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LETTER OF TRANSMITTAL

WASHINGTON, D.C.
January 15, 1964.

MY DEAR MR. PRESIDENT:

I have the honor to transmit herewith the Annual Report for Fiscal Year 1963 of the National Science Foundation for submission to the Congress as required by the National Science Foundation Act of 1950.

Respectfully,

LELAND J. HAWORTH
Director, National Science Foundation.

The Honorable
The President of the United States.

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THE DIRECTOR'S STATEMENT

The Thirteenth Annual Report of the National Science Foundation is for the period July 1, 1962, to June 30, 1963. The activities described were carried on under the direction of Dr. Alan T. Waterman, the Director of the Foundation during that period. Appropriately, therefore, he has written the Director's Statement.

LELAND J. HAWORTH
Director

This Annual Report covers my final years as Director of the National Science Foundation. The years of my association with the Foundation have coincided with a period of great growth and many changes in the research and development activities of the Nation as a whole. I should like to devote this final Statement to a review and critical analysis of overall trends in research and development and scientific manpower and the significance these may have for the Nation's strength in science and technology.

It is hoped that such a review may contribute to a clarification of the misunderstanding, now increasingly widespread, regarding the nature of research and development expenditures and the returns that may be expected, particularly from those funds that come from the Federal Government.

In the immediate postwar period, the impact of research on national defense, so recently and dramatically illustrated by the war, was fully appreciated, and expenditures for this purpose kept pace with our worldwide commitments to the defense of the western alliance. The establishment, in this period, of the National Science Foundation in 1950 was significant in its explicit recognition of the critical importance in the overall effort of basic research and education in the sciences.

The years just past have also been marked by the development and gradual maturing of government-university relationships to the great benefit of both. Government practice, inaugurated during the war, of contracting for research and development with universities and other nonprofit institutions greatly broadened the scope and strengthened the national effort in R and D by enabling the Government to draw upon and to back the highest competence, wherever it might happen to be.

At the same time, this policy has had a profound effect upon the academic institutions involved. Not only has it provided direct and much-needed support for their scientific and technical needs, but it furnished, for the first time, major financial support and interest on the part of the Federal Government in the broad basic fields of mathematics, science, and engineering. As this support grew, many institutions began to revise and strengthen the central administration of programs and funds secured from outside sources. At the same time, the rising volume of federal support began to introduce problems: such as coverage of administrative and operating costs, balanced support among the sciences, engineering, and the humanities, and a certain loss of independence and flexibility on the part of academic institutions in the planning and carrying out of their own programs. Fortunately the most serious potential problem, namely undue Federal influence and control, is generally acknowledged not to have materialized.

In the spectacular growth of science and technology, the Federal Government has played a leading part, both in the provision of funds and in the introduction and support of large and critical national programs. The Government's enlarged role in research and development has been accompanied by certain major organizational changes, such as the establishment of the Department of Defense, the Atomic Energy Commission, the Department of Health, Education, and Welfare, the National Science Foundation, the Federal Aviation Administration, and the National Aeronautics and Space Administration. Essential coordinating and supervisory functions were provided by Executive orders of the President which established the President's Science Advisory Committee, the Special Assistant to the President for Science and Technology, the Federal Council for Science and Technology, and most recently, the Office of Science and Technology in the Executive Office of the President.

In a movement of this magnitude, complexity, and acceleration, it is, of course, essential that steps of this nature should be taken.

As the national research and development effort began to assume major proportions it has quite justifiably come under scrutiny by the Congress, as well as by the Executive Branch, and by thoughtful citizens throughout the country. Some of the outstanding questions are:

(1) Is the grand total for R and D justifiable in the national interest, in terms of money, manpower, and other resources?

(2) Do the objectives of the undertaking represent a wise, prudent, and adequate selection of national priorities?

(3) To what extent are the component programs of the effort feasible, and intelligently designed to meet these objectives?

(4) Is the effort conducted with the proper efficiency and economy?

(5) Do we now have, and will we for the foreseeable future have, the requisite scientific and engineering manpower?

The study of these and other questions cannot be conducted with any degree of efficiency and economy without a knowledge of the facts, an analysis of these facts, and a thorough-going review by well-informed, experienced, and competent persons. Especially valuable for such a review is a study of the trend in this movement, and the nature and extent of participation by the various sectors of the economy.

The National Science Foundation aids such an analysis in two important ways, both specifically set forth in its enabling legislation. The one is a systematic data-gathering operation, together with factual analysis and periodic reporting. This was begun in 1953. The other is that of developing national science policy, with special reference to the role of the Federal Government as it relates to the health and progress of science—particularly basic research—and to the education and training of scientists and engineers. Both functions emphasize the role of the colleges and universities where basic research and advanced training go hand in hand. In the National Science Board of the

National Science Foundation, the Federal Government and the Nation have a statutory body exceptionally well qualified to deal with policy in government-university relations.

In view of the searching scrutiny to which the Nation's research and development activities are currently being subjected and the urgency that seems to attach to finding the right answers, it may be useful to review the basic issues as reflected in the findings and the thinking of the National Science Foundation.

What are the salient facts? In analyzing these it is instructive to focus attention on two aspects: (1) the degree of participation among the various sectors of the economy—that is, government, industry, universities, and other nonprofit institutions—and (2) the significant trends.

The national total for research and development is currently estimated at about $16 billion, which is three times the 1953 figure. This is somewhere between 2.8 and 2.9 percent of the Gross National Product, an increase from 1.4 percent in 1953–54. The Federal Government provides about 65 percent of the total, and about 32 percent is provided by industry. Thus industry and the Federal Government are bearing almost the entire cost of R and D in the ratio of 1 to 2.

In terms of performance, industry is doing most of the work. About 74 percent of the total funds are used by industry in performance of research and development, 14 percent by the Federal Government in its own laboratories, and 12 percent by nonprofit institutions (three quarters of this by colleges and universities).

The distribution of scientific and technical manpower among these sectors is similar. Thus, of the total number of scientists and engineers employed in R and D activities (1960), 75 percent were in industry, 11 percent in the Federal Government, 12 percent in colleges and universities, and 2 percent in other nonprofit institutions.

A point of major significance is that the distribution with respect to both the performance of research and development and the sources of funds has changed very little over the 9-year period since the Foundation began its analysis of the data. It is true that the Federal contribution has increased from 53 percent in 1953 to the present 65 percent. However, this increase took place between 1953 and 1957; since then the federally financed proportion has remained practically constant.

The situation with regard to basic research is somewhat different. The total national funds devoted to its support amount to nearly $1.5 billion, about three times what they were in 1953. As a percentage of the total for R and D, however, basic research funds remained nearly constant at 8 percent until the past 2 years, when they rose to about 10 percent. The increase largely reflects major new undertakings in such fields as oceanography, atmospheric sciences, high-energy physics, and space research—where vehicles for research are especially expensive.

The Federal Government is the source of somewhat less than 60 percent of the basic research funds, industry about 25 percent, and the rest comes from academic and other nonprofit institutions.

In the performance of basic research, colleges and universities lead, as expected, with a consistent proportion of nearly half, industry contributing a little more than a quarter (greater before 1957 and less since), and government about one-sixth.

Thus, statistically and fundamentally, the growth of science and technology among the three economic sectors over the last decade appears to have been balanced and consistent. Although the Federal Government has been the principal source of funds, the other sectors have contributed in remarkably steady proportions, especially during the past five years.

In view of the spectacular rise in national investment in research and development which has tripled during this period, the relatively stable distribution of funds, manpower, and effort is strikingly significant for an understanding of the current situation and its problems for the future.

Most of the research and development being done today is directly in the national interest and should be judged accordingly. The Federal Government is not acquiring a larger proportionate share in the national research and development investment; nor has it increasingly encroached upon the private or other sectors. There is no clear evidence that any one sector has more than its fair share of scientific and technical manpower. These are, of course, statistical conclusions and do not always apply within particular programs, projects, or areas of science.

From the overall point of view, a natural first question is whether the country can afford to carry out a program of the present magnitude and technical character. There are certainly budgetary limitations within which such a national program has to be accommodated. The extent of such accommodation depends upon the priorities of the program objectives, their feasibility, and upon their acceptance by the American public. It is obvious that the trend cannot continue indefinitely at its present rate. Neither can it realistically be expected to level off completely as long as we live in a competitive world. The single most important limiting factor is the number of scientists and engineers and the extent to which we can provide facilities for their education and training. Here it is the time-scale that is immediately critical. It takes several years to plan and construct special facilities for research and development, and many more years to train competent research scientists and engineers—at least seven or eight beyond high school. It is therefore of first importance to ascertain the number of scientists and engineers presently available, and the estimated rate of output in the years ahead. One must estimate, also, the costs of the specialized education and training involved, including the present and potential supply of teachers and the construction of laboratories for teaching and research.

A report by the National Science Foundation in 1961, "Investing in Scientific Progress," points out a surprisingly definite cultural trend during the last 40 years, namely: the number of baccalaureate degrees for a particular age group has been doubling every 18 years, and the number of advanced degrees in science and engineering every 12 years. Wars and recessions have caused only temporary fluctuations. It is logical to conclude, therefore, that barring some catastrophe, the number of scientists and engineers with advanced degrees in 1970 would be about double the number in 1960. The report also points out that in order to maintain present standards of quality, at least 40 percent of the annual output must join the faculties of academic institutions to provide the necessary instruction and research training. However, the report stresses the fact that this desired increase will not be realized unless the country is prepared to defray the cost of the facilities, equipment, faculty salaries, and operating expenses required. As of the time of the report—2 years ago—these efforts were lagging badly. They still are.

Last year the President's Science Advisory Committee issued a report* which called for specific drastic steps in support of the training of engineers, physical scientists, and technicians.

Recently the National Science Foundation has completed another report, "Profiles of Manpower in Science and Technology," which analyzes the actual employment of scientists, engineers and technicians, with breakdowns by discipline, age, type of activity and employment, location and sector of the economy. A forecast based on this study indicates that the employment of scientists, engineers, and technicians is expected to double by 1970.

Both studies indicate, incidentally, that the education and training of this special group can be accomplished without depriving the country of professionals in fields outside science and engineering. Although the scientific manpower problem is of great urgency, the underlying problem is the much broader one of providing thoroughly competent training in all fields.

The opportunities for radical improvement in general education are very great. Thus, recent studies indicate that children in the lower grades have a far greater capacity for comprehending abstract aspects of advanced fields in science and mathematics than had hitherto been supposed. We are beginning to realize, too, that it is important to equip new generations with basic knowledge and understanding that will stand them in good stead in the face of a continually changing employment situation which automation and computer techniques will increasingly pervade.

It is also becoming evident that careful study directed toward the improvement of elementary courses in standard subjects may be most decisive in producing effective long-range results. For example, in spite of the large funds that have been made available to academic institutions for the support of science and engineering, the proportion of students majoring in science has remained approximately the same, about 20 percent, and the

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*"Meeting Manpower Needs in Science and Technology, No. 1: Graduate Training in Engineering, Mathematics and the Physical Sciences"; The White House, Dec. 12, 1962.

proportion enrolled in engineering has actually decreased substantially during the past 5 years. On the other hand, the programs for improvement of instruction in the sciences and mathematics in the secondary schools has already produced significant increases in enrollment in these courses. This may be expected to continue in colleges and universities, especially as the teaching in these institutions becomes more effective. Thus, the evidence at hand suggests that the most decisive means of increasing the numbers of scientists and engineers may well lie in the improvement in courses at the introductory level. It is highly probable that similar consequences may ensue in other subjects of study, provided comparable attention is paid to their teaching.

In terms of policy, some further observations may be in order regarding the role of academic institutions with respect to the progress of science—and of basic research in particular. The present system for the support of basic research is largely the so-called "project" system, whereby a supporting agency selects projects to sponsor from among those proposed by individuals and groups with the endorsement of their institutions. The selection is made with the advice of authorities in the field concerned. This policy has the general endorsement of the scientific community. It enables the country's scientists and engineers to work cooperatively with the Federal Government in planning, and from the standpoint of progress in science it must be regarded as eminently sound. Since active research leaders are well informed on research in their specialties, the project system has the additional merit of built-in coordination and protection against undesirable duplication. Most of all, it promotes high national standards of quality in our national basic research effort.

However, as funds for the support of basic research have grown in volume, other critical problems of a policy nature have arisen. Thus, concentrated effort to meet certain objectives in fields essential to the national interest have given rise to the establishment by the Government of special research centers within the Federal establishment, and by contract, with industrial organizations and universities. These centers, in turn, have brought with them problems of their own. Among these is the question of the continuity of their missions. If and when a research center has largely accomplished its original purpose, what should become of it? Should its mission be altered, should it turn more to basic research, or should it be abolished; and if so, how can this be done?

As the volume of support for research has increased, another problem has become acute, especially at universities, namely, provision for full operating expenses for the work. Of particular importance is support for the institution itself, to enable it to work on research of its own planning to balance the work done with support provided from outside with earmarked funds. Good progress has been made toward this end by the institutional base grants from the National Science Foundation and the National Institutes of Health, whereby funds are furnished to the head of the institution to be used freely for scientific activities. Somewhat similar assistance is provided by a few selected programs under NASA, AEC, and the Department of Defense.

A further need, underscored in recent reports of the President's Science Advisory Committee, is for general assistance by the Federal Government to promising colleges and universities in the development of their latent research capabilities in order ultimately to broaden the base of academic research and graduate studies.

Still another perplexing problem has arisen, in the context of science itself, as well as in broad programs to solve national problems. I refer to the emergence of special integrated programs, which because of their great cost in dollars, manpower, and facilities compete with each other and with other large funding requirements lying wholly or partially outside science and technology. Even integrated programs devoted to scientific research, and not development, have caused considerable debate on "big" science versus "little" science. Recently the problem has become critical in such areas as oceanography, atmospheric sciences, and high energy physics. Sponsorship of such programs, impressive though they may be, should not be permitted to eliminate or unduly curtail support for individuals across all fields of science.

We have reviewed the growth of the national effort in science and technology, its distribution among economic sectors, its dependence upon available scientists and engineers and their future supply. It remains to consider the objectives of the enterprise, the efficiency and economy with which it is conducted, and to study the priority and feasibility of its major components.

Even a first glance at the national R and D budget will show that most of the money is spent for developmental programs, not for research. It is erroneous and misleading to consider the current level of R and D funds a "research budget," because 70 percent of it represents development. Neither is it a "science budget." Only 10 percent of it supports basic research, and only 30 percent research, both basic and applied. Most of the development funds go to support three main areas—defense, space, and atomic energy—and thus are primarily intended as expenditures for weapons and devices of warfare, space vehicles and launching devices, and nuclear power.

Clearly, if any substantial economies are to be effected they must take place in the 90 percent that is directed toward practical objectives, and not to the 10 percent for basic research. Any attempt to reduce the basic research effort would be false and even disastrous economy, because it is basic research that lays the groundwork for technological advances, that determines the potentialities of scientific progress, that leads to the outstanding breakthroughs, and provides the essential advanced training for scientists and engineers.

In concentrating attention upon the 90 percent which is devoted to applied research and development, we must reach a considered judgment as to our essential objectives and their priorities—whether present and contemplated R and D programs are designed to meet these objectives, whether they are feasible, and whether they are in competent hands and efficiently executed. We have a growing volume of experience in this type of analysis and review, particularly in industry. Especially valuable for the purpose are two modern techniques: systems analysis and operations research. The speed and thoroughness of such studies have been enormously enhanced by the application of modern computer techniques. The results of procedures and studies of this kind are of increasing importance to the decision-making process.

Any large developmental program requires evaluation from a number of different points of view, and it is important that each aspect be evaluated by an appropriate group of expert consultants, with a minimum of overlapping qualifications. Furthermore, final evaluation of large and costly national programs should be made by a body with high experience and competence in national affairs and not composed exclusively of scientists and engineers.

The national program in basic research has developed a variety and comprehensive strength that is a tribute to the generous and tireless collaboration of the country's scientists and engineers, in rendering consulting service on planning and evaluation. It is of the greatest importance to understand the significance of national support for basic research, so essential to the progress of science itself and to the training of scientists and engineers. It should never by regarded as competing with developmental programs. It represents the seedbed of technology. It brings to light new discoveries in many fields with wide potentialities for applied research and technological development. Basic research makes possible intelligent planning for the future.

Because basic reseach is the exploration of the unknown, however, it cannot predict the scientific significance of its findings, much less guarantee positive results of immediate practical value in any given field of investigation. It should be regarded as an investment, comprehensive in scope, and covering all areas of science. Like other investments it should include items of all degrees of promise, from those of almost sure return and low yield to those difficult and uncertain projects which would yield a high return if successful. When so planned and executed, the investment is statistically certain to produce results that more than pay for its cost, as industry well knows. Moreover, basic research is probably unique in that even negative results are valuable.

Basic research is a highly specialized activity; it is not one where the judgment of laymen has validity. Furthermore, complete evaluation of its findings must in general await corroboration by the scientific community, which may take years. Consequently, planning for basic research and such evaluation of its performance as is needed for the continuation of existing programs must be left in the hands of competent and experienced scientists.

So far as the future is concerned, if we are to do justice to the impressive potentialities of science and technology, one of our chief concerns must be a better public understanding of science and technology. Imparting a knowledge of the distinction between the two is the essential place to begin. Hopefully, in time, we shall be able to include science in the education of every child, but for the present it is important to try to give all citizens a clearer idea of the subject. This is not to say that every well informed citizen should expect to become a scientist, but merely that he should become aware of the coverage of scientific fields, the general purpose and nature of research, and especially that he should acquire some conception of its potentialities and limitations. Unless this general type of public understanding is developed, the country will not be prepared to deal intelligently or effectively with the major discoveries in science that are certain to occur.

Many of these will inevitably lead to issues involving technology that society will have to decide. Here the questions cannot be left to the scientists and engineers alone; their role is primarily to point out the scope and nature of a new field, its possibilities and limitations. We have already seen social questions of this sort arise, in the case of nuclear warfare and fallout, in particular. But it is certain that science will open up possibilities for development of an even more critical nature, in such sensitive fields as biology and psychology, for example. Imagine the social consequences of a discovery that would prolong human life to double its present span, or one that would predetermine the sex of a child. We do not know at the moment what discoveries of such critical magnitude will emerge, but we can be confident that discoveries of this degree of importance will ultimately occur. When that time comes, it is clearly of the greatest importance that all educated citizens be able to take an intelligent position on these issues.

One cannot conclude a discussion of the far-reaching sweep of scientific progress and its consequences without mentioning the involvement of international relations. An increasing number of scientific problems are global in nature and can be intelligently and effectively administered only by international cooperation. A brilliant example is the International Geophysical Year; the techniques developed during that period are being used with equal effectiveness in the Antarctic Program, the International Years of the Quiet Sun, and the International Indian Ocean Expedition.

As scientists well know, every field of science is international in the sense that its workers keep in close touch with the progress of their colleagues wherever they may happen to be. Geophysical subjects in particular contain a need for programing and collaboration of a different degree and kind, in that the collection of observations, the analysis of the data and its dissemination have to be planned and performed in a collaborative way throughout the world.

Another type of situation in which international cooperation appears to be the only rational solution is that where the magnitude of the effort is inherently great and where the consequences of experimentation are uncertain or possibly dangerous. If such enterprises are carried out in blind competition, they partake of the nature of "crash" programs which are expensive and wasteful. Furthermore, if the results of the research indicate the possibility of large-scale experiments that might involve the risk of altering the earth's environment, it is essential that the best minds available in all countries be brought to bear upon the problem. Some aspects of space exploration and research into weather modification are prime examples. No large-scale experiment or development should be attempted without the most careful research and every reasonable effort to anticipate its consequences, since it is possible that the sought-for effects might spontaneously implify to highly dangerous proportions.

For all these reasons it is of the greatest importance to move in the direction of increasing international cooperation in science, and where feasible, in development and technology.

When one considers the breadth, complexity, and inherent power of science and technology, one is moved to back away for a moment and ponder more deeply where we are heading—all of us. Man, by the use of his intellect, appears to have found ways to conquer most of the environmental hazards which confront him. The key to this triumph over nature is science. Man has learned, however, that the applications of science may also introduce new dangers.

Of especial significance to our generation is the realization that we may be able to take giant steps to create a new world—steps that are unprecedented in range and in novelty. Many of these we do not have to take, but we shall. This raises in new guise the problem of survival—survival in the presence of an environment we ourselves create.

How are we to meet this challenge and responsibility?

The history of science teaches that the survival of a species depends fundamentally upon striking an effective balance between two conflicting elements: competition and cooperation. In human affairs we seem thus far to have found that the most effective balance lies in a free, democratic society.

The limits of accomplishment of such a society rest ultimately upon the capabilities of the individuals composing it, their ideals, their standards of conduct, character, motivation, intelligence and, increasingly in this modern age, knowledge.

As the distinguished mathematician and philosopher, Whitehead, remarked 50 years ago: "In the conditions of modern life the rule is absolute—the race which does not value trained intelligence is doomed."

These are strong words, but they still are prophetic.

On the other hand, if we can help all men to acquire the knowledge that leads to understanding, we may hope to attain the wisdom needed to face the future with confidence.

ALAN T. WATERMAN

Program Activities
of the
National Science Foundation

SUPPORT OF SCIENTIFIC RESEARCH

A primary function of the National Science Foundation is the promotion of basic research by providing the scientist with the support necessary to carry out his creative work—the equipment, the assistance, and the time. Support is provided primarily through grants to colleges and universities for individual projects initiated by the scientist who would carry out the investigation. Also eligible for support are projects which are extremely broad in scope and which require an interdisciplinary approach.

Research grants are of significance not only for the scientific knowledge they produce, but also for the opportunities they provide for the next generation of scientists to receive research training and experience. Many more of these young people obtain their doctorate while participating as research assistants on grant-supported research than through the formal fellowship programs.

Support is provided for the purchase of research equipment (electron microscopes, ultracentrifuges, etc.) and for specialized facilities, such as Van de Graaff accelerators, oceanographic research vessels, and biological field stations. Funds have also been made available for the modernization and expansion of graduate-level research facilities—facilities which are now strained far beyond their design capacity.

Where the need was great and the facilities required were beyond the financial capability of any one university, the Foundation has established national research centers open to all qualified scientists. Four such centers have been created—National Radio Astronomy Observatory, at Green Bank, West Virginia; Kitt Peak National Observatory, near Tucson, Arizona; Cerro Tololo Inter-American Observatory, in Chile; and the National Center for Atmospheric Research, at Boulder, Colorado.

A number of national research programs are also supported and administered through the Foundation. These are programs which require a broad national effort because of the scope of the research involved; the financial requirements; and the need for coordination of scientific effort between Government agencies, colleges and universities, other private institutions, and even between nations are best handled in this fashion. Programs include: Weather Modification, U.S. Antarctic Research Program, International Years of the Quiet Sun, International Indian Ocean Expedition, and Project Mohole.

The Foundation also endeavors to keep abreast of those areas of science which become critical because of major breakthroughs or because of national needs. Increased support is then provided. A current example of such a field is oceanography, a field with great potential but one in which the research effort has been lagging.

This support is part of an overall 10-year national plan recommended by a Committee on Oceanography of the National Academy of Sciences-National Research Council and developed by the Interagency Committee on Oceanography of the Federal Council for Science and Technology. NSF, of course, is one of the Federal agencies most concerned with the basic research aspects of the plan. As envisaged in the plan, NSF would be responsible for approximately 22 percent of the recommended national oceanographic budget of $2.3 billion.

Support of oceanography is handled at the Foundation, not as a separate entity, but as an integral part of various existing programs. There are currently about 225 individual research projects being supported in biological oceanography and about 100 in physical oceanography. To date the Foundation has provided assistance for the construction or conversion of 11 research vessels and has made a number of grants to various institutions for the building and expansion of shore facilities, including research laboratory buildings.

In addition, oceanographic research is underway as part of two national research programs administered by the Foundation—the U.S. Antarctic Research Program and the U.S. portion of the International Indian Ocean Expedition.

Responsibility for the administration of research support programs is assigned among the following: 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 Division of Mathematical, Physical, and Engineering Sciences is concerned with the investigation of man's physical environment from the microcosm of the atomic nucleus to the macrocosm of outer space. The sectional organization of this division gives an indication of the broad scope of subject matter covered—Astronomy, Atmospheric Sciences, Chemistry, Earth Sciences, Engineering Sciences, Mathematical Sciences, and Physics.

Four national research centers, four university research facilities programs, and four national research programs are also administered through this division.

Astronomy

Research in astronomy is aimed at increasing man's knowledge of the physical universe—planets and their satellites, comets and meteors, sun, stars and clusters of stars, interstellar gas and dust, and the system of the Milky Way, and the other galaxies beyond the Milky Way. Observation of the radiations (light and radio waves) from the stars and other astronomical objects is the principal technique by which the astronomers and astrophysicists study the universe. During the 1963 fiscal year, probably the most significant research accomplished, through Foundation support, was the study of infrared radiation from Mars by use of the balloon-borne, 36-inch telescope STRATOSCOPE II. (See page 39 for a discussion of the results.)

The site of a third national astronomical research center has been selected—Cerro Tololo, Chile. It will make possible optical observations in the Southern Hemisphere. This observatory, along with the National Radio Astronomy Observatory, and the Kitt Peak National Observatory, will make vital facilities available to the Nation's astronomers. (See section on "National Research Centers" for details of activities at these centers.)

Though research in astronomy is going forward at a rapid pace—due largely to the development of new instruments and related equipment—the need for both radio and optical telescopes is increasing. Local university telescopes are needed for training for graduate work in modern astrophysics, and for faculty research use. Currently a study of these needs is being conducted by a scientific panel of the National Academy of Sciences. Meanwhile the Foundation is moving to partially correct this shortage by supporting such facilities. For example, a grant was awarded to Princeton University which will permit the construction of a modern 36-inch reflecting telescope, utilizing an already existing dome and mounting and replacing the present 23-inch old-fashioned, unused refracting telescope; a 36-inch quartz blank was already available as surplus to STRATOSCOPE II. This will result in a great saving of money when compared to the cost of a brand new telescope.

Atmospheric Sciences

Important trends in the field of atmospheric sciences have emerged more clearly in the past year. These include (a) the merging interests of atmospheric sciences and certain aspects of the new space science activities, (b) increasing evidence of the global scope of interest and operations in the atmospheric sciences, and (c) the growing capability of the universities in the areas encompassed by this field. In response to these trends the Atmospheric Sciences program was reorganized as a section with programs in meteorology, aeronomy, solar-terrestrial research, and weather modification.

Meteorology includes investigations of the lower atmosphere. In this field the Foundation has supported basic research investigations of the physical and chemical structure of the atmosphere, heat budget, climatology as a possible method of clarifying the long-term behavior of the atmosphere, air-sea interactions, cloud physics, precipitation, and other phenomena. In addition, theoretical studies of the general circulation as well as basic investigations of atmospheric turbulence and diffusion have been conducted.

In aeronomy, the study of the higher altitude regions, scientists, under NSF support, are probing to learn more of their effect on the total atmosphere. The regions concerned extend from the lower areas where the circulation, winds, horizontal humidity and temperature gradients, and the pressure systems characteristic of meteorology are present, to the exospheric regions where individual particles and molecules are important. The layer studied by aeronomists is important as the transmission agency by means of which solar activity and interplanetary space are related to the atmospheric layers near the earth's surface.

Solar terrestrial research is concerned with direct influences on the earth of variations in solar activity and with the outer envelope of the sun in its interactions with the upper atmosphere and planetary atmospheres generally. In this regard the program supports research projects studying the transport of energy and material from the sun to the planets, the modulations of that transport by variations in solar emission, the electric and magnetic fields of interplanetary space and their effects on cosmic radiation, mechanisms of solar disturbances, interaction of the sun on planetary atmospheres, and the effect of the sun on the outer atmosphere and radiation belts of the earth and other planets. Much of this work has a direct bearing on national space programs.

In one study of "airglow," a weak light that originates in the upper atmosphere, a scientist has developed instrumentation which permits study of the light during daylight hours without resort to more expensive techniques involving rockets or balloons. The light or glow, thought to arise from chemical reactions, can now be studied when the atmosphere is receiving the great amount of energy poured into it by the sun.

The work of another researcher could well lead to more accurate high altitude aerial navigation and flight safety. His work has shown that slowly moving gravity waves in the atmosphere are associated with strong wind shear such as frequently accompanies the jet stream. A technique developed around such observations may permit rapid determination of the presence of a jet stream or of turbulent clear air aloft.

Research in weather modification, a national research program, is administered as part of the Atmospheric Sciences program. (See page 53.) The National Center for Atmospheric Research, also administered through this program, is described on page 67.

Chemistry

The Foundation's chemistry program is concerned with fundamental research into the properties and characteristics of matter and of its transformations from one form into another. The discoveries and results of this research provide the basis for further investigation, both basic and applied, in biology, medicine, and the materials sciences.

Support is provided for research in the four classical subdisciplines of analytic, inorganic, organic, and physical chemistry. In analytical chemistry are included studies of electrochemistry, of transition metal ions (iron, cobalt, nickel), and separations and analyses by gas chromatography—a versatile, rapid, and extremely sensitive technique for the complete analysis of very complex mixtures of chemical compounds. A Foundation-supported scientist during the past year developed such a technique for the analysis of isotopic water samples which will make possible rapid and accurate analyses of heavy water samples.

Because the level of research activity in inorganic chemistry has been considered insufficient, special attention has been devoted to this area. During the past year grants were awarded for studies on coordination compounds; mechanisms of oxidation-reduction reactions; complexes, compounds and chemistry of transition metals; organometallic compounds; and boron hydrides and their derivatives.

The unusual and complex compounds of boron and hydrogen have been the object of increasing interest because of their potential for use as high-temperature resistant materials and as rocket fuels. Unfortunately, the difficult and expensive syntheses of some of the boron hydrides had hindered laboratory work and largely prevented consideration of these substances for practical use until the recent development of a new route to the formation of these compounds by a Foundation grantee. He discovered a simple synthesis of triborohydride salts from sodium borohydride. These salts can be converted to higher boron hydrides and their ionic derivatives, thus, making these compounds readily available for the first time.

Some typical areas in organic chemistry that have received Foundation support include syntheses of natural products, such as alkaloids and terpenes; syntheses of new types of organometallic compounds; syntheses of nonbenzenoid aromatic compounds; photochemistry studies; utilization of optical rotary dispersion for determination of absolute configuration of organic compounds; stereochemical and theoretical studies; and physical studies of the kinetics and mechanisms of organic reactions.

Two classical problems in the chemistry of aromatic molecules have been solved with the aid of a Foundation grant. The difficult and tedious synthesis of *trans*-15, 16-dimethyl-15, 16-dihydropyrene has been successfully completed. This compound, which has been shown to be aromatic, is unique in that it has functional groups within the cavity of an aromatic pi-electron cloud. This work paves the way to the synthesis of a variety of such molecules in order to test experimentally the exact nature of an aromatic pi-electron cloud with regard to various physical and chemical properties, such as steric hindrance, unusual bonding, and interactions with ions or radicals generated within the pi-electron cavity.

The hydrocarbons known as the caryophyllenes have occupied a unique position in the terpene field for more than a century because of the difficulty of synthesis. Isocaryophyllene, a naturally occurring sesquiterpenoid isolated from clove oil, possesses an unusual structure in that a 4-membered and a 9-membered ring are joined together. The structure had resisted synthesis due to the paucity of knowledge and methods available for the formation of its unusual ring system. A grantee has now solved this very difficult synthetic problem and has reported the total synthesis of isocaryophyllene by a brilliant and ingenious method.

In physical chemistry support was provided for studies on chemical and spectroscopic properties of compounds at low temperatures; determination of crystal structures by X-ray crystallography; electron spin resonance and nuclear magnetic resonance spectroscopy. A foundation-supported investigator has theoretically predicted and experimentally verified the existence of paramagnetic excitons in molecular crystals and solid free radicals. The lowest paramagnetic excited crystal states and the low-temperature paramagnetism of many aromatic free-radical solids is due to triplet exciton states. These crystal excitations can be thought of simply as running waves of molecular excitation. This work has significantly advanced our knowledge of the solid state by providing basic understanding at the molecular level and may result in useful applications in such diverse areas as electronics, materials of construction, and solid state chemistry and physics.

Earth Sciences

The Earth Sciences Section is responsible for research programs in geology, geochemistry, geophysics, seismology, oceanography, and in related fields such as hydrology and soil science. The scope ranges from the core of the earth to its surface, including both continents and oceans.

A major event in the past year has been the Foundation's support of university participation in the International Upper Mantle Project, a three-year international study of the earth's crust and upper mantle down to a depth of 1,000 kilometers (about 625 miles). Other parts of the U.S. effort are also being undertaken by the U.S. Geological Survey, the U.S. Coast and Geodetic Survey, and the Department of Defense through Project VELA Uniform. With NSF support, one scientist is studying tides in the solid earth, another is measuring the response of the earth's crust to surface loading (such as the shifts of water masses in tidal movements, or of low and high pressure centers in the atmosphere) and two others are studying free oscillations of the earth (such as overall earth motions set up by earthquakes) and the forces which operate to dampen them.

In attempting to achieve some of the goals of the Upper Mantle Project, American scientists for the first time are drilling holes specifically to obtain earth temperatures and establish the pattern of geothermal gradients. One grantee is conducting such a study between San Diego and the Rio Grande Valley. Another is working in several geologically critical areas in the United States in an attempt to establish regional heat flow patterns. A third investigator is probing thermally stable deep lakes in the United States and Canada.

Another powerful tool now in use in earth science research is the electron probe. This instrument permits the determination of the chemical composition of individual minerals within a rock. By scanning across minerals, an indication of the element distribution is obtained, and it becomes possible to elucidate some of the fundamental characteristics of minerals. Electron probe studies may thus provide truly basic information with respect to physico-chemical environment of formation of minerals and their host rocks. The resulting data in turn will be important in our understanding of genesis and evolution not only of individual minerals, but of ore deposits, rock groups, and indeed segments of the earth's crust itself.

In oceanography the Foundation has supported the operation of oceanographic vessels and has supplied special equipment for both ship- and shore-based laboratories. In addition, the Foundation's Program Director for Oceanography serves as U.S. Coordinator for the International Indian Ocean Expedition, which includes geologic, geophysical, geochemical, biological, and physical oceanographic studies. One grantee, studying cores of ocean-bottom sediments, has found evidence of a sharp climatic boundary between the Pliocene and Pleistocene—the beginning of the last great Ice Age. Another, also using cores, is inferring past climatic conditions by measuring the relative abundance of oxygen isotopes in shells.

Engineering Sciences

Turbulent fluid flow, gaseous plasma, expansive cements, and laser communication are indicative of the diversity of subject matter supported by the Foundation under the broad heading of basic research in the engineering sciences. Such support results sometimes in the extension of fundamental knowledge, sometimes in the development of information or techniques for the synthesis of existing knowledge into a new process or device, such as a digital computer or a supersonic transport. The classical engineering departments of major universities are all engaged in basic engineering research, but there is an increasing trend toward interdisciplinary work, not only between engineering disciplines but between engineering and the physical, life, and social sciences.

As an example of such interdisciplinary research, the Engineering Section, in cooperation with the Divisions of Biological and Medical Sciences and of Social Sciences, is supporting a university research program in the general area of communication sciences. This work involves the combined efforts of electrical (communications) engineers, biologists, psychologists, linguists, and neurophysiologists. The broad problem being attacked is that of transmission of information, whether it be in machines, communication links, or biological systems.

The fluctuating aerodynamic force that occurs when a viscous fluid flows past certain objects creates problems which have stimulated engineering research. A phenomenon of this type was noted in Roman times in the form of a musical tone emitted from a string stretched in a windy location. These "Aeolian" tones were only the subject of mild curiosity until recent years when it was discovered that the forces creating the tones could actually reach destructive magnitudes on certain types of structures or impair effective operation of many fluid-operated or immersed devices. The spectacular destruction of such structures as large power plant smoke stacks and a suspension bridge indicated that lateral forces due to fluid flow do exist in the turbulent flow region and need to be considered extremely carefully in the design of such structures. Recent studies supported by NSF are directed toward gaining a basic understanding of the forces that exist when there is turbulent flow around a circular cylinder. Such knowledge will provide the background for understanding more complicated situations such as exist around turbine blades or airfoils. Very important results have already been obtained from these studies. It has been found that the turbulent flow around a long circular cylinder is strongly three-dimensional, and that the unsteady aerodynamic forces can be expressed in terms of certain spatial correlation, stochastic (random function) analysis, and some characteristics of the surface. From the information already available it is possible to approach such problems as the analysis of the aerodynamic forces acting on a missile sitting on an open launching pad prior to and at the time of launch, as well as the types of problems previously mentioned.

Interest continues to grow in fundamental studies of plasma dynamics. This interest stems from the possible uses of plasmas for the propulsion of spacecraft, the generation of high-frequency electromagnetic energy, and the direct production of useful electrical energy by charged particle separation. Interest also comes from the fact that plasma in the upper atmosphere influences long range radio transmission. This phenomenon is apparent in the communication "blackout" which occurs during re-entry into the atmosphere of a space vehicle. Most current research on plasma is aimed at understanding its physical properties (electron density and energy) without disturbing the plasma by the insertion of a measurement probe. This was done by measuring the scatter of a laser beam passing through the plasma.

The laser itself continues to be the subject of much engineering research supported by NSF. This solid-state device, which emits an intense narrow beam of coherent light when properly excited, is receiving attention for such applications as high resolution radar, space communications, eye surgery, and determining properties of materials. Engineering research is directed primarily toward the areas of generation of coherent light at several different frequencies, modulation and demodulation of a coherent light beam for communication purposes, and investigation of methods of exciting laser action (aimed at the development of more efficient laser devices).

Engineers are conducting research to obtain very accurate and consistent measurements of the transport properties of gases. One group has concentrated on the viscosity of gases and has refined viscosity measuring techniques using both a capillary viscometer and an oscillating disk viscometer to a point where viscosity measurements are being performed at pressures from 1 to 50 atmospheres with an average error of only 1 part in 10,000. Accurate viscosity data are of immediate use in design; but perhaps more importantly, the scientific value of checking the validity of new theories of the transport properties of gases transcends the limited aim of immediate use.

Another example of very promising basic research being supported by NSF is the recent work on expansive cements. These cements have a composition which causes an expansion of the concrete as it sets. If the concrete is restrained during the setting process, either by internal reinforcement or by external forms, it is placed under compression (i.e. a state of prestress) without any external energy source. As concrete is very strong in compression and weak in tension, the material is utilized in the most efficient manner. Prestressing eliminates problems of shrinkage and cracking and may greatly reduce creep (a gradual flow of the material over a long period of time) making possible a greater efficiency in the use of reinforcing material. Thus, in a highway or airport runway, for example, the use of expansive cement can provide a self-prestressed pavement of very greatly increased durability as well as a greater load-carrying capacity for a given thickness of pavement. Although laboratory samples have demonstrated the feasibility of using expansive cements, further work is required to provide an understanding of all of the characteristics of this new material.

Mathematical Sciences

Mathematics is the basic language of science, a feature common to all the disciplines of the physical sciences, and increasingly to the biological and social sciences. Many of the problems encountered in these disciplines are mathematical in nature and for their solution require some of the most modern techniques available to present day mathematics. In fact, abstract mathematical theories have found application in a variety of disciplines in a surprisingly short time from their development. The lag between theory and application is becoming ever shorter.

The Foundation's program in the mathematical sciences ranges broadly from applied mathematics to theoretical symbolic logic, and through computer sciences is involved in the study of artificial intelligence, pattern recognition, etc.

Among the highlights of the program in 1963 was a major contribution in the field of algebraic geometry. It has been shown that singularities of an algebraic variety can always be resolved in a higher dimension. The result for curves had been known for many years, the two- and three-dimensional cases for 20 years. But it remained for a grantee to simultaneously prove the possibility of resolving singularities of algebraic varieties in the three previously known cases and in all higher dimensions.

In differential topology, two investigators have generalized the well-known case that one cannot tie knots in a string in four-dimensional space. They have shown that, in general, three extra dimensions suffice to unknot a manifold. Thus a two-dimensional surface can be unknotted in five-dimensional space, etc.

Physics

Physicists conducting research with NSF support are investigating problems in the areas of nuclear structure, elementary particles, solid state, and atomic and molecular physics In addition, the Foundation supports a program for nuclear research facilities. (See the "University Nuclear Research Facilities" section, page 71.)

Current studies of elementary particles largely involve learning more about their basic characteristics and interactions. The simplest and most direct experiment one can do to investigate new particles is to scatter them elastically. One group of physicists has found in its scattering measurements evidence in support of Regge pole behavior, a result which is extremely encouraging to those theorists who believe that the formalism of the theory is the doorway to our ultimately discovering the secret of the elementary-particle physics. Another important investigation concerns the behavior of high energy (and thus short wave length) particles in electromagnetic fields.

A Foundation-supported research group has presented a firmer figure for the recently discovered limit of applicability of electrodynamics to muon-proton interactions.

Another team of investigators has discovered a new particle, the positive anticascade particle, observed in a hydrogen bubble chamber exposed to antiprotons from the 33 billion electron volt (BeV) accelerator at Brookhaven. Its life span was found to be 3.5×10^{-11} seconds. The existence of this particle had been suspected from symmetry arguments but had not been confirmed by experiment. The event was found after 450,000 tracks were scanned on 34,000 photographs.

Cosmic radiation continues to be the only source of information on particle interactions in excess of 33 BeV. An experiment in which an array of scintillators was spread over a 4.5-square mile area at Volcano Ranch, New Mexico, has furnished definite information that particles with energies up to 10^{11} BeV are produced somewhere in the cosmos. Because the equipment used possessed directional discrimination, the investigation is expected to provide information on the source of these energetic particles.

While accomplishments were reported in many areas of atomic and molecular physics during the last year, most concerned the field of atomic and molecular spectroscopic techniques and instrumentation. Using new, high-sensitivity equipment, one investigator constructed a 45-meter multiple-pass absorption tube capable of simulating in the laboratory the optical thickness of the planetary atmospheres. Various gases are introduced into the tube and spectral data obtained. When these data coincide with those obtained from direct observation of the planet, the inference is that the same gas exists in the planetary atmosphere. By this means, strong evidence has been obtained for the existence of hydrogen on Jupiter, and it is now possible to estimate the total carbon dioxide content of Mars. Information such as this is extremely important to scientists in their theoretical analysis of the chemical, biological, thermal, and ecological characteristics of the planets.

The simultaneous observation and correlation of several parameters of an event adds new dimensions to nuclear structure research. This makes it possible, for example, to systematically study nuclear reactions involving three or more particles. An NSF grantee has been prominent in the recent development of "multiparameter analyzers," which not only perform this function but provide for the instantaneous display of intermediate results. One of these instruments is enabling him to study the "cluster" characteristics of the nucleus by means of reactions between complex nuclei.

Since World War II, solid state physics in the United States has enjoyed remarkable growth and scored brilliant successes. For the past several years fundamental understanding of the electronic behavior of semiconductors has been so satisfactory that semiconductor investigations have been conducted mainly as a branch of engineering. In consequence the interest of solid state physicists has turned increasingly toward other problems, such as the study of thermal vibration of metals, particularly superconductors. The problem of metals is more difficult than that of semiconductors. To account for the properties of metals it is necessary to consider the mutual strong interactions of a great many electrons. Moreover, at least in the case of superconducting metals, the interactions between electrons are greatly complicated by vibrations of the lattice, or "phonons."

During the past year NSF grantees have made substantial improvements in the theory of interactions between electrons and phonons. Investigators have shown that not simply the linking magnetic flux but rather a generalization of this parameter is the quantized property of superconducting circuits. This verifies a fundamental assumption of the theory put forward a few years ago by an NSF-supported investigator. One consequence of that theory should be the existence of stable, non-history-dependent, superconducting states for which magnetic flux does not vanish everywhere within the metal. Grantees have developed strong experimental evidence tending to confirm this prediction. This kind of flux retention is fundamental and quite distinct from what was previously known.

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Current Research in the Biological and Medical Sciences

Basic research in the biological and medical sciences is directed toward understanding the life processes in plants and animals. These processes are studied at various organizational levels from that of the chemical constituents of cells and the complex activities taking place therein to the organization of cells into tissues, tissues into organs, organs into individual organisms, and the individual organisms into populations.

The explosive impact of recent developments in biology have resulted from the ability of scientists to conduct investigations at the subcellular and molecular levels and thus obtain greater knowledge of the physical and chemical aspects of the life processes. The elucidation of the molecular structure of DNA, the hereditary material, and the cracking of the genetic code are some of the fruits of these investigations, investigations which may well have an effect on the human species of more significance than the development of nuclear energy.

As the physical and chemical techniques and concepts necessary for an understanding of the subcellular and molecular bases of life develop and expand, they are applied to an ever wider range of problems affecting the whole spectrum of biological research.

The Division of Biological and Medical Sciences in carrying out the Foundation's task of supporting basic biological and medical research is organized on a functional basis rather than on the basis of the classical teaching disciplines. The Division covers the whole range of subject matter through the following eight programs: Molecular Biology, Genetic Biology, Developmental Biology, Metabolic Biology, Regulatory Biology, Environmental Biology, Psychobiology, and Systematic Biology. A ninth program deals with support for specialized biological research facilities.

Molecular Biology

The Molecular Biology program is concerned with providing the means for developing further knowledge of the molecular basis of life.

It borrows and adapts the methodology and latest findings in chemistry and physics for use in biological research. As molecular approaches and techniques become clearly identified as useful, they are applied to the solution of problems in various areas of biology—genetic, metabolic, developmental, etc.

The Molecular Biology program can be described in terms of four areas which deal with the general objective of understanding the molecular basis of biological systems.

The first deals with the molecules which make up biological systems, and the determination of their structure. This involves support for the isolation of suitably pure preparations, their chemical and physicochemical characterization, and eventually the application of any method which will lead to an exact description of molecular structure. This research may involve sequence studies of polymeric macromolecules such as proteins, nucleic acids, polysaccharides and lipids as well as investigation of secondary and tertiary structure by optical methods or X-ray diffraction; or it may involve details of electronic structure by such methods as electron spin resonance.

The second area involves physico-chemical interactions between molecules, particularly between macromolecules of various kinds or between macromolecules and smaller molecules. These studies are currently directed toward molecular descriptions of active sites of enzymes, combining sites in antigens and antibodies, and interactions of hormones and receptor sites. Another aspect in which substantial progress is being made involves the interactions of DNA, RNA, and protein.

A third level of complexity deals with the molecular basis for structures such as membranes, ribosomes, mitochondria, the golgi apparatus, and the various "particles" in which several kinds of functional molecules appear to be organized as a system for some biochemical process.

Finally, research in this program is concerned with the molecular basis for energy conversion. Included here are studies of the structural basis for contractility in muscles, biological luminescence, photosynthesis, and electron transport. Support is being given to studies of transport mechanisms at the molecular level in the function of permeases and the transport of ions across membranes, and toward the possibility that mechanisms of semiconduction may play a role in electron transport or other bioelectric phenomena.

The following examples are typical of the research currently supported in the program: (1) the mechanism whereby photochemical energy is stored in photosynthetic systems, and the mechanism(s) whereby it is transduced from an energy-poor into an energy-rich biochemical compound; (2) the structure of the systems which allow energy transduction (what are the chemical component requirements of such systems?; Are there required genetic arrangements?); (3) the intimate structure of the enzymes which result in the catalysis of metabolic reactions under physiological conditions and the factors governing their specificity; (4) the organization of groups of enzymes into various subcellular units, and studies as to whether such organized groups operate in a different manner than the individual isolated enzymes; (5) the structure of the chromosomes, especially those polymers, the nucleic acids, in which the hereditary and enzyme-directing properties reside and the detailed chemistry of the method of self-reproduction of these hereditary units; and (6) the relation between such structures and their utilization, usurpation, or destruction by the nucleic acids of viruses.

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, evolutionary studies, and research in quantitative and mathematical genetics.

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. NSF-supported research on mutant forms of the enzyme tryptophan synthetase has pioneered in the analysis of mutant protein structure and the correlation of protein changes with specific changes in the hereditary material. This type of analysis is revealing additional features of the genetic code for amino acids (protein building blocks), and is being extended in other laboratories to a variety of enzymes and other proteins in bacteria and higher organisms. Other NSF-supported projects are concerned with the mechanisms of information transfer involved in genetic coding unit determination of the amino acid sequence of proteins. The physical-chemical properties of isolated genetic material are also being intensively examined. Incorporation of isolated genetic material into the genetic structure of bacteria (transformation) is being employed by a grantee to determine the effect of physical-chemical alterations in the isolated material on its ability to transmit genetic information. Recent studies indicate that the process of transformation may also occur in human cells in tissue culture. Thus, it appears that major breakthroughs may be imminent in the genetics of mammalian and human cells in tissue culture, and the NSF is supporting several promising programs in this area.

An important synthesis is being generated in genetic biology by current emphasis on the genetic regulation of gene and chromosomal activity. This development was sparked by investigations in bacteria on the way in which certain elements within the genetic material function as regulators of the activity of "structural genes." Studies on the extent and role of "regulatory" genetic elements are being conducted in such organisms as bacteria, *Neurospora* (a lower fungus) and corn. These studies are being integrated in many cases with studies of mutant enzyme structure and with studies of the genetic control of the enzymes associated in particular metabolic pathways. There is also great interest in certain seemingly diverse genetic phenomena in higher plants, insects, and mammals which have controlled changes in gene or chromosome activity in common. In addition, detailed morphological and biochemical studies of development in different genetic types are continuing. These diverse approaches are rapidly converging on one of the most important problems in modern biology—differentiation.

Projects on the genetic basis of evolutionary phenomena are an important part of the program and are frequently integrated with investigations of gene structure, transmission, and function. These evolutionary studies are concerned with genetic differences between species and natural populations and include investigations of chromosome and gene variation, inter-specific hybridization, and gene frequency changes in natural and laboratory populations under various environmental conditions. The Foundation is, for instance, supporting a coordinated attack on the evolutionary problems involved in the extraordinary proliferation of *Drosophila* (fruitfly) species which has occurred on the Hawaiian Islands. The rather short geological time involved in this evolution raises the hope that many species still are closely enough related that induced hybrids can be obtained, and that analysis of the genetic relations will be possible.

Many of the traits which appear to be most significant in evolutionary phenomena are determined by numerous genes acting in concert and must be studied by the complex techniques of quantitative genetics. The development of mathematical and statistical theory in conjunction with new experimental design is being sponsored. The use of electronic computers is contributing heavily in this area to experimental design development and the analysis of data.

Developmental Biology

Developmental biology is concerned with problems of growth and differentiation in all living organisms. These problems are analyzed at different levels of organization ranging from the whole organism through organs, cells, and subcellular systems, down to the molecular level. This multilevel analysis of development is essential since development begins at the primary site of gene action and involves a transition from the molecular to the multicellular condition characterized by the "translation" of intracellular genetic and macromolecular events into higher levels of organization.

At the molecular level of organization, research projects are being supported for research on the biochemistry of developing systems, the metabolic patterns of enzyme systems involved, and the role of precursors, small molecules, and growth-stimulating substances in developmental processes. The role of genes in development and the factors responsible for their activation and inhibition represent a new major effort in the program. *In vitro* protein-synthesizing systems are being studied in an effort to understand the factors responsible for the appearance of new proteins in cell and cell-free situations. Modern immunological, enzymological, and physicochemical techniques are being applied in an attempt to understand the fundamental molecular and macromolecular control systems participating in the phenomena of cell division, cell interaction, and cell differentiation.

At the subcellular level, new electron microscope techniques combined with cell fractionation procedures are used to correlate biochemical activity with fine structural analysis. A major research effort underway in many laboratories is an analysis of the mechanism of cell organelle differentiation (plant cell walls, flagella, mitochondria, pigment granules, spindles, etc.) in a variety of cells and tissues.

At the cellular level, significant advances have been made in the *in vitro* analysis of cell population interactions and the dynamics of the elaboration of tissue fabrics and patterns in plants and animals. Support has been given to studies of individual cell surface phenomena, such as motility, adhesiveness, aggregation, and surface contact interactions in order to understand the mechanism of form and pattern building. In numerous cell and tissue culture systems, morphologic and biochemical differentiation are being studied in an attempt to better understand causal interrelationship. These studies are reinforced by cytological, cytochemical, and histological analyses.

Cell-virus interactions are of current interest, since it appears that viruses may be employed as useful tools to modify the developmental and differentiation capacity of cell populations. Studies of transplantation immunity, compensatory growth, and regenerative growth are of considerable developmental interest and are supported by this program. Problems of neoplastic growth and of aging are extensions of fundamental aspects of cell growth, development, and differentiation, and represent a minor portion of the program's activities.

Finally, on the organism level, research programs in descriptive anatomy of plants and animals, descriptive embryology and descriptive plant morphogenesis are areas which continue to attract considerable interest. The new techniques of enzymology, electron microscopy, and immunology are being applied in descriptive studies of developmental systems, providing new insights into classic problems.

Metabolic Biology

Studies supported by the Foundation in metabolic biology are directed toward understanding the biochemical reactions involved in the building up and breaking down of the substances of cells and organisms. The range of these investigations include work in the biosynthesis of metabolites (the products of metabolism); energy metabolism; purification and characterization of enzymes (the catalysts of biochemical reactions); energy coupling systems; mechanism of enzyme action; isolation and identification of metabolites; enzyme, antibody, and other protein and nucleic acid synthesis; metabolic control by metabolite interaction (the "feedback" mechanism); photosynthesis; isolation and identification of vitamins, cofactors, and growth factors; metabolic role of trace elements; biochemistry of subcellular particles; microbiology; comparative biochemistry; overall metabolism of organisms; and nitrogen fixation.

Involved in these projects are the gamut of organisms from higher animals through plants, fungi, bacteria, and viruses. Many of the studies reveal patterns of similarity between diverse organisms, that is, provide a basis for a unity of biochemistry. However, as greater details of the steps and interrelationships in metabolism become known, fine differences in metabolic pattern appear and the possible significance of these differences becomes important. A sampling of research projects in metabolic biology supported by the Foundation follows.

A group of researchers is attempting to establish the metabolic reactions for which vitamin A is required. The scientists hope the results will demonstrate the general mechanisms of action of vitamin A as it functions in all tissues in the body.

Increased knowledge of antibiotics and the organisms that produce them is expected from an investigation of the biogenesis of the streptomycin group of antibiotics.

In an investigation of the synthesis of proteins in chloroplasts, scientists have developed a cell-free system in which isolated whole chloroplasts synthesize proteins from free amino acids as precursors. They are seeking evidence pointing to the source of messenger RNA for chloroplast protein synthesis—whether from the nucleus or the chloroplast itself. Ultimate goal of the work is clarification of the mechanism for light activation of chloroplast synthesis. Another investigator, studying the metabolism of the opening and closing of the stomates in leaves of plants has found classes of compounds which apparently are capable of greatly reducing water loss by their effect on the size of the pores through which water is lost by transpiration.

Regulatory Biology

Regulatory Biology supports research on the whole organism and its organ systems and includes most of what may be termed classical plant and animal physiology, also considerable research in pathology, nutrition, and transport of material. For convenience, current Foundation support can be categorized under five general headings: parasitism, neurophysiology, endocrinology, metabolism, and growth.

Some examples in the first category are host-parasite and symbiotic relations, including such areas as entomology, nitrogen fixation, plant disease, mechanisms in immunity, and epizootiology in insects. Examples of those under the heading of neurophysiology are subjects ranging from behavior to locomotion wherein investigators are concerned about the electrical and chemical phenomena of individual neurons and their membranes, as well as about mechanisms governing the function of special senses.

Grants for projects classified as endocrinology have been given for studies of insects as well as man; included are a considerable number centered around the pituitary-gonad axis. In the metabolism group the Foundation has supported studies in such areas as photosynthesis, transport and translocation, mineral metabolisms, and, in a general manner, certain aspects of metabolic regulation in the whole animal. The last category, growth, includes among other items problems of break in dormancy, indole auxins, certain aspects of the gibberellins, geotropism in roots and shoots, photoperiodism, and the effects of environment.

Remarkable advances in our knowledge of the basic processes of life have occurred over the past two decades and are presently occurring at an even more rapid rate. In the fields of neurophysiology and neurochemistry, further developments are expected from research into the manner in which the brain codes, retrieves, and acts on information it receives through the sense organs (vision, olfactory, taste, sound, touch, and pain). Basic to an understanding of the mechanisms involved is a fuller understanding of the nature and origin of rhythmic impulses and the significance of the different frequencies characteristic of many nerve elements.

It is now well established that the most profitable approach is through "comparative" experiments. Information obtained on the most simple or primitive nerve nets found in invertebrates has led to some startling discoveries that have advanced our knowledge on the functioning of the central nervous system of man. Following is a small, though representative, sampling of the profitable use of this comparative approach. A scientist working under NSF support is studying the crayfish and the Hawaiian crab; the latter has an unusually long external optic tract. His findings on the nature of the transmission, coding, and responses to visual stimuli are among the outstanding discoveries of the past decade. Another researcher is concerned principally in understanding the mechanism through which the excitation by light changes the visual pigment, rhodopsin, so that it causes the rods of the eye to respond in such a manner as to lead to the stimulation of the optic nerve. For his studies he uses rhodopsin prepared from the eyes of cattle. He has in the course of his investigation discovered the existence of a possible transient intermediate substance acting in the chain of events between rhodopsin and the stimulation of the optic nerve.

Yet another investigator has been employing squid as his source of nerve material. This marine invertebrate has a nerve with an axon unusually wide in diameter. The scientist is investigating the possibility that the operational properties of different nerve types are determined by the characteristics of the "ionic" current components.

To many experts in this field, it is becoming increasingly apparent that a mechanism may be involved in the symbiotic relationships between animals and plants and their parasites. Some have suggested that such an explanation can also extend to a variety of immunological phenommena, disease states, and even to the relationship between a cancer cell and its host tissue. It is quite likely that through the investigations of these biologists a unified theory may soon be forthcoming to explain their relationships. Here, as in most biological disciplines, the comparative approach—using many different species of plants, microorganisms, and animals—is proving to be the most fruitful.

Environmental Biology

The environmental biology program deals with support of investigation into the interactions between organisms and the physical, chemical, sociological, and other biological features of their environment. This program encompasses the broad spectrum of plant and animal ecology, including those areas sometimes identified more specifically as environmental physiology, paleoecology, palynology, limnology, biological oceanography, orientation and migration, macro- and microbioclimatology, phytosociology, animal community and population dynamics, bioenergetics, life history studies, environment-controlled distribution of organisms, biological productivity, and certain features of mycology and parasitology.

The substantial breadth of research supported through this program is best illustrated by the following sampling of grants activated in the past year.

One investigator is studying the effects of varying temperatures, light periods, and humidity levels upon infection time, incubation period, severity of host reaction, etc., of a fungus parasitic on potato plants to obtain a better understanding of the very complex phenomenon of parasitism as it involves the effects of various environmental factors on the host, the parasite, and on their interaction. Another grantee is investigating the conditions which control the numbers of individuals and species of organisms in a given habitat. Based on his previous studies of bird species in a few major habitat areas of the United States, it would appear that, if enough time has elapsed and the species are sufficiently plastic, habitats should have acquired those numbers of species that make all habitats equally difficult for a randomly chosen new species to colonize. If his conclusion is correct, this would mean the increased numbers of species present in the tropics reduces the opportunity for colonization by precisely as much as does the more severe and unpredictable climate of temperate regions.

A pilot study has been initiated to test the hypothesis that the blue hazes so commonly observed in the atmosphere are derived from organic substances, such as the terpenes, which emanate from plants. The grantee has suggested that this material condenses under the influence of light to produce the blue haze, and that it can be precipitated and become a source material for petroleum.

An investigation is being conducted to determine the degree of plant water stress which limits plant processes and modifies the quantity, quality, and mechanism of growth. A grant has been made for research on animal cycling and population regulation through a study of the ptarmigan population in Iceland.

Another area of interest is reflected by a grant in which the investigator hopes to interpret the distribution of certain amphibians in Puerto Rico on the basis of the relation of their water economy to the ecological conditions under which they live. If moisture is the restrictive factor between the distribution of restricted and widespread species, it would be expected that the widespread species will have broadly adaptive physiological traits which are lacking in the species restricted to moist forests.

In a study of energy transfer phenomena at various trophic levels of an ecosystem, a group of scientists has been engaged in concerted studies of the productivity and nutrient cycles of Arctic tundra ecosystems. The most recent NSF grant provides for the continuation of these investigations in the Point Barrow area in Alaska with greatest effort being directed to analyses of decomposition rates and chemical cycling in the tundra vegetation.

Another potentially significant research effort initiated during the past year is on heat transfer between plants and the environment. Many physiological processes within plant tissue depend upon the temperature of the plant which, in a given environment, is dependent in turn upon the heat load imposed by that environment. The investigator has demonstrated the manner in which transpiration rate and certain other fundamental physiological plant processes can be evaluated if the solar and thermal energy incident upon the leaf and the leaf temperature can be measured at the leaf surface. He has devised means of accurately determining heat transfer to and from plants and has proposed an equation to reflect this energy relation. The present effort will yield precise measurements of the actual thermal conditions of the environment which influence the physiological behavior of plants.

A final example of NSF-supported research in environmental biology is a continuing study of large marine turtles which inhabited the Caribbean at an earlier time and which have been disappearing at an alarming rate. The investigator, an outstanding authority on these marine reptiles, has been active for a number of years in conducting with NSF grants an exhaustive study of their life histories, reproductive ecology, migratory patterns, behavior and evolutionary history. Continuing studies concern the behavioral ecology and ecological geography of additional marine turtle genera.

Psychobiology

The Psychobiology program supports research on human and animal behavior. The work on human behavior falls for the most part within the traditional areas of experimental psychology, and encompasses such fields as psychophysics, perception, vision, hearing, other sensory systems, learning and memory, psychomotor behavior, motivation and emotion, problem solving and thinking, and physiological and neurological correlates of behavior. Certain types of studies in statistics and mathematical models also are supported when these are especially relevant to the research areas of the program. Studies of animal behavior may be conducted either in the laboratory or in the field. Laboratory research deals with such topics as sensory processes, learning, and motivation. Field studies tend to be centered around those forms of behavior which are best observed in a natural environment, such as social behavior and communication. Frequently, field observation is supplemented by laboratory experimentation.

There has been a growing interest in research dealing with sensory and perceptual functions in animals. Examples drawn from NSF-supported investigations include a study of how white pine weevils react to odorous compounds in white pines in order to determine how changes in these essential oils, resulting from hybridization of the pine, will alter their attractant and repellent effects on the weevil. The scientist expects the study to contribute to a better understanding of host specificity as it relates to the natural resistance of trees to the white pine weevil. This problem is a good example of how interdisciplinary techniques are used in animal behavior research. It involves methods and techniques used in plant genetics, gas chromatography, infrared spectrophotometry, and psychophysics of olfaction. In another study, an investigator has developed a procedure which allows him to determine auditory frequency thresholds of sharks and other bony fishes. Basic information about the quantitative aspects of hearing in fishes and the physiological mechanisms of their hearing will be correlated with behavioral studies to show how these animals utilize acoustic energy for the detection and location of moving objects, and for orientation and communication.

Bony fishes are being used by another team of researchers in studies of spectral sensitivities and capacities for hue and brightness discrimination. They are comparing, in specific instances, the behavioral data and electrophysiological data on the retinas and optic tracts of the same species. This is a comparative study directed toward determining the similarities and differences between the visual discriminative capacities of the bony fishes and those of humans and other mammals.

Another trend, reflected in grants awarded this year, is the growth of research in the general area of neurophysiological correlates of behavior. Projects in this field frequently use a multidisciplinary team approach. An example of research being supported is a study of the manner in which such behavioral variables as fatigue, effort, motivation level, emotional excitement, and the general activation level of the human subject simultaneously affect overt verbal and motor activity, and such somatic events as the electroencephalogram, tension level, skin conductance, heart rate, blood pressure, and eye movements. Another study deals with brain processes related to learning in monkeys. This study considers the behavioral and neuronal aspects of the occurrence of bursts of electrical current of a particular frequency recorded from the temporal cortex during the acquisition of visually guided tasks, and the facilitation of learning by low-voltage stimulation of the prefrontal cortex.

Several grants deal with more or less traditional psychophysical studies of the human senses. Among these are investigations of cutaneous communication, visual motions, and sound localization. The topics of learning and conditioning still account for about one-half of all the grants made in the Psychobiology program. Laboratory studies include verbal learning operant conditioning, classical conditioning, problem solving, and decision making.

The role of simple associative processes in the perception, learning, recall, and mediated generalization of children is being investigated. In one study an effort is being made to determine the extent to which the relationships established with adults may be used to account for children's behavior, and to examine some of the factors that may lead to differences in performance between adults and children. Other projects are being conducted on instrumental behavior of animals and relaxation-response as an important class of behavior in avoidance learning.

Systematic Biology

The scope of systematic biology is broad, calling for the survey and subsequent naming, description, and orderly arrangement by natural relationships of all forms of life, both past and present. Foundation support continues to encompass the entire taxonomic range of organisms—living and fossil—from the classical descriptive or evolutionary studies to investigations utilizing modern methods and recently developed and promising techniques. This work is of vital importance since, to some extent, all other biological disciplines are dependent upon it. Research projects in systematic biology are not limited by geographical or national boundaries, but must encompass the entire region or environment occupied by a particular organism.

One classical approach to systematic problems is the biotic survey. Among current projects supported by NSF are floral surveys of Panama, of the Iranian Highlands, of Indonesia, and of the United States. Studies are also being made of vascular plants of aquatic and marsh habitats and of marine algae of the Atlantic coast. In the sea—the western Atlantic—zoologists are conducting comparable faunistic surveys on stomatopod crustaceans, amphiurid brittlestars, and offshore Ectoprocta. Other marine studies are centered on intertidal amphipods, and on microorganisms of the deep sea; while, on the land, studies are progressing on the mammals of highland Ethiopia and of Panama.

Attention is being given to the Permo-Triassic reptiles of South Africa, Triassic tetrapods, and the phylogeny of Paleozoic reptiles.

Although work resulting in revision, clarification, and addition to classification arrangements may be initiated with the broad survey, grants are often made for projects devoted to a single specific genus. A case in point is an intensive study of the wheatgrasses (Agropyron). Cytology of somatic cells and pollen, paper chromatographic analysis, serodiagnostic methods, anatomy of stem and leaf, study of flowering periods, and interspecific hybridization are all utilized in this biosystematic research.

Monographic studies that produce revisions of taxa, the classification of which was once restricted largely to structural characters of diagnostic value, now draw freely on experimental techniques. This approach is essential for the clarification and understanding of the many perplexing problems awaiting systematists' serious attention. Work on chromosome numbers of orchids, modifications of morphological characters in lacustrine fungi resulting from culture techniques, and recent discovery of reproductive structures of trichomycete fungi living within insect larvae and nymphs—are representative of current investigations with systematic importance. Monographic treatments of Diptera (flies and mosquitoes) of Hawaii, of Orthotera (locusts and grasshoppers) in North America, and North American fossil cycads continue.

Studies of the fossil record are essential to the clarification of the status and relationship between extinct and living forms. Projects on mammals, amphibians, reptiles, birds, invertebrate groups (corals, bryozoans, crustaceans) are being conducted in the field and in study collections in the United States and in many other parts of the world, e.g., Mexico, Australia, New Zealand, Europe, and South Africa.

The Foundation, through the Systematic Biology program, also is lending support to the newer developments such as biochemical systematics and numerical taxonomy which employ the most recent advances in molecular biology and computer technology to resolve systematic problems. Sophisticated biochemical investigations directed toward clarifying questionable relationships are gaining favor. Examples include blood protein studies in amphibians, reptiles, birds, primates, fishes, insects, and biochemical constituent studies of plants (legumes, grasses, hops). The systematist's use of computers for statistical treatment, analysis, and interpretation of data is increasing. Research on methods and principles of numerical taxonomy continues. Comparative studies underway on both plant and animal groups should eventually clarify the feasibility, significance, and effectiveness of this computer approach. Both biochemistry and computer techniques are being used to achieve a more practical and useful classification of bacteria.

Behavioral aspects of speciation are being investigated in amphibians and birds, and the evolution of adaptation or functional morphology is also being studied in fishes, snakes, and lizards.

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Current Research in the Social Sciences

The primary justification for support of basic research in the social sciences is the same as that for the life or physical sciences—to enrich our understanding of the world we live in. In the case of the social sciences, this means investigation into man's behavior, in relation to other men as individuals, groups, and nations. A special challenge in pursuing such research comes from the difficulties of carrying on objective investigations in an area where unscientific ideas, misconceptions, and prejudices are often of ancient origin, deep-rooted, and of highly emotional content. Other sciences, of course, even geographical exploration, have encountered similar resistance, but it is probably true that the obstacles are unusually refractory in relation to the study of social behavior. However, this very challenge can inspire highly creative and productive research.

A second major reason for NSF support of the social sciences is their ultimate practical importance to the Federal Government itself. There is enormous potential in the practical usefulness of increases in knowledge of social behavior, even advances that do no more than allow crude analysis to be replaced by slightly less crude methods of understanding. Somewhat better economic analysis than we now have that would enable us to prevent, or mitigate, even a small depression would repay its cost of development by a tremendous margin. To learn how to reduce even slightly the socially produced psychological tensions of industrial and urban life would add exponentially to human happiness. So, too, would any improvements, however small, in our ability to understand differences in human behavior in different cultures—an understanding that would facilitate communication between peoples.

The program activities of the Foundation's Division of Social Sciences do not cover the entire range of interests of the sciences of man and society. Rather, these activities have been concerned with basic research, not with studies of public policy, social issues, or other applied problems. Research support has been focused on problems and topics which can be studied by objective methods, which will yield independently verifiable results, and above all, which are general in nature rather than specific to a particular time, place, or event. This orientation fits very well some of the major trends in all of the social sciences over the last two or three decades, in particular, the improvement of methods for the collection and analysis of data, and increasing sophistication and formalization of theoretical ideas and systems.

The Division of Social Sciences is organized into four programs: Anthropological Sciences—including archaeology, social and cultural anthropology, physical anthropology, and linguistics; Economic Sciences—including econometrics, mathematical economics, economics of science and technology, economic and social geography, and research in other areas of general economics which lend themselves to scientific treatment; Sociological Sciences—including sociology, social psychology, demography, and psycholinguistics; and the History and Philosophy of Science.

Anthropological Sciences

Through an analysis of past and present cultural events, the anthropological sciences seek to understand how man behaves in patterned ways and the processes involved in changing this behavior. They also study human biological phenomena in an effort to clarify how early man and modern types have evolved and the processes responsible for their development. The anthropology program supports research in these areas. Attention is also given to the testing and developing of new research techniques.

Archaeologists with Foundation support are investigating both primitive and complex societies of the recent prehistoric period as well as very early manifestations of culture. For example, one group of grants supports research on the prehistoric phases of the highly developed indigenous civilizations of Mexico, Central America, and Peru. This work has particular significance for anthropological theory because the great cultures of the Aztec, Maya, and Inca represent one of very few (perhaps only two) instances of the independent development of culture to the level of literacy and true urban social organization. Archaeological investigations at the opposite end of the cultural and time scales are concerned with the very old and relatively simple cultures of Europe, Africa, and North America. The age of these societies is measured in terms of tens and even hundreds of thousands of years. Another group of grants, the largest in number, supports the traditional central interest of American archaeologists, the construction of a detailed culture history of North America. The research covers every region in the United States and also adjoining areas in Canada and Mexico.

Physical anthropology is represented by several grants. One supports an investigation of the evolution of the primate pelvis by means of surgical modifications of monkeys. A second is a study of a unique blood component in South America that sheds light on the aboriginal peopling of that continent.

The third grant category, linguistics, supports research which describes and classifies the languages of the world, traces their historical interrelationships, and studies the dynamics of linguistic change and the relationship of language to other aspects of culture. One project involves the application of electronic computer methods to the deciphering of inscriptions in the Etruscan language. Another is the investigation of paralinguistic behavior at a New Mexican Indian pueblo. Paralinguistics is the study of phenomena closely related to and surrounding articulate language—grunts, groans, gestures, and the like—and the findings of this research will add new depth to the study of communication behavior.

Research projects in social anthropology and ethnology, the fourth support area, are directed mainly toward the cultures of Africa, Oceania, southern Asia, and Latin America. Several of these projects use the technique of cross-cultural comparison, in which two or more formerly similar communities are chosen for study because one has been subjected to some recent disturbing influence, frequently increased exposure to European-American culture. A variant of this technique is the restudy of a community after an interval of 20 or more years. These studies are designed to investigate the interrelationships of social organization, technology, and natural environment and to describe the dynamics of cultural change. Current research is also underway in comparing peasant communities within the complex societies of India, Latin America, and the Balkans.

Trends in ethnology and social anthropology are reflected by the character of Foundation grants. The natural history period of anthropological research is obviously drawing to a close; the simple expedition having the purpose of describing the culture of a hitherto unknown society in terms of certain standard categories is now a rarity. Ethnologists and social anthropologists now have a body of basic data about a large number of existing societies with which to test theories. At the same time, new formulations of social theories indicate a tendency for anthropology to develop stronger bonds of common interest with other fields. It has become apparent, for example, that social systems are not closed but are devices for operating other kinds of systems. Consequently, modern anthropologists no longer anticipate finding full explanations of present social behavior without considering many related variables, such as technology, ecology, and historical data.

Economic Sciences

This recently formed program makes support available for fundamental economic research not directed specifically toward an immediate solution to business, governmental, or local community problems. NSF offers the prospect of support for investigations using more sophisticated methods than those typical in economics today, and economists are challenged to develop new techniques. Often, but not always, these involve computer programming.

The economic research projects now underway vary greatly in subject and method. For example, one NSF-supported study is investigating relative prices and price changes and their influence on the composition and direction of world trade in manufactured goods. Although data are abundant about the prices of agricultural and other raw materials, little is known about manufactured goods. Another related study is reclassifying imports of leading countries by end-use categories and examining the United States shares and changes in them from this previously untried point of view.

Economic fluctuations, or business cycles, are another focus of public interest. One of the key problems is to explain business decisions to purchase new capital equipment, for variations in this component seem to be responsible for much fluctuation in Gross National Product, and consequently in employment and prices. On the individual level, studies are being carried out to investigate the decision-making behavior of persons with high incomes and wealth, since this factor is also very important to our economy.

Still more specific is the examination being made by a grantee of the determinants of expenditures on automobiles. The study also hopes to develop new methods of survey analysis.

Sociological Sciences

In addition to improving methods of research, this program seeks to encourage the development and verification of formal theories about social and psychological processes and to build a broad base of data for testing these theories, without being limited to a single culture or a narrow sample.

A number of grantees use computer simulation of social or cognitive processes to determine the implications of theoretical ideas. The outcomes of these simulations may then be compared to observations and data to test the adequacy of the theoretical ideas.

One such grant involves a model of community controversy. The model ties together various strands developed in previous psychological and sociological research and in a sense synthesizes the microphenomena of social psychology and the macrophenomena of mass sociology. Under the grant, a field study will be conducted to test the empirical adequacy of the initial model, and after appropriate revision, a further field study will be conducted in several communities. The specific setting used for the test will be community referenda on the issue of the fluoridation of water.

The implications of some simpler theoretical ideas about social and psychological processes are worked out in mathematical models that are soluble without computers. Under a grant dealing with the learning and use of language, an information-theoretic model of language learning has been developed and is being coordinated with a mathematical model of vocabulary structure. Both types of models are being developed in close interplay with experimental data on such matters as rote learning and concept formation.

Some grants involve formal theories of social and psychological processes expressed without the use of computer language or mathematics. For example, research was conducted during the American Mount Everest Expedition to test a theory about the feedback of information among members of a group under stress.

In an effort to establish a broader, more representative data base in sociology and social psychology, many cross-cultural or cross-national studies have been supported. Current projects include a study of child-rearing practices in the USA, Switzerland, and the USSR; a study of the social structure of isolated institutions in four Scandinavian countries; and one on occupational attitudes in Brazil, Mexico, and the United States. An example of a cross-national study recently begun is the investigation of social ramifications of modernization of Chile, Nigeria, and Pakistan, concentrating upon the changes in popular attitude and values that are associated with the process of industrialization in developing countries. This study is expected to make an important contribution to our understanding of the effects of work environment upon fundamental attitudes and values, and consequently may indirectly affect the technical assistance programs.

The objective of improving scientific methods of research is being pursued under several grants. One example is a program of research on the conceptualization and measurement of attitudes. The research includes refinement of older techniques and development of some very novel ones. For example, the investigator proposes to look into the potential value of pupillary contraction or dilation in the eye in response to various stimuli as an attitude measure. Preliminary research has suggested that dilation occurs when stimuli are regarded favorably, and contraction occurs in the case of disliked stimuli. Another example is a project to develop an automated system of analyzing the content of documents or conversations by computer.

A secondary aim of the program is to encourage new unconventional work that may challenge contemporary theories and widen research horizons. One project of this kind is devoted to the replication and elaboration of a field study of behavior settings in an American town and an English town. This work employs a novel conceptual framework and deals with problems of behavior in relation to broad features of the environment that have been largely ignored by other researchers. Hence, it is new both in the problem it attacks and in the perspective that brings to bear upon the problem.

The History and Philosophy of Science

This program is concerned with analyzing what scientists are actually doing when they say they are doing science, also with tracing the historical development of science.

During this fiscal year historians of science have been given support for projects ranging in time from Zeno (300 B.C.) through the 19th century, in subject matter from astronomy to zoology, and in purpose from the translation of Babylonian texts to the collecting and editing of basic documentation for the history of science. By far the majority of grants awarded this year supported research in the history of the life sciences. One investigator is concerned with the development of the germ theory of disease, another with the American patriot Benjamin Rush, who, among his many achievements, laid the foundations for modern psychiatry, and a third with the influence of chemistry and physics on modern biological theory. A study of the career of A. R. Wallace will not only be of intrinsic interest but will also illuminate the development of evolutionary thinking in the 19th century.

In the philosophy of science, grants were made for investigations into the philosophical bases of scientific thought as well as into the philosophical problems of specific scientific disciplines. One of the investigations of more general philosophical problems is an attempt to explain the probability concepts utilized by empirical sciences. This research is focused on the inductive methods for inferring or estimating relative frequencies of events (such as the collisions of molecules in a given solution), the grounds for selection of these methods, and the bearing of the selection of such methods on the problem of interpretation of probability concepts. Projects directed toward specific disciplines concern themselves with, among others, mathematics, psychology, and quantum mechanics. Although sharply focused, these researches will have broad relevance. For example, one study of logic has applications relating to the foundations of mathematics and behavioral science. It sheds light on the nature of the classical requirement of relevance between antecedent and consequent, a requirement which has been lacking in the modern tradition of mathematical logic. Experimental evidence indicates that for effective problem solving, the first clause of an "if . . . then . . ." statement must be relevant to the second. In another study, the analyses of cognitive behavior associated with recognition that have been contributed by three philosophic traditions—Aristotelianism, Empiricism, and Phenomenology—are being applied to the problems of mechanical pattern recognition encountered by computer technologists. Specific pattern-recognition techniques arising in the course of the project will be programmed and tested by computer and, if successful, will enable psychologists to conceptualize the structure of mental behavior and to devise new approaches to recognition and pattern.

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Significant Research Developments

SEQUENCE OF AMINO ACIDS ON PRIMARY CHAIN DETERMINES THREE-DIMENSIONAL CONFIGURATION OF A PROTEIN—Enzymes are biological compounds which make possible most of the chemical processes in the living cell, such as the conversion of food into energy or the transmission of nerve impulses. They serve as catalysts that speed up the biochemical reactions continuously taking place in the cell and are usually unaffected by the reactions they produce. Without enzymes these reactions would either not occur at all or would occur at an extremely slow rate. All known enzymes are proteins, which, in turn, are polymers of one or more amino acid chains. Many enzymes are "simple" proteins and do not contain other such compounds as liquids, carbohydrates, and pigments which are associated with many proteins. Nevertheless, even these simple proteins have a truly remarkable specificity for the nature and conditions of the reactions which they catalyze.

Although the specificity of an enzyme is known to be dependent, at least in part, on its three-dimensional configuration (tertiary structure), biochemists had long believed that the theoretically almost infinite variety of possible configurations of such a polymer would make it practically impossible to create the specific tertiary structure necessary for catalysis with the relatively crude techniques of modern biochemistry. It was therefore a discovery of great significance by an NSF grantee (Schachman, University of California, Berkeley) that the tertiary structure of some proteins was self-determined by the primary structure.

By the primary structure is meant the sequence of amino acids making up the chain. If the amino acids were given names corresponding to the alphabet: a, b, c, . . . etc., up to . . . r (only 20 of these amino acids are believed to be involved in protein formation), the primary sequence might be: a-c-c-p-r-m-n-g-g-g-i-b-c. This would be different from a sequence in which any one of the letters were changed, e.g., one in which the sequence read: a-b-c-p- . . . i-b-c, where the second amino acid "b" has replaced a "c".

By virtue of certain structural and chemical features common to all these amino acids, the primary chain tends to arrange itself into a helix or coil. That is, under the usual conditions, this secondary structure, the coil, is more stable (requires less energy for maintenance) than the random snake-like structure of the primary sequence.

What has now been shown is that the spatial arrangement of the secondary structure itself and the unique positions thereby accorded particular amino acids of the primary sequence, results in a further folding of the helix into the truly unique three-dimensional configuration (the tertiary structure) of any particular protein. Consequently, the primary structure predetermines a unique tertiary structure under physiologic conditions, even though, in theory, an almost astronomic number of tertiary configurations is possible.

It is, therefore, apparent that the accidental changing of even a single amino acid in a chain of hundreds, can result in a different tertiary structure. This change may be so profound that it will not allow the protein to function. Such is the case in "sickle cell disease," where the hemoglobin has been altered by a mutation in which a single amino acid has been replaced by a different amino acid (Ingram, Massachusetts Institute of Technology). The resulting hemoglobin can no longer combine effectively with oxygen and the whole red blood cell which, in normal human beings, lasts about 4 months, now has a lifetime of only a relatively few days.

Nevertheless, it is well known that the same enzyme (i.e., the enzyme which performs the same catalytic function) may have different compositions in different organisms. The most reasonable explanations of the allowance of such species differences is that certain positions in the primary structure must be relatively insensitive, exerting little effect upon the secondary and tertiary structure. An alternative possibility is that these substituted amino acids do have a profound effect on the tertiary structure but not in that portion of the enzyme where the catalysis itself occurs (the active site).

The primary amino acid sequence of a particular protein is determined by a corresponding sequence in another polymer, that of DNA, the deoxyribonucleic acid of the chromosomes in the cellular nuclei. A commonly studied system is the synthesis of the protein coat surrounding the nucleic acid (NA) of a virus. This viral nucleic acid thus has, as two of its major functions, the synthesis of enzymes whose function it is to produce more viral nucleic acid and, secondly, the synthesis of protein to coat the naked viral NA. Recently it has been shown (Fraenkel-Conrat, University of California, Berkeley) that certain sites on the viral NA are more susceptible to mutation than others. He observed that although the nucleic acids are composed of only six types of compounds (a sugar, phosphoric acid, and two each of two classes of common cyclic, nitrogenous compounds—purines and pyrimidines), a chemical reaction specific to one of the pyrimidines—of which there are from 1,000 to 10,000 per NA—does not result in many subsequent amino acid changes, but in relatively few. This implies that very few pyrimidines react—those in specific, exposed positions. Thus, certain positions are more mutagenic than others—a fact which has been known to geneticists for some time, but which did not have a firm basis until these molecular biological studies.

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CONFIRMATION OF OPERON THEORY THAT A SINGLE ELEMENT COORDINATES THE ACTIVITIES OF ADJACENT STRUCTURAL GENES—The study of regulatory systems in bacteria has led to the hypothesis that chromosomes may be organized into units of transcription and regulation called operons. An operon contains one or several adjacent structural genes whose activities are coordinated by a single element or operator. The operator is considered the receiver of the regulatory signal for the whole group of genes belonging to the operon. A major prediction of the operon model is that chromosomal rearrangements which result in a disconnection of a structural gene from its normal operator should result in some alterations in regulation.

This prediction has recently been substantiated by research supported by the National Science Foundation (Jacob *et al.*, Institute Pasteur). The eight genes involved in the pathway of histidine biosynthesis have been shown to constitute an operon controlled by a single operator. The activity of these eight genes is regulated by the end product of the biosynthetic pathway, histidine. Deletions of the operator result in a non-functioning of the whole operon. However, certain chromosomal rearrangements can restore the activity of the structural genes, but these genes are then no longer subject to regulation by histidine.

These experiments make it clear that the operator element controls the activity of the whole group of structural genes and is the exclusive receiver of the regulating signals. This striking confirmation of the operator's role is a major contribution of our understanding of the mechanisms by which the activities of genes are regulated.

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STRUCTURE OF ANTIBODY RELATED TO ITS FUNCTION OF IMMOBILIZING ANTIGENS—An antibody is a protein synthesized by specialized cells, created in response to the invasion of an organism by antigens—any of a variety of foreign substances (certain polymers found in bacteria entering the blood stream through a wound, in pollen, in specks of flour or fur dust impinging on the delicate mucous membrane, etc.) To all these, the response of the tissues is the synthesis of a specific antibody, so tailored that its shape or three-dimensional configuration allows it to combine with and immobilize the antigen. The blood protein fraction associated with disease resistance—gamma-globulin—is also the source of antibody formation. The gamma-globulins are simple proteins composed only of chains of amino acids.

Despite the uniqueness of the antigen-antibody interactions, there are certain structural features which the gamma-globulin (protein) antibodies have in common. One type of antibody, for example, can be treated in such a way as to suggest that it is derived not from a single chain of amino acids but from a combination of three different ones (called I, II, and III). NSF-supported investigators (Porter, St. Mary's Hospital Medical School, London and Haurowitz, University of Indiana) have shown that I and II are similar in size (400 amino acids long) and composition and contain the antigenic sites, whereas III (650 amino acids long) is apparently simply structural, i.e., for maintenance of the spatial configuration of chains I and II.

Recently, it has been demonstrated (Nisonoff, University of Illinois) that chains I and II are derived from different gamma-globulins, both of which contain what appear to be identical III chains. It is therefore suggested from this observation and from other more quantitative aspects that gamma-globulins are made of two, possibly identical, subunits. Each pair of subunits contains either chains I and III or chains II and III.

The particular grouping(s) of amino acids involved in the binding of antigens to antibodies is only beginning to be clarified. Two general methodologies are used. In one case, the antigen and antibody are allowed to combine and, while in combination, amino acids of the antibody are made to undergo unique reactions. These reactions presumably occur with all the amino acids except those at the antigenic site where the reactive atoms are being used in binding. Following reaction, the antibody is removed and broken down into its constituent individual amino acids to ascertain which did not react. In this way, it has been established that the amino acid tyrosine is at the reactive site of this antibody. An alternative, more direct procedure (Singer, University of California, LaJolla), is to attach a small reactive group on the antigen so that, following combination of antigen and antibody, a reaction occurs at the reactive site in which one of the antibody amino acids is modified. Then, following separation of antibody and breakdown into its individual amino acids, it can be ascertained which amino acids did react. By this procedure, tyrosine has again been identified as occurring at the active site in this type of antibody.

