Physics
PETERSEN, JON E., Tumwater, Mathematics
PETERSON, ROY J., Everett, Physics
RAYMONDA, JOHN W., Seattle, Chemistry
SCHREIBER, BERT M., Seattle, Mathematics
SHACKLEFORD, WILLIAM L., Seattle, Engineering
TOUGH, JAMES T., Seattle, Physics
WARREN, WILLIAM W., Jr., Seattle, Physics
WILSON, FREDDIE E., Pullman, Physiology

Summer Fellowships for Graduate Teaching Assistants

BRANSCOMB, ELBERT W., Tacoma, Physics
CALVIN, CLYDE L., Toledo, Agriculture
COOMBS, ROBERT H., Pullman, Sociology
FUCHS, STEPHANIE S., Seattle, Psychology
GILMORE, SUSAN K., Walla Walla, Psychology
GRILL, EDWIN V., Seattle, Oceanography
HOMANN, HENRY R., Pullman, Biochemistry
KUENZI, WILBUR D., Seattle, Earth Sciences
LARSEN, JOHN H., JR., Seattle, Zoology
MEREDITH, FARRIS R., Pullman, Botany
OVERSTREET, ROY, Seattle, Oceanography
PARISEAU, WILLIAM G., Ellensburg Engineering
SEESE, WILLIAM S., Pullman, Chemistry
STERNBERG, RICHARD W., Seattle, Oceanography
THORNBURGH, DALE A., Bremerton, Agriculture
WARREN, WILLIAM W., JR., Seattle, Physics
WILSON, FREDDIE E., Pullman, Physiology

Postdoctoral

ETHERTON, BUD, Pullman, Biophysics
HAIG, REV. FRANK R., Port Townsend, Physics
VANCE, WILLIAM H., Seattle, Engineering

Senior Postdoctoral

MEEUSE, BASTIAAN J. D., Seattle, Microbiology
STADLER, DAVID R., Seattle, Genetics

Science Faculty

AVANN, SHERWIN P., Seattle, Mathematics
MEYER, MERLE E., Walla Walla, Psychology
PARKS, THAYNE C., Everett, Biology
UNDERWOOD, DOUGLAS H., Walla Walla, Mathematics
YANDL, ANDRE L., Seattle, Mathematics

Summer Fellowships for Secondary School Teachers

BROUGH, SHERMAN G., Olympia, Botany
FISHER, G. LEE, Yakima, Mathematics
KINKADE, EMMETT D., Seattle, Mathematics
MEAD, GEORGE A., Seattle, Mathematics
SJUNNESEN, PAUL H., Bellevue, Mathematics

WEST VIRGINIA

Graduate

ARMSTRONG, DONALD J., Elm Grove, Botany
BILLHEIMER, JOHN W., Huntington, Engineering
BIRD, NANCY L., St. Albans, Zoology
CLEVELAND, JAMES D., Charleston, Chemistry
CURRY, SAMUEL J., Williamson, Engineering
DAVIES, CAROLYN M., Huntington, Psychology
DETCH, JOHN L., Lewisburg, Physics
HIRST, LESTER L., JR., Morgantown, Physics
HOLT, ROBERT B., Charleston, Chemistry
MARCUM, HOWARD B., St. Albans, Psychology

Cooperative Graduate

CALDWELL, RICHARD A., Huntington, Chemistry
CAMPBELL, LAURENCE J., Huntington, Physics
FRIEDLY, JOHN C., JR., Moundsville, Engineering
GOOCH, JAMES L., Parkersburg, Earth Sciences
WEIMER, ROBERT F., Wheeling, Engineering
WILSON, JAMES H., Clay, Engineering

Summer Fellowships for Graduate Teaching Assistants

BURLITCH, JAMES M., Wheeling, Chemistry
COLE, DAVID D., Morgantown, Psychology
FLETCHER, NORTH FRANCES, Charleston, Botany
GRIMES, THOMAS L., Huntington, Chemistry
MATHESON, AUDRIA, Ceredo, Microbiology
SIMMS, FREDERICK E., JR., Charleston, Earth Sciences

Science Faculty

COOK, CHARLES C., Morgantown, Engineering
DIGMAN, ROBERT V., Huntington, Chemistry
SHAFER, JAMES N., Morgantown, Psychology
SMITH, NELSON S., JR., Morgantown, Engineering
WRIGHT, JOHN C., Buckhannon, Chemistry

Summer Fellowships for Secondary School Teachers

BOONE, WELDON W., Hinton, Biology
HOOVER, ELOISE C., Morgantown, Biology
MANNING, DIX E., Beaver, Mathematics

WISCONSIN

Graduate

ADAMS, ARTHUR C., Madison, Chemistry
ANSORGE, JANET M., Gillett, Anthropology
BECKER, GEORGE C., Jr., Stevens Point, Zoology
BEITZEL, JOHN E., Wauwatosa, Earth Sciences
BRUENING, GEORGE E., Madison, Biochemistry
BUTTON, ALLAN C., Lake Geneva, Chemistry
CARHART, RICHARD A., Madison, Physics
CZEREPINSKI, RALPH G., Madison, Chemistry
DOEDENS, ROBERT J., New Glarus, Chemistry
EBERT, PAUL M., Watertown, Engineering
ELA, STEPHEN W., Madison, Chemistry
ELIAS, JOHN E., Hales Corners, Physics
EMLEN, STEPHEN T., Madison, Zoology
FREA, JAMES I., Sturgeon Bay, Microbiology
GLASER, LESLIE C., Madison, Mathematics
GRAMZA, ANTHONY F., Milwaukee, Biology
HAFEMANN, DENNIS R., Cedarburg, Chemistry
HALL, JAMES E., Madison, Mathematics
HAMMES, RICHARD R., Madison, Earth Sciences
HENDERSON, DAVID W., Madison, Mathematics
HENKE, WILLIAM L., Janesville, Engineering
HEYWOOD, JOHN G., Hudson, Mathematics
HOLLISTER, CHARLOTTE, Madison, Chemistry
HULS, THOMAS A., Stanley, Engineering
HUPPLER, JOHN D., Neenah, Engineering
INGRAHAM, EDWARD C., Madison, Mathematics
KAUFMAN, RONALD, Milwaukee, Psychology
KESTNER, NEIL R., Muskego, Chemistry
KRESS, LAWRENCE F., Milwaukee, Physiology
KRUBSACK, ARNOLD J., Clintonville, Chemistry
LEITH, JOHN D., Jr., Madison, Zoology
MACURDA, DONALD B., Jr., Madison, Earth Sciences
MANTIK, DAVID W., Gleason, Physics
MEYER, RALPH R., Milwaukee, Physiology
MUELLER, DENNIS C., Milwaukee, Economics
OSTRIKER, JEREMIAH P., Madison, Astronomy
PETROF, ROBERT C., Beloit, Engineering
POMRANING, GERALD C., Oshkosh, Engineering
PRICE, THOMAS M., Madison, Mathematics
REITER, ALLEN, Madison, Mathematics
ROBINSON, STEPHEN M., Madison, Mathematics
RUTHERFORD, REGINALD, Madison, Physics
SMITH, DENNIS E., Racine, Mathematics
STEWART, CHARLES R., Prairieduchien, Genetics
STOUSE, PIERRE A., Jr., Madison, Geography
WAGNER, EUGENE R., Madison, Chemistry
WISEMAN, JOHN R., Madison, Chemistry
WOLPERT, JULIAN, Madison, Geography
WYNGAARD, JOHN C., Madison, Engineering

Cooperative Graduate

ADAMS, JOHN R., Milwaukee, Engineering
APPLEMAN, JOAN D., Mukwonago, Chemistry
ASPNES, DAVID E., DeForest, Physics
BIELEFELD, MICHAEL J., Milwaukee, Chemistry
BJORKHOLM, JOHN E., Milwaukee, Engineering
BRILL, WESLEY A., Beloit, Engineering
BRONIKOWSKI, THOMAS A., Madison, Mathematics
BROWER, JAMES C., Madison, Earth Sciences
BROWN, ROBERT F., Madison, Mathematics
CHASE, LLOYD L., Milwaukee, Physics
ENNIS, ROBERT J., Menomanee Fall, Mathematics
ERICKSON, ROLFE C., Superior, Earth Sciences
FREY, ANTHONY L., Whitehall, Engineering
GREENWOOD, PRISCILLA E., Milwaukee, Mathematics
HANNA, MARTIN S., Madison, Mathematics
JACOBS, NANCY E., Superior, Chemistry
KARACKI, LOREN, Kenosha, Sociology
KRAUSE, EUGENE F., Madison, Mathematics
LAYLAND, JAMES W., LaCrosse, Engineering
MASTERS, CHRISTOPHER F., Milwaukee, Engineering

McClure, Charles W., Beloit, Engineering
McCormack, Charles E., Madison, Physiology
Murtha, James A., Madison, Mathematics
Myszewski, Michael E., Whitewater, Genetics
Nybakken, Bette H., Madison, Biology
Nybakken, James W., Madison, Biology
Peterson, David W., Madison, Engineering
Pitterle, Thomas A., Milwaukee, Engineering
Robinson, James H., South Milwaukee, Physics
Rublein, George T., West Allis, Mathematics
Rusch, Kenneth C., Milwaukee, Chemistry
Schumacher, Damian E., Milwaukee, Engineering
Shands, Henry L., Madison, Agriculture
Thompson, Henry E., Racine, Engineering
Vilmur, Richard J., West Allis, Engineering
Wagner, Curtis A., Monroe, Physics
Wendland, Daniel W., Glenbeulah, Engineering
Williams, Michael C., Madison, Engineering
Willson, Mary F., Baraboo, Zoology

Summer Fellowships for Graduate Teaching Assistants

Barr, George E., Milwaukee, Physics
Bos, William G., Mercer, Chemistry
Brown, Robert F., Madison, Mathematics
Croissant, Ann B., Madison, Botany
Frey, Frederick A., Wauwatosa, Chemistry
Gustafson, Gerald J., Eau Claire, Physics
Hawkins, Thomas W., Jr., Madison, Mathematics
Heal, Laird W., Madison, Psychology
Henderson, David W., Madison, Mathematics
Hoecker, Elisabeth S., Eagle River, Sociology
Howard, Eugene F., Milwaukee, Botany
Lynts, George W., Edgerton, Earth Sciences
Marquis, Edward T., Madison, Chemistry
Meyers, Judith A., Milwaukee, Biochemistry
Price, Thomas M., Madison, Mathematics
Ralph, Lois M., Hartland, Zoology
Robinson, James H., Oak Creek, Physics
Smith, Timothy A., Milwaukee, Psychology
Soulen, Thomas K., Madison, Biochemistry
Valdovinos, Jack G., Bloomington, Botany
Vanderbeke, Sr. Mary M., Milwaukee, Mathematics
Wood, Herbert T., Madison, Chemistry

Postdoctoral

Haberstroh, Robert A., Wauwatosa, Physics
Shands, Henry L., Madison, Genetics

Science Faculty

Baeten, Harold J., West De Pere, Zoology
Gilbert, William P., Appleton, Physics
Gulrajani, Bhagwan K., Madison, Engineering
Heider, Lester J., Milwaukee, Mathematics
Morrison, George A., Milwaukee, Mathematics
Moy, William A., Madison, Engineering
Rosenberg, Robert M., Appleton, Chemistry
Rosenthal, Philip C., Madison, Engineering
Trine, F. Dawson, Platteville, Mathematics

Summer Fellowships for Secondary School Teachers

Borkenhagen, A. Phillip, Edgerton, Mathematics
Byers, William M., Milwaukee, Mathematics
Cross, Robert C., West Bend, Biology
Dalton, Robert E., Oshkosh, Mathematics
Greiner, Sr. M. Ambrosia, Milwaukee, Mathematics
Passow, Merlin W., Ripon, Physics

WYOMING

Graduate

Davis, Brian K., Wheatland, Zoology
Orr, Henry T., Laramie, Earth Sciences
Rossi, Charles E., Gillette, Physics

Cooperative Graduate

Ferris, Clinton S., Jr., Laramie, Earth Sciences
Moore, Robert T., Moose, Mathematics

Summer Fellowships for Graduate Teaching Assistant

Strain, Boyd R., Newcastle, Botany

Science Faculty

Guenther, William C., Laramie, Mathematics
Wheasler, Robert A., Laramie, Engineering

Institutions Chosen by Fellowship Awardees—Fiscal Year 1962

[Key to table: A, Graduate; B, Cooperative Graduate; C, Summer Fellowships for Graduate Teaching Assistants; D, Postdoctoral; E, Senior Postdoctoral; F, Science Faculty; and G, Summer Fellowships for Secondary School Teachers.]

State and institution	A	B	C	D	E	F	G	Total
ALABAMA:								
Auburn University	2	4	2					
University of Alabama	2	1	5				1	
Sub-total	4	5	7				1	17
ALASKA:								
University of Alaska		1						1
ARIZONA:								
Arizona State University						1	2	3
University of Arizona	4	7	3			5	3	22
Sub-total	4	7	3			6	5	25
ARKANSAS:								
University of Arkansas		7	4			1	2	14
CALIFORNIA:								
California Institute of Technology	82	29	7	6		5		130
Center for Advanced Study in the Behavioral Sciences					2			2
Claremont University College		4						4
Dominican College of San Rafael							1	1
San Diego State College							1	1
San Francisco State College	1							1
San Jose State College							3	
Stanford University	131	25	22	9	1	21	4	21
University of California:								
Berkeley	171	39	17	13		13	1	254
Davis	2	4	3			2		11
Los Angeles	18	17	19	3		7	3	67
Riverside	1	3	2				1	7
San Diego	5	7		1	2	2		17
San Francisco		2	1					3
Santa Barbara							2	2
University of the Pacific		1	1			1	1	4
University of San Francisco							1	1
University of Southern California	4	13	2				1	20
Sub-total	415	144	74	32	6	51	19	741
COLORADO:								
Colorado State University	1	4	1			3	1	10
Colorado School of Mines	2		3					5
University of Denver		1					3	4
University of Colorado	8	7	6			4	3	28
Sub-total	11	12	10			7	7	47
CONNECTICUT:								
University of Connecticut		3	4			1		8
Wesleyan University							2	2
Yale University	61	17	4	2		5		89
Sub-total	61	20	8	2		6	2	99
DELAWARE:								
University of Delaware		7	1				1	9
DISTRICT OF COLUMBIA:								
American University			2				3	5
Carnegie Institution of Washington				1				1
Catholic University	3	7	1			3	16	30
Georgetown University	1	4	1					6
George Washington University		3	1					4
Howard University		1					1	2
U.S. Dept. of Defense, Walter Reed Army Institute of Research						1		1
U.S. Dept. of Health, Education & Welfare, National Institutes of Health				2				2
U.S. Dept. of the Interior, Bureau of Mines					1			1
Sub-total	4	15	5	3	1	4	20	51

Institutions Chosen by Fellowship Awardees—Fiscal Year 1962—Continued

State and institution	A	B	C	D	E	F	G	Total
FLORIDA:								
Florida State University	5	9	4				1	19
University of Florida	3	9	2			4	4	22
University of Miami		4	5				2	11
Sub-total	8	22	11			4	7	52
GEORGIA:								
Atlanta University							4	4
Emory University	3	2	3					8
Georgia Institute of Technology	2	5	1			3		11
University of Georgia	1	1	7				1	10
Sub-total	6	8	11			3	5	33
HAWAII:								
University of Hawaii	1	2	1			1	2	7
IDAHO:								
Idaho State College	1							1
University of Idaho	1	1						2
Sub-total	2	1						3
ILLINOIS:								
Illinois Institute of Technology		7	8			1	5	21
Loyola University			1					1
Northwestern University	19	12	18	2		3	4	58
Southern Illinois University	1	3	5					9
University of Chicago	57	21	13	1		1	1	94
University of Illinois	47	48	42	3	1	12	6	159
Western Illinois University							1	1
Sub-total	124	91	87	6	1	17	17	343
INDIANA:								
Indiana University	14	9	4			2	2	31
Purdue University	21	34	30			10	7	102
University of Notre Dame	7	7	4				10	28
Sub-total	42	50	38			12	19	161
IOWA:								
Iowa State University	12	16	10			3		41
State University of Iowa	4	8	7			6	1	26
Sub-total	16	24	17			9	1	67
KANSAS:								
Kansas State College of Pittsburg							1	1
Kansas State Teachers College							7	
Kansas State University	2	2	6			2		1
University of Kansas	8	8	8	1		2	1	2
Sub-total	10	10	14	1		4	9	48
KENTUCKY:								
University of Kentucky		5	3			1	1	10
University of Louisville		2	1					3
Sub-total		7	4			1	1	13
LOUISIANA:								
Louisiana State University	2	7	4			1	2	16
Northwestern State College of Louisiana							1	1
Tulane University	1	6	5			1		13
Sub-total	3	13	9			2	3	30
MAINE:								
University of Maine		3	4				1	8
MARYLAND:								
Johns Hopkins University	26	9	3					38
University of Maryland	5	9	4	1			1	20
Sub-total	31	18	7	1			1	58