Much work remains to be done. There is no assurance that different kinds of antibodies will not contain different amino acids. Absolutely nothing is known about the three-dimensional relationships or requirements of the binding site. And, finally, there is as yet little knowledge of the mechanism whereby the peptide strands of gamma-globulin can be folded into unique configurations to fit each antigen of diverse shape and composition or of the reason why some substances are antigenic and others not.

This last query is slowly being answered. For example, if a synthetic polypeptide chain consisting of the amino acids tyrosine, glutamic acid, and alanine serves as an antibody, the polypeptide chain must be at least 350 amino acid units long before it will induce antigenicity. Thus, size itself is a factor in the question as to when something is an antigen.

* * *

CHINESE HAMSTER EMBRYONAL CELLS PROVE SUITABLE MEDIUM FOR INVESTIGATION OF MECHANISM BY WHICH TUMOR-INDUCING VIRUSES TRANSFORM NORMAL INTO MALIGNANT CELLS—An understanding of the mechanisms by which cell populations become altered so that they exhibit uncontrolled proliferation (malignancy) is of the greatest importance in cancer research. However, studies of cells in the process of becoming malignant have been hampered by the usually rapid accumulation in tissue cultures of cells containing abnormal chromosome numbers.

It has been known for some time that Chinese hamster cells are much more stable in their chromosome numbers than those of other widely studied species. Recently NSF-supported research (Yerganian, Children's Cancer Research Foundation) has shown that embryonal cells from the Chinese hamster can be transformed by the tumor-inducing Polyoma and SV 40 viruses without increasing the low percentage of cells with abnormal chromosome numbers. Moreover, no increase in spontaneous chromosome breakage has taken place during the first twenty transfer generations after viral transformation. However, the transformed cells do feature distinct morphological and physiological relationships.

Future experiments under this program are designed to determine the exact nature of cell transformation by tumor-inducing viruses in the absence of the complicating factor of large numbers of cells with abnormal chromosome numbers.

* * *

PROCESS DISCOVERED BY WHICH BARK BEETLES IDENTIFY AND ATTACK SUSCEPTIBLE TREES—Bark beetles, native to large areas of the Western States, attack trees which have been uprooted by storms or chronically deprived of adequate moisture. Although all of the reasons for the relative inability of beetle populations to become established in healthy trees have not been positively identified, investigators have determined that the organisms are able to select trees which are receptive to attack.

After several years of NSF-supported effort, an investigator (Vité, Boyce Thompson Institute for Plant Research) has discovered the process by which the beetles identify and swarm to susceptible trees. Advance scouts attack trees at random but are successful in colonizing only those trees whose oleoresin exudation pressure is less than 4 atmospheres. Within 48 hours after this probing attack by the males of the species, a mass attack by both males and females is launched on the susceptible trees. The mass attack appears to be in response to a volatile attractant produced by the scouts' hindguts and released from the tunnels created by the probing males as they fed on phloem tissue. The grantee is now analyzing the attractant materials chemically to learn more about its production and influence on the behavior of other insect species.

* * *

STRATOSCOPE II MAKES FIRST SCIENTIFIC FLIGHTS—On the night of March 1–2, 1963, the 3½-ton balloon-borne telescope STRATOSCOPE II made its first scientific flight, from the NCAR Scientific Balloon Flight Station, at Palestine, Texas. A second flight was made November 26–27. STRATOSCOPE II is a Princeton University project under the overall direction of Dr. Martin Schwarzschild. Its initial flight, an infrared study of Mars, was a joint effort of Princeton and the

University of California, with Dr. Harold Weaver of California as faculty investigator. Dr. Robert Danielson of Princeton was on-site supervisor of the telescope during both preflight and flight operations. The second flight made an infrared study of Jupiter and certain red giant stars.

Results of the first flight, reported to the American Astronomical Society meeting in Tucson on April 20, showed that the atmosphere of Mars is almost completely lacking in water vapor. Earlier calculations and theoretical treatments had indicated that the water content of the Martian atmosphere might be between $\frac{1}{1000}$ and $\frac{1}{50}$ of the content in the earth's atmosphere. But examination of the Martian spectrum in the region of the three strongest bands of water vapor, a feat not possible from the surface of the earth, revealed the amount of water vapor to be definitely less than $\frac{4}{1000}$ and probably less than $\frac{1}{1000}$ of that in the earth's atmosphere.

Observations from the telescope, floating about 80,000 feet above the earth, clearly revealed a sizable measure of carbon dioxide on Mars, adding strong confirmation to earlier studies made from the earth's surface.

While scientific results of the second flight are not yet available, the operation was termed an unqualified success by Dr. Schwarzschild. Technical difficulties that arose during the first flight were fully overcome, resulting in unexpectedly fine scientific data that is now being analyzed. In addition to Jupiter, the instrument made infrared scans of Betelgeuse, Mira, Aldebaran, R. Leonis, Rho Persei, Mu Geminorum, and Mu Cephei, as well as the moon and Sirius for comparison purposes. Strong absorption bands were observed; in the case of the giant red stars, the bands appear to be very strong in the coolest stars.

Of great significance is the fact that a 6,800-pound telescope has been successfully lofted and flown through the night, while pointing and focusing operations were carried on by remote control from the ground. On both landings damage to the $2.5 million instrument was relatively small. It was the heaviest payload ever carried by a balloon system.

The flights prove the feasibility of large unmanned balloon flight systems for certain scientific purposes. A tandem balloon system was used, with a small "launch" balloon to hoist the main balloon and flight train into the air. During the ascent, as the helium in the top balloon expanded, it passed through a collar into the main balloon so that at altitude both balloons were fully inflated.

The first flight was also the first scientific operation from the Palestine balloon station, a facility of the National Center for Atmospheric Research sponsored and funded by the National Science Foundation.

STRATOSCOPE II is Princeton's continuing program of high altitude balloon-borne astronomical observations, jointly sponsored by NSF, the Office of Naval Research, and the National Aeronautics and Space Administration.

* * *

New Theory Explains Origin of Strange Radio Emissions From Jupiter—For years scientists have been puzzled by sporadic, low frequency radio emissions from Jupiter. These narrow band, sharply beamed signals occur in bursts of great intensity and exhibit a fairly consistent polarization; that is, the waves nearly always travel away from Jupiter with a corkscrew motion. Furthermore, they can be detected only when certain areas of Jupiter are facing the earth. The frequency of emissions from these regions varies as Jupiter rotates.

As a result of more than three years of observation, a grantee has proposed a new theory to explain the origin of these unusual radio emissions (Warwick, National Center for Atmospheric Research). The theory states that the magnetic field and subsequently the radiation belts of Jupiter are mysteriously off-center, virtually touching the skin-like atmosphere of the planet on one side of the Northern Hemisphere. Because high speed electrons moving along lines of magnetic force emit waves in a narrow frequency band (the frequency of the waves depending on the strength of the field) and because of the lopsided magnetic field of Jupiter, the variations are related to longitude. The investigator believes the earth's upper atmosphere rather than Jupiter's may cause the emissions to be received in bursts of great intensity.

Many questions about Jupiter's radio emissions remain unanswered. Further research in this area will contribute much to an understanding of planetary processes in general and may prove quite useful to manned space flight.

* * *

New Device Permits Daytime Observation of Light Radiating From High Atmosphere—Airglow, a type of weak light originating in the high atmosphere, is thought to arise from chemical reactions involving nitrogen, oxygen, and, to a lesser extent, hydrogen. There is a definite relation between the color of the light radiated and the chemical reaction producing it, and study of the light can therefore reveal much about the reactions taking place in the high atmosphere. Until recently observation of the radiation was confined to nighttime except for the expensive and limited observations from rockets and balloons which had the capability of lifting experiments above the region of the atmosphere in which the scattering of sunlight is appreciable.

Under an NSF grant a new device has been developed which permits ground observation during the daytime (Goody, Harvard University), when the state of the atmosphere and the reactions occurring differ greatly from nighttime conditions because of the great amount of energy poured into the atmosphere by the shining sun. The new development takes advantage of the fact that light originating from reactions in the high atmosphere is not polarized and the unwanted scattered light is polarized. The device responds to light polarized only in a particular way.

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NATIONAL RESEARCH PROGRAMS

Among the widely varied research programs for which the Foundation is responsible are those which, owing to geographical location, the need for international cooperation, and the necessity for coordinated planning, are best planned, administered, and funded as national programs. The Foundation's role in each of these varies with the nature of the program, but in each case stems from the Foundation's position as a leading Federal sponsor of basic research and from its close relationship with the scientific and academic community.

United States Antarctic Research Program

The Foundation, through its Office of Antarctic Programs, plans, coordinates, manages, and funds the United States Antarctic Research Program, known popularly as USARP. This program enables scientists of the Nation's colleges, universities, Government laboratories, and other research centers to carry out a wide variety of basic scientific investigations in Antarctica.

The Foundation is advised on polar research matters by 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). Logistic support for USARP is provided by the Department of Defense with the Navy having primary responsibility and, in special cooperative arrangements, by the expeditions of other nations.

During the past year, a new scientific station, Eights, was established on the plateau of West Antarctica; the Antarctic research vessel USNS *Eltanin* (equipped to permit research in a variety of scientific fields) completed her first year of operation in Antarctic waters; preliminary steps were taken for the establishment of a biological station on Palmer

Peninsula; grants were made in support of Arctic research projects with a direct bearing on overall Antarctic studies; and preparations were made for an increased emphasis on upper atmospheric research to coincide with the International Years of the Quiet Sun 1964–65.

At the completion of the austral summer field season, running roughly from October 1 to March 1, about 13 tons of scientific data and specimens were documented and shipped to the United States. Approximately 250 scientific personnel passed through McMurdo Station, the main U. S. Antarctic staging base, during that time.

International Activities

Antarctic Treaty—This treaty, which entered into force in June 1961, provides for international cooperation in the scientific exploration of Antarctica with exchange of data and personnel. The Second Antarctic Treaty Consultative Meeting took place in July 1962 in Buenos Aires and was attended by the Head of the Foundation's Office of Antarctic Programs.

Scientist Exchange—The exchange of scientists with the Soviet Antarctic Expedition, carried out since 1957, continued during the past year. An entomologist from Ohio State University spent the austral winter of 1962 at the Soviet Mirnyy Station investigating the microhabitats of coastal land invertebrates. During the Antarctic summer of 1962–63, a meteorologist from Texas A&M College spent 3 months aboard the Soviet research ship *Ob* studying surface radiation temperatures.

An investigator from the Soviet Arctic and Antarctic Research Institute was aboard the *Eltanin* during two cruises (February to June) and a meteorologist with the Hydrometeorology Institute in Leningrad studied atmospheric circulation at McMurdo Station during the winter of 1963.

The *Eltanin* was also host to a hydrographer of the Chilean Navy, as well as to two marine biologists of the University of Chile. At the same time, several University of Wisconsin geologists working in Tierra del Fuego and on Palmer Peninsula received logistic support, technical assistance, and scientific advice from Chilean authorities.

Cooperative and Joint Programs—The cooperative scientific program with Australia at Wilkes Station continued throughout the year with notable success. A similar arrangement with Argentina at Ellsworth Station, effective since 1959, was terminated in December 1962 when the Argentines decided to close the station because of the difficult logistics problems.

The joint New Zealand-United States program at Hallett Station continues very satisfactorily. Other arrangements with New Zealand

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during the past year included participation by a U.S. geologist with the Victoria University of Wellington field party in the ice-free valleys of the McMurdo Sound area, and the inclusion of a New Zealand geologist in a USARP field party in Victoria Land.

Cooperation continued between Canadian and U.S. institutions in conjugate-point investigation of radio-wave phenomena. For the second year, Canadian scientists went to Byrd Station to work, while Stanford University physicists took an active part in the operation of the Canadian end of the link. Two mobile stations were set up in Canada to aid in defining the conjugate area to Eights Station.

Antarctic Information

The Foundation serves as the clearinghouse and source of information for Antarctic records and documents. Furthermore, the United States bears responsibility under the Antarctic Treaty for exchange of information with other treaty signatories. Preliminary actions by NSF in this field include the organization of a library of Antarctic reference materials and the collection of a representative file of color slides. Also, a grant was awarded during the year to the Library of Congress for the preparation of a comprehensive bibliography of current Antarctic literature. This bibliography will be in the form of cards containing abstracts and indexes, to be followed later by annual or semiannual cumulative volumes.

In response to a report of the President's Science Advisory Committee concerning the responsibilities of the Government in the transfer of information, the Foundation is utilizing the facilities of the Department of Commerce's Office of Technical Services to announce and to distribute reports of NSF-sponsored Antarctic research.

Plans for an Antarctic Map Folio Series (Atlas) were formalized, and a contract for its preparation let to the American Geographical Society. In addition, papers were invited for an Antarctic Research Series to be published under a grant to the American Geophysical Union.

In cooperation with the Foundation's Office of Science Information Service, support was provided for continuation of the American Geophysical Union's *IG Bulletin*. Under a similar arrangement, the University of Wisconsin translated for publication the *Information Bulletin* of the Soviet Antarctic Expedition.

Science Programs

The scientific investigations of USARP are carried out at seven stations and a number of in-field regions throughout West Antarctica. The mainland U.S. stations are McMurdo, Pole, Byrd, and Eights.

Hallett Station is run jointly with New Zealand, and Australia's Wilkes Station has a cooperative scientific program with the United States. The *Eltanin*, a 266-foot ice-strengthened research vessel operated for NSF by the Military Sea Transportation Service, can be considered a floating scientific station since it is able to accommodate as many as 40 scientists in such a variety of disciplines as meteorology, upper atmosphere physics, gravity and magnetism, marine biology, entomology, oceanography, and submarine geology.

The *Eltanin*'s scientific and technical complement during the year numbered 101, representing 15 U.S. institutions as well as institutions in Brazil, Chile, and the U.S.S.R. The first American women scientists to work in the Antarctic regions, two marine biologists from De Paul University, participated in two cruises and were joined in one by two women biologists from the University of Chile. During the last year, the *Eltanin* spent 309 days at sea and traveled 44,575 nautical miles in 5 separate cruises in the area around the Drake Passage between Antarctic's Palmer Peninsula and the southern tip of South America.

During the 1963 fiscal year, the Foundation supported 71 active field projects involving 193 people. The accompanying table shows the distribution of effort by discipline.

Field Projects of U.S. Antarctic Research Program—1963

Discipline	Field project	Personnel
Biology	20	36
Geology	10	30
Glaciology	8	31
Gravity and Magnetics	3	3
Seismology	2	5
Oceanography	6	16
Upper Atmosphere Physics	15	32
Meteorology	6	32
Cartography	1	8
Total	71	193

BIOLOGY

During the past year there were 16 biological field programs and 1 caretaking project for the support of the biological laboratory at McMurdo. An additional two programs carried out Antarctic research at home institutions.

As in previous years, almost all field biological programs were based at McMurdo Station. This situation results partly from the excellent air transportation availability which greatly expands the area for investigations, and partly from the station's most extensive scientific complex, the biology laboratory which recently underwent a 50 percent enlargement. Stanford University marine investigations at McMurdo Station were conducted throughout the winter. Fish required in the metabolic studies were obtained by means of nets and traps through holes kept open in the sea ice throughout the period of investigation. A cooperative program between Stanford University and an investigator from the University of Sydney, Australia, to measure growth and development of phytoplankton utilized the aqualung for obtaining evidence of plankton bloom on the underside of the sea ice. Carbon-14 techniques were applied in a study by the University of California, Davis, to measure primary productivity in fresh water lakes at Cape Evans on Ross Island and in the ice-free valleys of Victoria Land. From experiments carried out to determine why algal growth was less evident in certain lakes, it appears that too much light inhibits optimum photosynthesis.

Ornithological programs were carried out by Johns Hopkins University and the University of Wisconsin. Field activities of the former centered around Cape Crozier, Bird Island in South Georgia, and West Point Island in the Falkland Islands. Birds banded by the South Georgia and Falkland Islands teams were 3,000 black-browed albatrosses and 800 giant petrels. So far, 14,800 birds have been banded and their recoveries may serve to reveal patterns of migration.

The homing and orientation program of the University of Wisconsin, hampered by adverse or marginal weather conditions, began in mid-October at Cape Crozier. In early November three sets of homing experiments were carried out with male Adelie penguins released in the center of the Ross Ice Shelf, on the Victoria Land plateau, and on the Marie Byrd Land plateau.

Surveys along the Victoria Land coast north and south from McMurdo Station extended the known locations of springtails and mites about 150 miles in both directions. The Bishop Museum party making this survey also recorded ecological data from various habitats.

Biological studies at Hallett Station by members of both the New Zealand and the U.S. programs were aided during the past season by the availability of a small laboratory and adequate equipment and supplies. The two U.S. biological programs at Cape Hallett were developed by Ohio State University. Lichen ecology studies included recordings of microclimate, rephotographing of lichen quadrants for growth rate measurements, and weekly moisture content determinations. An OSU microbiological program was begun in early November by fertilizing 1-yard plots in lichen-populated areas with minerals and various sources of carbon and nitrogen. A similar series was also laid out in lichen-free areas.

Primary productivity studies in Drake Passage were continued by Texas A&M College aboard two Argentine vessels. The concentration of chlorophyll *a* and carbon–14 uptake were found to be higher along the Patagonian coast than in the Drake Passage.

Five *Eltanin* cruises (4 through 8) represented the first year of work in Antarctic waters, largely in the Drake Passage and Scotia Sea area between 30° and 75° west longitude south to the limits of ice.

The Bishop Museum continued its overall Antarctic air sampling program by means of nets flown continuously from the *Eltanin's* main mast. The Lamont Geological Observatory of Columbia University carried on sea water analysis during all cruises for primary productivity studies, bacterial density profiles, phyto- and nano-plankton counts, and routine phosphate, nitrate, and silicate analyses. Abyssal, midwater, and surface gear was used to obtain biological specimens for the University of Southern California study. Generally, trawls in less than 300 fathoms gave very large collections, whereas deep-sea dredging or trawling was less productive of specimens. Faunal breaks appear to occur at the Antarctic and sub-Antarctic Convergences and definite vertical zonation of species was observed. During Cruise 4, 2,100 lantern fishes were taken.

Areas worked during Cruise 6 included the shallow waters of the Patagonian continental shelf, Burdwood Bank, and Bransfield Strait. This selection of locales gave good coverage of a wide variety of habitats in sub-Antarctic and Antarctic regions, and the marine collections from this program have made available a very good representative collection of the Antarctic fishes and other specimens currently so poorly represented in U.S. museums.

The Virginia Institute of Marine Science collected some 35 specimens of fish for ectoparasite materials during Cruise 5. A study of the metabolism and molt cycle of crustaceans in relation to temperature and temperature acclimation was conducted by De Paul University during Cruises 6 and 7.

EARTH SCIENCES

Geology—The most ambitious U.S. field geology program yet attempted in Antarctica took place in the summer of 1962–63, involving 10 agencies and 30 field personnel with operations that ranged from the southern tip of Chile to McMurdo Sound. As in previous years most of the work was concerned with reconnaissance geology.

The U.S. Geological Survey initiated geological studies in the Patuxent Mountains, the southernmost part of the Pensacola Mountains. In general, these mountains are mildly metamorphosed and much faulted, with rocks that are unlike any previously known in this part of Antarctica, though there may be some similarity with rocks from the Ellsworth Mountains. Geologists from the University of Minnesota continued work started in the 1961–62 season in the Ellsworth Mountains.

An Ohio State University party concentrated its studies in the Trans-antarctic Mountain range in the vicinities of Mount Weaver and Mount Wilbur. Coal beds found there attain thicknesses of 20 feet and are of better quality than those previously encountered in the Antarctic. Almost directly south of Mount Weaver is a half-eroded extinct volcano.

A party from Texas Technical College started geological work in the vicinity of the Shackleton Glacier, south of the Ross Ice Shelf, with a detailed study of the basement complex. A University of Wisconsin party, working from Punta Arenas, Chile, made a detailed sedimentological study of the Upper Cretaceous outcrop belt between the Straits of Magellan and the Ultima Esperanza Ranges some 200 miles north for comparison with similar cretaceous sequences of South Georgia and the Palmer Peninsula.

A study of the occurrence and distribution of inclusions in the volcanics of Ross Island was undertaken by a party from the University of Alaska. A Bowling Green State University geologist was included with the expedition from the Victoria University of Wellington, New Zealand, in ice-free ranges between the Darwin and Carlyon Glaciers of Victoria Land. Under a grant made to the Australian National University at Canberra, a special study was started of the chemical and mineralogical variations in the Ferrar dolerite sills, which are known to extend along most of the Trans-antarctic Mountains, intruded mainly in the Beacon sandstone group.

Studies of patterned ground by investigators from the University of Wisconsin continued for the third consecutive year. Pedological studies by investigators from Rutgers University continued programs started during the previous summer. Using trimetrogon photography obtained for mapping purposes, a photo-geology program was initiated at the University of Massachusetts. Studies are also underway to determine the feasibility of geologic mapping from this and from special color photography of the ice-free rock formations. Compilation of morphological data from the McMurdo Sound area is continuing under a program at Tufts University.

Glaciology—A traverse from the South Pole, operated by the University of Wisconsin and including scientists from Ohio State University and the U.S. Coast and Geodetic Survey, covered over 800 miles in two triangular routes between the South Pole and the Transantarctic Mountains in the vicinity of the Horlick Mountains. Snow elevation, ice thickness, near-surface snow and ice character, gravity and magnetic observations were obtained.

A photogrammetric ice movement study was initiated by Ohio State University geodesists with the placing of 178 markers along the 200-mile line between the Whitmore Mountains, which will serve as a fixed site, and Byrd Station. Aerial photographs of these markers were obtained at the end of the season and will be repeated after a few years to determine the ice movement along the line. Under a University of Michigan grant, a similar line of stakes was set out along the northern edge of the Ross Ice Shelf between a fixed site on Ross Island and the eastern part of the Ross Ice Shelf north of Roosevelt Island. Markers will be resurveyed after three years to determine the Shelf movements.

University of Wisconsin glaciologists concluded the initial phase of studies on Roosevelt Island, an ice-covered dome on the eastern side of the Ross Ice Shelf. Detailed ice thickness surveys showed the minimum value to be about 1,900 feet.

Ice deformation studies in the deep pit at the South Pole and at Byrd Station were continued by the Cold Regions Research and Engineering Laboratory. Research on the stable isotopes of oxygen and hydrogen and on microparticulates in the Antarctic snow layers was started by investigators from the University of Brussels. Results of these studies will provide clues to the recent climatic history of the ice cap and the worldwide accumulation of cosmic dust. Testing of the thermal drill designed to penetrate the complete ice sections in inland Greenland and Antarctica is again under way by engineers from CRREL at Camp Century, Greenland, after major delays from mechanical design problems.

Geophysics—Information on the crust below the Antarctic ice cap is obtained from gravity, seismic, and magnetic observations. Regional values of gravity and magnetic fields continued to be compiled in various areas of Antarctica during the past year. On the oversnow traverse, gravity and magnetic measurements were conducted by the University of Wisconsin and the U.S. Coast and Geodetic Survey. In the McMurdo Sound area, a University of Wisconsin investigator conducted local aerial magnetic surveys and obtained surface gravity values at various sites in the Trans-Antarctic Mountains. A proton magnetometer also was trailed behind the *Eltanin* throughout the operations in the Scotia Sea and Drake Passage, and to and from the scene of operations and the staging port of Valparaiso.

As part of a U.S. Coast and Geodetic Survey program of modernization and standardization of station seismograph equipment at more than 100 stations throughout the world, new equipment was installed in the summer of 1962–63 at the Hallett and South Pole Stations. Seismograph station operations continue also at Byrd Station, and at Wilkes Station, where California Institute of Technology instruments are run by Australian scientists.

Oceanography—Under grants to the Lamont Geological Observatory of Columbia University, a concentrated effort was made with closely spaced hydrographic stations and bathythermograph lowerings to detail the significant Antarctic water mass characteristics, particularly in the region of the Antarctic Convergence. *Eltanin* cruises in the Drake Passage and Scotia Sea were designed specifically for maximum information in the Convergence area. This area, present at all longitudes around the continent, is a region of transition where northward and southward surface movements meet.

Aboard the *Eltanin* another oceanographic program was carried out by Texas A&M College investigators studying carbon dioxide in the air and shallow waters, as well as carbonate saturation amounts. A further major program on the *Eltanin* was the routine collection of long cores of up to 50 feet in length by the heavy piston corer. Collection programs were carried out by Florida State University, Lamont Geological Observatory of Columbia University, and the University of Southern California. Standard bottom camera pictures for use by both biological and physical oceanographers were made at all stations occupied by the *Eltanin.*

On a Navy icebreaker used earlier in the summer season for assisting the passage of cargo ships to Antarctic bases, the U.S. Naval Oceanographic Office carried out a very successful survey in the western Ross Sea, accumulating data from over 120 closely-spaced hydrographic stations. Through a grant to the Texas A&M College, and with the cooperation of the Argentine Navy, investigators aboard an Argentine vessel in the Scotia Sea studied the structure of currents at different levels.

ATMOSPHERIC SCIENCES

Upper-Atmosphere Physics—Antarctic aurora and airglow observatories continued to be operated by the Arctic Institute of North America. A new development of the year was the initiation of work at an auroral substation some 40 miles northeast of Byrd Station. Auroral heights are now measured by coordinated photography from both Byrd Station and the substation. A program of the University of Colorado to obtain diurnal curves of the hydrogen alpha auroral emission in an area where total darkness prevails throughout the 24 hours is also continuing at Byrd Station. New and improved airglow photometers from the National Bureau of Standards are in operation at all stations, including the vessel *Eltanin.*

Geomagnetic observatories continue in operation at all U.S. Antarctic stations, including the new Eights Station, under the cognizance of the U.S. Coast and Geodetic Survey. Portable micropulsation equipment was installed at Byrd and Eights Stations by the National Bureau of Standards. Radio-noise monitoring on eight different frequencies continues at Byrd Station and has also been initiated aboard the *Eltanin.* Under an NSF contract, the AVCO Corporation is in its second year of a study of IGY data from all stations south of 30° S., while NBS investigators are analyzing *E* and F_1 region characteristics for variations in the composition of the upper atmosphere.

During the past year, prompted mainly by the coming IQSY program, riometers (relative-ionospheric-opacity meters) were installed at Byrd, Eights, and Pole Stations and on the *Eltanin.* These riometers monitor the absorption of cosmic radio noise caused by *D*-region ionization.

With the increased scope of upper-atmosphere physics operations on the Antarctic Continent, parallel programs are being initiated in eastern Canada. For polar areas, eastern Canada and western Antarctica are the only two large land masses magnetically conjugate to each other. Presently in operation or being installed are observatories in Canada at Great Whale (Byrd conjugate), Quebec City (Eights conjugate), Frobisher Bay (Pole conjugate), and Shepherd Bay (McMurdo conjugate). The work in the North is done in cooperation with various Canadian agencies.

Meteorology—The meteorological program of the U.S. Weather Bureau continues to be one of the largest maintained in the Antarctic. With a large volume of synoptic data now available for study, emphasis is being gradually shifted from the routine surface and upper-air studies on the continent to more special research programs and to observations in the waters north of the continent. Standard surface and upper-air programs were a regular part of operations on the *Eltanin.*

Texas Western College of the University of Texas continued its 2-year program of meteorological rocket soundings at McMurdo Station on a schedule of about one per week. Although mechanical difficulties with the rockets reduced the total number of firings, much new data on winds and temperatures to maximum heights of 38 miles were obtained.

Through the U.S. Weather Bureau, continued support went to the International Antarctic Analysis Centre at Melbourne, Australia, where synoptic charts prepared daily for the Antarctic and sub-Antarctic areas are used both for research requirements and in forecasting Antarctic flight conditions. The U.S. Weather Bureau continues its Polar Analysis Center in Washington, D.C., with emphasis on the description and explanation of the physical processes occurring in the atmosphere, ocean, and ice of Antarctica and the surrounding region, and on the establishment of the heat, mass, and water budgets.

CARTOGRAPHY

Although not a basic research field, Antarctic cartography is an essential requirement for the pursuit of studies in all other disciplines. Three phases are involved in the production of Antarctic maps, all of which were actively pursued during the past year—aerial photography, the establishment of geodetic control, and map compilation.

The U.S. Navy performed aerial mapping flights in the McMurdo Sound area and in the remote previously unphotographed parts of the Ellsworth and Pensacola Mountain areas.

In the 1962–63 austral summer, topographic engineers from the U.S. Geological Survey established control reference points in various parts of West Antarctica. One team transported by U.S. Army helicopters completed the program called "Topo East and West" in Victoria Land and in the mountain range southeast from Beardmore Glacier through the Queen Maud Range and Horlick Mountains. In 1,600 miles of traverse, 75 stations were occupied with electronic distance-measuring devices used for base-line measurements, these averaging about 20 miles in length. Field engineers also accompanied the geologists in the ice-free areas of the Ellsworth and Pensacola Mountains, obtaining mountain-peak locations from measured base lines referenced to astronomical positions. Considerable increase in accuracy was achieved by daylight stellar observations.

Production of maps and charts from aerial photographs and the adjustment of control data continued at the U.S. Geological Survey. Shaded-relief maps at the scale of 1: 250,000 were published for the Executive Committee Range, the Thiel Mountains and the Horlick Mountains. Special uncontrolled maps were compiled for local biological and geological work, and a two-layer plastic relief map of the continent, showing surface and subice topography, was completed during the year. The American Geographical Society continued to compile data for a small-scale map of the continent and published an up-to-date 1: 3,000,000 scale map in four colors.

Weather Modification

One of the great challenges to modern science is developing the means for altering the weather in a controlled fashion, so that rain falls where there are droughts, rain clouds are dissipated where there are storms, hail and lightning damage are prevented, etc. For the past 5 years, the National Science Foundation, in response to congressional directive, has been supporting a program of research and evaluation in the field of weather modification, as part of its broader program of basic research in the atmospheric sciences. The Foundation also serves as coordinator of the Federal effort in weather modification and has participated in several joint research projects with various Government agencies concerned with activities in this field.

The research program supported by the Foundation includes laboratory, field, and theoretical studies, and statistical evaluations, as well as support of research facilities and instrumentation.

Studies range in scope from examination of microscopic meteorological events to hemispheric or global phenomena, in subject from the nucleation of ice crystals to the physics of major storms, and in purpose from a better understanding of natural events to their artificial creation or dissipation. Included, too, are investigations of the possible effects of weather modification. One grantee, for instance, is studying the changes in heat and water budgets that weather modification might produce in the southwest United States—specifically the effects of 1, 5, 10, 20, and 50 percent increases in the mean annual precipitation. Aside from the obvious increase in water supply and the benefits accruing from it, such changes would alter maximum and minimum temperatures and would bring about departures from the present heat balance.

Much of the field research in weather modification is conducted in the Western States largely because they provide a natural laboratory where it is possible to study weather conditions ranging from the periods of relatively heavy precipitation in the Northwest to the arid Southwest; also to observe the strong influences of terrain (mountains and deserts) on local cloud conditions. In the studies scientists are using new methods and new instrumentation. For example, one group is using doppler radar in its investigation of cloud physics. This radar shows speed and direction of such phenomena as raindrops within a cloud. Computers are used in the formation of mathematical models of weather phenomena. In one such project an investigator is studying the feasibility of artificial modification of tropical storms. Other studies involve examination of lightning processes, hailstorms in the high plains, the physics of convective clouds, and other subjects.

Thirty-six NSF-supported research projects are now underway at university, government agency, and other nonprofitmaking institutions and laboratories. Details of the NSF weather modification program for 1963 will be presented in the fifth annual weather modification report, now being prepared.

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International Indian Ocean Expedition

The International Indian Ocean Expedition (IIOE) is a multinational effort to explore scientifically the world's least known ocean. The Indian Ocean, a fertile and productive sea, is surrounded by countries containing about a quarter of the world's total population. Merely learning more about this ocean's potentially rich and unharvested food resources might make it possible for nations rimming the Indian Ocean to better feed their people and promote their economic development.

The international character of the expedition continues the pattern of cooperative oceanographic studies that began during the International Geophysical Year. Overall coordination of this effort is in the hands of the International Oceanographic Commission for which the National Academy of Sciences is the U.S. representative; the U.S. program is coordinated by the National Science Foundation. Funding for the U.S. program is provided principally through the Foundation and the U.S. Navy, with smaller amounts provided by the Weather Bureau and the Bureau of Commercial Fisheries.

The U.S. program for the IIOE, in accordance with the stated aims of the expedition, is devoted to the scientific examination of four great areas of interest. The first is the tectonic framework—why is there an ocean basin in the first place; what are the forces that have shaped and are continuing to shape the basin; and what are the similarities and differences between this piece of the earth's crust and any other. The techniques used in attempting to answer these questions are primarily geophysical and geological, and they have been or will be employed on expeditions sent out by Scripps Institution of Oceanography, Lamont Geological Observatory, Stanford University, and Woods Hole Oceanographic Institution.

The second broad area of investigation involves the chemical and physical description of the waters and the study of their motions. The techniques used involve sampling of the waters in predetermined patterns, both horizontal and vertical; concurrent precise measurements of water temperatures; chemical and isotopic analyses; and the measuring of currents at various depths. All U.S. ships participating in the IIOE will be equipped for water sampling. The direct measurement of current flow is the particular object of a scientific party from the University of Rhode Island aboard the Scripps Institution's vessel *Argo*.

The third major field is the living populations of the Indian Ocean, plant and animal. All U.S. 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 will be equipped to make upper-air meteorological observations, but the greater part of the U.S. meteorological effort will be based ashore. Observations will be made from 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).

All U.S. vessels participating in the IIOE will contribute to at least two of the four fundamental areas of interest; some will contribute to three; and some to all four. In addition to the vessels already named, the *Spencer F. Baird*, the *Vema*, the *Conrad*, and the *Atlantis II* are or will be participating.

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International Years of the Quiet Sun

As part of the International Geophysical Year (1957–58), the earth was subjected to the most comprehensive examination it had ever received. Scientists of 66 nations participated in this effort. The sun during this period was especially active.

Scientists realized that the scientific knowledge gained during IGY, especially the synoptic data, would be greatly enhanced if complementary data obtained when the sun was quiet (a period of minimum activity) were also available. It was, therefore, decided at a metting of the International Council of Scientific Unions (ICSU) in September 1961 that an international geophysical program be conducted in 1964 and

1965, a period during which the sun would be in that part of its 11-year cycle when its activity would be at its low point. ICSU then recommended participation in this program, to be known as the International Years of the Quiet Sun (IQSY), to all scientific unions and nations.

In September 1962, President Kennedy authorized U.S. participation in the IQSY and designated 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 these additional activities which may be required.

The U.S. program for the IQSY divides naturally into two categories: (1) the continuation and intensification of synoptic geophysical observations, and (2) observations devoted to special research opportunities which are available at the time of least solar activity.

In the synoptic portion of the program there will be an intensified solar patrol: work in geomagnetism, aurora and airglow, ionosphere observations including a vertical incidence network, a radio noise network, a riometer network, several whistler networks covering both very low and extremely low frequencies, and cosmic ray neutron monitors and meson telescopes.

Special research activities during solar minimum will include solar optical and radio observations, as well as active radar, to study the electron density and "temperature" in the disturbed and quiet corona, X-ray and ultraviolet radiation measurements from space probes, examination of the interplanetary medium with plasma and particle detectors as well as magnetometers and instruments for measuring the galactic flux as a function of solar distance, rocket and balloon observations of particle streams entering the upper atmosphere at geomagnetically related points in Alaska, Canada, and the northern United States, conjugate to locations in Australia, New Zealand, and the Antarctic. In the Pacific regions, daily solar variation of the magnetic field will be measured, with special studies of the equatorial electrojet.

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Deep Crustal Studies of the Earth (Project Mohole)

Development of deep-drilling techniques is making possible an attempt to realize an old dream of scientific exploration of the earth's interior. Project Mohole is a national research program, funded and directed by the National Science Foundation. The purpose of the project is to drill through the earth's crust into the mantle. Sample cores and direct measurements obtained from such drilling will perhaps provide more information about critical geophysical problems than would any other project within current technological capabilities. From this project scientists hope to learn more about the structure and composition of our planet, its age and origin, the origin and evolution of life through studies of the fossils found in the sedimentary layers, and the age and structure of the ocean basins.

The crust, the earth's outer or surface layer of rock is between 15 and 45 miles thick beneath the continents, being thicker under the mountains, and between 3 and 6 miles thick beneath the oceans. Below the crust is the mantle, which extends about halfway to the earth's center (or to a depth of about 1,800 miles) and comprises about 80 percent of the planet's volume. The mantle envelops a core which has a radius of 2,175 miles.

The boundary between the crust and mantle is known as the Mohorovicic Seismic Discontinuity, named for the Yugoslav seismologist who discovered it through the study of the varying of velocity of earthquake waves. He concluded that the faster waves must be traveling through the denser underlying rocks; the slower, through the surface layer of rocks. The zone where these waves changed in velocity, the Moho, was established as the boundary between the mantle and the crust. Hence, the Mohole—a hole through the Moho. And because the crust is so much thinner in oceanic areas than under continents, the Mohole is to be drilled in a deep ocean basin.

Phase I of the project (a small-scale experiment) was completed in the spring of 1961 with the first successful drilling in deep water from an unanchored vessel. A number of holes were drilled, the deepest being 601 feet into the bottom in water more than 2 miles deep. The tests demonstrated that it was possible to hold an unmoored drilling vessel on station under its own power in deep water using steering motors.

With the feasibility of drilling in deep water thus demonstrated, Phase II began. For this effort, drillers will have to pierce 15,000 feet of sediment and rock at a point where the ocean is more than 3 miles deep. Phase II includes deep ocean surveys, the design and construction of deep drilling equipment, and the drilling of a series of holes in the deep ocean floor, one of which is to completely penetrate the earth's crust.

Scientific studies at the drill site, as well as the final disposition and distribution of samples and data, are responsibilities of the National Science Foundation. In carrying out these scientific activities, NSF has the advice and aid of the AMSOC Committee of the National Academy of Sciences-National Research Council. The Committee structure includes various specialized scientific and technical panels. In

1962, Brown & Root, Inc., of Houston, Texas, was selected by the Foundation as the prime contractor of Phase II of Project Mohole. This company has assembled a Mohole Project staff of 70 to 80 people—engineers specializing in drilling, mechanical, and stress analysis techniques and in instrumentation and electronics; naval architects; marine engineers; geologists; geophysicists; oceanographers; and meteorologists.

In general, the program developed by the prime contractor consists of several systems. Some use items readily available, or ones that require but slight modification; others involve new, unusual, and time-consuming developments.

The drilling vessel concept proposed by the contractor is a platform with six columns rising from twin submerged hulls of cylindrical shape. It is self-propelled with twin main propellers on the lower hulls. Positioning is accomplished by right-angle drive propellers located in the columns. The platform could be drydocked in some locations. From the standpoint of working area and stability the platform shows great promise. Power would be supplied by a 20,000 h.p. diesel-electric system. Design studies are continuing, including structural analysis of the platform design by computer methods. This will be followed by testing a model under various conditions of stress (wind, current, etc.).

A dynamic positioning system for the drilling vessel is being designed. A fully automatic system is required for determining and keeping position within a 500-foot radius in 18,000 feet of water. The proposed system will consist of an outer array of radar targets mounted on surface floats and an inner array of sonar targets mounted on taut-line bottom-moor subsurface buoys placed around the drill site. A third array of sea-floor mounted sonar targets will serve as a back-up system. Preliminary designs on propellers and positioning power units have been completed.

A drilling system has been laid out by Brown & Root that utilizes proven equipment design principles and materials and standard engineering practices to the fullest extent. Two methods of drilling are being considered: (1) the conventional method of rotating the drill string from the surface by use of either a rotary table or a power swivel; and (2) a turbo-coring tool, now under development, in which torque is applied directly at the drill bit by means of a fluid-driven turbine.

One of the most critical problems to be solved is that of developing a drill string that can withstand the loads to be encountered. The required string would be about 40 percent longer than any previously used in drilling on land. To solve this problem, the prime contractor has initiated a carefully coordinated laboratory and field testing program of steels of higher strength than that currently used in drill pipe. Successful performance of the drill pipe depends on increasing the mechanical strength of the pipe, reducing the effects of corrosion (by mud inhibitors, coatings, or both), and minimizing the fatigue damage imposed on the drill string by vessel motion in the open sea.

Concurrently with the drawing up of the engineering plan and the preliminary design work accomplished on many of the components, surveys were undertaken to determine possible sites for drilling the hole to the mantle. Seismic surveys of sites north of Puerto Rico and along the Barracuda Fault Zone off Antigua were completed in fiscal year 1963. Similar work in the Hawaiian arch area is to begin in the late summer of 1963.

The United States-Japan Cooperative Science Program

The United States-Japan Committee on Scientific Cooperation was established as a result of agreements between President Kennedy and Prime Minister Ikeda in June 1961. A joint committee of distinguished scientists was formed by the U.S. Department of State and the Japanese Foreign Office to explore ways in which scientific cooperation between the two countries could be improved. The task of the joint committee was not difficult because there are many areas in which mutual scientific interests and highly developed competence in both countries provide a broad and firm base for cooperative activities.

At the first meeting of the joint committee, held in Tokyo in December 1961, it was recommended that cooperative projects should be initiated in the following categories: (1) Exchange of Scholars in the Sciences, (2) Exchange of Scientific and Technical Information and Materials, (3) Research on Earth Sciences of the Pacific Area, (4) Research on Animal and Plant Geography and Ecology of the Pacific Area, and (5) Cancer Research. Subsequently, the Cancer Research Category has been redesignated as Medical Sciences, and two new categories have been added: Education in the Sciences, and Research on Hurricanes and Typhoons.

The National Science Foundation has been given the responsibility for the coordination, administration, and financial support of U.S. participation in this joint scientific venture.

In October 1962, an administrative meeting was held in Tokyo at which administrative ground-rules for the joint program were agreed upon. During the remainder of that fiscal year 9 research projects were funded, and 15 scientific meetings were convened which were attended by 80 American scientists and 80 Japanese scientists.

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Cooperative scientific activities which are now under way cover a wide range; included are studies such as joint analysis of TIROS weather data, the study of volcanoes in the United States and Japan, aeromagnetic surveys of calderas, completion and analyses of collections of Pacific Area insects, the study of rice blast fungus and special studies of the natural enemies of insect pests. Plans in various stages of implementation provide for activities such as exchanges of senior scientists to identify areas for future cooperation in research and study; small, intensive seminars on scientific topics; studies of deep ocean trenches, coral reefs, and migrations across the Pacific Ocean; improvement of exchanges of scientific information and materials; and cooperation on projects directed toward the improvement of education in the sciences.

A significant feature of the program is that it is fully cooperative both financially and scientifically. Japanese funds are used for Japanese participation, and U.S. funds support the participation of American scientists. In addition, Japanese and American scientists contribute equitably to each project in terms of special knowledge, facilities, equipment, or experience. Projects are supported in which the scientific achievements from a cooperative effort promise to be greater than if each group worked separately without the special knowledge of the other. For example, in a comparison of United States and Japanese magnetometers and gravity meters, different instruments developed in the two countries have for the first time been compared over the same oceanographic equipment range and under the same conditions. This has permitted evaluation of the advantages and disadvantages of each type of instrument, and more importantly, will permit meaningful exchanges of data collected in either country with either type of instrument. Another example is in the preparation of monographs on specific flora and fauna with the Japanese contributing their collections and knowledge of western Pacific species and Americans contributing their collections and knowledge of eastern Pacific species. The final product of collaboration is scientifically of much greater value and is achieved at much lower cost to each country than if each group had worked separately.

The confidence of President Kennedy and Prime Minister Ikeda that increased scientific cooperation between scientists of the two countries would be of mutual benefit has been borne out. The broad and intense interest in scientific cooperation between U.S. and Japanese scientists has needed only a mechanism for implementation. This has now been provided, and, even in this brief period, there are many evidences of beneficial scientific results. From the point of view of U.S. science, the program is demonstrating that significant gains can be achieved through the cooperative mechanism.

NATIONAL RESEARCH CENTERS

The national research centers maintained by the Foundation are capital research facilities that are deemed essential to the Nation's basic research effort. They have been established because the cost and other requirements of the programs render them unsuitable for operation by any single academic institution. They are available, or will be when completed, to all qualified U.S. scientists and visiting foreign scientists, subject to priorities based on scientific merit and feasibility of the proposed research. These facilities are also used by staff scientists as well as by a limited number of graduate students.

The centers are Government installations which are managed by independent nonprofit corporations composed of confederations of universities. They are four in number—National Radio Astronomy Observatory (Green Bank, West Virginia), Kitt Peak National Observatory (Tucson, Arizona), Cerro Tololo Inter-American Observatory (Chile), and the National Center for Atmospheric Research (Boulder, Colorado).

National Radio Astronomy Observatory

This observatory was the first national research center established by the Foundation in response to an urgent need for facilities, both complex and costly, to study the heavens by means of the radio waves emitted from sources in outer space. The wide spectrum of observable radio wavelengths as contrasted to the narrow range of visible light greatly extends the possible observation of the heavens, in character and in range. Radio wavelengths are more than 10,000 times longer than optical wavelengths.

To receive and analyze the weak radio signals from space requires a variety of techniques and equipment—huge radio antennas with directional capabilities similar to optical telescopes and very large apertures to intercept as much radiation as possible and to achieve high resolution for wavelengths which may range from one centimeter (about 0.4 inch) to 10 meters (about 11 yards), together with appropriate amplification and recording systems.

In September 1962, construction was completed on a 300-foot transit radio telescope, the largest movable parabolic antenna in the world. Research projects using this instrument have been under way for some time. The Observatory also operates an 85-foot fully steerable radio telescope, and several smaller instruments including a 40-foot automated dish, a 20-foot telescope, a 120-foot calibration horn antenna, and a 30-foot instrument used for continuing interference measurements. Construction is going forward on a fully steerable 140-foot telescope, expected to be the most accurate in existence when completed in the middle of 1965.

Staff investigations, during fiscal year 1963, included studies of terrestrial magnetism, supernova remnants, normal galaxies, discrete sources, and planets. The staff also initiated a survey of all radio sources on one celestial latitude, in this case $+40°$ declination. With the 300-foot telescope locked in this position, rotation of the earth allows the entire celestial latitude to be scanned every 24 hours.

Green Bank is located in a sheltered valley in the secluded hills of West Virginia, but some noise from nearby towns still interferes with telescope reception. One member of the staff has been studying noise levels in the 200–400 mc/sec. range in order to select optimum frequencies for observations with the 85-foot telescope.

Radio astronomers investigate not only the intensity and frequency of radio sources emanating from space, but also their polarization. The major research program during the past fiscal year was a polarization study by radio astronomers from the U.S. Naval Research Laboratory. These astronomers have observed more than 100 radio sources for possible polarization of radio waves. The 300-foot telescope is also being used for observing the distribution of hydrogen in the Andromeda galaxy and in our own galaxy.

Another 85-foot radio telescope is presently being built to be used in conjunction with the existing 85-foot telescope as a two-element interferometer. By taking advantage of wave interference phenomena, it is possible to increase the resolving power of the telescope combination above that of either telescope alone. The new telescope will be mounted on wheels so that it can be moved down a track for distances of up to 9,000 feet from its twin.

Kitt Peak National Observatory

Located 53 miles from Tucson, Arizona, the Kitt Peak National Observatory was established to provide optical astronomers with high quality telescopes and modern techniques at an ideal viewing location. Research is organized into three categories—stellar, solar, and space.

For stellar research, there is in operation of a 16-inch and a 36-inch reflecting telescope. An 84-inch reflecting telescope is essentially completed and astronomical research with this powerful new instrument has already been started. Plans have been made for the addition of another 36-inch telescope and a giant 150-inch reflecting telescope to the instruments now available to optical astronomers.

On November 2, 1962, the new McMath Solar Telescope was officially dedicated. This instrument, with an image-forming concave mirror 60 inches in aperture and a focal length of 300 feet, is the largest solar telescope in the world. It produces an image of the sun 34 inches in diameter. Already it is being used part-time for research and soon will be in full-time operation. Its great light-gathering power and variety of possible spectographic dispersions may make it the first optical telescope to be used around the clock. It is excellent for observing bright night-sky objects, such as first-magnitude stars, planets, and the moon.

Work on a 50-inch remotely controlled space telescope is continuing. Designed to develop techniques for operating orbiting telescopes in space and for testing them, this new telescope will be controlled by wire or radio from Tucson.

Most of the research carried on in fiscal year 1963 involved studies of spectra and light intensities of astronomical sources. The vacuum spectrograph attached to the solar telescope was used to make experimental photographs of solar spectra and of sunspot velocity fields. The solar telescope was used to photograph stars, planets, the moon, and the sun.

The 36-inch telescope was especially in demand by visitors for photoelectric photometry studies of the intensity of various light sources. In addition, it was used to make infrared scans of the planets and brighter stars and to obtain spectra of galaxies in the visual red region.

During the past year, substantial progress was made in the space program to obtain astronomical information from above the earth's atmosphere. Included was the firing of an Aerobee rocket equipped with a spectrometer to measure dayglow in the upper atmosphere. The rocket was launched from the White Sands Missile Range in April 1963, with the cooperation of the Naval Research Laboratory. In the future, it is hoped to be able to use space vehicles in conjuction with ground-based techniques in the study of zodiacal light and the atmosphere of the planets.

Other programs of current research include studies of airglow, the eerie glow in the night sky that limits the observation of faint stars. Astronomers are interested in finding out what causes this glow in the atmosphere and in measuring its brightness and variation with respect to sun spot activity and time of day. Another study is investigating the various disturbances in seeing with the telescopes on Kitt Peak, such as the microthermal fluctuations in the atmosphere and air currents close to the ground. One goal of this program is to determine the optimum design and location of the proposed 150-inch stellar telescope.

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Cerro Tololo Inter-American Observatory

A Foundation-supported search for a suitable location for an astronomical observing station in the Southern Hemisphere culminated early this year in the selection of a 7,400-foot mountain in northern Chile. Named Cerro Tololo, the mountain is located in the La Serena-Vicuna area about 300 miles north of Santiago. The site offers exceptionally fine observing conditions because of its altitude and extremely dry climate. The observatory to be constructed there will be accessible to U.S. astronomers on the same basis as the facilities on Kitt Peak.

Although the major portion of the observing time will be allotted to U.S. astronomers, Latin Americans will be encouraged to use the facilities of the Observatory. When completed, a 60-inch reflecting telescope of the most modern design and a 36-inch reflector identical to an existing telescope at Kitt Peak will enable astronomers to study such objects as the southern part of the Milky Way and the two nearest external galaxies (the Magellanic Clouds). These and other important astronomical objects cannot be observed from the Northern Hemisphere.

The major effort during the past year was the construction of a 14-mile road linking the observatory site with the nearest existing road. Construction is 30 percent complete, and the road should be finished this winter. Other funds were used for the development of an adequate water supply and other utility systems and for the purchase of basic equipment for a diesel generating system.

Following site survey work completed early in the year, actual astronomical research began on Tololo using one of Kitt Peak's two 16-inch reflecting telescopes. A program of photoelectric photometry designed to measure the intensity of various celestial light sources has been carried out. Excellent viewing conditions were reported with clear skies on 90 percent of the nights and with seeing very good most of the time.

Dr. Jurgen Stock, who conducted the site survey, has been appointed Director of the Cerro Tololo Observatory.

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National Center for Atmospheric Research

Established in 1960 at Boulder, Colorado, the National Center for Atmospheric Research seeks to advance basic knowledge in the atmospheric sciences through fundamental research programs and through major facilities developments designed to assist and extend the research and educational programs of universities and other research organizations. It makes possible an interdisciplinary effort on a scale beyond the means of any single university department.

NCAR operates two laboratories—the Laboratory of Atmospheric Sciences and the High Altitude Observatory—and a Facilities Division.

The Laboratory of Atmospheric Sciences is primarily concerned with studies of the terrestrial atmosphere below the levels of the ionosphere. These studies all relate to the development of a fundamental and quantitative theory of the general circulation and long-term climatic change. The problems range across atmospheric dynamics, chemistry, radiation physics, cloud physics, and the theory of turbulent exchange of heat, momentum, and energy.

By carefully observing the many phsyical processes that combine to make up the total behavior of the atmosphere, the center hopes to gain enough basic atmospheric knowledge to devise a mathematical model which simulates climate and weather phenomena. Such a model when perfected might make it possible to improve weather prediction all over the world. Also, using a simulated atmosphere, the total effect of various weather modification experiments could be tested to determine both their effectiveness for the region intended and possible harmful repercussions elsewhere. Currently, scientists at the Laboratory of Atmospheric Sciences are studying the physico-chemical reactions involved in silver iodide cloud-seeding experiments to produce rain, and are conducting theoretical studies of such matters, as propagation of seeding effects, fall rate of concentrated layers of meteoric dusts, development of a qualitative picture of the vertical and radial circulation of intense vortices, and stability and propagation of internal gravity waves.

In contrast, the High Altitude Observatory is dedicated to solar physics, planetary studies, and investigations of solar-terrestrial relationships. One current research program is designed to obtain improved photographic observations of the corona of the sun. Because dust in the atmosphere scatters light from the sun and smears fine details otherwise attainable by telescope, a group of scientists at the High Altitude Observatory send balloon-borne coronographs into the relatively "clean" upper atmosphere. Balloon flights in 1960 revealed that the earth is accompanied by a dust halo as it revolves about the sun. Knowledge gained about balloon observation techniques and capabilities was applied to an improved series of flights during the summer of 1963. A network of 10 simple eclipse telescopes for solar atmospheric motion studies was in operation during the total solar eclipse of July 1963.

Another atmospheric scientist of the High Altitude Observatory recently proposed a new theory to explain the origin of unusual radio emissions from Jupiter. For a full description of his findings, see page 41.

The Facilities Division is organized to develop plans for, establish, and operate national facilities required to meet those research needs in the atmospheric sciences which are clearly expressed by the university and associated scientific community. One such national facility is the Scientific Balloon Flight Station, located in Palestine, Texas, now in operation as a permanent balloon launching site. It is concerned with all technical aspects of scientific ballooning, including balloon development; command and control systems; tracking, launching, and recovery techniques; and safety devices. The results of the Stratoscope II flight which represents the largest flight yet staged at the station are discussed on page 39.

Personnel of the Facilities Division, in conjunction with scientists from the laboratories described previously, are available to serve as the nucleus of planning groups for coordinating the planning and operation of large-scale research programs required because of the global nature of atmospheric problems.

The detailed design plans for the construction of a permanent facility on Table Mountain just outside of Boulder are almost complete. A contract has been let for the construction of a road to the top of the mountain and for providing a permanent water supply.

RESEARCH FACILITIES

Graduate-Level Research Facilities

A very high proportion of the Nation's basic scientific research is performed in the graduate laboratories of our universities. These laboratories are used by faculty members, research associates, and graduate and postdoctoral students working on theses or other independent projects. The increasing amount of scientific activity and research training, much of it supported by the Federal Government, makes it essential that these laboratories be maintained at the highest possible level of productivity, so that there is no waste of scientific talent or of laboratory facilities.

Unfortunately, graduate-level research facilities in the United States are by and large marked by obsolescent equipment, obsolete buildings, and critically overcrowded laboratories. The vast amount of research, the fast pace of technological progress, and the increasing numbers of graduate students, have caused available facilities to be stretched far beyond a reasonable capacity. With the financial resources of our colleges and universities taxed to the utmost to take care of rising costs of the overall educational program, few institutions can undertake expansion of their graduate laboratories.

Consequently the Foundation in 1961 instituted a program to ameliorate the situation by offering support on a matching basis to institutions of higher learning so that they can carry out, at least in a limited fashion, some of the necessary renovation and expansion of these facilities.

University departments offering at least a master's degree in science were eligible to apply for support, if they could provide from non-Federal sources funds in amounts at least equalling those granted by the Foundation. General-purpose laboratory equipment could be included up to 10 percent of construction costs.

For fiscal year 1963, 142 grants totaling $29 million were awarded for graduate level research facilities. Amounts requested were greater in the physical sciences than in the life or social sciences. Of interest is the fact that there was a significant increase in the number of proposals received in the social sciences.

Although grants were almost equally divided in numbers between those for renovation (69) and those for new construction (73), in terms of dollars new construction accounted for 86 percent of the total.

Grants ranged from $2,100 for remodeling facilities for forest research to $1.6 million for an addition to an existing chemistry building. Representative grants include those for construction of new research facilities for electron microscopy and of research laboratories for a new Emperor tandem Van de Graaff accelerator, also those for remodeling of existing facilities to provide a small astronomical instrument laboratory and a laboratory for physiological psychology.

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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.

This specialized facilities program provides support for: (1) construction, renovation, and improvement of research facilities for inland field stations, marine biological laboratories, and private, nonprofit research institutions; (2) improvement of facilities for maintaining research materials, including museum research collections and other special materials such as microorganism collections; (3) development of new facilities, including unique designs of existing types of facilities such as large controlled-environment laboratories, cytostats for mass tissue culture work, and other new departures.

Twenty-eight grants totaling $3.5 million were awarded during 1963 in this program. The following are examples of the awards made. A grant was made to Indiana University to assist in the establishment of a new field station at Crooked Lake. NSF support provides funds for a 5,000-square-foot laboratory and a small storage building for boats and heavy equipment; university funds cover purchase of lake shore land and construction of dormitories, faculty housing, and a teaching laboratory. Limnological studies will constitute the primary emphasis of the station's research programs. Five other grants provided research facilities for field stations in southern California, Iowa, Texas, North Carolina, and the Canal Zone.

Grants to marine stations include one to the University of Hawaii for a small marine biology laboratory, another to the Cape Haze Marine Laboratory for a collecting boat, a renovation and facilities improvement grant to the Mt. Desert Island Biological Laboratory and a grant for an additional floor for a new marine physiology laboratory at Scripps Institution of Oceanography.

A major grant was made to the Chicago Natural History Museum to effect an increase of storage space for research collections in entomology and invertebrate paleontology. Another sizable grant was made to the Bishop Museum in Hawaii for construction of a 13,000-square foot entomology building to house the collections and research activities of this institution's comprehensive Pan-Pacific entomological program.

A central bio-instrumentation development facility will result from a grant to the University of California, Los Angeles, the purpose of which is to replace and expand the functions of small departmental machine shops to provide custom designing of instruments in a laboratory setting.

Specialized Social Science Research Facilities

This program was instituted during the past year in recognition of the need of social scientists for research facilities. These needs differ somewhat from those of the physical and life scientists. Except for specialized application of computers, sound recording equipment, and other data collection devices, the social scientist requires little equipment. He does have great need for research space, facilities for storing collections and data, and specialized (often temporary or short-life) buildings to serve as field station headquarters. Archaeological and enthnological museums, for example, are almost all badly over-crowded. Storage space of specimen collections is extremely difficult to come by or if available practically inaccessible. In economic and sociological research, the growth of specialized research operations has put severe pressure on the work-space available which is needed for the storage of extensive data and the housing of the analyst teams who process them.

In fiscal year 1963, five grants totaling $160,000 were made. These included: two grants for field training stations—one in the United States for archaeological research and one in Pakistan for social anthropological field work; two grants for mobile laboratories that will facilitate the security of psychological test data on school children (one is being "tropicalized" for later field work in Africa), and one grant that will provide housing for a computer-based teaching laboratory where new techniques of teaching will be explored.

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Oceanographic Research Vessels and Facilities

The Foundation through this program provides assistance for some of the most urgently required additions to the Nation's facilities for basic oceanographic research, both physical and biological. This consisted in 1963 of support for the construction or conversion of ships and the construction or expansion of shore facilities. Fifteen grants, totaling $5.9 million, were awarded.

One of the vessels is the *Atlantis II* of Woods Hole Oceanographic Institution, the largest and most up-to-date oceanographic research vessel ever built for a U.S. institution. Her design was commenced in 1960, and she was launched in September 1962 and delivered in February 1963. The *Atlantis II* is 210 feet overall and displaces 2,300 tons.

On one of her early short cruises she was within 100 miles of the spot where the USS *Thresher* disappeared in April 1963, and at the urgent request of the U.S. Navy was diverted from her scientific operation to take an active part in the initial search for the missing submarine. Following her release from that duty, the *Atlantis II* made a geophysical cruise to Puerto Rico to study the area for possible location of the site of the Mohole. Shortly after the first of July she sailed for the Indian Ocean,to carry out studies in the Arabian Sea as part of the International Indian Ocean Expedition.

Also in the 1963 fiscal year Stanford University's motor sailer *Te Vega* was converted for use as a biological research vessel and is now participating in the International Indian Ocean Expedition.

Another new vessel is a 100-foot catamaran to be built for The Johns Hopkins University. The catamaran principle—two long, narrow hulls joined by a rigid deck structure—has certain advantages for a research vessel. The long, narrow hulls have considerably less wave-making resistance than a single conventional hull of the same total displacement, and hence they permit much greater speed to be obtained for a given installed horsepower. At the same time, the double hull provides much more stability than a single hull—pendulum roll is eliminated, and the vessel merely adjusts itself to the slope of the sea surface. In the usual research vessel, deck space on which to conduct over-the-side operations is generally at a premium. In a catamaran, however, deck space is maximized and the separate hulls offer the possibility for the scientists to lower their gear through a hatch in the deck between the hulls, thereby facilitating many of their operations.

Since most of the program of the Chesapeake Bay Institute of The Johns Hopkins University is carried out within the sheltered waters of Chesapeake Bay, and much of it involves the necessity of taking quasi-synoptic observations up and down long estuaries, the speed and seaworthiness characteristics of the catamaran are particularly adapted to the needs of that organization. At the same time, the vessel's performance can be observed in the open sea outside the Virginia Capes and a thorough evaluation of the suitability of the catamaran design for adoption in ocean-going research vessels can be obtained.

Additional funds were provided to Duke University and a contract awarded by that institution for construction of a new 117-foot biological oceanographic vessel. Completion of the vessel is anticipated by early summer of 1964.

Among the shore facilities for which support was provided was a $1,400,000 grant to expand oceanographic facilities at the University of Washington. The University of California received funds for the construction of the research laboratory portion of a new marine biological station to be situated at Bodega Bay, north of San Francisco.

University Computing Facilities

Computers have become increasingly more useful and essential for research and training in virtually every scientific field. Their use makes possible solution of problems which because of their complexity and magnitude were previously considered insoluble.

The great need of universities for computer facilities compared with the high cost of acquisition makes it essential that the Foundation provide substantial assistance in this area. Consequently, a program to furnish computing facilities was introduced, with the purpose of providing for the needs of the institution as a whole rather than for one project or one department.

Of interest is the pattern that has emerged in the development of computer facilities at those universities with strong research programs. Once an institution has gained experience from a small machine, a full-time, three-shift operation has normally resulted in about a year and a half. The capacity of the computer is thus increased through acquisition of peripheral equipment. This is followed by acquisition of a computer of intermediate or large size. Eventually this system may be replaced by a very large computer. Currently a few universities have outgrown even these machines and are planning the construction of giant computing systems. Since none are commercially available, the cost of such systems may be as much as $20 million each.

This growth pattern is characteristic of computation centers which are very successful in serving the research activities of their institutions. It is not unusual, therefore, for the Foundation to receive and give favorable consideration for a proposal for assistance in acquiring a large computer for an institution which a few years earlier had received a grant for a smaller machine.

Because of the magnitude of the need, the Foundation has been able to provide only limited support. In some few cases institutions have been required to provide as much as two-thirds of the purchase price from a non-Federal source.

A requirement of the Foundation is that the computers to be acquired or rented must be high speed and of advanced design for use in basic research and available to all departments of the university.

In fiscal year 1963, 13 grants were made at a cost of $4,980,000.

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University Nuclear Research Facilities

Nuclear structure physics is a major field of research, presently accounting for about 25 percent of the doctoral dissertations in physics.

The National Science Foundation has played an increasingly significant role in the support of this research. In 1961–62, at the request of NSF, a panel of experts in theoretical and experimental nuclear structure physics made a detailed study of this field—to identify trends, describe the frontiers of research, and estimate present and future needs for equipment and operating funds. The panel report, *Research Trends 1962–1967: Nuclear Structure Physics,* was published in January 1963. It pointed out that recent developments in instrumentation, experimental results, and theory have caused a renewed interest in this field; it also stressed the fact that a major laboratory retooling would be necessary if effective use of manpower was to be achieved and the rare opportunity presented by these new developments fully exploited.

Even before the report was published the interest among university scientists was reflected in a surge of excellent proposals for the purchase and use of new types of accelerators and vastly improved terminal instrumentation. In response to this situation, the NSF expanded its university nuclear research facilities program to include accelerators and other auxiliary equipment for nuclear structure research.

Including fiscal year 1963, grants totaling $15.4 million have been made to eleven universities in partial support of modern accelerator facilities for nuclear structure physics. It is expected that efficient utilization of these facilities, upon their completion, will require an increase of approximately $2.6 million in the annual research operating cost at these universities.

This program also provides facility support for other nuclear research facilities at universities, such as research reactors for nuclear engineering. During fiscal year 1963, NSF made seven grants for accelerators and related equipment and one for a research reactor, for a total of $8,500,000. Under the program NSF provided third stages for each of two multistage electrostatic accelerators (with total energies of 21 MeV and 18 MeV, respectively), a 20-MeV, 2-stage electrostatic accelerator, a 50-MeV variable-energy cyclotron, and a 5.5-MeV electrostatic accelerator. In addition, grants were made to two universities to purchase auxiliary equipment for accelerator facilities, including one for which the university provided funds for the initial purchase of the machine. The research reactor grant was made in order to permit the purchase of a more powerful and improved reactor than the one for which funds were previously made available.

The provision of these facilities will help the United States in maintaining its position of leadership in the important field of nuclear research.

University Atmospheric Research Facilities

In keeping with the acceleration of the Nation's research effort in the atmospheric sciences, the number of major university departments engaged in such research has doubled in the past 3 years from 15 to about 30. However, there has been no substantial increase in the availability of facilities.

Most investigations of atmospheric processes, a recent report by the National Academy of Sciences emphasizes, require an outdoor laboratory equipped with batteries of electronic measuring and recording devices, and other observational and analytical instruments. Such installations are costly and the training of personnel capable of staffing and utilizing such a large-scale workbench is a lengthy process.

The Foundation has, therefore, established during 1963 a program of support to universities to enable them to acquire the necessary facilities for field and laboratory research in atmospheric sciences.

In 1963, five grants were made at a cost of $750,000 for such facilities and equipment. Illustrative of these grants is one for a field station to provide coordinated optical and electrical observation of lightning, and another for equipping a meteorological and hydrodynamics laboratory.

FISCAL ANALYSIS OF RESEARCH PROGRAMS

A total of 2,572 grants were made in support of basic research in the 1963 fiscal year and were awarded to 368 institutions throughout the United States and its possessions. Funds for research activities amounted to $194 million—$117 million for research grants, $53 million for facilities, $14.5 million for national research centers, and $9.5 million for the Indian Ocean Expedition, Project Mohole, International Year of the Quiet Sun, U.S.-Japan Cooperative Science Program.

Research grants in 1963 averaged $42,239 for a 2-year period. In the mathematical, physical, and engineering sciences, grants averaged $49,175; in the social sciences, $40,232; and in the biological and medical sciences, $34,362.

The accompanying table summarizes the research grant program by subject categories. A detailed listing of grants showing institutions, principal investigator(s), title of project, duration and amount is given in appendix C.

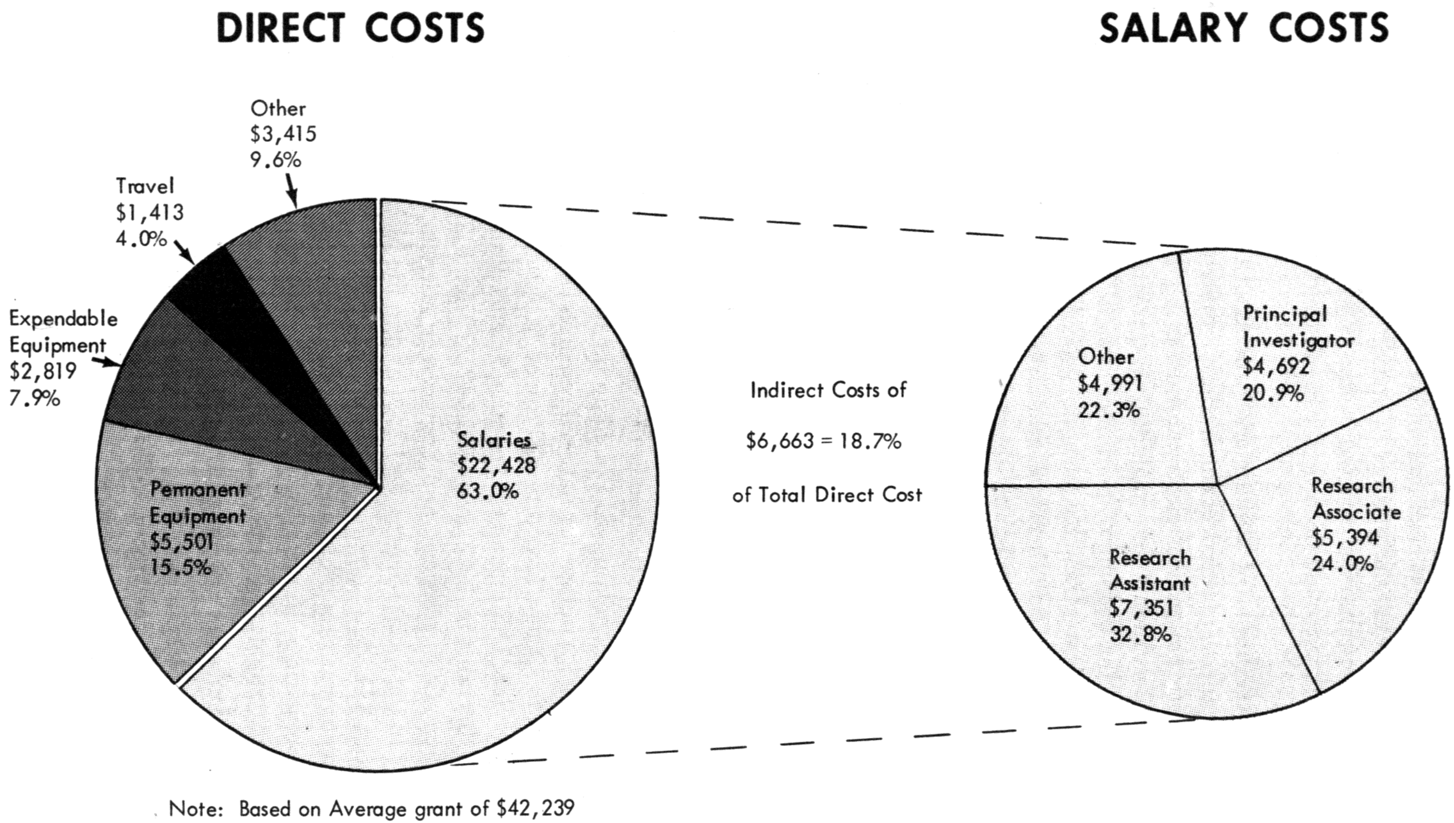

Figure 1. ***Distribution of Research Grant Funds, by Type of Expenditure, Fiscal Year 1963.***

To learn how plants adapt to vastly different environments, botanists at the White Mountain Research Center in California are conducting field studies of vegetation ranging from lichens to the extremely ancient bristlecone pines shown here. This is accomplished through analysis of plant respiration and metabolism while controlling temperature and light. Mounted on the tree is a temperature-controlled respiration chamber which, in conjunction with a gas analyzer, is being used to measure carbon dioxide metabolism.

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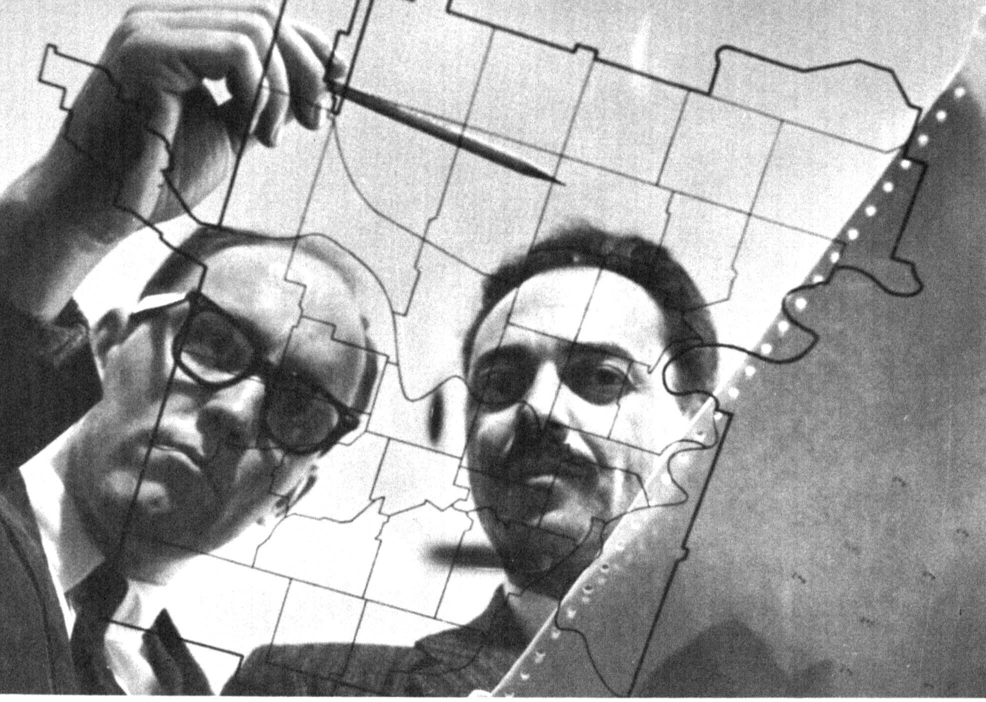
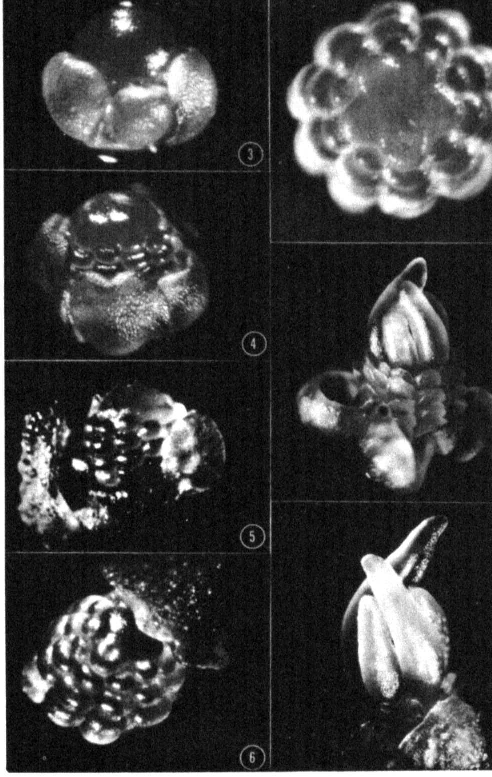


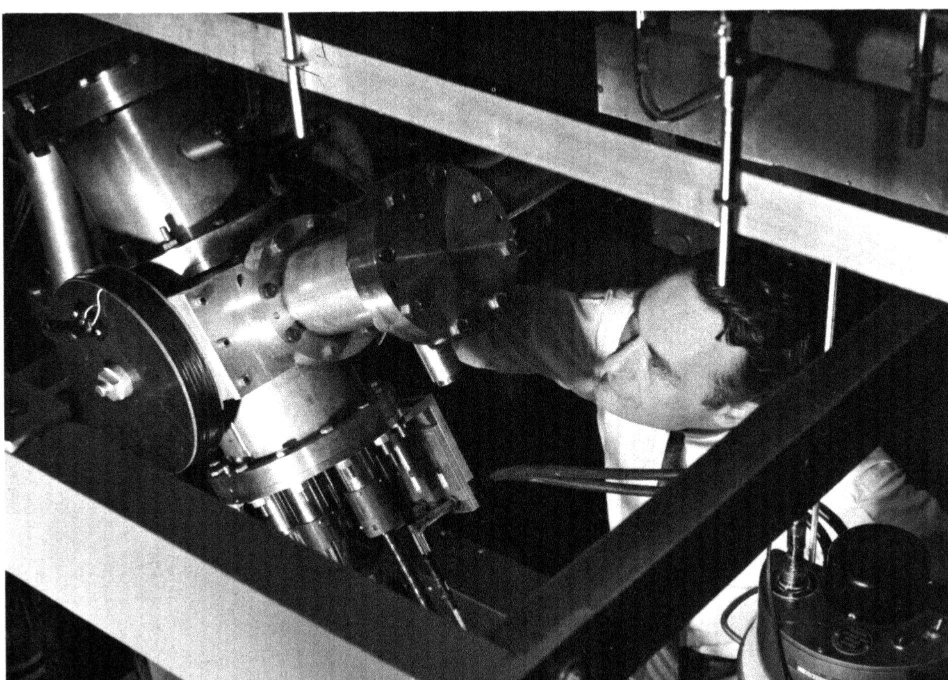
A new electronic mapping technique, developed at the University of Washington, is now being used in an urban renewal study in Spokane. Through the new technique, a computer prints out a given arrangement of land use factors on paper. When the paper is placed under an acetate outline map, the factors fit relative locations on the map.

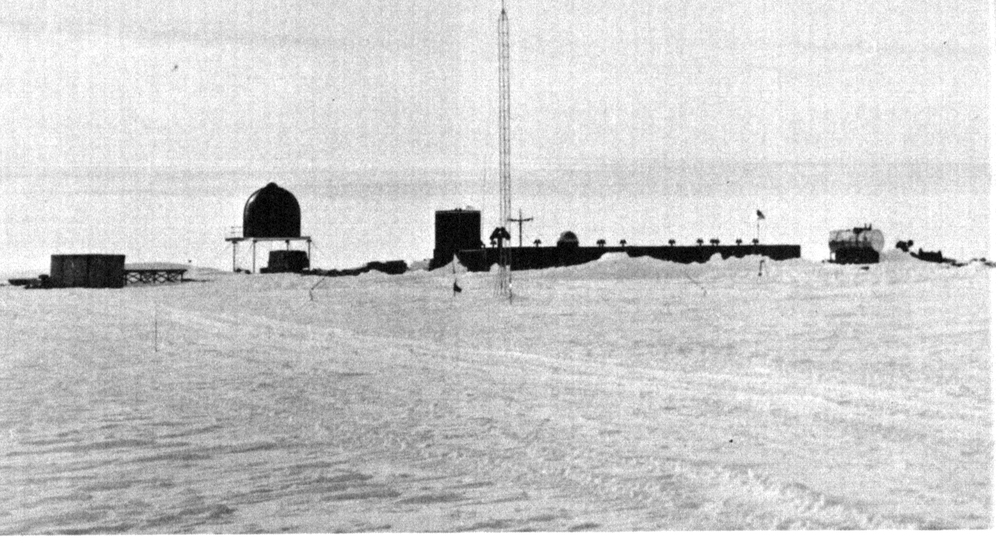
The flask of light-emitting bacteria being examined by a University of Georgia investigator is indicative of the increasing interest of scientists in bioluminescence, the production of light by living organisms. The study of bioluminescence is leading to a better understanding of energy transfer in biological systems.

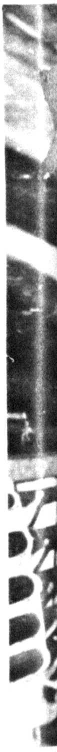


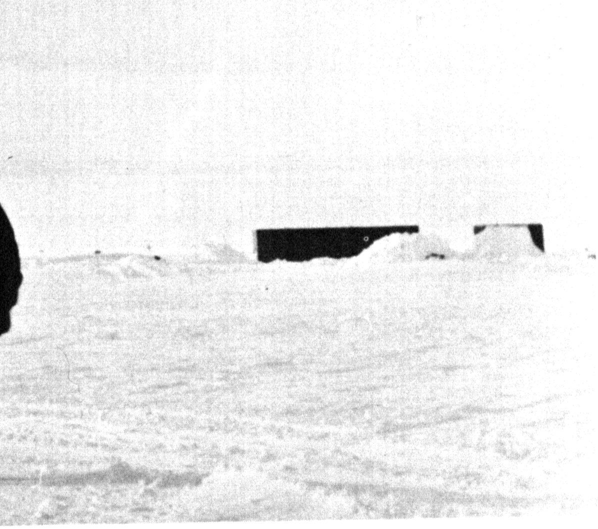
At the University of Oregon, success in growing tiny floral buds on a newly developed culture medium has provided scientists with a means of studying the mechanisms which control development and differentiation of floral structures. Figures 3, 4, and 7 show buds at various growth stages when placed in culture. Later growth, with development of various organs, is shown in figures 5, 6, 8, and 9.

Modern research in chemistry utilizes instruments which increase the speed and accuracy of measurements as well as make possible experiments not possible before. This University of Florida chemist operates a high resolution mass spectrometer in his study of reactions between ions and molecules. New ions resulting from such reactions are sorted out and identified with the aid of electric and magnetic fields.

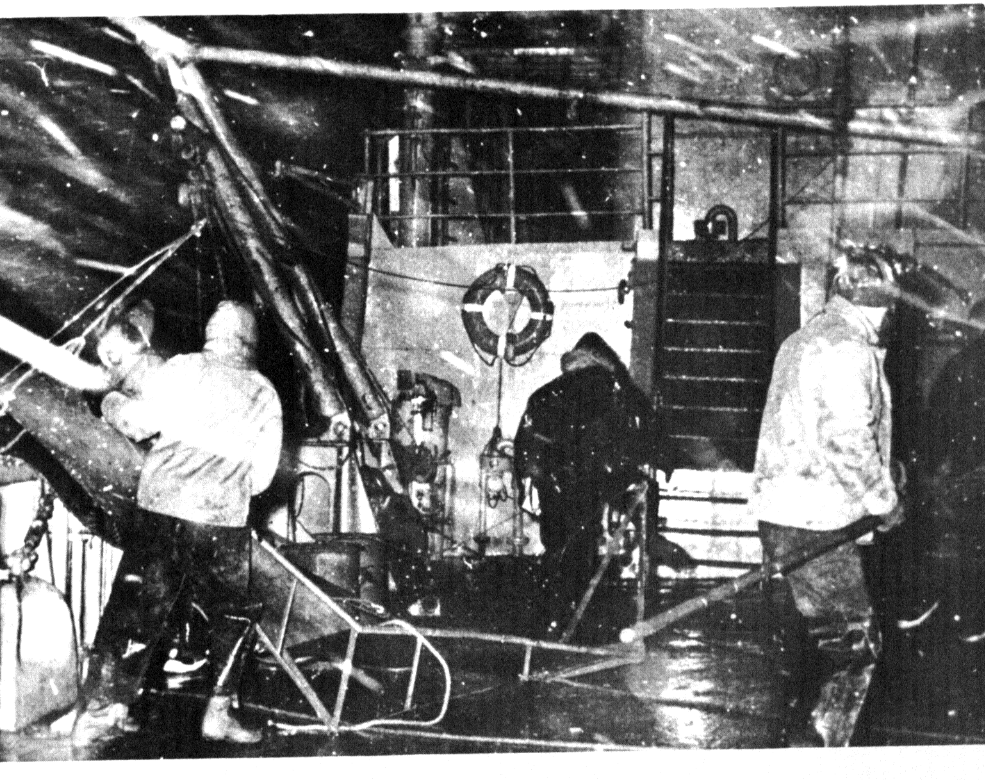




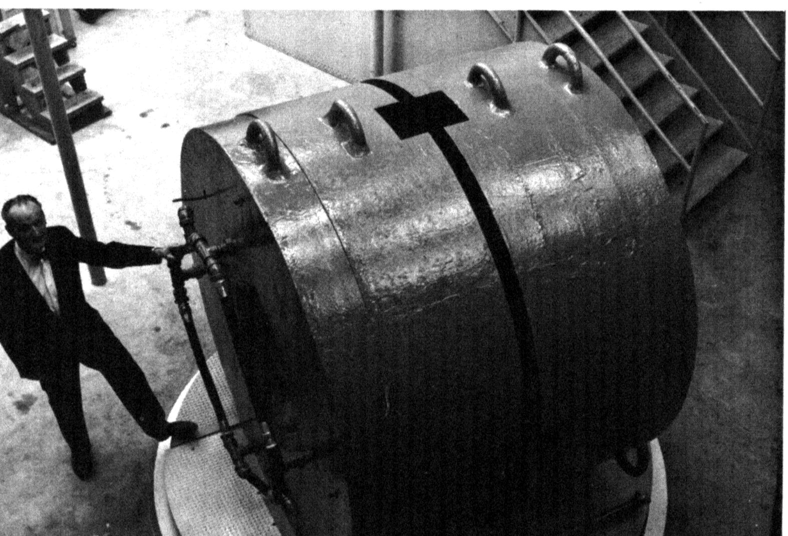


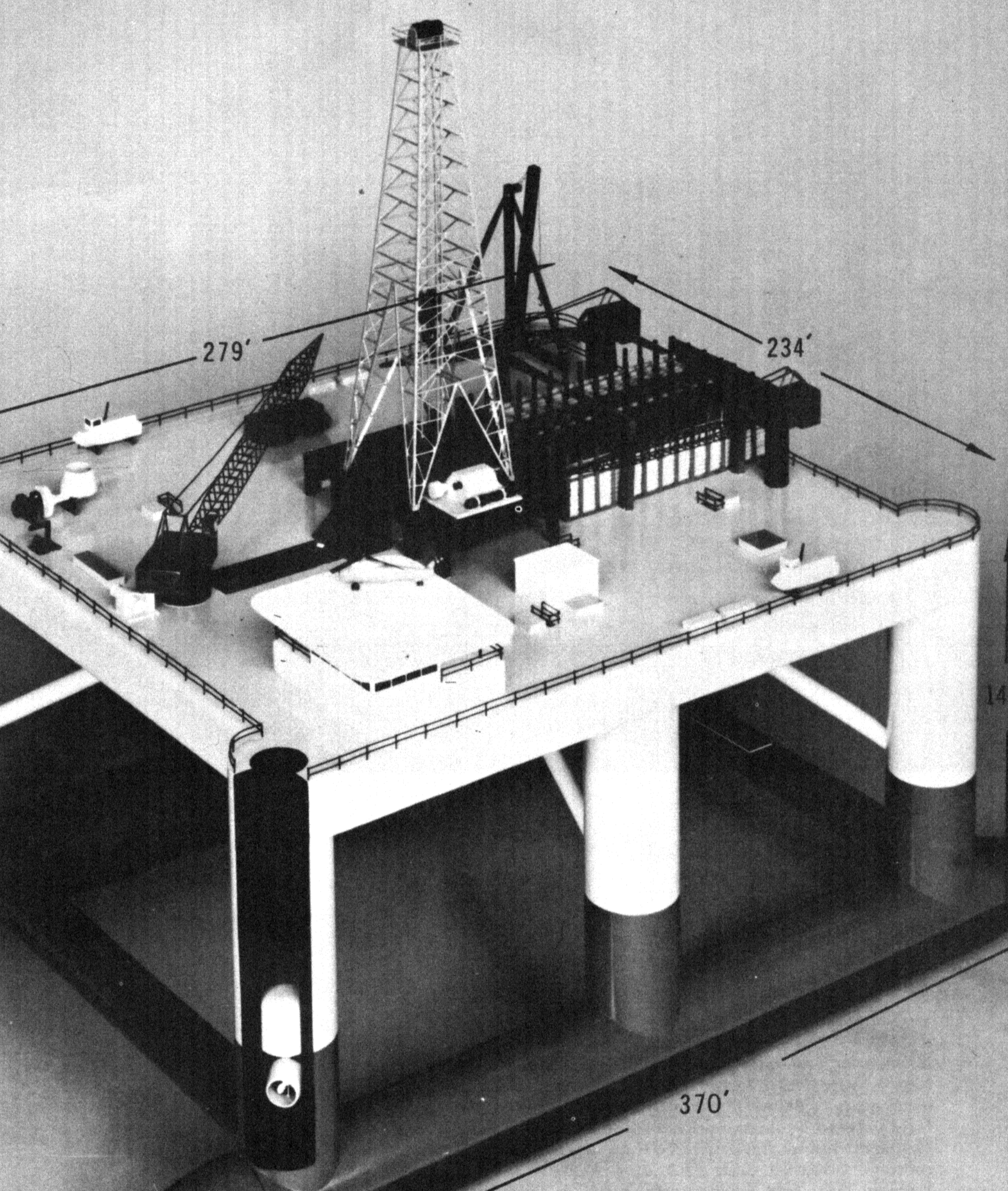


U.S. scientists, with the support of the Foundation, are probing nature's secrets on a broad front. At cold, windswept Eights Station, above, a new U.S. Antarctic Research Program facility established in 1962–63, scientists are conducting studies in upper atmosphere physics. They will take part in the International Years of the Quiet Sun program to begin early in 1964. Below, scientists aboard the research vessel *Eltanin* fight heaving decks, darkness, and a blizzard to haul in a trawl during a cruise in Antarctic waters. Below, left, in a warmer climate biologists aboard the *Anton Bruun*, U.S. research vessel taking part in the International Indian Ocean Expedition, sort specimens brought aboard by net.