State and institution	A	B	C	D	E	F	G	Total
MASSACHUSETTS:								
Boston College		2	1				2	5
Boston University	1	5	2				1	9
Brandeis University	4	8	3					15
Clark University		1	2					3
Harvard University	216	26	13	15		6	1	277
Massachusetts General Hospital				1				1
Massachusetts Institute of Technology	182	48	19	7	3	6		265
Northeastern University	2							2
Radcliffe College	24	6	4			1		35
Smith College			1					1
University of Massachusetts	1	1	4				1	7
Worcester Polytechnic Institute		1						1
Sub-total	430	98	49	23	3	13	5	621
MICHIGAN:								
Michigan State University	5	21	11			9	5	51
University of Detroit							3	3
University of Michigan	41	41	23	5	1	12	7	130
Wayne State University		7	10			2	1	20
Western Michigan University							2	2
Sub-total	46	69	44	5	1	23	18	206
MINNESOTA:								
University of Minnesota	23	29	38	1		6	3	100
MISSISSIPPI:								
Mississippi Southern College							1	1
Mississippi State University		1	1					2
University of Mississippi	1	3	3				3	10
Sub-total	1	4	4				4	13
MISSOURI:								
Central Missouri State College							1	1
St. Louis University		2	5			1	9	17
University of Missouri	2	9	17			2		30
Washington University	2	7	11		1	3	1	25
Sub-total	4	18	33		1	6	11	73
MONTANA:								
Montana State College	1	2	1			1		5
Montana State University		1	5			1	1	8
Sub-total	1	3	6			2	1	13
NEBRASKA:								
Creighton University							3	3
University of Nebraska	4	7	9			1		21
Sub-total	4	7	9			1	3	24
NEVADA:								
University of Nevada							1	1
NEW HAMPSHIRE:								
Dartmouth College						1		1
University of New Hampshire		1	1					2
Sub-total		1	1			1		3
NEW JERSEY:								
Institute for Advanced Study				6	4			10
Newark College of Engineering			1					1
Princeton University	139	12	9	6		1		167
Rutgers, The State University	3	9	8			1		21
Stevens Institute of Technology	3	7	2					12
Sub-total	145	28	20	12	4	2		211
NEW MEXICO:								
New Mexico Highlands University			3					3
New Mexico State University	1	7	8			1	1	18
University of New Mexico	1	3	5			2		11
Sub-total	2	10	16			3	1	32

State and institution	A	B	C	D	E	F	G	Total
NEW YORK:								
Adelphi College	------	1	------	------	------	------	------	1
American Museum of Natural History	------	------	------	2	------	------	------	2
Brooklyn College	1	------	------	------	------	------	------	1
City College of New York	------	------	------	------	------	------	1	1
Columbia University	47	34	28	4	------	3	1	117
Cornell University	32	35	24	1	------	3	3	98
Fordham University	------	5	1	------	------	1	11	18
New School for Social Research	------	2	------	------	------	------	------	2
New York University	22	33	8	------	------	6	4	73
Polytechnic Institute of Brooklyn	1	3	3	------	------	1	1	9
Presbyterian Hospital	------	------	------	1	------	------	------	1
Public Health Research Institute of City of N.Y.	------	------	------	1	------	------	------	1
Rensselaer Polytechnic Institute	3	7	6	1	------	1	1	19
Rockefeller Institute	------	------	------	1	1	------	------	2
St. Bonaventure University	------	------	1	------	------	------	------	1
St. John's University	1	1	1	------	------	------	2	5
State University College of Forestry at Syracuse University	------	2	1	------	------	1	------	4
Syracuse University	3	7	13	------	------	5	2	30
Teachers College	------	------	------	------	------	------	1	1
University of Buffalo	1	2	2	------	------	1	1	7
University of Rochester	6	4	6	3	------	------	------	19
Yeshiva University	------	3	------	------	------	------	------	3
Sub-total	177	139	94	14	1	22	28	415
NORTH CAROLINA:								
Appalachian State Teachers College	------	------	------	------	------	------	1	1
Duke University	9	7	2	------	------	4	------	22
North Carolina State College	4	8	4	------	------	5	------	21
University of North Carolina	5	7	13	1	------	------	1	27
Sub-total	18	22	19	1	------	9	2	71
NORTH DAKOTA:								
North Dakota State University	------	3	3	------	------	------	1	7
University of North Dakota	------	5	3	------	------	------	1	9
Sub-total	------	8	6	------	------	------	2	16
OHIO:								
Bowling Green State University	------	------	------	------	------	------	1	1
Case Institute of Technology	1	14	3	------	------	4	------	22
John Carroll University	------	------	------	------	------	------	1	1
Kent State University	------	------	4	------	------	------	------	4
Miami University	------	------	------	------	------	------	2	2
Ohio State University	14	31	21	------	------	4	6	76
Ohio University	------	------	1	------	------	------	------	1
University of Akron	------	3	------	------	------	1	------	4
University of Cincinnati	2	6	8	------	------	3	------	19
University of Toledo	------	------	------	------	------	------	1	1
Western Reserve University	1	6	2	------	------	------	2	11
Sub-total	18	60	39	------	------	12	13	142
OKLAHOMA:								
Oklahoma State University	5	6	5	------	------	4	13	33
University of Oklahoma	4	8	3	------	------	4	5	24
Sub-total	9	14	8	------	------	8	18	57
OREGON:								
Oregon State University	2	6	3	1	------	6	1	19
University of Oregon	4	3	8	------	------	1	2	18
University of Portland	------	------	1	------	------	------	------	1
Sub-total	6	9	12	1	------	7	3	38
PENNSYLVANIA:								
Bryn Mawr College	2	5	2	------	------	------	------	9
Carnegie Institute of Technology	10	17	4	1	------	1	------	33
Hahnemann Medical College	------	------	1	------	------	------	------	1
Indiana State College	------	------	------	------	------	------	1	1
Lehigh University	5	6	1	------	------	1	------	13
Pennsylvania State University	14	18	11	1	------	6	4	54
Philadelphia College of Pharmacy	------	1	------	------	------	------	------	1
Temple University	------	2	------	------	------	------	3	5
University of Pennsylvania	8	18	3	2	------	2	1	34
University of Pittsburgh	2	6	17	------	------	1	------	26
Villanova University	1	------	------	------	------	------	1	2
Sub-total	42	73	39	4	------	11	10	179

Institutions Chosen by Fellowship Awardees—Fiscal Year 1962—Continued

State and institution	A	B	C	D	E	F	G	Total
RHODE ISLAND:								
Brown University	11	7	3	1		2	2	26
University of Rhode Island		1	2					3
Sub-total	11	8	5	1		2	2	29
SOUTH CAROLINA:								
Clemson College		1	1					2
University of South Carolina	1	2	5					8
Sub-total	1	3	6					10
SOUTH DAKOTA:								
South Dakota School of Mines and Technology							1	1
South Dakota State College			1					1
State University of South Dakota		1					7	8
Sub-total		1	1				8	10
TENNESSEE:								
George Peabody College for Teachers			1				1	2
University of Tennessee	5	8	7			2	2	24
Vanderbilt University		4	6			2		12
Sub-total	5	12	14			4	3	38
TEXAS:								
Agricultural & Mechanical College of Texas	1	4	2			5		12
Baylor University		1	3			1		5
North Texas State College							3	3
Rice University	8	6	1	1				16
Texas Christian University		1	4					5
Texas Southern University							1	1
Texas Technological College			1				1	2
Texas Woman's University							1	1
University of Houston	1	4					2	7
University of Texas	10	12	7			5	3	37
Sub-total	20	28	18	1		11	11	89
UTAH:								
Brigham Young University	1	5	4					10
University of Utah	3	9	15			2	2	31
Utah State University		4	4			1		9
Sub-total	4	18	23			3	2	50
VIRGINIA:								
Madison College							2	2
Medical College of Virginia			1					1
University of Virginia	3	6	1			1		11
Virginia Polytechnic Institute	2	1						3
Sub-total	5	7	2			1	2	17
WASHINGTON:								
Seattle University							1	1
University of Washington	12	14	9	1		4	4	44
Washington State University	1	3	6					10
Sub-total	13	17	15	1		4	5	55
WEST VIRGINIA:								
West Virginia University		1	1			1	2	5
WISCONSIN:								
Institute of Paper Chemistry		1						1
Marquette University	2	5	1				3	11
University of Wisconsin	56	38	28	2		12	8	144
Sub-total	58	44	29	2		12	11	156
WYOMING:								
University of Wyoming	2	2	2				4	10
PUERTO RICO:								
University of Puerto Rico							4	4
Total, United States	1,727	1,200	868	111	18	292	300	4,516

Foreign Institutions Chosen by Fellowship Awardees—Fiscal Year 1962

[Key to table: A, Graduate;
D, Postdoctoral;
E, Senior Postdoctoral; and
F, Science Faculty.]

Country and institution	A	D	E	F	Total
AUSTRALIA:					
Australian National University	1		1		2
University of Melbourne		1			1
University of Sydney		2	2		4
Sub-total	1	3	3		7
AUSTRIA:					
University of Innsbruck			2		2
BELGIUM:					
University of Brussels		2	3		5
CANADA:					
National Research Council		1	1		2
University of Alberta	1				1
University of British Columbia				1	1
University of Toronto	1				1
Sub-total	2	1	1	1	5
DENMARK:					
Copenhagen University	1	5	3		9
State Serum Institute			1		1
Sub-total	1	5	4		10
FRANCE:					
Center of Research on Macromolecules			3		3
National Center of Scientific Research		2	2		4
College of France	1	1			2
Institute of Higher Scientific Studies		1			1
National Observatory		1			1
Pasteur Institute		1	1		2
Practical School of Higher Studies			1		1
Saclay Nuclear Research Center		3			3
University of Paris		5	3		8
University of Toulouse			1		1
Sub-total	1	14	11		26
GERMANY:					
Agricultural Research Center			1		1
Baden Institute of Technology	1				1
Carolo Wilhelmina Technical Institute				1	1
Eberhard Karls University			1		1
Johann Wolfgang Goethe University	1				1
Ludwig Maximilian University	1	3		1	5
Max Planck Institutes		8	1		9
Ruprecht Karl University		1		1	2
Technical Institute—Munich		1		1	2
University of Bonn	1	1			2
University of Cologne		1			1
University of Erlangen			1		1
University of Hamburg	1			1	2
University of Munster		1			1
Sub-total	5	16	4	5	30
INDIA:					
University of Baroda		1			1
University of Delhi		1			1
University of Gauhati				1	1
Sub-total		2		1	3
ISRAEL:					
Hebrew University	1	2	1		4
Institute of Technology			1		1
Weizmann Institute of Science		4	4		8
Sub-total	1	6	6		13

Foreign Institutions Chosen by Fellowship Awardees—Fiscal Year 1962—Continued

[Key to table: A, Graduate;
D, Postdoctoral;
E, Senior Postdoctoral; and
F, Science Faculty.]