Radio astronomers will have available the most accurate radio telescope of its type in the world when this instrument is completed at the National Radio Astronomy Observatory, Green Bank, W. Va., in 1965. The massive aluminum girders are part of the rigid, 2,500-ton, fully steerable 140-foot antenna which will detect radio emissions from sources deep in space. Below, the intense magnetic field developed by this 45-ton iron-core electromagnet at Ohio State University helps produce temperatures near absolute zero (—460° F.). These temperatures are necessary for the study of superconducting metals—metals which offer no resistance to electric current at extremely low temperatures.





Designed to ensure maximum stability and optimum positioning capability, this drilling platform is being considered for use in carrying out Project Mohole. The upper hull, or platform, has three decks and contains all machinery, living quarters, laboratories, and drilling equipment. The two lower hulls are used for storing food, drilling mud, and ballast. For drilling, the columns are partially flooded and the lower hulls submerged to increase the vessel's draft.

STRATOSCOPE II, Princeton's 36-inch balloon-borne telescope, during balloon inflation prior to the highly successful infrared study of Jupiter and red giant stars. Below is an artist's conception of the fully inflated balloons and telescope at 78,000 feet. The small launch balloon is 75 feet in diameter and contains 300,000 cubic feet of helium; the large balloon, 230 feet in diameter, holds 5.25 million cubic feet. The total weight being lifted is 13,250 pounds with the telescope weighing 6,800 pounds. See page 39.

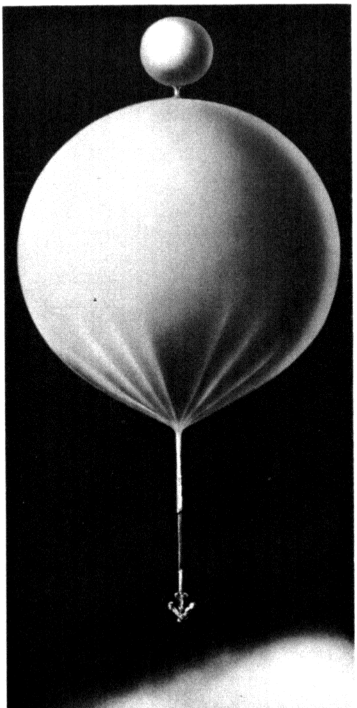


Table 1.—*National Science Foundation Research Grants, by Fields of Science, Fiscal Year 1963*

Field	Number	Amount
Biological and medical sciences:		
Developmental biology	104	$3, 982, 900
Environmental biology	156	4, 693, 900
Genetic biology	85	3, 784, 640
Metabolic biology	121	4, 485, 060
Molecular biology	164	7, 944, 225
Psychobiology	114	3, 282, 500
Regulatory biology	146	5, 149, 300
Systematic biology	208	3, 891, 222
General biology	12	938, 950
Subtotal	1, 110	38, 152, 697
Mathematical, physical, and engineering sciences:		
Astronomy	69	3, 701, 769
Atmospheric sciences (including weather modification)	72	7, 497, 710
Chemistry	238	9, 482, 440
Earth sciences	221	10, 227, 397
Engineering sciences	289	11, 973, 980
Mathematical sciences	242	9, 953, 450
Physics	194	12, 817, 250
Subtotal	1, 325	65, 653, 996
Social sciences:		
Anthropological sciences	94	2, 654, 750
Economic sciences	36	2, 211, 100
History and philosophy of science	29	451, 600
Sociological sciences	64	3, 660, 975
Subtotal	223	8, 978, 425
Antarctic research (life and physical sciences)	57	4, 428, 092
Total	2, 714	117, 213, 210

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INSTITUTIONAL GRANTS

The Institutional Grants for Science Program provides colleges and universities with funds which they may use freely for a variety of scientific purposes. Thus, whereas most Foundation programs support specific, well-defined activities, Institutional Grants may be employed by colleges and universities to offset imbalances or distortions in their science programs, extend or build excellence in self-chosen areas of specialization, or plan and develop new scientific activities. Designed to respect and sustain institutional integrity, the grants afford modest but effectual support for the reaching of goals in science set by the institutions themselves. The grants are "institutional" in a broad sense: the chief administrative and academic officers of the recipient institutions may determine how the funds shall be applied. They are required to use the funds only for science, not for other purposes or for indirect costs, and to report annually on the uses made of the grants.

When the program began in fiscal year 1961, it was intended especially to enhance the research capabilities of colleges and universities already receiving research grants from the Foundation. The flexibility of use of Institutional Grant funds, however, enabled recipient institutions to apply them to instruction in the sciences as well as to research. Reports on the uses of the first year's Institutional Grants show that in many institutions needs in research and education are inseparable and that advancement in one of the two areas may foster comparable advancement in the other.

Since Institutional Grants furnished an ideal way of promoting total institutional advancement in science—both in research and instruction—and the healthy stimulation each gives to the other, an important change was made in the program in fiscal year 1963. In addition to research grants, two programs in science education—Undergraduate Science Education and Research Participation for College Teachers—were added to the base from which Institutional Grants were computed. In this way, the grants reflected the Foundation's desire to encourage high-quality instruction in the sciences as well as high-quality research and to bolster the effort of certain institutions to increase the supply of highly trained scientific manpower. This broadening of the Institutional Grants base brought into the program for the first time a number of undergraduate colleges that have particularly emphasized education in science rather than faculty research. At the same time, of course, the extension of the program to these additional institutions furnished them with resources to encourage scientific research by their faculties.

Annual reports on the grants made in 1961 show a variety of uses. Among these were: the awarding of small research grants, particularly to young, new faculty members; the purchase of scientific equipment for research or instruction or both; the expansion of scientific libraries; the extension of research opportunities for both graduate and undergraduate students; the inauguration of new areas in science curricula and of new doctoral programs; the payment of honoraria to distinguished visiting scientists; the establishment or enlargement of computer facilities; and the development of cooperative activities in science among neighboring institutions.

In 1963, Institutional Grants totaling $7.6 million were awarded to 397 institutions.

As in the first 2 years of the program, Institutional Grants were computed by formula. In 1963, the formula was as follows: 100 percent of the base to $10,000, 10 percent from $10,000 to $100,000, and 5 percent thereafter to a maximum of $75,000. Twenty-two institutions received maximum grants. Over two-thirds (284) of the grants were for $10,000 or more, and over one-fourth (110) were for $20,000 or more. The 397 institutions receiving grants included colleges and universities in all 50 States, the District of Columbia, and Puerto Rico.

EDUCATION IN THE SCIENCES

Over the period of its existence, the Division of Scientific Personnel and Education has evolved a number of programs under which support is granted to scientists for projects designed to effect favorable changes in the processes of education in the sciences. Some of these programs are intentionally still small and experimental; some have been terminated; some have become impressive in size. One of the things that has been learned is that although small-scale experimental programs are very important in assaying the potential of new programs, they do not themselves initiate massive change. Massive change is effected only by a relatively comprehensive approach. This is not to say, however, that a program must be large enough to involve directly every relevant individual or institution in order to create effects that are felt by virtually all individuals or institutions. Rather, given an adequate magnitude—and this magnitude is never precisely measurable—a chain reaction begins which greatly enlarges upon the stimulus.

It is now abundantly clear that the educational programs of the Foundation, most notably the teacher institutes and course content improvement projects, have succeeded in changing the overall aspect of education in the United States. The change affects far more than just science—and it is far from complete.

The change is simply a rebirth of the idea that rigor, scholarship, and intellectual content are important. It is becoming respectable to be a first-rate student or a well-informed teacher. Further, it has become respectable for the eminent scholars to concern themselves with educational matters at all levels. Because the National Science Foundation has a unique relationship with the scientific community, the Foundation's programs have given scientists the vehicle for constructive involvement with educational processes without the feeling of loss of integrity as scientists. Clearly, the Foundation is only one of the organizations influencing modifications in American educational philosophy and practice. But—through its actions rather than through pronouncements or exhortations—the Foundation has become quite possibly the most influential body in American education.

Activities of the Division of Scientific Personnel and Education during fiscal year 1963 further emphasized moving ahead in the improvement of science education in the Nation's schools and colleges. Noteworthy progress was made in the total improvement effort; more scientists and students of science received support for further training; a greater number of teachers of science, mathematics, and engineering—at all educational levels—were enabled to participate in NSF-supported institute programs; various special projects in science education were given new scope and direction; and course-content improvement activities were appreciably expanded. As emerging needs have been identified, the Foundation has pursued new approaches; as certain programs have fulfilled needs at the national level to the desired extent, support has been shifted to more critical training areas.

Progress in the development of course content materials in science and mathematics for the secondary school level has been most gratifying. By the fall of 1963 commercial versions of texts and auxiliary course materials developed by NSF-supported study groups will be available for the three sciences (biology, chemistry, and physics) generally taught in the Nation's high schools. In addition, a source book for geology and earth sciences has been published. Definitive versions of the mathematics texts, sponsored by the School Mathematics Study Group, are being published and distributed.

It is important to note that success in improving course content at the secondary school level has helped to identify urgent needs at the elementary and junior-high school level as well as the college level. Consequently, support for improvement efforts at these levels has been increased. Improvement of course materials for the social sciences also received increased support this year. In addition to the development of courses and instructional materials in anthropology and the behavioral sciences, some fundamental investigations into the learning process and a number of evaluation studies have been undertaken with Foundation support. Recognition of the usefulness of films for teaching science has increased and Foundation support for film and television presentations has been increased accordingly.

Again many more applications for NSF fellowships were received than could be supported. However, fellowship awards offered in fiscal year 1963 reached an all-time high of 5,092—an increase of 301 over the number offered last year. A new NSF fellowship program—Senior Foreign Scientist Fellowships—was inaugurated by the Foundation this year. The aim of this program is to bring to the United States those outstanding senior foreign scientists whose formal training or teaching and research experience qualifies them to make significant contributions to our graduate training. In its first year of operation the program offered 53 awards.

Training opportunities for teachers of science, mathematics, and engineering provided by NSF-supported institutes increased from 40,700 in fiscal year 1962 to 42,000 in fiscal year 1963. Some 900 institutes received support, most of them offering subject-matter training for secondary school teachers. However there was an increase in the number of college teachers and elementary school personnel participating.

Among the latest developments in teacher-training activities for which the Foundation provided small-scale support in 1963 were: an experiment which may indicate how elementary school teachers can most effectively be trained through the institute mechanism; the inauguration of in-service institutes for college teachers on an experimental basis; a slight expansion of institutes in certain of the social sciences; and the provision of more training opportunities for teachers who teach in technical institutes.

Greater attention was focused on testing new approaches in the special projects in science education area. The Cooperative College-School Science Program, which provides for close association between scientists from colleges and universities and teachers and students from the secondary school level, was given a new direction this year. Grants were made to ten colleges and universities to enable their scientists to work closely with secondary school officials of nearby school systems who desire to introduce one or more of the new NSF-supported science courses into the curriculum of their high schools. In the Undergraduate Instructional Scientific Equipment Program new guidelines for assisting colleges and universities with the purchase of instructional scientific equipment were developed.

COURSE CONTENT IMPROVEMENT PROGRAMS

The Course Content Improvement Program is designed to help bring scholarship of the highest order to the development of curricula, courses, and instructional materials that reflect contemporary scientific knowledge and points of view. Its concern is the improvement of subject-matter content and instructional materials for programs in science and mathematics in elementary and secondary schools and for courses in science, mathematics, and engineering in colleges and universities.

With the successful maturing of this initial curriculum improvement effort, which concentrated on the secondary school program, came increased support for the improvement of teaching of science at the elementary-junior high school level and at the college and university level.

It has become increasingly apparent that curriculum reform in the social sciences is lagging behind the efforts in the biological and physical sciences and in mathematics. Support for projects in anthropology and the behavioral sciences has been increasing; it is anticipated that this trend will continue and extend over the other areas in the social sciences. In addition to the development of courses and instructional materials in these fields, some fundamental investigations into the learning process and a number of evaluation studies are receiving support. Such projects are expected to be helpful in reinforcing the curriculum reform efforts.

Support for film and television presentations ranging from brief film clips on single topics to complete courses is being increased. This reflects a recognition of the usefulness of films—both for enhancing the effectiveness of teaching and for meeting the manpower shortage. The growing interest in programmed learning probably will lead to the initiation of a variety of significant projects in this area.

A rather striking development in the Course Content Improvement Programs has been the great interest shown by foreign countries in curriculum materials developed specifically for our schools. This country's willingness to share these newly developed course content materials with other nations has generated much good will toward the U.S. The works of a number of the major projects have been, or soon will be, translated and adapted for use in other countries; such efforts have been initiated by foreign scientists and educators and supported outside the Foundation. One desirable result of this development is the enlargement of the arena in which the improved course materials will be tried out; use of the texts, laboratory manuals, and films of several of the larger projects in a variety of educational frameworks and instructional processes should yield valuable information for future curriculum improvement efforts. Also, participation of foreign scientists in some of the study groups has demonstrated that international cooperation is useful not only for the cooperating country, but also provides to the U.S. effort able scientists who can make substantial contributions to the projects.

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Course Content Studies and Development

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. A combination of scientific rigor and pedagogical effectiveness is sought in the treatment of a given discipline or field in order to bring to students at all levels materials presenting accurately and lucidly current scientific knowledge. NSF support provides for curriculum study conferences, planning groups, and projects to design and develop courses and course sequences, including textbooks, laboratory equipment and procedures, demonstrations, supplementary readings, films and programmed materials, source and guide books for teachers, and other learning and teaching aids. School trial of materials and revisions often are part of the development process. The material thus produced and information about its use are made widely available to schools and colleges. However, the final material must make its way on its own merits and the decision as to its adoption is left entirely to the judgment of the local school systems.

Elementary and Junior High Schools

Four major endeavors received support for preparing materials in mathematics. The School Mathematics Study Group (SMSG), which has produced prototype texts and teachers' guides for grades 4–12, is continuing work on mathematics for the primary grades (K–3). At Stanford University, Professor Patrick Suppes is directing experimentation on new approaches to mathematics for grades K–6. Now that its high school books, prepared with support from sources other than the National Science Foundation, will soon be available commercially, the University of Illinois Committee on School Mathematics has embarked on the development of a mathematics program for grades 7–12 which will take cognizance of improved preparation of students in elementary schools. Under the aegis of Educational Services Incorporated (ESI), a group of eminent mathematicians is re-examining the whole problem of the structure and content of mathematics in relation to the needs and learning capabilities of students through the whole elementary-secondary curriculum.

The past 2 years have witnessed substantial beginnings on efforts that promise to have as great an impact on the teaching of science in pre-high school years as the work carried out since 1956 has had on the reform of high school science and mathematics. A continuing campaign to cope with broad problems in this domain and to stimulate and correlate specific projects is being conducted by the Commission on Science Education of the American Association for the Advancement of Science. Three groups already involve substantial numbers of scientists and teachers and large-scale support. Educational Services Incorporated received additional funds for broad experimentation on science content and materials for the first nine grades. At the University of Minnesota, Professor Paul C. Rosenbloom is leading an effort to devise an integrated curriculum in mathematics and science for grades

K–9. A new project has been launched at the University of Illinois to experiment with still different approaches to science for these grades, with particular attention to the development of a sequential curriculum. Somewhat more modest projects include the continuation of a program at the University of Illinois for developing materials based on astronomy for upper elementary grades; experimental projects at the University of Maryland and Utah State University, at Princeton University development of a junior high school course on fundamental physical principles as revealed by study of the earth; under the sponsorship of Florida State University, the planning of an approach to a junior high school curriculum by scientists and teachers in the Southeast States; and first work by ESI on a ninth-grade physical science course that will draw upon such senior high school materials as those developed by the Physical Science Study Committee and the Chemical Bond Approach Project.

Secondary Schools

Definitive versions of text and auxiliary materials, such as laboratory manuals and teachers' guides developed by three major NSF-supported projects will be available commercially by the fall of 1963: Chemical Bond Approach Project (CBAP), Biological Sciences Curriculum Study (BSCS)—three versions—and Chemical Education Material Study (CHEM Study). These texts and materials are in addition to the PSSC physics text and the SMSG books which are already available.

The School Mathematics Study Group received a grant to continue its work at the secondary-school level, including the development of calculus courses for high school use, preparation of additional mathematics monographs for students (10 have been published to date), continuation of long-term evaluation studies, exploration of interdisciplinary approaches, and production of auxiliary materials, including experimentation with programing. A vector geometry course for senior-high school use and selected topics concerned with the application of mathematics to the physical and life sciences are under development by the University of Illinois Committee on School Mathematics.

Physical Science Study Committee activities, under grants to Educational Services Incorporated, include revision of the teachers' guide, continued work on advanced topics for use in a third semester of high school physics or a combined 2-year course in physics-chemistry, production of a second battery of tests, and filming of additional topics for the acclaimed PSSC film series.

In chemistry, the Chemical Bond Approach Project received funds to complete the final version of text, laboratory manual, and teacher's guides; the Chemical Education Material Study was awarded a grant to continue the evaluation and testing of the project's course materials, to prepare text materials for publication, and to produce more CHEM Study films.

The Biological Sciences Curriculum Study has been granted additional funds to prepare final manuscripts of the three versions of text, a teacher's handbook, and seven laboratory blocks; to continue development of five additional blocks; to work on methods useful to teaching the less able students and on materials for gifted students; and for further evaluation studies.

Two major grants were made in the earth sciences and meteorology. The American Geological Institute will develop curriculum resources for increasingly popular earth-space courses in secondary schools with initial concentration on the ninth grade. The American Meteorological Society will produce educational monographs in atmospheric science.

A study on new curriculum materials in social sciences in elementary and secondary schools was initiated at Stanford University to identify areas where course development is needed and feasible.

Colleges and Universities

Approximately half the support for college and university level projects went to "nerve center" commissions, whose functions are to act as information groups and to stimulate and coordinate research in course content done by others. For example, the newly formed Committee on Undergraduate Education in the Biological Sciences will center attention on four areas: a thorough study of the advanced undergraduate curriculum, with special emphasis on organization of the substance of modern biology for instruction; the inclusion of proper work in cognate and supportive disciplines in programs for students majoring in biology; better approaches to preparing future teachers of high school and college biology; and the develoment of special opportunities for the study of biology by nonbiology students.

The Committee on the Undergraduate Program in Mathematics (CUPM) was awarded a supplementary grant for 2 years. This group, after developing curriculum recommendations and course outlines for various categories of undergraduates majoring in mathematics, has found the need for suitable courses for preservice mathematics training of elementary school teachers so urgent that it has undertaken to create sample text materials for several such courses. In addition, the Committee will continue to study curriculum needs in mathematics for students majoring in such fields as the physical, engineering, biological, management, and social sciences. It is also arranging summer seminars to meet the needs of college mathematics teachers and beginning a coordinated testing program of new courses developed by separate projects along the lines of CUPM recommendations.

The Commission on College Physics received NSF funds to continue its activities, which include a survey of on-going projects, the planning of a series of curricular conferences for undergraduate major programs in physics, a program for a series of instructional monographs, the production of materials to introduce modern physics developments in basic physics courses, projects for film production at the college level and for a continuing survey of instructional films, the development and testing of additional teaching aids such as laboratory kits, and the publication of Resource Letters devoted to typical physics course lecture or laboratory topics.

Additional funds were also granted to the Commission on Engineering Education to continue its work in identifying needs and initiating projects for the development of instructional materials, including supplementary teaching aids, and to further the upgrading of engineering faculties.

In addition to grants in support of the activities of coordinating groups, the Foundation made a number of grants for the development of specific courses and materials. Some of these are related to, or stimulated by, the commissions; others have arisen independently.

In engineering, several grants were made to improve laboratory programs and to develop prototype equipment and teaching aids, including programing, in the context of revised courses. Some studies are also under way to improve courses in newer areas of engineering, such as semiconductor electronics and materials science. Of particular interest are two grants made to the American Society for Engineering Education, one for a study of graduate education in engineering, the other for an analysis of the goals of undergraduate engineering. It is hoped that these projects will provide a far-reaching and effective new basis for needed reforms in engineering education.

Recent grants in mathematics have reflected the emphasis on undergraduate mathematics training of prospective teachers, a problem area of national dimensions. However, at least three projects initiated in fiscal year 1963 are concerned with other phases of undergraduate training: Professors R. C. Buck and J. Nohel at the University of Wisconsin will develop an experimental curriculum in engineering mathematics; Professor A. H. Diamond at Stevens Institute of Technology is working on an undergraduate course in mathematical logic; and a grant to the Mathematical Association of America includes funds for producing a filmed course with auxiliary programed material in calculus and analytic geometry, generally regarded to be the cornerstone of the undergraduate mathematics curriculum.

Most projects supported in physics are concentrating their efforts in two major spheres, the development of new approaches and materials for introductory college physics courses, and the improvement of demonstration apparatus and laboratory courses and equipment. For example, a group under the leadership of Professor Charles Kittel is creating a rigorous elementary course which will anticipate the better physics preparation students are now receiving in many high schools. A combined 2-year course in chemistry-physics is under development at Bryn Mawr College. In addition, supplementary grants to continue work on elementary college physics courses have been made to Massachusetts Institute of Technology and Washington University. The American Institute of Physics has established a center for educational apparatus in physics to provide information on apparatus development to colleges and coordinate efforts for improving physics instructional equipment.

Supplementary Teaching Aids

The purpose of this program is to provide support, through grants made to colleges, universities, and scientific and educational organizations, for the development of audiovisual aids, improved instructional apparatus for laboratory demonstration lectures, and other aids to learning. The program is divided into two categories: The Science Teaching Equipment Development Program (STEDP) and Educational Films and Television.

Science Teaching Equipment Development

This program, instituted in 1959, was set up to receive proposals for the design, construction, and testing of new equipment of potentially wide use in engineering, mathematics, and the sciences. Support is provided for released faculty time, for materials for the design and construction of the equipment, and for trial in classrooms. Grantees make their results available through publication in appropriate journals, through distribution of final reports, and by demonstrations and talks presented at scientific meetings. Commercial production is encouraged when practical.

Educational Films and Television

Projects in this category are intended to increase the effectiveness of teaching by bringing into the classroom certain phenomena not readily available through other means. These include presentations by outstanding teachers and scientists, films describing laboratory techniques, films to be used primarily for teacher-training purposes, and supplementary teaching aids to alleviate the shortage of adequately prepared teachers at all levels.

The following are examples of such projects in a variety of fields that have been supported by NSF. Grants were made to the Lamont Geological Observatory, Columbia University, for a series of films on the earth and sea to be made during oceanographic research expeditions, and to the American Meteorological Society to continue production of films in meteorology. Several film projects in the social sciences have received support; among the topics to be filmed are Eskimo art, sequences on the current excavations at Tehuacan Valley in Mexico and on the surrounding culture of the existing Mixtec Indians, and a continuation of an extensive effort to record for documentation and teaching purposes the vanishing arts, crafts, ceremonies, and rituals of the Indian cultures of western North America. A number of projects are concerned with capturing on film, for instructional purposes, phenomena exceptionally difficult to treat effectively in the usual classroom or laboratory situations. Among these are projects on low-temperature phenomena and certain topics in fluid mechanics, for example. An area of major emphasis is the in-service and pre-service mathematics training of elementary and secondary school teachers. Several projects which will produce both classroom demonstration and subject content training films were initiated to help meet a problem of national concern, the inadequate mathematics preparation of a majority of this Nation's school teachers.

INSTITUTE PROGRAMS

The Foundation's institute programs for teachers continued to be the largest Federal activity in direct support of education in the sciences. These institutes are designed to improve instruction in science, mathematics, and engineering through the support of group training. Approximately 900 institutes were supported, and about 97,000 individuals filed a total of some 250,000 applications for 42,000 available training opportunities.

Four types of institute programs were supported: (1) Summer Institutes which provide generally 4 to 12 weeks full-time study during the vacation period; (2) Academic Year Institutes, which provide full-time study during regular school sessions for a comparatively small number of teachers who take leaves of absence for a year; (3) In-Service Institutes which provide part-time study for teachers who are simultaneously holding full-time positions in the schools; and (4) College Conferences serving special needs for extending knowledge in specialized fields which are operated for periods of up to four weeks during times of the year best suited to the schedules of the college faculty members who participate.

Table 2.—Percentage of Teacher Population Attending Institutes by Teaching Level, 1963

Teaching level	Training opportunities	Teacher population	Percent participating
College:			
Academic year institutes	100		
Summer institutes	2, 100		
In-service institutes	75	110, 000	3. 0
Conferences	1, 025		
	3, 300		
Secondary school (grade 7–12):			
Academic year institutes	1, 750		
Summer institutes	21, 000		
In-service institutes	13, 550	180, 000	20. 2
	36, 300		
Elementary school:			
Summer institutes	1, 000		
In-service insitutes	1, 400	1, 100, 000	0. 2
	2, 400		
Total	42, 000		

The fiscal year 1963 institute programs remained primarily focused upon the subject-matter training deficiencies of high school science and mathematics teachers at approximately the same levels as those of the previous year. However, 38 percent more elementary school personnel and 6 percent more college teachers were supported than in 1962.

The remarkably broad impact of the programs should be noted. During this 1 year, it is estimated that 70 percent of the colleges and universities granting degrees in the sciences had at least one faculty member (the average was between two and three) who attended an institute; the institutes for secondary school teachers probably included teachers from an even larger proportion of the Nation's schools. Although few institutes for elementary school personnel could be supported, they were designed to have maximum effect by emphasizing the selection and training of subject-matter supervisors and "key" teachers from the elementary school systems.

Increased assistance was offered in fiscal year 1963 for teachers who seek advanced degrees, although it is still true that NSF institute programs predominantly support remedial or up-dating training for individuals whose subject-matter background is either insufficient or acquired too long ago. For example, approximately 8,000 of the 21,000 secondary school teachers who attended Summer Institutes were involved in sequential institutes through which many may ultimately obtain a master's degree. Similarly, approximately 40 percent of the 13,545 secondary teachers in In-Service Institutes were enrolled in sequential programs which have a similar objective. In addition, the Academic Year Institutes will enable approximately two-thirds of their 1,865 participants to earn advanced degrees. Thus, the NSF-supported institutes provide not only "refresher" and critically needed short-term training opportunities, but also a very considerable amount of training in depth. (Approximately 34 percent of the individuals who participated in institute training during the past year should ultimately obtain an advanced degree through the assistance of Foundation-supported institutes.)

Grants were made for institutes to be conducted at about 265 different educational institutions, located in all 50 States, Puerto Rico, and the District of Columbia. In addition, new institutes have been designed especially for teachers from Samoa and the Virgin Islands.

Academic Year Institutes

The Academic Year Institutes normally provide full-time year-long study opportunities for experienced secondary and/or college teachers. A typical institute of this type is attended by from 25 to 45 teachers. Frequently, an Academic Year Institute will be attended by both college and secondary school teachers, an intermingling which has often provided extra dividends, particularly when a few college "teachers of teachers" are involved.

During fiscal year 1963, 63 grants were made to support academic-year training for approximately 100 college teachers and 1,750 secondary school teachers.

The following are some of the new developments of special note that occurred within the Academic Year Institutes Program during fiscal year 1963:

(a) Seven institutes were offered in which recent college graduates were eligible to participate as "pre-service" teachers if they had completed all requirements for certification to teach secondary-school science or mathematics, even though they had no actual teaching experience or adequate subject-matter training. These experimental activities were supported so that their adaptability as programs for use in the original preparation of teachers at advanced levels could be studied.

(b) Eight institutes were offered in which secondary-school teachers of science and mathematics with extensive teaching experience were eligible for special training to prepare them for supervisory or consultant positions in these fields.

Summer Institutes

Summer Institutes were supported for teachers on all levels of the educational system in 1963, with those for secondary school teachers constituting the largest group. The number of individuals participating in such institutes varied considerably, but 50 participants and 7 weeks' full-time attendance were average. Since the institutes offer a single summer project, a participant most often attends a given institute for one summer only. However, it is possible for participants to attend "sequential" institutes at which a coherent program leading to a graduate degree may be followed in successive summers. The program may consist of courses in a single academic field or of related courses in several fields of science.

This year 523 grants were made to enable approximately 2,100 college teachers, 21,000 secondary school teachers, and 1,050 elementary school personnel to attend summer institutes.

It should also be noted that two potentially important experiments were supported during this year. One of these was a project in Vermont to test a promising new institute approach to training large numbers of elementary school teachers. The institute director selected key elementary school teachers from schools throughout the State to participate in a mathematics institute with the expectation that they will return to their schools in the fall and organize in-service programs during the school year for training other teachers under the overall supervision of the institute director. The other exploratory project that may have widespread usefulness in the future involved support for several summer institutes to familiarize subject-matter supervisors and curriculum directors with the major developments in course content improvement. The results expected from this kind of project are that key school officials will become more adequately acquainted with the objectives and potential of current courses and course materials and that the benefits of recent improvements will come to be more extensively and more promptly realized.

Table 3.—Distribution of Summer Institutes, by Field of Study, 1963

Field	Elementary school personnel	High school teachers	High school and college teachers	College teachers
Anthropology	....	1	....	2
Astronomy	1	2	....	....
Biology	4	53	1	6
Chemistry	2	28	1	8
Earth sciences	4	22	....	2
Economics	....	1	....	....
Engineering	....	....	....	14
History and philosophy of science	....	1	....	2
Mathematics	11	117	2	10
Physics	....	24	....	4
Psychology	....	2	....	1
Radiation biology	....	12	3	6
Radiation in physical science	....	4	1	12
Multiple fields and general science	11	148	....	....
Total	33	415	8	67

In-Service Institutes

In-Service Institutes offer instruction for secondary school teachers and elementary school personnel during the school year on a part-time basis, at times so chosen that these teachers may participate and still carry on their regularly scheduled classroom duties. A typical institute meets once a week for 3 hours, either during late afternoons, in the evenings, or on Saturdays, with part or all of some meetings devoted to laboratory or field work. These institutes provide an excellent opportunity for the sponsoring colleges and universities to be closely associated with nearby schools in the improvement of science and mathematics instruction. Although the In-Service Institute projects are locally oriented, they are not controlled by particular local school systems but by the sponsoring colleges. The In-Service Institute is an effective mechanism for the training or retraining of a large number of teachers at a low unit cost; it is adaptable to local situations; and it enables the teacher to put the training to immediate use.

During fiscal year 1963, grants were made to enable approximately 75 college teachers, 13,550 secondary school teachers, and 1,400 elementary school personnel to attend NSF In-Service Institutes. The average attendance at an In-Service Institute is about 50 teachers. The principal innovation in this program was the initiation of In-Service

Institutes for College Teachers. The projects for elementary school personnel were expanded to include about 450 more individuals than was possible during the previous year.

Conferences for College Teachers

Conferences for College Teachers consist of short-term training activities (less than 4 weeks' duration) that are most frequently conducted during the late summer, although they may be held at other appropriate times during the year. Their subject matter is usually specialized, being especially designed for well-qualified teachers who need to be brought up-to-date in some very recent developments in their fields or of some subdivision thereof. This program helps radiate new knowledge, particularly that resulting from the scientific research conducted by graduate schools, to those colleges which do not have graduate schools or to other institutions concerned with such recent developments. During fiscal year 1963, the Conferences program granted support for approximately 1,000 college teachers.

SPECIAL PROJECTS IN SCIENCE EDUCATION

Special Projects in Science Education is the organizational unit concerned primarily with the design, operation, and evaluation of new ideas in science education. Many of the projects involve the continuation of programs initiated on an experimental basis in previous years. Others may be best described as exploratory.

Four major program categories are administered under Special Projects in Science Education: Secondary School Programs, Undergraduate Science Education Programs, Advanced Science Education Programs, and Developmental Programs.

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Secondary School Programs

The basic objectives of the Secondary School Programs are to identify talented potential scientists, mathematicians, and engineers; to reinforce and stimulate their motivation toward pursuing careers in scientific fields; and to advance their scholarly development. A concomitant purpose is, through example and cooperation, to help improve methods of teaching science and mathematics in the secondary schools. These objectives are sought through the especially designed programs described herein.

Summer Science Training Program for Secondary School Students

This program provides opportunities for a limited number of selected secondary school students to associate with scientists during the summer months or, in a few special cases, on a part-time basis during the academic year. Such experience may consist of classroom and laboratory instruction, service as a junior member of a research team, or a combination thereof. Grants are made to colleges, universities, and nonprofit research institutions to carry out these activities. Summer courses occupy the students' full time for a period of from 5 to 13 weeks; academic-year programs provide for approximately the same amount of contact time scheduled over a longer period. The course content of this training does not duplicate regular high school or college courses, and scholastic credit is not given.

During fiscal year 1963 grants for this program totaled 187, providing instruction for 7,000 carefully selected secondary school students. Since the student population in this age group is estimated at approximately 3 million, the program at its present level can accommodate only about 2 in 1,000 of the Nation's students, or 2 in 100 of the top 10 percent.

Cooperative College-School Program

The program is directed primarily toward the upgrading of instruction in science and mathematics at specific school systems. This is accomplished by making available to the secondary schools in a collaborative effort the intellectual resources and facilities of colleges and universities. An outgrowth of the Summer Science Training Program for Secondary School Students, this program too involves the exposure of selected high school students to intensive contacts with qualified scientists in classrooms or research participation situations. The difference is in the inclusion of participating high school teachers who will carry back to their regular teaching duties, first, a better understanding of science and, second, a clearer concept of the capabilities of their abler students.

A new type of activity even more specifically directed at the improvement of secondary-school science education is now supported under this program. It involves close collaboration between a college or university and secondary school officials in the planning, adaptation, and introduction of the newly developed science curricula into one or more nearby school systems.

A total of 46 grants were made in 1963, involving the participation of about 2,400 secondary school students and 730 teachers.

State Academies of Science

A very useful and effective mechanism for communication between the scientific community and the schools of a limited area is the State or regional academy of science. Its membership includes scientists from a broad spectrum of disciplines representing both education and industry. They are familiar with regional conditions and also with personnel of the schools, and they have a definite interest in the improvement of science education in their areas. Fifty grants were made during the year for various activities coordinated through academies such as visiting scientist projects, teacher seminars, junior academy projects, and traveling science exhibits.

Visiting Scientist (Secondary Schools)

This program provides grants to national scientific societies in four disciplines—biology, chemistry, mathematics, and physics—to support visits of outstanding scientists to secondary schools requesting such services. During these visits the scientists make personal contacts with students, science teachers, and administrators, and advise them on matters concerning their problems in science education and career counseling. A primary purpose of the national program is to fill in the geographic gaps where this service is not yet available through a State Academy of Science.

Holiday Science Lectures

Holiday Science Lectures represent a continuing program administered by the American Association for the Advancement of Science. It supports the presentation of lectures on science by eminent scientists in cities located in various parts of the Nation. Attendance is by invitation extended to outstanding students in the area, as well as to a small number of teachers. The usual presentation consists of a series of five lectures delivered in a 5-day period during the Christmas or Easter vacation. NSF made a single grant of $92,000 in fiscal year 1963 to continue this program.

During academic year 1962–63 lecture series were given in New York City, Boston, Chicago, Los Angeles, and Seattle to audiences of 400 to 500 persons in each city, 90 percent of which were students. In the academic year 1963–64, 10 lecture series will be presented.

Traveling Science Libraries

This program has been in operation since 1955. Its purpose is to make available, through temporary loan, sets of selected books on science subjects to elementary and secondary school students, with emphasis on the smaller and less privileged schools. It has been highly successful in stimulating student interest in science and in convincing school authorities that science books should be purchased for permanent use by their libraries.

Circulation of the books to secondary schools was discontinued at the end of the academic year 1961–62 on the ground that sufficient demonstration had been made of their value as permanent accessions to school libraries. For the same reason, a terminal grant of $65,000 was made during fiscal year 1963 to support a final year of circulation of the Traveling Elementary School Library. A total of 3,186 elementary schools have already received this service, and an additional 800 will be served during academic year 1963–64.

Supplementary Science Projects for Students

Concerns of the scientific community with respect to secondary school education result in frequent inquiries as to the possibility of support for projects which fall outside the scope of the categories already discussed. This program provides an avenue whereby a limited number of such projects with exceptional merit can be supported.

During fiscal year 1963 the Foundation awarded 12 grants for this program category. One grant is for the support of a special study to be conducted by a college and a local school system, directed toward the adoption of a new science curriculum; one grant will support a psychological study of high-ability mathematics students; and two will provide partial support for the publication of career information booklets in psychology and statistics. The remaining 10 grants will provide for the direct instruction of secondary school students through a variety of experimental projects outside the guide-lines of the ongoing programs.

Undergraduate Science Education Programs

The Undergraduate Science Education Programs offer opportunities for undergraduate institutions to raise the quality of their science instruction.

The able undergraduate is provided with the motivation and the challenge needed to inspire his best effort; the teacher with new insights into the problem of improving his entire instructional effort with emphasis on smoothing the transition between undergraduate instruction and graduate study.

Undergraduate Science Education

The Undergraduate Science Education activity has been a remarkably versatile mechanism for effecting improvement in education in the sciences. The original premise—that students of high ability placed in close working relationship with creative scholars will tend to become creative scholars themselves—seems fully justified. The conclusion is not surprising since it is the basic principle of graduate study. The difference lies in the application of the principle to able seniors, juniors, sophomores, and in a growing number of cases, freshmen.

In noting the impact of the Undergraduate Science Education Program on student participants, several other effects of considerable significance should not be overlooked. The growth of institutional interest in providing opportunities for the able undergraduate who is ready for graduate-level study is reflected not only in the rapid increase in the number of Undergraduate Science Education proposals received (1,128 in fiscal year 1963) but in a variety of other ways.

The effect on the faculty may be a most important long-range effect. There are, for example, a number of cases in the universities where graduate faculty members who previously had limited contact with undergraduates are now enthusiastic supporters of undergraduate research. In the smaller institutions many faculty members with good research training, unused because of heavy teaching duties, credit the Undergraduate Science Education Program with giving them the incentive and opportunity to regain lost ground, which comes through close, informal association with questing young minds.

A total of 530 grants were made in 1963, providing opportunities for approximately 6,500 undergraduates.

Three related projects were also supported. One grant, awarded to the Inter-University Committee on the Superior Student (located at the University of Colorado), provides for a study of the relationship between undergraduate research and honors programs in the State universities; two other grants support related conferences at the University of Colorado and at Illinois Institute of Technology, in which attention will be focused on the able student of engineering.

Undergraduate Instructional Scientific Equipment

The colleges and universities of the Nation are facing an ever-increasing tide of applicants for admission as well as increased pressures to assure that those students with the potential to become the next generation of scientists and engineers are adequately prepared for the necessary advanced study. The dissemination of knowledge, under these conditions, poses major problems which require careful attention to the design of new patterns of instruction and the revision of existing ones. In carrying out the necessary planning and development, substantial progress in upgrading science instruction has been limited by the inability of the institutions to provide an adequate supply of modern undergraduate instructional scientific equipment. To meet a national need in this area, the Undergraduate Instructional Scientific Equipment Program, initiated in fiscal year 1962, is designed to assist colleges and universities offering baccalaureates in the sciences by providing matching funds for the purchase of scientific equipment for undergraduate instruction.

During 1963, grants were made to 409 institutions in 47 States, the District of Columbia, and Puerto Rico. The average grant was for $13,047.

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Research Participation and Scientific Activities for Teachers

Projects supported within this area cover a broad range of activities directed toward improving the subject-matter competence of secondary school and college teachers of science, and toward generating the teachers' interest in the attainment of a broader scientific background and a greater understanding of, and involvement in, the problems of science education. These objectives are approached through research participation programs and through conferences, seminars, and visiting scientists programs.

Research Participation for College Teachers

This program provides the opportunity for college science teachers (including junior college teachers who are qualified) to gain research experience during the summer. Teachers with adequate subject-matter background, but limited research opportunity, have the chance to obtain that stimulation and identity with science which research experience effectively provides.

The program is designed to meet several research needs of college teachers: predoctoral teachers may undertake projects leading to thesis research problems; others may complete such projects. Postdoctoral teachers, particularly those whose home institutions do not have adequate research facilities, are offered an opportunity to again become active in research.

As in past years, academic-year-extension support was provided to selected participants to enable them to carry on at their home institutions research which is an extension or out-growth of work begun in the summer.

Grants awarded under this program provide support for a total of 375 college teachers (193 predoctoral and 182 postdoctoral). In addition, provision has been made for 113 academic-year extensions.

Research Participation for High School Teachers

This program affords a means for a limited number of qualified high school teachers (and junior college teachers not qualified for the companion RPCT program) to gain research experience with competent investigators at colleges, universities, and qualified nonprofit research organizations. Such experience is expected to raise the level of the teacher's classroom teaching by improving his understanding of science and the scientific method. In some cases, teachers are able to carry out research which may lead to an advanced degree.

The provision for a limited number of academic-year extensions has been continued, although the demand has been less than expected. This may be due, in part, to the free time limitations of high school teachers.

Grants made in this program will provide for 304 teachers, and extend support for 92 of them throughout the academic year.

Supplementary Training for Science Teachers

Science teacher-training projects which do not fit into any of the Foundation's established teacher-oriented programs such as fellowships, institutes, research participation activities, and advanced science seminars are considered under this program. The Foundation has encouraged the development of novel approaches to improving the competence of teachers of science, mathematics, and engineering, 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 vehicle 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 subject-matter competence of science, mathematics, and engineering teachers. Twenty-three grants were made in 1963.

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 their itineraries.

VISITING SCIENTISTS (COLLEGE)

The major objective of the visiting American scientists projects is to provide to undergraduates 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 faculty, and for guidance to local faculty and administration members on questions relating to curricula and the development of science programs. Visits are usually of 2 days' duration, during which the visiting scientists may give one or more formal lectures, conduct classes or seminars, engage in informal discussions with students, and confer with faculty members and administrative personnel.

During the past fiscal year, 20 proposals were granted support. Fifteen of these were awarded late in the fiscal year for support of programs to operate in academic year 1963–64. In fiscal year 1963 (i.e., during academic year 1962–63) 18 programs were in operation, providing approximately 3,650 days of visits annually to a total of 1,420 science departments. It is estimated that in academic year 1963–64 the number of programs in operation will be 19 or 20, approximately 3,700 days of visits.

VISITING SCIENTISTS (FOREIGN)

Under the foreign visitor program, distinguished foreign scientists are brought to the United States for periods ranging from 3 weeks to a full semester. For the shorter visits, an itinerary program providing for visits of 3 to 5 days is set up by the relevant professional society. For the longer visits, the scientist is usually attached to a major degree-granting institution which serves as his base, and from which he makes visits of 4 or 5 days' duration to other major institutions.

The primary objective of the program is to provide opportunities for broadening the perspective of science faculties and graduate students in the major graduate centers through interchange of scientific knowledge and through discussions of current research problems and research trends. As in the "college" program, the visitor engages in lecturing, participates in seminars, and confers with faculty members and administrative officers.

During fiscal year 1963, six proposals were granted support. In fiscal year 1963 (i.e., during academic year 1962–63) nine programs were in operation, providing approximately 2,200 days of visits annually.

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Specialized Advanced Science Education Projects

Two major functions are linked with the general effort to improve the quality of education in the sciences under this activity. One function, programmatic in nature, involves the administration of the Advanced Science Seminar and the Public Understanding of Science Programs; the other function, under the title Science Education Developmental Projects, is less restrained by the usual "programmatic" bounds and is concerned with the search for, and support of, more comprehensive plans for major improvement of the science education programs of departments or institutions.

Advanced Science Seminars

Advanced Science Seminars are focused on areas of science of a highly specialized nature or are based on a treatment of subject matter which is "advanced" relative to the formal backgrounds of the participants. Although the seminars are customarily intended for specialists in the field involved, participants are drawn not only from segments of the community of practicing scientists (universities, colleges, industry, and government), but also from appropriate levels of the body of "scientists-in-training" (talented graduate or undergraduate students) depending upon the level and nature of the subject-matter involved. Awards were made for 37 such seminars during the year. (See appendix G for list of seminars held during 1963.)

Public Understanding of Science

The Public Understanding of Science Program is concerned with the development of programs and materials designed to increase the scientific literacy of the general public. The principal devices thus far supported include conferences between scientists and representatives of the mass media of communications, such as editor, science writers, and public information officers; the planning and preparation of science programs for television; adult education programs; and public information services. Through such devices the program aims to develop in the nonscientific public some appreciation of scientific methods and the significance of the term "research," the historical and sociological implications of science, the limitations of science, and the value of opinions voiced by scientists, both as experts in their fields and as private citizens. A secondary aim of this program is to keep those who have had appreciable training in science abreast of scientific developments in disciplines other than their own.

This year saw a further diversification in the kinds of proposals received and grants awarded. One grant was made for a study of the relationships among the natural sciences, the social sciences, and the humanities. Another was made to assist in the maintenance of the U.S. Science Exhibit in Seattle, Washington, for public use and for the development of other educational programs to make further use of this facility. Two grants were made for symposia, with the majority of the audience being composed of scientists. In this instance, scientists were considered to be a special kind of public needing to understand disciplines other than their own. In addition, a grant was made for a new public information service designed to test the feasibility of translating newsworthy articles in physics journals into the language of laymen for the use of science newswriters.

Science Education Developmental Projects

These projects, experimental in nature, are directed toward support of integrated programs for raising the level of science education at colleges and universities. Requests for support usually originate in a single college department or disciplinary unit which, to reach a desired quality level, requires support for a range of activities not offered through any individual Foundation program.

In fiscal year 1963 a total of 10 grants were made. Included in these grants are support for such comprehensive and diverse activities as: summer fieldwork for graduate students; a massive study of current status and future directions in engineering; faculty study sessions aimed at graduate curriculum revision; teaching graduate students in chemistry how to teach chemistry; integration of computer techniques and ideas into all phases of education in a small technical institution; and a conference to consider training and manpower problems in mathematics.

FELLOWSHIP PROGRAMS

National Science Foundation fellowships are designed to strengthen the Nation's scientific potential by (1) enabling U.S. citizens and nationals of unusually high ability to increase their competence in science, mathematics, and engineering through the pursuit of advanced scientific study or scientific work, and (2) enriching graduate training in this country through in-residence awards to outstanding foreign scientists. Since the inception of NSF fellowship programs in fiscal year 1952, approximately 28,000 individuals have been offered awards in 8 fellowship programs. Fellowship recipients were selected on the basis of their ability from among some 96,000 applicants. The eighth program, the Senior Foreign Scientist Fellowship, was inaugurated during the past fiscal year.

Table 4.—NSF Fellowship Programs, 1963

Program	Number of applicants	Number of awards offered
Graduate fellowships	6, 122	1, 880
Cooperative graduate fellowships	4, 588	1, 300
Summer fellowships for graduate teaching assistants	2, 123	906
Postdoctoral fellowships	918	245
Senior postdoctoral fellowships	298	95
Science faculty fellowships	983	325
Summer fellowships for secondary school teachers	1, 305	288
Subtotal	16, 337	5, 039
Senior foreign scientist fellowships	60	53
Total	16, 397	5, 092

The extramural fellowship programs for U.S. citizens—North Atlantic Treaty Organization (NATO) Postdoctoral Fellowships in Science and the Organization for Economic Cooperation and Development (OECD) Senior Visiting Fellowships—normally administered by the Foundation for the Department of State, were inactive in fiscal year 1963 due to changes in funding procedures. It is anticipated that both programs will be reactivated in fiscal year 1964.

This year the Congress amended the National Science Foundation Act. As a result the National Science Board was given authority to refuse or revoke an award—ability of the applicant or fellow notwithstanding—if it were determined that such an award was not in the best interests of the United States. In addition, the "disclaimer" affidavit requirement was repealed and was replaced by (a) a penalty clause which makes it a crime to apply for a fellowship under certain conditions, and (b) a requirement that applicants file a supplementary statement listing previous criminal convictions and pending criminal charges.

Graduate Fellowships

This program enables students with demonstrated ability and special aptitude for advance training in science to complete their graduate studies with the least possible delay.

In fiscal year 1963 there was an increase of only 2.7 percent in the number of applicants over that of fiscal year 1962—the smallest increase in recent years. The number of applicants seeking fellowship renewals reached a new peak of 1,154. As many as 1,016 of them were offered the desired support. Among the 4,968 new applicants, only 864 could be offered awards with available funds.

Cooperative Graduate Fellowships

Introduced in fiscal year 1959, this program also is aimed at supporting unusually able graduate students, but differs from the Graduate Fellowship Program in that applicants apply through, and are initially evaluated by, the institution at which they propose to study.

For fiscal year 1963 the "recommendation numbers" assigned the participating institutions were the same as in fiscal year 1962, with every school being permitted to recommend at least 20 applicants for fellowships. The number of applicants (4,588) and the number of awards offered (1,300) reached new highs, representing increases of 11.4 percent and 8.3 percent, respectively, over the figures for fiscal year 1962.

Summer Fellowships for Graduate Teaching Assistants

These awards make it possible for Graduate Teaching Assistants in science, mathematics, and engineering to continue their academic studies on a full-time basis during the summer.

The number of applicants increased again this year—16.7 percent over the number for fiscal year 1962—under the system in which institutions are encouraged to recommend as many individuals as they consider qualified for these awards.

Postdoctoral Fellowships

Postdoctoral Fellowships enable persons who have recently obtained science doctorates to undertake additional advanced training as investigators in their specialized fields. Although there was a slight increase in the number of applicants, the number of awards offered was the same as last year (245).

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 298 individuals (28 more than in fiscal year 1962) and 95 awards were offered (only 3 more awards than in the previous year).

Science Faculty Fellowships

These fellowships provide an opportunity for college and university teachers of science, mathematics, and engineering with at least 3 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.

The 325 awards offered in this program for fiscal year 1963 represent the same number offered in fiscal year 1962. However, the number of applicants increased from 864 to 983.

Summer Fellowships for Secondary School Teachers of Science and Mathematics

This program emphasizes study by awardees in the natural sciences and mathematics at a level acceptable to their fellowship institutions as satisfying requirements for the traditional advanced degrees in science and mathematics. As contrasted to the group study programs existing at institutions, these fellowships are for individual study programs.

Both the number of applicants and the number of awards offered decreased for the third consecutive year. The number of applications received for fiscal year 1963 totaled 1,305, which represents a decrease of 264 as compared with the number received in the previous year. The present level of approximately 300 new awards per year appears to be optimum for this program.

Senior Foreign Scientist Fellowships

In November 1962 the Foundation inaugurated the Senior Foreign Scientist Fellowship Program—in cooperation with 80 participating U.S. universities. This program is designed to bring to the United States those outstanding senior foreign scientists whose formal training or teaching and research experience qualifies them to make significant contributions to graduate training in this country. Awards were made only in the mathematical, physical, biological, and engineering sciences and in interdisciplinary fields comprised of two or more of these sciences. Fifty-three awards were offered this year.

DISSEMINATION OF SCIENTIFIC INFORMATION

The Foundation, through its Office of Science Information Service, has continued to carry out its program for improving the availability to U.S. scientists of the results of worldwide scientific and technical research. The program is grounded in the conviction that no research project is complete until its results have been made available for use in further research, and that maximum scientific progress requires maximum effectiveness in the dissemination of research-produced knowledge.

Presidential and congressional directives in 1958 and 1959 charged the Foundation with responsibility for promoting the development of an effective national scientific information system. They place special emphasis upon supplementing, not supplanting, present Government and private efforts, and upon effecting coordination of numerous and varied existing scientific information programs.

THE CHANGING ENVIRONMENT IN THE FIELD OF SCIENTIFIC INFORMATION

The Federal Government

Since 1958, efforts of the Federal agencies with research and development programs, of the Office of Science and Technology (OST) and the Federal Council for Science and Technology (FCST), of Congress, and of the National Science Foundation have combined to create within the Government a vastly improved climate for developing an effective total Government scientific information program. In support of this statement, the following specific actions can be cited:

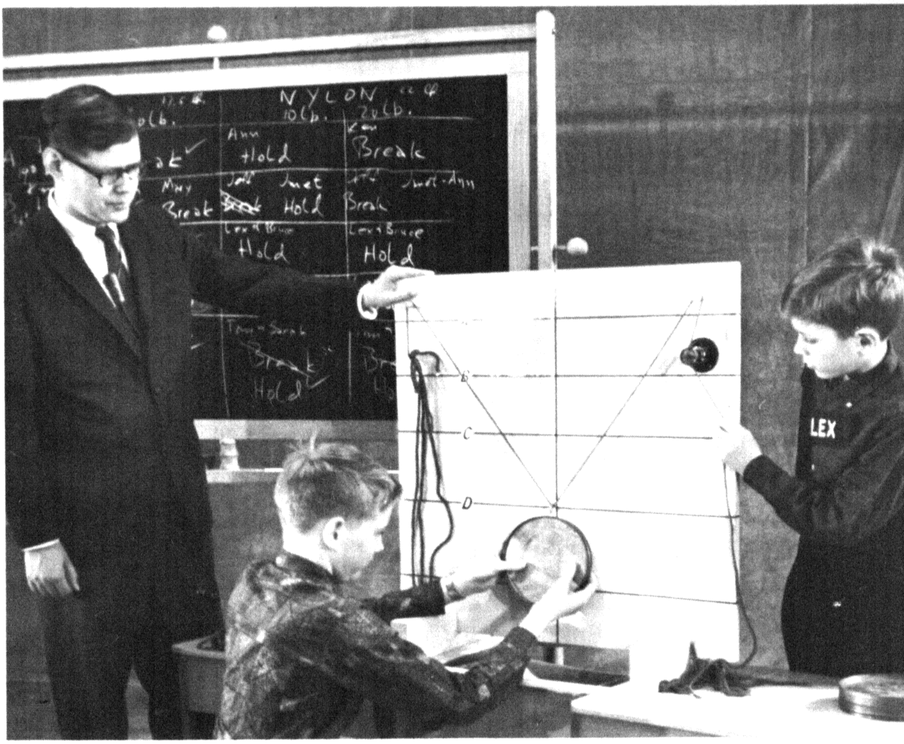
1. Every Federal agency with a significant program of research and development has designated an individual to be responsible for that agency's scientific information activities.
2. All such agencies have developed, or are developing, strengthened information programs. Examples include: the National Library of Medicine's Medical Literature Analysis and Reference Service (MEDLARS) and the proposed Drug Information Center of the Department of Health, Education, and Welfare; the Scientific and Technical Aerospace Reports (STAR) proj-

ect of the National Aeronautics and Space Administration; the Defense Documentation Center (successor to ASTIA) of the Department of Defense with its experimentation on indexing and other bibliographic problems; NSF's establishment of an information center on Antarctic research.

3. The FCST has established a standing, and very active Committee on Scientific Information. One of its principal current projects is the development of Federal policies on a variety of phases of information control and dissemination.
4. The major technical report issuing agencies—NASA, Atomic Energy Commission, and Department of Defense—are coordinating various aspects of their report processing and handling.
5. The Department of Commerce, in cooperation with NASA, AEC, DOD, and NSF, has extended the coverage of *U.S. Government Research Reports*, its subscription abstracting journal, to include abstracts and/or indexes of all of the unrestricted, unclassified reports of these agencies, and is making copies of the complete documents available for purchase; the Department, with Foundation assistance, also has established 12 regional centers with collections of these reports on which they provide loan, reference, and other services.
6. A Science Information Exchange has been established in the Smithsonian Institution to provide data on federally supported research in the life, physical, and behavioral sciences. It succeeds the former Biosciences Information Exchange.
7. A National Referral Center, set up in the Library of Congress, acts as a source of information on where the most authoritative scientific and technical data in any field can be obtained, inside and outside of Government.

The Scientific Community

In the nongovernment sector of the scientific information field, Foundation attention has been directed primarily to the activities of the professional scientific societies, both national and international. Of secondary, though still major, interest to the Foundation is the information role played by universities and commercial organizations. Among each of these groups, as with the Government agencies described earlier, the last 3 or 4 years have brought distinct changes of attitude and a growth of concern about the information problem. A wide variety of activities has been stimulated by this increased concern, ranging from a general questioning of the effectiveness of long-established communication media to an increase in university-directed documentation re-



In this scene from a classroom film, seventh grade students test calculations made about the breaking strength of yarn. The film, designed to help teachers learn new approaches in teaching mathematics, was prepared by the Syracuse University-Webster College Madison Project under an NSF program aimed at course content improvement. Left, an NSF Fellow at Auburn University uses radioactive techniques to study the effects of a herbicide on plants. The Foundation awarded over 5,000 fellowships in 1963.

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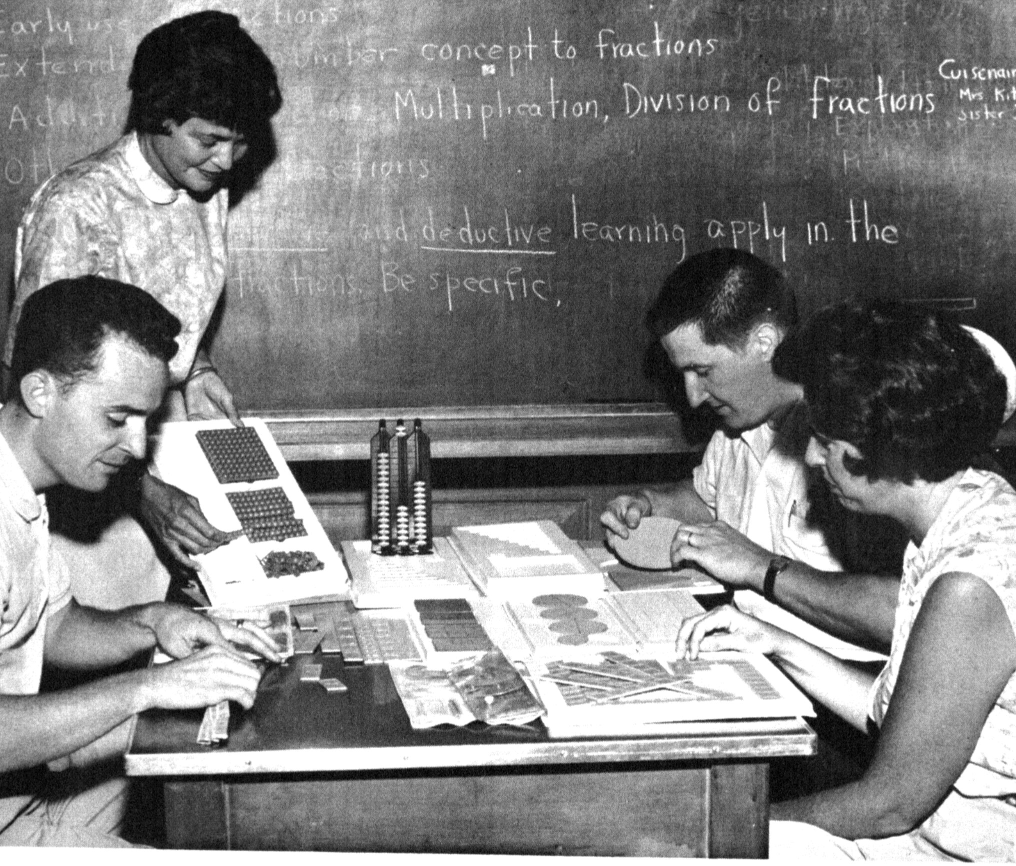
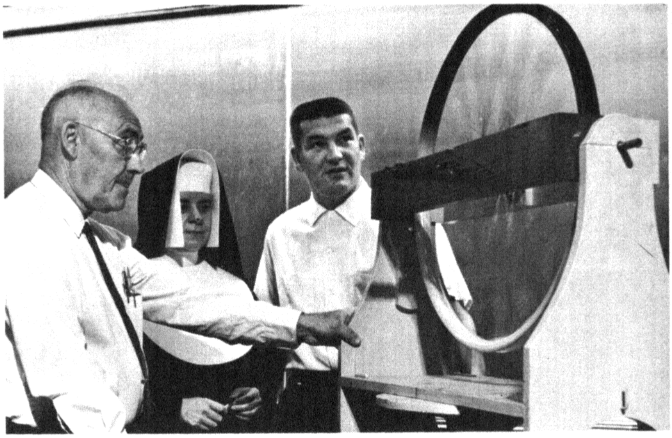
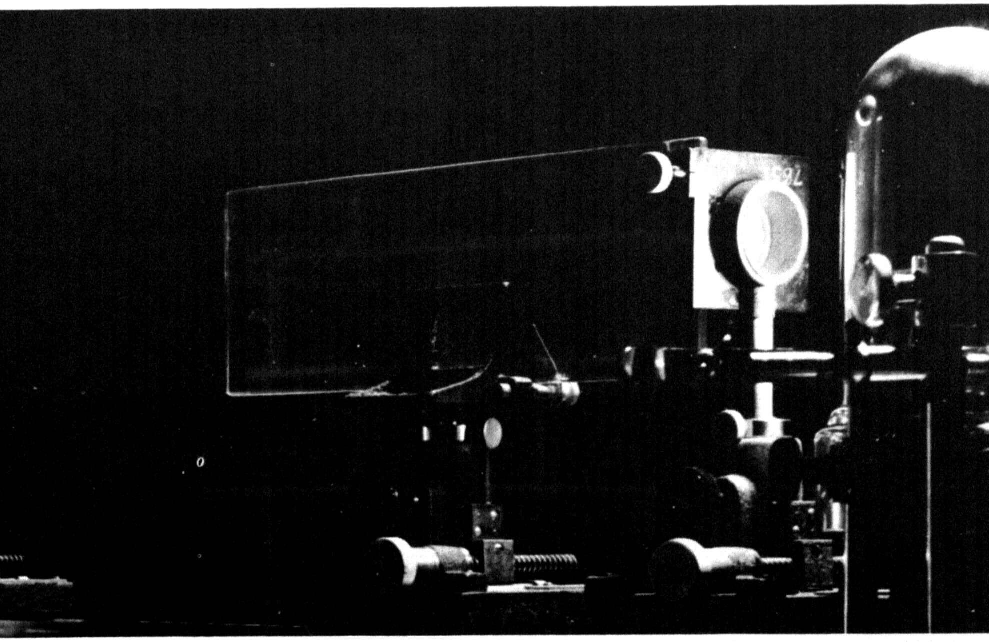
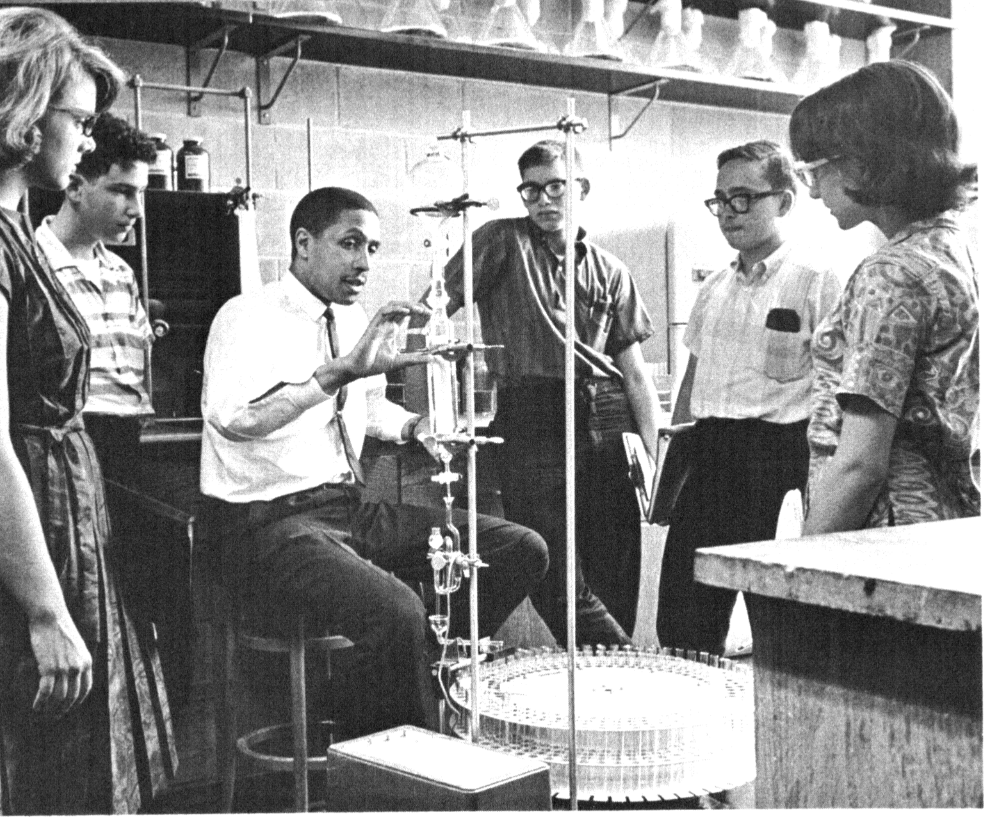

concept to fractions
Multiplication, Division of fractions
deductive learning apply in the
Be specific,



Designed to improve instruction in science, mathematics, and engineering, the Foundation's teacher institute programs are the largest Federal activity in direct support of education in the sciences. Representative of the activities at some 900 institutes held in 1963 are: Left, elementary school mathematics teachers at the University of Vermont study materials for teaching the early use of fractions. Above, a physics professor at Pennsylvania State University demonstrates the principles of a gyroscope to two secondary school teachers. Below, at an institute in basic atomic and nuclear physics at the University of Arkansas, a high school teacher uses a Lloyd's mirror to measure the wave length of monochromatic light.





This high school science teacher explains the operation of specialized chemistry apparatus to a group of superior secondary school students at St. John's University. All, including the teachers, received advanced instruction at St. John's in an NSF-supported cooperative college-school science program. Other scientifically talented high school students take part in research at colleges and universities. Below, this student concentrates on observation and notes during an investigation of hydrogen overvoltage on bright platinum at Newark College of Engineering.

search and the development of new college curricula for information specialists. With, in many instances, the encouragement and financial backing of the Foundation, a number of new approaches to scientific publication are being tried; for example, the major abstracting and indexing services in this country are cooperating with each other to extend and improve their coverage of the research literature. International groups such as the International Council of Scientific Unions (ICSU), International Federation for Documentation (FID), and United Nations Educational, Scientific, and Cultural Organization (UNESCO) are also devoting more effort to improving communication in the sciences.

Typical of the scientific societies' growing interest in information and communication are two broad studies underway in psychology and physics. Supported largely by NSF, analyses of the communication and information practices of research workers in these fields are underway. Studies include the coverage and readership of pertinent professional journals and the information exchange function of meetings. Abstracting and indexing services are being studied and new and different types of publications and other information services are being tried experimentally.

Among the first of the new approaches tried by private organizations with NSF encouragement and support was the biweekly journal *Chemical Titles,* which Chemical Abstracts Service initiated early in 1961. It is a permuted title index in which papers from more than 500 journals are announced on an average of some 2 weeks after they appear in a primary journal. A Foundation grant, awarded in 1959, made possible a 4-month trial of the publication. Enough subscriptions were received during the first year of publication to make further Government aid unnecessary. Also during 1961 Biological Abstracts, Inc. launched the semimonthly *BASIC* (Biological Abstracts' Subject in Context), a permuted title index to the abstracts in *Biological Abstracts*. *BASIC* is being published both with the abstracts and as a separate journal.

Citation indexing is another new technique being investigated experimentally with NSF and NIH funds. Citation indexes provide a means for tracing bibiographic "descendants"; conventional indexing methods trace bibliographic "antecedents." The studies, one in genetics, the other in statistics, are designed to test both the usefulness of citation indexes and the methodology of their preparation.

Another area of scientific communication in which the Foundation has assumed leadership is the development of procedures for publication of significant research results—more rapidly than is possible with the usual journal form. For example, the American Institute of Physics,

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with NSF support, has experimented successfully with two new "letters" journals, which publish brief articles on important new experimental developments. The first, started in 1958, is *Physical Review Letters;* its more recent counterpart, *Applied Physics Letters,* was started in 1962. With these two journals, which are published by photo-offset from typewritten copy, publication delays are measured in weeks instead of months. The success of this form of publication and its acceptance by the scientific community has encouraged several societies to consider other, more radical, experiments with the long-established research journal form.

Joint Government-Private Efforts

Many of the activities mentioned above involve Federal assistance to non-Government groups through grants or contracts for specified time periods. In another category of information effort, however, joint Government and private participation is much more intimate and occurs on more of a continuing partnership basis. Most activities in this group concern the general area of scientific publication.

NSF's specific responsibility in this area, plus the growing concern of the FCST, the OST, and the Congress about the scientific information problem, led to increasing recognition within Government of the need for consistent, overall Federal policy affecting Government support for non-Government scientific publication. The first concrete result of this concern was the enunciation by the FCST in 1961 of its approval of the use of Federal R&D funds for the payment of page charges for the primary publication of the results of Government-supported research. This Council action dealt, however, with only one phase of the total publication support problem. In cooperation with the FCST Committee on Scientific Information, the Foundation has continued to study other aspects of the support of non-Federal scientific publishing by Federal agencies. Other policy recommendations can be expected in the near future.

A somewhat different kind of Government-private cooperative effort is exemplified by the activities of the National Federation of Science Abstracting and Indexing Services (NFSAIS). The membership of this association, founded in 1958 under the leadership and with the support of NSF, includes 20 of the Nation's leading private and Government scientific abstracting and indexing organizations. Its objective is to foster cooperation among the member services to improve their ability to serve the total scientific and technical community. Among its major projects is the development of a national plan in this field.

DOCUMENTATON RESEARCH

The primary mission of the Documentation Research program is the stimulation, support, and coordination of research directed toward development of new or improved methods, including mechanized systems, for making scientific information available. Research directed toward this objective includes fundamental studies of the communication practices and information needs of scientists and the development of techniques for organizing and disseminating information to meet the scientists' needs.

Communication Practices and Information Needs of Scientists

Extensive studies of information problems and practices by the American Institute of Physics (AIP) and the American Psychological Association are being supported by the Foundation. One of the AIP studies nearing completion is a survey of the types of questions physicists would like to be able to put to an ideal searching system. A thorough analysis of the concepts contained in these questions, as compared with entries in existing indexes, is in progress. Based on results thus far obtained, an improved system for indexing physics research papers is being tried experimentally in *Applied Physics Letters* and may be tried in other journals. The American Psychological Association has prepared a series of reports on its studies of the dissemination of information in psychology. Drexel Institute of Technology has undertaken a survey of information needs and practices of engineers, a survey of particular interest to the Engineers Joint Council. A related study is being made by Herner & Co. of the character and degree of use of published index data and of the indexing thesaurus in the field of chemical engineering.

Automatic Language Processing and Mechanical Translation Research

Research in automatic language processing is essentially long range. The accomplishments of any year, therefore, consist primarily of a steady increase in the understanding of language phenomena; further development of grammars for various languages for eventual use in analyzing texts and producing machine output in intelligible language; compilation of dictionary information; and development of improved, and in some cases automated, techniques for handling data and facilitating research in this field.

Among recent results stemming from NSF-supported research in language processing are: the Harvard computer program for the automatic-syntactic analysis of English; a five-volume set of *Chinese Character Indexes,* produced with the aid of a computer and published by the University of California project; the Massachusetts Institute of Technology computer program for a French grammar and parallel computer programs for grammars of Arabic and English; and a new tool in mechanical translation (MT) research called the "Translation Error Detector," a computer program developed by the Thompson Ramo-Wooldridge project, which compares experimental MT output with a human translation of the same text.

Organization and Searching of Information

One of the NSF-supported current projects in this area is an experimental comparison at the Harvard Computation Laboratory of three different models for the analysis of document content. One employs high frequency words or word groups, a second introduces hierarchical structures with cross-references and synonym lists, and a third employs a form of syntactical analysis. Procedures for automatically indexing abstracts of scientific papers are being studied at Western Reserve University. The hope is that workable procedures can be devised that will not require full syntactic analysis of the sentences of the abstract.

Other studies include: investigation at Advanced Information System, Inc., of search strategies and of the organization of large information retrieval files, with special attention to the possibilities of automatic self-organization of the files according to amount of use; and research at the Cambridge (England) Language Research Unit and the System Development Corp. on automatic techniques for grouping related items in an index.

Testing and Evaluation of Information-Handling Systems and Techniques

Carefully designed experimental tests and objective evaluations of information systems and techniques are essential to an assessment of their merits and weaknesses. The Foundation has therefore undertaken in a preliminary fashion the support of urgently needed research in the development of such test methods and evaluative criteria.

A 2½-year test program of a retrieval system for metallurgy, developed by the Western Reserve University, has been completed and the final report is being prepared. This program included: full-scale operation of a partially mechanized searching service covering technical literature of interest to metallurgists, as well as compilation of data on cost, value, and efficiency of the service. These data have been analyzed by a special committee of the National Academy of Sciences-National Research Council (NAS–NRC); its evalution report is expected shortly.

Under other NSF grants, MIT is developing a test environment in which to study information systems based on clerical and automatic techniques for processing physics papers and matching them to the interests of the physicists participating in the test program. An NAS–NRC study of chemical notation systems in current use in the U.S. has been completed and is being extended to cover systems in use in Europe. An NSF grant has also been made to the University of Pennsylvania for analysis of the two major chemical notation codes to check for uniqueness, avoidance of ambiguity, and efficiency.

Surveys and Reports

To inform both administrators of documentation research programs and researchers of current activities in the field, an extensive survey of current projects here and abroad, entitled *Current Research and Development in Scientific Documentation,* is published by the Foundation every 6 months.

To provide state-of-the-art reports on selected areas of documentation research, the Foundation continues to furnish partial support for the Research Information Center and Advisory Service on Information Processing at the National Bureau of Standards. During the past year, two reports have been issued and others are in preparation. A Foundation grant to the Department of Commerce will make possible the establishment, within the Office of Technical Services of a master collection of research reports on documentation research and development. The Foundation has also contracted with the Thompson Ramo-Wooldridge Corp. for a study of the needs of researchers for texts in machine-usable form; its main purpose is to determine the desirability of establishing a center to store machine-usable texts for use in documentation research and to provide researchers with services in connection with these texts. In accordance with the wishes of several cooperating agencies, the Foundation made a grant to Wayne State University for centralized compilation of information on Russian words and phrases for all research groups working on Russian-English mechanical translation.

SUPPORT OF SCIENTIFIC PUBLICATIONS

The objective of this program is development of the optimum publication system for information dissemination. Such a system must enable scientists to publish the results of their research promptly and in adequate detail and format (primary publications). It must also facilitate scientists' access to what they need from the ever-increasing volume of research information (secondary publications). Projects supported are of two types: those providing emergency assistance to present scientific publishing services; and those investigating new or improved systems, providing faster, more comprehensive services at the lowest possible cost.

Primary Publications

Key grants for support of journals were made last year for *Applied Physics Letters* and *Reviews of Geophysics.* The letters journal was described previously on page 120, as the second experimental rapid publication journal of the American Institute of Physics. *Reviews of Geophysics* was initiated by the American Geophysical Union to provide a periodical review medium to bring together elements of the very diverse and rapidly growing field of geophysics.

Six other widely differing journals received Foundation funds last year to help them overcome particular, short-term difficulties. These included *Solar Energy, Journal of the American Rocket Society* (prior to its merger with *Journal of the Aerospace Sciences,* also a Foundation grantee), the *Journal of Glaciology* (sole English language journal in its field), *Journal of Heredity, Computers in Behavioral Science,* and the *Transactions of the American Society of Lubrication Engineers.* This last journal is serving a growing field that involves an unusual interrelation between science, engineering, and technology.

Some 33 monographs, catalogs, and handbooks were awarded publication grants in 1963, including works on Antarctic research, botany, zoology, mathematical psychology, and the history of science.

Secondary Publications

Grants in support of secondary publications underscore the importance that the Foundation places upon the development of a national network of superior, comprehensive abstracting and indexing services. *Biological Abstracts, GeoScience Abstracts, Meteorological and Geoastrophysical Abstracts,* and *Sociological Abstracts* received grants to further increase the amount of research information they collect, screen, and redistribute in summarized form.

Support of bibliographies and special indexes was limited to those for which there was a clearly demonstrated need or which were of an experimental nature. Grants were made for publication of specialized bibliographies or indexes in botany, linguistics, astronomy, and seismology.

Studies and Experiments

Several specialized bibliographies were produced experimentally by Chemical Abstracts Service through its computer-centered development program which is supported in part by NSF. The CAS type of development promises relatively simple, fast, specialized bibliographies that treat their topics comprehensively. Biological Abstracts, Inc., is experimenting with "prepacking" biological information through publication in microform. The experiment is in response to a long-felt need for an inexpensive means by which individuals can regularly receive only those portions of a comprehensive abstracting-indexing service containing information of recurring interest to them. The American Chemical Society is analyzing the role that computers may be able to play in the reproduction, distribution, and retrieval of scientific papers and data. On the national level, support, financial and otherwise, was provided the National Federation of Science Abstracting and Indexing Services for its secretariat, for preparation of a *Guide to the World's Abstracting and Indexing Services in Science and Technology,* and for the development of a national plan to improve abstracting and indexing products and services.

One of the most interesting and potentially significant communications experiments undertaken in some time is the "Science and Engineering Television Journal," spearheaded by the American Association for the Advancement of Science and supported cooperatively by the Foundation, educational station WETA–TV, New York, and 12 professional scientific and engineering groups which prepared programs. The programs, ranging in length from ½ to 1½ hours, were produced for scientists rather than for the general public.

On the international level, cooperative support was continued through the mechanisms of the Abstracting Board of the International Council of Scientific Unions and the International Federation for Documentation (FID).

FOREIGN SCIENCE INFORMATION

Because the quality and quantity of scientific research in many countries is increasing at a rate comparable to our own, it is essential that American scientists have ready access to the results of this research. Because much of it is published in languages unfamiliar to American scientists, it must be made available in translation. The Foundation's Foreign Science Information Program has therefore been designed to:

1. Increase the scope, quality, and quantity of translations of the most important foreign scientific publications.

2. Provide data on sources and availability of foreign scientific information and increase the current awareness of the U.S. scientific community.
3. Promote the effective acquisition of foreign scientific publications through purchase and exchange between U.S. and foreign organizations.
4. 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

Almost two-thirds of the funds available to the program in fiscal year 1963 were used to support the translation, publication, and dissemination of 41 of the Soviet Union's leading physical and life sciences journals. More than 84,000 pages were translated during the year and made available to about 21,000 subscribers. The number served through libraries and information centers may be estimated at several times this. In addition, two Japanese electronics journals and one Communist Chinese mathematics journal were translated.

The National Science Foundation continued support of U.S. scientific translations programs in Poland, Yugoslavia, and Israel, using foreign currencies which accrued to the credit of the United States. During this year, 10 Polish and 9 Yugoslav scientific journals were translated into English. The Israeli program produced English translations of Soviet journals, serials, patents, abstracts, books, and monographs. The translation effort in these 3 countries produced 42,500 pages of scientific and technical literature for the benefit of U.S. scientists.

Sources of Current Information on Foreign Science Activities

The Foundation supports preparation, publication, and announcement of bibliographies, directories, guides, studies, and reviews; the convening of conferences and symposia; the establishment of information centers; and the "use" studies—all designed to assist the U.S. scientist in learning "what," "who," and "where" in the realm of foreign science. Examples of Foundation supported projects in this area are:

1. Publication of the *World List of Future International Meetings, Part I,* by the Library of Congress.
2. Continuation of the Bureau of the Census series of *Bibliographies of Foreign Social Science Periodical and Monographs.*

3. Completion by the Battelle Memorial Institute of a *Directory of Selected Scientific Institutions in the USSR,* listing 1,135 Soviet scientific institutions.
4. Publication by the Library of Congress of *International Scientific Organizations: A Guide to Their Library Documentation, and Information Services* (1962). This 792-page book lists 449 intergovernmental and nongovernmental organizations, each with a description.

Acquisitions and Exchanges

The Foundation continued its efforts to foster the acquisition and exchange of important foreign scientific publications. In May 1963, 40 titles of 1963 Communist Chinese primary scientific and technological journals were received on exchange from Peking by the National Federation of Science Abstracting and Indexing Services (NFSAIS). The American Mathematical Society (AMS) continued its exchange agreement with the Academy of Sciences of the U.S.S.R. The AMS is now receiving more than 1,200 subscriptions, an increase of 296 over last year. In turn, the AMS exchanged U.S. journals with the Soviet Academy. Efforts were continued to develop acquisition and exchange programs with the East European countries.

RESEARCH DATA AND INFORMATION SERVICES

The Research Data and Information Services program is concerned with promoting improvement in, and developing a better understanding of, specialized data and information services. Efforts in 1963 fell into the following four broad categories: national information planning studies, coordination and improvement of Federal Government information activities, survey and study of specialized information and data services, and support and encouragement of improvements in library services.

National Information Planning Studies

To increase understanding of questions implicit in any consideration of national patterns of information dissemination and utilization, studies are being made to (a) assess the effect of centralization on information handling, and (b) ascertain the significant factors relating to the development of an effective information network serving users on a national and regional basis.

Under contract to NSF, A. D. Little, Inc., is studying the effect of varying degrees of centralization on the information dissemination process. This study, phases of which are still incomplete, indicates the need to interconnect existing services and systems rather than to superimpose a single centralized system.

Another study, undertaken by Information Dynamics Corp. with NSF support, is focused on broad questions concerning information centers and services operating within the national system. Still in its early stages, the study will develop economic and other guidelines for comparing and assessing the relative advantages of subject-oriented and regional-oriented information centers as means of providing the Nation's scientific community with adequate information services.

Coordination and Improvement of Government Information Services

Major emphasis continued to center upon improving existing Government services and providing new services. A new Government information service began operations in the past year—the National Referral Center for Science and Technology in the Library of Congress. The Center serves to interconnect the potential science information user with the Nation's best sources of the desired information. The Center also plans to publish, on a selective basis, up-to-date directories of information resources.

NSF support was also provided to the Science Information Exchange to expand its coverage of current research in the physical sciences as well as to continue its established service to the life sciences, and to the 12 regional technical report centers of the Commerce Department's Office of Technical Services (OTS). Other support was given OTS for publishing *Keywords Index,* an experimental report title index provided to subscribers of *United States Government Research Reports.* Additional steps taken to improve Government information services include placement in the OTS system of the documents of the National Science Foundation, the Department of the Interior, and the National Academy of Sciences. Other measures were taken to effect compatibility in the physical form of reports being produced by large Government information producers such as AEC, NASA, and DOD. A continuing inventory of Government information activities was being provided by publication of *Scientific Information Activities of Federal Agencies,* an NSF information bulletin series. Descriptions of the information services of the Air Force, Army, and Navy are currently underway; 17 bulletins have been published to date.

Survey and Study of Specialized Information and Data Services

A study was made of the data produced by the 1961 survey of specialized science information centers in the physical and biological sciences revealed trends in the history, growth, geographical distribution, subject coverage, types of services offered, and methods of communication utilized by these centers. A similar survey was initiated for the social sciences. Continued NSF support of the Office of Critical Tables and the recent establishment of the National Standard Reference Data System by the National Bureau of Standards mark the beginning of a new era of closer coordination in the dissemination of critically evaluated data in the physical sciences.

The NSF publication *Nonconventional Technical Information Systems in Current Use* issued during the year provided a comprehensive survey of mechanization and other nonstandard information-handling principles employed by specialized information services.

Support and Encouragement of Improvements in Library Services

Emphasis has been directed toward broad-scale improvements rather than to specific support of individual libraries. West Virginia University is conducting a study of interlibrary loan operations involving a large univeristy and its association with small colleges and the industrial community within the same region; and the Johns Hopkins University is studying the possible application of operations research and systems engineering concepts to a large university library. Two grants were made to support specific library mechanization activities. One is concerned with mechanizing conventional library processes. The other deals with the development of a mechanized cooperative cataloging activity.

STUDIES OF SCIENCE RESOURCES

The welfare, security, and economic well-being of the Nation are dependent on the continuing strength of its scientific and technological effort. It is, therefore, essential that the resources of skilled manpower, facilities, and equipment are available to meet current and future needs.

This requires fact finding and analytical studies, many of which are conducted or sponsored by the Foundation in fulfillment of its statutory responsibilities. Such studies provide a basis for science resources planning pertinent to the development of national policy for research and education in the sciences and engineering. They provide an understanding of the present organization, interrelationships, and allocation of such resources among these activities. Periodic surveys provide information on research and development activities and scientific manpower which make possible the projections of growth of resources. By comparing trends with estimated needs, it becomes feasible to determine what additional national effort is necessary. Other studies, of a nonrecurrent nature, are undertaken to provide reliable data on subjects of particular interest. For example, they may deal with various aspects of science education, science organization, and needs for science facilities and equipment.

These studies and surveys are conducted or directed by the Science Resources Planning Office, Office of Economic and Statistical Studies, and Scientific Personnel and Education Studies Section of the Division of Scientific Personnel and Education.

The results of these studies are used by many organizations both public and private. However, the primary use is by the Foundation itself, the Office of Science and Technology, the Federal Council for Science and Technology, and other Government agencies. In addition to these studies carried on by the Foundation, the efforts of other organizations, such as the National Academy of Sciences, are also of great value in providing a complete and comprehensive picture of the Nation's scientific and technical resources.

Trends in Manpower for Science and Technology

The Foundation completed a study of the characteristics of the Nation's scientific manpower with projections to 1970 of employment trends (ref. 1). It showed that the Nation employed ½ million scientists, nearly 1 million engineers, 1 million technicians, and ¼ million teachers of science and mathematics in secondary schools. This specialized manpower in science and technology presently accounts for 3.6 percent of the labor force. The figure was about 1.5 percent in 1940 and is expected to reach 4.7 percent in 1970. (See table 5 and figure 2.)

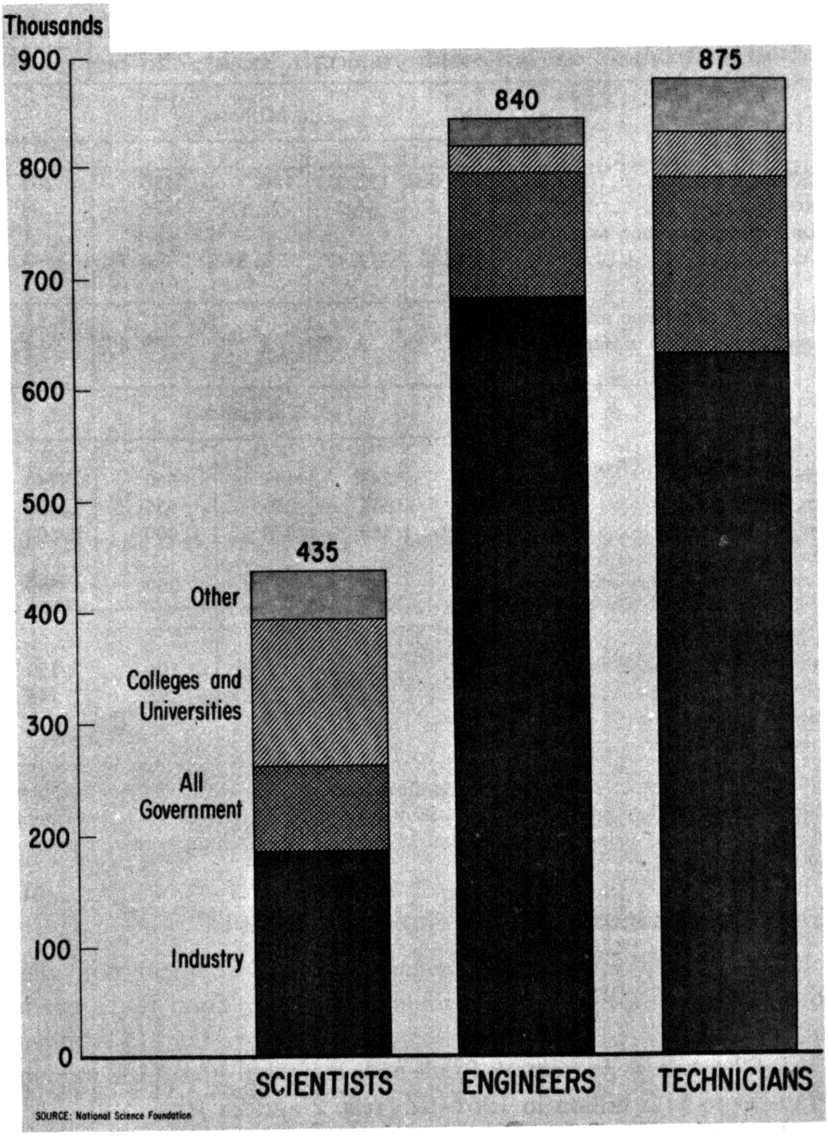

Figure 2. ***Scientists, Engineers, and Technicians, by Sector, 1960.***

Further findings indicated that about 1 scientist in 5 and 1 engineer in 100 has a doctorate. Industry in 1960 employed about one of every four scientists, and about four of every five engineers. Half of the Nation's scientists and engineers work in six States—California, Illinois, New Jersey, New York, Ohio, and Pennsylvania.

Table 5.—*Trends and Projections in Manpower, by Category, 1940–70*

	1940	1950	1960	1963 estimate	1970 estimate
	Millions				
USA population	132.0	152.3	180.7	190	209
Labor force	56.2	64.7	73.1	76	86
Manpower in science and technology	0.86	1.47	2.37	2.7	4.0
Manpower in science and technology as percent of labor force	1.5%	2.2%	3.2%	3.6%	4.7%
	Thousands				
Scientists	145	245	435	500	740
Engineers	300	545	840	935	1,400
Technicians	300	550	875	1,000	1,600
Teachers of science and mathematics in secondary schools	110	130	220	250	300
Doctoral scientists and engineers	28	45	89.2	106	170
Scientists	27.5	43.5	81.7	96	153
Engineers	0.5	1.5	7.5	10	17

NOTE.—Estimates shown for 1970 represent neither a forecast of supply nor a statement of future need. They are projections based upon current trends in employment in relevant fields, and upon the assumption of no substantial changes in economic and political conditions.

Trends in Research and Development Funds

A time series on funds for research and development is available covering the period 1953–54 through 1961–62. Total R&D expenditures have increased from $5.2 billion in 1953–54 to the $14.7 billion in 1961–62, while basic research funds have increased from $432 million in 1953–54 to $1.5 billion in 1961–62 (refs. 2 and 2a.)

The total for research and development in 1961–62 represents about a $1-billion increase over 1960–61. If the latest estimate of Federal expenditures for research and development holds firm, the national total of R&D funds for 1962–63 will probably be about $16 billion. These funds have risen from 1.41 percent of the gross national product in 1953–54 to 2.84 in 1961–62. (See figures 3 and 4.)

The data on R&D funds are obtained from surveys of each sector of the economy. (Figure 5 indicates in what sector the R&D funds originated and in what sector they were spent for work performed.) Of the 1961–62 total, $10.9 billion was spent by industrial firms, with $6.3 billion coming from the Federal Government for contractual work. Colleges and universities, a primary interest of the Foundation, in that

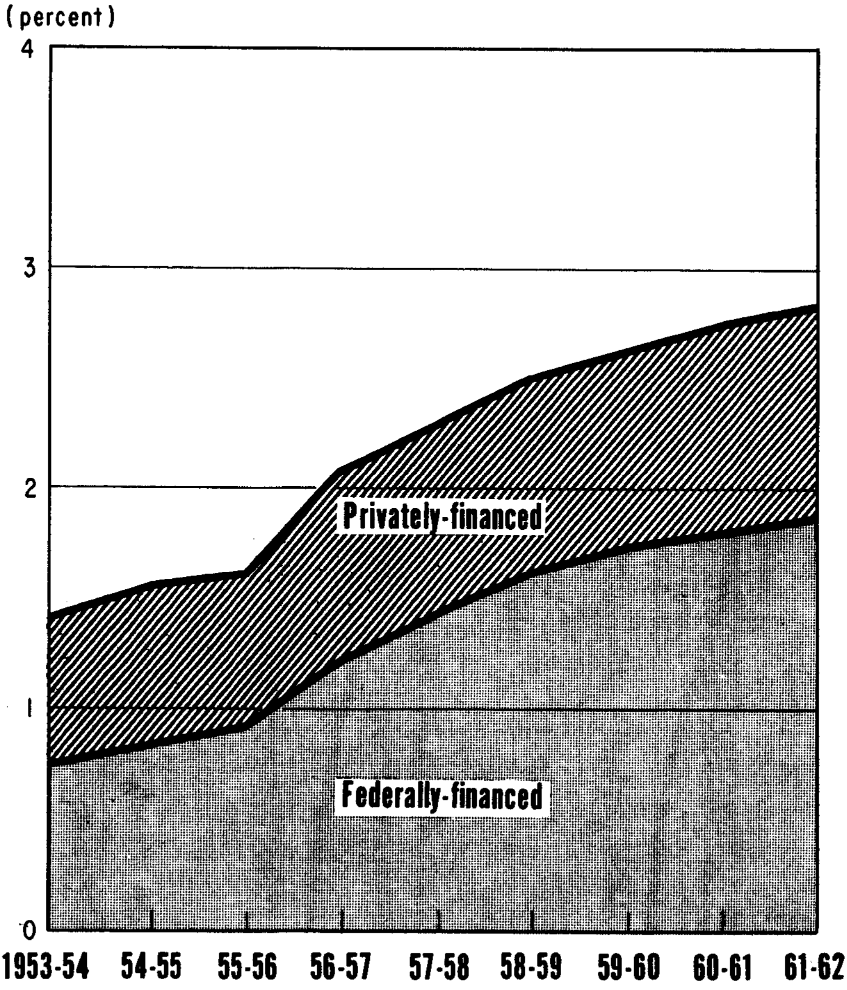

Figure 3. ***Research and Development As a Percent of the Gross National Product, 1953–54—1961–62.***

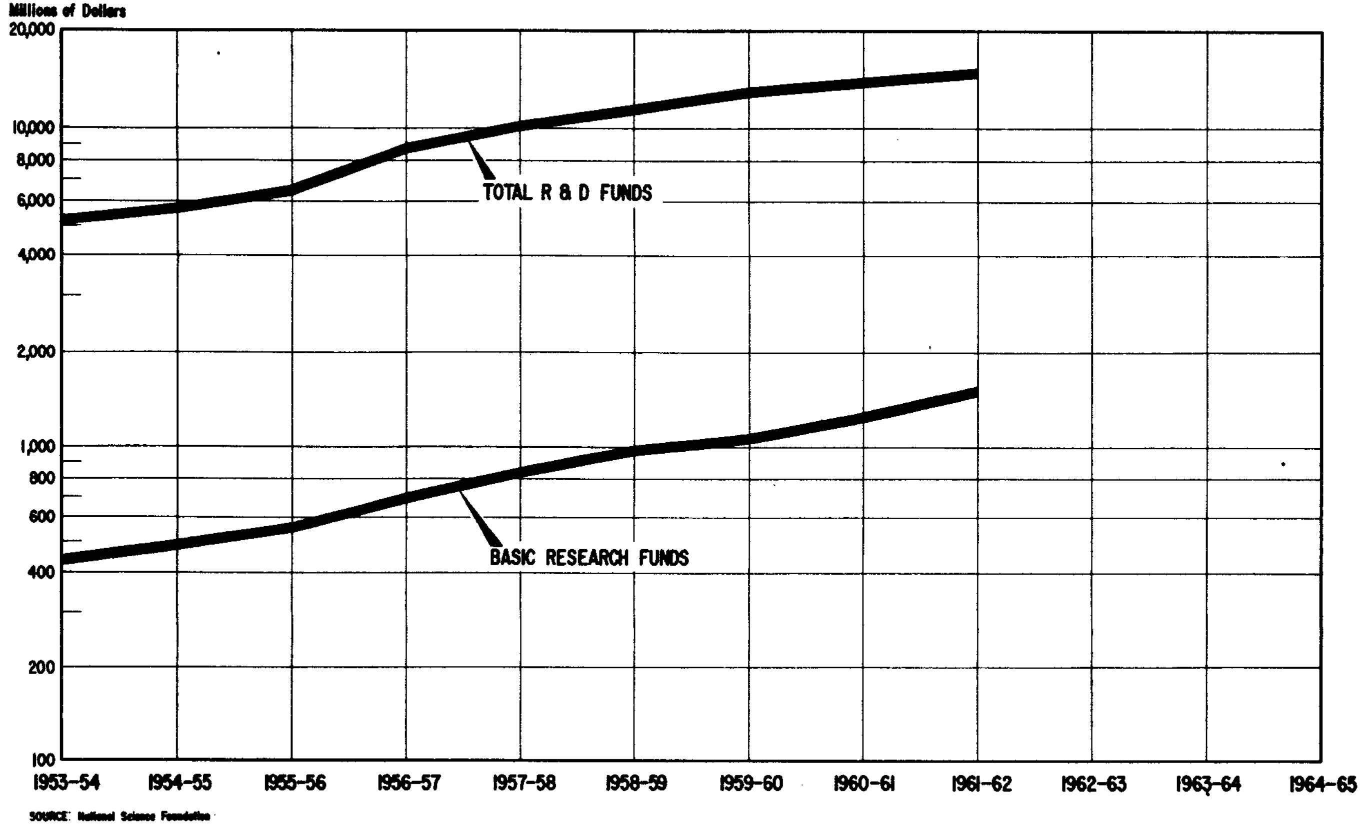

Figure 4. ***Trends in Research and Development Funds and Basic Research Funds, 1953–54—1961–62.***

(Millions of Dollars)

SOURCES OF FUNDS USED	RESEARCH AND DEVELOPMENT PERFORMERS						PERCENT DISTRIBUTION R&D SOURCES
	FEDERAL GOVERNMENT	INDUSTRY	COLLEGES & UNIVERSITIES		OTHER NONPROFIT INSTITUTIONS	TOTAL	
			PROPER[a]	FED'L CONTR. RESEARCH CENTERS			
FEDERAL GOVERNMENT	$2,090	$6,310[b]	$600	$450	$200[b]	$9,650	65
INDUSTRY	-	4,560	55	-	90	4,705	32
COLLEGES & UNIVERSITIES[c]	-	-	230	-	-	230	2
OTHER NONPROFIT INSTITUTIONS[c] ..	-	-	65	-	90	155	1
TOTAL	$2,090	$10,870[b]	$950	$450	$380[b]	$14,740	100
PERCENT DISTRIBUTION, R&D PERFORMANCE	14	74	6	3	3	100	

[a] Includes agricultural experiment stations.
[b] This amount includes funds from the Federal Government for research centers administered by organizations under contract with Federal agencies.
[c] Data include State and local government funds.

NOTE: All data are based on reports by the performers.

Source: National Science Foundation.

Figure 5. ***Research and Development, 1961–62—Intersectoral Transfers of Funds Used for Performance (Preliminary)***

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year spent $1.4 billion, $1 billion of this representing Federal grants or contracts with academic institutions; the remainder, $0.4 billion, came from colleges and universities themselves, other nonprofit institutions, or industry.

Similar information was obtained on funds for basic research. Following the pattern of the totals for all research and development, these sums show a rapid rise in this component of research and development.

Federal Government Studies

A report published in March 1963 presented organization of the Federal Governmentt for scientific activities (ref. 3). Based on information obtained from the 40 Federal agencies involved in scientific activities, the report covers scientific research and development, extramural training in science, scientific and technical information, scientific general-purpose data, and scientific testing and standardization. (See fig. 6.) Included are descriptions of advisory and coordinating mechanisms, installations and field stations, and federally supported research centers. Also, historical trends in R&D funds and scientific manpower and other major characteristics are described by agency.

The eleventh annual volume in the series, *Federal Funds for Science,* was published during the past fiscal year (ref. 4). This report deals with Federal support of research and development and of scientific and technical information, in terms of obligations and expenditures. The data provide answers to questions such as what amounts of funds are administered by the Federal agencies, what types of organizations perform the work, what the character of work is (basic and applied research and development), and what fields of science are being supported.

Collected as a part of the Civil Service Commission's annual white collar survey, the data on R&D personnel in the Federal Government are published by the Foundation as a separate report (ref. 5). The report gives the distribution of scientists, engineers, technicians, and other specialized personnel employed by Federal agencies.

College and University Studies

A survey of the number of scientists and engineers employed in colleges and universities in 1961 was completed and the results published. It identified scientists and engineers as faculty members or as other professional personnel and indicated the organizational units in which they were employed, the field of science in which they were working, and how many were engaged in teaching or in research within each field. The findings indicate that scientists and engineers engaged in research and development were concentrated in relatively few institutions of higher education (ref. 6).

A final report on a survey of colleges and universities was published during the past year. It covers expenditures and manpower engaged in research and development in colleges and universities (ref. 7).

To augment the data on resources for science and education in colleges and universities, two major studies are underway. One deals with need for scientific and engineering facilities and apparatus required for teaching and research during the next 10 years. It is intended to show anticipated facility requirements as well as the capabilities of educational institutions to meet the costs of expected expansion. The other is even broader and deals not only with facility requirements, but also with manpower (undergraduate and graduate student populations, faculty required for teaching, and research investigators and supporting personnel), course content improvement, etc. This study projects total costs to the Nation for academic science for the 1965–75 period and analyzes non-Federal funds likely to be available.

A case study was completed of support of university proposals for scientific and engineering research. The project sought to determine what factors influenced the acceptance or rejection of such proposals by outside sponsors. The study was conducted by New York University and the University of Michigan, under contract with the Foundation, and undertook to trace the flow of formal research proposals initiated by their respective staffs and submitted to the Federal Government, private industry, nonprofit institutions, and State and local governments during the period January 1, 1958, to December 31, 1959 (ref. 8).

Industry Studies

During the past year, the Foundation published two reports on surveys of research and development performed by industrial firms, one on preliminary findings of a 1961 survey and the final report of a survey covering the previous year (refs. 9 and 10). These annual surveys of industry provide dollar measures of research and development in terms of volume, industry distribution, size-of-company composition, and character of the work, as well as data on R&D personnel employed by industrial firms. Trend data collected in these surveys are used in conjunction with other economic variables to forecast long-term projections and to assist in business and Government economic decision-making.

Complementing the survey of funds was one, conducted by the Bureau of Labor Statistics, dealing with scientific and technical personnel in

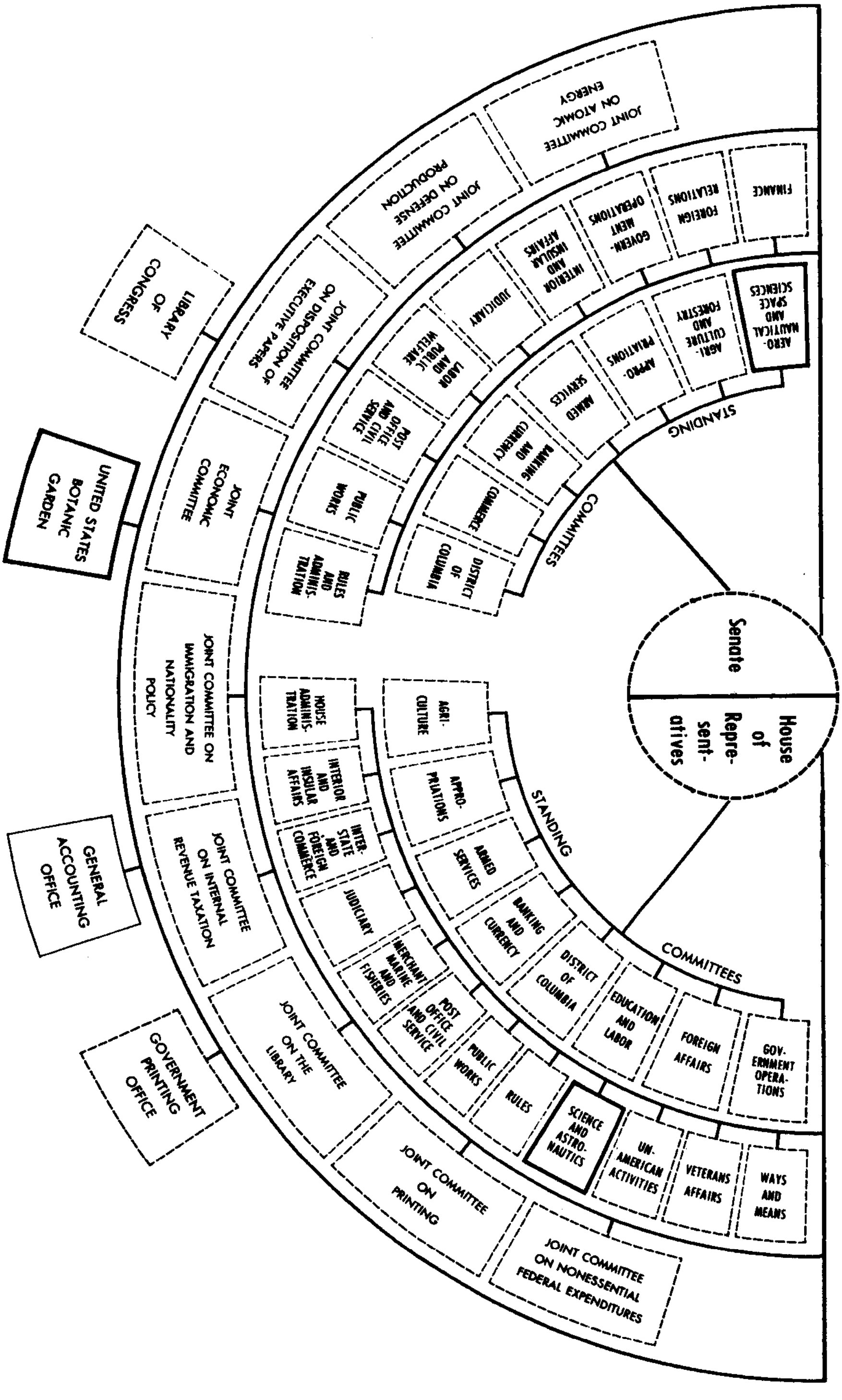
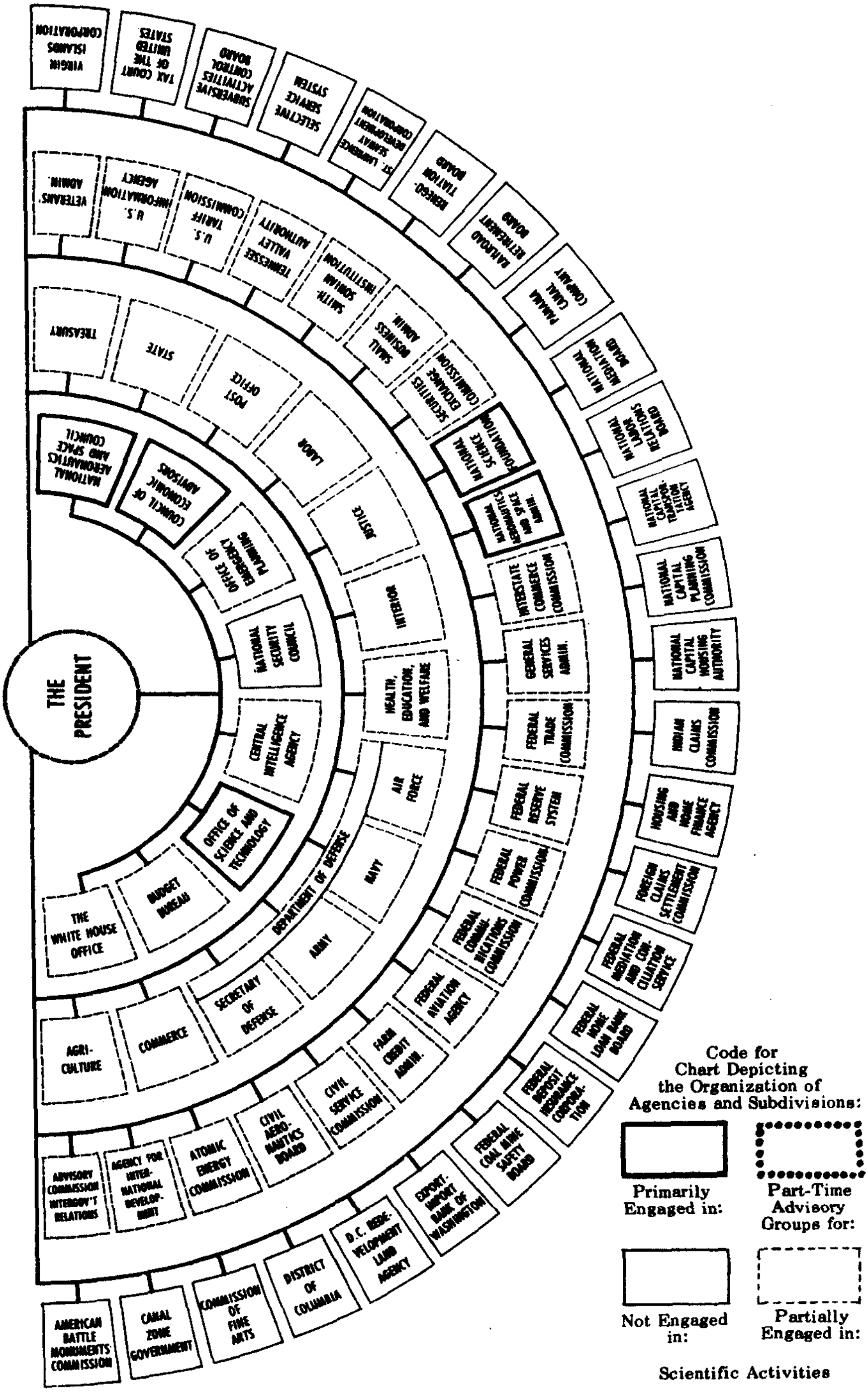


Figure 6. Organization of the Executive and Legislative



Branches of the Federal Government for Scientific Activities.

industrial firms. The findings for the year 1961 were in process of publication (ref. 11).

A series of reviews of selected industries was inaugurated during the year (ref. 12). The first in the series treated the aircraft and missiles industry, the largest performer in terms of dollars spent in performance of research and development. (See fig. 7.)

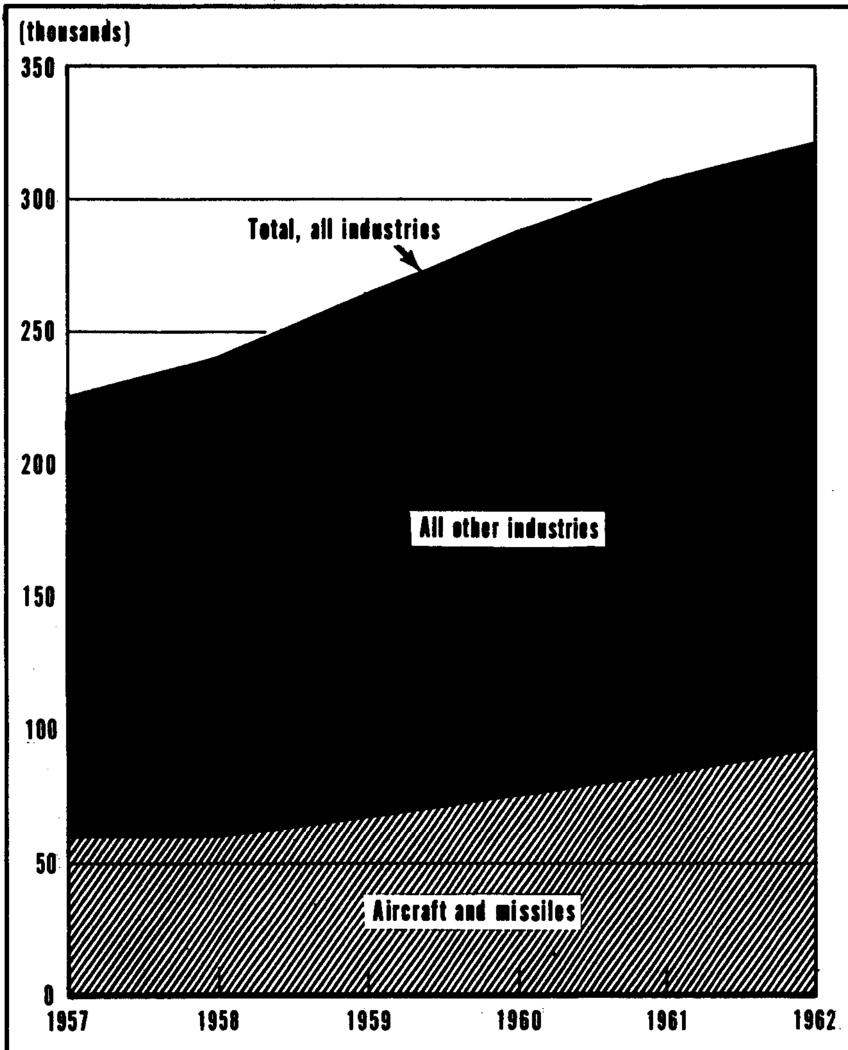


Figure 7. *Full-Time Equivalent Number of R&D Scientists and Engineers Employed in the Aircraft and Missiles Industry Compared with Number Employed in All Other Industries, January 1957–January 1962.*

A study of technological change was completed. Three bulletins reported various phases of the project dealing with the spread of innovation, interfirm differences, technological change, and the relation between innovation and research and development (refs. 13–15).

Other studies include those dealing with R&D decision-making, organization of industrial firms to receive and exploit scientific findings, relation of industrial R&D statistics to other economic variables, research and development in small business firms, and social science research in industry, labor market behavior of scientists and engineers in jet and missile production, and a pilot study on occupational detail of engineers in industry.

Other Science Resource Studies

In addition to studies of major sectors of the economy, the Foundation conducts studies of activities not limited to any one sector, but dealing with a particular type of scientific activity or of scientific manpower.

As part of its responsibility for maintaining a national register of scientific and technical personnel, the Foundation conducts biennial surveys (ref. 16). Preliminary results of the 1962 survey are summarized in table 6. Also see figure 8.

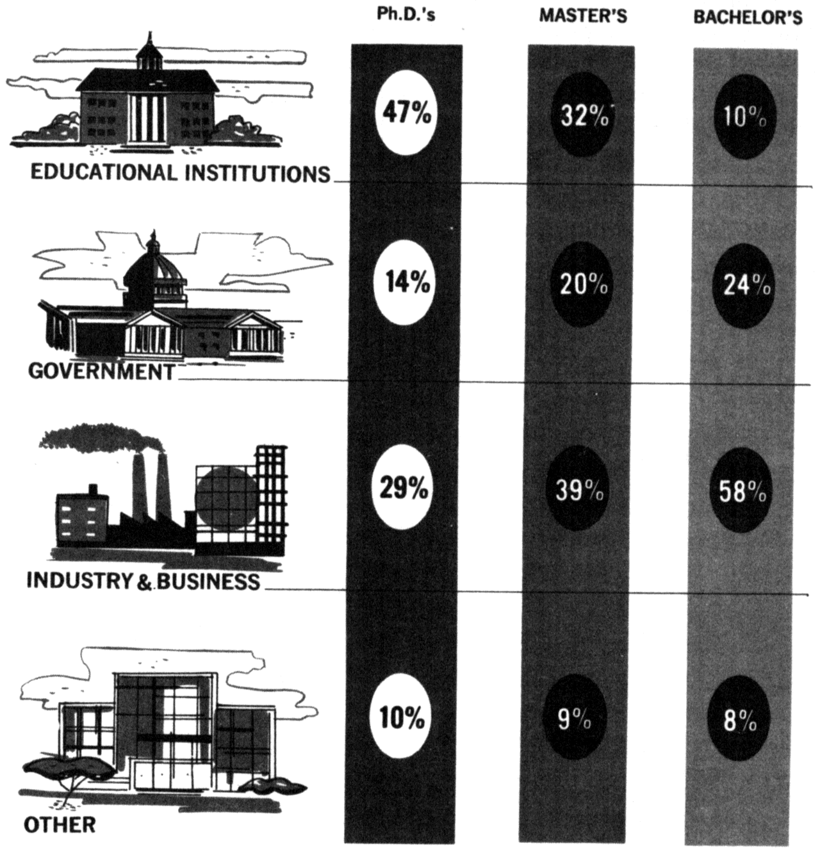
Table 6.—*General Characteristics of U.S. Scientists in the National Register of Scientific and Technical Personnel, 1962*

Characteristics	Number	Percent
Registered scientists	214, 940	100
Men	200, 362	93
Women	14, 578	7
Fields of science:		
Agricultural sciences	12, 389	6
Biological sciences	25, 554	12
Psychology	16, 791	8
Earth Sciences	18, 725	9
Meteorology	5, 379	3
Mathematics and statistics	18, 189	8
Physics and astronomy	25, 725	12
Chemistry	54, 130	25
Sanitary engineering	4, 923	2
Other fields	33, 135	15
Highest degree:		
Bachelor's	78, 574	36
Master's	56, 660	26
Professional medical	5, 693	3
Ph. D	66, 133	31
No report and less than bachelor's	7, 880	4

Table 6.—General Characteristics of U.S. Scientists in the National Register of Scientific and Technical Personnel, 1962—Continued

Characteristics	Number	Percent
Age group (median age, 38):		
20–29 years	39, 145	18
30–39 years	81, 143	38
40–49 years	56, 177	26
50–59 years	26, 705	12
60 years and over	11, 288	6
No report	482	....
Employment status:		
Full-time civilian employed	185, 191	86
Active military duty and Public Health Service	5, 325	3
Students	13, 085	6
Other	11, 339	5
Type of employer:		
Educational institutions	60, 319	28
Government organizations, including Military and Public Health Service	43, 488	21
Nonprofit organizations	9, 445	4
Industry and business	90, 800	42
Self-employed	5, 095	2
Other	5, 793	3
Work activity:		
Research, development, or design	75, 679	35
Teaching	33, 907	16
Management or administration	48, 226	22
Other	57, 128	27
Professional experience:		
1 year or less	5, 508	3
2–4 years	32, 261	15
5–9 years	43, 563	20
10–14 years	44, 454	21
15–19 years	21, 537	10
20 years or more	50, 608	23
No report	17, 009	8
Salary distribution of full-time employed scientists:	1962 salary	
Lower decile	$6, 000	
Lower quartile	8, 000	
Median	10, 000	
Upper quartile	13, 000	
Upper decile	16, 000	

Another study by the Foundation was the fourth annual inventory of social science research projects concerned with the economic and social implications of science and technology. The survey covered only educational institutions (ref. 17).



SOURCE: National Register of Scientific and Technical Personnel, 1962

Figure 8. *Type of Employer of Scientists Holding Bachelor's, Master's, and Ph.D. Degrees.*

A pilot study has been completed and a report is being prepared on the nontechnical aspects of the use of instruments and equipment in research and development; data were obtained on expenditures and the impact of these resources on the organization of the scientific personnel involved.

Another survey is under way on R&D expenditures and scientific personnel in certain regions in relation to the surrounding economic and educational development.

A study of the supply and demand of scientists, engineers, and technicians in the 1960's was completed and is in press (ref. 18).

Highlights of manpower developments in 1962 were contained in a report issued during the year which contained selected papers delivered at the Eleventh Scientific Manpower Conference (ref. 19).

The Foundation undertook a project on the work and study patterns of college graduates (see fig. 9). A report was issued during the past year on a 1960 survey of 1958 college graduates (ref. 20).

Other representative science manpower studies under way include offerings and enrollments in science and mathematics in nonpublic secondary schools, identifying high-level talent at the secondary school level, financial status of graduate students, doctorate production in U.S. universities (1920–61), factors influencing the number and quality of

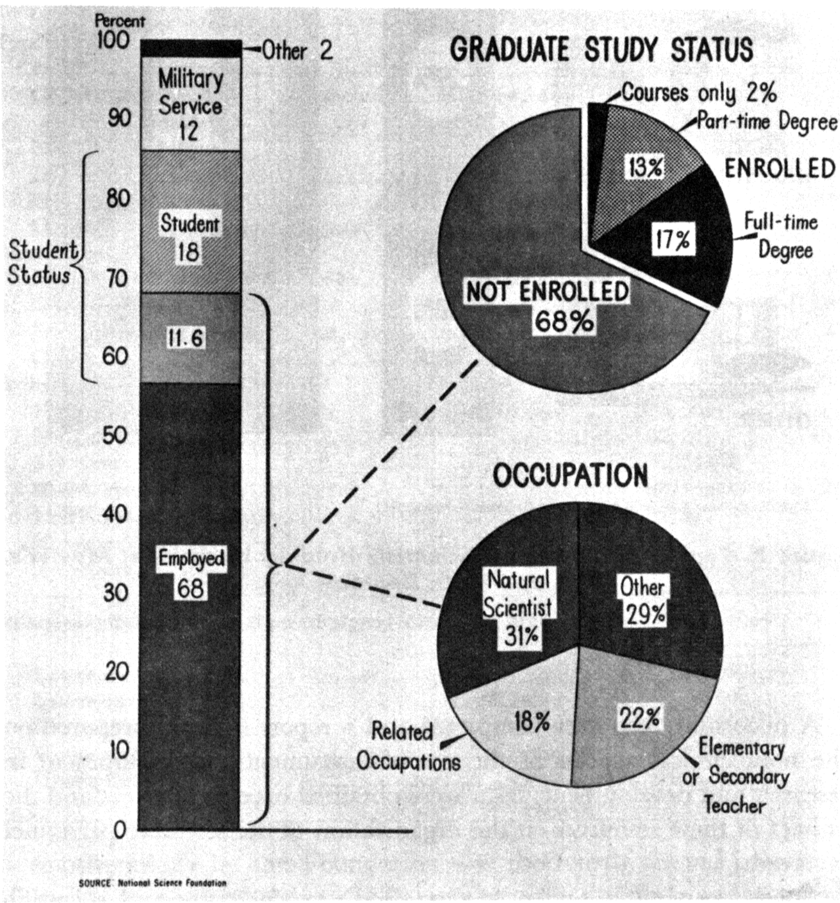


Figure 9. ***Activities of Male College Graduates in the Natural Sciences Two Years After the Bachelor's Degree, 1960.***

persons entering engineering, and status and career orientation of college faculties, 1963–64 registration of high school science and mathematics teaching, and survey of technicians.

A study of secondary school teachers of science and mathematics yielded information on their salaries, levels of education, and workload, and types and sizes of high school employing them (ref. 21).

In progress are studies leading to a global inventory of resources. They pertain to the U.S.S.R., Communist China, Sino-Soviet countries, and the Middle East. They deal with education and training of scientific and technical manpower, economic aspects of science and technology, R&D expenditures, and organization and management of science.

A specialized study provided information on immigration of scientists and engineers to the United States over the past decade (ref. 22). Also published were studies of the Organization of Science in Germany and India (refs. 23 and 24).

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2. *Reviews of Data on Research & Development,* No. 33, "Trends in Funds and Personnel for Research and Development, 1953–61," April 1962 (62–9).

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17. *Current Projects on Economic and Social Implications of Science and Technology, 1962* (63–8).
18. *Scientists, Engineers, and Technicians in the 1960's—Requirements and Supply* (63–34).
19. *Scientific Manpower, 1962* (63–31).
20. *Two Years After the College Degree—Work and Further Study Patterns* (63–26).
21. *Secondary School Science and Mathematics Teachers—Characteristics and Service Loads* (63–10).
22. *Scientific Manpower from Abroad, United States Scientists of Foreign Birth and Training* (62–24).
23. *Organization of Scientific Activities in India, No. 1* (62–40).
24. *Organization of Science in Germany, No. 2* (63–25).

APPENDICES

APPENDIX A

National Science Board, Staff, Committees, and Advisory Panels

National Science Board

Terms Expire May 10, 1964

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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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WILLIAM V. HOUSTON, Honorary Chancellor, William Marsh Rice University, Houston, Tex.
ROBERT S. MORISON, Director, Medical and Natural Sciences, The Rockefeller Foundation, New York, N.Y.
JOSEPH C. MORRIS, Vice President, Tulane University, New Orleans, La.
E. R. PIORE, Vice President for Research and Engineering, International Business Machines Corp., New York, N.Y.

WILLIAM W. RUBEY, Professor of Geology and Geophysics, Department of Geology and Institute of Geophysics, University of California, Los Angeles, Calif.

ERIC A. WALKER, President, The Pennsylvania State University, University Park, Pa.

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EDWARD J. MCSHANE, Professor of Mathematics, Department of Mathematics, University of Virginia, Charlottesville, Va.

EDWARD L. TATUM, Member, The Rockefeller Institute, New York, N.Y.

RALPH W. TYLER, Director, Center for Advanced Study in the Behavioral Sciences, Stanford, Calif.

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LELAND J. HAWORTH, Director, National Science Foundation, Washington, D.C.

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Mathematics	Milton E. Rose
Probability and Statistics	(Vacant)
Section Head for Physics	Wayne R. Gruner (Acting)
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Elementary Particles Physics	J. Howard McMillen
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Section Head for Course Content Improvement.	CHARLES A. WHITMER
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David S. Heeschen, National Radio Astronomy Observatory, Green Bank, W. Va.

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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.

Advisory Panel for Regulatory Biology

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

Carlos O. Miller, Botany Department, Indiana University, Bloomington, Ind.

Gilbert Mudge, Dartmouth College, Medical School, Hanover, N.H.

Erling J. Ordal, Department of Microbiology, University of Washington, Seattle, Wash.

George Sayers, Department of Physiology, Western Reserve University, School of Medicine, Cleveland, Ohio.

Per F. Scholander, Scripps Institute of Oceanography, La Jolla, Calif.

Robert D. Tschirgi, Department of Physiology, University of California, School of Medicine, Los Angeles, Calif.

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.

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 and Social Psychology

Robert P. Abelson, Department of Psychology, Yale University, New Haven, Conn.

David Gold, Department of Sociology, State University of Iowa, Iowa City, Iowa.

Edward E. Jones, Department of Psychology, Duke University, Durham, N.C.

Herbert Rubenstein, Operational Applications Laboratory, Bedford, Mass.

Leo F. Schnore, Department of Sociology, University of Wisconsin, Madison, Wis.

Karl F. Schuessler, Department of Sociology, Indiana University, Bloomington, Ind.

M. Brewster Smith, Department of Psychology, University of California, Berkeley, Calif.

Advisory Panel for Specialized Biological Facilities

A. Geoffrey Norman, Department of Botany, University of Michigan, Ann Arbor, Mich.

John L. Patterson, Department of Medicine, Medical College of Virginia, Richmond, Va.

William T. Peake, Department of Electrical Engineering, Massachusetts Institute of Technology, Cambridge, Mass.

E. Lowe Pierce, University of Florida, College of Arts and Sciences, Gainesville, Fla.

D. B. Polis, Naval Air Development Center, Johnsville, Pa.

Luigi Provasoli, Haskins Laboratories, New York, N.Y.

Carl D. Riggs, Department of Zoology, University of Oklahoma, Norman, Okla.

Murray D. Rosenberg, Rockefeller Institute, New York, N.Y.

Seymour Shapiro, Institute of Molecular Biology, University of Oregon, Eugene, Oreg.

Athelstan F. Spilhaus, Institute of Technology, University of Minnesota, Minneapolis, Minn.

William C. Steere, The New York Botanical Garden, New York, N.Y.

A. H. Stockard, Department of Zoology, University of Michigan, Ann Arbor, Mich.

H. M. Tsuchiya, Department of Chemical Engineering, University of Minnesota, Minneapolis, Minn.

Albert Tyler, Department of Embryology, California Institute of Technology, Pasadena, Calif.

Arthur A. Ward, Jr., Division of Neurosurgery, University of Washington Medical School, Seattle, Wash.

Karl M. Wilbur, Department of Zoology, Duke University, Durham, N.C.

Sheldon Wolff, Biology Division, Oak Ridge National Laboratory, Oak Ridge, Tenn.

George Anastos, Department of Zoology, University of Maryland, College Park, Md.

Sanford S. Atwood, Provost, Cornell University, Ithaca, N.Y.

Rolf L. Bolin, Hopkins Marine Station of Stanford University, Pacific Grove, Calif.

Mary A. B. Brazier, Brain Research Institute, University of California, Los Angeles, Calif.

S. F. Carson, Biology Division, Oak Ridge National Laboratory, Oak Ridge, Tenn.

Jerome Cox, Jr., Central Institute for the Deaf, St. Louis, Mo.

Charles F. Ehret, Argonne National Laboratory, Lemont, Ill.

Robert K. Enders, Zoology Department, Swarthmore College, Swarthmore, Pa.

George A. Feigen, School of Medicine, Stanford University, Stanford, Calif.

H. O. Halvorson, Department of Bacteriology, University of Illinois, Urbana, Ill.

Joel W. Hedgpeth, Pacific Marine Station, College of the Pacific, Marin County, Calif.

Edwin P. Hiatt, Department of Physiology, Ohio State University, Columbus, Ohio.

Theodore H. Hubbell, Museum of Zoology, University of Michigan, Ann Arbor, Mich.

F. F. Koczy, The Marine Laboratory, University of Miami, Miami, Fla.

William D. McElroy, McCollum-Pratt Institute, The Johns Hopkins University, Baltimore, Md.

John P. Meehan, School of Medicine, University of Southern California, Los Angeles, Calif.

Charles D. Michener, Department of Entomology, University of Kansas, Lawrence, Kans.

Emil M. Mrak, Chancellor, University of California, Davis, Calif.

William Duwayne Neff, Cambridge, Mass.

Advisory Panel for Special Projects in Science Education

R. H. Bing, Institute for Advanced Study, Princeton, N.J.

Marcus E. Hobbs, Dean of the University, Duke University, Durham, N.C.

James H. Jensen, President, Oregon State University, Corvallis, Oreg.

Joseph L. McCarthy, Dean, The Graduate School, University of Washington, Seattle, Wash.

Robert MacVicar, Dean, Graduate School and Vice President, Academic Affairs, Oklahoma State University, Stillwater, Okla.

John W. Oswald, Vice President, Administration, University of California, Berkeley, Calif.

Howard M. Phillips, Sr., 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 S. Wilks, Department of Mathematics, Princeton University, Princeton, N.J.

Advisory Panel for Systematic Biology

Constantine J. Alexopoulos, Department of Botany, University of Texas, Austin, Tex.

Frederick M. Bayer, Institute of Marine Science, Miami, Fla.

George F. Edmunds, Division of Biology, University of Utah, Salt Lake City, Utah.

Charles B. Heiser, Department of Botany, Indiana University, Bloomington, Ind.

Harold W. Manter, Department of Zoology, University of Nebraska, Lincoln, Nebr.

Alden H. Miller, Museum of Vertebrate Zoology, University of California, Berkeley, Calif.

Bobb Schaeffer, American Museum of Natural History, New York, N.Y.

Charles G. Sibley, Department of Conservation, Cornell University, Ithaca, N.Y.

Franklin Sogandares, Department of Zoology, Tulane University, New Orleans, La.

W. H. Wagner, Department of Botany, University of Michigan, Ann Arbor, Mich.

Advisory Panel for University Computing Facilities

Mary A. B. Brazier, Brain Research Institute, University of California, Los Angeles, Calif.

Joseph O. Hirschfelder, Department of Chemistry, University of Wisconsin, Madison, Wis.

Paul Horst, Department of Philosophy, University of Washington, Seattle, Wash.

Philip M. Morse, Department of Physics, Massachusetts Institute of Technology, Cambridge, Mass.

Martin Schwarzschild, Department of Astronomy, Princeton University, Princeton, N.J.

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

Charles V. L. Smith, Head, Mathematics and Computer Section, Division of Research, U.S. Atomic Energy Commission, Washington, D.C.

Frederick T. Wall, Dean, Graduate School, University of Illinois, Urbana, Ill.

Advisory Panel for Weather Modification

Eugene Bollay, E. Bollay Associates, Inc., Santa Barbara, Calif.

Richard A. Craig, Department of Meteorology, Florida State University, Tallahassee, Fla.

Paul Klopsteg (Chairman), Glenview, Ill.

Victor K. LaMer, Department of Chemistry, Columbia University, New York, N.Y.

Stephen E. Reynolds, State Capitol, Santa Fe, N. Mex.

Bernard Vonnegut, Arthur D. Little, Inc., Acorn Park, Cambridge, Mass.

APPENDIX B

Financial Report for Fiscal Year 1963

SALARIES AND EXPENSES APPROPRIATION

Receipts

Appropriated for fiscal year 1963	$322, 500, 000	
Unobligated balance from fiscal year 1962	3, 641, 149	
Less:		
Transfer to General Services Administration for space rental	—24, 389	
Total availability		$326, 116, 760

Obligations

Basic research project support:	
Biological and medical sciences	38, 394, 851
Mathematical, physical, and engineering sciences	59, 895, 475
Social sciences	8, 956, 172
Subtotal	107, 246, 498
Development and improvement of institutional science programs:	
Institutional base grants	7, 601, 685
Instructional equipment for undergraduate education	7, 734, 063
Undergraduate and graduate science facilities	28, 993, 638
Subtotal	44, 329, 386
Specialized research facilities support:	
Specialized biological facilities	3, 499, 480
Specialized social sciences facilities	159, 550
University computing facilities	4, 980, 000
University nuclear research facilities	8, 500, 000
Oceanographic research vessels and facilities	5, 913, 200
University atmospheric research facilities	750, 000
Subtotal	23, 802, 230
National research centers:	
National Radio Astronomy Observatory	4, 550, 000
Kitt Peak National Observatory	3, 750, 000
Cerro-Tololo Inter-American Observatory	1, 000, 000
National Center for Atmospheric Research	5, 180, 000
Subtotal	14, 480, 000

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Obligations—Continued

National research programs:		
Antarctic research	6, 358, 602	
Indian Ocean expedition	4, 420, 400	
Deep crustal studies (Mohole)	3, 277, 787	
Weather modification	1, 281, 833	
U.S.-Japan Cooperative Science Program	717, 460	
International Years of the Quiet Sun	1, 021, 600	
Subtotal	17, 077, 682	
Science information services:		
Dissemination of science information	9, 576, 408	
International scientific information exchanges	749, 358	
Subtotal	10, 325, 766	
Science education programs:		
Fellowships	21, 678, 136	
Institutes	41, 804, 084	
Research participation and scientific activities for teachers	2, 559, 079	
Science education for undergraduate students	5, 878, 348	
Science education for secondary school students	3, 682, 732	
Specialized advanced science education projects	2, 752, 589	
Course content improvement	12, 632, 408	
Subtotal	90, 987, 376	
Science resources planning:		
Science resources planning analysis	163, 076	
Economic and statistical studies	308, 000	
Scientific personnel and education studies	1, 145, 256	
Subtotal	1, 616, 332	
Program development and management	10, 865, 568	
Total, NSF	320, 730, 838	
Allocation to other Government agencies	18, 947	
Total obligations, fiscal year 1963		320, 749, 785
Unobligated balance carried forward to fiscal year 1964		5, 366, 975
Total		326, 116, 760

TRUST FUND

Receipts

Unobligated balance from fiscal year 1963	$6, 690	
Donations from private sources	1, 847	
Total availability		$8, 537

Obligations

Total obligations fiscal year 1963	1, 850	
Unobligated balance carried forward into fiscal year 1964	6, 687	
Total availability		8, 537

APPENDIX C

Grants For Basic Research

BIOLOGICAL AND MEDICAL SCIENCES

DEVELOPMENTAL BIOLOGY

AMERICAN SOCIETY OF ANIMAL SCIENCE, Beltsville, Md.; H. H. Cole, University of California, Davis; *Animal Reproduction Symposium;* 1 year; $2,700

BRANDEIS UNIVERSITY, Waltham, Mass.; Chandler Fulton; *Cell Organelle Development in Naegleria;* 3 years; $56,800

BROWN UNIVERSITY, Providence, R.I.; Maimon Nasatir; *Free Amino Acids and Deoxyribosides in Mitosis;* 2 years; $19,200

CALIFORNIA INSTITUTE OF TECHNOLOGY, Pasadena; Anton Lang; *Action of Gibberelline in Plant Development;* 2 years; $97,500
Albert Tyler; *Problems of Fertilization and Early Development;* 5 years; $89,000

CARLETON COLLEGE, Northfield, Minn.; Thurlo B. Thomas; *Lacrimal Gland Cytology;* 1 year; $5,200

COLLEGE OF THE HOLY CROSS, Worcester, Mass.; B. T. Lingappa; *Self-inhibition of Germination in Fungi;* 2 years; $27,400

COLLEGE OF WILLIAM AND MARY, Williamsburg, Va.; Robert E. L. Black; *Enzyme Systems in Marine Embryos;* 2 years; $28,200

COLUMBIA UNIVERSITY, New York, N.Y.; Paul A. Marks and David Danon; *Mammalian Erythrocyte Aging;* 1 year; $18,000
Melvin L. Moss; *Comparative Calcification Mechanisms of Invertebrates;* 3 years; $27,700

FREDERICK BURK FOUNDATION FOR EDUCATION, San Francisco, Calif.; James T. Duncan; *Differentiation of Melanophores in the Skin of Certain Salamanders;* 27 months; $27,300

GRAMBLING COLLEGE, Grambling, La.; Vernon Henderson; *Regeneration of Fin Elements in Fish;* 1 year; $4,900

HOWARD UNIVERSITY, Washington, D.C.; John P. Rier; *Organization of Vascular Tissues in Plants;* 1 year; $11,800

INTER-AMERICAN INSTITUTE OF AGRICULTURAL SCIENCES OF THE ORGANIZATION OF AMERICAN STATES, Turrialba, Costa Rica; Lee M. Hutchins; *Gall Development and Behavior;* 2 years; $15,000

JOHNS HOPKINS UNIVERSITY, Baltimore, Md.; Betsy G. Bang; *Vertebrate Upper Respiratory Tract Anatomy;* 2 years; $12,800

KENTUCKY RESEARCH FOUNDATION, Lexington; R. H. Weaver; *The Branching Mechanism in Lactobacillus Bifidus;* 2 years; $15,800

LOUISIANA STATE UNIVERSITY, Baton Rouge; John A. Davison; *Frog Spotting Patterns;* 2 years; $14,700

LOUISIANA STATE UNIVERSITY, Baton Rouge; Willie M. Reams, Jr.; *Pigment Cell Behavior in PET Mice;* 2 years; $26,300

MANHATTAN COLLEGE, New York, N.Y.; Ulrich Naf; *Antheridium Formation in Ferns;* 3 years; $100,000

MASSACHUSETTS INTITUTE OF TECHNOLOGY, Cambridge; Eugene Bell; *Cellular Differentiation and Limb Development;* 5 years; $249,800

MASSACHUSETTS GENERAL HOSPITAL, Boston; Jerome Gross; *Fine Structure of Differentiating Tissues;* 1 year; $46,100

MEDICAL COLLEGE OF SOUTH CAROLINA, Charleston; Elsie Taber; *Differentiation, Growth and Function of Gonadal Tissue;* 3 years; $40,000

MERCY INSTITUTE FOR BIOMEDICAL RESEARCH, Denver, Colo.; V. L. can Breemen; *Electron Microscopic Studies of Interfibrillar Membrane Systems in Striated Muscle;* 1 year; $19,300

MICHIGAN STATE UNIVERSITY, East Lansing; G. B. Wilson; *Chemical Disruption of the Mitotic Cycle;* 2 years; $15,000

NEW YORK UNIVERSITY, New York; John R. Cook; *DNA-Polymerase and Photoreactivating Enzyme in Echinoderm Zygotes;* 2 years; $35,800

NORTHWESTERN UNIVERSITY, Evanston, Ill.; Joan M. Whitten; *Morphology of Insect Growth and Metamorphosis;* 3 years; $37,100

PASADENA FOUNDATION FOR MEDICAL RESEARCH, Pasadena, Calif.; C. M. Pomerat; *Experimental Cytology Using Cell Cultures;* 3 years; $84,000

PRINCETON UNIVERSITY, Princeton, N.J.; William P. Jacobs; *Control of Differentiation and Growth in Higher Plants;* 3 years; $86,400

PURDUE RESEARCH FOUNDATION, Lafayette, Ind.; Joe H. Cherry; *Nucleic Acid Metabolism in Development of Plant Cells;* 3 years; $35,400
James S. Lovett; *Morphogenesis in Aquatic Fungi;* 1 year; $10,000
D. James Morre; *Membrane Structures in Cell Wall Formation;* 3 years; $46,500
Richard C. Sanborn; *Properties of Anthropod Cells and Tissues in Culture;* 1 year; $19,000
Joseph W. Vanable, Jr.; *Skin Gland Emergence During Amphibian Metamorphosis;* 3 years; $50,000
Richard H. White; *Eye and Brain Development in the Mosquito;* 3 years, $119,000

RESEARCH FOUNDATION OF STATE UNIVERSITY OF NEW YORK, ALBANY; Wilfred A. Cote, Jr., College of Forestry at Syracuse University, Syracuse, N.Y.; *Ultrastructure of Wood Cells;* 2 years; $8,600

RESEARCH FOUNDATION, OKLAHOMA STATE UNIVERSITY; Stillwater; E. A. Grula; *Cell Division in Bacterial and Mammalian Cells;* 1 year; $18,300

ROCKEFELLER INSTITUTE, New York, N.Y.; Armin C. Braun; *Normal and Abnormal Growth and Development in Plants;* 4 years; $67,200

Sam Granick; *Studies Toward the Growth and Differentiation of Chloroplasts in Vitro;* 2 years; $41,100

RUTGERS, THE STATE UNIVERSITY, New Brunswick, N.J.; Michael J. LaMarca; *Functional Studies of the Reproductive Organs of Elasmobranchs;* 3 years; $25,700

Albert List, Jr.; *Changes Accompanying Differentiation in Plant Cells;* 2 years; $44,600

SAN DIEGO STATE COLLEGE FOUNDATION, San Diego, Calif.; David C. Shepard; *Growth of Single Cells During the Post Irradiation Division Pattern;* 1 year; $11,600

SETON HALL UNIVERSITY, South Orange, N.J.; Silvio Fiala, Jersey City; *Biochemical Aspects of Cellular Growth and Proliferation;* 2 years; $41,000

SIMPSON COLLEGE, Indianola, Iowa; Margaret L. Watson; *Maturation of the Visual System;* 2 years; $10,700

SMITH COLLEGE, Northampton, Mass.; David A. Haskell; *Origin and Development of Growth Centers in the Plant Embryo;* 1 year; $6,600

SOUTHERN UNIVERSITY AND AGRICULTURAL AND MECHANICAL COLLEGE, Baton Rouge, La.; James Travis Coleman, New Orleans; *Effect of Nervous Tissue in Regeneration;* 2 years; $5,400

STANFORD UNIVERSITY, Stanford, Calif.; Allen H. Gates and Robert C. Goodlin; *Regulation of Development of the Mouse Egg;* 2 years; $51,500

Donald L. Stilwell; *Vascularization and Innervation of Skeletal Structures;* 2 years; $29,400

STATE UNIVERSITY OF IOWA, Iowa City; Eleanor H. Slifer; *Fine Structure of Insect Sense Organs;* 1 year; $7,600

STATE UNIVERSITY OF NEW YORK COLLEGE OF AGRICULTURE AT CORNELL UNIVERSITY, Ithaca; Stanley A. Zahler; *Developmental Biology of Myxobacteria;* 3 years; $38,900

STATE UNIVERSITY OF SOUTH DAKOTA, Vermillion; Herman J. Haas; *Pattern Formation in Embryonic Systems;* 3 years; $22,200

SYRACUSE UNIVERSITY, Syracuse, N.Y.; Roy H. Doi; *Control Mechanisms in Bacterial Differentiation;* 3 years; $68,200

SYRACUSE UNIVERSITY RESEARCH INSTITUTE, Syracuse, N.Y.; Bertie F. Argyris; *Mechanism of Acquired Tolerance in Mice;* 2 years; $29,600

Thomas S. Argyris; *Hair Growth Stimulation During Skin Regeneration;* 2 years; $51,400

John H. Miller and Pauline M. Miller; *Morphogenetic Factors in Fern Gametophyte Development;* 3 years; $37,200

TEXAS AGRICULTURAL EXPERIMENT STATION, College Station; Julius W. Dieckert; *Fine Structure of Plant Embryos;* 3 years; $26,900

Henry C. Tracy, Memphis, Tenn.; *The Anatomy and Development of the Toadfish;* 1 year; $200

UNION COLLEGE AND UNIVERSITY, Schenectady, N.Y.; Raymond Rappaport, Jr.; *Mechanisms of Cytokinesis in Animal Cells;* 3 years; $9,200

UNIVERSITY OF CALIFORNIA, Berkeley; F. W. Lorenz and F. X. Ogasawara, Davis; *Physiology of the Avian Oviduct;* 2 years; $50,400

Richard C. Strohman; *Muscle Protein Biosynthesis During Embrionic Development;* 3 years; $42,100

Ursula K. Abbott, Davis; *Relative Growth of Bone Rudiments;* 3 years; $51,900

E. M. Gifford, Jr., Davis; *Cytology and Morphogenesis of Vegetative and Flowering Shoots;* 2 years; $29,400

W. O. Reinhardt, San Francisco; *Micro-Injection of Mammalian Ova;* 1 year; $4,900

UNIVERSITY OF COLORADO, Boulder; Douglas E. Kelly; *Cellular Differentiation of the Amphibian Pineal Body;* 3 years; $35,400

Seymour Katsh and John T. Willson, Denver; *Cell Culture of Testicular Tissue;* 3 years; $35,300

UNIVERSITY OF CONNECTICUT, Storrs; Walter Landauer; *Studies of Developmental Malformations in the Chick Embryo;* 3 years; $15,900

UNIVERSITY OF DELAWARE, Newark; Marenes R. Tripp; *Maintenance of Oyster Tissues in Vitro;* 2 years; $16,000

UNIVERSITY OF GEORGIA, Athens; David T. Lindsay; *Role of Histone Proteins in Cellular Differentiation;* 3 years; $51,900

UNIVERSITY OF IDAHO, Moscow; Lorin W. Roberts; *Differentiation of Wound Vessel Members;* 1 year; $3,800

UNIVERSITY OF ILLINOIS, Urbana; Frank H. Moyer; *Control of Melanocyte Differentiation;* 3 years, $90,400

Dominick J. Paolillo, Jr.; *Archegonial Maturation in Vascular Cryptogams;* 2 years; $20,800

UNIVERSITY OF KANSAS, Lawrence; Eleanor Wenger and Paul A. Kitos; *Differentiation and Carbohydrate Metabolism in the Salamander;* 2 years; $34,500

UNIVERSITY OF LAGOS MEDICAL SCHOOL, Surulere Lagos, Nigeria; Robert D. Cahn; *Embryonic Cellular Enzyme Differentiation;* 3 years; $60,600

UNIVERSITY OF MASSACHUSETTS, Amherst; Arthur C. Gentile; *Visible Light Effects in Plant Tissue Culture;* 3 years; $21,000

John G. Moner; *Effects of Deuterium Oxide on Synchronized and Logarithmic Populations of Tetrahymena Pyriformis;* 2 years; $23,200

John R. Rowley; *Origin of the Pollen and Spore Exine and Nature of Sporopollenin;* 2 years; $31,000

UNIVERSITY OF MICHIGAN, Ann Arbor; Alexander Barry; *Development of the Duct System of the Liver;* 2 years; $26,000

James N. Cather; *Development and Differentiation of the Molluscan Shell Gland;* 3 years; $21,800

Wilfrid T. Dempster; *Architectonics of the Human Skull;* 3 years; $29,400

UNIVERSITY OF MINNESOTA, Minneapolis; Martin Dworkin; *Nutrition and Developmental Physiology of the Fruiting Myxobacteria;* 3 years; $77,600

A. Glenn Richards, St. Paul; *Structure and Development of Insect Membranes;* 3 years; $60,800

UNIVERSITY OF PENNSYLVANIA, Philadelphia; Ralph B. L. Gwatkin and John D. Biggers; *Effects of Viruses and Nucleic Acids on Early Development;* 3 years; $67,900

UNIVERSITY OF PITTSBURGH, Pa.; Peter Gray; *Studies of Electron Microscope Techniques;* 1 year; $17,000

UNIVERSITY OF ROCHESTER, N.Y.; William B. Muchmore: *Immunochemical Studies of Muscle Development;* 2 years; $31,100

UNIVERSITY OF SOUTHERN CALIFORNIA, Los Angeles; Carmel M. Roberts; *Early Differentiation in the Embryonic Heart;* 1 year; $12,700

UNIVERSITY OF TEXAS, Austin; Harold C. Bold; *Cytoplasmic Lamella Systems in Algae;* 3 years; $73,000

W. Gordon Whaley; *Structure and Functioning of the Golgi Apparatus;* 3 years; $126,900

UNIVERSITY OF VIRGINIA, Charlottesville; J. David Deck; *Studies of Amphibian Limb Regeneration;* 2 years; $14,300

James E. Kindred; *Histological Studies of Vertebrate Blood Cells;* 1 year; $1,000

Robert Louarn Searls; *Metabolic Control in the Early Embryo;* 3 years; $60,600

UNIVERSITY OF WASHINGTON, Seattle; Alex J. Haggis; *Inducing Capacity of Amphibian Brain Fractions;* 2 years; $41,000

UNIVERSITY OF WISCONSIN, Madison; Ray F. Evert; *Development of the Phloem in Woody Dicotyledons;* 2 years; $29,600

Eldon H. Newcomb; *Electron Microscopic Investigations of Higher Plant Development;* 4 years; $113,000

WABASH COLLEGE, Crawfordsville, Ind.; Willis H. Johnson; *Culture of Planarian Cells in vitro;* 2 years; $41,500

WASHINGTON UNIVERSITY, St. Louis, Mo.; Allen C. Enders; *Mechanisms of Implantation in Mammals;* 1 year; $20,200

WAYNE STATE UNIVERSITY, Detroit, Mich.; Werner G. Heim; *Occurrence, Nature and Role of Certain Blood Proteins;* 2 years; $31,200

WESLEYAN UNIVERSITY, Middletown, Conn.; Earl D. Hanson; *Studies of Morphogenesis and Differentiation in Paramecium and Other Organisms;* 2 years; $36,500

John B. Morrill; *Problems of Mosaic Development in Mollusca;* 2 years; $27,000

WOMAN'S MEDICAL COLLEGE OF PENNSYLVANIA, Philadelphia; Thomas D. Malewitz; *Histological Studies of the Reproductive System;* 2 years; $8,600

WOODSTOCK COLLEGE, Woodstock, Md.; Roland J. Lesseps; *Cell Affinities in Drosophila Imaginal Discs;* 2 years; $6,000

Anthony P. Mahowald; *Development of Polar Granules in Drosophila;* 2 years; $6,000

YALE UNIVERSITY, New Haven, Conn.; Edgar J. Boell; *Developmental Changes in Mitochondria;* 3 years; $62,700

Sheila J. Councé and Donald F. Poulson; *Analysis of Insect Embryogenesis;* 3 years; $66,700

Dorothea Rudnick; *Glutamotransferase in the Chick Embryo During Development;* 1 year; $4,900

J. P. Trinkaus; *Histogenetic and Contact Specificity of Differentiating Cells;* 3 years; $84,900

YESHIVA UNIVERSITY, New York, N.Y.; Lois Jean Smith; *Factors Controlling Normal Axial Development;* 2 years; $20,900

ENVIRONMENTAL BIOLOGY

ALMA COLLEGE, Alma, Mich.; Ronald O. Kapp; *Pollen Analytical Studies of Middle Pleistocene Sediments;* 3 years; $19,800

AMERICAN MUSEUM OF NATURAL HISTORY, New York, N.Y.; Phyllis H. Cahn; *Acoustico-Lateralis Function in Fish;* 3 years; $18,100

Hugo D. Freudenthal; *Nutrition and Physiology of Planktonic Foraminifera;* 2 years; $26,300

ARIZONA STATE UNIVERSITY, Tempe; Gerald A. Cole; *Limnological Investigations in Arizona;* 3 years; $46,000

AUBURN UNIVERSITY, Auburn, Ala.; E. W. Shell; *Reproduction Control Factor in Fishes;* 2 years; $24,200

BERMUDA BIOLOGICAL STATION FOR RESEARCH, INC., St. George's West; David W. Menzel; *Equipment for Analysis of Nutrients in Marine Environments;* 1 year; $14,500

BOYCE THOMPSON INSTITUTE FOR PLANT RESEARCH, INC., Yonkers, N.Y.; Jean P. Vite, Forest Research Laboratory, Grass Valley, Calif.; *Response of* Ips *and* Dendroctonus *to Attractants;* 3 years; $57,600

BROOKLYN COLLEGE, Brooklyn, N.Y.; Solomon Goldstein and Melvin M. Belsky; *Developmental Morphology and Nutritional Requirements of Marine Fungi;* 2 years; $38,100

CALIFORNIA ACADEMY OF SCIENCES, San Francisco; William J. Hamilton III; *Night celestial Orientation in Migratory Birds;* 2 years; $18,100

CHICAGO NATURAL HISTORY MUSEUM, Ill.; Robert F. Inger and Bernard S. Greenberg, Roosevelt University; *Herpetofauna of an Oriental Rain Forest Area;* 3 years; $32,900

CHICAGO ZOOLOGICAL PARK, Ill.; George B. Rabb; *Breeding Behavior of Anurans;* 2 years; $15,800

COLORADO STATE UNIVERSITY RESEARCH FOUNDATION, Fort Collins; Paul H. Baldwin; *Ecology of Rocky Mountain Picidae;* 3 years; $27,600

Richard T. Ward; *Ecotypic Variation in Various Plant Species;* 3 years; $12,100

COLUMBIA UNIVERSITY, New York, N.Y.; Allan W. H. Be', Palisades; *Ecology of Living Planktonic Foraminifera;* 3 years; $73,600

CORNELL UNIVERSITY, Ithaca, N.Y.; Clifford O. Berg; *Biology of European Sciomyzidae;* 2 years; $23,200

Roger A. Morse; *Social Organization in Apis Mellifera Colonies;* 3 years; $40,800

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UNIVERSITY OF PENNSYLVANIA, Philadelphia; Alan Garen; *Genetic Control of Alkaline Phosphatase Formation in E. Coli;* 3 years; $105,000

John R. Preer, Jr.; *Gene Action in Paramecium;* 3 years; $62,600

UNIVERSITY OF ROCHESTER, N.Y.; R. C. Lewontin; *Experimental Studies of Population Fitness;* 2 years; $44,700

Arnold W. Ravin; *Molecular Genetics of Streptomycin Resistance;* 2 years; $41,100

UNIVERSITY OF SOUTHERN CALIFORNIA, Los Angeles; Beatrice L. Kelly; *Relationship Between P2 Prophage and Its Host Cell, Escherichia Coli;* 2 years; $33,100

Margaret Lieb; *Mechanisms of Mutation in Bacteria and Bacteriophages;* 3 years; $48,900

UNIVERSITY OF TEXAS, Austin; David P. Bloch; *Role of Histones in Cell Division and Cell Development;* 3 years; $36,000

Thomas S. Matney; *Recombination in Bacteria;* 2 years; $21,800

Marshall R. Wheeler and Wilson S. Stone; *Evolutionary Relationships of the Drosophilidae of the Hawaiian Islands;* 18 months; $45,200

UNIVERSITY OF UTAH, Salt Lake City; George D. Hanks; *Genetic Analysis and Population Studies of Meiotic Drive in Drosophila Melanogaster;* 2 years; $10,800

UNIVERSITY OF WISCONSIN, Madison; S. J. Peloquin; *Genetics of Solanum Tuberosum;* 3 years; $35,600

Ruby Marie Valencia, Oak Ridge, Tenn.; *Cytogenetic Analysis of Irradiated Whole Genomes of Drosophila;* 2 years; $28,600

WASHINGTON STATE UNIVERSITY, Pullman; William C. McDonald; *Genetic Studies on Bacterial Growth at High Temperatures;* 2 years; $14,000

WESTERN RESERVE UNIVERSITY, Cleveland, Ohio; Irving P. Crawford; *Effect of Mutation on Enzymes;* 3 years; $86,700

WISTAR INSTITUTE OF ANATOMY AND BIOLOGY, Philadelphia, Pa.; Drew Schwartz; *Genetic Studies on Mutant Enzymes in Maize;* 3 years; $129,300

Andrzej W. Kozinski; *Incomplete or Partial Replication of the T4 Phage DNA;* 3 years; $121,700

YALE UNIVERSITY, New Haven, Conn.; Edward A. Adelberg; *Equipment for Microbial Physiology;* 1 year; $19,700

METABOLIC BIOLOGY

ALBERT EINSTEIN MEDICAL CENTER, Philadelphia, Pa.; Herman Friedman; *Role of Nucleoproteins in Antibody Biosynthesis;* 2 years; $36,000

Robert Rabin; *Glyoxylate Metabolism as a Function of Butyrate in Bacteria;* 2 years; $15,000

BOYCE THOMPSON INSTITUTE FOR PLANT RESEARCH, INC., Yonkers, N.Y.; Karl Maramorosch; *Regulation of Insect Metabolism by Plant Viruses;* 3 years; $83,200

Leonard H. Weinstein and Clark A. Porter; *Biosynthesis and Metabolism of Quinic Acid in Higher Plants;* 3 years; $44,500

BRANDEIS UNIVERSITY, Waltham, Mass.; Attila O. Klein; *Early Metabolic Events Induced by Light in Dark-grown Leaves;* 2 years; $15,500

Harold P. Klein; *Formation of Alpha-amylase by Pseudomonas Saccharophila;* 3 years; $40,000

John Martin Lowenstein; *Control of Metabolism by Intracellular Compartmentation;* 3 years; $50,000

Morris Soodak; *Enzymatic Mechanisms Involved in the Bioysynthesis of Thyroglobulin, a Glycoprotein;* 3 years; $35,000

BRIGHAM YOUNG UNIVERSITY, Provo, Utah; Richard D. Sagers; *Acetate Formation in Anaerobic Microorganisms;* 4 years; $76,000

CALIFORNIA INSTITUTE OF TECHNOLOGY, Pasadena, Calif.; Samuel Epstein and Isaac R. Kaplan; *The Biological Fractionation of Carbon and Hydrogen Stable Isotopes;* 3 years; $30,000

CHICAGO MEDICAL SCHOOL, Ill.; S. G. A. Alivisatos; *Metabolism of Histamine and Related Compounds;* 2½ years; $37,500

COLORADO STATE UNIVERSITY RESEARCH FOUNDATION, Fort Collins; Ralph Baker; *Mechanism of Reproduction in Hypomyces Solani F. Cucurbitae;* 2 years; $11,600

Cleon W. Ross; *Synthesis of Pyrimidine Nucleotides of Ribonucleic Acid in Higher Plants;* 3 years; $26,000

COLUMBIA UNIVERSITY, New York, N.Y.; R. F. Dawson; *Biosynthesis of Nicotinic Acid and Related Pyridine Compounds in Nicotiana;* 3 years; $35,400

David B. Sprinson; *Biosynthesis of Aromatic Amino Acids;* 5 years; $125,000

CORNELL UNIVERSITY, Ithaca, N.Y.; James L. Gaylor; *Precursors of Steroidal Hormones;* 3 years; $30,300

DARTMOUTH COLLEGE, Hanover, N.H.; Melvin V. Simpson; *Biosynthesis of Cytochromes in Liver and Particles from Rhodospirillum Rubrum;* 3 years; $30,000

GEORGE WASHINGTON UNIVERSITY, Washington, D.C.; Robert C. Wood; *Folic Acid Metabolism in Bacteria;* 2 years; $45,000

GOUCHER COLLEGE, Baltimore, Md.; Helen M. Habermann; *Comparative Physiology of Pigment-Deficient Sunflower Mutants;* 3 years; $50,700

HAHNEMANN MEDICAL COLLEGE AND HOSPITAL, Philadelphia, Pa.; Herbert J. Eichel; *Studies on Respiratory Enzymes in Protozoa;* 2 years; $26,600

HARVARD UNIVERSITY, Cambridge, Mass.; Edmund Chi Chien Lin; *Evolution of Biochemical Pathways in Bacteria;* 3 years; $31,300

Herbert L. Ennis and Martin Lubin; *Biosynthetic Control Mechanisms in Mammalian and Bacterial Cells;* 2 years; $32,600

Leon Goldstein; *Regulation of Ammonia Excretion;* 3 years; $30,000

Martin Lubin; *The Amino Acid and Cation Transport Systems of Bacterial Cells;* 2 years; $20,000

INDIANA UNIVERSITY FOUNDATION, Bloomington; Arthur R. Schulz; *A Study of the Mechanism of Photophosphorylation;* 1½ years; $13,900

IOWA STATE UNIVERSITY, Ames; S. Aronoff; *Biogenesis of Chlorophyll;* 3 years; $37,800

Robert M. Chasson; *Mitochondrial Development and Activity in Relation to Formation of Ion Absorption Capacity in Plant Cells;* 2 years; $15,800

JOHNS HOPKINS UNIVERSITY, Baltimore, Md.; Andre T. Jagendorf; *Synthesis of Chloroplast Proteins;* 4 years; $90,000

Gale W. Rafter; *Chemistry and Metabolism of Escherichia Coli Phosphoproteins;* 2 years; $20,000

KAISER FOUNDATION RESEARCH INSTITUTE, Oakland, Calif.; Morton Rothstein; *Lysine Metabolism in Algae;* 1 year; $10,000

KANSAS STATE COLLEGE OF PITTSBURG, Howard J. Stein; *Uptake and Utilization of Amino Acids by the Roots of Higher Plants;* 2 years; $13,100

LETOURNEAU COLLEGE, Longview, Tex.; Robert L. Stephens; *Biological Oxidation of Alcohols to Carbonyl Compounds by Plants and Higher Fungi;* 2 years; $4,000

LOS ANGELES STATE COLLEGE FOUNDATION, Calif.; Joseph A. Sacher; *Tissue Senescence: Metabolism and Permeability;* 3 years; $29,100

LYNCHBURG COLLEGE, Lynchburg, Va.; Paul J. Osborne; *Phylogenetic and Ontogenetic Study of Phosphatases;* 2 years; $15,000

MIAMI UNIVERSITY, Oxford, Ohio, David W. Newman; *Physiology and Biochemistry of Chromoplasts-Lipides;* 2 years; $15,000

MICHAEL REESE HOSPITAL AND MEDICAL CENTER, Chicago, Ill.; Clarence Cohn; *Influence of Rate of Ingestion of Diet on Intermediary Metabolism;* 2 years; $10,000

MICHIGAN STATE UNIVERSITY, East Lansing; Norman E. Good and Seikichi Izawa; *The Mechanism of the Hill Reaction and Photophosphorylation;* 3 years; $70,000

Harold M. Sell; *Biochemistry of Natural and Synthetic Growth Substances as Applied to Higher plants;* 2 years; $18,000

OHIO UNIVERSITY, Athens; John T. McQuate, Richard T. Huling and James A. Wilson; *Biochemical Equipment (Recording Spectrophotometer)*; 2 years; $5,100

OKLAHOMA STATE UNIVERSITY, Stillwater; Norman N. Durham; *Utilization of D-Tryptophane and Anthranilic Acid by Microorganisms;* 1 year; $6,100

Franklin R. Leach; *Uptake of Lipoic Acid by Streptococcus Faecalis;* 3 years; $17,600

OREGON STATE UNIVERSITY, Corvallis, Victor J. Brookes; *Biochemistry of Insect Development;* 2 years; $20,000

Te May Ching; *Fat Metabolism in Germinating Seed of Douglas Fir;* 2 years; $11,800

Leo W. Parks; *Ergosterol Metabolism in Saccharomyces Cervisiae;* 2 years; $25,000

PENNSYLVANIA STATE UNIVERSITY, University Park; E. S. Lindstrom; *Chromatophoral Photometabolism of Rhodospirullum;* 2 years; $19,000

PURDUE RESEARCH FOUNDATION, Lafayette, Ind.; Joseph Kuc and Oliver E. Nelson; *Biochemical Pathways for the Synthesis of Lignin in Plants;* 1 year; $2,900

E. B. Williams and Joseph Kuc; *Metabolic Pathways Controlling Host-Parasite Relationships;* 2 years; $30,000

REED COLLEGE, Portland, Oreg.; Helen A. Stafford; *The Physiology of Lignin Formation;* 3 years; $39,300

RESEARCH FOUNDATION OF STATE UNIVERSITY OF NEW YORK, Albany; Vincent Santilli, Buffalo; *Role of Leaf Ribonuclease in Tobacco Mosaic Virus Infection;* 2 years; $20,000

RESEARCH INSTITUTE OF TEMPLE UNIVERSITY, Philadelphia, Pa.; John M. Ward; *Biochemical Aspects of Morphogenesis of the Slime Mold;* 3 years; $45,000

RUTGERS, THE STATE UNIVERSITY, New Brunswick, N.J.; Bernard W. Koft; *Biosynthesis of Pteridines by Bacteria;* 2 years; $16,000

James Oliver Lampen; *Enzyme Secretion and Cell Wall Formation;* 1 year; $7,000

Wayne W. Umbreit; *A study of Autotrophy;* 3 years; $54,100

Selman A. Waksman; *Biogenesis of the Streptomycin Group of Antibiotics;* 2 years; $32,200

SAINT JOSEPH HOSPITAL, Burbank, Calif.; Morris Cohen, Reuben Straus and Charles I. Barron; *Hypoxic Induction of a Structural Abnormality in Liver Mitochondria;* 2 years; $20,000

SAN FERNANDO VALLEY STATE COLLEGE FOUNDATION, Northridge, Calif.; Warren A. Furumoto; *The Initial Acts of Infection by Tobacco Mosaic Virus;* 1 year; $5,500

SETON HALL UNIVERSITY, South Orange, N.J.; Vincent P. Cirillo, Jersey City; *Role of Facilitated Diffusion in Active Transport;* 3 years; $26,600

John H. Glick, Jr. and Amedeo F. D'Adamo, Jr.; *The Pathway of Aspartate Metabolism in Mammalian Tissues;* 2 years; $19,000

STANFORD UNIVERSITY, Stanford, Calif.; Frederick A. Fuhrman; *Regulation of Carbohydrate Metabolism at Low Temperatures;* 2 years; $29,000

STATE UNIVERSITY OF IOWA, Iowa City; R. E. Kallio; *Study of Certain Lithotrophic Microorganisms;* 2 years; $25,000

TRAINING SCHOOL AT VINELAND, N.J.; George Rendina; *The Regulation of Carbohydrate Metabolism in Brain Subcellular Particles;* 2 years; $26,000

TEXAS AGRICULTURAL AND MECHANICAL RESEARCH FOUNDATION, College Station; Donald W. Hood; *Lipids of Organisms Constituting the Main Bulk of a Coral Reef, With Emphasis on Hydrocarbons;* 2 years; $24,000

TUFTS UNIVERSITY, Medford, Mass.; Alton Meister, Boston; *Biochemical Mechanisms;* 5 years; $169,800

UNION COLLEGE AND UNIVERSITY, Schenectady, N.Y.; C. Hurwitz, R. A. Peabody and C. L. Rosano, Albany; *Mechanism of Action of Streptomycin;* 2 years; $16,000

UNIVERSITY OF CALIFORNIA, Berkeley; Gordon Mackinney; *Carotenoid Differences in Tomatoes;* 3 years; $40,000

Clinton O. Chichester, Davis; *Biosynthesis of Carotenoids: The Pathway of Synthesis of the Isoprenoid C40 Compounds in Plant Material;* 3 years; $75,000

Mendel Mazelis, Davis; *Metabolic Role of Peroxidase in Higher Plants;* 3 years; $35,500

Robert J. Weaver, Davis; *Metabolism of Gibberellin in Vitis Vinifera L.;* 2 years; $26,300

S. C. Rittenberg, Los Angeles; *Bacterial Metabolism and Physiology;* 7 months; $24,200

Sydney C. Rittenberg, Los Angeles; *Bacterial Metabolism and Physiology;* 3½ years; $121,800

Otto H. Scherbaum, Los Angeles; *Cytochemical and Immunochemical Analysis of Mechanisms Regulating Regeneration and Digestion in Stentor;* 1 year; $15,000

John A. DeMoss, San Diego; *Regulation of Cellular Metabolism;* 3 years; $63,800

UNIVERSITY OF CHICAGO, Ill.; Lawrence Bogorad; *Chloroplast Development and Ultrastructure;* 3 years; $42,000

Wayne J. McIlrath; *Physiological Functions of Boron in Plants;* 2 years; $20,000

UNIVERSITY OF DELAWARE, Newark; John H. McClendon; *Respiratory Mechanisms in the Cultivated Mushroom;* 2 years; $9,000

UNIVERSITY OF FLORIDA, Gainesville; Merrill Wilcox and S. H. West; *Aryl Hydroxylation in Higher Plants;* 2 years; $12,500

UNIVERSITY OF GEORGIA, Athens; William J. Payne; *Influence of Cations on the Metabolism of Marine Bacteria;* 2 years; $20,000

D. S. Van Fleet; *Chemistry and Function of the Endodermis;* 2 years; $10,000

D. S. Van Fleet; *Histochemical and Cytochemical Studies of Phloem;* 1 year; $4,560

UNIVERSITY OF ILLINOIS, Urbana; H. P. Broquist; *Folic Acid and Leucine Metabolism in Yeast;* 3 years; $31,500

R. H. Hageman and E. R. Leng; *Physiological Basis of Hybrid Vigor in Corn;* 2 years; $20,000

B. Connor Johnson; *Metabolism of Acetate and Other Volatile Fatty Acids in Ruminant;* 2 years; $20,000

UNIVERSITY OF KANSAS, Lawrence; David Paretsky; *Studies on the Biochemistry of Rickettsiae;* 2 years; $35,000

UNIVERSITY *of* LOUISVILLE, Ky.; John W. Brown; *Interrelationships Between Bacterial Nucleoproteins;* 2 years; $48,000

Thomas G. Scharff; *Sugar and Potassium Transport in Yeast;* 2 years; $25,000

UNIVERSITY OF MARYLAND, College Park; Leslie C. Costello; *Instrumentation for Identification of Enzyme Systems Related to the Oxidative Metabolism of Developing Ascaris Eggs;* 1 year; $14,200

Morris Lieberman; *Biosynthesis of Ethylene and Related Problems;* 2 years; $18,400

UNIVERSITY OF MASSACHUSETTS, Amherst; Trevor Robinson; *Enzymatic Pathways of Alkaloid Biosynthesis;* 3 years; $16,600

UNIVERSITY OF MICHIGAN, Ann Arbor; James F. Hogg; *Function of Glyoxylate By-pass Enzymes;* 2 years; $28,400

UNIVERSITY OF MINNESOTA, Minneapolis; Edward Leete; *Biosynthesis of Natural Products;* 3 years; $60,000

UNIVERSITY OF NEBRASKA, Lincoln; Francis A. Haskins; *Chemical Genetics of Metabolism of Coumarin and Related Compounds in Melilotus Alba and Other Plant Species;* 5 years; $98,750

UNIVERSITY OF NORTH CAROLINA, Chapel Hill; Max H. Hommersand; *Effects of Monochromatic Light on Photosynthesis, Respiration, and Intermediary Metabolism;* 2 years; $25,500