Country and institution	A	D	E	F	Total
ITALY:					
Polytechnic Institute			1		1
University of Pavia			2		2
University of Rome		1	1		2
Sub-total		1	4		5
JAPAN:					
Kyoto University		1			1
MALAGASY REPUBLIC:					
Institut de Recherche Scientifique Tananarive			1		1
NETHERLANDS:					
International Training Centre for Aevial				1	1
School of Economics		1			1
University of Delft			2		2
University of Groningen		1			1
University of Leiden	1	1			2
University of Utrecht		1			1
Willie Commelin Scholten			1		1
Sub-total	1	4	3	1	9
NEW ZEALAND:					
University of Canterbury	1				1
University of New Zealand	1				1
Victoria University			1		1
Sub-total	2		1		3
NORWAY:					
Technical University		1			1
University of Oslo	1	1		1	3
Sub-total	1	2		1	4
SPAIN:					
University of Seville		1	1		2
SWEDEN:					
Royal Carolina Medico Surgical Institute		2	1		3
Royal Institute of Technology				2	2
Swedish Seed Association		1			1
University of Lund			1	1	2
University of Uppsala		2		1	3
Sub-total		5	2	4	11
SWITZERLAND:					
C E R N		7	4	1	12
Swiss Federal Institute of Technology	1	2	1	2	6
University of Bern		1	1		2
University of Zurich		1	1		2
Sub-total	1	11	7	3	22
UGANDA:					
Uganda Museum		1			1
UNITED KINGDOM:					
Atomic Energy Research Establishment		3			3
British Museum of Natural History			1	1	2
Cambridge University	6	20	7	5	38
Dept. of Scientific and Industrial Research			1		1
Institute of Psychiatry			1		1
John Innes Horticultural Institution			1		1
Lister Institute		1			1
Medical Research Council		2	1		3
National Institute for Medical Research		2			2
Oxford University	3	8	3	4	18
Plant Breeding Institution		1			1
Rothamsted Experimental Station		2			2
Royal Institution of Great Britain		1			1
Tavistock Clinic and Institute of Human Relations				1	1
University of Birmingham		3			3

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Foreign Institutions Chosen by Fellowship Awardees—Fiscal Year 1962—Continued

[Key to table: A, Graduate;
D, Postdoctoral;
E, Senior Postdoctoral; and
F, Science Faculty.]

Country and institution	A	D	E	F	Total
UNITED KINGDOM—Continued					
University of Bristol		1	1		2
University of Edinburgh		2			2
University of Glasgow		1			1
University of Liverpool				3	3
University of London	9	8	4	4	25
University College of North Wales		1			1
University of Sheffield			1		1
Victoria University-Manchester		2			2
Sub-total	18	59	21	17	115
Total outside United States	34	134	74	33	275

Present or Most Recent Institutional Affiliation of Individuals Offered Science Faculty, Senior Postdoctoral, and Postdoctoral Fellowships for Fiscal Year 1962

	Science faculty	Senior post-doctoral	Post-doctoral
ALABAMA:			
Auburn University	3		
Howard College	1		
ALASKA:			
University of Alaska	1		
ARIZONA:			
University of Arizona	1		
CALIFORNIA:			
California Institute of Technology	1	1	9
California State Polytechnic College	1		
Chico State College	2		
Contra Costa College	1		
Fresno State College	1		
Fullerton Junior College	1		
Glendale College	1		
Humboldt State College	1		
La Verne College	1		
Los Angeles Pierce College	1		
Los Angeles State College of Applied Arts and Sciences	1		
Los Angeles Valley College	1		
Loyola University of Los Angeles	1		
Mills College	1		
Mount San Antonio College	2		
Orange County State College	1		
Pomona College	1		
Reedly College	1		
Sacramento State College	1		
San Jose State College	3		
Stanford Research Institute		2	
Stanford University	3	3	8
University of California, Berkeley	3	5	32
University of California, Davis	2	2	3
University of California, Los Angeles		2	6
University of California, Riverside	1		
University of California, San Diego			1
University of Southern California		2	1
Ventura College	1		
Westmont College	1		
COLORADO:			
Colorado State College	1		
Colorado State University	1	1	
University of Colorado	5	1	1
University of Denver	1		
CONNECTICUT:			
Albertus Magnus College	1		
Trinity College			1
University of Bridgeport	1		
University of Connecticut	2		1
Wesleyan University	1		
Yale University		2	6

Present or Most Recent Institutional Affiliation of Individuals Offered Science Faculty, Senior Postdoctoral, and Postdoctoral Fellowships for Fiscal Year 1962—Continued

	Science faculty	Senior post-doctoral	Post-doctoral
DELAWARE:			
E. I. du Pont de Nemours		1	
DISTRICT OF COLUMBIA:			
Catholic University of America	2		1
Howard University	2		
U.S. Naval Research Laboratory		1	
FLORIDA:			
Florida State University			3
University of Florida	3		
GEORGIA:			
Emory University		1	
Georgia Institute of Technology	3		
Georgia Southern College	1		
IDAHO:			
Idaho State College	1		
University of Idaho	2		
ILLINOIS:			
Argonne National Laboratory		1	1
Illinois Institute of Technology	1		
MacMurray College	1		
Morton Junior College	1		
Northern Illinois University	1		
Northwestern University	8	1	5
Olivet Nazarene College	1		
Southern Illinois University	1	2	
University of Chicago	2	8	13
University of Illinois	7	3	8
INDIANA:			
Anderson College and Theological Seminary	1		
Indiana State College	1		
Indiana Technical College	1		
Indiana University		3	1
Purdue University	5	1	3
St. Francis College	1		
University of Notre Dame			1
IOWA:			
Iowa State University of Science and Technology	2	1	2
St. Ambrose College	1		
State University of Iowa	2		4
KANSAS:			
Fort Hays Kansas State College	1		
Kansas State Teachers College	1		
Kansas State University of Agriculture and Applied Science	1	1	
University of Kansas	1		1
University of Wichita	1		
KENTUCKY:			
University of Kentucky	1		
University of Louisville	2		
Ursuline College	1		
LOUISIANA:			
Louisiana State University	4	1	
Tulane University of Louisiana	1		2
MAINE:			
University of Maine	1		
MARYLAND:			
Army Chemical Center			1
Coppin State Teachers College	1		
Johns Hopkins University			2
National Institutes of Health			1
University of Maryland	1		5
Woodstock College			1
MASSACHUSETTS:			
Amherst College	2		1
Boston College	1		
Boston University		1	1
Brandeis University		2	
College of the Holy Cross	1		
Harvard University	1	1	21
Massachusetts Institute of Technology			14
Massachusetts Mental Health Center		1	
Simmons College	1		
State College at Boston	1		
Tufts University	1		1
University of Massachusetts	8	1	
Williams College	1		

Present or Most Recent Institutional Affiliation of Individuals Offered Science Faculty, Senior Postdoctoral, and Postdoctoral Fellowships for Fiscal Year 1962—Continued

	Science faculty	Senior post-doctoral	Post-doctoral
MICHIGAN:			
Calvin College	1		
Central Michigan University	1		
Detroit Institute of Technology	1		
Flint Junior College	1		
Michigan College of Mining and Technology	1		
Michigan State University of Agriculture and Applied Science	8	3	1
University of Detroit	1		
University of Michigan	4	1	7
Wayne State University	2	1	1
Western Michigan University	1		
MINNESOTA:			
Augsburg College and Theological Seminary	1		
Bethel College and Seminary	1		
Carleton College	1		
Mankato State College	1		
St. Olaf College	1		
University of Minnesota	2	5	3
MISSISSIPPI:			
Mississippi State University	1		
MISSOURI:			
University of Missouri	6		
Washington University	1	1	1
MONTANA:			
College of Great Falls	1		
Western Montana College of Education	1		
NEBRASKA:			
Nebraska Wesleyan University	1		
University of Nebraska	1		1
NEVADA:			
University of Nevada	1		
NEW HAMPSHIRE:			
Dartmouth College	3		
NEW JERSEY:			
Princeton University	2	3	7
St. Peter's College	1		
Stevens Institute of Technology	2		
Upsala College	1		
NEW MEXICO:			
University of New Mexico	4		
NEW YORK:			
Brookhaven National Laboratory		1	
Brooklyn College	1		
City College	1		
Clarkson College of Technology	4		
Columbia University		3	8
Cooper Union	1		
Cornell University	4	4	6
Erie County Technical Institute	1		
General Electric Research Laboratory		1	
Houghton College	1		
Hunter College	1		
Jamestown Community College	1		
Manhattan College	1		
New York City Community College of Applied Arts and Sciences	1		
Polytechnic Institute of Brooklyn	2		
Rensselaer Polytechnic Institute	1		2
St. Lawrence University	1		
Skidmore College	1		
State University College of Education, Albany	2		
Syracuse University	1		
U.S. Merchant Marine Academy	1		
Union College and University	1		
University of Rochester			4
NORTH CAROLINA:			
Davidson College	1		
Duke University	1	1	
State College of Agriculture and Engineering	5		1
University of North Carolina	2	1	
OHIO:			
Case Institute of Technology	2		1
Kent State University	1		
Kenyon College	1		
Marietta College	2		
Ohio State University	1	3	1
Ohio University	2		
University of Cincinnati			1
University of Dayton	2		

Present or Most Recent Institutional Affiliation of Individuals Offered Science Faculty, Senior Postdoctoral, and Postdoctoral Fellowships for Fiscal Year 1962—Continued

	Science faculty	Senior post-doctoral	Post-doctoral
OHIO—Continued			
University of Toledo	2		
Western Reserve University	1	1	
Wittenberg University	1		
Xavier University	2		
The Youngstown University	1		
OKLAHOMA:			
Oklahoma State University of Agriculture and Applied Science	1		
University of Oklahoma	5	1	
OREGON:			
Lewis and Clark College	1		
Linfield College	1		
Oregon State University	3		1
Reed College			1
University of Oregon	1		1
University of Portland	1		
PENNSYLVANIA:			
Bucknell University	2		
Carnegie Institute of Technology	1	1	2
Drexel Institute of Technology	3		
Grove City College	1		
Haverford College		1	
Lafayette College	1		
Lehigh University	1		1
Mellon Institute		1	
The Pennsylvania State University	4		
California State College	1		
Swarthmore College	1		
Temple University	1		
Thiel College	1		
University of Pennsylvania		3	7
University of Pittsburgh	1	1	
Villanova University	1		
RHODE ISLAND:			
Brown University		1	
University of Rhode Island	2		1
SOUTH CAROLINA:			
Clemson Agricultural College	1		
University of South Carolina	1		
SOUTH DAKOTA:			
Black Hills Teachers College	1		
South Dakota State College of Agriculture and Mechanic Arts	2		
TENNESSEE:			
Fisk University	1		
University of Tennessee	2		
Vanderbilt University	1		2
TEXAS:			
Agricultural and Mechanical College of Texas	3		
Arlington State College	1		
East Texas Baptist College	1		
North Texas State University	1		
Sam Houston State Teachers College	1		
San Antonio College	2		
Southern Methodist University	1		
Southwest Texas State College	1		
University of Texas	2	1	2
Rice University	1		1
UTAH:			
Brigham Young University	1		
University of Utah	2	1	
Utah State University of Agriculture and Applied Science			1
VERMONT:			
Norwich University	1		
University of Vermont and State Agricultural College	1	1	
VIRGINIA:			
Randolph-Macon Woman's College	1		
University of Virginia	1		
Virginia Polytechnic Institute		1	
WASHINGTON:			
Everett Junior College	1		
Seattle University	1		
University of Washington	1	2	3
Washington State University			2
Whitman College	2		
WEST VIRGINIA:			
Marshall University	1		
West Virginia University	3		
West Virginia Wesleyan College	1		

Present or Most Recent Institutional Affiliation of Individuals Offered Science Faculty, Senior Postdoctoral, and Postdoctoral Fellowships for Fiscal Year 1962—Continued

	Science faculty	Senior post-doctoral	Post-doctoral
WISCONSIN:			
Lawrence College	2		
Marquette University	1		
Milwaukee School of Engineering	1		
St. Norbert College	1		
University of Wisconsin	5		6
Wisconsin State College and Institute of Technology	1		
WYOMING:			
University of Wyoming	2		
PUERTO RICO:			
U.S. Department of Agriculture		1	
University of Puerto Rico	1		
AUSTRALIA:			
University of Melbourne			1
University of Sydney			1
CANADA:			
MacDonald College			1
McGill University			1
ENGLAND:			
Oxford University			2
University of Birmingham			1
Total	325	92	245

APPENDIX F

Patents Resulting from Activities Supported by The National Science Foundation

The Foundation, since its last annual report, has received notification of the issuance of four patents by the U.S. Patent Office covering inventions arising out of Foundation-supported activities.

1. Patent No. 3,003,113 entitled "Low Differential Amplifier" was issued on October 3, 1961, to Edward F. MacNichol, Jr. on an invention made during the course of research supported by a grant to Johns Hopkins University.

2. Patent No. 3,007,918 entitled "Thiolation of Carbohydrates" was issued on November 7, 1961, to Reinhold Benesch and Ruth E. Benesch on an invention made during the course of research supported by grants to the State University of Iowa. It relates to methods for the introduction of sulfhydryl (–SH) groups into carbohydrates and to the thiolated carbohydrates thereby produced.

3. Patent No. 3,013,079 entitled "Ring Halogenation of Aromatic Carbonyl Compounds" was issued on December 12, 1961, to Donald E. Pearson and Hughlan W. Pope on an invention made during the course of research supported by grants to Vanderbilt University. It relates to a method for effecting the ring halogenation of aromatic carbonyl compounds and to certain novel ring-halogenated aromatic carbonyl compounds.

4. Patent No. 3,051,684 entitled "Organosiloxane Polymers Containing Polydiene Blocks" was issued on August 28, 1962, to Maurice Morton and Alan Rembaum on an invention made during the course of research supported by a grant to the University of Akron. It relates to organo-siloxane polymers.

Pursuant to the provisions of the grants involved, the Foundation has secured for the Federal Government royalty-free licenses to utilize these inventions for governmental purposes.

APPENDIX G

National Science Foundation-Sponsored Scientific Conferences, Symposia, and Advanced Science Seminars Held During Fiscal Year 1962

SCIENTIFIC CONFERENCES AND SYMPOSIA IN THE BIOLOGICAL AND MEDICAL SCIENCES

FOURTH INTERNATIONAL CONFERENCE ON MEDICAL ELECTRONICS—New York City, N.Y.; July 16–21, 1961; Chairman: Leslie E. Flory, Research Engineer, RCA Laboratories, Princeton, N.J.; Cosponsor: National Institute of Health.

RADIATION EFFECTS ON ANIMAL REPRODUCTION—Knoxville, Tenn.; Aug. 3–5, 1961; Chairman: N. L. Van Demark, Department of Dairy Science, University of Illinois; Cosponsor: University of Tennessee.

BIOCHEMISTRY OF PLANT PHENOLIC SUBSTANCES—Fort Collins, Colo.; Aug. 31–Sept. 1, 1961; Chairman: Gestur Johnson, Department of Chemistry, Colorado State University Research Foundation.

CONFERENCE ON BEHAVIORAL GENETICS—Stanford, Calif.; Aug. 14–Sept. 3, 1961; Chairman: Jerry Hirsch, Department of Psychology, University of Illinois; Cosponsor: Center for Advanced Study in the Behavior Sciences, Stanford, Calif.

CONFERENCE ON SEX AND BEHAVIOR—Berkeley, Calif.; Aug. 7–11, 1961; Chairman: Frank A. Beach, Department of Psychology, University of California, Berkeley; Cosponsor: National Institutes of Health.

WORKSHOP ON ANTIBODY SYNTHESIS AND CHARACTERIZATION—London, Eng.; Aug. 30–Sept. 1, 1961; Chairman: R. R. Porter, Department of Immunology, St. Mary's Hospital Medical School, London, England.

CONFERENCE ON EXPERIMENTAL TECHNIQUES FOR STUDYING VERY FAST REACTION IN SOLUTION—Madison, Wis.; Sept. 14–16, 1961; Chairman: Robert A. Alberty, Department of Chemistry, University of Wisconsin; Cosponsor: University of Wisconsin.

SECOND ANIMAL SYMPOSIUM ON COMPARATIVE BIOLOGY—Oakland, Calif.; Sept. 6–10, 1961; Chairman: Clifford H. Keene, The Kaiser Foundation Research Institute, Richmond, Calif.

FIFTH TISSUE TRANSPLANTATION CONFERENCE—New York City, N.Y., Feb. 8–10, 1962; Chairman: John M. Converse and Blair O. Rogers, Institute of Reconstructive Plastic Surgery, New York University School of Medicine, New York City; Cosponsor: New York University Medical Center.

SECOND CONFERENCE ON BRAIN AND BEHAVIOR: THE INTERNAL ENVIRONMENT AND ALIMENTARY BEHAVIOR—Los Angeles, Calif.; Feb. 18–21, 1962; Chairman: H. W. Magoun, Department of Anatomy, University of California, Los Angeles; Cosponsor: American Institute of Biological Sciences and the University of California, Los Angeles.

SYMPOSIUM ON ADVANCES IN IMMUNOLOGY AND ONCOLOGY—Houston, Tex.; Mar. 1–3, 1962; Chairman: Felix L. Haas, Texas Medical Center, Houston; Cosponsor: University of Texas.