A. T. Miller and Werner Straus; *Lysosomes, Phagosomes and Hydrolytic Enzymes;* 3 years; $36,000

Walter J. Dobrogosz, Raleigh; *Mechanism of the Diauxie Phenomenon;* 3 years; $38,500

UNIVERSITY OF OKLAHOMA, Norman; John R. Sokatch, Oklahoma City; *Oxidation of the Branched Chain Amino Acids by Microorganisms;* 3 years; $32,000

UNIVERSITY OF OKLAHOMA RESEARCH INSTITUTE, Norman; Simon H. Wender; *Production of Scopolin, Scopoletin, and Related Compounds in Plants;* 3 years; $30,000

UNIVERSITY OF OREGON, Eugene; William R. Sistrom; *Control of Enzymes Concerned in Oxidation of Aromatic Compounds;* 2 years; $35,300

Jacob Straus; *Changes in the Nutrient Medium Caused by Plant Tissue Cultures;* 2 years; $20,900

UNIVERSITY OF PENNSYLVANIA, Philadelphia; Walter D. Bonner; *Electron Transport Systems in Higher and Lower Plants;* 1 year; $37,000

UNIVERSITY OF TENNESSEE, Knoxville; D. Frank Holtman; *Factors Influencing Growth and Pathogenicity of Staphylococci Under Anaerobic Conditions;* 2 years; $15,000

John T. Smith; *Sulfur Metabolism and Vitamin E;* 2 years; $19,300

UNIVERSITY OF TEXAS, Austin; Jack Myers; *Photosynthetic Metabolism of Algae;* 1 year; $6,500

Edward G. Rennels, Galveston; *A Study of Luteal Function in the Rat Ovary with Emphasis on its Hormonal Control;* 2 years; $32,000

UNIVERSITY OF VERMONT, Burlington; Donald B. Melville; *Ergothioneine Function and Biosynthesis;* 3 years; $36,000

UNIVERSITY OF WASHINGTON, Seattle; Erling J. Ordal; *Trace Inorganic Elements in the Metabolism of Bacteria;* 4 years; $100,000

UNIVERSITY OF WISCONSIN, Madison; Robert M. Bock and Harlyn O. Halvorson; *Biochemical and Biophysical Investigations of Protein Synthesis at the Template Level;* 5 years; $272,100

Dexter S. Goldman; *Fatty Acid Metabolism of the Tubercle Bacillus;* 2 years; $24,000

P. W. Wilson and R. H. Burris; *Biological Fixation of Nitrogen;* 5 years; $130,800

VALPARAISO UNIVERSITY, Valparaiso, Ind.; Kenneth E. Nichols; *Identification of the Photoreceptor in Phycocyanin Synthesis;* 3 years; $20,800

VANDERBILT UNIVERSITY, Nashville, Tenn.; Oscar Touster; *Biosynthesis of Glucuronate an Ascorbate;* 3 years; $72,750

WASHINGTON STATE UNIVERSITY, Pullman; Herbert M. Nakata; *Physiology of Sporulation in Aerobic Bacilli;* 2 years; $14,000

J. L. Stokes; *Physiology of Psychrophilic Bacteria;* 3 years; $63,200

WAYNE STATE UNIVERSITY, Detroit, Mich.; Chauncey R. Benedict; *Metabolism and Enzymology of Citramalic Acid;* 2 years; $20,000

WELLESLEY COLLEGE, Wellesley, Mass.; Clifford R. Noll, Jr.; *Diphosphopyridine Nucleotide-linked Dehydrogenases in Lower Plants;* 1½ years; $11,200

WEST VIRGINIA UNIVERSITY, Morgantown; Wayne W. Luchsinger; *The Mechanism of Action of the Beta-Glucanases;* 3 years; $42,400

Elon G. Scott; *A Study of the Metabolic Role of Boron in Plants;* 2 years; $10,400

WISTAR INSTITUTE OF ANATOMY AND BIOLOGY, Philadelphia, Pa.; Angus F. Graham; *Biosynthesis of Ribonucleic Acid in Mammalian and Bacterial Cells Infected with Ribonucleic Acid Containing Viruses;* 3 years; $36,000

YALE UNIVERSITY, New Haven, Conn.; G. B. Bouck, J. Cronshaw and A. W. Galston; *Structural and Functional Association of Cytoplasmic Components of the Plant Cell;* 2 years; $60,000

YESHIVA UNIVERSITY, New York, N.Y.; Jerard Hurwitz; *Role of DNA in RNA Synthesis;* 3 years; $153,800

M. J. Osborn; *Biosynthesis of Bacterial Lipopolysaccharides;* 3 years; $82,500

Harold J. Strecker; *Metabolism of Proline in Relation to Ornithine;* 3 years; $45,700

MOLECULAR BIOLOGY

ALBERT EINSTEIN MEDICAL CENTER, Philadelphia, Pa.; Daniel A. Boroff, David Ezekiel, and Robert J. Suhadolnik; *Equipment for Research in Biochemistry;* 1 year; $50,000

Daniel A. Boroff; *Chemistry of the Toxin of Clostridium Botulinum;* 1 year; $80,000

BAYLOR UNIVERSITY, Waco, Tex.; Harris Busch, Houston; *Biochemistry of the Nucleolus;* 2 years; $45,000

Saul Kit, Houston; *Enhanced Enzymatic Activity in Vaccinia Infected Animal Cells;* 2 years; $70,000

BERMUDA BIOLOGICAL STATION FOR RESEARCH, INC., St. George's West; Donald G. Comb, Harvard University, Boston, Mass.; *Biochemistry of Differentiation;* 1 year; $9,800

BOSTON COLLEGE, Chestnut Hill, Mass.; Joseph A. Orlando; *Isolation and Function of Bacterial Haem Proteins;* 2 years; $28,000

BOSTON UNIVERSITY, Mass., George E. Hein; *Enzyme Specificity Used to Elucidate 'Active Sites';* 2 years, $35,000

Karl Schmid; *Chemical Structure of the Low Molecular Weight Human Plasma Glycoproteins;* 2 years; $25,800

Frederick S. Brackett, Rockville, Md.; *Data Processing in Molecular Biology;* 2 years, $21,000

BRANDEIS UNIVERSITY, Waltham, Mass.; Gerald D. Fasman; *Conformational Studies of Synthetic Poly-a-amino Acids;* 2 years; $40,000

Lawrence Grossman; *Structure and Function of Nucleic Acids;* 2 years; $57,000

Thomas C. Hollocher; *Mechanisms of Enzymatic Oxidation-Reduction Reactions;* 2 years; $60,000

Thomas C. Hollocher, Jr., *Mechanisms of Enzymatic Reactions;* $5,000

Mary Ellen Jones; *Biosynthetic and Transfer Reactions;* 2 years; $65,000

Julius Marmur; *Biological and Physical Properties of DNA;* 2 years; $70,000

Richard S. Morgan; *Structure of Microsomal Particle;* 2 years; $30,000

Edgar Zwilling; *Ultracentrifugal Studies of Biological Materials;* 3 years; $43,000

BROWN UNIVERSITY, Providence, R.I.; Paul R. Gross; *Messenger RNA Synthesis in Yeasts and in Higher Cells;* 2 years; $45,000

Seymour Lederberg; *Origin and Function of Subcellular Particles of Micro-organisms;* 2 years; $25,000

CALIFORNIA INSTITUTE OF TECHNOLOGY, Pasadena; H. K. Mitchell; *Peptides and Protein Synthesis in Drosophila;* 2 years; $48,000

CASE INSTITUTE OF TECHNOLOGY, Cleveland, Ohio; James E. Shields; *Side-Chain Interactions in Peptides;* 1 year; $8,000

COLUMBIA UNIVERSITY, New York, N.Y.; Eloise E. Clark; *Equipment for Research on the Macromolecules and Their Biological Functions;* 1 year; $13,000

Eloise E. Clark; *Interactions of Muscle Protein Actin;* 2 years; $30,000

Bernard F. Erlanger; *Relationship of Structure to Activity of Trypsin;* 2 years; $35,000

Teru Hayashi; *Role of Actin in Muscle Contraction;* 2 years; $46,000

Alvin I. Krasna; *Denaturation of Deoxyribonucleic Acids;* 2 years; $25,000

Barbara W. Low; *X-Ray Crystal Structure Studies of Insulin and Oxytocin;* 2 years; $90,000

William L. Nastuk, *Quaternary Ammonium Ions on Junctional and Non-Junctional Membranes of Excitable Cells;* 2 years; $40,000

Stephen Zamenof; *Biochemistry of Polysugarphosphates;* 3 years; $40,000

CORNELL UNIVERSITY, Ithaca, N.Y., Robert W. Holley; *Biosynthesis of Proteins;* 3 years; $88,300

Harold A. Scheraga; *Thermodynamic and Kinetic Studies of Protein Reactions;* 3 years; $120,000

J. R. Vallentyne; *Biogeochemistry of Amino Compounds;* 1 year; $14,500

J. R. Vallentyne; *Ecological and Biogeochemical Studies on Amino Acids and Polypeptides;* $2,900

DARTMOUTH COLLEGE, Hanover, N.H.; R. Clinton Fuller; *Intracellular Structure and Function in Microbial Cells;* 2 years; $110,000

DUKE UNIVERSITY, Durham, N.C.; J. J. Blum; *Induced Enzyme Formation in Protozoa;* 2 years; $40,000

Paul Horowicz; *Electrical Properties of Muscle Membranes;* 2 years; $50,000

DUQUESNE UNIVERSITY, Pittsburgh, Pa.; Oscar Gawron; *Chemistry and Biochemistry of Sulfur Amino Acids;* 2 years; $32,000

EVANSTON HOSPITAL ASSOCIATION, Evanston, Ill.; Georg F. Springer; *Nature of Blood Group Active Substances from Bacteria and Higher Plants;* 2 years; $50,000

FLORIDA STATE UNIVERSITY, Tallahassee; Hans Gaffron; *Photobiology;* 2 years; $100,000

FRESNO STATE COLLEGE FOUNDATION, Fresno, Calif.; John H. Carr; *The Bacillus Pumilus-Bacteriophage System;* 2 years; $9,200

HARVARD UNIVERSITY, Cambridge, Mass.; Konrad E. Bloch; *Biological Synthesis of Unsaturated Fatty Acids;* 3 years; $60,000

Bruce A. Bonner; *Chemical and Physical Properties of Phytochrome;* 2 years; $18,000

Oleg Jardetzky; *Nuclear Magnetic Resonance Studies of Biologically Important Molecules;* 2 years; $90,000

John H. Law; *Biological Transalkylation Reactions;* 2 years; $50,000

Thomas J. Gill III, Lewis T. Mann, Jr. and Gustave J. Dammin, Boston; *In Vivo Fate of Antigen Using Synthetic Polypeptide Antigens of Varying Physical Chemical Properties;* 2 years; $53,000

HEALTH RESEARCH INC., Albany, N.Y.; Donald S. Berns; *Physical Chemistry of Deuteriated Proteins;* 2 years; $25,000

HEALTH RESEARCH INC., Buffalo, N.Y.; David Harker; *Crystal Structure of Ribonuclease;* 3 years; $150,000

HOWARD UNIVERSITY, Washington, D.C.; Felix Friedberg; *Estimation of Peptides;* 2 years; $17,000

HUNTER COLLEGE, New York, N.Y.; Marcia Brody; *States of Chlorophyll in Vivo and Their Photochemical Activities;* 2 years; $30,000

INDIANA UNIVERSITY FOUNDATION, Bloomington; Eugene H. Cordes; *Catalytic Mechanisms Involved in Carbonyl Addition Reactions;* 2 years; $30,000

INSTITUTE FOR CANCER RESEARCH, Philadelphia, Pa.; Thomas F. Anderson; *Equipment for the Determination of Fine Structure of Genetic Control Mechanisms;* 1 year; $40,000

Thomas F. Anderson; *Specific Syntheses in Cellular and Viral Systems;* 2 years; $150,000

IOWA STATE UNIVERSITY, Ames; S. Aronoff; *Intercellular Movement of Organic Compounds;* 2 years; $32,000

JOHNS HOPKINS UNIVERSITY, Baltimore, Md.; Howard M. Dintzis, G. von Ehrenstein and Michael A. Naughton; *Sequence Determination in Proteins and Nucleic Acids;* 2 years; $100,000

Paul O. P. Ts'o; *Hydrophobic and Stacking Interaction of Bases in Nucleic Acids;* 3 years; $90,500

KABUL UNIVERSITY, Kabul, Afghanistan; Syed Alef Shah Ghazanfar; *A Study of Abnormal Hemoglobins and Varieties of Plasma Proteins;* 2 years; $20,000

KANSAS STATE UNIVERSITY, Manhattan; Karl G. Lark; *Cellular Control of Macromolecule Biosynthesis;* 2 years; $32,500

LOUISIANA STATE UNIVERSITY, Baton Rouge; A. N. J. Heyn, New Orleans; *Fiber and Ultra Structure Research;* 2 years; $41,800

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge; J. E. Darnell, Jr.; *Ribonucleic Acid Synthesis;* 2 years; $70,000

Cyrus Levinthal; *Control of the Alkaline Phosphatase in Escherichia Coli;* 3 years; $110,000

S. E. Luria; *Function and Organization of Viruses and Other Episomes;* 3 years; $160,000

Boris Magasanik; *Regulation of the Metabolic Processes of the Single Cell at the Molecular Level;* 3 years; $125,000

MASSACHUSETTS GENERAL HOSPITAL, Boston; Roger W. Jeanloz; *Chemistry of Neuraminic and Muramic Acids;* 3 years; $50,000

Dorothy F. Travis; *Molecular Biology of Crustacean Mineralized Tissues;* 2 years; $40,000

McLEAN HOSPITAL, Belmont, Mass.; J. David Robertson and Helen H. Hess; *Molecular Architecture of the Retinal Rod Outer Segment;* 2 years; $78,000

MICHIGAN STATE UNIVERSITY, East Lansing; Barnett Rosenberg; *Electrical Conductivity of Proteins in the Solid State;* 1 year; $25,000

MONTANA STATE COLLEGE, Bozeman; K. J. Goering; *Isolation, Composition and Structure of the Carbohydrate Present in Myrosin;* 2 years; $12,000

PENNSYLVANIA HOSPITAL, Philadelphia; Gilbert N. Ling; *Induction and Cooperative Phenomena in the Behavior of Isolated Proteins and of Living Cells;* 2 years; $70,000

POLYTECHNIC INSTITUTE of Brooklyn, N.Y.; Murray Goodman; *Synthesis, Properties and Reactions of Peptides and Their Derivatives;* 2 years; $60,000

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PURDUE RESEARCH FOUNDATION, Lafayette, Ind.; Frederick L. Crane; *Comparative Biochemistry of Plastoquinones;* 2 years; $45,000

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ROCKEFELLER INSTITUTE, New York, N.Y.; Lucien G. Caro and George E. Palade; *Synthetic Processes in Bacteria;* 2 years; $28,000

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STANFORD UNIVERSITY, Stanford, Calif.; M. S. Blois; *Electron Paramagnetic Resonance Study of Unpaired Electrons in Photosynthetic Mutant and Wildtype Organisms;* 2 years; $25,000

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UNIVERSITY OF CALIFORNIA, Berkeley; Charles A. Dekker; *Structural Studies on Nucleic Acids;* 2 years; $55,000

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Clarence Sterling, Davis; *Crystallographic Structure of B-Carotene;* 1 year; $10,000

Denis L. Fox, La Jolla; *Spectroscopic, Chemical and Metabolic Studies of Carotenoids, Carotenoid Chromoproteins, and Associated Lipids in Animals;* 2 years; $30,000

UNIVERSITY OF CALIFORNIA, Los Angeles; William G. Clark, Los Angeles; *Mammalian Histidine Decarboxylase;* 2 years; $30,000

Fritiof S. Sjostrand, Los Angeles; *In Vitro Studies on the Control of Hemoglobin Synthesis;* 2 years; $32,000

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S. Spiegelman; *Mechanism of Enzyme Synthesis;* 3 years; $135,000

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UNIVERSITY OF WISCONSIN, Madison; Arthur D. Hasler; *Orientation Studies of Migratory Fishes;* 2 years; $35,900

Leonard E. Ross; *Studies of Inhibitory Phenomena Resulting From Non-reward in Selective Learning Situations;* 2 years; $13,400

Willard R. Thurlow; *Temporal Aspects of Sound Localization Mechanisms;* 2 years; $19,700

C. G. Screven and Harry L. Madison, Milwaukee; *Combining Effects of Internal and External Stimulation on Free Operant Performance Arousal;* 2 years; $21,600

WESLEYAN UNIVERSITY, Middletown, Conn.; William R. Thompson; *Behavior and Stress;* 2 years; $45,500

YALE UNIVERSITY, New Haven, Conn.; Richard J. Andrew; *Vocalization and Associated Responses in the Chick;* 2 years; $44,400

John P. Flynn; *Neural Mechanisms Mediating Attack;* 2 years; $68,300

YERKES LABORATORIES OF PRIMATE BIOLOGY, INC., Orange Park, Fla.; Irwin S. Bernstein; *Social Organization and Activity of Primate Groups;* 1 year; $27,500

YESHIVA UNIVERSITY, New York, N.Y.; Irvin Rock; *Orientation in Form Perception;* 2 years; $20,000

REGULATORY BIOLOGY

AGRICULTURAL AND MECHANICAL COLLEGE OF TEXAS, College Station; James R. Couch; *Muscular Dystrophy in the Avian Species;* 2 years; $25,400

ALFRED UNIVERSITY, Alfred, N.Y.; Charles A. Gifford; *Respiration in the Land Crab, Cardisoma Guanhumi;* 2 years; $13,700

AMERICAN FOUNDATION FOR CREATIVE RESEARCH, Palo Alto, Calif.; Ralph Buchsbaum; *Biology of Convoluta Roscoffensis;* 2 years; $5,800

AMERICAN MOUNT EVEREST EXPEDITION 1963, Santa Monica, Calif.; William E. Siri; *Erythropoiesis and Adrenocortical Function in Man at High Altitude;* 1 year; $11,600

ARIZONA STATE UNIVERSITY, Tempe; Howard G. Applegate; *Hormones on Sex Expression in Cannabis Sativa L., Lychnis Dioica L. and Cleome Spinosa Jacq;* 3 years; $32,300

BOSTON COLLEGE, Chestnut Hill, Mass.; Robert M. Coleman; *Types of Immunological Response and Unresponsiveness to the Dwarf Tapeworm;* 3 years; $34,800

BOSTON DISPENSARY, Mass.; Edward H. Frieden and Arthur I. Cohen; *Effects of Pituitary Gonadotropins Upon Rat Ovarian Cells* in Vitro; 3 years; $42,100

BOSTON UNIVERSITY, Mass.; Stewart Duncan; *Histopathology of the Coccidial Parasite, Eimeria Labbeana;* 1 year; $10,200

BOYCE THOMPSON INSTITUTE FOR PLANT RESEARCH, INC., Yonkers, N.Y.; Robert G. Owens and Eli V. Crisan; *Thermophilic Fungi and Thermophilism;* 3 years; $62,200

BRYN MAWR COLLEGE, Bryn Mawr, Pa.; L. Joe Berry; *Metabolic Effects of Bacterial Endotoxins;* 3 years; $75,700

CARLETON COLLEGE, Northfield, Minn.; Douglas C. Pratt; *Flash-Photolytic Investigation of Rhodopsin;* 3 years; $28,500

CHICAGO COLLEGE OF OSTEOPATHY, Ill.; Shannon C. Allen; *Mechanism of Oxygen Toxicity in the Development and Maintenance of Higher Organisms;* 2 years; $23,900

CHILDREN'S ASTHMA RESEARCH INSTITUTE AND HOSPITAL, Denver, Colo.; Kimishige Ishizaka; *Equipment for Research on Molecular Bases of Hypersensitivity Reactions;* 1 year; $29,600

CITY COLLEGE, New York, N.Y.; William Etkin; *Hypothalamic-pituitary Interactions in the Frog;* 4 years; $64,200

CLARK UNIVERSITY, Worcester, Mass.; Vernon Ahmadjian; *Laboratory Controlled Lichen Synthesis;* 2 years; $21,200

COLORADO STATE UNIVERSITY RESEARCH FOUNDATION, Fort Collins; Ronald H. Olsen; *Physiological Studies on Psychrophilic Bacteria;* 3 years; $34,600

COLUMBIA UNIVERSITY, New York, N.Y.; Soll Berl; *Amino Acid and Carbon Dioxide Metabolism in Developing Brain;* 2 years; $27,400

Louis J. Cizek and Mero R. Nocenti; *Hormonal Factors Influencing the Electrolyte and Water Exchanges in Normal and Starvation-Induced Salt Deficient Rabbits;* 3 years; $39,100

Werner R Loewenstein; *Intracellular Membranes;* 5 years. $179,100

Fred A. Mettler, *Effect of 6-Aminonicotinamide on Equine Neural System;* 1 year; $3,600

Lee D. Peachey; *Cellular Mechanisms of Muscle Contraction and of Antidiuretic Hormone Action;* 5 years; $177,500

THE CONNECTICUT AGRICULTURAL EXPERIMENT STATION, New Haven; James G. Horsfall; *Mode of Action of Powdery Mildew Fungicides;* 2 years; $15,800

CORNELL UNIVERSITY, Ithaca, N.Y.; Richard H. Barnes; *Contributions of Intestinal Microflora to the Nutrition of the Host Animal;* 4 yrs.; $90,900

Gerhard Giebisch and Erich E. Windhager; New York; *Ion Transport Across Renal Tubules of the Kidney;* 3 yrs.; $47,500

DARTMOUTH COLLEGE, Hanover, N.H.; Kurt Benirschke; *Laboratory Equipment for Steroid Analysis;* 6 months; $25,900

William T. Jackson; *Cellular Control of Cytoplasmic Streaming;* 2 years; $23,500

Robert B. Hill; *Neural Control of Molluscan Myocardial Rhythmicity;* 3 years; $35,200

DUKE UNIVERSITY, Durham, N.C.; F. G. Hall; *Regulation and Adaptive Responses in Small Mammals to Environmental Stresses;* 3 years; $25,900

F. Harold McCutcheon; University of Pennsylvania; *Pressure Responses, Buoyancy Reflexes, Volume Control, and Ventilation Regulation in Aquatic Vertebrates;* 3 years; $41,300

DUQUESNE UNIVERSITY, Pittsburgh, Pa.; Howard G. Ehrlich; *Host-Parasite Relationships in Stem Rust of Wheat;* 1 year; $8,700

Howard G. Ehrlich; *Purchase of an Electron Microscope and Related Research Equipment;* 1 year; $33,900

FLORIDA STATE UNIVERSITY, Tallahassee; George W. Keitt, Jr.; *Chemical Control of Growth and Differentiation in Plants;* 2 years; $31,800

FOUNDATION FOR RESEARCH ON THE NERVOUS SYSTEM, Boston, Mass.; Samuel Bogoch; *Isolation and Characterization of Glycoproteins of Bovine and Human Brain;* 3 years; $27,700

FRANKLIN AND MARSHALL COLLEGE, Lancaster, Pa.; Wilbur D. Shenk; *Distribution of Activity of Acetylcholine Esterase in Skeletal Muscle;* 1 year; $4,000

GEORGETOWN UNIVERSITY, Washington, D.C.; Seymour Ehrenpreis; *Action of Drugs on Isolated Aortic Strip;* 3 years; $27,100

Richard J. Feinberg and Robert Feinberg; *Reagin Antibody—Physical and Chemical Characterization;* 3 years; $33,000

GEORGE WASHINGTON CARVER FOUNDATION, Tuskegee Institute, Ala.; James H. M. Henderson; *Mechanism of Action of Plant Growth Regulators;* 3 years; $28,100

GRAVELY SANATORIUM, Chapel Hill, N.C.; H. Mac Vandivier and H. S. Willis; *Host Resistance in Chronic Infections;* 1 year; $9,500

HASKINS LABORATORIES, New York, N.Y.; S. H. Hutner and John J. Lee; *Nutrition of Trichomonads from Poikilotherms;* 2 years; $35,900

L. Provasoli; *Nutritional Studies on Marine Organisms;* 3 years; $84,200

INDIANA UNIVERSITY FOUNDATION, Bloomington, Ind.; Robert W. Bullard; *Role of Physiological Factors in Tolerance to Hypoxia;* 3 years; $23,800

IOWA STATE UNIVERSITY, Ames; Loyd Y. Quinn; *Mesophilic Holotrichic Ciliates in Axenic Defined Medium;* 2 years; $17,900

JOHNS HOPKINS UNIVERSITY, Baltimore, Md.; Abraham G. Osler; *Mechanisms of Hypersensitivity Phenomena;* 5 years; $104,200

KANSAS STATE UNIVERSITY, Manhattan; Theodore L. Hopkins; *Functions of Cholesterol and Related Sterols in Insects;* 2 years; $13,700

KENTUCKY RESEARCH FOUNDATION, Lexington; Richard Thurston and Walter T. Smith, Jr.; *Resistance in Nicotiana to Myzus Persicae;* 3 years; $36,800

LONGWOOD COLLEGE, Farmville, Va.; Robert T. Brumfield; *Control of Cell Division and Growth of Plant Root Meristems;* 1 year; $5,400

LOUISIANA STATE UNIVERSITY, Baton Rouge; L. D. Newsom; *Action Spectrum for the Photoperiodic Induction of Diapause in the Boll Weevil;* 2 years; $10,600

Carlton Heckrotte, New Orleans; *Temperature Acclimation Mechanisms;* 1 year; $3,100

MEDICAL COLLEGE OF SOUTH CAROLINA, Charleston; Sherwin Mizell; *Rhythmic Biological Phenomena;* 2 years; $13,600

MICHIGAN STATE UNIVERSITY, East Lansing; Harry H. Murakishi and G. Bernard Wilson; *Virus Synergy and Antagonism in Plant Cells;* 3 years; $38,000

MISSISSIPPI STATE UNIVERSITY, State College; Bruce Glick; *Influence of Testosterone Propionate on Bursa of Fabricius and Antibody Production of Chickens;* 3 years; $21,500

MONTANA STATE COLLEGE, Bozeman; R. H. McBee and D. E. Worley; *Rumen Physiology and Parasitology of the Yellowstone Elk;* 1 year; $12,000

MONTANA STATE UNIVERSITY, Missoula; E. W. Pfeiffer and Robert S. Hoffmann; *Endocrine Factors Controlling Behavior and Breeding Plumage in Male and Female Wilson's Phalarope (Steganopus Tricolor);* 1 year; $8,400

MOUNT ST. MARY'S COLLEGE, Los Angeles, Calif.; Mary Gerald Leahy; *Reproductive Physiology of Aedes Aegypti;* 2 years; $15,000

NEW YORK UNIVERSITY, New York; W. G. Van der Kloot; *Equipment for Department of Physiology and Biophysics;* 1 year; $12,700

NEW YORK ZOOLOGICAL SOCIETY, New York; Thomas Goreau; *Photosynthesis and Calcium Carbonate Production in the Reef Building Corals and Algae;* 3 years; $53,800

NORTH TEXAS STATE UNIVERSITY, Denton; James R Lott; *Water and Ion Movement in Root Systems;* 1 year; $4,400

NORTHWESTERN UNIVERSITY, Evanston, Ill.; Albert Wolfson; *Regulation of Gonadotropic Activity of the Anterior Pituitary;* 3 years; $59,800

OHIO STATE UNIVERSITY RESEARCH FOUNDATION, Columbus; R. E. Franklin and E. O. McLean; *Effects of Colloids on Plant Nutrition;* 2 years; $30,500

OREGON STATE UNIVERSITY, Corvallis; Austin W. Pritchard; *Osmotic and Ionic Regulation in Crayfish;* 3 years; $21,500

PRINCETON UNIVERSITY, Princeton, N.J.; Robert D. Lisk; *Gonadal Hormones and the Hypothalamus;* 3 years; $51,400

PSYCHIATRIC RESEARCH FOUNDATION OF CLEVELAND, Cleveland, Ohio; Margaret A. Kelsall; *Hormones on DNA and Nucleoli in Purkinje Cells;* 2 years; $15,100

PURDUE RESEARCH FOUNDATION, Lafayette, Ind.; Richard C. Sanborn; *Regulation of Growth of Arthropod Tissues;* 4 years; $4,950

REED COLLEGE, Portland, Oreg.; Stephen J. Karakashian; *Biochemical Investigation of an Hereditary Endosymbiosis Between Paramecium and Chlorella;* 3 years; $29,900

RESEARCH FOUNDATION OF STATE UNIVERSITY OF NEW YORK, Albany; Svend O. Heiberg and Albert L. Leaf, College of Forestry, Syracuse University, N.Y.; *Forest Tree Nutrition and Forest Fertilization;* 1 year; $10,500

Hope T. M. Ritter, Jr. (Buffalo; *Hind-Gut Fluid Properties of a Roach Which Support in Vitro Cultivation of its Mutualist Protozoa;* 3 years; $22,400

RUTGERS, THE STATE UNIVERSITY, New Brunswick, N.J.; James H. Leathem; *Gonadotrophin Stimulated Ovary;* 1 year; $3,700

James H. Leathem; *Reptilian Gonodal Hormones;* 1 year; $7,600

Paul D. Sturkie and Donald S. Douglas; *Role of Neurohypophysial Hormones on Oviposition and Water Metabolism in Chickens;* 1 year; $8,300

ST. JOHN'S UNIVERSITY, Jamaica, N.Y.; Daniel M. Lilly; *Biosynthesis of Growth Regulators in Protozoa;* 2 years; $25,600

ST. JOSEPH'S HOSPITAL, Phoenix, Ariz.; Eduardo Eidelberg; *Electrophysiological Studies on the Developing Brain;* 3 years; $43,300

SAN FERNANDO VALLEY STATE COLLEGE FOUNDATION, Northridge, Calif.; Mary Ritzel Corcoran; *Naturally-Occurring Inhibitors of Gibberellin-Induced Growth;* 3 years; $41,800

SOUTHERN ILLINOIS UNIVERSITY, Carbondale; Aristotle J. Pappelis, James N. BeMiller, and Walter E. Schmid; *Physiology of Senescence and Parasitism in Corn Stalk Tissue;* 3 years; $69,900

STANFORD UNIVERSITY, Stanford, Calif.; O. H. Robertson; *Hyperadrenocorticism in Pacific Salmon;* 3 years; $36,100

STATE UNIVERSITY OF IOWA, Iowa City; Rubin H. Flocks; *Urinary Transport System in Vertebrates;* 3 years; $65,200

Robert M. Muir; *Mechanism of Gibberellin Action;* 2 years; $27,900

STEPHEN F. AUSTIN STATE COLLEGE, Nacogdoches, Tex.; M. Victor Bilan; *Growth and Development of Root Systems in Loblolly Pine Seedlings;* 3 years; $34,900

TULANE UNIVERSITY, New Orleans, La.; Eugene Copeland; *Histophysiology of Gas Secretion;* 3 years; $56,400

UNIVERSITY OF ALABAMA, University; Howard C. Elliott and Herschel V. Murdaugh, Jr., Birmingham; *Excretion of Endogenous Metabolites and Related Transport Mechanisms;* 1 year; $15,000

UNIVERSITY OF ARKANSAS, Fayetteville; Lowell F. Bailey; *Growth Inhibiting Substances in Dormant Buds;* 2 years; $18,100

Joseph P. Fulton; *Nematode Transmission of Tobacco Ringspot Virus;* 2 years; $51,300

UNIVERSITY OF ARIZONA, Tucson; R. H. Maier; *Chemical Characterization of Iron Localized in Plant Cell Wall Material;* 1 year; $9,100

Lyle K. Sowls; *Reproduction in Collared Peccary;* 2 years; $800

UNIVERSITY OF CALIFORNIA, Berkeley; Howard A. Bern and Jean Nandi; *Interrenal Gland in Teleost Fishes and Its Relation to Osmoregulation;* 3 years; $39,900

Samuel Lepkovsky; *Regulation of the Pancreas;* 3 years; $60,200

Leonard Machlis; *Sex Hormones in Plants;* 5 years; $217,300

Elwin Marg; *Investigation of Accessory Optic System in Primates;* 1 year; $29,300

Herbert H. Srebnik; *Effects of Protein Deprivation on Pituitary Control of Reproduction in Male Rats;* 2 years; $17,200

C. E. Yarwood; *Predisposition in Plants;* 3 years; $33,500

Richard A. Boolootian, Los Angeles; *Digestion, Absorption, Translocation, and Storage of Food Stuffs by the Sea Urchin;* 3 years; $25,700

Morton I. Grossman, Los Angeles; *Pancreatic Physiology;* 5 years; $67,700

Bruce C. Parker, Los Angeles; *Translocation in the Giant Kelp Macrocystis;* 2 years; $30,600

M. J. Pickett, Los Angeles; *Cellular Immunity;* 3 years; $66,500

Ralph R. Sonnenschein, Los Angeles; *Physiology of Reptilian Circulation;* 1 year; $4,200

Warren J. Gross, Riverside; *Physiological Adaptations for Terrestrial Life Among the Crustacea;* 2 years; $21,500

John Letey, Jr., Riverside; *Role of Oxygen in the Rooting Behavior of Plants;* 3 years; $42,900

Marvin Nachman, Riverside; *Neurophysiological Mechanisms in Salt Preferences;* 2 years; $19,900

George A. Zentmyer and Donald C. Erwin, Riverside; *Physiology, Nutrition, and Morphology of the Reproductive and Growth Processes in the Genus Phytophthora;* 5 years; $61,500

UNIVERSITY OF COLORADO, Boulder; Joseph C. Daniel, Jr.; *Growth of Mammalian Embryos in Vitro;* 3 years; $27,000

Paul W. Winston; *Physiology of the Humidity Receptor Mechanism of the Grasshopper;* 2 years; $17,200

Alfred J. Crowle, Denver; *Acquired Immunity to Tuberculosis;* 2 years; $27,000

UNIVERSITY OF CONNECTICUT, Storrs; Donald F. Wetherell; *Physiological Basis of Salt Tolerance in Unicellular Green Algae;* 2 years; $33,000

UNIVERSITY OF FLORIDA, Gainesville; Stanley E. Leland; *In Vitro Growth Requirements of Parasitic Nematodes;* 1 year; $13,600

UNIVERSITY OF HAWAII, Honolulu; Richard B. Hine; *Infection Process of Phytophthora Parasitica as Influenced by Living-Host Tissue and Extracts of Papaya (Carica-Papaya L.);* 3 years; $28,100

Fred I. Kamemoto; *Ionic and Osmotic Relations in Earthworm and Other Annelids;* 1 year; $3,200

Fred I. Kamemoto; *Neurosecretions and Ionic and Osmotic Relations in Annelids;* 3 years; $44,100

UNIVERSITY OF ILLINOIS, Urbana; Marlyn E. Clark and Williamina A. Himwich; *Hemodynamic Similitude Studies of the Circle of Willis;* 1 year; $4,700

Frederick Sargent; *Responses and Adjustments of the Human Female and Male to Hot Atmospheres;* 2 years; $51,000

Kurt Stern; *Reticulo-Endothelial System in the Regulation of Growth;* 3 years; $49,000

UNIVERSITY OF KANSAS CENTER FOR RESEARCH, INC., Lawrence; Cora M. Downs; *Penetration and Growth of Pasteurella Tularensis and Coxiella Burnetii in Immune and Non-Immune Cells;* 3 years; $34,250

UNIVERSITY OF KANSAS, MEDICAL CENTER; Kansas City; Lawrence P. Sullivan; *Control of Collecting Duct Secretion of Hydrogen and Potassium;* 3 years; $50,700

UNIVERSITY OF MARYLAND, College Park; William J. Adelman, Jr.; *Comparative Study of Ionic Conductances in Various Axon Populations;* 3 years; $66,200

Robert G. Grenell, Baltimore; *Cell Regulatory Mechanisms and Membranes in Brain;* 2 years; $39,600

Gabriel G. Pinter, Baltimore; *Blood Flow Through the Renal Medulla;* 2 years; $28,800

Allen L. Steinhauer; *Hemolymph Proteins in the Molting Cycle of Insects;* 1 year; $10,100

UNIVERSITY OF MIAMI, Coral Gables, Fla.; David C. B. Bridges, Miami; *Natural History of Photosensitive Retinal Pigments;* 3 years; $27,800

UNIVERSITY OF MICHIGAN, Ann Arbor; Bernard W. Agranoff; *Biochemical Correlates of Behavior;* 3 years; $72,700

Robert C. Lasiewski; *Bioenergetics of Hummingbirds;* 2 years; $14,900

UNIVERSITY OF MISSOURI, Columbia; Jacob Levitt; *Resistance of Plants to Frost and Drought;* 3 years; $48,800

UNIVERSITY OF MINNESOTA, Minneapolis; Ralph L. Kitchell and Archie L. Good, St. Paul; *Respiratory Regulation by the Carotid Body in Aves;* 2 years; $26,000

UNIVERSITY OF NEVADA, Reno; Dean C. Fletcher and Allie M. Lee; *Influence on Deoxyribose Nucleic Acid Levels in Rat Tissue Nuclei of Acute Stress-Producing Agents;* 2 years; $15,000

UNIVERSITY OF NORTH CAROLINA, Chapel Hill; Irvine R. Hagadorn; *Neurosecretion in the Leech;* 3 years; $41,300

UNIVERSITY OF NOTRE DAME, Notre Dame, Ind.; Bernard S. Wostmann; *Antibody Formation with Germfree Animals;* 2 years; $38,300

UNIVERSITY OF PENNSYLVANIA, Philadelphia; T. Richard Houpt; *Nitrogen Metabolism in Herbivorous Mammals;* 3 years; $48,500

Benjamin Wolf and Israel Live; *Cellular Induction of Antibody Formation;* 3 years; $60,200

UNIVERSITY OF PITTSBURGH, Pa.; Charles L. Ralph; *Neuroendocrinology of Arthropods;* 2 years; $24,600

UNIVERSITY OF ROCHESTER, N.Y.; E. F. Adolph; *Regulatory Activities in Animals;* 3 years; $61,500

Dale P. J. Goldsmith; *Isolation and Characterization of Enterocrinin;* 1 year; $12,000

UTAH STATE UNIVERSITY, Logan; Datus M. Hammond; *Life Cycle Stages of Bovine Coccidia;* 3 years; $17,100

UNIVERSITY OF TENNESSEE, Knoxville; James W. Fisher, Memphis; *Influence of Hormones and Radiation on Erythropoietin Production by the Kidney;* 1 year; $900

UNIVERSITY OF VERMONT, Burlington; Thomas Sproston; *Role of Sterols in Metabolism and Reproduction of the Fungus Sclerotinia;* 3 years; $29,500

UNIVERSITY OF WASHINGTON, Seattle; Arthur W. Martin; *Comparative Circulatory Physiology;* 3 years; $81,900

UNIVERSITY OF WISCONSIN, Madison; Robert S. Dorney; *Epizootiology of Blood and Coccidial Protozoa;* 2 years; $6,200

Philip R. Ruck; *Visual Mechanisms in Insects;* 3 years; $28,600

Luis Sequeira; *Growth Regulators and Pathogenesis in Wilt Diseases;* 3 years; $40,100

VIRGINIA POLYTECHNIC INSTITUTE, Blacksburg; Richard E. Phillips; *Striatal Function in Birds;* 3 years; $37,900

William W. Scott; *Degradation of Submerged Organic Debris by Aquatic Fungi;* 3 years; $13,500

WAKE FOREST COLLEGE, Winston-Salem, N.C.; David W. Johnston; *Autumnal Migration in the Indigo Bunting;* 3 years; $6,200

WASHINGTON STATE UNIVERSITY, Pullman; R. C. Lindner; *Mechanism of Action of Pear Psylla Toxin;* 2 years; $36,800

WASHINGTON UNIVERSITY, St. Louis, Mo.; Jack Davies; *Hormonal Interrelationships of the Placenta, Pituitary Gland, Ovary and Adrenal Cortex in the Pregnant Rabbit;* 3 years; $54,600

Theodor Rosebury; *Comparative Studies of Spirochetes of the Normal Flora of Man;* 2 years; $31,100

Theodor Rosebury; *Significance of Antibodies to Indigenous Anaerobic Bacteria;* 3 years; $37,800

WOMAN'S MEDICAL COLLEGE OF PENNSYLVANIA, Philadelphia; A. B. Beasley, *Central Nervous System of the Laboratory Mouse;* 3 years; $12,500

WOODS HOLE OCEANOGRAPHIC INSTITUTION, Woods Hole, Mass.; John W. Kanwisher; *Physiology of Whales and Porpoises;* 2 years; $42,000

YALE UNIVERSITY, New Haven, Conn.; Grace E. Pickford; *Fish Endocrinology;* 3 years; $49,900

Anna M. Slicher; *Hematological Studies in Teleost Fishes;* 2 years; $39,900

Jerome Sutin; *Central Nervous System Mechanism Regulating Food Intake;* 3 years; $3,600

YESHIVA UNIVERSITY, New York, N.Y.; Sheldon E. Kalmutz; *Development of Immunological Responses During Embryonic Life;* 3 years; $85,200

Frederick N. Sudak; *Events of the Cardiac Cycle in Elasmobranchii and Teleostei;* 3 years; $8,600

SYSTEMATIC BIOLOGY

AGRICULTURAL AND MECHANICAL COLLEGE OF TEXAS, College Station; Frank W. Gould; *Biosystematic Studies in the Genus Bouteloua;* 2 years; $19,000

ALBION COLLEGE, Albion, Mich.; William J. Gilbert; *Morphologic and Systematic Studies of Tropical Pacific Marine Algae;* 2 years; $14,700

AMERICAN MUSEUM OF NATURAL HISTORY, New York, N.Y.; Roger L. Batten; *A Systematic Study of Some Carboniferous Gastropoda;* 1 year; $6,000

William K. Emerson; *Reactivation of the Mollusk Reference Collection of the American Museum of Natural History;* 2 years; $18,000

William G. George; *Classification of Perching Birds;* 2 years; $18,000

Willis J. Gertsch; *American Spiders of the Families Dictynidae, Filistatidae, and Linyphiidae;* 3 years; $31,800

Meredith L. Jones; *Abyssal and Neritic Benthonic Macroorganisms Collected by the R/V VEMA;* 2 years; $26,800

Kumar Krishna; *Termites of Burma and Revision of the Genus Capritermes;* 3 years; $14,000

Frederick H. Rindge; *North American Geometridae;* 3 years; $17,500

Patricia Vaurie; *Revision of the Weevil Genus Metamasius;* 2 years; $18,000

AMERICAN SOCIETY OF ICHTHYOLOGISTS AND HERPETOLOGISTS, University of Hawaii, Honolulu; Carl L. Hubbs; *Semi Centennial Meeting of the American Society;* 6 months; $10,000

AMERICAN SOCIETY FOR PLANT TAXONOMISTS, Knoxville, Tenn.; Raymond C. Jackson; *Index of Current Research in Plant Taxonomy;* 5 years; $3,200

ARIZONA STATE COLLEGE, Flagstaff; Richard S. Beal, Jr.; *Taxonomic Investigation of the Dermestid Beetle Genus Attagenus;* 1 year; $5,200

ASHEVILLE-BILTMORE COLLEGE, Asheville, N.C.; Cornelia Ann Serota; *Studies of Karyotypic Variation in Isolated and Mixed Populations of Trillium Species;* 2 years; $7,000

Irving W. Bailey, Cambridge, Mass.; *Comparative Anatomy of the Cactaceae in Relation to Taxonomy;* 2 years; $11,400

BEAUDETTE FOUNDATION FOR BIOLOGICAL RESEARCH, Santa Ynez, Calif.; J. L. Barnard; *Systematics of Intertidal Marine Amphipoda of California;* 2 years; $15,500

BERNICE P. BISHOP MUSEUM, Honolulu, Hawaii; J. L. Gressitt; *Zoogeographic Studies of New Guinea Insects, Particularly the Family Chrysomelidae (Beetles);* 2 years; $50,000

BRIGHAM YOUNG UNIVERSITY, Provo, Utah; David L. Clark; *Cretaceous Cephalopods of Texas;* 4 years; $800

Stephen L. Wood; *Taxonomy and Distribution of Bark and Ambrosia Beetles (Scolytidae and Platypodidae) in Central America and Mexico;* 2 years; $22,500

Stephen L. Wood, Smithsonian Institution; *Purchase of the Karl E. Schedl Collection of Scolytidae and Platypodidae (Coleoptera);* 1 year; $18,750

BROWN UNIVERSITY, Providence, R.I.; George L. Church; *Analyses of Southern Species Complexes in the Genus Elymus;* 3 years; $27,000

CALIFORNIA ACADEMY OF SCIENCES, San Francisco; G. Dallas Hanna; *Siliceous Microfossils of the Late Miocene-Pliocene Part of Tertiary Sediments of California;* 1 year; $4,800

Edward S. Ross; *A Monograph of the Insect Order, Embioptera;* 3 years; $25,300

Vincent D. Roth; *South American Spiders of the Family Agelenidae;* 2 years; $1,400

CALIFORNIA DEPT. OF FISH AND GAME, Sacramento; S. Stillman Berry, Redlands; *Systematic and Taxonomic Review of Pacific Coast Cephalopods;* 2 years; $29,000

CANISIUS COLLEGE, Buffalo, N.Y.; John L. Blum; *Monographic Studies in Salt Marsh Algae;* 2 years; $8,000

CAPE HAZE MARINE LABORATORY, INC., Sarasota, Fla.; Dorothy C. Saunders; *Blood Parasites of Florida Fishes;* 1 year; $4,900

CARNEGIE MUSEUM, Pittsburgh, Pa.; Richard M. Fox; *Monograph of the Ithomiidae (Lepidoptera);* 2 years; $16,000

CATHOLIC UNIVERSITY, Washington, D.C.; Ross H. Arnett, Jr.; *Isolating Mechanisms in Speciation of Oedemerid Beetle Genus Oxacis;* 3 years; $26,000

Robert A. Davidson; *Biometrics of Variation and Cytotaxonomy of Froelichia;* 3 years; $17,300

CHICAGO NATURAL HISTORY MUSEUM, Ill.; Joseph Curtis Moore; *Revision of the Beaked Whale Genus, Mesoplodon;* 4 years; $8,000

Louis O. Williams; *Botanical Field Work in Central America;* 2 years; $35,800

William D. Turnbull and Ernest L. Lundelius, Jr., University of Texas, Austin; *Mammalian Paleontology in Australia;* 1 year; $26,100

CHICO STATE COLLEGE, Chico, Calif.; Kingsley R. Stern; *Cytogeographic and Experimental Studies in the Fumariaceous Genus Dicentra;* 3 years; $13,000

CLEMSON COLLEGE, Clemson, S.C.; G. M. Armstrong and J. K. Armstrong; *Host Re-*

lationships of Fusaria, Section Elegans (Wilt Fusaria) ; 2 years ; $19,500

COLORADO STATE UNIVERSITY RESEARCH FOUNDATION, Fort Collins ; Edward B. Reed ; *Free-Living Freshwater Nearctic Cyclopoid Copepoda;* 2 years ; $15,000

Otto Degener, *Botanical Exploration of the Island of Lanai;* 1 year ; $2,000

COLUMBIA UNIVERSITY, New York, N.Y. ; Lindsay S. Olive ; *Cellular Slime Molds (Acrasiales) of the Pacific Area;* 1 year ; $6,000

Paul R. Burkholder, Palisades ; *Identity of Marine Bacteria in the Culture Collection;* 2 years ; $38,000

DUKE UNIVERSITY, Durham, N.C. ; Lewis E. Anderson ; *Systematic Studies of Mosses of the United States and Canada;* 3 years ; $52,100

Terry W. Johnson, Jr. ; *The Systematics and Occurrence of Marine Plankton-Inhabiting Fungi;* 2 years ; $53,300

Robert J. Menzies, Beaufort ; *Anatomy of Radular Apparatus and Its Musculature in Marine Mollusks, Particularly in Neopilina;* 1 year ; $5,500

Robert Ornduff ; *Breeding Systems and Biosystematics of Heterostylous Plants;* 2 years ; $18,700

FAIRCHILD TROPICAL GARDEN, Miami, Fla. ; P. B. Tomlinson ; *Systematic Anatomy of the Monocotyledons;* 2 years ; $24,700

FLORIDA GEOLOGICAL SURVEY, Tallahassee ; Harbans S. Puri ; *Revision of Muller's Type Collections of Recent Ostracoda;* 3 years ; $2,880

FLORIDA STATE UNIVERSITY, Tallahassee ; Harry W. Wells ; *Porifera of the Carolinian Province;* 2 years ; $17,500

FORDHAM UNIVERSITY, New York, N.Y. ; James Forbes ; *Anatomical and Histological Studies of Male Ants;* 2 years ; $10,100

FOUNTAIN VALLEY SCHOOL, Colorado Springs, Colo. ; F. Martin Brown ; *A Critical Study of W. H. Edwards' Type Specimens;* 2 years ; $14,000

Hugh Avery Freeman, Garland, Tex. ; *Systematic Study of the Megathymidae of North America;* 3 years ; $8,600

HARVARD UNIVERSITY, Cambridge, Mass. ; William J. Clench ; *Monographs of the Land Mollusca of Cuba;* 3 years ; $10,400

Philip J. Darlington, Jr. ; *Carabid Beetles of the Australian Region and Southern South America;* 3 years ; $30,700

Elizabeth Deichmann and Giles Mead ; *Marine Nematodes of the North Atlantic;* 1 year ; $4,200

Bryan Patterson, Alfred Sherwood Romer, and George Gaylord Simpson ; *Technical Assistance for Research on Vertebrate Paleontology;* 2 years ; $52,800

Carroll E. Wood, Jr. and Reed C. Rollins ; *Flora of the Southeastern United States;* 3 years ; $71,300

INDIANA UNIVERSITY FOUNDATION, Bloomington ; James E. Canright ; *Comparative Morphology and Phylogeny of the Annonaceae and Related Ranalean Families;* 2 years ; $16,700

David G. Frey ; *The Systematics, Distribution, and Ecology of the Chydoridae (Cladocera)* ; 2 years ; $28,600

Charles B. Heiser, Jr. ; *Numerical Taxonomic Studies of Solanum* (Morella) ; 2 years ; $8,200

JOHNS HOPKINS UNIVERSITY, Baltimore, Md. ; David M. Raup ; *Orientation of Calcite Crystals in Fossil and Living Echinoderms;* 2 years ; $22,000

KANSAS STATE UNIVERSITY, Manhattan ; Aylward E. R. Downe ; *Serological Studies of Insect Proteins;* 2 years ; $19,200

C. W. Rettenmeyer and Richard J. Elzinga ; *Systematics of Mites Associated with Army Ants;* 3 years ; $8,900

LOS ANGELES COUNTY MUSEUM, Calif. ; J. R. Macdonald ; *Geology and Paleontology of the Wounded Knee Area, South Dakota;* 2 years ; $16,800

LOUISIANA POLYTECHNIC INSTITUTE, Ruston ; Robert Kral ; *Taxonomic Revision of Fimbristylis in North America;* 3 years ; $21,500

LOUISIANA STATE UNIVERSITY, Baton Rouge ; W. A. van den Bold ; *Studies on the Miocene to Recent Ostracoda of the Caribbean Region;* 2 years ; $21,600

Herbert J. Howe, New Orleans ; *A Taxonomic Study of Three Genera of Brachiopods;* 1 year ; $3,300

MARQUETTE UNIVERSITY, Milwaukee, Wis. ; R. M. Darnell and Peter Abramoff ; *Serological Analysis of a Gynogenetic Fish Species;* 2 years ; $18,000

MIDWESTERN UNIVERSITY, Wichita Falls, Tex. ; Walter W. Dalquest ; *Paleoniscoid Fishes of the Leuders Formation, Permian of Texas;* 1 year ; $10,000

MISSOURI BOTANICAL GARDEN, St. Louis ; Frits W. Went ; *Botanical Information on Costa Rica;* 1 year ; $1,900

Robert E. Woodson, Jr. ; *Flora of Panama;* 3 years ; $36,000

MUSKINGUM COLLEGE, New Concord, Ohio ; Clement E. Dasch ; *Nearctic Diplazoninae and Mesochorinae (Ichneumonidae);* 1 year ; $9,000

NEW YORK BOTANICAL GARDEN, New York ; Caroline K. Allen ; *American Lauraceae: Taxonomy and Geographical Distribution;* 3 years ; $27,000

NORTHEASTERN UNIVERSITY, Boston, Mass. ; Andrew Starrett ; *Morphology of Bats;* 1 year ; $3,000

NORTHWESTERN UNIVERSITY, Evanston, Ill. ; Charles F. Nadler ; *Chromosome Analysis in Comparative Taxonomy of the Sciuridae;* 2 years ; $16,000

OBERLIN COLLEGE, Oberlin, Ohio ; Helen P. Foreman ; *Taxonomic and Stratigraphic Study of Cretaceous Radiolarians;* 2 years ; $11,600

OHIO STATE UNIVERSITY RESEARCH FOUNDATION, Columbus ; Dwight M. DeLong ; *The Gyponinae of the World;* 2 years ; $15,100

John J. Stephens ; *Equipment for Museum Collections in Paleontology at Ohio State University;* 1 year ; $14,000

OHIO WESLEYAN UNIVERSITY, Delaware ; Elwood B. Shirling and David Gottlieb ; *Characterization of Type Species of the Genus Streptomyces;* 32 months ; $50,500

OKLAHOMA STATE UNIVERSITY, Stillwater; Jan M. J. deWet; *Biosystematics of Bothriochloininae;* 3 years; $36,200

Jack R. Harlan; *Biosystematics of the Genus Cynodon;* 2 years; $22,000

OREGON STATE UNIVERSITY, Corvallis; Harold J. Jensen; *Preparation of a Permanent Slide Collection of Soil Nematodes;* 2 years; $5,600

Herman A. Scullen; *Taxonomic Studies of the Wasp Tribe Cercerini;* 2 years; $9,800

PRINCETON UNIVERSITY, Princeton, N.J.; Glenn L. Jepsen; *Paleocene and Eocene Vertebrate Faunas;* 2 years; $44,200

PURDUE RESEARCH FOUNDATION, Lafayette, Ind.; John S. Karling; *Systematic and Phylogenetic Study of Plasmodiophorales;* 3 years; $33,700

REED COLLEGE, Portland, Oreg.; Bertram G. Brehm; *A Chemo-taxonomic Study of the Genus Tragopogon (Compositae);* 3 years; $25,600

RESEARCH FOUNDATION OF STATE UNIVERSITY OF NEW YORK, Albany; Ronald H. Petersen, Buffalo; *Taxonomic Study of the Clavariaceae of the Eastern United States and Canada;* 3 years; $13,200

Robert L. Gilbertson, Syracuse; *A Taxonomic Study of Resupinate Hydnaceae of North America;* 2 years; $11,800

Josiah L. Lowe, Syracuse University, Syracuse, N.Y.; *Taxonomic Study of the Polyporaceae of North America;* 2 years; $16,200

ROOSEVELT UNIVERSITY, Chicago, Ill.; Charles H. Seevers; *Systematic Studies of the North American Staphylinidae (Coleoptera);* 3 years; $15,800

RUTGERS, THE STATE UNIVERSITY, New Brunswick, N.J.; Herbert A. Lechevalier; *Mode of Formation of Spores of Actinomycetes;* 2 years; $18,000

SMITHSONIAN INSTITUTION, Washington, D.C.; Doris Holmes Blake; *Revision of the Beetles of the Genus Neobrotica Jacoby,* 1 year; $2,600

Richard S. Boardman; *Revision of the Genera of Paleozoic Bryozoa;* 3 years; $33,000

Doris M. Cochran; *Frogs of Western Brazil and of Colombia;* 1 year; $2,700

Carl J. Drake; *Monographic Studies of the Tingidae of the World;* 2 years; $18,700

Porter M. Kier; *Tertiary Echinoids of the Eastern United States and the Caribbean;* 3 years; $23,500

Karl V. Krombein; *Indo-Australian Vespidae sens. lat. and Sphecidae;* 2 years, $11,000

Harald Rehder; *Marine Mollusks of Polynesia;* 3 years; $20,500

Leonard P. Schultz; *Monographic Revision of Carcharinid Sharks of the Tropical Indo-Pacific Oceans;* 1 year; $16,900

Waldo L. Schmitt; *The American Commensal Crabs of the Family Pinnotheridae;* 3 years; $47,700

I. Gregory Sohn; *Lower Cretaceous Ostracoda of Israel;* 1 year; $18,000

Donald F. Squires; *Zoogeography of Southern Ocean Scleractinian Coral Faunas;* 3 years; $31,000

Jack A. Wolfe; *European Tertiary Dicotyledon Floras;* 1 year; $9,000

SOUTHERN METHODIST UNIVERSITY, Dallas, Tex.; Thomas E. Williams; *Permian Fusulinidae of the Hueco Mountains;* 2 years; $14,500

Thomas E. Williams; *Recovery of Vertebrate Fossils of Pleistocene Age from Active Gravel Pit, Dallas County, Texas;* 6 months; $5,100

STANFORD UNIVERSITY, Stanford, Calif.; Paul R. Ehrlich; *Evolutionary Relationships in the Lepidoptera;* 2 years; $20,000

Warren C. Freihofer; *Peripheral Nervous System of the Order Salmopercae;* 2 years; $21,000

Virginia Page; *Wood from the Upper Cretaceous of California;* 2 years; $9,000

Peter H. Raven; *Systematics of Oenothera;* 3 years; $29,500

STATE UNIVERSITY OF IOWA, Iowa, City; George W. Martin; *Myxomycetes of the World;* 3 years; $15,400

STATE UNIVERSITY OF NEW YORK, COLLEGE OF AGRICULTURE AT CORNELL UNIVERSITY, Ithaca; J. Chester Bradley; *Revisions of the Taxonomy of the Scoliidae (Insecta: Hymenoptera);* 2 years; $17,000

William T. Keeton; *Systematics of Diplopoda;* 2 years; $15,600

Robert E. Lee and H. E. Moore, Jr.; *Biosystematic Studies in the Gesneriaceae;* 1 year; $1,900

Harold E. Moore, Jr.; *Storage of Research Herbarium Specimens;* 1 year; $7,900

Edward C. Raney; *Cornell University Fish Collection;* 3 years; $22,000

Edward C. Raney; *North American Ichthyology;* 1 year; $10,000

TEXAS RESEARCH FOUNDATION, Renner; Donovan S. Correll; *Vascular Plants of Texas;* 2 years; $25,300

TULANE UNIVERSITY, New Orleans, La.; Harold E. Vokes; *Catalogue of the Genera of Pelecypoda;* 1 year; $1,800

UNIVERSITY OF ALASKA, College; J. J. Gonor; *Pogonophores off the Northern Coast of Alaska;* 3 months; $1,500

UNIVERSITY OF ARIZONA, Tucson; Floyd G. Werner; *Systematic Studies of the New World Anthicidae;* 4 years; $11,000

UNIVERSITY OF ARKANSAS, Fayetteville; G. T. Johnson; *The Trypetheliaceae of North America;* 2 years; $14,100

UNIVERSITY OF CINCINNATI, Ohio; Maxine L. Abbott; *Compression Flora of Upper Freeport Coal;* 2 years; $18,800

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UNIVERSITY OF COLORADO, Boulder; Dharani Dhar Awasthi; *Taxonomic Studies in the Lichens of India and South Africa;* 1 year; $7,500

UNIVERSITY OF DENVER RESEARCH INSTITUTE, Colo.; Kenneth R. Porter; *Investigation of Mating Calls and Parotoid Gland Secretions of Central American Bufo;* 2 years; $21,200

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UNIVERSITY OF ILLINOIS, Urbana; John O. Corliss; *Systematics of Ciliate Protozoa;* 2 years; $31,500

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Theodore H. Eaton, Jr.; *Phylogeny of Paleozoic Reptiles;* 2 years; $20,000

Theodore H. Eaton, Jr.; *Revision of Niobrara (Cretaceous) Elopid, Clupeid and Enchodontid Fishes;* 2 years; $28,500

E. Raymond Hall; *Curatorial Assistance for the Museum of Natural History;* 1 year; $6,000

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Robert W. Lichtwardt; *Developmental and Systematic Studies of Fungi;* 1 year; $700

Charles D. Michener; *Taxonomic Study of Halictine Bees;* 3 years; $35,500

Robert K. Selander and Richard F. Johnston; *Geographic Variation and Evolution in North American House Sparrows;* 2 years; $14,000

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Robert T. Wilce; *Benthic Marine Algae of Northeast Canada;* 3 years; $18,000

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Gilbert L. Voss, Miami; *Monograph of the Cephalopods of the North Atlantic;* 3 years; $32,000

Donald P. de Sylva, Miami; *Systematics of Larval and Juvenile Fishes of the Family Istiophoridae;* 2 years; $11,400

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Don L. Frizzell, Rolla; *Otoliths of Lower Cenozoic Fishes of the Gulf Coast;* 2 years; $14,500

UNIVERSITY OF NEBRASKA, Lincoln; Paul A. Johnsgard; *Systematic Studies on the Avian Family Anatidae;* 3 years; $41,000

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Harold W. Manter; *Trematodes of Australian Fishes;* 2 years; $14,200

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asitic on Fishes of the Hawaiian Islands; 3 years; $7,500

Marian H. Pettibone; *Polychaetous Annelids of New England;* 2 years; $27,400

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UNIVERSITY OF OKLAHOMA RESEARCH INSTITUTE, Norman; Maxim K. Elias; *Carboniferous Bryozoa of America and Europe;* 2 years; $29,000

UNIVERSITY OF PENNSYLVANIA, Philadelphia; Hui-Lin Li; *The Flora of Formosa (Taiwan)*; 2 years; $17,700

UNIVERSITY OF SOUTH FLORIDA, Tampa; Robert W. Long; *Taxonomic and Genetic Investigations in Ruellia (Acanthaceae)*; 3 years; $16,000

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UNIVERSITY OF TENNESSEE, Knoxville; L. R. Hesler; *Taxonomic Study of the Agaricales of the Southeastern United States;* 3 years; $27,600

UNIVERSITY OF TEXAS, Austin; Constantine J. Alexopoulos; *Taxonomic Problems in the Myxomycetes;* 2 years; $22,100

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UNIVERSITY OF UTAH, Salt Lake City; Stephen D. Durrant; *Taxonomy and Evolution of Mammals From the Zones of Contact Between the Major Faunal Areas;* 2 years; $20,800

George F. Edmunds, Jr.; *Centipeds, Millipeds, and Spiders in the Chamberlin Collection;* 2 years; $15,300

John M. Legler; *Improvement of Research and Curatorial Facilities for Herpetology;* 3 years; $10,100

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VIRGINIA POLYTECHNIC INSTITUTE, Blacksburg; Perry C. Holt; *Systematic Studies of the Branchiobdellidae;* 3 years; $11,300

William W. Scott; *Taxonomy and Biology of Fungi Associated with Fish and Fish Eggs;* 3 months; $2,340

Stuart E. Neff, *Immature Stages of Scatomyzinae;* 3 years; $20,000

Chauncey G. Tillman; *Brachiopod Fauna of the Lower Devonian Rocks;* 2 years; $14,400

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Marion Ownbey; *Purchase of Herbarium Cases for Washington State University;* 1 year; $6,600

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Robert E. Woodson, Jr.; *Biometric Studies of the Butterfly Weed (Asclepias Tuberosa)*; 1 year; $3,700

WAYLAND BAPTIST COLLEGE, Plainview, Tex.; Gordon C. Creel; *Invertebrate Fauna of Estelline Salt Spring;* 1 year; $2,000

WEST VIRGINIA UNIVERSITY, Morgantown; M. E. Gallegly; *Sexuality in the Genus Phytophthora;* 2 years; $20,000

WILLIAM MARSH RICE UNIVERSITY, Houston, Tex.; Harold W. Harry; *Systematics of Freshwater Mollusca of Puerto Rico;* 1 year; $9,100

WOODS HOLE OCEANOGRAPHIC INSTITUTION, Woods Hole, Mass.; Harold L. Sanders and Olga Hartman; *Deep-Water Benthic Polychaetes of the Gayhead-Bermuda Transect;* 2 years; $29,700

YALE UNIVERSITY, New Haven, Conn.; Hempstead Castle; *Revision of the Genus Radula;* 3 years; $27,000

Theodore Delevoryas; *North American Cycadeoids;* 1 year; $9,000

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Willard D. Hartman; *Indo-Pacific Coral Reef-Inhabiting Sponges;* 2 years; $26,000

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Don B. Stallings; *Biosystematics of Megathymidae;* 3 years; $5,800

Karl M. Waage, A. L. McAlester, John H. Ostrom and E. L. Simons; *Revision of Research Collections in Paleontology;* 2 years; $77,200

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Philip B. Armstrong; *Operation of Boat for Collecting Research Materials;* 2 years; $50,000

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WOODS HOLE OCEANOGRAPHIC INSTITUTION, Woods Hole, Mass.; John H. Ryther; *U.S. Program in Biology for the International Indian Ocean Expedition;* 3 years; $271,600

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Eugenie Clark; *Research Boat for Marine Biological Program;* 1 year; $25,000

CHICAGO NATURAL HISTORY MUSEUM, Ill.; E. Leland Webber; *Facilities and Support for Improvement of Research Collections;* 5 years; $399,800

COLUMBIA UNIVERSITY, New York, N.Y.; Paul R. Burkholder, Palisades; *Research Laboratory for Marine Biology;* $21,000

COLORADO STATE UNIVERSITY RESEARCH FOUNDATION, Fort Collins; Ralph Baker; *Construction of a Prototype Controlled Environment Chamber for Plants Research;* 1 year; $4,400

DARTMOUTH COLLEGE, Hanover, N.H.; Raymond W. Barratt; *Collection and Maintenance of Genetic Stocks;* 5 years; $80,000

DUKE UNIVERSITY, Durham, N.C.; C. G. Bookhout, Beaufort; *Cooperative Research and Research Training Program in Biological Oceanography;* 5 years; $200,000

Peter H. Klopfer and Donald K. Adams; *Additions to the Duke Field Station for Animal Behavior Studies;* 1 year; $25,000

Paul J. Kramer; *Feasibility Study for Construction of a Two-Unit Phytotron for the Southeastern States;* 1 year; $40,500

GULF COAST RESEARCH LABORATORY, Ocean Springs, Miss.; Gordon Gunter; *Conversion and Outfitting of a 65-foot Research Vessel;* 1 year; $99,350

INDIANA UNIVERSITY FOUNDATION, Bloomington; Dean Fraser; *Electron Microscope for Biological Research;* 1 year; $33,600

Shelby D. Gerking; *Construction of Biological Research Facilities;* 1 year; $126,500

MICHIGAN STATE UNIVERSITY, East Lansing; John H. Beaman; *Herbarium Facilities for Research Collections;* 1 year; $25,100

MOUNT DESERT ISLAND BIOLOGICAL LABORATORY, Salisbury Cove, Maine; Alvin F. Rieck, Marquette University, Milwaukee, Wis.; *Remodeling, Renovation, Construction and General Support of Facilities;* 3 years; $63,900

NAPLES ZOOLOGICAL STATION, Naples, Italy; Peter Dohrn, *Renovation and Refurbishing of Laboratories for Physiological Research;* 3 years; $200,000

NEW YORK BOTANICAL GARDEN, N.Y.; Bassett Maguire, Sr.; *Acquisition and Installation of Herbarium Cases;* 2 years; $88,800

ROCKY MOUNTAIN BIOLOGICAL LABORATORY, Crested Butte, Colo.; Robert K. Enders; *Construction and Improvement of Research and Living Quarters;* 1 year; $5,000

SMITHSONIAN INSTITUTION, Washington, D.C.; Martin H. Moynihan, Canal Zone Biological Area, Balboa, Canal Zone; *Installation of Power Line to Barro Colorado Island from Mainland;* 2 years; $110,000

STANFORD UNIVERSITY, Stanford, Calif.; Rolf Bolin; *Research and Graduate Training in Biological Oceanography;* 5 years; $348,750

STATE UNIVERSITY OF IOWA, Iowa City; Richard V. Bovbjerg; *Building Addition for the Iowa Lakeside Laboratory;* 1 year; $21,000

UNIVERSITY OF CALIFORNIA, Berkeley; Cadet Hand, Bodega Marine Laboratory; *Construction of Research Facilities for the Bodega Marine Laboratory;* 3 years; $1,100,000

Gordon H. Ball, Los Angels; *Bio-instrumentation Facility;* 2 years; $150,000

John D. French, Los Angeles; *Laboratory and Tank Facilities for Marine Neurophysiological and Biological Research;* 3 years; $240,000

Karl C. Hamner, Los Angeles; *Construction of a Prototype Low Cost Controlled Environment Chamber;* 2 years; $25,000

Lars Carpelan, Riverside; *Completion of Facility for Desert Research;* 1 year; $18,200

UNIVERSITY OF DELAWARE, Newark; Franklin C. Daiber; *Conversion of a Motor-Sailer for Oceanographic Research;* 1 year; $15,000

UNIVERSITY OF HAWAII, Honolulu; Albert H. Banner; *Construction of a Laboratory Building;* 1 year; $11,500

UNIVERSITY OF MIAMI, Coral Gables; Samuel P. Meyers, Miami; *Renovation of Research Facilities for Marine Microbiology;* 1 year; $16,300

UNIVERSITY OF MINNESOTA, Minneapolis; William H. Marshall and E. W. Ziebarth; *Summer Research at Lake Itasca Station;* 2 years; $42,800

UNIVERSITY OF OKLAHOMA, Norman; Carl D. Riggs; *Construction of Research Facilities at the University of Oklahoma Biological Station;* 2 years; $114,500

UNIVERSITY OF PUERTO RICO, Mayaguez; John E. Randall; *Additions to Research Facilities on Magueyes Island;* 1 year; $25,000

UNIVERSITY OF TEXAS, Austin; H. C. Bold and W. S. Stone; *Construction of Brackenridge Field Laboratory;* 3 years; $258,000

UNIVERSITY OF VIRGINIA, Charlottesville; James L. Riopel; *Renovation and Improvement of Facilities at the Mountain Lake Biological Station;* 2 years; $5,400

UNIVERSITY OF WASHINGTON, Seattle; Robert L. Fernald; *Expansion of Facilities and Support of Research on Marine Sciences at the Friday Harbor Laboratories;* 3 years; $437,900

UNIVERSITY OF WISCONSIN, Madison; Harlyn Halvorson and Robert Burris; *Construction of a Laboratory of Molecular Biology;* 3 years; $600,000

WOODS HOLE OCEANOGRAPHIC INSTITUTION, Woods Hole, Mass.; Bostwick H. Ketchum; *Expansion of Biological Research Programs and Provision of Related Shiptime;* 3 years; $400,000

ZOOLOGICAL SOCIETY OF SAN DIEGO, Calif.; Georges Ungar; *Furnishings for New Laboratory Facility at the Institute for Comparative Biology;* 2 years; $93,000

MATHEMATICAL, PHYSICAL AND ENGINEERING SCIENCES

ASTRONOMY

AMHERST COLLEGE, Amherst, Mass.; Robert H. Koch and Albert P. Linnell; *Eclipsing Binaries;* 3 years; $97,300

CALIFORNIA INSTITUTE OF TECHNOLOGY, Pasadena; Bruce C. Murray and Guido Munch; *Long Wavelength Infrared Ground-Based Astronomy;* 1 year; $26,400

Bruce C. Murray and James A. Westphal; *Long Wavelength Infrared Ground-Based Astronomy;* 1 year; $25,000

Fritz Zwicky, *Construction of Catalog of Galaxies and Clusters of Galaxies;* 2 years; $58,500

Fritz Zwicky, *Supernova Search;* 1 year; $21,000

CASE INSTITUTE OF TECHNOLOGY, Cleveland, Ohio; S. W. McCuskey, *Low Dispersion Stellar Spectroscopy,* 1 year; $95,600

S. W. McCuskey; *Renovation of the 36-Inch Cassegrain Reflector of the Warner and Swasey Observatory;* 1 year; $15,000

CORNELL UNIVERSITY, Ithaca, N.Y.; Martin Harwit; *Detection of Near Infrared Radiation from Inter-Stellar Molecular Hydrogen;* 2 years; $53,900

GEORGETOWN UNIVERSITY, Washington, D.C.; Vera C. Rubin; *Galactic Space Motion of Stars and Photometry of Galaxies;* 2 years; $8,100

HARVARD UNIVERSITY, Cambridge, Mass.; David Layzer; *Atomic Energy Levels and Transition Probabilities;* 1 year; $66,600

David Layzer; *Theoretical Studies in Cosmology and Cosmogony;* 1 year; $27,400

A. Edward Lilley; *Hydrogen Line Radio Astronomy;* 1 year; $202,800

Alan Maxwell; *Observations in Radio Astronomy at C-Band and L-Band;* 1 year; $52,000

Fred L. Whipple; *Harvard Radio Meteor Project;* 2 months; $33,000

INDIANA UNIVERSITY FOUNDATION, Bloomington, Ind.; Benjamin F. Peery, Jr.; *Observations of Astronomical Spectra with an Image Intensifier;* 2 years; $13,300

INSTITUTE FOR ADVANCED STUDY, Princeton, N.J.; Otto Struve; *Preparation of the Manuscript for a Monograph on Astrospectroscopy;* 1 year; $4,200

KING COLLEGE, Bristol, Tenn.; William W. Rolland, *Photoelectric Photometry of Variable Stars;* 1 year; $12,000

William W. Rolland, *Photoelectric Study of Variable Stars;* 6 months; $5,000

LOWELL OBSERVATORY, Flagstaff, Ariz.; Henry L. Giclas, *Proper Motion Survey of the Northern Hemisphere with the 13-inch Photographic Telescope;* 3 years; $60,800

John S. Hall; *Improvements to the Perkins Reflector;* 1 year; $111,300

MARQUETTE UNIVERSITY, Milwaukee, Wis.; William L. Reitmeyer; *Photoelectric Determination of Rotational Velocities and Redshifts of External Galaxies;* 6 months; $3,600

NATIONAL ACADEMY OF SCIENCES—NATIONAL RESEARCH COUNCIL, Washington, D.C.; G. M. Clemence; *Support of Astrometric Research in the Southern Hemisphere;* 1 year; $20,400

NORTHWESTERN UNIVERSITY, Evanston, Ill.; John D. R. Bahng; *Infrared Spectrophotometry of Stars;* 3 years; $40,300

OHIO STATE UNIVERSITY RESEARCH FOUNDATION, Columbus; Philip C. Keenan; *Spectra of Mira Variables;* 2 years; $8,800

John D. Kraus; *Research in Radio Astronomy;* 2 years; $176,500

Walter E. Mitchell, Jr.; *The Solar Spectrum in the Range 0.295–5.0 Microns;* $23,600

PAN AMERICAN COLLEGE, Edinburg, Tex.; Paul R. Engel; *The Classification of the Spectra of B and B_e Stars by Photoelectric Photometry;* 1 year; $14,300

POMFRET SCHOOL, Pomfret, Conn.; James R. McCullough; *Ultra-Short-Period Variable Stars and Photoelectric Timing of Occultations;* 2 years; $7,000

PRINCETON UNIVERSITY, Princeton, N.J.; Martin Schwarzchild; *Project Stratoscope II;* $325,100

Lyman Spitzer, Jr.; *Modernization of Princeton Telescope;* 1 year; $5,100

SAN DIEGO STATE COLLEGE FOUNDATION, San Diego, Calif.; Burt Nelson; *Photoelectric Study of Eclipsing Binary Stars;* 1 year; $7,200

SMITHSONIAN INSTITUTION, Washington, D.C.; Charles A. Whitney, Cambridge, Mass.; *Stellar Atmospheres;* 1 year; $28,900

STANFORD UNIVERSITY, Stanford, Calif.; Ronald N. Bracewell; *Microwave Radio Telescope Design;* 4 months; $35,400

Ronald N. Bracewell; *Microwave Radio Telescope Design;* 1 year; $30,000

SWARTHMORE COLLEGE, Swarthmore, Pa.; Peter van de Kamp; *Astrometric Study of Nearby Stars;* 2 years; $33,800

TUFTS UNIVERSITY, Medford, Mass.; George S. Mumford, III; *Eclipsing Binaries Among the Dwarf Novae;* 14 months; $11,100

DEPARTMENT OF THE NAVY, OFFICE OF NAVAL RESEARCH, Washington, D.C.; W. C. Hall; *Laboratory High Temperature Spectroscopy;* 1 year; $75,000

Herbert Friedman; *Research in Rocket and Satellite Astronomy;* 1 year; $800,000

UNIVERSITY OF ALASKA, College; Leif Owren; *Radio Studies of Solar Particle Emissions and the Solar Corona;* 2 years; $115,700

UNIVERSITY OF ARIZONA, Tucson; Gerard P. Kuiper; *Stars and Stellar Systems;* 2½ years; $65,000

Beverly T. Lynds; *Catalogue of Bright Nebulae;* 2 years; $9,400

UNIVERSITY OF CALIFORNIA, Berkeley; Paul W. Hodge; *Southern Members of the Local Group of Galaxies;* 2 years; $28,400

Jerzy Neyman; *Statistical Studies of Systems of Galaxies;* 1 year; $40,600

George Wallerstein; *Abundances in Stars of Type F, G, and K;* 2 years; $21,000

George Wallerstein; *Hydrogen to Metal Ratios in the Magellanic Clouds;* 1 year; $4,000

Harold Weaver; *Kinematic Properties of Stars and Distribution of Mass in the Galaxy;* 1 year; $11,900

George H. Herbig, Mount Hamilton; *High Dispersion Stellar Spectrography;* $31,200

T. D. Kinman, Mount Hamilton; *RR Lyrae and Blue Stars of the Galactic Halo;* 2 years; $10,000

Gerald E. Kron, Mount Hamilton; *Image Tube Development;* 1 year; $35,000

Geoffrey Burbidge and E. Margaret Burbidge, San Diego; *Structure and Dynamics of External Galaxies;* 2 years; $61,800

UNIVERSITY OF CANTERBURY, Christchurch, New Zealand; C. Ellyett; *High-Rate Radar Study of Variations in the Rate of Incidence of Meteors;* 3 years; $19,900

UNIVERSITY OF CHICAGO, Ill.; W. A. Hiltner; *Galactic Structure;* 1 year; $26,700

Masatoshi Koshiba and Riccardo Levi-Setti; *Nuclear Emulsion Detection of Gamma Rays in the Cosmic Radiation;* 1 year; $42,200

Paul H. Roberts; *Stellar Dynamics;* 1 year; $10,300

George Van Biesbroeck, Yerkes Observatory, Williams Bay, Wisconsin; *Astrometric Investigations;* 1 year; $9,900

UNIVERSITY OF FLORIDA, Gainesville; Alex G. Smith; *Measurement and Analysis of Planetary Emissions at Radio Frequencies;* 3 years; $62,600

Alex G. Smith; *Radio Observations of Jupiter and Saturn from Chile;* 2 years; $65,100

UNIVERSITY OF MARYLAND, College Park; Roger Bell and Gart Westerhout; *Atmospheric Parameters of Cepheid Variables;* 1 year; $7,500

UNIVERSITY OF MICHIGAN, Ann Arbor; Fred T. Haddock; *Solar Radio Bursts;* 2 months; $3,800

William E. Howard, III; *Catalogue of Spectra of Cosmic Radio Sources;* 1 year; $10,400

Otto Laporte; *Measurement of F-Values Using a Shock Tube;* 1 year; $36,500

George Makhov; *Design and Construction of an X-Band Ruby Maser Radiometer;* $32,900

Orren C. Mohler; *Measurements of Double Stars and the Spectral Classification of Bright Stars in the Southern Hemisphere;* 1 year; $59,600

Orren C. Mohler; *Observation of Double Stars;* 4 months; $13,000

UNIVERSITY OF OREGON, Eugene; E. G. Ebbighausen; *Scanner for Spectrograms of Spectroscopic and Eclipsing Binaries;* 1 year; $5,500

E. G. Ebbighausen; *The Establishment of a Summer Mountain Research Observatory;* 6 months; $4,400

UNIVERSITY OF PENNSYLVANIA, Philadelphia; L. Binnendijk; *Photoelectric Photometry of W Ursae Majoris Systems;* 1 year; $3,500

L. Binnendijk; *Photoelectric Photometry of W Ursae Majoris Systems;* 2 years; $8,300

Frank B. Wood; *New Zealand Site Survey;* 1 year; $29,000

Frank B. Wood; *Multicolor Observations of Selected Eclipsing Variables;* 2 years; $25,500

UNIVERSITY OF SYDNEY, Australia; B. Y. Mills; *Extension of Mills Cross Radio Telescope;* $450,000

UNIVERSITY OF TEXAS, Austin; Frank N. Edmonds, Jr.; *An Analysis of Solar Granulation;* 1 year; $2,500

UNIVERSITY OF WISCONSIN, Madison; John S. Mathis; *Photometry of Gaseous Nebulae and Evolution of a Rotating Star;* 2 years; $18,300

Donald E. Osterbrock; *Photoelectric Photometry of Comets and Nebulae;* 3 years; $22,100

VAN TUYL RUSCH, WILLARD, Los Angeles, Calif.; *Millimeter-Wavelength Radio Astronomy;* 6 months; $300

VANDERBILT UNIVERSITY, Nashville, Tenn.; Robert H. Hardie; *Galactic Structure;* 2 years; $40,000

VASSAR COLLEGE, Poughkeepsie, N.Y.; Henry Albers; *A Photoelectric Study of Selected M Stars;* 2 years; $7,000

YALE UNIVERSITY, New Haven, Conn.; Harlan J. Smith and James N. Douglas; *Planetary and Solar Non-thermal Radio Emission;* 1 year; $65,000

YOUNG, ANDREW T., Cambridge, Mass.; *Spiral Arms in the Galaxy;* 1 year; $669

ATMOSPHERIC SCIENCES

COLORADO STATE UNIVERSITY RESEARCH FOUNDATION, Fort Collins; Ferdinand Baer; *Possible Solution of Applicable Equations for Atmospheric Circulation;* 3 years; $78,400

COLUMBIA UNIVERSITY, New York, N.Y.; William L. Donn, Palisades; *Atmospheric Microoscillations;* 3 years, $108,700

James R. Heirtzler, Palisades; *Cooperative Geomagnetic Micropulsation Measurement Program for the International Year of the Quiet Sun;* 1 year; $10,500

DARTMOUTH COLLEGE, Hanover, N.H.; Millett G. Morgan and Thomas Laaspere; *The Synoptic Study of Audio-Frequency Electromagnetic Waves at the "Whistlers-East" Network Under a Modified Program;* 1 year; $111,800

DEPARTMENT OF THE AIR FORCE, Washington, D.C.; E. J. Timberlake; *Research Meteorologists for the International Indian Ocean Expedition;* 1 year; $60,000

FLORIDA STATE UNIVERSITY, Tallahassee; Charles L. Jordan; *Large-Scale Aspects of Air-Sea Interactions in the Tropics;* 3 years; $58,400

FRANKLIN INSTITUTE, Philadelphia, Pa.; Martin Pomerantz; *Time Variations of the Primary Cosmic Radiation Near the North Geomagnetic Pole;* 3 years; $127,000

GRADUATE RESEARCH CENTER OF THE SOUTHWEST, Dallas, Tex.; Lloyd V. Berkner, Lauriston C. Marshall and Chaim Richman; *A Mathematical Model of Variations of Atmospheric Constituents over the Geologic Eras;* 2 years; $87,700

Kenneth G. McCracken; *Super Neutron Monitor Studies During the International Year of the Quiet Sun;* 1 year; $168,100

HARVARD UNIVERSITY, Cambridge, Mass.; Richard Goody; *Atmospheric Physics;* 3 years; $504,000

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge; Raymond Hide; *Hydrodynamics of Rotating Fluids;* 6 months; $40,000

Frederick Sanders; *Frontal Structure and the Dynamics of Frontogenesis;* 9 months; $30,200

Victor P. Starr; *Observational and Theoretical Studies of Planetary Atmospheres;* 18 months; $200,000

Hurd C. Willett; *Ocean and Atmosphere Interaction During Climatic Fluctuations;* 3 years; $113,550

NATIONAL ACADEMY OF SCIENCES—NATIONAL RESEARCH COUNCIL, Washington, D.C.; Hugh Odishaw; *Support of Ad Hoc Committee on International Programs in Atmospheric Sciences and Hydrology;* 1 year; $35,400

Hugh Odishaw; *Support of the Geophysics Research Board;* 1 year; $118,600

Hugh Odishaw; *World Data Center A-Data Coordination Office;* 1 year; $32,000

Hugh Odishaw; *Support of Ad Hoc Committee on International Programs in the Atmospheric Sciences and Hydrology;* 1 year; $11,800

John R. Sievers; *Activities of the Committee on Atmospheric Sciences;* 1 year; $62,000

NEW MEXICO INSTITUTE OF MINING AND TECHNOLOGY, Socorro; W. D. Crozier; *Atmospheric Space Charge;* 1 year; $26,000

Marvin H. Wilkening; *Radon and Its Decay Products in the Lower Atmosphere;* 1 year; $26,500

NEW YORK UNIVERSITY, New York; Serge A. Korff; *Operation of Cosmic Ray Neutron Monitor in Alaska;* 2 years; $38,000

Max Woodbury; *Extraterrestrial Correlations with Meteorological Parameters;* 2 years; $23,700

PENNSYLVANIA STATE UNIVERSITY, University Park; A. J. Ferraro and H. S. Lee; *D-Region by the Wave Interaction Technique During the International Year of the Quiet Sun;* 1 year; $49,600

Charles L. Hosler; *Cloud and Precipitation Processes in Hilly Terrain;* 3 years; $297,600

RESEARCH FOUNDATION OF STATE UNIVERSITY OF NEW YORK, Albany; Narayan R. Gokhale; *Dynamic Behavior of Nuclei in Ice-Formation;* 3 years; $34,900

Vincent J. Schaefer; *Cloud Physics Field Research;* 2 years; $53,000

Richard J. Howard, Buffalo; *Molecular Association in Supersaturated Vapors;* 2 years; $28,300

SAN JOSE STATE COLLEGE FOUNDATION, San Jose, Calif.; Albert Miller; *Land-Sea Boundary Effects on Small-Scale Circulations;* 2 years; $95,000

STANFORD RESEARCH INSTITUTE, Menlo Park, Calif.; Robert A. Young; *Very High Resolution Spectroscopic Studies of the Airglow;* 1 year; $45,100

STANFORD UNIVERSITY, Stanford, Calif.; R. A. Helliwell; *Conjugate VLF Studies at Great Whale River;* 1 year; $48,000

Allen M. Peterson; *Backscatter Sounding Research;* 6 months; $9,250

U.S. ATOMIC ENERGY COMMISSION, New York, N.Y.; Morris Goldberg; *Use of AEC IBM-7090 Computer;* 1 year; $2,965