SYMPOSIUM ON THE EVOLUTION AND PHYLOGENY OF CRUSTACEA—Cambridge, Mass.; Mar. 6–8, 1962; Chairman: H. B. Whittington, Department of Geological Sciences, Harvard University.

CONFERENCE ON ACTIVE SITES OF ENZYMES, AND MOLECULAR BIOLOGY OF COLLAGEN—Washington, D.C.; Mar. 21–22, 1961; Chairman: A. E. Heming, Division of Biological Chemistry, American Chemical Society; Cosponsor: American Chemical Society.

SYMPOSIUM ON HISTOCHEMISTRY AND EXTRA-CELLULAR SUBSTANCES—Atlantic City, N.J.; Apr. 13, 1962; Chairman: William L. Doyle, Department of Anatomy, University of Chicago; Cosponsor: Histochemical Society.

CONFERENCE ON THE APPLICATIONS OF FUNDAMENTAL BIOLOGY TO THE NEEDS OF MAN—New Brunswick, N.J.; Apr. 27–28, 1962; Chairman: James W. Green, Department of Physiology and Biochemistry, Rutgers University; Cosponsor: Rutgers University.

TRANSFER OF CALCIUM AND STRONTIUM ACROSS BIOLOGICAL MEMBRANES (with Emphasis on Gastrointestinal Absorption)—Ithaca, N.Y.; May 13–16, 1962; Chairman: R. H. Wasserman, Department of Physical Biology, Cornell University; Cosponsors: Atomic Energy Commission and National Institutes of Health.

CONFERENCE ON BIOCHEMISTRY OF MUSCLE CONTRACTION—Dedham, Mass.; May 20–24, 1962; Chairman: John Gergely, Director of Muscle Research, Retina Foundation, Boston, Mass.

COLD SPRING HARBOR SYMPOSIUM ON QUANTITATIVE BIOLOGY—Cold Spring Harbor, N.Y.; June 7–13, 1962; Chairman: Arthur Chovnick, Director, Cold Spring Harbor Laboratory; Cosponsors: National Institutes of Health, Atomic Energy Commission, Air Force Office of Scientific Research, and the Rockefeller Foundation.

CONFERENCE ON PLEUROPNEUMONIA-LIKE ORGANISMS—Storrs, Conn.; June 14–16, 1962; Chairman: R. C. Cleverdon, Department of Bacteriology, University of Connecticut; Cosponsor: University of Connecticut.

XIII INTERNATIONAL ORNITHOLOGICAL CONGRESS—Ithaca, N.Y.; June 17–21, 1962; Chairman: Charles G. Sibley, Department of Conservation, Cornell University; Cosponsor: American Ornithologists Union, Ithaca, N.Y.

SEDIMENTATION ANALYSIS—New York City, N.Y.; June 17–21, 1962; Chairman: J. W. Williams, Department of Chemistry, University of Wisconsin; Cosponsor: National Academy of Sciences-National Research Council.

GORDON RESEARCH CONFERENCE ON STRUCTURE AND FUNCTION OF MULTILAYER SYSTEMS IN CELLS—Meriden, N.H.; June 18–22, 1962; Chairman: W. George Parks, Department of Chemistry, University of Rhode Island; Cosponsor: Gordon Research Conferences, Inc.

INTERNATIONAL CONGRESS ON TECHNOLOGY AND BLINDNESS—New York City, N.Y.; June 18–22, 1962; Chairman: Martynas Ycas, Department of Microbiology, Upstate Medical Center, Research Foundation of State University of New York, Albany, N.Y.; Cosponsor: Department of Health, Education, and Welfare.

RESEARCH CONFERENCE IN COMPUTER TECHNIQUES FOR BIOLOGICAL SCIENTISTS—Cambridge, Mass.; June 18—July 6, 1962; Chairman: Thomas T. Sandel, Massachusetts Institute of Technology; Cosponsor: Massachusetts Institute of Technology.

GORDON RESEARCH CONFERENCE ON NUCLEIC ACIDS AND PROTEINS—New Hampton, N.H.; June 25–29, 1962; Chairman: Cyrus Levinthal, Massachusetts Institute of Technology, and Leon A. Heppel, National Institutes of Health; Cosponsor: Gordon Research Conferences, Inc.

SCIENTIFIC CONFERENCES AND SYMPOSIA IN THE MATHEMATICAL, PHYSICAL, AND ENGINEERING SCIENCES

INTERNATIONAL ASTRONOMICAL UNION SYMPOSIUM ON PROBLEMS OF EXTRAGALACTIC RESEARCH—Santa Barbara, Calif.; Aug. 10–12, 1961; Chairman: Dr. O. Heckman, Leuschner Observatory; Cosponsor: University of California.

INTERNATIONAL ASTRONOMICAL UNION SYMPOSIUM ON THE SOLAR CORONA—Cloudcroft, N. Mex.; Aug. 27–30, 1961; Chairman: Donald E. Billings, High Altitude Observatory, Boulder, Colo.; Cosponsors: Sacramento Peak Observatory and the U.S. Air Force.

INTERNATIONAL ASTRONOMICAL UNION SYMPOSIUM ON VISUAL DOUBLE STARS—Berkeley, Calif.; Aug. 11–12, 1962; Chairman: Peter van de Kamp, Sproul Observatory, Swarthmore College, Pa.; Cosponsor: Swarthmore College.

SYMPOSIUM ON MAGNETIC FIELDS IN THE SOLAR SYSTEM—Denver, Colo.; Dec. 29, 1961; Chairman: Alan Shapley, National Bureau of Standards, Boulder, Colo.; Cosponsors: American Astronomical Society and High Altitude Observatory of the University of Colorado.

THE THIRD INTERNATIONAL SPACE SCIENCE SYMPOSIUM AND COSPAR PLENARY MEETING—Washington, D.C.; Apr. 30–May 9, 1962; Chairman: Hendrik van de Hulst, University of Leiden Observatory; Cosponsors: National Academy of Sciences-National Research Council and National Aeronautics and Space Administration.

CONFERENCE ON A PROGRAM FOR ATMOSPHERIC RESEARCH ON THE BLACK HILLS REGION—Rapid City, S. Dak.; Feb. 27–28, 1962; Chairman: Horace R. Byers, Department of Geophysical Sciences, University of Chicago; Cosponsor: South Dakota School of Mines and Technology.

GORDON RESEARCH CONFERENCE ON INORGANIC CHEMISTRY—New Hampton, N.H.; Aug. 21–25, 1961; Vice chairman: Helmut M. Haendler, University of New Hampshire; Sessions-chairmen: George H. Cady, University of Washington; Derro Knox, Bell Telephone Laboratories; S. Young Tyree, University of North Carolina; Donald C. Bradley, University of Western Ontario; Cosponsor: American Association for the Advancement of Science.

INTERNATIONAL CONFERENCE ON IRREVERSIBLE THERMODYNAMICS—Providence, R.I.; June 11–16, 1962; Chairman: John Ross, Department of Chemistry, Brown University; Cosponsors: International Union of Pure and Applied Physics, Air Force Office of Scientific Research, and Brown University.

SYMPOSIUM ON BIOLOGICAL AND PHYSICAL ASPECTS OF LIGHT IN THE SEA—Honolulu, Hawaii; Aug. 21–Sept. 6, 1961; Chairman: John E. Tyler, Visibility Laboratory, Scripps Institution of Oceanography; Cosponsors: National Academy of Sciences-National Research Council and the Pacific Science Board.

SYMPOSIUM ON THE PRINCIPLES OF PALEOECOLOGY—Cincinnati, Ohio; Nov. 2–4, 1961; Chairman: L. L. Sloss, Northwestern University; Cosponsor: Paleontological Society.

THE TENTH ANNUAL CONFERENCE ON CLAYS AND CLAY MINERALS—Austin, Tex.; Oct. 16–18, 1961; Chairman: Earl Ingerson, University of Texas; Cosponsors: National Academy of Sciences-National Research Council and industrial organizations.

CONFERENCE ON ADVANCES IN NUCLEAR GEOPHYSICS—Woods Hole, Mass.; June 7–9, 1962; Chairman: G. W. Wetherill, University of California, Los Angeles; Cosponsor: National Academy of Sciences-National Research Council.

SYMPOSIUM ON THE BIOGEOCHEMISTRY OF SULFUR ISOTOPES—New Haven, Conn.; Apr. 12–14, 1962; Chairman: Mead LeRoy Johnson, Department of Geology, Yale University; Cosponsor: Yale University.

FIFTH ROCK MECHANICS SYMPOSIUM—Minneapolis, Minn.; May 3–5, 1962; Chairman: Eugene P. Pfleider, School of Mines and Metallurgy, University of Minnesota; Cosponsors: Colorado School of Mines, University of Minnesota, Missouri School of Mines and Metallurgy, and Pennsylvania State University.

INTERNATIONAL CONFERENCE ON MODERN TRENDS IN ACTIVATION ANALYSIS—College Station, Tex.; Dec. 15–16, 1961; Chairmen: Derek Giffons, United Kingdom

Atomic Energy Authority, and Richard E. Wainerdi, Agricultural and Mechanical College of Texas; Cosponsors: International Atomic Energy Agency, U.S. Atomic Energy Commission, and the Agricultural and Mechanical College of Texas.