Morris Goldberg; *Use of AEC IBM-7090 Computer;* 1 year; $7,000

U.S. DEPARTMENT OF COMMERCE, COAST AND GEODETIC SURVEY, Washington, D.C.; J. H. Nelson; *Observations at Island Stations of the Daily Magnetic Variations (Sq) in the Pacific Ocean Area*; 1 year; $69,700

U.S. NAVAL RESEARCH LABORATORY, Washington, D.C.; J. E. Dinger; *Water Vapor Measurement in the Stratosphere;* 1 year; $50,000

UNIVERSITY OF ALASKA, College; C. S. Deehr; *Spectrophotometry of Atmospheric Phenomena During a Total Eclipse of the Sun;* 1 year; $50,000

C. T. Elvey; *IQSY Program of Auroral, Ionospheric and Magnetic Investigations in Alaska;* 1 year; $191,200

Robert D. Hunsucker; *Radio Studies of the High-Latitude Ionosphere During a Solar Eclipse;* 1 month; $4,600

Merle J. Young; *Operation of IGY World Data Center A—Aurora (Instrumental);* 1 year; $37,700

UNIVERSITY OF ARIZONA, Tucson; Myron L. Corrin; *Surface Properties of Heterogeneous Condensation Nuclei;* 3 years; $95,400

Walter H. Evans, Robert L. Walker, and Martin A. Uman; *Field and Laboratory Studies of Lightning Processes;* 9 months; $40,000

A. Richard Kassander and Louis J. Battan; *Physics of Convective Clouds and of Cloud Modification;* 1 year; $46,600

UNIVERSITY OF CALIFORNIA, Berkeley; Robert R. Brown; *Ionospheric Current Systems and Cosmic Radio Noise Absorption;* 3 years; $150,000

Joanne S. Malkus, Los Angeles; *Cloud Formations Over Heat Sources;* 1 year; $25,000

UNIVERSITY OF CHICAGO, Ill.; Roscoe R. Braham, Jr.; *Physical Effects of Silver Iodide Seeding in Cumulus Clouds;* 2 years; $400,000

Dave Fultz; *Meteorological Experimental Hydrodynamics;* 3 years; $224,800

Colin O. Hines; *Theory of Magnetic Storms and Related Ionospheric Phenomena;* 3 years; $190,500

H. L. Kuo; *Planetary Thermal Circulations;* 3 years; $158,750

George W. Platzman; *Dynamical Studies of the Atmospheric General Circulation;* 3 years; $150,000

UNIVERSITY OF COLORADO, Boulder; A. Rense and Manfred H. Rees; *Theoretical Physics of the Upper Atmosphere;* 3 years; $130,000

UNIVERSITY OF IDAHO, Moscow; J. S. Kim; *Auroral Radar Echoes;* 3 years; $75,000

UNIVERSITY OF ILLINOIS, Urbana; Sidney A. Bowhill; *Production and Loss Processes for Atmospheric Ionization;* 1 year; $28,900

Glenn E. Stout, Richard G. Semonin and Donald W. Staggs; *Cloud Electrification Studies in Illinois;* $5,000

G. W. Swenson; *Atmospheric Ionization During a Solar Eclipse;* 1 year; $79,500

UNIVERSITY OF MICHIGAN, Ann Arbor; E. Wendell Hewson and Gerald C. Gill; *Atmospheric Diffusion in Transitional States;* $5,000

E. Wendell Hewson; *Atmospheric Diffusion in Transitional States;* 1 year; $47,000

Donald J. Portman; *Heat and Water Vapor Exchange at the Air-Sea Interface for the International Indian Ocean Expedition;* $86,500

UNIVERSITY OF MINNESOTA, Minneapolis; John L. Gergen; *Atmospheric Energy Balance;* 2 years; $30,400

Alfred O. C. Nier; *Composition of Upper Atmosphere with Rocket-borne Magnetic Spectrometers II;* 1 year; $17,500

William R. Webber; *Operation of IGY Data Center A—Cosmic Rays;* 1 year; $14,700

UNIVERSITY OF MISSOURI, Columbia; Wayne L. Decker; *Rain Gage Records Analysis of the University of Chicago Cumulus Cloud Research Project;* 3 years; $39,500

UNIVERSITY OF NEW MEXICO, Albuquerque; Victor H. Regener; *Time Variation of Cosmic Radiation;* 18 months; $4,695

UNIVERSITY OF NEVADA, Reno; Wendell A. Mordy; *Nevada Atmospheric Research Project;* 1 year; $83,000

UNIVERSITY OF ROCHESTER, N.Y.; Morton F. Kaplon; *Cosmic Ray Studies During the IQSY;* 1 year; $54,900

UNIVERSITY OF UTAH, Salt Lake City; J. Vern Hales; *Evaluation of Weather Modification;* 3 years; $35,000

E. Paul Palmer; *Measuring the Influx of Interplanetary Dust by Means of Light Scattering;* 1 year; $40,000

UNIVERSITY OF WASHINGTON, Seattle; Robert G. Fleagle; *Energy Transfer Near the Earth's Surface;* 1 year; $140,000

UNIVERSITY OF WESTERN AUSTRALIA, Nedlands, Western Australia; William C. Macklin; *The Physics of the Growth of Hailstones;* 2 years; $22,900

UNIVERSITY OF WISCONSIN, Madison; Reid A. Bryson; *Interdisciplinary Study in Climatology;* 1 year; $200,000

Verner E. Suomi and William P. Birkemeier; *The Lower Atmosphere Using Scattering of Microwaves;* 1 year; $161,500

WEATHER BUREAU, U.S. DEPARTMENT OF COMMERCE, Washington, D.C.; J. W. Osmun; *Upper Air Observations;* 2 years; $11,000

F. W. Reichelderfer; *Weather Bureau Research Aircraft for the Indian Ocean Expedition;* 1 year; $490,980

F. W. Reichelderfer; *International Indian Ocean Expedition Meteorological Program Aboard Oceanographic Vessels;* 3 years; $330,000

WOODS HOLE OCEANOGRAPHIC INSTITUTE, Woods Hole, Mass; Andrew F. Bunker; *Air-Sea Interaction for the International Indian Ocean Expedition;* 1 year; $110,720

Eric B. Kraus; *Air-Sea Interactions;* 3 years; $99,000

Joseph Levine; *Cumulus Convection and its Interaction with Larger Scales of Motion;* 2 years; $45,000

CHEMISTRY

AMHERST COLLEGE, Amherst, Mass.; L. Willard Richards; *Vibrational Relaxation of Oxygen in Shock Waves;* 2 years; $9,200

BOSTON COLLEGE, Chestnut Hill, Mass.; George Vogel; *Nucleophilic Attack on the 2-Pyrone Ring System;* 3 years; $28,500

BOSTON UNIVERSITY, Mass.; Ronald M. Milburn; *Redox Reactions of Ligands;* 5 months; $4,290

BRANDEIS UNIVERSITY, Waltham, Mass.; James B. Hendrickson; *Generalized Synthetic Approach to Some Indole Alkaloids;* 3 years; $33,000

Thomas N. Margulis; *Crystal and Molecular Structure of Organic Compounds;* 2 years; $21,800

Thomas R. Tuttle, Jr.; *Application of Electron Spin Resonance to Problems of Electronic Structure and Chemical Reactivity;* 1 year; $17,600

BROWN UNIVERSITY, Providence, R.I.; Joseph F. Bunnett; *Benzyne and Phenyl Anion Chemistry;* 3 years; $40,200

Richard L. Carlin; *Electronic Behavior in Transition Metal Complexes;* 2 years; $19,700

BRYN MAWR COLLEGE, Bryn Mawr, Pa.; Frank B. Mallory; *Studies of Furazan Oxides and Related Heterocycles;* 3 years; $49,300

CALIFORNIA INSTITUTE OF TECHNOLOGY, Pasadena; Harden M. McConnell; *Free Radicals in Crystals;* 2 years; $107,000

John H. Richards; *Chemistry of Metallocenes;* 3 years; $39,700

G. Wilse Robinson; *Low Temperature Chemistry and Spectroscopy;* 3 years; $81,100

William P. Schaefer; *Vanadium (II) Complexes;* 2 years; $14,000

CANISIUS COLLEGE, Buffalo, N.Y.; Raymond Annino and Ronald E. Erickson; *Stereochemistry of Electroreductions;* 2 years; $12,700

CASE INSTITUTE OF TECHNOLOGY, Cleveland, Ohio; Gordon M. Barrow; *Nature of Water-Base Complexes in Solution;* 2 years; $30,700

Gordon M. Barrow; *Purchase of a Proton Magnetic Resonance Spectrometer;* 1 year; $26,800

John P. Fackler, Jr.; *Properties and Structures of Oxygen-Containing Chelate Complexes;* 3 years; $46,200

Malcolm E. Kenney; *Inorganic Studies Based on the Phthalocyanines;* 6 months; $3,750

Jay K. Kochi; *Autoxidations Catalyzed by Metal Salts;* 3 years; $52,100

Warren E. Thompson; *Spectroscopy of Trapped Free Radicals from Low Temperature Hydrogen Atom Reactions;* 2 years; $27,400

CATHOLIC UNIVERSITY OF AMERICA, Washington, D.C.; Jan Rocek; *Chromic Acid Oxidation of Olefins;* 3 years; $41,700

COLLEGE OF WOOSTER, Wooster, Ohio; Donald A. Tarr; *Hydroxamic Acid Complexes of Transition Metal Ions;* 2 years; $7,600

COLUMBIA UNIVERSITY, New York, N.Y.; Charles O. Beckmann; *Purchase of a Mass Spectrometer;* 1 year; $67,000

Ronald Breslow; *Pseudoaromatic Systems;* 3 years; $51,500

Benjamin P. Dailey; *Microwave, Direct Quadrupole, and Nuclear Magnetic Resonance Spectroscopy;* 2 years; $110,800

George K. Fraenkel; *Relaxation Effects in Electron Spin Resonance Spectra of Free Radicals;* 2 years; $38,500

Harry B. Gray; *Substitution and Exchange Reactions of Transition Metal Hydrides and Nitrosyls;* 3 years; $62,100

Thomas J. Katz; *Organometallic Compounds;* 3 years; $56,200

Cheves Walling; *Organic Reaction Mechanisms;* 3 years; $103,100

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William C. Wildman; *Alkaloid Degradations;* 3 years; $46,600

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Albert C. Zettlemoyer; *Wetting of Solids by Liquids;* 6 months; $4,600

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MICHIGAN STATE UNIVERSITY, East Lansing; Harold Hart; *Fundamental Studies in Organic Chemistry;* 3 years; $58,100

NATIONAL ACADEMY OF SCIENCES—NATIONAL RESEARCH COUNCIL, Washington, D.C.; G. D. Meid; *Support of the U.S. National Committee of the International Union of Crystallography;* 3 years; $9,000

NEW MEXICO STATE UNIVERSITY, University Park; John J. Monagle, Jr.; *Nucleophilic Activity of Organic Derivatives of Pentavalent Phosphorus, Arsenic and Antimony;* 2 years; $24,700

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Roger E. Gerkin; *Electron Paramagnetic Resonance Studies at Low and High Fields;* 2 years; $55,900

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William W. Paudler; *Isolation and Structure Determination of Certain New Alkaloids;* 2 years; $15,200

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Thomas Wartik; *Purchase of Electron Paramagnetic Resonance Spectrometer;* 1 year; $29,600

POLYTECHNIC INSTITUTE OF BROOKLYN, N.Y.; Reed F. Riley; *Fused Salts and Their Solutions of Complex Forming Metal Ions;* 2 years; $41,600

PURDUE RESEARCH FOUNDATION, Lafayette, Ind.; Robert A. Benkeser; *Chemistry of the Organic Compounds of Silicon, Germanium and Tin;* 3 years; $61,200

James W. Cobble; *The Thermodynamic Properties of High Temperature Solutions;* 1 year; $17,800

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Peter T. Lansbury, Buffalo; *New Reactions of Lithium Aluminum Hydride in Pyridine Solution;* 3 years; $35,000

Barry M. Gordon, Oyster Bay; *Kinetic Investigation of Fast Electron-Transfer Reactions in Aqueous Solution;* 2 years; $17,300

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Conrad Schuerch, College of Forestry, Syracuse; *Stereoisomerism of Vinyl Polymers;* 2 years; $18,000

RESEARCH FOUNDATION, OKLAHOMA STATE UNIVERSITY, Stillwater; J. Paul Devlin; *Vibrational Spectra and Thermodynamic Properties of Some Cyanoethylenes and π-Complexes of Tetracyanoethylene;* 2 years; $13,400

Leon H. Zalkow; *Synthesis and Stereochemistry of Tetracarbocyclic Diterpenoid Alkaloids and Related Diterpenes;* 3 years; $37,500

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Robert L. Scott, Los Angeles; *Liquids and Solutions;* 2 years; $36,200

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M. Frederick Hawthorne, Riverside; *Displacement Reactions of Tetracoordinate Boron;* 3 years; $42,700

James N. Pitts, Jr., Riverside; *Conversion of Dual-Purpose Electron Paramagnetic Resonance—Nuclear Magnetic Resonance Spec-*

trometer to Separate EPR and NMR Spectrometers; 1 year; $16,500

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J. W. Stout; *Electronic Energy Levels in Paramagnetic Crystals;* 2 years; $84,200

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Kenneth B. Wiberg; *Mechanisms of Oxidation Reactions;* 3 years; $92,400

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AMERICAN GEOGRAPHICAL SOCIETY, New York, N.Y.; William O. Field; *Continuation of World Data Center A: Glaciology;* 1 year; $25,000

AMERICAN MUSEUM OF NATURAL HISTORY, New York, N.Y.; Brian H. Mason; *The Mineralogical and Chemical Composition of Stony Meteorites;* 3 years; $24,700

BRIGHAM YOUNG UNIVERSITY, Provo, Utah; Harold J. Bissell; *Permian Marine Basins of Sedimentation, Western Utah and Eastern Nevada;* 2 years; $17,000

Lehi F. Hintze; *Structural Analysis of Mt. Nebo Overthrust Area;* 1 year; $7,600

William R. Phillips; *Purchase of X-ray Diffraction Equipment;* 1 year; $15,000

J. Keith Rigby; *Acquisition of Cut-off Saw, Grinder, and Finishing Lap;* 1 year; $3,300

CALIFORNIA INSTITUTE OF TECHNOLOGY, Pasadena; Egon T. Degens; *Geochemical Spectrum of Organic Compounds in Ancient Sediments;* 2 years; $7,100

P. Edgar Hare and Heinz A. Lowenstam; *A Comparative Study on the Amino Acid Composition of Some Biologically Mineralized Materials, Both Recent and Fossil;* 2 years; $25,800

Heinz A. Lowenstam; *The Contribution of Unrecognized Mineral Precipitates of Marine Organisms to Marine Sediments;* 3 years; $48,600

Claire C. Patterson; *Construction of a Mass Spectrometer;* 1 year; $9,900

Robert P. Sharp; *Glaciological Investigations on Blue Glacier, Washington;* 2 years; $25,900

Leon T. Silver; *Uranium-Thorium-Lead Isotopic Systems in Minerals of Gabbroic Rocks;* 1 year; $12,500

G. J. Wasserburg; *Reconstruction of Gas Mass Spectrometer to Increase Sensitivity;* 1 year; $13,400

CARNEGIE INSTITUTE OF WASHINGTON, Washington, D.C.; Merle A. Tuve; *Geophysics Program in the Central Andes;* 3 years; $120,000

Merle A. Tuve; *Logistics for International Seismic Crustal Studies in Lake Superior;* 1 year; $58,400

COLORADO SCHOOL OF MINES, Golden, J. Harlan Johnson; *Fossil Algae from Guatemala;* 2 years; $20,000

COLUMBIA UNIVERSITY, New York, N.Y.; Charles H. Behre, Jr.; *Nature and Origin of Zinc-Lead and Copper Gossans;* 2 years; $18,800

Fred A. Donath; *Experimental Development of Metamorphic Structures Deep-Sea Sediments;* 3 years; $40,000

John Imbrie; *Stratigraphy and Genesis of Post-Pleistocene Bahamian Sediments;* 2 years; $20,000

Marshall Kay; *Comparative Stratigraphy and Structure on the Newfoundland and Irish Coasts;* 3 years; $22,700

Allan W. H. Be, Palisades; *Paleoecology of Planktonic Foraminifera and Other Organic Constituents in North Atlantic;* 3 years; $48,000

Wallace S. Broecker, Palisades; *Uranium Series Inequilibrium in Pleistocene Carbonates;* 2 years; $40,000

William A. Cassidy, Palisades; *Meteoritic Impact Sites;* 1 year; $21,700

Maurice Ewing, Palisades; *Participation in the International Indian Ocean Expedition;* 1 year; $544,200

Maurice Ewing, Palisades; *Support for Research Vessel VEMA;* 1 year; $180,000

James R. Heirtzler, Palisades; *Geomagnetic Studies;* 18 months; $43,300

Maurice Ewing, John Kuo and Kenneth Hunkins, Palisades; *Solid Earth Tides;* 2 years; $75,000

William M. Sackett, Palisades; *Stable Isotope Investigation of the Carbon Cycle;* 2 years; $55,000

David L. Thurber, Palisades; *Natural Variations in U^{234}/U^{238} Ratios;* 1 year; $29,400

DARTMOUTH COLLEGE, Hanover, N.H.; Robert C. Reynolds, Jr., *The Salinity of Precambrian Seas;* 1 year; $5,900

FORDHAM UNIVERSITY, New York, N.Y.; Bartholomew Nagy; *Geologic Chromatography;* 6 months; $5,000

Norman O. Smith and Bartholomew Nagy; *Solubility of Gases in Connate Water;* 2 years; $19,000

FRANKLIN AND MARSHALL COLLEGE, Lancaster, Pa.; Stearns A. Morse; *Mineralogical, Geochemical and Structural Study of the Kiglapait Layered Intrusion, Labrador;* 2 years; $31,250

FRESNO STATE COLLEGE FOUNDATION, Fresno, Calif.; George M. Stanley; *Relations of Quaternary Lakes of Salton Basin and Lower Colorado River;* 18 months; $18,300

GEORGIA INSTITUTE OF TECHNOLOGY, Atlanta; William M. Spicer; *Purchase of an Ultraviolet-Visible Spectrophotometer;* 1 year; $10,000

GRADUATE RESEARCH CENTER OF THE SOUTHWEST, Dallas, Tex.; John W. Graham; *Paleomagnetic Research;* 1 year; $45,000

Anton L. Hales; *Seismic Crustal Structure Studies;* 1 year; $40,000

Anton L. Hales; *The Response of the Earth's Crust to Surface Loading;* 2 years; $55,000

HAMILTON COLLEGE, Clinton, N.Y.; Donald B. Potter; *Stratigraphy and Structure of the Central Taconic Region, New York;* 2 years; $16,000

HARVARD UNIVERSITY, Cambridge, Mass.; Francis Birch; *Measurement of Heat Flow in the United States;* 1 year; $153.000

J. O. Brew; *Geology, Paleontology and Archaeology of the Pleistocene Valesquillo Region, Mexico;* 1 year; $18,900

Bryan Patterson; *Paleontology of the East African Tertiary;* 3 years; $56,200

Alfred S. Romer; *Stratigraphy of the Wichita Redbeds, North Central Texas;* 3 years; $7,700

Henry Stommel; *Research in Oceanic Physics;* 1 year; $40,000

HOLMES, G. WILLIAM, Rockville, Md.; *The Ra-Salpauseelka Moraine System in Norway and Sweden;* 1 year; $3,200

INSTITUTO GEOFISICO BOLIVIANO, La Paz, Bolivia; Reynaldo Salgueiro; *Geomagnetism and Gravity Work in Bolivia;* 3 years; $33,000

INSTITUT POUR LA RECHERCHE SCIENTIFIQUE EN AFRIQUE CENTRALE, Brussels, Belgium; Eduard Berg; *Occurrence and Mechanisms of Earthquakes in Central Africa;* 1 year; $19,500

JOHNS HOPKINS UNIVERSITY, Baltimore, Md.; R. B. Montgomery; *Field Study of Equatorial Waters Near the Gilbert Islands;* 1 year; $10,000

LEHIGH UNIVERSITY, Bethlehem, Pa.; Keith E. Chave; *Geochemistry of Estuarine Plankton;* 1 year; $25,000

J. Donald Ryan; *Purchase of Spectrophotometer for Research in Geochemistry;* 1 year; $5,073

LEO, GERHARD W., Washington, D.C.; *Petrology of Metapelitic Rocks, Brazil;* 1 year; $5,700

LONG BEACH STATE COLLEGE FOUNDATION, Long Beach, Calif.; John G. Dennis; *Basic English Terminology for the International Tectonic Dictionary;* 1 year; $11,900

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge; William F. Brace; *A Theoretical and Experimental Study of Brittle Behavior of Rocks;* 3 years; $90,000

William F. Brace; *Brittle Fracture of Rocks;* 1 year; $18,500

D. E. Carritt; *Chemical Oceanography;* 2 years; $75,000

William H. Dennen; *Trace Elements in Quartz;* 1 year; $15,500

Ely Mencher; *Geology of Northern Aroostook County, Maine;* 3 years; $37,300

MICHIGAN STATE UNIVERSITY, East Lansing; Aureal T. Cross; *Significance of Spores and Other Detritus in Recent Sediments;* 2 years; $43,400

MILTON, CHARLES, Washington, D.C.; *Petrology and Mineralogy of Carbonatites of Tanganyika and Israel;* 1 year; $6,500

MONTANA STATE UNIVERSITY, Missoula; Robert W. Fields; *Origin and Development of Northern Rocky Mountain Tertiary Basins;* 3 years; $29,200

NATIONAL ACADEMY OF SCIENCES—NATIONAL RESEARCH COUNCIL, Washington, D.C.; Linn Hoover; *Support of Coordinator, Indian Ocean Expedition;* 1 year; $19,300

Linn Hoover; *Committee on INQUA in Plans to Sponsor the 7th International Congress of INQUA in 1965;* 3 years; $15,000

NATIONAL ACADEMY OF SCIENCES—NATIONAL RESEARCH COUNCIL, Washington, D.C.; William L. Petrie; *Support of AMSOC Committee Activities in Project Mohole;* 1 year; $108,100

Richard C. Vetter; *Support of the Special Committee on Oceanographic Research;* 1 year; $3,000

NATIONAL OCEANOGRAPHIC DATA CENTER, Washington, D.C.; Woodrow C. Jacobs; *Support for World Data Center-A for Oceanography (WDC–A);* 3 years; $27,000

NORTH DAKOTA STATE UNIVERSITY, Fargo; John A. Brophy; *Late Wisconsin and Post-Wisconsin Geologic History of Sheyenne Delta of Lake Agassiz;* 3 years; $11,250

OHIO STATE UNIVERSITY RESEARCH FOUNDATION, Columbus, Ohio; Harold W. Borns, Jr. and Richard P. Goldthwait; *Glacial Geology of the Kaskawulsh Glacier Area, Yukon Territory;* 14 months; $6,500

Richard P. Goldthwait and John H. Mercer; *Chronology of Late Glacial Movements, Patagonia Icefield;* 1 year; $16,900

George M. Haselton; *Glacial Geology of Upper Muir Inlet Area, Alaska;* 20 months; $14,200

W. A. Heiskanen and U. A. Uotila; *Purchase of Light Interference Comparator for Establishing a Geodetic Standard Base Line at Ohio State University;* 16 months; $22,000

Malcolm P. Weiss and Walter C. Sweet; *Lithostratigraphy and Biostratigraphy of the Type Cincinnatian;* 3 years; $39,200

Samuel B. Treves; *Igneous-Metamorphic Geology of the Tasersiaq Area, Southwest Greenland;* 1 year; $9,700

OREGON STATE UNIVERSITY, Corvallis; Joseph W. Berg, Jr. and Peter Dehlinger; *Navigational Instrumentation to Facilitate Marine Geophysics Research;* 1 year; $17,500

Wayne V. Burt; *Oregon Oceanographic Studies;* 1 year; $177,000
versity Park: Thomas F. Bates; *X-Ray Diffractometer;* 1 year; $6,300

William H. Taubeneck; *Evolution of the Wallowa Mountains, Oregon;* 1 year; $9,900

PENNSYLVANIA STATE UNIVERSITY, University Park; Thomas F. Bates; *X-Ray Amorphous Mineral Materials and Their Role in the Weathering Process;* 3 years; $50,000

Russell R. Dutcher and Frank Dachille; *Effect of Heat and Pressure on Organic Matter in Coal Seams;* 3 years; $25,000

Peter H. Given; *Chemical Investigation of the Petrological Components of Bituminous Coal;* 2 years; $32,100

D. L. Hamilton and C. Wayne Burnham; *Phase Equilibrium Studies in a Simplified Eclogite System;* 2 years; $50,000

Leonard F. Herzog, II; *Be^{10} Dating Studies by Mass Spectrometry;* 8 months; $3,037

B. F. Howell, Jr.; *Cooperation in Seismic Measurements of Crustal Structure in Minnesota;* 1 year; $7,800

E. F. Osborn and A. Muan; *Role of Oxygen Pressure in Crystallization and Differentiation of Basaltic Magma;* 2 years; $24,600

Robert Scholten; *Mechanisms of Transport in Rocky Mountain Thrust Belt;* 3 years; $45,000

William Spackman; *Characteristics of Modern Organic Sediments and Their Use in the Identification, Description and Interpretation of Carbonaceous Rocks and Rock Sequences;* $4,000

O. Frank Tuttle; *Leucocratic Rocks and Their Role in the Evolution of the Earth's Crust;* 3 years; $75,000

O. F. Tuttle; *Experimental Study of Magmatic Origin for Magnetite-Apatite, Ilmenite-Hematite and Related Ore Deposits;* 3 years; $50,000

Vladimir Vand and Frank Dachille; *X-ray Diffraction Studies of Minerals Formed at Very High Pressures;* 2 years; $50,000

PIERCE, WILLIAM G., Menlo Park, Calif.; *Tectonic Mechanisms for Movement of Decollement of Detachment-type Thrust Faults;* 1 year; $12,500

POMONA COLLEGE, Claremont, Calif.; Alexander K. Baird and Donald B. McIntyre; *Distributions of Elements in the Batholith of Southern California and Their Petrogenetic Significance;* 3 years; $80,000

PRINCETON UNIVERSITY, Princeton, N.J.; William E. Bonini, A. F. Buddington, Alfred G. Fischer and R. B. Hargraves; *Rock Magnetism;* 2 years; $69,000

William E. Bonini; *Seismic Crustal Studies;* 2 years; $30,500

Walter M. Elsasser; *Convection in the Earth's Outer Mantle;* 2 years; $31,500

Hugh J. Greenwood; *Hydrothermal Research on Mineral Systems;* 2 years; $38,600

R. B. Hargraves; *Petrologic Study of the Diana Syenite Complex;* 3 years; $25,000

Heinrich D. Holland; *Solubility of Carbonates in Aqueous Solutions at High Temperatures and Pressures;* 2 years; $40,000

H. H. Hess, John C. Maxwell and Eldridge M. Moores; *Petrology, Structure, and Origin of Highly Differentiated Alpine Ophiolites;* 2 years; $25,000

PURDUE RESEARCH FOUNDATION, Lafayette, Ind.; Joe L. White; *The Weathering Sequence of Micaceous Clay Minerals;* 3 years; $32,500

RENSSELAER POLYTECHNIC INSTITUTE, Troy, N.Y.; Samuel Katz; *The Elasticity and Density of the High-Pressure Polymorphs of Selected Solids;* 2 years; $61,000

RIVERSIDE CITY COLLEGE, Calif.; Richard K. Rozelle; *Acidic Volcanic Activity in Late Cretaceous History of Northern California;* 1 year; $2,700

ROSS, CLYDE P.; *The Origin of the Idaho Batholith;* $1,600

ST. LOUIS UNIVERSITY, Mo.; Stanislaw A. Vincenz; *Experimental Study of the Natural Remanent Magnetization of Rocks;* 2 years; $38,000

SMITH COLLEGE, Northampton, Mass.; Bruce Hawkins; *Calculation of a Model for Planet Formation;* 2 years; $9,400

SMITHSONIAN INSTITUTION, Washington, D.C.; Edward P. Henderson; *Collection of Meteorites and Tektites in Australia;* 1 year; $10,200

SOUTHERN METHODIST UNIVERSITY, Dallas, Tex.; Michael J. Holdaway; *Hydrothermal Studies of Epidotes;* 2 years; $13,800

Gene Simmons; *Temperature Dependence of the Elastic Constants of Rock-Forming Minerals;* 2 years; $27,600

STANFORD UNIVERSITY, Stanford, Calif.; Stanley N. Davis; *Micromovements of the Land Surface Produced by Subsurface Flow of Fluids;* 3 years; $26,000

William R. Evitt; *Palynological Survey of Certain Mesozoic-Tertiary Strata in California;* 1 year; $25,000

John W. Harbaugh; *Dolomite in Modern Sediments;* $3,200

STEVENS INSTITUTE OF TECHNOLOGY, Hoboken, N.J.; Stephen J. Lukasik; *Data Recording System for Wave Energy Dissipation Studies;* 1 year; $21,000

TEXAS AGRICULTURAL AND MECHANICAL RESEARCH FOUNDATION, College Station; Lela M. Jeffrey; *Development of Chemical Methods for Isolation and Characterization of the Principal Organic Compounds in Sea Water;* 2 years; $40,000

Hugh J. McLellan; *Support of the Operation of the Research Vessel HILDALGO;* 1 year; $55,700

Robert O. Reid; *Direct Evaluation of Sea Surface Roughness and Vertical Flux of Heat and Momentum;* 1 year; $57,000

TEXAS CHRISTIAN UNIVERSITY, Fort Worth; Dan E. Feray, Arthur J. Ehlmann and Neil C. Hulings; *Tectonic and Environmental Factors in the Origin and Distribution of Puerto Rico Sediments;* 1 year; $40,000

TUFTS UNIVERSITY, Medford, Mass.; Robert L. Nichols; *Geomorphology of Inglefield Land, Northwest Greenland;* 1 year; $13,000

J. H. Nelson; *World Data Center A for Geomagnetism, Seismology, and Gravity;* 1 year; $32,000

U.S. NAVY OCEANOGRAPHIC OFFICE, Washington, D.C.; Woodrow C. Jacobs; National *Oceanographic Data Center;* 1 year; $80,000

OFFICE OF NAVAL RESEARCH, Washington, D.C.; L. D. Coates; *Support of the Committee on Oceanography of the National Academy of Sciences;* 1 year; $20,000

UNIVERSITY OF ARIZONA, Tucson; Paul E. Damon; *Geochemical Dating of Precambrian Rocks, Southwestern United States and Mexico;* 2 years; $53,500

Robert L. DuBois; *Paleomagnetism of Rocks, Meteorites, and Archeological Materials;* 2 years; $48,000

UNIVERSITY OF CALIFORNIA, Berkeley; Mark N. Christensen; *Pleistocene Deformation in the California Coast Ranges;* 18 months; $15,800

Garniss H. Curtis and Jack F. Evernden; *Potassium-Argon Method of Dating Minerals and Rocks;* 30 months; $71,000

Stanley H. Ward; *Polarization of Natural Magnetic Fields by Major Geologic Structures;* 1 year; $15,000

Charles Meyer; *Mineral Equilibria at Broken Hill, Australia;* 2 years; $18,900

George Backus and Freeman Gilbert, La Jolla; *The Free Oscillations of the Earth;* 1 year; $39,000

Victor Vacquier, La Jolla; *Magnetic Properties of Rocks, Sediments and Minerals;* 2 years; $49,000

Leason H. Adams and George C. Kennedy, Los Angeles; *Rapidly Running Transitions at Very High Pressures;* 1 year; $20,000

Daniel I. Axelrod, Los Angeles; *Tertiary Floras of Nevada;* 3 years; $28,000

W. G. Ernst, Los Angeles; *Stability Relations of Minerals Under Hydrothermal Conditions;* 2 years; $33,000

W. F. Libby, Los Angeles; *Radiocarbon Dating Method and New Dating Methods of Longer Time Scale;* $24,000

George W. Wetherill, Los Angeles; *Long-Lived Radioisotopes for Geochronological and Other Geophysical Problems;* 2 years; $60,500

Nathaniel T. Coleman, Riverside; *Sorption of Hydrolyzable Metal Ions by Clays;* 3 years; $41,600

Frank W. Dickson, Riverside; *Ore-forming Processes;* 2 years; $42,000

George Tunell, Riverside; *Ore-Forming Processes in Mercury and Antimony Deposits;* 2 years; $25,800

G. Arrhenius, San Diego; *Geology of Pacific Ocean Floor off Central America;* 1 year; $25,500

Robert L. Fisher and F. N. Spiess, San Diego; *Participation in the International Indian Ocean Expedition;* 1 year; $680,300

John D. Isaacs, San Diego; *Development of Inexpensive Deep-Sea Devices;* 1 year; $35,100

Alexander R. McBirney, San Diego; *Marine and Terrestrial Tectonic Relations in the Western Caribbean;* 1 year; $126,900

Alexander R. McBirney and Howel Williams, San Diego; *Petrology of the Central American Volcanic Province;* 2 years; $54,000

Melvin N. A. Peterson, San Diego; *Geochemistry of Marine Diagenesis and A Study of Marine Volcanism;* 2 years; $50,000

William R. Riedel, San Diego; *Detailed Field Study of Stratigraphy in Part of the Western Pacific;* 1 year; $5,000

W. R. Riedel, San Diego; *Stratigraphy and Paleoceanography in Part of the Southeast-Tropical Pacific;* 1 year; $116,600

George G. Shor, Jr., San Diego; *Reflection Studies of Geological Structure Under the Oceans;* 1 year; $230,000

J. E. Tyler, San Diego; *Hydrologic Optics Research-Spaceflight Spectroscopy;* 2 years; $100,000

Victor Vacquier, San Diego; *Deep Ocean Magnetic Recorders;* 18 months; $75,000

T. H. Van Andel and J. R. Curray, San Diego; *Sediments and Post-Pleistocene History of Continental Shelves;* 1 year; $17,400

Richard P. Von Herzen, San Diego; *Geothermal Heat Flow Between San Diego and the Rio Grande Valley;* 1 year; $166,800

UNIVERSITY OF CHICAGO, Ill.; John C. Jamieson; *Crystal Imperfections Using Pulse Techniques;* 1 year; $4,900

Robert C. Newton; *High Temperature and High Pressure in Solid State Geophysics;* 3 years; $40,000

Joseph V. Smith; *Structural and Chemical Analysis of Minerals;* 2 years; $20,000

UNIVERSITY OF CINCINNATI, Ohio; Hans J. Hofmann; *Primary and Secondary Structures, Southwestern Ohio;* 1 year; $2,300

Leonard H. Larsen; *Quartzite-Granite Series, Beartooth Mountains, Montana-Wyoming;* 2 years; $13,000

UNIVERSITY OF COLORADO, Boulder; Donald D. MacPhail; *Glacio-Climatic Mapping of Front Range Glaciers;* 18 months; $17,500

UNIVERSITY OF CONNECTICUT, Storrs; George R. Rumney, Noank; *Sea-Water Temperature Fluctuations in Shallow Tidal Estuaries;* 1 year; $5,500

UNIVERSITY OF DELAWARE, Newark; Johan J. Groot; *A Palynological Investigation of Atlantic Ocean Bottom Sediments;* 2 years; $44,800

UNIVERSITY OF EDINBURGH, Scotland; Patrick L. Willmore; *World Seismic Computation Project;* 3 years; $280,700

UNIVERSITY OF GEORGIA, Athens; William K. Hamblin; *Radiographic Techniques for Geologic Study;* 2 years; $20,000

John H. Hoyt and Vernon J. Henry, Jr.; *Sedimentation, Structure and Development of Salt Marshes and Divergent Barrier Islands of the Georgia Coast;* 3 years; $45,000

UNIVERSITY OF HAWAII, Honolulu; Taivo Laevastu; *Energy Exchange Between the Sea and the Atmosphere in the North Pacific;* 2 years; $20,400

John J. Naughton; *Potassium-Argon Method of Dating Volcanic Rocks and Minerals, Hawaiian Islands;* 2 years; $55,000

G. Donald Sherman; *The Evaluation of*

Past Climates as Expressed in Fossil Soils; 1 year; $5,000

UNIVERSITY OF ILLINOIS, Urbana; A. H. Beavers; *Characterization of Opal Phytoliths in Soils and Selected Plants;* 1 year; $17,600

Jack L. Hough; *Geological Studies in Lake Michigan;* 1 year; $33,900

Harold R. Wanless; *Sequential Mapping of Paleoenvironments of the Pennsylvanian Period;* 2 years; $32,500

UNIVERSITY OF MIAMI, Coral Gables, Fla.; James F. Corwin, Miami; *Isolation and Identification of Volatile Organic Matter in Tropical Sea Water;* 2 years; $40,000

Cesare Emiliani, Miami; *Palynological Research on Southeastern United States Fresh Water Deposits;* 2 years; $30,000

Cesare Emiliani; *Support of LOCO Committee;* 1 year; $18,400

Cesare Emiliani; *Investigations of the Deep-Sea Floor and Adjacent Slopes of the Tropical-Subtropical Western Atlantic and Caribbean;* 1 year; $230,000

Cesare Emiliani; *Paleotemperatwie Research;* 2 years; $80,900

J. Edward Hoffmeister, Miami; *Florida Coral Reef Studies;* 2 years; $14,600

Gote Ostlund and Gene A. Rusnak, Miami; *Facility for Low Tritium Measurements;* 1 year; $54,600

Gene A. Rusnak, Miami; *Rates of Sedimentation and Chronology of Late Pleistocene Events by Radiocarbon Dating;* 2 years; $50,000

F. G. Walton Smith, Miami; *Support of the Research Vessel GERDA;* 1 year; $25,200

F. G. Walton Smith and Robert F. White, Miami; *Support of Research Vessel GERDA;* 1 year; $28,100

UNIVERSITY OF MICHIGAN, Ann Arbor; Leigh C. Anderson; *Purchase of a Nuclear Magnetic Resonance Spectrometer;* 1 year; $15,500

William C. Kelly and F. Stewart Turneaure; *Thermometry of Ores of the Bolivian Tin Belt;* 3 years; $28,000

David E. Willis; *A Seismic Refraction Study and Attenuation Measurement Program in the Great Lakes Region;* 1 year; $12,700

James H. Zumberge; *Lake Superior Coring II;* 1 year; $57,000

UNIVERSITY OF MINNESOTA, Minneapolis; Harold L. James; *Origin of Iron Ores of Lake Superior Type;* 3 years; $55,000

Henry Lepp; *Distribution of Manganese in Certain Iron Formations, Minnesota;* 2 years; $21,200

Harold M. Mooney, Glenn E. Bowie and J. Campbell Craddock; *Geophysical and Geological Investigation of the Keweenawan Rocks of Southeastern Minnesota and Western Wisconsin;* 2 years; $54,000

William C. Phinney; *Application of Phase Equilibrium Data to Interpretation of Petrologic Problems;* 3 years; $31,900

Tibor Zoltai, *Mineral Structure Determinations;* 2 years; $25,000

UNIVERSITY OF MISSOURI, Columbia; Walter D. Keller; *Origin of Flint Clay Deposits;* 3 years; $28,000

Maynard Slaughter; *Crystal Structures of Some Natural Zeolites;* 3 years; $24,200

UNIVERSITY OF NEVADA, Reno; Alexis von Volborth; *X-ray Analysis of Rocks and Computation of "true" Rock Composition;* 1 year; $14,500

UNIVERSITY OF NEW MEXICO, Albuquerque; Roger Y. Anderson; *Climatic Cycles and Patterns in Varved Sediments;* 2 years; $22,900

UNIVERSITY OF NORTH CAROLINA, Chapel Hill; William A. White; *Topographic Effects of Solution in Surficial Deposits of Coastal Plains;* 1 year; $10,000

Ralph J. McCracken, Raleigh; *Weathering and Soil Genesis in Piedmont and Coastal Plain Regions;* 2 years; $15,900

UNIVERSITY OF NOTRE DAME, Ind.; Raymond C. Gutschick; *Biostratigraphy of Madison Group and Sappington Formation, Western Montana;* 2 years; $20,000

UNIVERSITY OF OREGON, Eugene; Francis J. Reithel; *Purchase of an Ultraviolet-Visible and a Nuclear Magnetic Resonance Spectrometer;* 2 years; $25,000

UNIVERSITY OF PENNSYLVANIA, Philadelphia; Elizabeth K. Ralph; *Carbon-14 Measurements of Known Age Samples;* 2 years; $30,000

UNIVERSITY OF PITTSBURGH, Pa.; Takesi Nagata; *Influence of Chemical and Pressure Effects on Rock Magnetism;* 2 years; $50,000

UNIVERSITY OF ROCHESTER, N.Y.; William A. Bassett and Taro Takahashi; *Development of High Pressure-Temperature X-ray Camera;* 1 year; $10,000

UNIVERSITY OF SOUTHERN CALIFORNIA, Los Angeles; George V. Chilingar; *Overburden Pressure and Moisture Content of Silicic Acid, Organic Colloids, and Various Clays;* $637

UNIVERSITY OF TEXAS, Austin; Virgil E. Barnes; *Composition and Origin of Tektites;* 2 years; $30,000

Gregory A. Davis; *Structure and Petrology of the Klamath Mountains Area, California;* 28 months; $16,300

William H. Easton; *Pleistocene Raised Reefs, Volcanic Ash, and Sediments in Hawaii;* 1 year; $12,300

K. O. Emery; *A Study of Monterey Bay and Submarine Canyon;* $1,800

J. Hoover Mackin; *Tertiary Deformational History of the Great Basin-Colorado Plateau, Southwestern Utah;* 2 years; $13,700

Richard Merriam; *Source and Mode of Deposition of Palm Spring Formation, California;* 1 year; $1,000

John A. Wilson and Stephen E. Clabaugh; *Early Tertiary Vertebrates and Potassium-Argon Dating of Associated Volcanic Rocks;* 2 years; $36,800

UNIVERSITY OF WASHINGTON, Seattle; P. E. Church; *Photography of Northwest North American Glaciers;* 2 years; $25,000

B. J. Enbysk; *Sedimentation and Foraminifera Distribution off the Washington-Oregon Coast;* 2 years; $30,700

Richard H. Fleming; *Improvement in Sea-Going Scientific Capabilities;* 1 year; $10,600

R. H. Fleming; *Expansion of Oceanographic Facilities;* 2 years; $1,400,000

Maurice Rattray, Jr.; *Theoretical Studies in the Dynamics of Estuarine Circulation;* 1 year; $19,600

UNIVERSITY OF WISCONSIN, Madison; Sturges W. Bailey; *Microbeam Crystal Structure Determination of Clay Minerals;* 1 year; $18,000

Murli H. Manghnani and Robert P. Meyer; *Seismic and Gravity Investigation of the Bitterroot Valley, Montana;* 1 year; $7,800

Robert P. Meyer; *Reduction and Analysis of Seismic Refraction Measurements;* 2 years; $75,000

Robert P. Meyer; *Crust and Upper Mantle Studies Through Explosion Seismology;* 1 year; $115,000

Ned A. Ostenso and George P. Woollard, *Gravity Investigations of the Arctic Ocean Basin;* 1 year; $13,500

G. P. Woollard and T. S. Laudon; *Gravity and Magnetic Studies in the Solomon Islands;* 1 year; $22,400

VIRGINIA POLYTECHNIC INSTITUTE, Blacksburg; Bruce W. Nelson; *Geochemistry of Sediment Suspensions in the Upper Adriatic Sea;* 1 year; $10,900

WASHINGTON STATE UNIVERSITY, Pullman; Ronald K. Sorem; *Mineralogy of Manganese Oxide Ores in Washington;* 1 year; $5,100

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Robert F. Lambert; *Signal Extraction from Turbulent Media;* 3 years; $115,900

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Richard A. Swalin; *Diffusion and Defect Studies in High Temperature Oxides;* 2 years; $58,000

A. van der Ziel; *Noise in Gas Discharge Probes;* 3 years; $37,400

K. M. van Vliet; *Generation-Recombination Noise and Related Photoconductive Properties of Solids;* 2 years; $47,400

UNIVERSITY OF MISSOURI, Columbia; L. E. Marc de Chazal; *Drops from Submerged Nozzles;* 2 years; $34,200

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Truman S. Storvick; *Vapor Phase Viscosity of Polar Substances;* 3 years; $36,500

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Turgut Sarpkaya; *Vortex Formation and Drag in Unsteady Flow;* 2 years; $32,400

UNIVERSITY OF NEW MEXICO, Albuquerque; Frederick D. Ju and James T. P. Yao; *Fracture and Yielding Under Low-Cycle Loading;* 1 year; $9,800

UNIVERSITY OF NORTH CAROLINA, Chapel Hill; C. Arthur Hart and Alfred J. Stamm; *Moisture Movement in Wood;* 2 years; $42,300

Shao-lin Lee, Raleigh; *Convection Plumes Above a Diffusion Fire;* 2 years; $49,000

Paul Zia, Raleigh; *Combined Bending and Torsion in Concrete;* 2 years; $32,700

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James J. Carberry; *Fluid Flow in Fixed Beds;* 2 years; $17,100

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William C. Cohen; *Multivariable Control of the Chemical Reactor at the Unstable Steady State;* 27 months; $56,800

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Y. H. Ku; *Stability of Nonlinear Physical Systems;* 3 years; $95,200

Mitchell Litt; *Chemical Reactions on a Rotating Disk;* 2 years; $39,200

UNIVERSITY OF PITTSBURGH, Pa; Shiao-Hung Chiang; *Interfacial Temperature in Mass Transfer;* 1 year; $7,750

UNIVERSITY OF RHODE ISLAND, Kingston; Frederick L. Test; *Heat Transfer with Temperature Dependent Viscosity;* 2 years; $15,300

UNIVERSITY OF SOUTHERN CALIFORNIA, Los Angeles; Zohrab A. Kaprielian and David B. Wittry; *A Liquid Helium Facility;* 1 year; $17,800

UNIVERSITY OF ROCHESTER, N.Y.; Hing-Cheong So; *Application of Matrix Construction and Realization Techniques to Network Synthesis;* 2 years; $27,000

William Streifer; *Propagation and Generation of Coherent Radiation;* 1 year; $3,800

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Ashley F. Emery and Creighton A. Depew; *Liquid Metal Heat Transfer;* 1 year; $6,100

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Edwin N. Lightfoot; *Multicomponent Diffusion in Liquids and Gels;* 2 years; $65,500.

Dale F. Rudd; *Chemical Processing System Sensitivity;* 2 years; $28,200

Alwyn C. Scott; *Non-Linear Wave Propagation;* 2 years; $26,000

UTAH STATE UNIVERSITY, Logan; Dean F. Peterson, Jr.; *A Study of Bed Roughness in Relation to Flow in Very Deep, Rough Natural Open Channels;* 2 years; $30,100

VANDERBILT UNIVERSITY, Nashville, Tenn.; Franklin D. Farrar, Jr. and Charles E. Farrell; *The Biophysics of Bird Flight;* 2 years; $75,200

VIRGINIA INSTITUTE OF MARINE SCIENCE, Gloucester Point; Clarence D. Cone, Jr.; *Albatross Soaring Flight in Ocean Shear-Layers;* 1 year; $3,900

VIRGINIA POLYTECHNIC INSTITUTE, Blacksburg; Henry R. Bungay, 3rd; *Separation of Solids and Liquids at Transition Boundaries;* 1 year; $6,100

WASHINGTON UNIVERSITY, St. Louis, Mo.; Pierre M. Honnell; *The Matric Computer—Theory, Electronics, Applications;* 6 months; $8,000

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C. Y. Wen; *Turbulent Mixing in Fluidized Beds;* 2 years; $24,100

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David J. Hellums; *Numerical Finite Difference Methods for Transport Problems;* 2 years; $23,900

Riki Kobayashi, Thomas W. Leland, Jr. and Vernon E. Denny; *Transport Properties of Non-Polar Fluids;* 2 years; $102,800

WORCESTER POLYTECHNIC INSTITUTE, Worcester, Mass.; C. W. Shipman; *Combustion Reactions in Turbulent Shear Flow;* 2 years; $31,600

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A. Erdelyi; *Functional Analysis and Its Applications;* 2 years; $76,000

CARNEGIE INSTITUTE OF TECHNOLOGY, Pittsburgh, Pa.; Morris H. DeGroot; *Uncertainty, Information and Optimal Experimentation;* 2 years; $14,000

Malempati M. Rao; *Operator-Valued Martingales and Inference Problems;* 2 years; $10,400

CASE INSTITUTE OF TECHNOLOGY, Cleveland, Ohio; Zakkula Govindarajulu; *Non-Parametric Statistical Inference;* 2 years; $13,200

CHRISTIAN BROTHERS COLLEGE, Memphis, Tenn.; H. Louis Althaus; *Establishment of a Computing Center;* 3 years; $20,000

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CLARKSON COLLEGE OF TECHNOLOGY, Potsdam, N.Y.; H. L. Shulman; *Additional Components for Computing System;* 1 year; $15,000

COLORADO STATE UNIVERSITY RESEARCH FOUNDATION, Fort Collins; E. R. Deal; *Quasi-Spectral Theory;* 2 years; $7,300

COLUMBIA UNIVERSITY, New York, N.Y.; S. Eilenberg; *Groups, Differential Modules, and Differential Equations;* 1 year; $90,000

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Hassler Whitney; *Problems in Analysis;* 1 year; $97,000

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ence Properties on Topological Groups; 1 year; $4,500

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Watson Fulks; *Partial Differential and Integral Equations and Asymptotics;* 1 year; $21,000

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Hajimu Ogawa, Riverside; *Partial Differential Equations of Mixed Type;* 2 years; $7,200

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Evelyn Frank, Chicago; *Numerical Continued Fractions;* 2 years; $9,600

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UNIVERSITY OF MICHIGAN, Ann Arbor; William V. Caldwell; *Light Interior Mappings;* 2 years; $8,400

Lamberto Cesari; *Continuous Transformations and Integral Manifolds;* 27 months; $47,000

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UNIVERSITY OF MISSOURI, Columbia; M. V. SubbaRao; *Families of Function Spaces;* 2 years; $7,900

UNIVERSITY OF NOTRE DAME, Ind.; George Kolettis, Jr.; *Ulm's Theorem on Abelian Groups;* 2 years; $20,000

UNIVERSITY OF OREGON, Eugene; Paul Civin; *Normal Algebras and Harmonic Analysis; Analysis;* 2 years; $50,000

UNIVERSITY OF PENNSYLVANIA, Philadelphia; Lewis E. Ward, Jr.; *Partially Ordered Topological Spaces;* 2 years; $19,800

Edwin J. Akutowicz; *Applications of Distributions to Analysis;* 3 months; $5,500

Murray Gerstenhaber; *Algebras with Non-Zero Radical and Certain Combinatorial Problems;* 2 years; $37,000

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Emil Grosswald; *Quadratic Forms and the Riemann Zeta Function;* 2 years; $24,700

UNIVERSITY OF ROCHESTER, N.Y.; Leonard Gillman; *Rings of Functions and Compactifications;* 2 years; $75,000

Richard E. Johnson; *Quotient Structure in Rings;* 2 years; $61,000

Johannes H. B. Kemperman; *Probability and Analysis;* 2 years; $50,000

Winston D. Walters; *Thermal Reactions of Small-Ring Compounds in the Vapor Phase;* 2 years; $22,000

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James Dugundji; *Absolute Neighborhood Retracts;* 2 years; $29,000

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UNIVERSITY OF UTAH, Salt Lake City; C. E. Burgess; *Structural and Mapping Properties of Continua;* 2 years; $18,200

UNIVERSITY OF VERMONT, Burlington; Erling W. Chamberlain; *Asymptotic Theory of Differential Equations;* 1 year; $3,700

UNIVERSITY OF WASHINGTON, Seattle; Ross A. Beaumont and Richard S. Pierce; *Modules, Rings, and Groups;* 1 year; $52,000

Gunter Lumer; *Contraction Semigroups and Probability;* 2 years; $45,000

Ronald Pyke; *Stochastic Processes and Related Problems in Statistical Inference;* 2 years; $48,000

Victor L. Klee, Jr.; *Convexity and Functional Analysis;* 2 years; $90,000

Ernest A. Michael; *Abstract Spaces;* 2 years; $74,000

Robert F. Tate; *Estimation Problems in Statistics;* 2 years; $19,000

UNIVERSITY OF WISCONSIN, Madison; R. H. Bing; *Topology of Three-Space;* 1 year; $53,000

Richard H. Bruck; *Algebra, Number Theory and Geometry;* 1 year; $70,000

Edmund H. Feller; *Prime and Semi-Prime Rings;* 2 years; $6,200

Stephen C. Kleene; *Non-Classical Logics;* 2 years; $72,000

John A. Nohel; *Lyapunov Functions;* 2 years; $33,000

Walter Rudin; *Problems in Analysis;* 1 year; $52,000

WASHINGTON STATE UNIVERSITY, Pullman; T. G. Ostrom; *Finite Projective Planes;* 2 years; $21,500

WASHINGTON UNIVERSITY, St. Louis, Mo.; Allen Devinatz; *Problems in Analysis;* 2 years; $76,000

Franklin Haimo; *Groups, Lie Groups, and Group Algebras;* 2 years; $100,000

WAYNE STATE UNIVERSITY, Detroit, Mich.; Hidegoro Nakano; *Functional Analysis and Integration;* 2 years; $54,000

S. Sherman; *The Ising Model;* 2 years; $60,000

Daniel Waterman; *Fourier Analysis;* 2 years; $26,000

WESLEYAN UNIVERSITY, Middletown, Conn.; Edward K. Blum; *Computer and Automata Theory;* 1 year; $26,000

WESTERN RESERVE UNIVERSITY, Cleveland, Ohio; George F. Leger; *Classification of Nilpotent Lie Algebras;* 1 year; $12,500

WEST VIRGINIA UNIVERSITY, Morgantown; Henry W. Gould; *Binomial Coefficient Summations;* 2 years; $14,200

YALE UNIVERSITY, New Haven, Conn.; Frederic B. Fitch; *Consistency of the Foundations of Mathematics;* 2 months; $4,500

Alan T. James; *Multivariate Statistical Analysis;* 2 years; $36,000

Shizuo Kakutani and Charles E. Rickart; *Analysis and Banach Algebras;* 2 years; $48,000

YESHIVA UNIVERSITY, New York, N.Y.; Martin Davis; *Algorithms, Symbolic Logic, and Recursive Function Theory;* 2 years; $36,000

Leopold Flatto; *Overdetermined Systems of Partial Differential Equations;* 1 year; $11,000

Donald J. Newman; *Uniqueness Problems for Unbounded Curves;* 2 years; $36,000

Harry E. Rauch; *Differential Geometry in the Large;* 2 years; $70,000

Jean F. Treves; *Partial Differential Operators;* 2 years; $27,000

PHYSICS

ADELPHI COLLEGE, Garden City, N.Y.; C. Rutherford Fischer; *Scattering of Electrons and Mesons;* 2 years; $8,400

AMERICAN UNIVERSITY OF BEIRUT, Beirut, Lebanon; Frans Bruin; *Paramagnetic Resonance of Free Radicals;* 3 years; $12,600

Frans Bruin; *Paramagnetic Resonance of Free Radicals at Weak Magnetic Fields;* 2 months; $7,800

AMHERST COLLEGE, Amherst, Mass.; Robert H. Romer; *Nuclear Spin Resonance in Helium Three;* 3 Years; $29,700

ARIZONA STATE UNIVERSITY, Tempe; Arnold G. Meister and Jerome M. Dowling; *Vibration-Rotation Spectra of Simple Polyatomic Molecules;* 1 year; $23,800

BOSTON UNIVERSITY, Mass.; Edward C. Booth; *Nuclear Resonance Scattering of Bremsstrahlung;* 2 years; $14,000

BRANDEIS UNIVERSITY, Waltham, Mass.; Saul Barshay, Kenneth W. Ford and Silven S. Schweber; *Elementary Particle Theory;* 2 years; $123,500

Stephan Berko; *Positron Electron and Phonon Interaction Experiments;* $5,000

Edgar Lipworth and Milton Baker; *Atomic Beam Study of Rare Earths;* 2 years; $90,000

David L. Falkoff, Eugene P. Gross and Ronald Rockmore; *Statistical Mechanics and Theory of the Many Body Problem;* 2 years; $65,000

BRIGHAM YOUNG UNIVERSITY, Provo, Utah; Harvey Fletcher; *Musical Acoustics;* 2 years; $17,000

BROWN UNIVERSITY, Providence, R.I.; Rohn Truell; *Defects in Solids Using Ultrasonic Techniques;* 2 years; $43,000

BUCKNELL UNIVERSITY, Lewisburg, Pa.; Robert A. Artman; *Ultrasonic Waves in Anisotropic Media;* 2 years; $10,400

CALIFORNIA INSTITUTE OF TECHNOLOGY, Pasadena; Jesse W. M. DuMond and Felix Boehm; *An Inhomogeneous Field Magnetic Spectrometer;* 16 months; $50,000

Jesse W. M. DuMond and Harry A. Kirkpatrick; *Precision Comparison of the X-ray Wavelength Scales;* 1 year; $4,800

CARLETON COLLEGE, Northfield, Minn., William A. Butler and Robert A. Reitz; *Thermoluminescence and Optical Absorption in Alkali-Halides;* 2 years; $18,000

CARNEGIE INSTITUTE OF TECHNOLOGY, Pittsburgh, Pa.; J. S. Langer; *Solid State Theory;* 2 years; $40,000

Emerson M. Pugh; *Magnet Power Supply;* 1 year; $19,800

CASE INSTITUTE OF TECHNOLOGY, Cleveland, Ohio; Thomas G. Eck; *Fine and Hyperfine Structure of Excited States of Atoms;* 2 years; $40,200

CATHOLIC UNIVERSITY OF AMERICA, Washington, D.C.; Theodore A. Litovitz; *Ultrasonic Spectroscopy in Molten Oxides;* 2 years; $24,000

T. A. Litovitz; *Structural Relaxation in Associated Liquids;* 2 years; $66,000

CITY UNIVERSITY OF NEW YORK, N.Y.; G. E. McDuffie and Robert M. Lea, City College; *Antiproton-Proton Scattering at 3.7 BeV/c;* 2 years; $69,900

COLUMBIA UNIVERSITY, New York, N.Y.; Henry A. Boorse; *Energy Gap and Heat Capacity Measurements in Superconductivity;* 2 years; $84,000

Sven R. Hartmann; *Adiabatic Demagnetization in the Rotating Frame;* 2 years; $55,000

Robert L. Mieher; *ENDOR, NMR and Optical Measurements on Alkali Halides;* 2 years; $69,000

Robert Novick; *The Optical Maser Applied to Brillouin Scattering Spectroscopy;* 2 years; $70,000

CORNELL UNIVERSITY, Ithaca, N.Y., David M. Lee; *Magnet and Power Supply for Low Temperature NMR;* 1 year; $21,900

Watt W. Webb; *Critical Defects in Ideal Crystals;* 2 years; $80,000

DARTMOUTH COLLEGE, Hanover, N.H.; W. Frank Titus; *Gamma Ray Pair Production at High Atomic Number;* 1 year; $8,300

DUKE UNIVERSITY, Durham, N.C.; Henry A. Fairbank; *Low Temperature Physics;* 2 years; $82,000

Hertha Sponer; *Low Temperature Spectroscopy of Aromatic Molecules;* 2 years; $42,000

FLORIDA PRESBYTERIAN COLLEGE, St. Petersburg; Paul J. Haigh; *Molecular Structure and Vibrations of Nitrogen Compounds;* 2 years; $12,000

FORDHAM UNIVERSITY, New York, N.Y.; Joseph I. Budnick; *Nuclear Magnetic Resonance on Ferromagnetic Metals and Alloys;* 1 year; $24,000

FRANKLIN INSTITUTE, Philadelphia, Pa.; Franz R. Metzger; *Nuclear Structure Physics;* 2 years; $195,000

GEORGIA INSTITUTE OF TECHNOLOGY, Atlanta; James R. Stevenson; *Optical Phenomena in Insulators;* 1 year; $16,000

L. D. Wyly and C. H. Braden; *Nuclear Data Decay Experiments;* 2 years; $43,200

GEORGE WASHINGTON UNIVERSITY, Washington, D.C.; Herbert Jehle; *Consistent Spinor Formulation of Kinematics and Dynamics;* 2 years; $20,500

HARVARD UNIVERSITY, Cambridge, Mass.; Gerald Holton; *Ultrasonic Velocity and Attenuation in Liquids at High Pressures;* 2 years; $42,000

Norman F. Ramsey; *Molecular Beams and Hydrogen Masers;* 2 years; $150,000

HARVEY MUDD COLLEGE, Claremont, Calif.; Robert P. Wolf; *Nuclear Magnetic Resonance in Solid Deuterated Methanes;* 1 year; $55,400

ILLINOIS INSTITUTE OF TECHNOLOGY, Chicago; Thomas Erber; *Vacuum Polarization in Quantum Electrodynamics;* 1 year; $10,000

INDIANA UNIVERSITY FOUNDATION, Bloomington; E. J. Konopinski; *Theory of Elementary Particle Interactions;* 2 years; $145,000

Hugh J. Martin; *Experimental Investigations of Elementary Particles;* 2 years; $177,000

Daniel W. Miller; *Nuclear Structure Physics with Indiana University Cyclotron;* 2 years; $214,100

JOHNS HOPKINS UNIVERSITY, Baltimore, Md.; Richard Zdanis; *Spark Chamber Studies of Elementary Particles;* 2 years; $94,000

KANSAS STATE UNIVERSITY, Manhattan; George L. Hall; *Quantum Theory of Disordered Alloys;* 2 years; $16,000

KENTUCKY RESEARCH FOUNDATION, Lexington; V. P. Kenney; *Elementary Particle Resonance Studies;* 2 years; $181,700

LAWRENCE COLLEGE, Appleton, Wis.; W. Paul Gilbert and J. Bruce Brackenridge; *A Hydro-Jet-Edge System;* 2 years; $26,000

LEHIGH UNIVERSITY, Bethlehem, Pa.; Peter Havas; *Relativistic Theory of Interacting Particles;* 2 years; $40,000

James A. Lennan, Jr.; *Statistical Mechanics and Kinetic Theory of Transport Processes;* 2 years; $41,000

Wesley R. Smith; *Shock Tube Condensation Studies;* 2 years; $65,000

LONG BEACH STATE COLLEGE FOUNDATION, Long, Beach, Calif.; Charles A. Roberts, Jr. and K. Y. Shen; *Green's Functions for the Many-Body Problem;* 2 years; $30,700

LOUISIANA STATE UNIVERSITY, Baton Rouge; Richard W. Huggett; *Ultra High Energy Phenomena;* 2 years; $90,000

MANHATTAN COLLEGE, New York, N.Y.; Gabriel Kane; *Cooperative Nuclear Emulsion Research;* 2 years; $13,300

LOYOLA UNIVERSITY, New Orleans, La.; Carl H. Brans; *New Mathematical Methods in General Relativity;* 2 years; $16,600

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge; Norman C. Rasmussen; *Precision Measurement of Nuclear Gamma-Ray Energies;* 1 year; $60,000

John C. Slater; *Chemical and Solid State Physics;* 2 years; $399,000

MICHIGAN COLLEGE OF MINING AND TECHNOLOGY, Houghton; Rolland O. Keeling, Jr.; *Dielectric Study of Hydrated Nitrates;* 1 year; $19,000

MICHIGAN STATE UNIVERSITY, East Lansing; Thomas H. Edwards and Clarence D. Hause; *Near Infrared Molecular Spectroscopy;* 2 years; $38,000

Sherwood K. Haynes; *Beta-ray Spectroscopy at Very Low Energies;* 2 years; $30,000

Egon A. Hiedemann; *Diffraction of Light by Ultrasonic Waves in Transparent Solids;* 2 years; $18,000

Julius S. Kovacs and Don B. Lichtenberg; *Theory of the Interactions of Mesons and Hyperons;* 2 years; $35,000

James H. Roberts and Raymond G. Ammar; *Investigation of Hyperfragments;* 1 year; $35,100

Kamal K. Seth; *Nuclear Structure Physics;* 1 year; $30,000

Truman O. Woodruff and Michael J. Harrison; *Theory of Solid-State Plasmas;* 2 years; $46,400

NATIONAL ACADEMY OF SCIENCES—NATIONAL RESEARCH COUNCIL, Washington, D.C.; G. D. Meid and John S. Coleman; *Committee on Nuclear Science;* 21 months; $40,000

NEW MEXICO STATE UNIVERSITY, University Park; H. Bartel Williams; *Spectrum Produced by Electron Multipacting Devices;* 1 year; $35,000

NEW YORK UNIVERSITY, New York; Martin Pope; *Electronic Conductivity in Organic Solids;* 2 years; $47,000

NORTHEASTERN UNIVERSITY, Boston, Mass.; Richard L. Arnowitt; *Theory of Elementary Particles;* 2 years; $34,600

Michael J. Glaubman; *Nuclear Gamma Ray Spectroscopy;* 2 years; $36,400

Roy Weinstein; *Elementary Particle Physics with Hodoscopes;* 2 years; $110,400

NORTHWESTERN UNIVERSITY, Evanston, Ill.; Laurie M. Brown and Richard H. Capps; *Field Theory and High Energy Physics;* 2 years; $60,000

James H. Roberts and Raymond G. Ammar; *Investigation of Hyperfragments;* 1 year; $59,100

Kamal K. Seth; *Nuclear Structure Physics;* 1 year; $30,000

OHIO STATE UNIVERSITY RESEARCH FOUNDATION, Columbus; J. G. Daunt; *Physical Phenomena at Very Low Temperatures;* 2 years; $259,000

J. C. Harris, H. J. Hausman, D. F. Herring and K. W. Jones; *Nuclear Structure Experiments;* 1 year; $170,000

Robert L. Mills; *Quantum Field Theory;* 2 years; $40,000

Harald H. Nielsen and K. Narahari Rao; *Infrared Spectroscopy;* 2 years; $43,800

Charles H. Shaw; *X-Ray Scattering at Low Temperatures in Liquids and Solids;* 2 years; $32,000

PENNSYLVANIA STATE UNIVERSITY, University Park; Walter I. Goldburg; *Nuclear Magnetic Resonance and Mossbauer Experiments;* 2 years; $52,000

Alan M. Jacobs; *Elementary Solution Methods in the Transport Equation;* 2 years; $14,000

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John A. Sauer and Arthur E. Woodward; *Dynamic Mechanical Behavior of High Polymers Over a Wide Temperature Range;* 2 years; $24,000

POLYTECHNIC INSTITUTE OF BROOKLYN, N.Y.; Benjamin Post; *X-Ray Dispersion Effects;* 2 years; $28,000

Alfred Zajac; *Borrmann Effect in Perfect Crystals;* 2 years; $29,300

PRINCETON UNIVERSITY, Princeton, N.J.; Allen G. Shenstone; *Atomic Spectra;* $4,650

Roman Smoluchowski; *Inelastic Scattering of Neutrons;* 2 years; $140,000

Eugene P. Wigner; *Quantum Theory;* 2 years; $34,700

PURDUE RESEARCH FOUNDATION, Lafayette, Ind.; Alexander N. Gerritsen; *Electron Transport Properties of Dilute Alloys;* 2 years; $60,000

Masao Sugawara; *Interactions of Elementary Particles;* 2 years; $30,000

REED COLLEGE, Portland, Oreg.; John I. Shonle; *The Scattering of Electrons from Inert Gases;* 2 years; $25,000

RENSSELAER POLYTECHNIC INSTITUTE, Troy, N.Y.; Hillard B. Huntington; *Calculations on Problems in Metal Physics;* 1 year; $11,800

Heinrich A. Medicus and Paul F. Yergin: *Photonuclear Research;* 1 year; $85,000

Roger W. Shaw; *Superconductivity and Lattice Defects;* 2 years; $21,600

RESEARCH FOUNDATION OF STATE UNIVERSITY OF NEW YORK, Albany; Robert G. Arns, Buffalo; *Experimental Beta Decay;* 2 years; $20,000

Nandor L. Balas, Oyster Bay; *Theories of Irreversible Processes;* 2 years; $20,500

ROLLINS COLLEGE, Winter Park, Fla.; John S. Ross; *Atomic Isotope Shifts of Rare Earths;* 3 years; $30,000

RUTGERS, THE STATE UNIVERSITY, New Brunswick, N.J.; Elihu Boldt; *Decay of Cosmic Ray Particles at Sea Level;* 1 year; $4,000

Theodore H. Kruse; *Nuclear Spectroscopy With a Van de Graaff Accelerator;* 1 year; $94,400

Charles Pine; *Dielectric Dispersion of Liquids;* 2 years; $24,000

Richard J. Plano; *Elementary Particle Physics;* 2 years; $195,300

Bernard Serin, Ernest A. Lynton, Peter Lindenfeld and William L. McLean; *Low Temperature Properties of Bulk and Film Metals and Alloys;* 1 year; $52,700

Henry C. Torrey and Herman Y. Carr; *Magnetic Resonance Studies of Solids, Liquids and Gases;* 2 years; $130,000

Henry C. Torrey; *Auxiliary Equipment for a Tandem Accelerator;* 1 year; $272,000

SAINT OLAF COLLEGE, Northfield, Minn.; Thomas D. Rossing; *Ferromagnetic Resonance in Thin Films;* 2 years; $22,000

SAINT PETER'S COLLEGE, Jersey City, N.J.; Po Lee; *Electric Discharge Through a Metallic Capillary;* 2 years; $13,000

SOUTH DAKOTA STATE COLLEGE, Brookings; George H. Duffey; *Application of Quantum Mechanics to Chemical Bonding;* 2 years; $20,000

SOUTHERN MISSIONARY COLLEGE, Collegedale, Tenn.; Ray Hefferlin; *Oscillator Strengths of Transition Elements;* 3 years; $25,200

STANFORD UNIVERSITY, Stanford, Calif.; William A. Little; *Many Particle Systems at Low Temperatures;* 2 years; $92,000

Walter E. Meyerhof; *Nuclear Structure Research;* 1 year; $55,000

Marshall S. Sparks; *Theoretical Solid State Physics;* 2 years; $31,700

STATE UNIVERSITY OF IOWA, Iowa City; Fritz Rohrlich and Max Dresden; *Classical and Quantum Field Theory;* 1 year; $33,500

J. A. Van Allen; *Lithium-Induced Nuclear Reactions;* 1 year; $120,000

STEVENS INSTITUTE OF TECHNOLOGY, Hoboken, N.J.; Snowden Taylor and Earl L. Koller; *Properties of Elementary Particles;* 2 years; $83,400

SYRACUSE UNIVERSITY RESEARCH FOUNDATION, Syracuse, N.Y.; Peter G. Bergmann and Arthur B. Komar; *Gravitation and General Relativity;* 2 years; $77,000

Arnold Honig; *Paramagnetic Resonance at Very Low Temperatures;* 2 years; $53,000

Nahmin Horwitz; *Properties of K-minus Mesons;* 2 years; $79,000

TEMPLE UNIVERSITY, Philadelphia, Pa.; Elmer L. Offenbacher; *Paramagnetic Resonance Spectra of Rare Earth Ions;* 1 year; $15,500

TULANE UNIVERSITY, New Orleans, La.; Robert H. Morriss; *An Electron Microscopic and Light Scattering Examination of Multilayer Metallic Colloids;* 2 years; $17,600

UNIVERSIDAD MAYOR DE SAN ANDRES, La Paz, Bolivia; Ismael Escobar; *Construction of Super Pile on Mt. Chacaltaya, La Paz, Bolivia;* 2 years; $64,600

UNIVERSITY OF ARIZONA, Tucson; Theodore Bowen; *Spark and Counter Investigation of Elementary Particles;* 2 years; $131,900

UNIVERSITY OF CALIFORNIA, Berkeley; Sumner P. Davis; *Hyperfine Structure and Nuclear Properties;* 2 years; $50,000

John J. Hopfield; *Non-Linear Optical Investigations in Solids;* 2 years; $45,000

William A. Nierenberg and Howard A. Shugart; *Hyperfine Structure Anomaly;* 2 years; $36,000

M. Tinkham; *Far Infrared Resonance and Superconductivity in Solids;* 2 years; $86,000

George Feher, San Diego; *Paramagnetic Resonance Research;* 3 years; $114,000

UNIVERSITY OF CHICAGO, Ill.; Herbert L. Anderson; *High Energy Physics;* 2 years; $200,000

Morrel H. Cohen, James C. Phillips and Leopoldo M. Falicov; *The Electron Theory of Solids;* 2 years; $140,000

Riccardo Levi-Setti; *Lambda Binding Energies in Heavy Hypernuclei;* 1 year; $41,600

Masatoshi Koshiba and Riccardo Levi-Setti; *Nuclear Emulsion Research in Cosmic Rays and High Energy Physics;* 1 year; $103,200

Robert S. Mulliken and C. C. J. Roothaan; *Quantum Mechanical Studies on Molecular Structure;* 15 months; $120,000

Le Roy G. Schulz; *Optical Properties of Metals and Alloys;* 2 years; $32,000

Robert W. Thompson; *High Energy Cosmic Ray Detector;* 1 year; $150,000

UNIVERSITY OF COLORADO, Boulder; Asim O. Barut; *Strong Interactions of Elementary Particles;* 2 years; $16,300

Masataka Mizushima; *Microwave Spectroscopy;* 2 years; $34,800

Frank Oppenheimer; *Elementary Particle Interactions from Bubble Chamber Photographs;* 2 years; $150,000

UNIVERSITY OF CONNECTICUT, Storrs; Arnold Russek; *Theory of High-Energy Atomic Collisions;* 2 years; $27,000

UNIVERSITY OF FLORIDA, Gainesville; Thomas A. Scott, Arthur A. Broyles and E. Dwight Adams; *Cryogenic Measurements at High Pressures;* 2 years; $62,600

UNIVERSITY OF ILLINOIS, Urbana; Donald M. Ginsberg; *Properties of Superconductors;* 2 years; $76,000

John C. Wheatley; *Properties of Matter at Low Temperatures;* 2 years; $36,000

UNIVERSITY OF KANSAS, Lawrence; J. W. Culvahouse; *Spin-Spin and Spin-Lattice Interactions in Paramagnetic Materials at Low Temperatures;* 2 years; $50,000

UNIVERSITY OF MARYLAND, College Park; Hans R. Griem and Thomas D. Wilkerson; *Shock Wave Structure and Precursor Effects;* 1 year; $45,000

John S. Toll; *Support of Research in Theoretical Physics;* 1 year; $30,000

UNIVERSITY OF MICHIGAN, Ann Arbor; Kenneth M. Case and George W. Ford; *Kinetic Theory of Gases and Plasmas;* 2 years; $32,500

Wayne E. Hazen; *Nuclear Components of Air Showers;* 2 years; $84,000

Noah Sherman; *The Pairing Interaction in Nuclei;* 2 years; $37,000

UNIVERSITY OF MISSISSIPPI, University; A. J. Zuchelli; *The Annihilation of Positrons in Condensed Media;* 1 year; $18,000

UNIVERSITY OF MISSOURI, Columbia; Richard A. Anderson, Rolla; *Mercury Vapor as a Buffer Gas Upon the Fluorescence Spectrum;* 2 years; $17,500

Roland A. Hultsch; *Nuclear Magnetic Resonance of Alkali Halides as a Function of Pressure;* 2 years; $37,700

UNIVERSITY OF NEBRASKA, Lincoln; Paul A. Goldhammer and Henry S. Valk; *Nuclear Structure and Elementary Particle Physics;* 2 years; $55,000

UNIVERSITY OF NORTH CAROLINA, Chapel Hill; Richard C. Jarnagin and Marvin Silver; *The Nature of Charge Transport in Organic Substances;* 2 years; $42,000

UNIVERSITY OF NOTRE DAME, Ind.; Frederick D. Rossini; *Purchase of an Electron Paramagnetic Resonance Spectrometer;* 1 year; $30,000

UNIVERSITY OF OKLAHOMA RESEARCH INSTITUTE, Norman; Sybrand Broersma; *Stationarity and Inertia in Viscous Flow;* 2 years; $22,400

Richard G. Fowler; *Mobility of $H+$ Ions in Atomic Hydrogen;* 18 months; $14,400

Richard G. Fowler; *Positive Column Discharge;* 2 years; $25,000

Chun C. Lin; *Microwave Spectroscopy;* 2 years; $35,000

J. Rud Nielsen; *Vibrational Spectra of Crystals and Polymers;* 2 years; $13,200

UNIVERSITY OF OREGON, Eugene; Bernd Crasemann; *Atomic Electrons in Nuclear Decay;* 1 year; $8,400

UNIVERSITY OF PENNSYLVANIA, Philadelphia; Kenneth R. Atkins; *Liquid Helium;* 2 years; $90,000

William E. Stephens; *Nuclear Structure Research with a Tandem Accelerator;* 25 months; $679,100

G. Theodore Wood; *Nuclear Spectroscopy;* 1 year; $40,300

UNIVERSITY OF PITTSBURGH, Pa.; Norman Austern; *Nuclear Structure;* 2 years; $105,000

Irving J. Lowe; *Pulsed Nuclear Magnetic Resonance in Solids;* 1 year; $17,200

UNIVERSITY OF PUGET SOUND RESEARCH INSTITUTE, Tacoma, Wash.; Martin E. Nelson; *Elementary Cosmic Ray Particles in Nuclear Emulsions;* 3 years; $22,800

UNIVERSITY OF ROCHESTER, N.Y.; Edward H. Jacobsen; *Experiments in Phonon Physics;* 2 years; $91,000

Morton F. Kaplon; *The Primary Cosmic Ray Flux;* 2 years; $165,700

Ronald D. Parks; *Paramagnetic Metals at Low Temperatures;* 2 years; $63,000

UNIVERSITY OF SANTA CLARA, Santa Clara, Calif.; William Duffy, Jr.; *Magnetic Susceptibilities of Crystalline Stable Free Radicals;* 2 years; $21,000

UNIVERSITY OF TENNESSEE, Knoxville; David T. King; *Multiple Production of Pions;* 2 years; $28,200

UNIVERSITY OF TEXAS, Austin; J. David Gavenda; *Ultrasonic Measurements of the Electronic Properties of Metals;* 2 years; $36,000

Walter E. Millett; *Annihilation of Positrons in Matter;* 1 year; $16,000

UNIVERSITY OF UTAH, Salt Lake City; B. G. Dick; *Theory of Metals and Ionic Crystals;* 2 years; $40,000

Grant R. Fowles; *Fluorescence of Iodine Vapor;* 2 years; $19,000

J. W. Keuffel; *Kiloton Detector for Cosmic Ray Neutrinos;* 2 years; $68,500

UNIVERSITY OF VERMONT, Burlington; Thomas D. Sachs; *Intersecting Acoustic Beams;* 1 year; $19,400

UNIVERSITY OF VIRGINIA, Charlottesville; Frank L. Hereford; *Reactions Induced by 1 Mev Deuterons;* 2 years; $49,000

Frank L. Hereford, Jr. and Walter D. Whitehead, Jr.; *Acquisition of a 5.5 Mev Van de Graaff Accelerator;* 2 years; $526,000

UNIVERSITY OF WASHINGTON, Seattle; J. J. Lord; *Analysis of ICEF Nuclear Emulsion Stack;* 1 year; $18,000

Mark N. McDermott; *Nuclear Magnetic Moments;* 2 years; $48,000

Edwin A. Uehling; *Magnetic Relaxation in Crystals;* 2 years; $40,000

Robert W. Williams, Young B. Kim, George E. Masek and Howard F. Davis; *Elementary Particle High Energy Physics;* 2 years; $367,300

UNIVERSITY OF WISCONSIN, Madison; Adam M. Bincer, Raymond F. Sawyer, Charles J. Goebel and Kirk W. McVoy; *Dispersion Relations in Elementary Particle Theory;* 2 years; $60,000

Harold W. Lewis; *Many-Body Problems and Meson Theory;* 2 years; $39,000

UNVERSITY OF WYOMING, Laramie; Burton H. Muller; *Nuclear Magnetic Relaxation;* 2 years; $30,000

VANDERBILT UNIVERSITY, Nashville, Tenn.; Royal G. Albridge; *Permanent Magnet Electron Spectrograph;* 2 years; $10,000

WABASH COLLEGE, Crawfordsville, Ind.; Robert L. Henry, Lewis S. Salter and Vernon J. Easterling; *Anharmonicity of Lattice Vibration in Crystals;* 2 years; $12,900

WASHINGTON UNIVERSITY, St. Louis, Mo.; J. H. Burgess; *Hypersonic Interactions in Paramagnetic Solids;* 2 years; $54,000

M. W. Friedlander and J. Klarmann; *Primary Cosmic Radiation;* 2 years; $72,000

G. E. Pake; *Nuclear Magnetic Relaxation and Knight Shifts;* 2 years; $61,000

Franklin B. Shull; *Equipment for 30 MeV Cyclotron;* 1 year; $45,000

WAYNE STATE UNIVERSITY, Detroit, Mich.; Leonard O. Roellig; *Bubble Nucleation and Positron Annihilation in Liquids;* 2 years; $46,000

WESTERN RESERVE UNIVERSITY, Cleveland, Ohio; Leonard S. Kisslinger; *Nuclear Structure with Simple Residual Forces;* 2 years; $55,000

WILLIAM MARSH RICE UNIVERSITY, Houston, Tex.; Harold E. Rorschach, Jr.; *Low Temperature Physics;* 2 years; $40,000

YALE UNIVERSITY, New Haven, Conn.; Loyal Durand III, and Charles M. Sommerfield; *Elementary Particle Structure;* 2 years; $50,000

Robert L. Gluckstern; *Theory of Elementary Particle Interactions;* 2 years; $31,000

Jay L. Hirshfield; *Instability in Plasmas;* 2 years; $48,000

Robert G. Wheeler; *Far Infrared Spectroscopy of Spin Waves in Antiferromagnetic Crystals;* 2 years; $55,000

MATHEMATICAL, PHYSICAL, AND ENGINEERING SCIENCE FACILITIES

ADELPHI COLLEGE, Garden City, N.Y.; Frederick V. Pohle; *Establishment of Computing Center;* 2 years; $50,000

BRADLEY UNIVERSITY, Peoria, Ill.; Francis C. Mergen; *Establishment of Computing Center;* 2 years; $20,000

CALIFORNIA INSTITUTE OF TECHNOLOGY, Pasadena; F. C. Lindvall: *Expansion of a Computing Center;* 3 years; $400,000

G. J. Stanley, Owens Valley Observatory; *The Construction of a Large Radio Telescope at the Owens Valley Observatory;* 1 year; $220,000

CASE INSTITUTE OF TECHNOLOGY, Cleveland, Ohio; R. J. Nelson; *Expansion of Computing Center*; 1 year; $500,000

COLUMBIA UNIVERSITY, New York, N.Y., Charles F. Bonilla; *Modification of the Nu-*

clear Research Reactor Facility; 2 years; $120,000

Ralph S. Halford; *Establishment of a Computing Center;* 2 years; $200,000

COLLEGE OF WILLIAM AND MARY, Williamsburg, Va.; James D. Lawrence, Jr.; *Establishment of a Small Computer Facility;* 1 year; $20,000

COLORADO STATE UNIVERSITY RESEARCH FOUNDATION, Fort Collins; Herbert Riehl; *Facilities for Field Research in Atmospheric Sciences;* 2 years; $101,500

CORNELL UNIVERSITY, Ithaca, N.Y.; Henry G. Booker; *Facilities for Probing the Magnetosphere, the Ionosphere, and the Subionosphere at High Frequencies;* 2 years; $115,000

J. Barkley Rosser; *Expansion of Computing Center;* 1 year; $700,000

Boyce D. McDaniel; *Electron Acceleration Studies at 3 Bev;* 6 months; $25,000

FLORIDA STATE UNIVERSITY, Tallahassee; E. P. Miles, Jr.; *Support of Computing Center;* 1 year; $100,000

GEORGIA INSTITUTE OF TECHNOLOGY, Atlanta; William M. Spicer; *Purchase of an Ultraviolet-Visible Spectrophotometer;* 1 year; $10,000

HARVARD UNIVERSITY, Cambridge, Mass.; Anthony G. Oettinger; *Operation of Computing Center;* 1 year; $50,000

HOWARD UNIVERSITY, Washington, D.C.; Herman Branson; *Expansion of Computing Center;* 1 year; $40,000

JOHNS HOPKINS UNIVERSITY, Baltimore, Md.; Donald W. Pritchard; *Construction and Outfitting of a 150-Ton Catamaran Oceanographic Research Vessel;* 1 year; $1,291,200

MICHIGAN STATE UNIVERSITY, East Lansing; Henry G. Blosser; *Construction of a 40–Mev Cyclotron;* $673,000

NATIONAL ACADEMY OF SCIENCES, Washington, D.C.; Frederick Seitz; *Physical Sciences Wing and Related Facilities;* 2 years; $240,000

OAKLAND UNIVERSITY, Rochester, Minn.; Beauregard Stubblefield; *Establishment of a Small Computing Center;* 1 year; $20,000

OHIO UNIVERSITY, Athens; Lawrence J. Gallaher; *Digital Computer Installation;* 3 years; $25,000

OREGON STATE UNIVERSITY, Corvallis; Wayne V. Burt; *Converting and Outfitting a 180-Foot Oceanographic Research Vessel;* 1 year; $600,000

PENNSYLVANIA STATE UNIVERSITY, University Park; Donald T. Laird; *Operation of Computing Center;* 3 years; $150,000

PRINCETON UNIVERSITY, Princeton, N.J.; Robert M. Drake, Jr., *Establishment of a Computing Center;* 1 year; $700,000

RESEARCH FOUNDATION OF STATE UNIVERSITY OF NEW YORK, Albany; Aaron Finerman, Oyster Bay; *Establishment of a Computing Center;* 1 year; $40,000

STANFORD UNIVERSITY, Stanford, Calif.; George E. Forsythe; *Expansion of Computing Center;* 3 years; $600,000

Walter E. Meyerhof; *Acquisition of a Multi-Stage Van de Graaff Accelerator;* $600,000

U.S. NAVAL OCEANOGRAPHIC OFFICE, Washington, D.C.; E. C. Stephan; *Oceanographic Exhibit To Be Located in the Life of the Sea Hall of the Smithsonian Institution;* 1 year; $15,000

SYRACUSE UNIVERSITY RESEARCH INSTITUTE, Syracuse, N.Y.; Otway O'M. Pardee; *Expansion of Computing Center;* 3 years; $200,000

UNIVERSITY OF ARIZONA, Tucson; Gerard P. Kuiper; *A 10-Foot Infrared Telescope;* 1 year; $153,300

Leon E. Salanave; *A Field Station Facility for Coordinated Optical and Electrical Observations of Lightning;* 1 year; $14,500

Albert W. Wymore; *Expansion of Computing Center;* 2 years; $200,000

UNIVERSITY OF CALIFORNIA, Berkeley; W. F. Giauque; *Construction of a Highly Precise 10,000 Ampere Current Regulator;* 1 year; $42,500

Stanislavs Vasilevskis, Mt. Hamilton; *Equipment for Surveying and Automatic Measurement of Astrographic Plates;* $23,570

Charles G. McClintock, Santa Barbara; *Establishment of a Computer Center;* 2 years; $50,000

Clay L. Perry, San Diego; *Development of Computation Procedures;* 1 year; $31,700

UNIVERSITY OF CHICAGO, Ill.; A. Adrian Albert; *Establishment of Computing Center;* 3 years; $500,000

Dave Fultz; *Equipment for Meteorological Hydrodynamics Laboratory;* 3 years; $200,000

UNIVERSITY OF FLORIDA, Gainesville; John E. Maxfield; *Purchase of Digital Computer;* 1 year; $60,000

UNIVERSITY OF HAWAII, Honolulu; Colin S. Ramage; *Atmospheric Circulation Project for the International Indian Ocean Expedition;* 1 year; $181,800

Walter R. Steiger; *K-Coronameter Mounting on Mount Haleakala;* 1 year; $50,000

Walter R. Steiger; *Mount Haleakala Flare Patrol;* 1 year; $34,400

UNIVERSITY OF IDAHO, Moscow; Ward Crowley; *Establishment of a Computing Center;* 1 year; $10,000

UNIVERSITY OF ILLINOIS, Urbana; J. N. Snyder; *Expansion of Computer Center;* 3 years; $700,000

UNIVERSITY OF MIAMI, Coral Gables, Fla.; F. F. Koczy, Miami; *Outfitting and Equipping FS–529 for Oceanographic Work;* 2 years; $350,300

Frederich F. Koczy, Miami; *Scientific Equipment for R/V JOHN ELLIOTT PILLSBURY for Participation in EQUALANT II and III;* 1 year; $56,300

UNIVERSITY OF MICHIGAN, Ann Arbor; Robert C. F. Bartels; *Expansion of Computing Facility;* 2 years; $180,000

E. Wendell Hewson; *Meteorological Computation and Data-Analysis Facility;* 2 years; $319,000

UNIVERSITY OF MINNESOTA, Minneapolis; Stanley Bruckenstein; *Purchase of Ultra-*

violet-Visible Spectrophotometers; 1 year; $9,900

Stuart W. Fenton; *Purchase of Recording UV-Visible Spectrophotometer and Automatic Rotary Dispersion Instrument;* 1 year; $24,800

UNIVERSITY OF NEW HAMPSHIRE, Durham; M. Evans Munroe; *Augmentation of Computer Facility at University of New Hampshire;* 2 years; $20,000

UNIVERSITY OF OREGON, Eugene; Francis J. Reithel; *Purchase of an Ultraviolet-Visible and a Nuclear Magnetic Resonance Spectrometer;* 2 years; $25,000

UNIVERSITY OF PITTSBURGH, Pa.; B. L. Cohen; *Acquisition of a Three Stage Tandem Van de Graaff Accelerator;* $815,600

UNIVERSITY OF ROCHESTER, N.Y.; Harry E. Gove; *Acquisition of a 20 MeV Tandem Van de Graaff Accelerator;* 3 years; $3,561,000

UNIVERSITY OF SOUTH CAROLINA, Columbia; O. D. Bonner; *Purchase of a Proton Magnetic Resonance Spectrometer;* 1 year; $22,000

UNIVERSITY OF TOLEDO, Ohio; E. T. Kirkpatrick; *Establishment of a Computation Center;* 1 year; $20,000

UNIVERSITY OF WASHINGTON, Seattle; Ronald Geballe; *Acquisition of a Tandem Van de Graaff Accelerator;* $2,040,500

UNIVERSITY OF WISCONSIN, Madison; J. E. Willard; *Expansion of Computing System;* 1 year; $100,000

WOODS HOLE OCEANOGRAPHIC INSTITUTION, Woods Hole, Mass.; Paul M. Fye; *Design and Construction of an Oceanographic Research Vessel;* $167,600

SOCIAL SCIENCES

ANTHROPOLOGICAL SCIENCES

AMERIND FOUNDATION, INCORPORATED, Dragoon, Ariz.; Charles C. Di Peso; *Casas Grandes Material Culture;* 3 years; $78,100

ARIZONA STATE UNIVERSITY, Tempe; Reynold J. Ruppe; *Archaeological Investigations in Arizona;* 2 years; $25,000

BENNINGTON COLLEGE, Bennington, Vt.; L. M. Hanks; *Ethnographic Survey of Southeast Asia;* 3 years; $86,400

BROOKLYN COLLEGE, Brooklyn, N.Y.; Robert W. Ehrich; *European Prehistory;* 1 year; $7,000

CARNEGIE MUSEUM, Pittsburgh, Pa.; Don W. Dragoo; *Prehistoric Cultures of the Ohio River Valley;* 2 years; $18,800

CASE INSTITUTE OF TECHNOLOGY, Cleveland, Ohio; Olaf H. Prufer; *Ohio Hopewell;* 2 years; $14,200

CENTER FOR ADVANCED STUDY IN THE BEHAVIORAL SCIENCES, Stanford, Calif.; George L. Trager; *Language of the Taos Indians;* 1 year; $9,600

CHICAGO NATURAL HISTORY MUSEUM, Ill.; Paul S. Martin; *Cultural Processes and Adaptive Systems in Prehistoric Arizona;* 1 year; $25,000

COLUMBIA UNIVERSITY, New York, N.Y.; Morton H. Fried; *The Structure of a Taiwan Kinship System;* 2 years; $26,300

Melvin L. Moss; *The Morphology of the Primate Pelvis;* 3 years; $23,900

Ralph S. Solecki; *Prehistory of the Zagros-Taurus Mountain Province;* 1 year; $19,600

Uriel Weinreich; *Linguistic Distributions in Coterritorial Societies;* 1 year; $33,000

CORNELL UNIVERSITY, Ithaca, N.Y.; Allan R. Holmberg; *Prehistoric Human Ecology in Peru;* 3 years; $45,000

G. William Skinner; *Differential Patterns of Acculturation;* 2 years; $42,400

CORYNDON MUSEUM CENTRE FOR PREHISTORY AND PALEONTOLOGY, Nairobi, Kenya; L. S. Leakey; *Prehistory of Olduvai Gorge;* 5 years; $48,400

DARTMOUTH COLLEGE, Hanover, N.H.; Elmer Harp, Jr.; *Dorset Eskimo Culture;* $2,200

FORDHAM UNIVERSITY, New York, N.Y.; Stephen P. Dunn and Ethel D. Dunn; *Culture Change in the Soviet Union;* 1 year; $11,800

GREAT PLAINS HISTORICAL ASSOCIATION, Lawton, Okla.; Adrain D. Anderson; *Pleistocene Ecology of the Domebo Mammoth Site;* 1 year; $1,500

HARVARD UNIVERSITY, Cambridge, Mass.; Cora DuBois; *Culture Change and Stability;* 3 years; $52,400

Hugh Hencken and Robert J. Rodden; *Early Food-Producing Communities in Northern Greece;* 2 years; $34,000

Hallam L. Movius, Jr.; *Upper Palaeolithic Cultures in the Dordogne;* 2 years; $51,200

Douglas Oliver; *Javanese Immigrants in New Caledonia;* 2 years; $20,800

Hugh O'Neill Hencken; *Prehistoric Illyrians;* 1 year; $2,600

Philip Phillips and Stephen Williams; *Archaeology of the Upper Tensas Basin, Louisiana;* 2 years; $34,500

Evon Z. Vogt and Irven DeVore; *Evolution of Human Behavior;* 2 years; $44,900

Evon Z. Vogt; *Land Use and Settlement Patterns;* 2 years; $49,900

Gordon R. Willey; *Archaeology of the Mayan Site of Seibal;* 4 years; $94,600

HUNTER COLLEGE, New York, N.Y.; Alphonse Riesenfeld; *The Effects of Upright Posture;* 1 year; $600

IDAHO STATE COLLEGE, Pocatello; Earl H. Swanson, Jr.; *Archaeological Exploration in Eastern Idaho;* 1 year; $10,500

ILLINOIS ARCHAEOLOGICAL SURVEY, Urbana; Melvin L. Fowler, Southern Illinois University, Carbondale; *Archaeology of the Mississippi River Valley;* 1 year; $35,500

INDIANA HISTORICAL SOCIETY, Indianapolis; Glenn A. Black, Newburgh; *Proton Magnetometer Project;* 1 year; $11,400

INSTITUTE FOR ADVANCED STUDY, Princeton, N.J.; Stephen Foltiny; *Iron Age Civilizations in Southeastern Europe;* 1 year; $3,600

INSTITUTE OF ANDEAN RESEARCH, INC., New York, N.Y.; John V. Murra; *Provincial Inca Life;* 3 years; $89,300

MUSEUM OF NEW MEXICO, Sante Fe; Fred Wendorf and Ralph S. Solecki; *Nubian Prehistory and Geology;* 1 year; $13,500

NEBRASKA STATE HISTORICAL SOCIETY, Lincoln; Marvin F. Kivett; *Archaeological Investigation of the Logan Creek Complex;* 2 years; $14,100

NEVADA STATE MUSEUM, Carson City; Richard Shutler, Jr.; *Pleistocene Man at Tule Springs;* 1 year; $42,200

NORTHWESTERN UNIVERSITY, Evanston; Paul Bohannan and Laura Bohannan; *Divorce in Cross-Cultural Perspective;* 2 years; $29,800
Robert C. Hunt and M. Eva Verbitsky Hunt; *Inter-Village Structure in Oaxaca;* 1 year; $17,900

PENNSYLVANIA STATE UNIVERSITY, University Park; William T. Sanders; *Prehispanic Settlement Patterns of Teotihuacan;* 1 year; $22,300

PORTLAND STATE COLLEGE, Portland, Oreg.; Marshall T. Newman; *Physical Changes in Vicos Indians;* 1 year; $500
Joe E. Pierce; *Indigenous Languages of Oregon;* 1 year; $10,900

QUEENS COLLEGE, Flushing, N.Y.; Ernestine Friedl; *Urbanization of Migrant Village Families;* 2 years; $16,600

ROBERT S. PEABODY FOUNDATION FOR ARCHAEOLOGY, Andover, Mass.; Frederick Johnson; *Radiocarbon Chronology for Tehuacan;* 1 year; $6,600
Richard S. MacNeish; *Tehuacan Archaeological Investigations;* 2 years; $32,300

SMITHSONIAN INSTITUTION, Washington, D.C.; C. G. Holland; *Prehistory of Southwest Virginia;* 1 year; $3,100
Saul H. Riesenberg; *Megalithic Structures of Ponape;* 1 year; $10,650
Frank H. H. Roberts; *An Archaeological Investigation of the Key School Site, Georgia;* 1 year; $2,100
William C. Sturtevant; *Ethnoscientific Analysis of Material Culture;* 1 year; $26,900

SOUTHERN METHODIST UNIVERSITY, Dallas, Texas; Jack Frederick Kilpatrick; *Cherokee Ethnology and Linguistics;* 1 year; $15,100

UNIVERSITY OF ARIZONA, Tucson; Bryant Bannister; *Dendrochronology of Southwestern United States;* 2 years; $51,200
Bryant Bannister; *Turkish Dendrochronology;* 1 year; $3,900
Edward H. Spicer; *Cultural Continuation and Extinction in the Casas Grandes Area;* 2 years; $23,600
Raymond H. Thompson; *Modern Tzotzil Cosmology and Prehistoric Maya Civilization;* 2 years; $13,700

UNIVERSITY OF ARKANSAS, Fayetteville; Charles R. McGimsey III; *The Prehistory of Arkansas;* 1 year; $16,000

UNIVERSITY OF BRITISH COLUMBIA, Vancouver, Canada; Robert J. Drake; *Animal Remains from Archaeological Sites;* 1 year; $12,900

UNIVERSITY OF CALIFORNIA, Berkeley; J. Desmond Clark; *Archaeology of Northern Rhodesia;* $1,500

J. B. Birdsell and Johannes Wilbert, Los Angeles; *Population Genetics of the Diego Antigen;* 1 year; $16,800
Joel M. Halpern, Los Angeles; *Urbanization of Peasant Communities;* 1 year; $13,800
H. B. Nicholson, Los Angeles; *Archaeology of Etzatlan;* 1 year; $9,300
H. B. Nicholson, Los Angeles; *Excavations at Cerro Portezuelo;* 1 year; $5,400
David Gebhard, Santa Barbara; *Prehistoric Petroglyphs of North America;* 2 years; $4,800

UNIVERSITY OF CHICAGO, Ill.; Robert J. Braidwood; *The Appearance of Food Production in Southwest Asia;* 3 years; $79,400
F. Clark Howell; *Acheulian Site in Torralba, Spain;* 2 years; $59,700
Sol Tax; *Ethnographic Restudy of Panajachel;* 3 years; $28,900

UNIVERSITY OF CINCINNATI, Ohio; John L. Caskey; *Animal Bones of Ancient Troy and Lerna;* 1 year; $15,100

UNIVERSITY OF COLORADO, Boulder; Gordon W. Hewes; *Archaeological Salvage near Wadi Halfa, Sudan;* 2 years; $35,000
Robert H. Lister; *The Prehistory of the Utes;* 1 year; $10,400
Joe Ben Wheat; *The Earl H. Morris Papers;* 1 year; $9,300

UNIVERSITY OF FLORIDA, Gainesville; William C. Massey; *Cultures of Baja California;* 1 year; $20,300

UNIVERSITY OF ILLINOIS, Urbana; Kenneth L. Hale; *Analysis and Classification of Native Australian Languages;* 1 year; $2,300

UNIVERSITY OF KANSAS, Lawrence; Carlyle S. Smith; *South Dakota Archaeology;* 1 year; $6,000

UNIVERSITY OF MARYLAND, College Park; Walter Deshler, *African Agricultural Patterns;* 3 years; $17,900

UNIVERSITY OF MICHIGAN, Ann Arbor; James B. Griffin; *Prehistoric Occupations of the Great Lakes Area;* 1 year; $20,900
Marshall D. Sahlins; *Intercultural Relations in Contiguous Societies;* 2 years; $31,800

UNIVERSITY OF MISSOURI, Columbia; Carl H. Chapman; *Osage Prehistory;* 1 year; $16,400

UNIVERSITY OF NEW MEXICO, Albuquerque; Harry W. Basehart; *The Matengo;* 3 years; $24,900

UNIVERSITY OF NORTH CAROLINA, Chapel Hill; Robert L. Rands; *Ecology of Mayan Centers;* 3 years; $63,500

UNIVERSITY OF OKLAHOMA RESEARCH INSTITUTE, Norman; Robert E. Bell; *Caddoan Archaeology;* 1 year; $18,600
Robert E. Bell; *Caddoan Archaeology;* 3 years; $30,000

UNIVERSITY OF OREGON, Eugene; Luther S. Cressman and Don E. Dumond; *Prehistory of Southwestern Alaska;* 2 years; $57,600

UNIVERSITY OF PENNSYLVANIA, Philadelphia; Ann Chowning and Jane C. Goodale; *The Ethnography of New Britain;* 2 years; $37,200
Froelich Rainey; *Research on Archaeological Techniques;* 1 year; $27,900

UNIVERSITY OF PITTSBURGH, Pa.; John A. Morrison; *Changes in an Anatolian Village: 1932–1962;* 1 year; $14,900

UNIVERSITY OF ROCHESTER, N.Y.; Rene Millon; *Map of Classic Period Teotihuacan;* 3 years; $34,600

Walter H. Sangree; *The Angas of Nigeria;* 2 years; $50,200

UNIVERSITY OF TEXAS, Austin; Jeremiah F. Epstein; *Archaeology of Northeastern Mexico;* 2 years; $21,000

UNIVERSITY OF UTAH, Salt Lake City; David M. Pendergast; *Archaeology of the Mayan Caves of Cayo District;* 1 year; $5,500

UNIVERSITY OF VIRGINIA, Charlottesville; Charles Kaut; *Tagalog Social Organization;* 3 years; $35,000

UNIVERSITY OF WASHINGTON, Seattle; Sol Saporta; *Psycholinguistic Analysis of Consonant Clusters;* $800

Laurence C. Thompson and William H. Jacobsen, Jr.; *Analysis of Linguistic Relationships;* 2 years; $36,500

James B. Watson; *Dynamics and Microevolution of a Human Community;* 1 year; $82,200

UNIVERSITY OF WISCONSIN, Madison; Murray Fowler; *Computer Analysis of the Etruscan Language;* 2 years; $50,400

William S. Laughlin and William G. Reeder; *Aleut-Konyag Prehistory;* 1 year; $30,000

Robert J. Miller; *Isolation and Integration of Communities in India;* 1 year; $31,100

WAYNE STATE UNIVERSITY, Detroit Mich.; James B. Christensen; *The Luguru of Tanganyika;* 1 year; $6,600

WESLEYAN UNIVERSITY, Middletown, Conn.; David P. McAllester; *Analysis of Navaho Ritual;* 3 years; $26,100

WICHITA FOUNDATION, INC., Wichita, Kans.; Herbert W. Dick, Fort Burgwin Research Center, Taos, N. Mex.; *Picuris Pueblo Archaeology;* 1 year; $24,000

WILLIAM MARSH RICE UNIVERSITY, Houston, Tex.; Frank Hole; *Archaeological Investigation of Deh Luran, Iran;* 2 years; $52,900

YALE UNIVERSITY, New Haven, Conn.; Cornelius Osgood; *Culture Change in Simple and Complex Societies of Aplichau;* 2 years; $48,400

ECONOMIC SCIENCES

ASSOCIATED ROCKY MOUNTAIN UNIVERSITIES, Boulder, Colo.; Nathaniel Wollman; *Economic and Technical Coefficients of Water Use;* 2 years; $68,500

BROOKINGS INSTITUTION, Washington, D.C.; Lawrence R. Klein; *An Econometric Model of the United States Economy;* 3 years; $248,400

CARNEGIE INSTITUTE OF TECHNOLOGY, Pittsburgh, Pa.; Michael C. Lovell; *Fluctuations in Inventory Investment;* 7 months; $10,800

Edwin Mansfield; *Econometric Studies of Research and Development;* 3 years; $113,600

CORNELL UNIVERSITY, Ithaca, N.Y.; Ta-Chung Liu; *A Recursive Monthly Econometric Model;* 2 years; $40,000

GRINNELL COLLEGE, Grinnell, Iowa; John C. Dawson; *Savings-Investment Fluctuations;* 1 year; $10,400

HARVARD UNIVERSITY, Cambridge, Mass.; Alfred H. Conrad; *Empirical Study of Technological Change;* 1 year; $12,200

Edwin Mansfield; *Econometric Studies of Research and Development;* 1 year; $16,100

HAVERFORD COLLEGE, Haverford, Pa.; Eugene Smolensky; *Economic Model of Urban Growth;* 15 months; $10,700

IOWA STATE UNIVERSITY, Ames; Bob R. Holdren; *Theory of the Multi-Product Firm;* 2 years; $20,400

JOHNS HOPKINS UNIVERSITY, Baltimore, Md.; Carl F. Christ; *Econometric Study of Liquid Assets;* 3 years; $46,300

Kelvin J. Lancaster; *Utilization of Data in Econometrics;* 2 years; $41,400

KANSAS STATE UNIVERSITY, Manhattan; Walter D. Fisher; *Aggregation-Partition Problem in Economics*; 3 years; $28,700

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge; Albert K. Ando; *Economic Growth of the United States;* 3 years; $140,300

MICHIGAN STATE UNIVERSITY, East Lansing; Thomas R. Saving; *Relationship of the Demand for Educational Facilities to Relative Wage Changes;* 15 months; $25,900

NATIONAL BUREAU OF ECONOMIC RESEARCH, INC., New York, N.Y.; H. G. Georgiadis; *Economic Performance in International Competition;* 30 months; $72,600

NATIONAL INDUSTRIAL CONFERENCE BOARD, INC., New York, N.Y.; Daniel Creamer; *Statistical Analysis of Location of Manufacturing, 1947 to 1958;* $1,700

PRINCETON UNIVERSITY, Princeton, N.J.; Oskar Morgenstern; *Mathematical Methods for Time Series Analysis;* 2 years; $80,500

STANFORD UNIVERSITY, Stanford, Calif.; Marc Nerlove; *Methods of Analyzing Economic Time Series;* 3 years; $130,400

Hirofumi Uzawa; *Two-Sector Model of Economic Growth;* 2 years; $44,300

UNIVERSITY OF CALIFORNIA, Berkeley; Dale W. Jorgenson; *Electronic Computation in Econometrics;* 1 year; $21,850

T. A. Marschak and C. B. McGuire; *Information Technology and Organizations;* 2 years; $51,300

UNIVERSITY OF CHICAGO, Ill.; Arcadius Kahan; *Russian GNP and National Income, 1855–1913;* 2 years; $32,600

James H. Lorie; *Research in Security Prices;* 2 years; $68,300

UNIVERSITY OF ILLINOIS, Urbana; Donald R. Hodgman and Robert W. Gillespie; *Micro-Analytic Simulation of the Banking System;* 3 years; $80,200

UNIVERSITY OF MICHIGAN, Ann Arbor; W. H. Locke Anderson; *Econometric Model of the U.S.;* 3 years; $68,900

James N. Morgan; *Testing of Economic Theories on Investment;* 2 years; $98,000

James N. Morgan and John A. Sonquist; *Methods of Survey Data Analysis;* 1 year; $27,700

UNIVERSITY OF NORTH CAROLINA, Chapel Hill; George S. Tolley; *Area Population Adjustment and Economic Activity;* 2 years; $40,000

UNIVERSITY OF PITTSBURGH, Pa.; Gerhard Tintner; *Stochastic Theory of Economic Development;* 3 years; $43,300

UNIVERSITY OF ROCHESTER, N.Y.; Richard N. Rosett; *Investigation of Household Economic Behavior;* 6 months; $3,550

Sho-Chieh Tsiang; *Theory of the Forward Exchange Market;* 2 years; $24,200

UNIVERSITY OF VIRGINIA, Charlottesville; Gordon Tullock; *Models of Collective Decision;* 3 years; $30,300

UNIVERSITY OF WASHINGTON, Seattle; Edgar M. Horwood; *Electronic Mapping Development;* 2 years; $73,100

UNIVERSITY OF WISCONSIN, Madison; Arnold Zellner; *Bayesian Inference and Aggregation and Specification in Econometrics;* 3 years; $107,000

WILLIAM MARSH RICE UNIVERSITY, Houston, Tex.; Sydney N. Afriat; *Analysis of Consumers' Preferences and Construction of Index-Numbers;* 2 years; $38,400

YALE UNIVERSITY, New Haven, Conn.; Tjalling C. Koopmans; *Mathematical Economic Models;* 3 years; $124,200

James Tobin; *Financial Institutions and Capital Markets;* 3 years; $115,000

HISTORY AND PHILOSOPHY OF SCIENCE

AMERICAN UNIVERSITY OF BEIRUT, Lebanon; E. S. Kennedy; *History of Islamic Astronomy;* 1 year; $8,400

AMERICAN UNIVERSITY, Washington, D.C.; Eduard Farber; *The Chemistry of Oxidation;* 1 year; $15,600

BROOKLYN COLLEGE, N.Y.; Gerald M. Henderson; *The Contributions of A. R. Wallace to the Foundations of Modern Biology and Anthropology;* 1 year; $4,700

CITY COLLEGE, New York, N.Y.; Isaac Levi; *Probability and Potential Surprise;* 1 year; $3,000

CORNELL UNIVERSITY, Ithaca, N.Y.; Eric T. Carlson, New York City; *The Psychiatric Thought of Benjamin Rush;* 1 year; $7,200

DUKE UNIVERSITY, Durham, N.C.; Romane L. Clark and Robert W. Binkley; *The Concept of Causal Necessity;* 2 years; $21,300

FRESNO STATE COLLEGE FOUNDATION, Fresno, Calif.; George B. Kauffman; *Alfred Werner's Coordination Theory;* 2 years; $24,600

HARVARD UNIVERSITY, Cambridge, Mass.; I. Bernard Cohen; *The Scientific Thought of Isaac Newton;* 3 years; $36,200

Everett Mendelsohn; *The Development of Modern Biology;* 1 year; $6,400

John E. Murdoch; *The Concept of the Continuum;* 2 years; $20,600

INDIANA UNIVERSITY FOUNDATION, Bloomington; Edward Grant; *A Study of Mathematical Proportionality*; 3 years; $12,100

Wesley C. Salmon; *Probability, Frequency and Induction;* 2 years; $8,000

JOHNS HOPKINS UNIVERSITY, Baltimore, Md.; Peter Achinstein; *Scientific Theories: Explanation, Theoretical Terms, and Models;* 3 years; $11,800

PRINCETON UNIVERSITY, Princeton, N.J.; Keith Gunderson; *Computer Models of Human Behavior;* 1 year; $2,100

John E. Murdoch; *Medieval Treatment of the Continuum;* 2 years; $18,700

Gregory Vlastos; *Zeno's Criticisms of Plurality and Motion;* 2 years; $11,800

POMONA COLLEGE, Claremont, Calif.; Morton Orvan Beckner; *Philosophy of Psychology;* 2 years; $11,800

RUTGERS, THE STATE UNIVERSITY, New Brunswick, N.J.; Frederic Schick; *Inductive Consistency;* 1 year; $10,700

SYRACUSE UNIVERSITY RESEARCH INSTITUTE, Syracuse, N.Y.; Albert D. Menut; *Critical Edition of Oresme's Scientific Works;* 1 year; $7,500

TUFTS UNIVERSITY, Medford, Mass.; Mary B. Miller; *Logical Systems and Quantum Mechanics;* 1 year; $7,000

UNIVERSITY OF CALIFORNIA, Berkeley; Benson Mates; *History of Formal Logic;* 2 years; $13,100

UNIVERSITY OF MARYLAND, College Park; Raymond N. Doetsch; *American Contributions to the Germ Theory of Disease;* 1 year; $4,800

UNIVERSITY OF NOTRE DAME, Ind.; Kenneth M. Sayre; *Simulation of Mental Processes;* 2 years; $35,700

UNIVERSITY OF WISCONSIN, Madison; Aaron J. Ihde; *Development of Biochemistry in America;* 3 years; $30,600

WASHINGTON UNIVERSITY, St. Louis, Mo.; Thomas S. Hall; *Ideas of Life and Matter;* 1 year; $18,700

YALE UNIVERSITY, New Haven, Conn.; Asger Aaboe; *Astronomical Cuneiform Tablets;* 1 year; $5,300

Alan Ross Anderson; *Mathematical Logic;* 2 years; $23,200

Thomas R. Forbes; *John Hunter's Contributions to Reproductive Pysiology;* 2 years; $2,100

SOCIOLOGICAL SCIENCES

ALAMEDA COUNTY STATE COLLEGE FOUNDATION, INC., Hayward, Calif.; Cletus J. Burke; *Two-Person Interactions From the Standpoint of Stochastic Learning Theory;* 4 years; $34,350

AMERICAN MOUNT EVEREST EXPEDITION 1963, Santa Monica, Calif.; Richard M. Emerson, U. of Cincinnati; *Communication Feedback Under Stress;* 3 years; $24,700

BUCKNELL UNIVERSITY, Lewisburg, Pa.; David Chaplin; *Analysis of a Peruvian Census;* 1 year; $3,200

COLUMBIA UNIVERSITY, New York, N.Y.; Richard Christie; *Instrumentalist Tendencies in Interpersonal Relations;* 18 months; $36,900

Herbert H. Hyman; *Communication, Perception and Social Behavior;* 18 months; $68,000

Henry L. Lennard; *Family Communication and Child-Rearing;* 1 year; $18,200

Robert K. Merton; *Patterns of Scientific Collaboration;* 1 year; $5,000

CORNELL UNIVERSITY, Ithaca, N.Y.; Howard B. Adelmann; *Malphighi's Correspondence and Protocols;* 3 years; $68,600
William W. Lambert; *Bio-Chemical Correlates of Aggressiveness;* 6 months; $3,660

DUKE UNIVERSITY, Durham, N.C.; Alan C. Kerckhoff; *Conflict Resolution in an Industrial Setting;* 2 years; $36,100

FREDERIC BURK FOUNDATION FOR EDUCATION, San Francisco, Calif.; Philburn Ratoosh; *Cognition in Organizational Decision-Making;* 2 years; $32,900

HARVARD UNIVERSITY, Cambridge, Mass.; Robert F. Bales and Philip J. Stone; *The General Inquirer System for Content Analysis;* 3 years; $220,400
Alex Inkeles; *Social and Cultural Aspects of Modernization;* 3 years; $173,250
Stanley Milgram; *Obedience to Authority;* 2 years; $24,500
George A. Miller and Jerome S. Bruner; *Human Cognition and Communication;* 3 years; $139,700
Robert Rosenthal; *Mediation of Experimenter Bias;* 18 months; $36,700
Ezra F. Vogel; *Family Functions in Contemporary China;* 30 months; $54,700
Harrison C. White; *Models of Social Mobility;* 15 months; $10,600

HAVERFORD COLLEGE, Haverford, Pa.; Sidney I. Perloe; *Judgment of Social Stimuli;* $1,065

INDIANA UNIVERSITY FOUNDATION, Bloomington; Fred W. Householder, Jr.; *Syntactic and Semantic Structure of English;* 2 years; $120,000
Rudolph J. Rummel; *Dimensionality of Nations;* 1 year; $14,900

INSTITUTE FOR RESEARCH, State College, Pa.; Emir H. Shuford, Jr.; *Heuristic Models of Human Behavior;* 7 months; $23,100

JOHNS HOPKINS UNIVERSITY, Baltimore, Md.; Arthur L. Stinchcombe; *Comparative Rural Social Structure;* 2 years; $24,600

KANSAS STATE UNIVERSITY, Manhattan; E. Jerry Phares; *Expectancy Changes;* 2 years; $19,500

MIAMI UNIVERSITY, Oxford, Ohio; Fred Cottrell; *The Impact of Technological Change;* 2 years; $15,700

MICHIGAN STATE UNIVERSITY, East Lansing; William H. Form; *Patterns of Social Integration;* 1 year; $3,400

NATIONAL OPINION RESEARCH CENTER, Chicago, Ill.; Peter H. Rossi, James A. Davis and Jacob J. Feldman; *Occupations and Social Stratification;* 3 years; $186,000

NEW MEXICO HIGHLANDS UNIVERSITY, Las Vegas; Alan H. Roberts and Joel B. Greene; *Cultural Differences in Time Perspective;* 15 months; $11,200

NEW YORK UNIVERSITY, New York; Arthur R. Cohen; *Consequences of Commitment to Motive Deprivation;* 3 years; $83,400
Stuart W. Cook; *Conceptualization and Measurement of Attitude;* 2 years; $57,300

OHIO STATE UNIVERSITY RESEARCH FOUNDATION, Columbus; Ilse Lehiste; *General Acoustic Phonetics;* 30 months; $42,100

RUTGERS, THE STATE UNIVERSITY, New Brunswick, N.J.; Bertram D. Cohen; *Verbal Behavior as Interpersonal Communication;* 18 months; $28,200

SAN DIEGO STATE COLLEGE FOUNDATION, San Diego, Calif.; William Paul Smith; *Dependency in Small Groups;* 1 year; $9,700

STANFORD RESEARCH INSTITUTE, Stanford, Calif.; William G. Madow; *Estimating Sampling and Non-Sampling Error;* 2 years; $48,700

STANFORD UNIVERSITY, Stanford, Calif.; Jonathan L. Freeman; *Psychological Mechanisms for Resisting Persuasion;* 3 years; $30,500

STATE UNIVERSITY OF IOWA, Iowa City; Milton E. Rosenbaum; *Observational Learning;* 3 years; $43,800

TUFTS UNIVERSITY, Medford, Mass.; Thornton B. Roby; *Behavioral Factors in Decision-Making;* 2 years; $31,200

UNIVERSITY OF CALIFORNIA, Berkeley; Charles Y. Glock; *International Archive of Survey Materials Collected in the Developing Nations;* 3 years; $136,100
Erving Goffman; *Study of Individual-Group Interactions;* 2 years; $12,250
C. West Churchman; *Cognition in Organizational Decision-Making;* 2 years; $34,600
Ralph H. Turner, Los Angeles; *Mobility Ideologies in the United States and England;* 2 years; $24,900
Oscar Grusky and Lindsey Churchill, Los Angeles; *Succession and Effectiveness in Organizations;* 2 years; $70,800
David O. Sears, Los Angeles; *The Effects of Adversary Proceedings on Audience Opinions;* 3 years; $38,500
Harold B. Gerard, Riverside; *Attitudinal Residues of Social Interaction;* 1 year; $30,-600

Petitions and Motivating Mechanisms; 3 years; $52,900
Duncan MacRae; *Computer Studies of Representation;* $5,000

UNIVERSITY OF COLORADO, Boulder; Kenneth R. Hammond and Frederick J. Todd; *Two-Person Conflict and Differential Training;* 2 years; $67,600
William N. McPhee; *Formal Models of Mass Social Processes;* 3 years; $53,200

UNIVERSITY OF ILLINOIS, Urbana; Charles E. Osgood and Murray S. Miron; *Comparative Psycholinguistics;* 5 years; $228,100

UNIVERSITY OF KANSAS, Lawrence; Roger G. Barker; *Environmental Change in an American and an English Town;* 3 years; $67,400

UNIVERSITY OF MICHIGAN, Ann Arbor; Ronald Lippitt; *Orientations to Work Among Teenagers;* 1 year; $6,100
Warren E. Miller; *Data Repository for the Inter-University Consortium;* 18 months; $95,000
Donald C. Pelz; *Factors in Scientific Performance;* 6 months; $21,200
Marc Pilisuk and Anatol Rapoport; *Psychology of Conflict;* 2 years; $25,600
Anatol Rapoport; *Psycholinguistic Models;* 3 years; $95,900

Stanley E. Seashore; *Assessment of Organizational Performance;* 2 years; $64,700

Albert J. Reiss, Jr.: *Evaluations, Expectations and Transactions in a Formal Organization;* 5 years; $245,800

UNIVERSITY OF MINNESOTA, Minneapolis; Elliot Aronson; *Antecedents of Personal Esteem;* 3 years; $44,300

Murray A. Straus; *Family Support and Power Structure in Experimentally-Induced Crisis;* 18 months; $15,200

UNIVERSITY OF NORTH CAROLINA, Chapel Hill; John Schopler; *Influence and Dependence;* 2 years; $17,600

Harry S. Upshaw; *Principles of Scale Formation;* 2 years; $37,000

UNIVERSITY OF PENNSYLVANIA, Philadelphia; Dorothy S. Thomas and Vincent H. Whitney; *Correlates of Migration and Urbanization;* 3 years; $157,000

UNIVERSITY OF PITTSBURGH, Pa.; C. K. Yang; *Community Analysis of Foshan;* 2 years; $17,500

UNIVERSITY OF ROCHESTER, N.Y.; Vera P. John; *Development of Cognitive Skills;* 2 years; $36,600

UNIVERSITY OF WISCONSIN, Madison; Leonard Berkowitz; *Responsible Behavior in Dependency Relations;* 2 years; $10,800

WASHINGTON UNIVERSITY, St. Louis, Mo.; Gilbert Shapiro; *Quantitative Analysis of the 'Cahiers de Doleances' of 1789;* 2 years; $22,800

YALE UNIVERSITY, New Haven, Conn.; Robert P. Abelson; *Field Study of a Computer Simulation Model;* 2 years; $109,300

Stanley H. Udy, Jr.; *Technology and Administration in Industry;* 2 years; $17,500

SOCIAL SCIENCE FACILITIES

HARVARD UNIVERSITY, Cambridge, Mass.; Jerome S. Bruner; *Mobile Laboratory for Studies of Cognitive Processes;* 1 year; $17,250

UNIVERSITY OF MINNESOTA, Minneapolis; Robert F. Spencer; *Minnesota-Pakistan Research Facility;* 5 years; $15,000

UNIVERSITY OF MISSOURI, Columbia; Carl H. Chapman; *Construction of the Van Meter State Park Archaeological Research Center;* 2 years; $73,300

STANFORD UNIVERSITY, Stanford, Calif.; Eleanor E. Maccoby; *Mobile Laboratory for Research in Child Development;* 1 year; $4,000

Patrick Suppes; *Construction of a Computer-Based Learning and Teaching Laboratory;* 1 year; $50,000

ANTARCTIC RESEARCH

ARCTIC INSTITUTE OF NORTH AMERICA, Washington, D.C.; Robert C. Faylor; *Chief Scientist, U.S. Antarctic Research Program;* 1 year; $3,868

Edwin A. McDonald; *A Special Study to Determine Suitable Sites for a Scientific Station in the Palmer Peninsula Area, Antarctica;* 9 months; $17,000

AUSTRALIAN NATIONAL UNIVERSITY, Canberra, Australia; B. M. Gunn, Otago University, Dunedin, New Zealand; *Differentiation of Ferrar Dolerites of the McMurdo Sound Area, Antarctica;* 18 months; $13,200

BARTOL RESEARCH FOUNDATION OF THE FRANKLIN INSTITUTE, Philadelphia, Pa.; Martin A. Pomerantz; *USNS "Eltanin" Cosmic Ray Station;* 1 year; $21,200

Martin A. Pomerantz; *Investigations of Time Variations of The Primary Cosmic Radiation at the Geographic South Pole;* 1 year; $31,200

Martin A. Pomerantz, Swarthmore; *Time Variations of Primary Cosmic Radiation Near the South Geomagnetic Pole;* 18 months; $48,100

BERNICE P. BISHOP MUSEUM, Honolulu, Hawaii; J. Linsley Gressitt; *Entomological Research in Antarctic Regions, with Emphasis on Natural Dispersal;* 1 year; $14,600

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; $36,300

CLARK UNIVERSITY, Worcester, Mass.; Vernon Ahmadjian; *Cultural Study of Antarctic Lichen Fungi;* 1 year; $9,100

COLORADO SCHOOL OF MINES, Golden; Hans Meinardus; *Graduate Studies in Geophysics;* 1 year; $4,800

COLUMBIA UNIVERSITY; New York, N.Y.; Maurice Ewing; *Systematic Oceanographic Survey in the Drake Passage and in the South Antillean Sea (Scotia Sea);* 1 year; $156,300

Paul R. Burkholder, Palisades; *Microbiological Investigations Aboard the "Eltanin";* 1 year $47,400

Jack Oliver, Palisades; *Continued Conduct of Station Seismology Program—1963;* 1 year; $1,800

DE PAUL UNIVERSITY, Chicago, Ill.; Mary A. McWhinnie and J. R. Cortelyou; *The Relation of Water Temperature to the Physiology of Molting in Marine Crustaceans;* 1 year; $15,300

FLORIDA STATE UNIVERSITY, Tallahassee; H. G. Goodell and J. K. Osmond; *Marine Geologic Field Work in Antarctica Aboard the "Eltanin" in the South Antilles Basin;* 1 year; $47,900

H. G. Goodell and J. K. Osmond; *Analysis of Antarctic Bottom Sediments, 1962–63;* 1 year; $19,100

H. G. Goodell and J. K. Osmond; *Marine Geology Aboard the USNS "Eltanin";* 1 year; $77,100

GEOLOGICAL SURVEY, U.S. DEPARTMENT OF THE INTERIOR, Washington, D.C.; Thomas B. Nolan; *Antarctic Mapping Operations 1962–63;* 1 year; $339,600

HARVARD UNIVERSITY, Cambridge, Mass.; I Mackenzie Lamb; *Botanical Survey in West Antarctica;* $455

LIBRARY OF CONGRESS, Washington, D.C.; David H. Kraus; *Abstracting and Indexing Service for Current Antarctic Literature;* 1 year; $63,000

NATIONAL ACADEMY OF SCIENCES-NATIONAL RESEARCH COUNCIL, Washington, D.C.; Ross

710-258 O—64——18

C. Peavey; *Support of Committee on Polar Research Activities;* 1 year; $75,100

NATIONAL BUREAU OF STANDARDS, U.S. DEPARTMENT OF COMMERCE, Washington, D.C.; D. K. Bailey, Boulder, Colo.; *Forward Scatter Observations in the Antarctic During IQSY—PHASE I: Instrumentation and Activation;* 1 year; $150,000

C. Gordon Little, Boulder, Colo.; *The High Latitude Ionosphere at Magnetically Conjugate Points;* $149,300

R. B. Scott, Boulder Laboratories, Colo.; *Radio Noise Measurements—Floating Antarctic Research Station;* 9 months; $18,150

NEW YORK BOTANICAL GARDEN, New York, N.Y.; William C. Steere; *Identification of Antarctic Bryophytes;* 1 year; $8,600

NEW YORK ZOOLOGICAL SOCIETY, Bronx; Carleton Ray; *Physiological Ecology and Parasitology of Antarctic Seals, Tribe Lobodontini;* 1 year; $7,600

OHIO STATE UNIVERSITY RESEARCH FOUNDATION, Columbus; Richard L. Cameron; *Byrd Station Glaciology, 1963–64;* 15 months; $28,200

Richard P. Goldthwait; *Support of the Institute of Polar Studies 1963–64;* 1 year; $25,000

William E. Long; *Geology of Central Queen Maud Range, Antarctica;* 1 year; $32,200

E. D. Rudolph; *Ecology and Floristic Investigations of Antarctic Lichens;* 1 year; $17,900

OLD DOMINION COLLEGE, Norfolk, Va.; Jacques S. Zaneveld; *The Benthic Algal Vegetation of Antarctica;* 1 year; $19,900

SMITHSONIAN INSTITUTION, Washington, D.C.; David L. Correll; *Pelagic Phosphorus Metabolism; Phosphorus-containing Compounds in Plankton;* 6 months; $3,400

STANFORD UNIVERSITY, Stanford, Calif.; Robert A. Helliwell; *Radioscience Research Aboard the USNS "Eltanin";* 1 year; $88,500

Robert A. Helliwell; *VLF Phenomena in the Antarctic, 1963–64;* 1 year; $102,100

Donald E. Wohlschlag; *Ecological and Physiological Studies of McMurdo Sound Marine Animals;* $960

Donald E. Wohlschlag; *Growth and Metabolic Characteristics of McMurdo Sound Fishes;* 1 year; $41,600

TEXAS AGRICULTURAL AND MECHANICAL RESEARCH FOUNDATION, College Station; Sayed Z. El-Sayed; *Primary Productivity in Drake Passage (Southern Ocean);* 1 year; $38,500

Guy A. Franceschini; *Effective Radiation Temperature of Surface Waters and Associated Energy Losses (Antarctic Ocean, 0–100 Degrees East Longitude);* 11 months; $28,400

Donald W. Hood; *Calcium Carbonate Saturation Level of the Ocean from Latitudes of North America to Antarctica;* 16 months; $7,200

Donald W. Hood; *Chemical Oceanography of the Antarctic Ocean;* 6 months; $20,100

U.S. ARMY COLD REGIONS RESEARCH AND ENGINEERING LABORATORY, Hanover, N.H.; James A. Bender; *Snow and Ice Deformation and Analysis of Deep Ice Cores;* 1 year; $54,900

James A. Bender; *Snow and Ice Deformation and Analysis of Deep Ice Cores;* 1 year; $39,900

U.S. DEPARTMENT OF COMMERCE, COAST AND GEODETIC SURVEY, Washington, D.C.; H. Arnold Karo; *Station Magnetic Observatories, 1963–64;* 22 months; $107,800

H. Arnold Karo; *Seismological Observatories, 1963–64;* 22 months; $8,800

C. Gordon Little, Boulder, Colo.; *The High Latitude Ionosphere at Magnetically Conjugate Points;* $40,200

U.S. DEPARTMENT OF COMMERCE, WEATHER BUREAU, Washington, D.C.; F. W. Reichelderfer; *Antarctic Meteorological Research Program Aboard the USNS "Eltanin";* 1 year; $58,400

F. W. Reichelderfer; *Atmospheric-Oceanic-Glaciological Interaction in Antarctica;* 1 year; $235,900

F. W. Reichelderfer; *International Antarctic Analysis Center, United States Participation;* 16 months; $31,800

F. W. Reichelderfer; *Meteorological Research Program in Antarctica, 1962–63;* $278,400

F. W. Reichelderfer; *Meterological Research Program in Antarctica, 1963–64;* 37 months; $435,500

F. W. Reichelderfer, *USARP Field Operations;* 20 months; $171,100

U.S. NAVAL OCEANOGRAPHIC OFFICE, Washington, D.C.; E. C. Stephan; *Ship-based Oceanography in the Antarctic and Subantarctic;* 1 year; $64,600

UNIVERSITY OF ALASKA, College; T. Neil Davis; *Analysis of USNS "Eltanin" Photometer Data;* 9 months; $21,500

Keith B. Mather; *Conjugate Ionospheric Phenomena (USNS "Eltanin");* 1 year; $67,200

Keith B. Mather; *Quantitative Studies of the Katabatic Wind and Related Glaciological Phenomena;* 1 year; $19,500

UNIVERSITY OF ARIZONA, Tucson; Albert R. Mead; *Diving Behavior and Physiology of the Weddell Seal, Leptonychotes Weddelli (Lesson);* 1 year; $5,700

UNIVERSITY OF BRUSSELS, Belgium; E. E. Picciotto; *Snow Samples Collection at the South Pole Station for Geochemical and Cosmic Dust Investigation;* 1 year; $8,000

UNIVERSITY OF CALIFORNIA, Berkeley; George M. Briggs; *Nutrition and Ecology of Antarctic Micrometazoa (Fresh Water);* 4 months; $1,900

Robert R. Brown; *Conjugate Point Measurements of High Altitude Radiation Effects in the Geomagnetic Field;* 1 year; $92,900

Hellmuth A. Sievers; *Graduate Studies in Oceanography;* 1 year; $4,200

UNIVERSITY OF COLORADO, Boulder; Manford H. Rees; *Diurnal Motion of Auroral Hydrogen Emission at Byrd Station;* 1 year; $3,700

UNIVERSITY OF KANSAS, Lawrence; Kenneth B. Armitage; *A Limnological and Geo-*

chemical Investigation of Lakes Bonney and Vanda, Antarctica; 6 months; $1,800

UNIVERSITY OF MARYLAND, College Park; S. F. Singer; *Cosmic Ray Monitoring at Hallett Station, Antarctica;* 18 months; $32,700

UNIVERSITY OF MASSACHUSETTS, Amherst; H. T. U. Smith; *Feasibility Study for Photogeologic Mapping of Ice-free Areas in Antarctica;* 1 year; $5,900

UNIVERSITY OF MICHIGAN, Ann Arbor; D. F. Eschman; *Genesis of Macro- and Microforms in a Polar Glaciated Landscape;* 14 months; $14,000

UNIVERSITY OF MINNESOTA, Minneapolis; Campbell Craddock; *Geology of the Ellsworth Mountains;* 1 year; $63,300

UNIVERSITY OF SOUTHERN CALIFORNIA, Los Angeles; John L. Mohr and Leslie A. Chambers; *Biological Oceanology in the Antarctic Seas;* 1 year; $248,800

UNIVERSITY OF TEXAS, Austin; Thomas G. Barnes; *Meteorological Rocket Probes of the Upper Atmosphere in the Antarctic;* 11 months; $207,800

Orville Wyss; *Bacteria, Fungi, and Other Biota in Air, Soil, Snow and Melt Pools in Antarctica;* 1 year; $24,200

UNIVERSITY OF WASHINGTON, Seattle; Donald K. Reynolds; *Antenna Feasibility Study;* 1 year; $23,300

UNIVERSITY OF WISCONSIN, Madison; Charles R. Bentley; *Preparation of Antarctic Maps;* 6 months; $1,075

Charles R. Bentley; *Oversnow Traverse Program;* 1 year; $65,200

Charles R. Bentley and John C. Behrendt; *Aeromagnetic Measurements in Antarctica;* 1 year; $24,400

Robert F. Black; *Patterned Ground in Antarctica;* 1 year; $22,100

Robert H. Dott, Jr.; *Sedimentological and Stratigraphic Studies in the Antarctic Peninsula and Southern Chile;* 1 year; $30,900

Robert A. Ragotzkie; *Physical Limnology of Antarctic Lakes;* $2,100

George P. Woollard; *Support of the Geophysical and Polar Research Center;* 1 year; $65,500

VIRGINIA INSTITUTION OF MARINE SCIENCE, Gloucester Point; William J. Hargis, Jr.; *Parasites of Antarctic Vertebrates and Invertebrates;* $1,884

William J. Hargis, Jr.; *Certain Parasites of Antarctic Vertebrates and Invertebrates;* 1 year; $11,200

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; $51,721

UNIVERSITY OF MINNESOTA, Minneapolis; Will M. Myers, St. Paul; 10 months; $54,300

ACADEMIC YEAR INSTITUTES FOR SECONDARY SCHOOL AND JUNIOR COLLEGE TEACHERS

CORNELL UNIVERSITY, Ithaca, N.Y.; Damon Boynton; 11 months; $278,287

UNIVERSITY OF OKLAHOMA, Norman; Gene Levy; 11 months; $139,400

ACADEMIC YEAR INSTITUTES FOR SECONDARY SCHOOL AND COLLEGE TEACHERS

HARVARD UNIVERSITY, Cambridge, Mass.; David V. Widder; 13 months; $329,786

LOUISIANA STATE UNIVERSITY, Baton Rouge; Houston T. Karnes; 11 months; $274,743

OHIO STATE UNIVERSITY, Columbus; John S. Richardson; 12 months; $304,230

OKLAHOMA STATE UNIVERSITY, Stillwater; James H. Zant; 11 months; $228,000

OREGON STATE UNIVERSITY, Corvallis; Stanley E. Williamson; 11 months; $293,723

SYRACUSE UNIVERSITY, Syracuse, N.Y.; Alfred T. Collette; 11 months; $275,385

UNIVERSITY OF COLORADO, Boulder; John R. Clopton; 12 months; $314,765

UNIVERSITY OF ILLINOIS, Urbana; Joseph Landin; 12 months; $313,200

UNIVERSITY OF MICHIGAN, Ann Arbor; A. M. Elliott; 11 months; $278,700

UNIVERSITY OF OREGON, Eugene; Sanford S. Tepfer; 11 months; $128,800

UNIVERSITY OF TEXAS, Austin; Robbin C. Anderson; 11 months; $264,000

WASHINGTON UNIVERSITY, St. Louis, Mo.; Thomas S. Hall; 13 months; $278,100

ACADEMIC YEAR INSTITUTES FOR SECONDARY SCHOOL TEACHERS

AGRICULTURAL AND MECHANICAL COLLEGE OF TEXAS, College Station; James G. Potter; 12 months; $197,100

AGRICULTURAL AND TECHNOLOGICAL COLLEGE OF NORTH CAROLINA, Greensboro; Gerald A. Edwards; 9 months; $117,700

ARIZONA STATE UNIVERSITY, Tempe; Alan T. Wager; 11 months; $264,700

ATLANTA UNIVERSITY, Atlanta, Ga.; K. A. Huggins; 11 months; $263,300

BOSTON COLLEGE, Chestnut Hill, Mass.; Stanley J. Bezuszka; 11 months; $221,950

BOWDOIN COLLEGE, Brunswick, Maine; Reinhard L. Korgen; 11 months; $70,000

BOWLING GREEN STATE UNIVERSITY, Bowling Green, Ohio; Bruce R. Vogeli; 10 months; $190,500

BROWN UNIVERSITY, Providence, R.I.; Elmer R. Smith; 11 months; $264,600

FISK UNIVERSITY, Nashville, Tenn.; Myron B. Towns; 9 months; $108,600

ILLINOIS INSTITUTE OF TECHNOLOGY, Chicago; L. R. Wilcox; 11 months; $108,531

KANSAS STATE TEACHERS COLLEGE, Emporia; Ted F. Andrews; 12 months; $215,404

MICHIGAN STATE UNIVERSITY, East Lansing; John Wagner; 12 months; $288,527

NEW MEXICO HIGHLANDS UNIVERSITY, Las Vegas; E. Gerald Meyer; 12 months; $285,400

PENNSYLVANIA STATE UNIVERSITY, University Park; Thomas C. Benton; 9 months; $173,700

William H. Powers; 10 months; $630

RUTGERS, THE STATE UNIVERSITY, New Brunswick, N.J.; Kenneth G. Wolfson; 11 months; $198,580

SAN DIEGO STATE COLLEGE FOUNDATION, San Diego, Calif.; Gerald A. Becker; 11 months; $171,429

SAN JOSE STATE COLLEGE FOUNDATION, San Jose, Calif.; Leonard Feldman; 10 months; $147,300

STANFORD UNIVERSITY, Stanford, Calif.; Harold M. Bacon; $3,830

STATE COLLEGE OF IOWA, Cedar Falls; Robert A. Rogers; 11 months; $244,193

STATE UNIVERSITY OF SOUTH DAKOTA, Vermillion; Charles M. Vaughn; 13 months; $299,313

TEMPLE UNIVERSITY, Philadelphia, Pa.; Richard M. Stavseth; 12 months; $166,700

TEXAS WOMAN'S UNIVERSITY, Denton; Dixie Young; 11 months; $58,600

TUSKEGEE INSTITUTE, Tuskegee Institute, Ala.; Lawrence F. Koons; 9 months; $100,100

UNIVERSITY OF ARKANSAS, Fayetteville; William R. Orton; 12 months; $98,100

UNIVERSITY OF DETROIT, Mich.; Lyle E. Mehlenbacher; 11 months; $147,596

UNIVERSITY OF FLORIDA, Gainesville; C. Rappenecker; 9 months; $146,600

UNIVERSITY OF GEORGIA, Athens; Jonathan J. Westfall; 11 months; $268,400

UNIVERSITY OF HAWAII, Honolulu; Michael M. Frodyma; 11 months; $123,900

UNIVERSITY OF MISSISSIPPI, University; William H. Norman; 10 months; $183,400

UNIVERSITY OF NEW MEXICO, Albuquerque; Wilson Ivins; 11 months; $256,100

UNIVERSITY OF NORTH CAROLINA, Chapel Hill; E. C. Markham; 11 months; $290,946

UNIVERSITY OF NORTH DAKOTA, Grand Forks; J. Donald Henderson; 11 months; $256,695

UNIVERSITY OF NOTRE DAME, Ind.; Arnold E. Ross; 11 months; $255,700

UNIVERSITY OF PENNSYLVANIA, Philadelphia; J. F. Hazel; 11 months; $272,545

UNIVERSITY OF PUERTO RICO, Rio Piedras; Mariano Garcia; 9 months; $146,337

UNIVERSITY OF SOUTH CAROLINA, Columbia; W. L. Williams; 11 months; $184,800

UNIVERSITY OF TENNESSEE, Knoxville; J. A. Cooley; 11 months; $143,400

UNIVERSITY OF TEXAS, Austin; Robbin C. Anderson; $4,260

UNIVERSITY OF UTAH, Salt Lake City; Thomas J. Parmley; 11 months; $265,675

UNIVERSITY OF VIRGINIA, Charlottesville; James W. Cole, Jr.; 11 months; $4,320
 James W. Cole, Jr.; 1 year; $267,317

UNIVERSITY OF WASHINGTON, Seattle; Roy Dubisch; 11 months. $67,231

UNIVERSITY OF WISCONSIN, Madison; Henry Van Engen; 11 months; $108,205

WESLEYAN UNIVERSITY, Middletown, Conn.; James E. Cronin; 11 months; $82,300

WEST VIRGINIA UNIVERSITY, Morgantown; James B. Hickman; 10 months; $174,900

ADVANCED SCIENCE SEMINARS

AMERICAN ASSOCIATION OF MUSEUMS, Washington, D.C.; E. W. Haury, Arizona State Museum, University of Arizona, Tucson; 9 months; $46,095
 I. M. Levitt, Fels Planetarium, The Franklin Institute, Philadelphia, Pa.; 10 months; $39,330

AMERICAN MATHEMATICAL SOCIETY, Providence, R.I.; Gordon L. Walker; 10 months; $30,655

BERMUDA BIOLOGICAL STATION, St. George's West; Keith E. Chave, Lehigh University, Bethlehem, Pa.; 1 year; $20,270
 Gordon A. Riley, Yale University, New Haven, Conn.; 10 months; $14,600

BRANDEIS UNIVERSITY, Waltham, Mass.; David F. Aberle; 1 year; $13,090
 Kenneth W. Ford; 1 year; $42,420
 Harold I. Levine; 1 year; $38,350

CONNECTICUT AGRICULTURAL EXPERIMENT STATION, New Haven; Israel Zelitch; 8 months; $9,060

DARTMOUTH COLLEGE, Hanover, N.H.; Walter H. Stockmayer; 10 months; $5,600

FLORIDA INSTITUTE FOR CONTINUING UNIVERSITY STUDIES, Tallahassee; William A. Nash, University of Florida, Gainesville; 9 months; $25,790

HARVARD UNIVERSITY, Cambridge, Mass.; William Liller; 10 months; $15,240
 Evon Z. Vogt; 1 year; $18,075

LEHIGH UNIVERSITY, Bethlehem, Pa.; Keith E. Chave; 10 months; $10,480

MICHIGAN STATE UNIVERSITY, East Lansing; Maynard M. Miller; 11 months; $17,835

NATIONAL ACADEMY OF SCIENCES—NATIONAL RESEARCH COUNCIL, Washington, D.C.; Paul H. Reitan, Stanford University, Stanford, Calif.; 15 months; $55,980

NORTHWESTERN UNIVERSITY, Evanston, Ill.; Richard R. Goldberg; 1 year; $39,440

OHIO STATE UNIVERSITY, Columbus; John D. Lee; 9 months; $29,620

OHIO STATE UNIVERSITY RESEARCH FOUNDATION, Columbus; H. H. Nielsen; 9 months; $2,875

PENNSYLVANIA STATE UNIVERSITY, University Park; Donald G. Johnson; 1 year; $39,765

RAND CORPORATION, Santa Monica, Calif.; David G. Hays; 1 year; $56,250

RESEARCH FOUNDATION OF STATE UNIVERSITY OF NEW YORK, Albany; Hardy L. Shirley, Syracuse; 1 year; $24,425

SOCIAL SCIENCE RESEARCH COUNCIL, New York, N.Y.; Francis H. Palmer; 10 months; $76,320

SOUTHERN FOREST TREE IMPROVEMENT COMMITTEE, Savannah, Ga.; John W. Johnson; 5 months; $2,600

UNIVERSITY OF CALIFORNIA, Berkeley; Robert L. Usinger; 2 years; $121,650

UNIVERSITY OF COLORADO; Boulder; Wesley E. Brittin; 11 months; $81,375

UNIVERSITY OF DELAWARE, Newark; William F. Ames; 8 months; $21,170

UNIVERSITY OF DENVER, Colo.; William M. Mueller; 9 months; $38,200

UNIVERSITY OF FLORIDA, Gainesville; Per-Olov Lowdin; 8 months; $67,500

UNIVERSITY OF HOUSTON, Tex.; Douglas Muster; 5 months; $6,975
 Elliott I. Organick; 10 months; $69,210

UNIVERSITY OF KANSAS, Lawrence; E. Raymond Hall; 8 months; $2,000

UNIVERSITY OF NORTH CAROLINA, Chapel Hill; F. E. McVay, Raleigh; 1 year; $89,710

UNIVERSITY OF SOUTHERN CALIFORNIA, Los Angeles; Donn S. Gorsline; 1 year; $300
 Jay M. Savage; 1 year $49,210

UNIVERSITY OF TEXAS, Austin; Howard T. Odum; 1 year $9,000

UNIVERSITY OF WISCONSIN, Madison; Robert G. Sachs; 26 months; $80,000

VIRGINIA POLYTECHNIC INSTITUTE, Blacksburg; James A. Jacobs; 10 months; $53,355

WASHINGTON STATE UNIVERSITY, Pullman; William W. Elmendorf; 10 months; $8,170

WILLIAM MARSH RICE UNIVERSITY, Houston, Tex.; Jim Douglas, Jr.; 1 year; $40,720

WOODS HOLE OCEANOGRAPHIC INSTITUTION, Woods Hole, Mass.; Columbus O'D. Iselin; 12 weeks; $162,390
 George Veronis; 8 months; $36,280

YALE UNIVERSITY, New Haven, Conn.; F. R. E. Crossley; 15 months; $38,175
 Talbot H. Waterman; 1 year; $20,340

COORDINATED SUMMER AND IN-SERVICE INSTITUTES

ADELPHI COLLEGE, Garden City, N.Y.; Marie E. Conklin; 11 months; $103,580
 Donald Solitar; 11 months; $77,700

BOSTON COLLEGE, Chestnut Hill, Mass.; Stanley J. Bezuszka; 10 months; $73,020

BOWLING GREEN STATE UNIVERSITY, Bowling Green, Ohio; Bruce R. Vogeli; 12 months; $63,750

FORDHAM UNIVERSITY, New York, N.Y.; Charles J. Lewis; 11 months; $82,580

MONTCLAIR STATE COLLEGE, Upper Montclair, N.J.; Max A. Sobel; 12 months; $87,450

NORTHWESTERN UNIVERSITY, Evanston, Ill.; E. H. C. Hildebrandt; 11 months; $90,830

RESEARCH FOUNDATION OF STATE UNIVERSITY OF NEW YORK, Albany; Harriet F. Montague, Buffalo; 10 months; $56,100

RESEARCH FOUNDATION OF THE UNIVERSITY OF TOLEDO, Ohio; Archie N. Solberg; 11 months; $74,450

UNIVERSITY OF NEW HAMPSHIRE, Durham; John C. Mairhuber; 11 months; $89,900

UNIVERSITY OF OREGON, Eugene; A. F. Moursund; 10 months; $71,810

UNIVERSITY OF PUERTO RICO, Mayaguez; Virgilio Biaggi, Jr.; 11 months; $48,650

UNIVERSITY OF SANTA CLARA, Calif.; Abraham P. Hillman; 13 months; $86,130

VIRGINIA STATE COLLEGE, Petersburg; T. Nelson Baker; 11 months; $147,460

WAYNE STATE UNIVERSITY, Detroit, Mich.; Harold T. Slaby; 11 months; $77,780

WESTERN KENTUCKY STATE COLLEGE, Bowling Green; Ward C. Sumpter; 11 months; $94,790

WESTERN MICHIGAN UNIVERSITY, Kalamazoo; James H. Powell; 11 months; $81,720

WORCESTER POLYTECHNIC INSTITUTE, Worcester, Mass.; Richard F. Morton; 11 months; $96,650

COOPERATIVE COLLEGE-SCHOOL SCIENCE PROGRAM

AUSTIN PEAY STATE COLLEGE, Clarksville, Tenn.; William G. Stokes; 9 months; $7,770

BROWN UNIVERSITY, Providence, R.I.; John A. Finger; 9 months; $10,980

CARNEGIE INSTITUTE OF TECHNOLOGY, Pittsburgh, Pa.; Lawrence N. Canjar; 8 months; $21,580
  Lawrence N. Canjar; 17 months; $36,395

CHAPMAN COLLEGE, Orange, Calif.; Peter Coad; 11 months; $13,645

CLARKSON COLLEGE OF TECHNOLOGY, Potsdam, N.Y.; Robert D. Larsson; 8 months; $4,550

COLGATE UNIVERSITY, Hamilton, N.Y.; Robert Goodwin; 9 months; $20,950

COLUMBIA UNIVERSITY, New York, N.Y.; Donald Barr; 7 months; $45,000

CORNELL UNIVERSITY, Ithaca, N.Y.; Matthew H. Bruce, Jr.; 6 months; $22,685

DARTMOUTH COLLEGE, Hanover, N.H.; William P. Davis, Jr.; 2 months; $36,010

DENISON UNIVERSITY, Granville, Ohio; Robert W. Alrutz; 2 months; $16,105

FAIRMONT STATE COLLEGE, Fairmont, W.Va.; James A. LaRue; 9 months; $11,260

LAMAR STATE COLLEGE OF TECHNOLOGY, Beaumont, Tex.; Edwin S. Hayes; 9 months; $8,090

LOUISIANA STATE UNIVERSITY, Baton Rouge; Harry J. Bennett; 3 months; $23,295

MANHATTAN COLLEGE, New York, N.Y.; Leonard O'Connor; 2 months; $19,040

MERRIMACK COLLEGE, North Andover, Mass.; William E. McGuire; 2 months; $18,990

NEW ENGLAND COLLEGE, Henniker, N.H.; Harold C. Downes; 5 months; $7,225

NORTH DAKOTA STATE UNIVERSITY, Fargo; Donald Schwartz; 11 months; $2,600

OKLAHOMA STATE UNIVERSITY, Stillwater; Robert C. Fite; 2 months; $32,990

POLYTECHNIC INSTITUTE OF BROOKLYN, N.Y.; Almon G. Turner; 2 months; $17,895

PURDUE UNIVERSITY, Lafayette, Ind.; M. Wiles Keller; 9 months; $32,510

ST. CLOUD STATE COLLEGE, St. Cloud, Minn.; Philip Youngner; 1 month; $26,760

ST. JOHN'S UNIVERSITY, Jamaica, N.Y.; John J. Coffey; 4 months; $15,115

SAN DIEGO STATE COLLEGE FOUNDATION, San Diego, Calif., Jim G. Malik; 2 months; $16,090

TENNESSEE WESLEYAN COLLEGE, Athens; William H. Adams; 1 year; $1,650

UNIVERSITY OF FLORIDA, Gainesville; A. H. Gropp; 4 months; $770
  A. H. Gropp; 9 months; $2,700

UNIVERSITY OF HAWAII, Honolulu; Michael M. Frodyma; 10 months; $27.865

UNIVERSITY OF MIAMI, Coral Gables, Fla.; Herman Meyer; 8 months; $12,690

UNIVERSITY OF MINNESOTA, Minneapolis; Paul C. Rosenbloom; 12 months; $25,110

UNIVERSITY OF NEW HAMPSHIRE, Durham; Richard H. Balomenos; 18 months; $16,875

UNIVERSITY OF NORTH CAROLINA, Chapel Hill; W. A. Reid, Raleigh; 2 months; $23,785

UNIVERSITY OF PITTSBURGH, Pa.; John R. Jablonski; 12 months; $38,545

UNIVERSITY OF PUERTO RICO, Rio Piedras; Mariano Garcia; 9 months; $7,300

UNIVERSITY OF RHODE ISLAND, Kingston; James E. Casey; 6 months; $13,175

UNIVERSITY OF VIRGINIA, Charlottesville; A. R. Kuhlthau; 2 months; $5,690
  A. R. Kuhlthau; 2 months; $6,810
  A. R. Kuhlthau; 8 months; $10,060

VIRGINIA INSTITUTE OF MARINE SCIENCE, Gloucester Point; Robert S. Bailey; 2 months; $9,295

VIRGINIA STATE COLLEGE, Petersburg; Paul L. Brown, Norfolk; 2 months; $17,495

WALDEMAR MEDICAL RESEARCH FOUNDATION, INC., Port Washington, N.Y.; Norman Molomut; 2 months; $22,110
  Norman Molomut; 6 months; $9,560

WESTERN MICHIGAN UNIVERSITY, Kalamazoo, George G. Mallinson; 16 months; $8,985

WEST VIRGINIA WESLEYAN COLLEGE, Buckhannon; John C. Wright; 2 months; $27,540
  John C. Wright; 9 months; $7,020

WOODS HOLE OCEANOGRAPHIC INSTITUTION, Woods Hole, Mass.; Charles S. Yentsch; 10 months; $7,400

COURSE CONTENT STUDIES AND DEVELOPMENT

AMERICAN ASSOCIATION OF PHYSICS TEACHERS; Minneapolis, Minn.; Arnold Arons, Harvard University, Cambridge, Mass.; *A Study of the Usefulness of Resource Letters in Physics;* 2 years; $23,870

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;* 9 months; $146,000

William P. Viall; *Regional Conferences of School Administrators on New Science Curricula;* 7 months; $9,100

AMERICAN INSTITUTE OF PHYSICS, New York, N.Y.; Elmer Hutchisson; *A Center for Educational Apparatus in Physics;* 2 years; $120,750

Elmer Hutchisson; *Source Material on the Recent History of Physics in the United States;* 2 years; $17,510

AMERICAN METEOROLOGICAL SOCIETY, Boston, Mass.; Kenneth C. Spengler; *Development of Educational Motion Pictures, Film Strips and Lantern Slides in Meteorology;* 9 months; $600,700

Kenneth C. Spengler; *Educational Monographs in Atmospheric Sciences;* 3 years; $51,290

AMERICAN PSYCHOLOGICAL ASSOCIATION, Washington, D.C.; Arthur H. Brayfield; *Film Series in Psychology;* 2 months; $29,400

AMERICAN SOCIETY, FOR ENGINEERING EDUCATION, Ames, Iowa; George A. Hawkins, Purdue University, Lafayette, Ind.; *A Study on the Goals of Engineering Education;* 3 years; $209,090

Joseph M. Pettit; *Study of Graduate Education in Engineering;* 3 years; $98,100

ASSOCIATION OF AMERICAN GEOGRAPHERS, Washington, D.C.; John F. Lounsbury, Eastern Michigan University, Ypsilanti; *Geography in Liberal Education Project;* 1 year; $56,550

BOSTON COLLEGE, Chestnut Hill, Mass.; E. G. Bombolakis; *Development of Photoelastic Stress Analysis of Structural Geology Problems;* 1 year; $3,500

BRYN MAWR COLLEGE, Bryn Mawr, Pa.; Rosalie C. Hoyt and George L. Zimmerman; *Development of a Combined College Chemistry-Physics Course;* 2 years; $43,470

Walter C. Michels; *Commission on College Physics;* 1 year; $91,490

CARNEGIE INSTITUTE OF TECHNOLOGY, Pittsburgh, Pa.; Stanley W. Angrist; *Development of Simple Experiments for Studying the Nature of Coupled Flows in Direct Energy Conversion Devices;* 1 year; $14,950

CASE INSTITUTE OF TECHNOLOGY, Cleveland, Ohio; James B. Reswick; *Development of Dynamics Course Using Analog Computers;* 4 months; $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;* 24 months; $1,440

COLUMBIA UNIVERSITY, New York, N.Y.; Maurice Ewing, Palisades; *A Series of Educational Films About the Earth and Sea;* 2 years; $363,400

CORNELL UNIVERSITY, Ithaca, N.Y.; R. J. Walker; *Experimental Teaching Program in Algebra;* 21 months; $16,580

EARLHAM COLLEGE, Richmond, Ind.; Laurence E. Strong; *The Chemical Bond Approach Project;* 1 year; $200,300

EDUCATIONAL SERVICES, INCORPORATED, Watertown, Mass.; Andrew M. Gleason, Harvard University, Cambridge; William T. Martin, Massachusetts Institute of Technology, Cambridge; *Study of the Structure of the Mathematics Curriculum in Grades 1–12;* 1 year; $185,505

David Hawkins; *Elementary School Science Curriculum Project;* 4 months; $605,490

Philip Morrison, Cornell University, Ithaca, N.Y.; *Elementary School Science Curriculum Project;* 4 months; $219,650

Uri Haber-Schaim; *One-Year Course in Physical Science for Junior High Schools;* 1 year; $120,980

Uri Haber-Schaim; *The Revision of the Physical Science Study Committee Teacher's Resource Book and Guide;* 18 months; $69,660

Uri Haber-Schaim; *Briefing Conference for Senior Staff of PSSC Summer and In-Service Institutes;* 5 days; $9,350

Uri Haber-Schaim; *Extension of the Physical Science Study Committee Physics Course for Use in Colleges and Junior Colleges;* 2 years; $35,000

Charles Kittel; *Development of an Elementary College Physics Course;* 26 months; $232,250

Campbell L. Searle; *Semiconductor Electronics Education Committee;* 1 year; $133,400

Jerrold R. Zacharias; *Development of Alternate Battery of Physical Science Study Committee Tests;* 8 months; $53,590

FLORIDA STATE UNIVERSITY, Tallahassee; J. Stanley Marshall; *Planning Conferences on a Junior High School Curriculum Center;* 6 months; $7,850

HARVARD UNIVERSITY, Cambridge, Mass.; Jerome Bruner; *A Planning Conference on Research on Children's Learning;* 7 months; $16,100

IOWA STATE UNIVERSITY, Ames; Glenn Murphy; *Improvement of Laboratory Instruction in the Science of Materials;* 3 years; $62,800

JOHNS HOPKINS UNIVERSITY, Baltimore, Md.; Alsoph H. Corwin; *An Organic Chemistry Course for Sophomores;* 15 months; $10,000

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge; Jerrold R. Zacharias; *The Science Teaching Center: College Physics;* 1 year; $198,000

MATHEMATICAL ASSOCIATION OF AMERICA, Buffalo, N.Y.; R. Creighton Buck, University of Wisconsin; *Committee on the Undergraduate Program in Mathematics;* 1 year; $1,081,620

Holbrook M. MacNeille; *The Committee on Educational Media Films and Other Teaching Materials for College Mathematics;* 3 years; $80,000

MICHIGAN STATE UNIVERSITY, East Lansing; Alfred Leitner; *Films on Low-Temperature Phenomena;* 1 year; $15,990

L. W. Von Tersch; *Engineering Educational Development Program;* 1 year; $90,000

NATIONAL ACADEMY OF SCIENCES—NATIONAL RESEARCH COUNCIL, Washington, D.C.; Robert L. Heller, University of Minnesota, Minneapolis; *Curriculum Resources for Earth Science Teaching in Secondary Schools;* 10 months; $147,182

POLYTECHNIC INSTITUTE OF BROOKLYN, N.Y.; Mischa Schwartz; *Development of a Communications Systems Laboratory;* 2 years; $78,200

PRINCETON UNIVERSITY, Princeton, N.J.; Frederick L. Ferris, Jr.; *Junior High School Science Project;* 1 year; $20,000

PURDUE UNIVERSITY, Lafayette, Ind.; C. F. Warner; *Development of Equipment for Mechanical Engineering Laboratories;* 1 year; $21,110

RENSSELAER POLYTECHNIC INSTITUTE, Troy, N.Y.; Walter Eppenstein and Robert Resnick; *Workshop for Development of Apparatus for College Physics;* 1 year; $72,110

STANFORD UNIVERSITY, Stanford, Calif.; E. G. Begle; *School Mathematics Study Group;* 1 year; $1,567,200

Paul R. Hanna; *Working Conference on Developing New Curriculum Materials in the Social Sciences for the Schools;* 1 year; $18,700

Robert R. Sears; *Working Conference on Research on Children's Learning;* 6 months; $22,860

STATE COLLEGE OF IOWA, Cedar Falls; E. Glenadine Gibb; *Development of Teacher Training Materials in Mathematics;* 10 months; $4,500

STATEN ISLAND COMMUNITY COLLEGE, Staten Island, N.Y.; Reuben Benumof; *Design of Optical Pumping Apparatus and Experiments for the Study of Hyperfine Zeeman Transitions;* 2 years; $11,770

STEVENS INSTITUTE OF TECHNOLOGY, Hoboken, N.J.; Ainsley H. Diamond; *Development of an Undergraduate Course in Mathematical Logic;* 18 months; $15,800

UNIVERSITY OF CALIFORNIA, Berkeley; Herbert L. Mason; *Elementary School Science Project;* 1 year; $142,140

George C. Pimentel; *Chemical Education Material Study;* 15 months; $981,325

UNIVERSITY OF COLORADO, Boulder; H. Bentley Glass; *The Biological Sciences Curriculum Study;* 15 months; $1,800,000

UNIVERSITY OF HOUSTON, Tex.; Glen E. Peterson; *Briefing Session for Potential Teachers of High School Biology from the Biological Sciences Curriculum Studies;* 14 months; $6,570

UNIVERSITY OF ILLINOIS, Urbana; Max Beberman; *University of Illinois Committee on School Mathematics;* 18 months; $130,000

Max Beberman; *Series of Films for Training of Ninth Grade Algebra Teachers;* 21 months; $195,980

Lee J. Cronbach, Champaign; *Study Conference on Evaluation of Course Content Improvement Projects;* 5 months; $6,000

Gilbert C. Finlay; *A Project on Elementary School and Junior High School Course Content Improvement;* 1 year; $228,200

UNIVERSITY OF KANSAS, Lawrence; John S. McNown; *An Experiment with Laboratory Courses in Engineering;* 15 months; $11,040

UNIVERSITY OF MARYLAND, College Park; Robert Karplus; *Elementary School Science Curriculum Study;* 10 months; $40,250

John R. Mayor and Helen L. Garstens; *Development of a New Course in Mathematics for Prospective Elementary School Teachers;* 3 years; $7,480

UNIVERSITY OF MINNESOTA, Minneapolis; Paul C. Rosenbloom; *Development of a Science and Mathematics Curriculum for Grades K–9;* 1 year; $405,560

UNIVERSITY OF ROCHESTER, N.Y.; John A. Fox; *Design and Construction of a Small Laboratory and Demonstration Hypersonic Wind Tunnel;* 6 months; $4,390

UNIVERSITY OF WASHINGTON, Seattle; J. Maurice Kingston; *Development of New Mathematics Course for Prospective Junior High School Teachers;* 1 year; $20,410

UNIVERSITY OF WISCONSIN, Madison; R. C. Buck and John Nohel; *Experimental Curriculum in Engineering Mathematics;* 2 years; $59,000

UTAH STATE UNIVERSITY, Logan; John K. Wood; *Course Content Improvement in Elementary School Science;* 2 years; $75,500

VALPARAISO UNIVERSITY, Valparaiso, Ind.; Leslie M. Zoss; *Development of Experiments for Teaching Closed Loop Control Theory;* 1 year; $4,315

WASHINGTON UNIVERSITY, St. Louis, Mo.; John M. Fowler; *Development of Lecture Demonstration Material and Laboratory Exercises for Introductory College Physics;* 1 year; $16,350

Thomas S. Hall; *The Commission on Undergraduate Education in the Biological Sciences;* 20 months; $157,700

WAYNE STATE UNIVERSITY, Detroit, Mich.; Yehuda Klausner; *Designing and Building a Pneumatic Loading Device for Pure Deviatoric Loading of Soils;* 34 months; $4,440

WEBSTER COLLEGE, Webster, Mo.; Robert B. Davis; *Syracuse-Webster Elementary Mathematics Project;* 1 year; $208,340

WELLESLEY COLLEGE, Wellesley, Mass.; Delaphine G. R. Wyckoff; *Intensive Study Session for High School Teachers of Biology;* 14 months; $29,890

DEVELOPMENTAL PROJECTS (SCIENCE EDUCATION)

CASE INSTITUTE OF TECHNOLOGY, Cleveland, Ohio; James B. Reswick; *Faculty-Student Conference on Engineering Education;* 17 months; $18,020

CONFERENCE BOARD OF THE MATHEMATICAL SCIENCES, Washington, D.C.; Leon W. Cohen; *Conference on the Training of Mathematicians;* 3 days; $16,490

DUKE UNIVERSITY, Durham, N.C.; Charles R. Vail; *Developmental Program in the College of Engineering;* 18 months; $149,790

EDUCATIONAL SERVICES, INC., Watertown, Mass.; Paul F. Chenea, Purdue University, Lafayette, Ind.; *The Central Office Activities* *of the Commission on Engineering Education;* 1 year; $123,355

NEWARK COLLEGE OF ENGINEERING RESEARCH FOUNDATION, Newark, N.J.; Frederick G. Lehman; *Expansion and Integration of Activities in Education and Research in the Newark College of Engineering Computing Center;* 3 years; $45,400

POLYTECHNIC INSTITUTE OF BROOKLYN, N.Y.; C. G. Overberger; *A Chemistry Teacher Trainee Program;* 3 years; $37,950

REED COLLEGE, Portland, Oreg.; Frederick D. Tabbutt; *Summer Program in Inorganic Chemistry;* 38 months; $1,950

UNIVERSITY OF ARIZONA, Tucson; John W. Harshbarger; *Education in Hydrology;* 3 years; $105,110

UNIVERSITY OF ROCHESTER, N.Y.; Bernard S. Cohn; *Establishment of a Faculty Curriculum-Study Seminar in the Department of Anthropology;* 43 months; $71,000

YALE UNIVERSITY, New Haven, Conn.; Albert L. Washburn; *A Summer Field Program for Predoctoral Geology Students;* 3 years; $17,-595

FOREIGN PARTICIPATION

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, Washington, D.C.; Dael Wolfle: 16 months; $71,200

SYRACUSE UNIVERSITY, Syracuse, N.Y.; Alfred T. Collette; 14 months; $14,800

HOLIDAY LECTURES

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, Washington, D.C.; Dael Wolfle; *Holiday Lectures for Selected High School Students;* 1 year; $92,000

IN-SERVICE INSTITUTES FOR ELEMENTARY SCHOOL TEACHERS

AGRICULTURAL AND MECHANICAL COLLEGE OF TEXAS, College Station; James G. Potter; 9 months; $3,860

ALAMEDA COUNTY STATE COLLEGE FOUNDATION, INC., Hayward Calif.; John D. Hancock; 9 months; $7,960

AMERICAN MUSEUM OF NATURAL HISTORY, New York, N.Y.; Franklyn M. Branley; 4 months; $3,230

ARKANSAS STATE COLLEGE, State College; W. W. Nedrow; 9 months; $4,860

ARKANSAS STATE TEACHERS COLLEGE, Conway; O. L. Hughes; 9 months; $5,890

BELOIT COLLEGE, Beloit, Wis.; John L. Biester; 8 months; $4,230

CALVIN COLLEGE, Grand Rapids, Mich.; Carl J. Sinke; 9 months; $6,960

CENTRAL MICHIGAN UNIVERSITY, Mount Pleasant; Julia Adkins; 9 months; $6,350

EASTERN MICHIGAN UNIVERSITY, Ypsilanti; James W. Gallagher; 10 months; $6,920

FAIRLEIGH DICKINSON UNIVERSITY, Rutherford, N.J.; Malcolm Sturchio; 9 months; $4,800

FLORIDA AGRICULTURAL AND MECHANICAL UNIVERSITY, Tallahassee; Israel E. Glover; 9 months; $5,230

HUMBOLDT STATE COLLEGE FOUNDATION, Arcata, Calif.; Roy W. Tucker; 9 months; $7,020

INDIANA STATE COLLEGE, Terre Haute; John C. Hook; 8 months; $6,720

JERSEY CITY STATE COLLEGE, Jersey City, N.J.; John Reckzeh; 9 months; $6,560

KANSAS STATE TEACHERS COLLEGE, Emporia; Ted F. Andrews; 9 months; $8,760

KANSAS STATE UNIVERSITY, Manhattan; C. Alan Riedesel; 9 months; $7,110

KNOXVILLE COLLEGE, Knoxville, Tenn.; Robert H. Harvey; 8 months; $6,330

LOYOLA UNIVERSITY, New Orleans, La.; John F. Keller; 9 months; $6,560

MACMURRAY COLLEGE, Jacksonville, Ill.; Herman H. Siemers; 9 months; $6,110

MILLERSVILLE STATE COLLEGE, Millersville, Pa.; William B. McIlwaine; 9 months; $7,230

NEBRASKA STATE TEACHERS COLLEGE, Wayne; Lyle E. Seymour; 8 months; $6,070

NEW MEXICO WESTERN COLLEGE, Silver City; Jesse F. Bingaman; 9 months; $8,730

NORTHEASTERN UNIVERSITY, Boston, Mass.; Benjamin C. Friedrich; 9 months; $3,000

PORTLAND STATE COLLEGE, Portland, Oreg.; J. Richard Byrne; 8½ months; $4,900

PRAIRIE VIEW AGRICULTURAL AND MECHANICAL COLLEGE, Prairie View, Tex.; Samuel H. Douglas; 9 months; $7,840

RESEARCH FOUNDATION OF STATE UNIVERSITY OF N.Y., Albany; Daniel W. Snader, Fredonia; 9 months; $7,840

RHODE ISLAND COLLEGE, Providence; Renato E. Leonelli; 9 months; $6,100

SACRAMENTO STATE COLLEGE FOUNDATION, Sacramento, Calif.; H. Stewart Moredock; 9 months; $7,810

ST. AUGUSTINE'S COLLEGE, Raleigh, N.C.; Joseph Jones, Jr.; 9 months; $6,030

SAN JOSE STATE COLLEGE FOUNDATION, San Jose, Calif.; John L. Marks; 9 months; $6,510

SHORTER COLLEGE, Rome, Ga.; Philip F-C. Greear; 9 months; $6,080

SOUTHEASTERN STATE COLLEGE, Durant, Okla.; Leslie A. Dwight; 9 months; $7,050

TALLADEGA COLLEGE, Talladega, Ala.; Cohen T. Simpson; 7 months; $3,940

TEXAS WOMAN'S UNIVERSITY, Denton; Helen A. Ludeman; 9 months; $6,580

UNIVERSITY OF ARKANSAS, Fayetteville; William R. Orton; 9 months; $6,550

UNIVERSITY OF CALIFORNIA, Berkeley; Mario Menesini; 9 months; $8,800

UNIVERSITY OF COLORADO, Boulder; James R. Wailes; 8 months; $6,810

UNIVERSITY OF DELAWARE, Newark; G. Cuthbert Webber; 9 months; $4,890

UNIVERSITY OF DETROIT, Mich.; Lyle E. Mehlenbacher; 9 months; $6,630

UNIVERSITY OF GEORGIA, Athens; Charles L. Koelsche; 9 months; $7,570

UNIVERSITY OF HAWAII, Honolulu; Michael M. Frodyma; 8 months; $19,000

UNIVERSITY OF NORTH DAKOTA, Grand Forks; Bernt L. Wills; 9 months; $6,880

UNIVERSITY OF OKLAHOMA, Norman; Dora McFarland; 9 months; $8,160

UNIVERSITY OF THE PACIFIC, Stockton, Calif; John V. Schippers; 9 months; $8,030

UNIVERSITY OF PUERTO RICO, Rio Piedras; Mariano Garcia; 9 months; $6,430

UNIVERSITY OF SOUTHWESTERN LOUISIANA, Lafayette; James R. Oliver; 9 months; $6,360

UNIVERSITY OF VERMONT, Burlington; N. James Schoonmaker; 10 months; $5,480

IN-SERVICE INSTITUTES FOR JUNIOR HIGH SCHOOL TEACHERS

KNOX COLLEGE, Galesburg, Ill.; Rothwell Stephens; 9 months; $1,450

IN-SERVICE INSTITUTES FOR SECONDARY SCHOOL TEACHERS

AGRICULTURAL AND MECHANICAL COLLEGE OF TEXAS, College Station; Dale F. Leipper; 9 months; $6,060

ALABAMA AGRICULTURAL AND MECHANICAL COLLEGE, Normal; Winfred Thomas; 9 months; $7,350

ALAMEDA COUNTY STATE COLLEGE FOUNDATION, INC., Hayward, Calif.; C. T. Purvis; 9 months; $9,630
C. T. Purvis; 9 months; $920