WORKSHOP ON THE PHYSICS OF FLUX REVERSAL IN MAGNETIC MATERIALS—New Haven, Conn.; Mar. 20–22, 1962; Chairman: R. C. Barker, Yale University; Cosponsors: American Institute of Electrical Engineers and Yale University.

SYMPOSIUM ON HIGH-SPEED COMPUTING AND MATHEMATICAL RESEARCH—Atlantic City, N.J.; Apr. 16–19, 1962; Cosponsors: Association for Computing Machinery, American Mathematical Society, and the Army Research Office (Durham).

SEMINAR IN MATHEMATICS—Montreal, Canada; Aug. 14–Sept. 9, 1961; Chairman: L. F. S. Ritcey, McGill University; Cosponsors: Canadian Mathematical Congress, and Societe Mathematique du Canada.

CONFERENCE ON ABELIAN GROUPS—University Park, N. Mex.; June 4–8, 1962; Chairman: E. A. Walker, New Mexico State University; Cosponsor: New Mexico State University.

SYMPOSIUM ON EFFECTS OF SURFACE AND ENVIRONMENT ON STRENGTH—Detroit, Mich.; Oct. 23–24, 1961; Chairman: Marvin Metzger, University of Illinois; Cosponsor: Metallurgical Society of the American Institute of Mechanical Engineers.

THE XIITH INTERNATIONAL ASTRONAUTICAL CONGRESS—Washington, D.C.; Oct. 2–7, 1961; Chairman: James J. Harford; Cosponsor: American Rocket Society.

SECOND SYMPOSIUM ON THERMOPHYSICAL PROPERTIES—Princeton, N.J.; Jan. 24–26, 1962; Chairman: Eric F. Lype, Thompson-Ramo-Wooldridge; Cosponsors: American Society of Mechanical Engineers and Princeton University.

INTERNATIONAL HEAT TRANSFER CONFERENCE—Boulder, Colo.; Aug. 28–Sept. 1, 1961, and London, England, Jan. 8–12, 1962; Chairman: A. C. Mueller, Joint Committee on North American Participation, ASME; Cosponsors: Office of Naval Research, American Society of Mechanical Engineers, and the Institute of Mechanical Engineers and the Institution of Chemical Engineers of Great Britain.

SYMPOSIUM ON THE IMPACT OF SYSTEMS ENGINEERING CONCEPTS ON ENGINEERING EDUCATION AND RESEARCH—Washington, D.C.; Oct. 17, 1961; Chairman: Robert J. Jeffries, President, Data Control Systems, Inc.; Cosponsor: The Foundation for Instrumentation Education and Research.

INTERNATIONAL SYMPOSIUM ON ELECTRIC CONTACT THEORY—Orono, Maine; Nov. 14–16, 1961; Chairman: Ralph E. Armington, University of Maine; Cosponsors: University of Maine and the American Institute of Electrical Engineers.

CONFERENCE ON CRYSTAL SYNTHESIS AND STRUCTURE IN SOLID STATE RESEARCH—University Park, Pa.; Apr. 26–27, 1962; Chairman: Rustum Roy, College of Mineral Industries; Cosponsor: Pennsylvania State University.

SECOND CONFERENCE ON FUNDAMENTAL RESEARCH IN PLAIN CONCRETE—Allerton Park, Ill.; Sept. 5–8, 1961; Chairman: Clyde E. Kessler, Professor of Theoretical and Applied Mechanics, University of Illinois; Cosponsors: American Concrete Institute, American Society of Civil Engineers, American Society for Testing Materials, Portland Cement Association, Reinforced Concrete Research Council, and University of Illinois.

INTERNATIONAL SYMPOSIUM ON PHOTOELASTICITY—Chicago, Ill.; Oct. 29–31, 1961; Chairman: M. M. Frocht, Department of Mechanical Engineering, Illinois Institute of Technology; Cosponsors: Army Research Office (Durham) and Illinois Institute of Technology.

WORKSHOP ON AUTOMATIC CONTROL RESEARCH—Washington, D.C.; Feb. 5–6, 1962; Chairman: Harold Chestnut, President, American Automatic Control Council; Cosponsor: American Automatic Control Council.

Research Symposia of the American Institute of Mechanical Engineers Annual Meeting—New York, N.Y.; Feb. 19–22, 1962; Chairman: J. Stuart Smart, Jr., President, Metallurgical Society of the American Institute of Mechanical Engineers; Cosponsor: American Institute of Mechanical Engineers.

Mathematical Models in the Physical Sciences—Notre Dame, Ind.; Apr. 15–17, 1962; Chairman: Arnold E. Ross; Cosponsor: University of Notre Dame.

Symposium on Ergodic Theory—New Orleans, La.; Oct. 23–27, 1961; Chairman: Fred B. Wright; Cosponsor: Tulane University.

First International Conference on Vacuum Ultra-Violet Radiation Physics—Los Angeles, Calif.; Apr. 16–19, 1962; Conference director: G. L. Weissler, University of Southern California; Cosponsors: International Union of Pure and Applied Physics, Geophysics Research Directorate of the U.S. Air Force Cambridge Research Laboratories, and the University of Southern California.

Gordon Conference on Photonuclear Reactions—Meredin, N.H.; Aug. 21–25, 1961; Chairman: James E. Leiss, National Bureau of Standards; Cosponsors: Office of Naval Research and Air Force Office of Scientific Research.

International Conference on Chemical Physics of Nonmetallic Crystals—Evanston, Ill.; Aug. 28–31, 1961; Program chairman: W. J. Moore, Indiana University; Cosponsors: American Physical Society, The American Chemical Society, Northwestern University, Atomic Energy Commission, Air Force Office of Scientific Research, and Advanced Research Projects Agency.

The American Meteorological Society Conference on International Cooperation in the Atmospheric Sciences—Boston, Mass.; Dec. 19–20, 1961; Chairman: Thomas F. Malone, Travelers Insurance Company; Cosponsor: American Meteorological Society.

ADVANCED SCIENCE SEMINARS

Institute in Tropical Biology in Costa Rica—University of Southern California, Los Angeles, Calif.; July 3–Aug. 13, 1961; Director: Jay M. Savage.

Institute in Theoretical Physics—University of Colorado, Boulder, Colo.; June 26–Sept. 4, 1962; Director: Wesley E. Brittin.

Computer Programming and Applications—University of Oklahoma, Norman, Okla.; June 6–30, 1962; Director: William Viavant.

Infrared Spectroscopy and Gas Chromatography Institute—Fisk University, Nashville, Tenn.; Aug. 23–Sept. 1, 1961; Director: Nelson Fuson.

Nuclear-Cytoplasmic Relationships—Colorado State University, Fort Collins, Colo.; Aug. 18–19, 1961; Director: Glenwood P. Epling.

Transport Phenomena—University of Wisconsin, Madison, Wis.; July 10–28, 1961; Director: R. Byron Bird.

Shallow Water Oceanography—Florida State University, Tallahassee, Fla.; Oct. 22–Nov. 2, 1961; Director: Donn Gorsline.

Conference on Physics of the Solar System and Reentry Dynamics—Virginia Polytechnic Institute, Blacksburg, Va.; Aug. 20–Sept. 2, 1961; Director: D. H. Pletta.

Infrared Spectroscopy—Canisius College, Buffalo, N.Y.; Aug. 14–18, 1961; Director: Herman A. Szymanski.

Dynamical Astronomy—University of Arizona, Tucson, Ariz.; July 10–Aug. 4, 1961; Director: Gerald P. Kuiper.

COMPUTER PROGRAMMING—Agricultural and Mechanical College of Texas, College Station, Tex.; July 17–Aug. 25, 1961; Director: B. C. Moore.

PHILOSOPHY OF SCIENCE—University of Pittsburgh, Pittsburgh, Pa.; Oct. 1, 1961–Apr. 1, 1962; Director: Adolf Grünbaum.

QUANTUM CHEMISTRY AND SOLID-STATE PHYSICS—University of Florida, Gainesville, Fla.; Dec. 11, 1961–Jan. 13, 1962; Director: Per-Olov Löwdin.

COMPUTER SCIENCE—University of North Carolina, Chapel Hill, N.C.; June 11–July 20, 1962; Director: John W. Carr, III.

COMPUTER PROGRAMMING—Carnegie Institute of Technology, Pittsburgh, Pa.; June 26–Aug. 3, 1962; Director: Alan J. Perlis.

FRONTIERS IN BRAIN RESEARCH—University of California, Berkeley, Calif.; Oct. 14–15, 1961; Director: Charles H. Sawyer.

CONFERENCE ON THEORY OF WOOD ADHESION—University of Michigan, Ann Arbor, Mich.; July 26–Aug. 4, 1961; Director: Alan A. Marra.

INTERNATIONAL FIELD INSTITUTE, ALPS—National Academy of Science-National Research Council, Washington, D.C.; June 27–Aug. 22, 1962; Director: D. L. Blackstone, Jr.

THE ATMOSPHERE AND THE WATER CYCLE—Colorado State University, Greeley, Colo.; Jan. 1–Mar. 31, 1962; Director: Herbert Riehl.

SUMMER INSTITUTE IN MATHEMATICS FOR ADVANCED GRADUATE STUDENTS SPECIALIZING IN ALGEBRA—University of Oregon, Eugene, Oreg.; June 13–Aug. 7, 1962; Director: A. F. Moursund.

SUMMER INSTITUTE FOR ADVANCED GRADUATE STUDENTS IN APPLIED MATHEMATICS—University of Kansas, Lawrence, Kans.; June 18–Aug. 11, 1962; Director: G. Baley Price.

SOUTHERN REGIONAL GRADUATE SUMMER SESSION IN SOIL CLAY MINERALOGY—Virginia Polytechnic Institute, Blacksburg, Va.; June 14–July 12, 1962; Director: C. I. Rich.

USE OF COMPUTERS IN ENGINEERING EDUCATION—University of Houston, Houston, Tex.; June 17–Aug. 11, 1962; Director: Elliott I. Organick.

ADVANCED COURSE IN THEORETICAL AND MATHEMATICAL BIOLOGY—Yale University, New Haven, Conn.; Jan. 15–May 1, 1962; Director: Talbot H. Waterman.

SUMMER INSTITUTE IN TOPOLOGY FOR ADVANCED GRADUATE STUDENTS—University of Rochester, Rochester, N.Y.; June 13–Aug. 7, 1962; Director: Leonard Gillman.

INSTITUTE IN MATHEMATICS FOR ADVANCED GRADUATE STUDENTS SPECIALIZING IN ANALYSIS—Florida State University, Tallahassee, Fla.; June 11–Aug. 5, 1962; Director: Charles R. Starey, Jr.

SUMMER INSTITUTE FOR COLLEGE TEACHERS OF KINEMATICS—Illinois Institute of Technology, Chicago, Ill.; June 25–Aug. 18, 1962; Director: Richard S. Hartenberg.

SUMMER INSTITUTES IN THEORETICAL PHYSICS—Brandeis University, Waltham, Mass.; June 11–July 23, 1962; Director: Saul Barshay.

FIELD METHODS FOR SYSTEMATIC VERTEBRATE ZOOLOGISTS AND PALEONTOLOGISTS—University of Kansas, Lawrence, Kans.; June 11–Aug. 5, 1962; Director: E. Raymond Hall.

TROPICAL FORESTRY AND RESEARCH TECHNIQUES—Research Foundation of State University of New York, Albany, N.Y.; June 10–July 21, 1962; Director: Hardy L. Shirley.

Institute in Theoretical Metallurgy—Colorado Seminary (University of Denver), Denver, Colo.; June 10–Aug. 4, 1962; Director: William M. Mueller.

Harvard-Columbia Special Field Institute in Anthropology—Harvard University, Cambridge, Mass.; June 10–Sept. 10, 1962; Director: Evon Z. Vogt.

Summer Institute in Plasma Physics—Princeton University, Princeton, N.J.; June 25–Aug. 3, 1962; Director: Melvin B. Gottlieb.

Graduate Research in Marine Science—Bermuda Biological Station, St. George's West, Bermuda; Summer 1962; Director: Keith E. Chave.

Summer Institute in Dynamical Astronomy—Yale University, New Haven, Conn.; June 25–Aug. 3, 1962; Director: Dirk Brouwer.

Institute in Nuclear Rocket Propulsion—University of Florida, Gainesville, Fla.; June 18–Aug. 10, 1962; Director: Robert E. Uhrig.

Theoretical Studies in Geophysical Fluid Dynamics—Woods Hole Oceanographic Institute, Woods Hole, Mass.; June 15–Sept. 15, 1962; Director: Melvin E. Stern.

Marine Science Institute—University of Texas, Austin, Tex.; June 15–Aug. 15, 1962; Director: Howard T. Odum.

Conference in Neutron Physics—University of Michigan, Ann Arbor, Mich.; June 10–17, 1962; Director: Paul F. Zweifel.

APPENDIX H

Publications of the National Science Foundation

This listing includes publications issued by the National Science Foundation during fiscal year 1962. A complete listing of available Foundation publications may be obtained upon request to the Foundation.

The publications marked with a price may be obtained from the Superintendent of Documents, Government Printing Office, Washington 25, D.C. Other publications are available from the Foundation.

ANNUAL REPORTS

Eleventh Annual Report, for fiscal year ending June 30, 1961: NSF 62–1, $1.25.

Third Annual Weather Modification Report, for fiscal year ending June 30, 1961: NSF 62–27, $0.30.

MANPOWER AND EDUCATION REPORTS

1. Scientific Manpower—1961 (the latest in a general series which contains the papers of the Conference on Scientific Manpower held in conjunction with the meetings of the AAAS in December of each year): NSF 62–22, $0.25.
2. Employment in Professional Mathematical Work in Industry and Government: NSF 62–12, $0.55.
3. Scientific and Technical Personnel in Industry, 1960: NSF 61–75, $0.45.
4. The Long-Range Demand for Scientific and Technical Personnel: NSF 61–65, $0.50.
5. Women in Scientific Careers: NSF 61–50, $0.20.
6. American Science Manpower, 1956–1958: NSF 61–45, $0.50.
7. The National Register of Scientific and Technical Personnel: NSF 61–46.
8. Scientists and Engineers in the Federal Government, October 1958: NSF 61–43, $0.35.
9. Education and Professional Employment in the USSR, by Nicholas DeWitt, 1961: NSF 61–40, $5.50.
10. The Duration of Formal Education for High-Ability Youth, a study of retention in the educational system: NSF 61–36.
11. Employment of Scientific and Technical Personnel in State Government Agencies, Report on a 1959 Survey: NSF 61–17, $0.45.
12. Scientific Manpower Bulletins:

    No. 17. Summary Characteristics of Scientists Reporting to the National Register of Scientific and Technical Personnel, 1960: NSF 62–11.

    No. 16. Foreign-Language Proficiency of Scientists Reporting to the National Register of Scientific and Technical Personnel, 1960: NSF 61–72.

    No. 15. Geographic Distribution of Scientists in the National Register of Scientific and Technical Personnel, 1960: NSF 61–69.

    No. 14. Earnings of American Scientists, 1960: NSF 61–44.

    No. 13. Scientists and Engineers Employed at Colleges and Universities, 1958: NSF 61–38.

RESEARCH AND DEVELOPMENT ECONOMIC REPORTS

1. Federal Funds for Science X, Fiscal Years 1960, 1961, and 1962: NSF 61–82, $0.75.
2. Reviews of Data on Research & Development (A series of leaflets devoted to specific aspects of research and development economics):

    No. 34. Innovation in Individual Firms: NSF 62–16, $0.05.

    No. 33. Trends in Funds and Personnel for Research and Development, 1953–61: NSF 62–9, $0.10.

No. 32. Indirect Costs of Research and Development in Colleges and Universities, 1960: NSF 62–7, $0.10.

No. 31. Diffusion of Technological Change: NSF 61–52, $0.10.

No. 30. Funds for Performance of Research and Development in American Industry, 1960: NSF 61–51, $0.10.

No. 29. Scientists and Engineers in Research and Development, 1958: NSF 61–49, $0.10.

No. 28. Capital Expenditures for Research and Development in Colleges and Universities, Fiscal Year 1958: NSF 61–31, $0.05.

3. Funds for Research and Development in Industry, 1958: NSF 61–32, $0.65.
4. Funds for Research and Development in Industry, 1959: NSF 62–3, $0.60.
5. Scientific Research and Development in Nonprofit Organizations—Expenditures and Manpower, 1957: NSF 61–37, $0.45.
6. Current Projects on Economic and Social Implications of Science and Technology, 1961: NSF 62–4, $0.40.
7. Publication of Basic Research Findings in Industry, 1957–59, NSF 61–62, $0.25.
8. Federal Organization for Scientific Activities, 1962 (in press).
9. Proceedings of a Conference on Academic and Industrial Basic Research: NSF 61–39, $0.55.

SCIENTIFIC INFORMATION EXCHANGE REPORTS

1. Scientific Information Notes (bimonthly periodical reporting national and international developments in scientific and technical information dissemination): Single copy $0.25, subscription $1.25 per year.
2. Scientific Information Activities of Federal Agencies (a series of pamphlets describing the policies and procedures of Federal Agencies relative to their scientific activities):

   No. 14. Federal Aviation Agency: NSF 62–19, $0.10.

   No. 13. Smithsonian Institution: NSF 62–8, $0.15.

   No. 12. U.S. Department of the Interior: NSF 61–77, $0.25.

   No. 11. Treasury Department: NSF 61–64, $0.15.
3. Current Research and Development in Scientific Documentation (Semiannual reports containing descriptive statements from individuals and organizations involved in this field):

   No. 9. NSF 61–76, $1.25.
4. Specialized Science Information Services: NSF 61–68, $1.75.
5. List of Russian Scientific Journals Available in English: NSF 61–66.
6. National Science Programs for Dissemination of Scientific Information: NSF 61–63.

SCIENCE ADMINISTRATION REPORTS

National Science Foundation Grants for Graduate-Level Research Facilities: NSF 61–81.

U.S. GOVERNMENT PRINTING OFFICE: 1962