ALBANY STATE COLLEGE, Albany, Ga.; William E. Johnson, Jr.; 9 months; $19,350

ALBERTUS MAGNUS COLLEGE, New Haven, Conn.; Florence D. Jacobson; 8 months; $11,510

ALBRIGHT COLLEGE, Reading, Pa.; Richard J. Kohlmeyer; 9 months; 6,250

AMERICAN UNIVERSITY; Washington, D.C.; Leo Schubert; 9 months; $27,990
Leo Schubert; 9 months; $2,640

ANDREWS UNIVERSITY, Berrien Springs, Mich.; Harold T. Jones; 9 months; $5,230

ANTIOCH COLLEGE, Yellow Springs, Ohio; James F. Corwin; 10 months; $9,740

ARIZONA STATE UNIVERSITY, Tempe; Lehi T. Smith; 9 months; $7,560
Ernest E. Snyder; 9 months; $13,240
Alan T. Wager; 9 months; $5,930

ARKANSAS STATE COLLEGE, State College; W. W. Nedrow; 9 months; $9,780

AUSTIN PEAY STATE COLLEGE, Clarksville, Tenn.; Haskell C. Phillips; 9 months; $8,460

BALDWIN-WALLACE COLLEGE, Berea, Ohio: Dean L. Robb; 9 months; $5,990

BATES COLLEGE, Lewiston, Maine; Robert M. Chute; 6 months; $5,930

BEMIDJI STATE COLLEGE, Bemidji, Minn.; Paul M. Grabarkewitz; 6 months; $13,760

BOSTON COLLEGE, Chestnut Hill, Mass.: John H. Kinnier; 9 months; $5,520
William G. Guindon; 9 months; $650

BOWLING GREEN STATE UNIVERSITY, Bowling Green, Ohio; W. H. Hall; 9 months; $17,210

BROOKLYN COLLEGE, N.Y., Meyer Jordan; 9 months; $8,780

BROWN UNIVERSITY, Providence, R.I.; Charles B. MacKay; 9 months; $7,160

BUTLER UNIVERSITY, Indianapolis, Ind.; Harry E. Crull; 9 months; $20,850

CALIFORNIA STATE COLLEGE, California, Pa.; A. H. Anderson: 9 months: $13.620

CALVIN COLLEGE, Grand Rapids, Mich.; Carl J. Sinke; 9 months; $11,020

CATHOLIC UNIVERSITY OF PUERTO RICO, Ponce; Rafael Burgos-Macias; 10 months; $9,970

CENTRAL MICHIGAN UNIVERSITY, Mount Pleasant; Wilbur J. Waggoner; 9 months; $18,170

CHICAGO TEACHERS COLLEGE, Ill.; Robert J. Goldberg; 8 months; $1,700

CITY COLLEGE, New York, N.Y.; Sherburne F. Barber; 9 months; $6,380
Alexander Joseph, Bronx Community College; 9 months; $9,400
Chester B. Kremer; 9 months; $11,870

CLARKSON COLLEGE OF TECHNOLOGY, Potsdam, N.Y.; John M. Perry; 9 months; $12,000

COLLEGE OF THE HOLY CROSS, Worcester, Mass.; John W. Flavin; 8 months; $6,030
Robert B. MacDonnell; 9 months; $6,260
Vincent O. McBrien; 9 months; $6,640

COLLEGE OF IDAHO, Caldwell; Boyd Henry; 9 months; $11,130

COLLEGE OF WILLIAM AND MARY, Williamsburg, Va.; Richard W. Copeland; 9 months; $8,850

COLORADO STATE COLLEGE, Greeley; Robert B. Sund; 9 months; $9,350

CONNECTICUT COLLEGE, New London; L. Aileen Hostinsky; 8 months; $7,720

DARTMOUTH COLLEGE, Hanover, N.H.; W. T. Jackson; 6 months; $7,500
Charles J. Lyon; 7 months; $440

DOMINICAN COLLEGE OF SAN RAFAEL, Calif.; Sister Mary Augusta; 8 months; $16,050

DRAKE UNIVERSITY, Des Moines, Iowa; Earle L. Canfield; 9 months; $15,960

DREW UNIVERSITY, Madison, N.J.; Bernard Greenspan; 8 months; $6,440

EARLHAM COLLEGE, Richmond, Ind.; Howard W. Alexander; 9 months; $7,110

EAST CAROLINA COLLEGE, Greenville, N.C.; Frank W. Eller; 9 months; $8,040

EAST TENNESSEE STATE COLLEGE, Johnson City; Lester C. Hartsell; 9 months; $18,130

EAST TEXAS STATE COLLEGE, Commerce; Arthur M. Pullen; 9 months; $6,820
Charles S. Rohrer; 1 year; $150
Charles S. Rohrer; 9 months; $12,820
Charles J. Stuth; 9 months; $9,140

EASTERN MONTANA COLLEGE OF EDUCATION, Billings; Oliver W. Peterson; 3 months; $4,700

EASTERN NAZARENE COLLEGE, Wollaston, Mass.; W. Lloyd Taylor; 9 months; 14,550

EMORY UNIVERSITY, Atlanta, Ga.; Charles T. Lester; 7 months; $13,230

EMORY AND HENRY COLLEGE, Emory, Va.; W. Thomas Graybeal; 9 months; $6,120

EVANSVILLE COLLEGE, Evansville, Ind.; Ralph H. Coleman; 9 months; $4,980

FAIRFIELD UNIVERSITY, Fairfield, Conn.; John A. Barone; 9 months; $14,840

FAIRLEIGH DICKINSON UNIVERSITY, Rutherford, N.J.; Harold Weinberger; 8 months; $9,000

FENN COLLEGE, Cleveland, Ohio; Walter R. Van Voorhis; 8 months; $11,400

FLORIDA INSTITUTE FOR CONTINUING UNIVERSITY STUDIES, Tallahassee; Kenneth P. Kidd, University of Florida, Gainesville; 10 months; $29,450

J. Stanley Marshall, Florida State University; 9 months; $27,880

J. Stanley Marshall, Florida State University; 10 Months; $7,740

J. Stanley Marshall, Florida State University; 10 months; $15,840

Eugene D. Nichols, Florida State University; 10 months; $28,440

G. Ray Noggle, University of Florida, Gainesville; 10 months; $27,370

FORT HAYS KANSAS STATE COLLEGE, Hays; W. Toalson; 9 months; $7,780

FRANKLIN AND MARSHALL COLLEGE, Lancaster, Pa.; John H. Moss; 9 months; $10,450

GEORGE PEABODY COLLEGE FOR TEACHERS, Nashville, Tenn.; J. Houston Banks; 9 months; $7,990

GEORGETOWN UNIVERSITY, Washington, D.C.; M. P. Thekaekara; 9 months; $16,680

GEORGIA SOUTHERN COLLEGE, Statesboro; Richard P. King; 9 months; $6,880

GLASSBORO STATE COLLEGE, Glassboro, N.J.; Clyde W. Hibbs; 9 months; $8,960

Warren G. Roome; 9 months; $13,090

HAMPTON INSTITUTE, Hampton, Va.; Victor H. Fields; 8 months; $14,130

HOLY NAMES COLLEGE, Spokane, Wash.; Sister M. Eugene Gautereaux; 7 months; $12,700

HOWARD PAYNE COLLEGE, Brownwood, Tex.; Dale Maness; 9 months; $8,380

HUMBOLDT STATE COLLEGE FOUNDATION, Arcata, Calif.; Henry S. Tropp; 9 months; $9,260

ILLINOIS INSTITUTE OF TECHNOLOGY, Chicago; Haim Reingold; 9 months; $96,200

Daisy M. Tagliacozzo; 9 months; $9,690

INCARNATE WORD COLLEGE, San Antonio, Tex.; Sister Claude Marie; 9 months; $10,170

Sister Joseph Marie; 9 months; $11,050

INDIANA CENTRAL COLLEGE, Indianapolis; Robert M. Brooker; 9 months; $7,270

INTER AMERICAN UNIVERSITY, San German, Puerto Rico; Ismael Velez; 8 months; $16,370

IONA COLLEGE, New Rochelle, N.Y.; George S. Pappas; 9 months; $8,320

KANSAS STATE COLLEGE OF PITTSBURG; R. G. Smith; 9 months; $19,030

R. G. Smith; 9 months; $9,400

KANSAS STATE TEACHERS COLLEGE, Emporia; Ted Andrews; 9 months; $25,820

KENT STATE UNIVERSITY, Kent, Ohio; Kenneth B. Cummins; 9 months; $8,230

KNOXVILLE COLLEGE, Knoxville, Tenn.; Robert H. Harvey; 8 months; $11,880

LAFAYETTE COLLEGE, Easton, Pa.; Charles W. Saalfrank; 9 months; $7,690

LAKE FOREST COLLEGE, Lake Forest, Ill.; John W. Coutts; 9 months; $8,740

LONG BEACH STATE COLLEGE FOUNDATION, Long Beach, Calif; John J. Baird; 9 months; $11,750

LOUISIANA COLLEGE; Pineville; Henry T. Donohoe; 9 months; $7,910

LOUISIANA STATE UNIVERSITY, Baton Rouge; Dennis M. Nead; 8 months; $10,750

Harry D. Richardson; 9 months; $1,800

LOYOLA UNIVERSITY, New Orleans, La.; F. A. Benedetto; 9 months; $8,560

H. R. Jolley; 8 months; $10,330

John F. Keller; 9 months; $15,330

MADISON COLLEGE, Harrisonburg, Va.; J. Emmert Ikenberry; 9 months; $9,690

MANHATTAN COLLEGE, New York, N.Y.; Luke V. Titone; 9 months; $10,760

Bernard Alfred Welch; 9 months; $12,060

MARSHALL FOUNDATION, INC., Huntington, W. Va.; Harold E. Ward; 9 months; $7,520

MARYLHURST COLLEGE, Marylhurst, Oreg.; Sister M. Loretta Ann; 8 months; $9,750

MARYWOOD COLLEGE, Scranton, Pa.; Sister M. Coleman; 9 months; $3,790

MCNEESE STATE COLLEGE, Lake Charles, La.; S. M. Spencer; 9 months; $10,400

MEMPHIS STATE UNIVERSITY, Memphis, Tenn.; Rayburn W. Johnson; 9 months; $3,000

H. S. Kaltenborn; 8 months; $7,750

F. B. Schirmer; 9 months; $1,600

MILES COLLEGE, Birmingham, Ala.; James S. Sutton; 9 months; $10,830

MILLERSVILLE STATE COLLEGE, Millersville, Pa.; William B. McIlwaine; 9 months; $6,080

MISSISSIPPI COLLEGE, Clinton; Archie H. Germany; 9 months; $16,020

MOUNT MERCY COLLEGE, Pittsburgh, Pa.; William A. Uricchio; 8 months; $7,060

MUNICIPAL UNIVERSITY OF OMAHA, Nebr.; Merle E. Brooks; 9 months; $24,740

MURRAY STATE COLLEGE FOUNDATION, Murray, Ky.; Alfred Wolfson; 9 months; $6,450

NEW YORK UNIVERSITY, N.Y.; Melvin Hausner; 9 months; $30,950

NEWARK COLLEGE OF ENGINEERING RESEARCH FOUNDATION, Newark, N.J.; Herbert Barkan; 9 months; $7,650

Paul O. Hoffman; 9 months; $9,030

Frederick G. Lehman; 9 months; $4,820

NORTH DAKOTA STATE UNIVERSITY, Fargo; Joel W. Broberg; 8 months; $21,130

NORTHEAST MISSOURI STATE COLLEGE, Kirksville; Dean A. Rosebery; 9 months; $15,500

NORTHERN MICHIGAN COLLEGE, Marquette; W. James Merry; 8 months; $10,500

NORTHLAND COLLEGE, Ashland, Wis.; Louis J. Kolonko; 9 months; $4,880

NORTH TEXAS STATE UNIVERSITY, Denton, Tex.; Robert C. Sherman; 8 months; $14,200

NORTHWESTERN STATE COLLEGE, Alva, Okla.; Jerrold J. Burnett; 9 months; $5,900

OHIO STATE UNIVERSITY, Columbus; William R. Riley; 9 months; $11,130

Fred R. Schlessinger; 9 months; $20,660

OREGON STATE UNIVERSITY, Corvallis; Albert R. Poole; 9 months; $4,040

PACE COLLEGE, New York, N.Y.; Edward Ritter; 8 months; $8,900

PENNSYLVANIA STATE UNIVERSITY, University Park; William H. Powers; 10 months; $41,540

PHILADELPHIA COLLEGE OF PHARMACY AND SCIENCE, Pa.; Arthur Osol; 9 months; $560

POLYTECHNIC INSTITUTE OF BROOKLYN, Brooklyn, N.Y.; Seymour Lipschutz, 9 months; $12,750

PORTLAND STATE COLLEGE, Portland, Oreg.; J. Richard Byrne; 8 months; $5,090

PRAIRIE VIEW AGRICULTURAL AND MECHANICAL COLLEGE, Prairie View, Tex.; E. E. O'Banion; 9 months; $16,820

PURDUE UNIVERSITY, Lafayette, Ind.; Clarence J. Goodnight; 9 months; $34,750
M. Wiles Keller; 9 months; $41,920

REED COLLEGE, Portland, Oreg.; Lloyd B. Williams; 9 months; $16,440

RESEARCH FOUNDATION OF STATE UNIVERSITY OF NEW YORK, Albany; Edith R. Schneckenburger, Buffalo; 9 months; $7,820
Daniel W. Snader, College at Fredonia; 9 months; $22,210
Stephen S. Winter, Buffalo; 9 months; $19,450
Emery L. Will, Oneonta; 9 months; $6,060

RHODE ISLAND COLLEGE, Providence; Patrick J. O'Regan; 9 months; $9,160

ROCKFORD COLLEGE, Rockford, Ill.; John A. Schumaker; 9 months; $6,500

ROOSEVELT UNIVERSITY, Chicago, Ill.; Eugene Lieber; 8 months; $8,050

RUTGERS, THE STATE UNIVERSITY, New Brunswick, N.J.; Orhan H. Alisbah, Rutgers College of South Jersey, Camden; 9 months; $11,130
Guido G. Weigend; 9 months; $9,700

SACRAMENTO STATE COLLEGE FOUNDATION, Sacramento, Calif.; Gordon R. Glabe; 9 months; $21,930

ST. CLOUD STATE COLLEGE, St. Cloud, Minn.; Harold Hopkins; 9 months; $5,960

ST. JOSEPH COLLEGE, West Hartford, Conn.; Sister Maria Clare Markham; 9 months; $14,300

ST. LOUIS UNIVERSITY, Mo.; John J. Andrews; 9 months; $7,920

ST. MARTIN'S COLLEGE, Olympia, Wash.; John Raymond; 8 months; $12,210

ST. MARY'S COLLEGE, Winona, Minn.; L. George; 9 months; $2,180

ST. MARY'S DOMINICAN COLLEGE, New Orleans, La.; Sister Mary Albert Kaack; 9 months; $4,000

ST. PETER'S COLLEGE, Jersey City, N.J.; Perry Y. Jackson; 9 months; $7,950
Francis A. Varrichio; 9 months; $9,810

SAN DIEGO STATE COLLEGE FOUNDATION, San Diego, Calif.; D. I. Eidemiller; 10 months; $12,200
Adam Gifford; 9 months; $7,920

SAN FERNANDO VALLEY STATE COLLEGE FOUNDATION, Northridge, Calif.; F. Lynwood Wren; 9 months; $13,820

SAN JOSE STATE COLLEGE FOUNDATION, San Jose, Calif.; Robert E. Arnal; 9 months; $11,120
Max Kramer; 9 months; $19,730
Laurence E. Wilson; 9 months; $14,170

SARAH LAWRENCE COLLEGE, Bronxville, N.Y.; Edward J. Cogan; 8 months; $19,370

SAVANNAH STATE COLLEGE, Savannah, Ga.; Charles Pratt; 9 months; $8,050

SHORTER COLLEGE, Rome, Ga.; Phillip F-C Greear; 9 months; $12,590

SMITH COLLEGE, Northampton, Mass.; Kenneth W. Sherk; 8 months; $23,580

SOUTH CAROLINA STATE COLLEGE, Orangeburg; George W. Hunter; 9 months; $32,260

SOUTHEASTERN STATE COLLEGE, Durant, Okla.; Leslie A. Dwight; 9 months; $5,420

STATE COLLEGE AT SALEM, Mass.; Thomas I. Ryan; 8 months; $14,690

STATE UNIVERSITY OF IOWA, Iowa City; Robert E. Yager; 9 months; $16,750

STATE UNIVERSITY OF SOUTH DAKOTA, Vermillion; Theodore L. Reid; 9 months; $28,770
Theodore L. Reid; 9 months; $13,440

STEVENS INSTITUTE OF TECHNOLOGY, Hoboken, N.J.; Robert H. Seavy; 9 months; $13,950

STONEHILL COLLEGE, North Easton, Mass.; Thomas E. Lockary; 8 months; $11,600

TALLADEGA COLLEGE, Talladega, Ala.; Cohen T. Simpson; 7 months; $14,620

TEACHERS COLLEGE, COLUMBIA UNIVERSITY, New York, N.Y.; Howard F. Fehr; 8 months; $12,880

TEMPLE UNIVERSITY, Philadelphia, Pa.; Leonard Muldawer; 9 months; $19,000

TENNESSEE AGRICULTURAL AND INDUSTRIAL STATE UNIVERSITY, Nashville; William N. Jackson; 9 months; $12,820

TENNESSEE POLYTECHNIC INSTITUTE, Cookeville; G. B. Pennebaker; 9 months; $6,930

TEXAS WOMAN'S UNIVERSITY, Denton; Harlan C. Miller; 9 months; $6,780

TEXAS COLLEGE OF ARTS AND INDUSTRIES, Kingsville; Olan E. Kruse; 9 months; $6,860

TRENTON STATE COLLEGE, Trenton, N.J.; Victor L. Crowell; 10 months; $10,620

TRINITY UNIVERSITY, San Antonio, Tex.; Donald E. McGannon, Jr.; 9 months; $6,030

TUSKEGEE INSTITUTE, Tuskegee Institute, Ala.; B. D. Mayberry; 9 months; $3,300

UNION COLLEGE AND UNIVERSITY, Schenectady, N.Y.; John R. Haines; 9 months; $17,480

UNIVERSITY OF AKRON, Ohio; Mabel M. Riedinger; 9 months; $8,900
Mabel M. Riedinger; 9 months; $9,820

UNIVERSITY OF ARIZONA, Tucson; Ulrich H. Bents; 30 months; $400
Robert W. Hoshaw; 9 months; $15,310
Arthur H. Steinbrenner; 9 months; $6,250

UNIVERSITY OF ARKANSAS, Fayetteville; William R. Orton; 9 months; $27,990

UNIVERSITY OF CALIFORNIA, Berkeley; George Jura; 9 months; $2,550
Lola S. Kelly; 9 months; $2,980
A. L. McClellan; 9 months; $10,240
Richard C. Strohman; 9 months; $9,900
Clifford Bell, Los Angeles; 8 months; $30,830

UNIVERSITY OF CHATTANOOGA, Tenn.; Kenneth A. Fry; 9 months; $12,300

UNIVERSITY OF CHICAGO, Ill.; Alfred L. Putnam; 6 months; $2,100

UNIVERSITY OF CINCINNATI, Ohio; I. A. Barnett; 9 months; $16,370

UNIVERSITY OF COLORADO, Boulder; William E. Briggs; 9 months; $11,260

UNIVERSITY OF CONNECTICUT, Storrs; David J. Blick; 9 months; $14,570

UNIVERSITY OF DELAWARE, Newark; G. Cuthbert Webber; 9 months; $6,870

UNIVERSITY OF DETROIT, Mich.; Lyle E. Mehlenbacher; 9 months; $14,530

UNIVERSITY OF GEORGIA, Athens; Charles L. Koelsche; 9 months; $16,800

UNIVERSITY OF HAWAII, Honolulu; Iwao Miyake; 6 months; $18,070

UNIVERSITY OF KANSAS, Lawrence; William M. Balfour; 9 months; $7,730

UNIVERSITY OF LOUISVILLE, Ky.; Thomas H. Crawford; 9 months; $5,780
W. H. Spragens; 9 months; $5,420

UNIVERSITY OF MARYLAND, College Park; Robert W. Detenbeck; 9 months; $17,520
Stanley B. Jackson; 9 months; $12,560.

UNIVERSITY OF MICHIGAN, Ann Arbor; Charles Brumfiel; 9 months; $16,460

UNIVERSITY OF MINNESOTA, Minneapolis; Theron O. Odlaug, Duluth; 6 months; $4,540

UNIVERSITY OF MISSOURI, Columbia; Harold Q. Fuller, Rolla; 8 months; $9,270

UNIVERSITY OF NEVADA, Reno; E. M. Beesley; 10 months; $19,830

UNIVERSITY OF NORTH CAROLINA, Chapel Hill; Joseph W. Straley; 9 months; $12,490
William A. White; 9 months; $8,980
Hollis J. Rogers, Greensboro; 9 months; $420
Hollis J. Rogers, Greensboro; 9 months; $23,110
H. V. Park, Raleigh; 9 months; $7,640

UNIVERSITY OF NORTH DAKOTA, Grand Forks; Walter L. Moore; 9 months; $12,380
William D. Schmid; 9 months; $13,390

UNIVERSITY OF OKLAHOMA, Norman; Doyle E. Anderegg; 8 months; $15,720
Richard V. Andree; 10 months; $33,270
Harold V. Huneke; 10 months; $7,390

UNIVERSITY OF PENNSYLVANIA, Philadelphia; J. F. Hazel; 10 months; $12,810

UNIVERSITY OF PITTSBURGH, Pa.; Peter Gray; 8 months; $8,050
John C. Knipp; 8 months; $9,060

UNIVERSITY OF PUERTO RICO, Rio Piedras; Augusto Bobonis; 9 months; $14,970
Mariano Garcia; 9 months; $6,100
Francisco Garriga; 9 months; $14,000

UNIVERSITY OF REDLANDS, Calif.; Paul R. Gleason; 8 months; $11,270

UNIVERSITY OF ROCHESTER, N.Y.; John J. Montean; 9 months; $10,950

UNIVERSITY OF SAN FRANCISCO, Calif.; Edward J. Farrell; 10 months; $10,070

UNIVERSITY OF SCRANTON, Pa.; Joseph A. Rock; 9 months; $21,620

UNIVERSITY OF SOUTHERN CALIFORNIA, Los Angeles; Paul A. White; 9 months; $22,810

UNIVERSITY OF SOUTHERN MISSISSIPPI, Hattiesburg; Virginia Felder; 9 months; $1,030
Virginia Felder; 9 months; $11,470

UNIVERSITY OF SOUTHWESTERN LOUISIANA, Lafayette; James R. Oliver; 9 months; $10,750
James R. Oliver; 9 months; $7,090
James R. Oliver; 9 months; $6,820
James R. Oliver; 9 months; $13,730

UNIVERSITY OF UTAH, Salt Lake City; E. Allan Davis; 9 months; $8,390

UNIVERSITY OF VIRGINIA, Charlottesville; James W. Cole, Jr.; 9 months; $33,230
William C. Lowry; 9 months; $10,440

UNIVERSITY OF WASHINGTON, Seattle; Roy Dubisch; 6 months; $5,050
Roy Dubisch; 3 months; $3,530

UNIVERSITY OF WISCONSIN, Madison; Peter J. Salamun, Milwaukee; 10 months; $6,860
Marion B. Smith; 7 months; $36,520

UNIVERSITY OF WYOMING, Laramie; W. Norman Smith; 9 months; $1,500

UTAH STATE UNIVERSITY, Logan; Marden Broadbent, Provo; 8 months; $5,950
Neville C. Hunsaker; 9 months; $11,630

VILLANOVA UNIVERSITY, Villanova, Pa.; J. Bernard Hubbert; 9 months; $25,350

WAKE FOREST COLLEGE, Winston-Salem, N.C.; Ben M. Seelbinder; 9 months; $7,520

WAYNE STATE UNIVERSITY, Detroit, Mich.; William V. Mayer; 10 months; $8,020

WEST CHESTER STATE COLLEGE, West Chester, Pa.; Albert E. Filano; 9 months; $14,500

WESTERN ILLINOIS UNIVERSITY, Macomb; H. William Crall; 9 months; $5,740

WESTERN MICHIGAN UNIVERSITY, Kalamazoo; George G. Mallinson; 9 months; $13,200

WESTERN RESERVE UNIVERSITY, Cleveland, Ohio; Stefan Machlup; 9 months; $9,050
Ralph H. Petrucci; 9 months; $9,840

WEST VIRGINIA UNIVERSITY, Morgantown; I. Dee Peters; 9 months; $35,940

YESHIVA UNIVERSITY, New York, N.Y.; Abe Gelbart; 9 months; $89,500

YOUNGSTOWN UNIVERSITY, Youngstown, Ohio; Bernard J. Yozwiak; 9 months; $11,750

PUBLIC UNDERSTANDING OF SCIENCE

AMERICAN ACADEMY OF ARTS AND SCIENCES, Boston, Mass.; Stephen R. Graubard; *A Study of the Relationships Among the Natural Sciences;* 1 year; $29,850

AMERICAN INSTITUTE OF PHYSICS, New York, N.Y.; Elmer Hutchisson; *A New Public Information Service to Promote Scientific Understanding;* 3 years; $65,880
Elmer Hutchisson; *Three Seminars for Science Writers in Rapidly Advancing Areas of Physics;* 1 year; $15,530

ASPEN INSTITUTE FOR HUMANISTIC STUDIES, Aspen, Colo.; Robert W. Craig; *Four Seminars on the Public Understanding of the Role of Science in Society;* 1 year; $42,210

CITY UNIVERSITY OF NEW YORK, New York, N.Y.; Mina Rees; *Filming of a New Educational Television Series, Toward the Unknown;* 2 months; $18,170

COLORADO STATE UNIVERSITY RESEARCH FOUNDATION, Fort Collins; Herman M. Weisman; *Science News Writing Seminar for Rural Community Press;* 6 months; $13,210

PACIFIC SCIENCE CENTER FOUNDATION, Seattle, Wash.; Joseph L. McCarthy: *The Pa-*

cific Science Center Project; 17 months; $100,000

STATE OF WEST VIRGINIA—DEPARTMENT OF ARCHIVES AND HISTORY, Charleston; Leonard P. Stavisky; *Preparation of a Radio Astronomy Exhibit;* 1 year; $65,000

UNIVERSITY OF OKLAHOMA, Norman; J. Teague Self; *Comprehensive Program for the Development of Public Understanding in Science;* 18 months; $14,710

UNIVERSITY OF TENNESSEE, Knoxville; Alvin H. Nielsen; *A Symposium on Present Frontiers in Physics;* 6 months; $1,200

WEST VIRGINIA UNIVERSITY, Morgantown; Guy H. Stewart; *Symposium on Health Sciences Reporting;* 5 months; $5,140

WESTERN RESERVE UNIVERSITY, Cleveland, Ohio; William M. Heston; *Symposium on the Living State;* 5 months; $20,020

RESEARCH PARTICIPATION FOR COLLEGE TEACHERS PROGRAM

AGRICULTURAL AND MECHANICAL COLLEGE OF TEXAS, College Station; Jesse B. Coon; 3 months; $10,760

BOSTON UNIVERSITY, Boston, Mass.; Lowell V. Coulter; 2 months; $21,500

BRANDEIS UNIVERSITY, Waltham, Mass.; Thomas R. Tuttle, Jr.; 3 months; $11,960

CASE INSTITUTE OF TECHNOLOGY, Cleveland, Ohio; J. Reid Shelton; 2 months; $16,910

FLORIDA STATE UNIVERSITY, Tallahassee; B. B. Scarborough; 2 months; $16,910

FRANKLIN INSTITUTE, Philadelphia, Pa.; W. E. Danforth, Swarthmore; 10 months; $7,120

GEORGIA INSTITUTE OF TECHNOLOGY, Atlanta; James A. Stanfield; 2 months; $14,250

ILLINOIS INSTITUTE OF TECHNOLOGY, Chicago; Werner W. Brandt; 3 months; $22,785

INDIANA UNIVERSITY FOUNDATION, Bloomington; Harry G. Day; 2 months; $10,160
L. S. McClung; 2 months; $9,145
John B. Patton; 2 months; $11,420

IOWA STATE UNIVERSITY, Ames; C. C. Bowen; 2 months; $25,600

KANSAS STATE UNIVERSITY, Manhattan; Jack L. Lambert; 2 months; $20,745

LOUISIANA STATE UNIVERSITY, Baton Rouge; Robert V. Nauman; 2 months; $30,500
Dorr C. Ralph; 2 months; $13,860

NEW MEXICO HIGHLANDS UNIVERSITY, Las Vegas; James P. Zietlow; 11 months; $26,250

NORTH DAKOTA STATE UNIVFRSITY, Fargo; J. A. Callenbach; 2 months; $6,230
J. A. Callenbach; 2 months; $10,250
J. A. Callenbach; 2 months; $2,010

OKLAHOMA STATE UNIVERSITY, Stillwater; Glenn W. Todd; 2 months; $15,000

OREGON STATE UNIVERSITY, Corvallis; E. C. Gilbert; 2 months; $33,250

PURDUE UNIVERSITY, Lafayette, Ind.; Glenn B. Bergeson; 3 months; $13,160
Irwin Tessman; 2 months; $21,000

RESEARCH FOUNDATION, OKLAHOMA STATE UNIVERSITY, Stillwater; Troy C. Dorris; 3 months; $5,980
Marvin T. Edmison; 2 months; $16,000

RESEARCH FOUNDATION OF STATE UNIVERSITY OF NEW YORK, Albany; Edwin C. Jahn, Syracuse; 2 months; $7,500
Howard Tieckelmann, Buffalo; 3 months; $15,850

ROSEWELL PARK MEMORIAL INSTITUTE, Buffalo, N.Y.; Edwin A. Mirand; 3 months; $40,770

SOUTH DAKOTA STATE COLLEGE, Brookings; A. W. Halverson; 2 months; $2,500

STANFORD UNIVERSITY, Stanford, Calif.; Willis W. Harman; 3 months; $31,080

STATE UNIVERSITY OF SOUTH DAKOTA, Vermillion; George P. Scott; 2 months; $4,735
George P. Scott; 2 months; $4,735

SYRACUSE UNIVERSITY, Syracuse, N.Y.; James A. Luker; 3 months; $9,570

UNIVERSITY OF CALIFORNIA, Berkeley; Robert A. Rice; 2 months; $24,250

UNIVERSITY OF COLORADO, Boulder; Albert A. Bartlett; 1 year; $20,500
Bert M. Tolbert; 1 year; $26,750

UNIVERSITY OF DELAWARE, Newark; Leonard Skolnick; 2 months; $5,000

UNIVERSITY OF FLORIDA, Gainesville; Stanley S. Ballard; 2 months; $16,000
Wallace S. Brey, Jr.; 2 months; $16,000

UNIVERSITY OF GEORGIA, Athens; W. J. Payne; 2 months; $10,000

UNIVERSITY OF ILLINOIS, Urbana; F. R. Steggerda; 2 months; $17,680

UNIVERSITY OF MARYLAND, College Park; John S. Toll; 2 months; $26,500

UNIVERSITY OF MASSACHUSETTS, Amherst; Edward L. Davis; 2 months; $7,660

UNIVERSITY OF MICHIGAN, Ann Arbor; Robert Isaacson; 2 months; $27,500

UNIVERSITY OF MISSISSIPPI, University; Russell W. Maatman; 2 months; $21,305

UNIVERSITY OF NORTH CAROLINA, Chapel Hill; Homer C. Folks, Raleigh; 3 months; $47,250
T. Ewald Maki, Raleigh; 2 months; $7,500

UNIVERSITY OF NORTH DAKOTA, Grand Forks; A. W. Johnson; 2 months; $3,620

UNIVERSITY OF OKLAHOMA, Norman; Richard V. Andree; 2 months; $40,000
H. H. Bliss; 2 months; $23,675
Carl D. Riggs; 2 months; $10,050

UNIVERSITY OF TENNESSEE, Knoxville; William E. Bull; 3 months; $28,825

UNIVERSITY OF TEXAS, Austin; Harold C. Bold; 2 months; $17,330

UNIVERSITY OF WISCONSIN, Madison; Robert W. Finley; 2 months; $22,550

VIRGINIA INSTITUTE OF MARINE SCIENCE, Gloucester Point; Robert S. Bailey; 3 months; $22,430

RESEARCH PARTICIPATION FOR HIGH SCHOOL TEACHERS PROGRAM

BOYCE THOMPSON INSTITUTE FOR PLANT RESEARCH INCORPORATED, Yonkers, N.Y.; Lawrence P. Miller; 1 year; $12,430

CITY COLLEGE, New York, N.Y.; Chester B. Kremer; 11 months; $16,340

CLARK UNIVERSITY, Worcester, Mass.; Roy S. Anderson; 11 months; $7,350

COLORADO STATE UNIVERSITY RESEARCH FOUNDATION, Fort Collins; Merle G. Payne; 11 months; $27,400

COLLEGE OF WOOSTER, Wooster, Ohio; John D. Reinheimer; 1 year; $9,160

GEORGE WASHINGTON CARVER FOUNDATION, Tuskegee Institute, Ala.; Clarence T. Mason; 2 months; $11,020

ILLINOIS INSTITUTE OF TECHNOLOGY, Chicago; Werner W. Brandt; 12 months; $16,310

INDIANA UNIVERSITY FOUNDATION, Bloomington; L. S. McClung; 11 months; $8,550

IOWA STATE UNIVERSITY, Ames; C. C. Bowen; 11 months; $31,300

KANSAS STATE TEACHERS COLLEGE, Emporia; Ted F. Andrews; 1 year; $23,960

MARQUETTE UNIVERSITY, Milwaukee, Wis.; Raymond A. Bournique; 2 months; $7,720

NEWARK COLLEGE OF ENGINEERING RESEARCH FOUNDATION, Newark, N.J.; James A. Bradley; 11 months; $19,800

NEW MEXICO HIGHLANDS UNIVERSITY, Las Vegas; E. Gerald Meyer; 11 months; $12,000

NEW YORK UNIVERSITY, New York; John P. Nielsen; 2 months; $9,400

NORTH DAKOTA STATE UNIVERSITY, Fargo; J. A. Callenbach; 11 months; $23,660

Ray L. McDonald; 2 months; $5,790

NORTH TEXAS STATE UNIVERSITY, Denton; Robert C. Sherman; 12 months; $22,270

PRAIRIE VIEW AGRICULTURAL AND MECHANICAL COLLEGE, Prairie View, Tex.; E. E. O'Banion; 12 months; $20,235

RENSSELAER POLYTECHNIC INSTITUTE, Troy, N.Y.; Samuel C. Wait, Jr.; 2 months; $19,300

ST. JOHN'S UNIVERSITY, Jamaica, N.Y., Paul T. Medici; 2 months; $21,230

STANFORD UNIVERSITY, Stanford, Calif.; O. Cutler Shepard; 11 months; $16,440

STATE UNIVERSITY OF SOUTH DAKOTA, Vermillion; George P. Scott; 1 year; $22,650

TEXAS WOMEN'S UNIVERSITY, Denton; Lyman R. Caswell; 11 months; $6,340

U.S. NAVY ELECTRONICS LABORATORY, San Diego, Calif.; R. W. Young; 11 months; $14,500

UNIVERSITY OF ARIZONA, Tucson; Jefferson C. Davis; 11 months; $26,800

UNIVERSITY OF CALIFORNIA, Berkeley; E. R. Parker; 11 months; $41,050

R. L. Thornton; 2 months; $42,000

UNIVERSITY OF HAWAII, Honolulu; Harry Zeitlin; 2 months; $11,850

UNIVERSITY OF MISSISSIPPI, University; Barton Milligan; 11 months; $10,475

UNIVERSITY OF NORTH DAKOTA, Grand Forks; Francis A. Jacobs; 1 year; $3,920

UNIVERSITY OF OKLAHOMA, Norman; Doyle E. Anderegg; 11 months; $17,240

Carl D. Riggs; 11 months; $15,230

UNIVERSITY OF THE PACIFIC, Stockton, Calif.; Joel W. Hedgpeth; 1 year; $13,420

UNIVERSITY OF RHODE ISLAND, Kingston; Eugene C. Winslow; 2 months; $14,240

UNIVERSITY OF VERMONT, Burlington; Howard M. Smith, Jr.; 11 months; $12,530

UNIVERSITY OF WISCONSIN, Madison; Donald H. Bucklin; 11 months; $45,800

WAYNE STATE UNIVERSITY, Detroit, Mich.; John P. Oliver; 2 months; $10,860

SCIENTIFIC MANPOWER STUDIES

AMERICAN INSTITUTE OF PHYSICS, New York, N.Y.; Elmer Hutchisson; *Analysis of Education and Manpower Data in Physics;* 1 year; $23,580

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, Washington, D.C.; Ralph C. M. Flynt; *1962 Survey of Students Enrolled for Advanced Degrees;* 1 year; $10,000

Herbert H. Rosenberg; *Study of 1964 Graduating Classes;* 18 months; $50,000

Ralph C. M. Flynt; *Status and Career Orientation of College Faculty 1962–63;* 15 months; $20,800

MIDDLE EAST INSTITUTE, Washington, D.C.; Fahim I. Qubain; *The Employment and Training of Scientists and Engineers in the Middle East;* 27 months; $17,675

NATIONAL SCIENCE TEACHERS ASSOCIATION, Washington, D.C., Robert H. Carleton; *1963–64 Registry of High School Science and Mathematics Teachers;* 12 months; $47,400

UNIVERSITY OF MARYLAND, College Park; Howard Laster; *Scientific and Technical Manpower Resources in Space Sciences and Technology in the U.S.S.R.—A Pilot Project;* 1 year; $23,700

STATE ACADEMIES OF SCIENCE PROGRAM

ALABAMA ACADEMY OF SCIENCE, Mobile; Ruric E. Wheeler, Howard College, Birmingham; 9 months; $11,500

ARIZONA ACADEMY OF SCIENCE, Flagstaff; David T. Smith, Tucson Public Schools; 9 months; $3,305

Chester R. Leathers, Arizona State University, Tempe; 9 months; $15,155

ARKANSAS ACADEMY OF SCIENCE, Conway; William R. Orton, University of Arkansas, Fayetteville; 9 months; $6,060

CHICAGO ACADEMY OF SCIENCES, Ill.; William J. Beecher; 9 months; $8,000

CITY UNIVERSITY OF NEW YORK, New York, N.Y.; James N. Eastham, Queensborough Community College, Bayside; 9 months; $6,990

COLORADO-WYOMING ACADEMY OF SCIENCE, Greeley, Colo.; Richard G. Beidleman, Colorado College, Colorado Springs; 9 months; $4,420

ENGINEERING AND TECHNICAL SOCIETIES COUNCIL OF DELAWARE VALLEY, Philadelphia, Pa.; F. Reinitz; 9 months; $2,000

FLORIDA ACADEMY OF SCIENCES, Coral Gables; Paul A. Vestal, Rollins College, Winter Park; 9 months; $13,000

FRANKLIN INSTITUTE, Philadelphia, Pa.; Robert W. Neathery; 9 months; $2,485

HAWAIIAN ACADEMY OF SCIENCE, Honolulu; Albert B. Carr, University of Hawaii, Honolulu; 9 months; $4,220

Wallace G. Sanford, Pineapple Research Institute, Honolulu; 9 months; $15,065

IDAHO ACADEMY OF SCIENCE, Moscow; Elmer K. Raunio, University of Idaho, Moscow; 9 months; $13,135

INDIANA ACADEMY OF SCIENCE, Bloomington, William G. Kessel, Indiana State College, Terre Haute; 9 months; $14,295

IOWA ACADEMY OF SCIENCE, INC., Pella; T. R. Porter, State University of Iowa, Iowa City; 9 months; $20,370

KANSAS SENIOR ACADEMY OF SCIENCE, Manhattan; Margaret Parker, Kansas State College, Pittsburg; 9 months; $17,000

LOUISIANA STATE UNIVERSITY, Baton Rouge; Harry J. Bennett; 9 months; $6,410

Harry J. Bennett; 9 months; $13,900

MARYLAND ACADEMY OF SCIENCES, Baltimore; Nigel O'C. Wolff; 9 months; $3,760

Nigel O'C. Wolff; 9 months; $16,110

Nigel O'C. Wolff; 9 months; $2,475

Nigel O'C. Wolff; 9 months; $2,740

MICHIGAN ACADEMY OF SCIENCE, ARTS AND LETTERS, Bloomfield Hills; Wayne Taylor, Michigan State University, East Lansing; 9 months; $5,235

Wayne Taylor, Michigan State University, East Lansing; 9 months; $17,800

MINNESOTA ACADEMY OF SCIENCE, Minneapolis; Robert L. Evans; 9 months; $6,785

Robert L. Evans; 9 months; $2,530

MISSISSIPPI ACADEMY OF SCIENCE, University; Clyde Q. Sheely, Mississippi State University, State College; 9 months; $22,770

MONTANA ACADEMY OF SCIENCES, Bozeman; John P. Robinson, Missoula; 9 months; $7,665

MUSEUM OF ART, SCIENCE AND INDUSTRY, Bridgeport, Conn.; Augusta Mendel; 15 months; $9,845

NEBRASKA ACADEMY OF SCIENCES, INC., Lincoln; James A. Rutledge, University of Nebraska, Lincoln; 9 months; $13,950

NEW MEXICO ACADEMY OF SCIENCE, Albuquerque; Joseph A. Schufle, New Mexico Institute of Mining and Technology, Socorro; 9 months; $10,045

NORTH CAROLINA ACADEMY OF SCIENCE, Durham; Grover C. Miller, North Carolina State College, Raleigh; 9 months; $7,375

Herbert E. Speece, North Carolina State College, Raleigh; 17 months; $11,180

NORTHERN NEW ENGLAND ACADEMY OF SCIENCE, Hanover, N.H.; Allen L. King, Dartmouth College, Hanover; 9 months; $13,500

Howard I. Wagner, New Hampshire Department of Education; 9 months; $4,000

OHIO ACADEMY OF SCIENCE, Cincinnati; William A. Manuel, Ohio Wesleyan University, Delaware; 9 months; $26,000

OKLAHOMA ACADEMY OF SCIENCE, Tulsa; Robert C. Fite, Oklahoma State University, Stillwater; 9 months; $6,265

J. Teague Self, University of Oklahoma, Norman; 9 months; $12,290

J. Teague Self, University of Oklahoma, Norman; 9 months; $1,035

OREGON ACADEMY OF SCIENCE, Corvallis; John T. Van Bruggen, University of Oregon Medical School, Portland; 9 months; $7,935

PENNSYLVANIA ACADEMY OF SCIENCE, University Park; Charles L. Bikle, Milton Hershey School, Hershey, Pa.; 9 months; $7,990

Albert F. Eiss, Department of Public Instruction, Harrisburg, Pa.; 9 months; $4,505

SOUTH DAKOTA ACADEMY OF SCIENCE, Rapid City; Theodore Van Bruggen, State University of South Dakota, Vermillion; 9 months; $3,040

Theodore Van Bruggen, State University of South Dakota, Vermillion; 9 months; $1,940

Theodore Van Bruggen, State University of South Dakota, Vermillion; 9 months; $2,945

Theodore Van Bruggen, State University of South Dakota, Vermillion; 9 months; $9,540

TENNESSEE ACADEMY OF SCIENCE, Martin; Myron S. McCay, University of Chattanooga; 9 months; $10,505

Albert L. Myers, Carson-Newman College, Jefferson City; 9 months; $4,650

William R. Rusk, University of Tennessee, Knoxville; 9 months; $12,530

TEXAS ACADEMY OF SCIENCE, Galveston; Charles LaMotte, A & M College of Texas, College Station; 9 months; $10,465

Addison E. Lee, University of Texas, Austin; 9 months; $23,295

UNIVERSITY OF MISSOURI, Columbia, Clayton H. Johnson; 9 months; $10,900

UNIVERSITY OF PUERTO RICO, Rio Piedras; Herminio Lugo Lugo; 9 months; $20,355

UTAH ACADEMY OF SCIENCES, ARTS AND LETTERS, Salt Lake City; Orson Whitney Young, Weber College, Ogden; 9 months; $14,720

VIRGINIA JUNIOR ACADEMY OF SCIENCE, Richmond; William W. Scott, Virginia Polytechnic Institute, Blacksburg; 9 months; $9,725

WASHINGTON ACADEMY OF SCIENCES, Washington, D.C.; John K. Taylor, National Bureau of Standards, Washington; 9 months; $6,990

John K. Taylor, National Bureau of Standards, Washington; 9 months; $900

John K. Taylor, National Bureau of Standards, Washington; 9 months; $7,985

WEST VIRGINIA ACADEMY OF SCIENCE, Bethany; Arthur B. Gould, West Virginia Wesleyan College, Buckhannon; 9 months; $6,100

SUMMER CONFERENCES FOR COLLEGE TEACHERS

AMERICAN UNIVERSITY, Washington, D.C.; Matthew F. Norton; 14 days; $16,100

CARLETON COLLEGE, Northfield, Minn; Kenneth W. Wegner; 25 days; $16,475

COLORADO STATE UNIVERSITY, Fort Collins; Ferdinand Baer; 1 month; $19,400

COLORADO STATE UNIVERSITY RESEARCH FOUNDATION, Fort Collins; Donald R. Wood; 1 month; $15,185

DARTMOUTH COLLEGE, Hanover, N.H.; Allen L. King; 20 days; $18,000

DUKE UNIVERSITY, Durham, N.C.; F. John Vernberg, Beaufort; 9 days; $10,200

INSTITUTE FOR PAPER CHEMISTRY, Appleton, Wis.; Elwood O. Dillingham; 12 days; $13,800

MARQUETTE UNIVERSITY, Milwaukee, Wis.; John E. Kelley; 19 days; $16,600

MICHIGAN COLLEGE OF MINING AND TECHNOLOGY, Houghton; Kenneth M. McMillin; 19 days; $7,600
James M. Neilson; 18 days; $19,500

NEW MEXICO HIGHLANDS UNIVERSITY, Las Vegas; M. Gordon Howat; 12 days; $7,800

NEW MEXICO STATE UNIVERSITY, University Park; J. W. Clark; 24 days; $24,700

NORTHWESTERN UNIVERSITY, Evanston, Ill.; William L. Garrison; 14 days; $15,900

OHIO STATE UNIVERSITY, Columbus; Devon W. Meek; 12 days; $14,800

OHIO WESLEYAN UNIVERSITY, Delaware; Thomas S. Oey; 12 days; $20,800

POMONA COLLEGE, Claremont, Calif.; John E. Quinlan; 12 days; $12,200

RUTGERS, THE STATE UNIVERSITY, New Brunswick, N.J.; Benjamin H. Davis; 13 days; $14,900

SETON HALL UNIVERSITY, South Orange, N.J.; Richard F. Gabriel; 20 days; $18,500

SOUTHERN METHODIST UNIVERSITY, Dallas, Tex.; Joe P. Harris, Jr.; 20 days; $15,700

STEVENS INSTITUTE OF TECHNOLOGY, Hoboken, N.J.; Theodore Gela; 19 days; $12,700

TUFTS UNIVERSITY, Medford, Mass.; M. Kent Wilson; 12 days; $13,480

UNIVERSITY OF ARIZONA, Tucson; Donald L. Webb; 19 days; $17,985

UNIVERSITY OF ARKANSAS, Fayetteville; William R. Orton; 20 days; $17,400

UNIVERSITY OF COLORADO, Boulder; Malcolm Correll; 26 days; $24,000

UNIVERSITY OF ILLINOIS, Urbana; Howard V. Malmstadt; 21 days; $24,800

UNIVERSITY OF MIAMI, Coral Gables, Fla.; Emmet F. Low, Jr.; 26 days; $15,700

UNIVERSITY OF NORTH CAROLINA, Chapel Hill; Victor A. Greulach; 19 days; $15,400

UNIVERSITY OF OKLAHOMA, Norman; Richard V. Andree; 27 days; $25,800

UNIVERSITY OF PUERTO RICO, Rio Piedras; Herminio Lugo Lugo; 1 month; $18,888

UNIVERSITY OF SOUTHERN CALIFORNIA, Los Angeles; Robert D. Vold; 16 days; $16,440

UNIVERSITY OF SOUTHWESTERN LOUISIANA, Lafayette; James R. Oliver; 27 days; $23,700

UNIVERSITY OF VERMONT, Burlington; Clinton D. Cook; 12 days; $12,700

UNIVERSITY OF WASHINGTON, Seattle; W. Ryland Hill; 5 days; $5,975

VANDERBILT UNIVERSITY, Nashville, Tenn.; B. F. Bryant; 24 days; $16,400

WAYNE STATE UNIVERSITY, Detroit, Mich.; Willard H. Parsons; 20 days; $21,800

SUMMER INSTITUTES FOR COLLEGE TEACHERS

AGRICULTURAL AND MECHANICAL COLLEGE OF TEXAS, College Station; J. H. Caddess; 9 months; $53,300
Robert G. Cochran; 2 months; $17,400
Bill C. Moore; 2 months; $24,000
J. G. Potter; 3 months; $42,600

AMERICAN UNIVERSITY, Washington, D.C.; Leo Schubert; 2 months; $51,105

AUBURN UNIVERSITY, Auburn, Ala.; L. P. Burton; 3 months; $34,750

ARIZONA STATE UNIVERSITY, Tempe; Robert L. Burgess; 2 months; $39,900

BELOIT COLLEGE, Beloit, Wis.; Sumner C. Hayward; 2 months; $35,010

BOWLING GREEN STATE UNIVERSITY, Bowling Green, Ohio; John R. Coash; 2 months; $41,600

CLAREMONT GRADUATE SCHOOL, Claremont, Calif.; S. Leonard Dart; 2 months; $30,568

COLORADO STATE UNIVERSITY RESEARCH FOUNDATION, Fort Collins; Milton E. Bender; 2 months; $36,300

DUKE UNIVERSITY, Durham, N.C.; F. John Vernberg; 1 month; $15,120

EMORY UNIVERSITY, Atlanta, Ga.; William H. Jones; 2 months; $43,300

HOFSTRA COLLEGE, Hempstead, N.Y.; Harold E. Clearman; 2 months; $12,200

LOUISIANA STATE UNIVERSITY, Baton Rouge; Robert V. Nauman; 2 months; $17,300
Harry D. Richardson; 2 months; $25,500

MICHIGAN COLLEGE OF MINING AND TECHNOLOGY, Houghton; Kenneth M. McMillin; 3 months; $36,700

NEW MEXICO HIGHLANDS UNIVERSITY, Las Vegas; James K. Koehler; 2 months; $29,225

NEW YORK UNIVERSITY, New York; Joseph D. Gettler; 2 months; $44,800.

OAK RIDGE INSTITUTE OF NUCLEAR STUDIES, Oak Ridge, Tenn.; Ralph T. Overman; 2 months; $17,000
Ralph T. Overman; 2 months; $17,600
Ralph T. Overman; 2 months; $19,200
Ralph T. Overman; 1 month; $6,100

OHIO STATE UNIVERSITY, Columbus; William R. Riley; 2 months; $34,500

OKLAHOMA STATE UNIVERSITY, Stillwater; J. H. Boggs; 2 months; $58,400
Jan J. Tuma; 2 months; $59,300

OREGON STATE UNIVERSITY, Corvallis; A. V. Logan; 2 months; $450

PENNSYLVANIA STATE UNIVERSITY, University Park; B. W. Niebel; 1 month; $38,500
Martin W. Schein; 2 months; $45,400

RENSSELAER POLYTECHNIC INSTITUTE, Troy, N.Y.; V. Lawrence Parsegian; 2 months; $22,800
Frank A. Valente; 2 months; $19,000

RUTGERS, THE STATE UNIVERSITY, New Brunswick, N.J.; Joshua Barlaz; 2 months; $58,600

SAN JOSE STATE COLLEGE FOUNDATION, San Jose, Calif.; Marion T. Bird; 2 months; $40,150

STEVENS INSTITUTE OF TECHNOLOGY, Hoboken, N.J.; Robert H. Seavy; 2 months; $42,100

SYRACUSE UNIVERSITY, Syracuse, N.Y.; M. W. Jennison; 2 months; $14,500

TEXAS WOMAN'S UNIVERSITY, Denton; Helen A. Ludeman; 2 months; $19,000

TUFTS UNIVERSITY, Medford, Mass.; M. Kent Wilson; 2 months; $25,300

TULANE UNIVERSITY, New Orleans, La.; John K. Hampton, Jr.; 2 months; $19,000

UNIVERSITY OF CALIFORNIA, Berkeley; George Jura; 2 months; $22,800

Daniel J. Crowley, Davis; 2 months; $43,900

E. Ward Cheney, Los Angeles; 2 months; $70,200

University of Colorado, Boulder; James Chinn; 3 months; $59,000

John Greenway; 3 months; $69,509

B. E. Lauer; 2 months; $53,800

University of Georgia, Athens; John Jewett; 3 months; $30,950

University of Houston, Tex.; Herbert H. Curry; 2 months; $52,800

University of Illinois, Urbana; Joseph Landin; 3 months; $76,348

University of Kansas, Lawrence; Arnold A. Strassenburg; 3 months; $48,100

University of Michigan, Ann Arbor; Lloyd E. Brownell; 2 months; $22,800

Claire J. Shellabarger; 2 months; $14,500

University of Missouri, Columbia; Karl H. Evans; 2 months; $52,500

Ralph E. Lee, Rolla; 2 months; $37,800

University of New Mexico, Albuquerque; James R. Barton; 2 months; $51,700

Loren D. Potter; 2 months; $12,900

University of North Carolina, Chapel Hill; H. D. Crockford; 2 months; $35,100

H. F. Robinson: 2 months; $43,200

University of Notre Dame, Ind.; Edward W. Jerger; 2 months; $40,725

University of Oklahoma, Norman; George W. Reid; 2 months; $22,800

Thomas M. Smith; 2 months; $40,300

University of Tennessee, Knoxville; Isabel H. Tipton; 2 months; $22,800

University of Washington, Seattle; J. E. Colcord, Jr., 2 months; $35,200

John C. Sherman; 2 months; $28,500

West Virginia University, Morgantown; Charles R. Jenkins; 2 months; $33,800

Williams College, Williamstown, Mass.; William C. Grant, Jr.; 2 months; $46,300

SUMMER INSTITUTES FOR SECONDARY SCHOOL AND COLLEGE TEACHERS

Indiana University Foundation, Bloomington; L. S. McClung; 1 month; $29,200

Montana State College, Bozeman, Rod J. O'Connor; 1 month; $56,300

Philadelphia College of Pharmacy and Science, Arthur Osol; 2 months; $20,300

Princeton University, Princeton, N.J.; Charles L. Taggart; 2 months; $49,000

University of Hawaii, Honolulu; Sidney C. Hsiao; 2 months; $14,500

University of Kansas, Lawrence; G. Baley Price; 2 months, $97,700

Tuskegee Institute, Tuskegee Institute, Ala.; James H. M. Henderson; 2 months; $19,000

University of Washington, Seattle; Arthur D. Welander; 2 months; $38,000

SUMMER INSTITUTES FOR SECONDARY SCHOOL TEACHERS

Adler Planetarium and Astronomical Museum, Chicago, Ill.; Robert I. Johnson; 1 month; $46,000

Agricultural and Mechanical College of Texas, College Station; Melvin C. Schroeder; 3 months; $68,200

R. E. Stevenson; 1 month; $24,200

Agricultural and Technical College of North Carolina, Greensboro; Gerald A. Edwards; 2 months; $60,000

Gerald A. Edwards; 2 months; $64,300

Artis P. Graves; 2 months; $72,100

Alabama Agricultural and Mechanical College, Normal; Winfred Thomas; 3 months; $44,800

Alabama College, Montavallo; Paul C. Bailey; 3 months; $95,300

Alameda County State College Foundation, Hayward, Calif.; C. Richard Purdy; 2 months; $41,900

Albany State College, Albany, Ga.; William E. Johnson, Jr.; 2 months; $51,000

Alfred University, Alfred, N.Y.; E. Gordon Ogden; 2 months; $58,400

American University, Washington, D.C.; Leo Schubert; 2 months; $59,800

Andrews University, Berrien Springs, Mich.; Harold T. Jones; 2 months; $29,600

Antioch College, Yellow Springs, Ohio; James F. Corwin; 2 months; $96,100

Appalachian State Teachers College, Boone, N.C.; J. Frank Randall; 2 months; $57,900

Arizona State College, Flagstaff; John H. Chilcott; 2 months; $45,700

Arizona State University, Tempe; George M. Bateman; 2 months; $52,600

Lehi T. Smith; 2 months; $44,600

Alan T. Wager; 2 months; $65,100

Atlanta University, Atlanta, Ga.; K. A. Huggins; 2 months; $64,700

Auburn University, Auburn, Ala.; R. K. Butz; 3 months; $58,300

Augustana College, Sioux Falls, S. Dak.; Richard W. Forman; 2 months; $47,300

Baldwin-Wallace College, Berea, Ohio; Dean L. Robb; 2 months; $40,800

Ball State Teachers College, Muncie, Ind.; Jerry J. Nisbet; 3 months; $76,700

Baylor University, Waco, Tex.; Bryce C. Brown; 2 months; $79,000

Bemidji State College, Bemidji, Minn.; William G. Britton; 2 months; $14,500

Bethany College, Bethany, W. Va.; Bradford Tye; 2 months; $57,600

Birmingham–Southern College, Birmingham, Ala.; Wiley S. Rogers; 2 months; $79,500

Boston College, Chestnut Hill, Mass.; Walter J. Fimian, Jr.; 2 months; $13,600

William G. Guindon; 2 months; $32,000

Boston University, Mass.; J. D. Barton, Jr.; 2 months; $42,440

Bowdoin College, Brunswick, Maine; Alton H. Gustafson, 2 months; $40,200

Reinhard L. Korgen; 2 months; $54,400

Bowling Green State University, Bowling Green, Ohio; W. H. Hall; 3 months; $40,200

Bradley University, Peoria, Ill.; A. Wayne McGaughey; 2 months; $43,200

Brigham Young University, Provo, Utah; Lane A. Compton; 2 months; $9,000

BROWN UNIVERSITY, Providence, R.I.; Leallyn B. Clapp; 2 months; $45,600
Elmer R. Smith; 2 months; $59,500

BUCKNELL UNIVERSITY, Lewisburg, Pa.; Lester Kieft; 2 months; $66,500

CAPITAL UNIVERSITY, Columbus, Ohio; Carl F. Sievert; 2 months; $37,700

CARLETON COLLEGE, Northfield, Minn.; Duncan Stewart; 2 months; $47,900
Kenneth W. Wegner; 2 months; $53,750

CASE INSTITUTE OF TECHNOLOGY, Cleveland, Ohio; Paul E. Guenther; 2 months; $62,200

CATHOLIC UNIVERSITY OF AMERICA, Washington, D.C.; Raymond W. Moller; 2 months; $53,000

CATHOLIC UNIVERSITY OF PUERTO RICO, Santa Maria, Ponce; Joseph Frohnhoefer; 2 months; $39,500

CENTRAL CONNECTICUT STATE COLLEGE, New Britain; Richard L. Mentzer; 2 months; $51,200

CENTRAL MICHIGAN UNIVERSITY, Mount Pleasant; Carl A. Scheel; 2 months; $42,300
Lester H. Serier; 2 months; $76,500

CENTRAL MISSOURI STATE COLLEGE, Warrensburg; Sam P. Hewitt; 3 months; $91,400

CHICAGO PARK DISTRICT FOR THE ADLER PLANETARIUM AND ASTRONOMICAL MUSEUM, Ill.; Robert I. Johnson; 2 months; $46,000

CITY COLLEGE, New York, N.Y.; Chester B. Kremer; 2 months; $50,700

CLAFLIN COLLEGE, Orangeburg, S.C.; Hampton D. Smith; 2 months; $48,300

CLAREMONT GRADUATE SCHOOL, Claremont, Calif.; Graham B. Bell; 2 months; $41,000

CLARKSON COLLEGE OF TECHNOLOGY, Potsdam, N.Y.; F. Gordon Lindsey; 2 months; $97,200

COLBY COLLEGE, Waterville, Maine; Evans B. Reid; 2 months; $84,600

COLGATE UNIVERSITY, Hamilton, N.Y.; Carl W. Munshower; 2 months; $49,900
Oran B. Stanley; 2 months; $60,800

COLLEGE OF ST. THOMAS, St. Paul, Minn.; Martin Allen; 2 months; $48,600

COLLEGE OF THE HOLY CROSS, Worcester, Mass.; Robert B. MacDonnell; 2 months; $57,000
Vincent O. McBrien; 2 months; $55,500

COLLEGE OF WILLIAM AND MARY, Williamsburg, Va.; Melvin A. Pittman; 2 months; $120,600

COLORADO COLLEGE, Colorado Springs; Richard G. Beidleman; 2 months; $90,800
Richard G. Beidleman; 2 months; $43,900

COLORADO SCHOOL OF MINES, Golden; James L. Hall; 2 months; $47,900

COLORADO STATE COLLEGE, Greeley; Bert O. Thomas; 3 months; $80,800
William D. Derbyshire; 2 months; $38,000

COLORADO STATE UNIVERSITY RESEARCH FOUNDATION, Fort Collins; Ralph H. Niemann; 2 months; $54,000
Edward B. Reed; 2 months; $52,700
George H. Splittgerber; 2 months; $34,300

COLUMBIA COLLEGE, Columbia, S.C.; Philip E. Graef; 2 months; $63,900

CORNELL UNIVERSITY, Ithaca, N.Y.; R. William Shaw; 2 months; $71,200

DENISON UNIVERSITY, Granville, Ohio; Robert A. Roberts; 2 months; $48,600

DEPAUW UNIVERSITY, Greencastle, Ind.; Clinton B. Gass; 2 months; $42,500

DILLARD UNIVERSITY, New Orleans, La.; Jan Hamer; 2 months; $38,800

DRAKE UNIVERSITY, Des Moines, Iowa; Leland P. Johnson; 2 months; $73,900
Philip S. Riggs; 2 months; $70,500

DREW UNIVERSITY, Madison, N.J.; Bernard Greenspan; 2 months; $47,300

DUKE UNIVERSITY, Durham, N.C.; Thomas D. Reynolds; 2 months; $139,600

EARLHAM COLLEGE, Richmond, Ind.; Murvel R. Garner; 2 months; $35,100

EAST CAROLINA COLLEGE, Greenville, N.C.; Frank W. Eller; 2 months; $42,800

EASTERN ILLINOIS UNIVERSITY, Charleston; Weldon N. Baker; 2 months; $78,600

EASTERN KENTUCKY STATE COLLEGE, Richmond; Darnell Salyer; 2 months; $45,800

EASTERN MICHIGAN UNIVERSITY, Ypsilanti; James M. Barnes; 2 months; $64,700

EASTERN NEW MEXICO UNIVERSITY, Portales; Ruth B. Thomas; 2 months; $84,300

EMORY UNIVERSITY, Atlanta, Ga.; Trevor Evans; 2 months; $51,700

FISK UNIVERSITY, Nashville, Tenn.; Edward L. Maxwell; 2 months; $83,300

FLORIDA STATE UNIVERSITY, Tallahassee; J. Stanley Marshall; 2 months; $79,200
Sherwood M. Reichard; 2 months; $19,000
James E. Snover; 2 months; $42,300

FORDHAM UNIVERSITY, New York, N.Y.; Frederick L. Canavan; 2 months; $44,000

FORT HAYS KANSAS STATE COLLEGE, Hays; W. Toalson; 2 months; $58,000

FRANKLIN AND MARSHALL COLLEGE, Lancaster, Pa.; Frank D. Enck; 2 months; $62,500
Bernard Jacobson; 2 months; $40,000
Marvin E. Kauffman; 2 months; $42,900

FREDERIC BURK FOUNDATION FOR EDUCATION, San Francisco, Calif.; Peter F. Buri; 2 months; $51,600
James S. Perlman; 2 months; $36,600

FRESNO STATE COLLEGE, Fresno, Calif.; Doris F. Falk; 2 months; $46,400
Anthony E. Lebarre, Jr.; 2 months; $33,800

FURMAN UNIVERSITY, Greenville, S.C.; J. A. Southern; 2 months; $56,600

GEORGE PEABODY COLLEGE FOR TEACHERS, Nashville, Tenn.; H. Craig Sipe; 3 months, $130,100
H. Craig Sipe; 3 months; $80,200

GEORGETOWN UNIVERSITY, Washington, D.C.; Malcolm W. Oliphant; 2 months; $52,000
Matthew P. Thekaekara; 2 months; $49,300

GEORGIA INSTITUTE OF TECHNOLOGY, Atlanta; James A. Stanfield; 2 months; $33,900

GRAMBLING COLLEGE, Grambling, La.; Joseph L. Harrison; 2 months; $49,100

HAMILTON COLLEGE, Clinton, N.Y.; C. Stanley Ogilvy; 2 months; $52,100

HAMPTON COLLEGE, Hampton, Va.; Victor H. Fields; 2 months; $58,800

HOWARD PAYNE COLLEGE, Brownwood, Tex.; Leonard R. Daniel; 2 months; $49,200

HOWARD UNIVERSITY, Washington, D.C.; Marie C. Taylor; 2 months; $52,900

HUMBOLDT STATE COLLEGE FOUNDATION, Arcata, Calif.; William M. Lanphere; 2 months; $79,400

HUSTON-TILLOTSON COLLEGE, Austin, Tex.; J. H. Morton; 2 months; $51,900

IDAHO STATE COLLEGE, Pocatello; John Hilzman; 2 months; $62,900

ILLINOIS INSTITUTE OF TECHNOLOGY, Chicago; Haim Reingold; 2 months; $106,900

ILLINOIS WESLEYAN UNIVERSITY, Bloomington; Wayne W. Wantland; 2 months; $71,800

INCARNATE WORD COLLEGE, San Antonio, Tex.; Sister Claude Marie; 2 months; $28,500

INDIANA STATE COLLEGE, Indiana, Pa.; Ralph R. Booth; 2 months; $62,700

INDIANA UNIVERSITY FOUNDATION, Bloomington; Judson Mead; 2 months; $38,600
- T. G. Perry; 2 months; $34,400
- Frederic C. Schmidt; 2 months; $52,900
- Marie S. Wilcox; 2 months; $53,400
- Frank Jacob Zeller; 2 months; $40,100

IOWA STATE UNIVERSITY, Ames; Orlando C. Kreider; 2 months; $81,800

JACKSON STATE COLLEGE, Jackson, Miss.; Wilbert Greenfield; 2 months; $35,000

JOHNS HOPKINS UNIVERSITY, Baltimore, Md.; William Kelso Morrill, Sr.; 2 months; $65,050

JUNIATA COLLEGE, Huntingdon, Pa.; David M. Hercules; 2 months; $40,800

KANSAS STATE COLLEGE OF PITTSBURG; Margaret B. Parker; 2 months; $53,800
- R. G. Smith; 2 months; $77,700

KANSAS STATE TEACHERS COLLEGE, Emporia; Ted F. Andrews; 3 months; $228,000

KANSAS STATE UNIVERSITY, Manhattan; J. R. Chelikowsky; 2 months; $55,600
- Leonard E. Fuller; 2 months; $60,500

KENT STATE UNIVERSITY, Kent, Ohio; Kenneth B. Cummins; 2 months; $66,600

KENTUCKY RESEARCH FOUNDATION, Lexington; John M. Carpenter; 2 months; $92,800

KNOX COLLEGE, Galesburg, Ill.; Herbert Priestley; 2 months; $60,800
- Rothwell Stephens; 2 months; $49,800

LAFAYETTE COLLEGE, Easton, Pa.; B. E. Rhoades; 2 months; $51,900

LEHIGH UNIVERSITY, Bethlehem, Pa.; Clarence A. Shook; 2 months; $49,200

LORETTO HEIGHTS COLLEGE, Loretto, Colo.; Jeanne d'Arc; 2 months; $47,100

LOS ANGELES STATE COLLEGE FOUNDATION, Calif.; R. J. Diamond; 2 months; $35,800

LOUISIANA STATE UNIVERSITY, Baton Rouge; Benjamin E. Mitchell; 2 months; $59,400
- Robert V. Nauman; 2 months; $58,100
- Hulen B. Williams; 2 months; $45,900

MACALESTER COLLEGE, St. Paul, Minn.; Russell B. Hastings; 2 months; $72,900

MARQUETTE UNIVERSITY, Milwaukee, Wis.; Raymond A. Bournique; 2 months; $53,200
- L. J. Heider; 2 months; $35,500

MARSHALL FOUNDATION, Huntington, W. Va.; Donald C. Martin; 3 months; $78,950

MEMPHIS STATE UNIVERSITY, Memphis, Tenn.; J. W. Fox; 2 months; $77,400

MIAMI UNIVERSITY, Oxford, Ohio; Lyman C. Peck; 2 months; $38,800
- Bruce V. Weidner; 2 months; $97,600

MICHIGAN COLLEGE OF MINING & TECHNOLOGY, Houghton; D. O. Wyble; 2 months; $51,900

MICHIGAN STATE UNIVERSITY, East Lansing; C. N. McCarty; 2 months; $49,350
- T. Wayne Porter; 3 months; $100,400

MIDDLE TENNESSEE STATE COLLEGE, Murfreesboro; J. Eldred Wiser; 3 months; $107,600

MILLERSVILLE STATE COLLEGE, Millersville, Pa.; William B. McIlwaine; 2 months; $32,600

MISSISSIPPI STATE UNIVERSITY, State College; Clyde Q. Sheely; 3 months; $122,800

MONTANA STATE COLLEGE, Bozeman; Henry E. Gerry; 3 months; $47,500
- William G. Walter; 1 month; $29,900

MONTANA STATE UNIVERSITY, Missoula; William M. Myers; 3 months; $76,200
- *Sherman J. Preece, Jr.; 3 months*; $82,100

MORGAN STATE COLLEGE, Baltimore, Md.; *Thomas P. Fraser; 2 months*; $65,200

MUNICIPAL UNIVERSITY OF OMAHA, Nebr.; Merle E. Brooks; 2 months; $67,900

MURRAY STATE COLLEGE FOUNDATION, Murray, Ky.; Walter E. Blackburn; 2 months; $63,700

NEBRASKA WESLEYAN UNIVERSITY, Lincoln; Walter R. French, Jr.; 2 months; $65,300

NEW MEXICO HIGHLANDS UNIVERSITY, Las Vegas; Galen W. Ewing; 1 month; $34,400
- Clarence G. Stuckwisch; 3 months; $82,400

NEW MEXICO STATE UNIVERSITY, University Park; E. L. Cleveland; 2 months; $53,800

NORTH CAROLINA COLLEGE AT DURHAM; James S. Lee; 2 months; $76,500

NORTH DAKOTA STATE UNIVERSITY, Fargo; F. L. Minnear; 2 months; $95,000

NORTH TEXAS STATE UNIVERSITY, Denton; Robert C. Sherman; 3 months; $77,500

NORTHEAST LOUISIANA STATE COLLEGE, Monroe; B. Earl Prince; 2 months; $43,700

NORTHEAST MISSOURI STATE TEACHERS COLLEGE, Kirksville; Dean A. Rosebery; 2 months; $77,400

NORTHEASTERN UNIVERSITY, Boston, Mass.; Benjamin C. Friedrich; 2 months; $46,950

NORTHERN ILLINOIS UNIVERSITY, De Kalb; Frederick W. Rolf; 2 months; $53,400

NORTHERN MICHIGAN COLLEGE, Marquette; Roy E. Heath; 2 months; $51,500

NORTHWESTERN STATE COLLEGE, Alva, Okla.; Kathrine C. Mires; 2 months; $53,200

OAK RIDGE INSTITUTE OF NUCLEAR STUDIES, INC., *Oak Ridge*, Tenn.; W. W. *Grigorieff*; 3 months; $40,800

OBERLIN COLLEGE, Oberlin, Ohio; E. P. Vance; 2 months; $122,700

OHIO STATE UNIVERSITY, Columbus; Robert C. Fisher; 2 months; $91,020
- Alfred B. Garrett; 2 months; $50,250
- John S. Richardson; 2 months; $54,700
- Edmund M. Spieker; 2 months; $39,800

Ohio University Fund, Inc., Athens; Lawrence P. Eblin; 2 months; $63,500

Ohio Wesleyan University, Delaware; Arthur C. Breyer; 2 months; $55,110
Robert L. Wilson; 2 months; $39,700
Leonard N. Russell; 2 months; $83,100

Oklahoma Baptist University, Shawnee; Jack Olen Purdue; 2 months; $51,600

Oklahoma City University; Moody L. Coffman; 2 months; $53,300

Oklahoma State University, Stillwater; James H. Zant; 2 months; $60,400

Oregon State University, Corvallis; A. V. Logan; 2 months; $42,500
Albert R. Poole; 2 months; $65,900
Stanley E. Williamson; 2 months; $65,200

Pennsylvania State University, University Park; T. C. Benton; 2 months; $36,300
William H. Powers; 3 months; $100,700

Portland State College, Portland, Oreg.; J. Richard Byrne; 2 months; $39,700

Prairie View Agricultural and Mechanical College, Prairie View, Tex.; E. E. O'Banion; 2 months; $37,000

Pratt Institute, Brooklyn, N.Y.; John Michael O'Gorman; 2 months; $40,400

Princeton University, Princeton, N.J.; Charles L. Taggart; 2 months; $55,180

Purdue University, Lafayette, Ind.; J. H. Carter; 2 months; $66,800
John E. Christian; 2 months; $19,000
M. Wiles Keller; 2 months; $69,600
Ralph W. Lefler; 2 months; $48,300
Ralph W. Lefler; 2 months; $49,100
J. D. Novak; 2 months; $69,600

Randolph-Macon Woman's College, Lynchburg, Va.; Helen L. Whidden; 2 months; $61,800

Reed College, Portland, Oreg.; Burrowes Hunt; 2 months; $99,500
Arthur H. Livermore; 2 months; $46,500
Leslie H. Squier; 2 months; $42,300

Rensselaer Polytechnic Institute, Troy, N.Y.; S. C. Bunce; 2 months; $128,200

Research Foundation of State University of New York, Albany; M. Ira Dubins, Oneonta; 2 months; $55,100
Edgar W. Flinton; 2 months; $47,200
Alexander G. Major, Potsdam; 2 months; $66,700
Emery L. Will, Oneonta; 2 months; $41,000
Stephen S. Winter, Buffalo; 2 months; $44,300

Ripon College, Ripon, Wis.; Leonard W. Vaughan; 2 months; $63,500

Rutgers, The State University, New Brunswick, N.J.; Joshua Barlaz; 2 months; $57,900
Edwin T. Moul; 2 months; $48,400
Robert L. Sells; 2 months; $57,400
William W. Wiles; 2 months; $42,200

Sacramento State College Foundation, Sacramento, Calif.; Melvin O. Fuller; 2 months; $41,100
Carl E. Ludwig; 2 months; $62,100

St. Augustine's College, Raleigh, N.C.; Prezell R. Robinson; 2 months; $38,300

St. Cloud State College, St. Cloud, Minn.; Harold Hopkins; 1 month; $50,700

St. Louis University, Mo.; Francis Regan; 2 months; $49,400
Arthur G. Rouse; 2 months; $23,800

St. Mary's College, Winona, Minn.; Brother H. Charles; 2 months; $33,400
Brother L. George; 2 months; $19,000

San Diego State College Foundation, San Diego, Calif.; Paul Stewart; 2 months; $57,800

San Jose State College Foundation, San Jose, Calif.; Kenneth A. Fowler; 2 months; $39,600
James R. Smart; 2 months; $48,600

Seattle University, Wash.; James J. Cowgill; 2 months; $76,200

Seton Hall University, South Orange, N.J.; Eugene V. Petrik; 2 months; $32,300

Seton Hill College, Greensburg, Pa.; Sister Mary Thaddeus; 2 months; $45,200

Simmons College, Boston, Mass.; Frank C. DeSua; 2 months; $46,100
John A. Timm; 2 months; $24,700

South Carolina State College, Orangeburg; George W. Hunter; 2 months; $77,500

South Dakota State College, Brookings; Kenneth E. Howard; 2 months; $80,700

Southeast Missouri State College, Cape Girardeau; Robert J. Kuster; 2 months; $51,800

Southeastern State College, Durant, Okla.; Leslie A. Dwight; 2 months; $74,200

Southern Illinois University, Carbondale; Morton R. Kenner; 2 months; $63,600
I. L. Shechmeister; 2 months; $60,900

Southern Methodist University, Dallas, Tex.; Joe P. Harris, Jr.; 2 months; $41,900

Southern University and Agricultural and Mechanical College, Baton Rouge, La.; Russell M. Ampey; 2 months; $61,300
Spaulding M. Ruffin; 2 months; $38,000

Southwestern State College, Weatherford, Okla.; Earl A. Reynolds; 2 months; $51,400
Earl A. Reynolds; 2 months; $49,200

Stanford University, Stanford, Calif.; Harold M. Bacon; 2 months; $54,050

State College at Bridgewater, Mass.; James R. Brennan; 2 months; $39,600

State College of Iowa, Cedar Falls; Irvin H. Brune; 2 months; $60,700
Dorothy C. Matala; 2 months; $61,700

State University of Iowa, Iowa City; Robert E. Yager; 2 months; $78,200

State University of South Dakota, Vermillion; Charles R. Estee; 2 months; $78,700
M. M. Hasse; 2 months; $65,800

Stetson University, DeLand, Fla.; Gene W. Medlin; 2 months; $62,100

Stevens Institute of Technology, Hoboken, N.J.; Robert H. Seavy; 2 months; $64,600

Stonehill College, North Easton, Mass.; Joseph B. Chiccarelli; 2 months; $32,700

Syracuse University, Syracuse, N.Y.; John G. Burdick; 2 months; $51,400
Robert B. Davis; 2 months; $51,900
W. R. Fredrickson; 2 months; $61,600

Teachers College, New York, N.Y.; Frederick L. Fitzpatrick; 2 months; $30,300

Temple University, Philadelphia, Pa.; Richard M. Stavseth; 2 months; $60,000

Tennessee Agricultural and Industrial State University, Nashville; Rutherford H. Adkins; 2 months; $51,800

Texas Christian University, Fort Worth; Leo Hendricks; 2 months; $92,400

Texas College of Arts and Industries, Kingsville; Olan E. Kruse; 2 months; $31,000

Texas Southern University, Houston; Robert J. Terry; 3 months; $94,900

Texas Technological College, Lubbock; Earl D. Camp; 2 months; $85,500

Texas Woman's University, Denton; Harold T. Baker; 2 months; $21,200
Harlan C. Miller; 2 months; $40,600

Tulane University, New Orleans, La.; Gail S. Young; 2 months; $77,100

Tuskegee Institute, Tuskegee Institute, Ala.; Lawrence F. Koons; 2 months; $59,500

Union College and University, Schenectady, N.Y.; D. K. Baker; 2 months; $133,400

University of Alabama, University; Julian D. Mancill; 3 months; $64,700

University of Alaska, College; Francis D. Parker; 2 months; $70,800

University of Arizona, Tucson; Millard G. Seeley; 2 months; $75,000
Arthur H. Steinbrenner; 2 months; $65,100

University of Arkansas, Fayetteville; William R. Orton; 2 months; $46,800
Leo J. Paulissen; 2 months; $59,600
Paul C. Sharrah; 2 months; $14,500

University of California, Berkeley; Gideon T. James; 2 months; $63,100
Lola S. Kelly; 2 months; $21,800
Mario Menesini; 2 months; $64,100
Roderic B. Park; 2 months; $51,500
Robert L. Pecsok, Los Angeles; 2 months; $35,800
William H. Meyer, Santa Barbara; 2 months; $50,250
John H. Reynolds; 2 months; $51,700
Paola S. Timiras; 2 months; $39,100
Harvey White; 2 months; $52,200
Clifford Bell, Los Angeles; 2 months; $34,900
George C. Pimentel; 2 months; $66,600

University of Chattanooga, Tenn.; Kenneth A. Fry; 2 months; $47,000

University of Cincinnati, Ohio; H. David Lipsich; 2 months; $52,000

University of Colorado, Boulder; Charles R. Bitter; 2 months; $39,100
John R. Clopton; 2 months; $111,900
James R. Wailes; 1 month; $18,900

University of Dayton, Ohio; K. C. Schraut; 2 months; $40,700

University of Delaware, Newark; John A. Brown; 2 months; $29,500

University of Detroit, Mich.; Lyle E. Mehlenbacher; 2 months; $49,500

University of Florida, Gainesville; N. Eldred Bingham; 2 months; $76,400
William A. Gager; 2 months; $85,400
Carl D. Monk; 2 months; $37,520

University of Georgia, Athens; Charles L. Koelsche; 3 months; $74,300
T. H. Whitehead; 3 months; $80,100

University of Hawaii, Honolulu; Harry Zeitlin; 2 months; $21,200
Harry Zeitlin; 2 months; $67,900

University of Houston, Tex.; Curtis A. Rogers; 2 months; $39,900

University of Idaho, Moscow; William F. Barr; 2 months; $27,300
Edgar H. Grahn; 2 months; $97,900
Hans Sagan; 2 months; $45,400

University of Illinois, Urbana; Max Beberman; 2 months; $225,450
Jerry S. Dobrovolny; 2 months; $54,200
Lewis E. Wagner; 2 months; $44,900
Peter E. Yankwich; 2 months; $48,200

University of Kansas, Lawrence; Edward I. Shaw; 2 months; $19,000

University of Maine, Orono; Clarence E. Bennett; 2 months; $38,900
S. H. Kimball; 2 months; $49,050

University of Maryland, College Park; Guydo R. Lehner; 2 months; $36,500

University of Michigan, Ann Arbor; Charles Brumfiel; 2 months; $57,700

University of Minnesota, Minneapolis; William H. Marshall; 1 month; $20,600
Francis A. Spurrell; 2 months; $14,500
Frank Verbrugge; 3 months; $114,400
John E. Hafstrom; 3 months; $52,450
Blanchard O. Krogstad; 1 month; $29,900

University of Mississippi, University; William H. Norman; 3 months; $116,600

University of Missouri, Columbia; Robert F. Brooks; 2 months; $60,800
Paul B. Burcham; 2 months; $52,400
Harold Q. Fuller, Rolla; 2 months; $97,100
Louis V. Holroyd; 2 months; $65,900

University of Nebraska, Lincoln; Wendell Gauger; 2 months; $93,800
Walter E. Mientka; 2 months; $53,000

University of Nevada, Reno; R. N. Tompson; 2 months; $49,900

University of New Hampshire, Durham; Paul R. Jones; 2 months; $82,400
Charlotte G. Nast; 2 months; $54,300

University of New Mexico, Albuquerque; Frank C. Gentry; 2 months; $65,500
Merle Mitchell; 2 months; $30,600
Loren D. Potter; 2 months; $25,700

University of North Carolina, Chapel Hill; Roy L. Ingram; 2 months; $40,100
Edwin C. Markham; 2 months; $98,300
Henry A. Shannon, Raleigh; 2 months; $37,400

University of North Dakota, Grand Forks; J. Donald Henderson; 2 months; $81,000

University of Notre Dame, Ind.; Emil T. Hofman; 2 months; $77,800
Arnold E. Ross; 2 months; $154,900

University of Oklahoma, Norman; Doyle E. Anderegg; 2 months; $66,200
Richard V. Andree; 2 months; $63,200
Horace H. Bliss; 2 months; $73,400
Robert D. Burns; 2 months; $47,200
Edward A. Frederickson; 1 month; $40,600
Donald L. Patten; 2 months; $38,800

University of Oregon, Eugene; Richard W. Castenholz; 2 months; $35,200
Arnold L. Soderwall; 2 months; $37,100

University of Pennsylvania, Philadelphia; J. F. Hazel; 2 months; $81,100

University of Pittsburgh, Pa.; John C. Knipp; 2 months; $31,500

University of Puerto Rico, Rio Piedras; Augusto Bobonis; 2 months; $95,800

Juan D. Curet; 2 months; $72,636
Mariano Garcia; 2 months; $68,425
Frederick Rushford; 2 months; $14,300

UNIVERSITY OF REDLANDS, Calif.; Reinhold J. Krantz; 2 months; $58,175

UNIVERSITY OF RHODE ISLAND, Kingston; Elmer A. Palmatier; 2 months; $43,600

UNIVERSITY OF ROCHESTER, N.Y.; John J. Montean; 2 months; $38,300

UNIVERSITY OF SAN FRANCISCO, Calif.; Edward J. Farrell; 2 months; $36,400

UNIVERSITY OF THE SOUTH, Sewannee, Tenn.; H. Malcolm Owen; 2 months; $61,300

UNIVERSITY OF SOUTH CAROLINA, Columbia; W. L. Williams; 2 months; $87,600

UNIVERSITY OF SOUTH FLORIDA, Tampa; Gid E. Nelson, Jr.; 2 months; $45,100

UNIVERSITY OF SOUTHERN CALIFORNIA, Los Angeles; Paul A. White; 2 months; $44,400

UNIVERSITY OF SOUTHERN MISSISSIPPI, Hattiesburg; B. O. Van Hook; 2 months; $59,000

UNIVERSITY OF SOUTHWESTERN LOUISIANA, Lafayette; James R. Oliver; 2 months; $60,500
James R. Oliver; 2 months; $54,900

UNIVERSITY OF TENNESSEE, Knoxville; Edgar D. Eaves; 2 months; $62,500

UNIVERSITY OF TEXAS, Austin; Addison E. Lee; 2 months; $118,375

UNIVERSITY OF UTAH, Salt Lake City; E. Allen Davis; 2 months; $67,200
Thomas J. Parmley; 2 months; $70,300
Robert C. Pendleton; 2 months; $19,000

UTAH STATE UNIVERSITY, Logan; Joe Elich; 3 months; $79,700
Neville C. Hunsaker; 3 months; $81,600

UNIVERSITY OF VERMONT, Burlington; N. James Schoonmaker; 2 months; $67,000
Nelson L. Walbridge; 2 months; $69,900

UNIVERSITY OF VIRGINIA, Charlottesville; William C. Lowry; 2 months; $46,600

UNIVERSITY OF WASHINGTON, Seattle; Richard H. Fleming; 2 months; $48,600
L. A. Sanderman; 2 months; $51,200

UNIVERSITY OF WYOMING, Laramie; Carl A. Cinnamon; 2 months; $20,400
Samuel W. Harding; 3 months; $98,700
Nathan Schwid; 1 month; $42,200

UNIVERSITY OF WISCONSIN, Madison; Robert A. Jaggard; 2 months; $65,200
George W. Sledge; 2 months; $32,700

VALPARAISO UNIVERSITY, Valparaiso, Ind.; Arthur E. Hallerberg; 2 months; $41,600

VASSAR COLLEGE, Poughkeepsie, N.Y.; John H. Johnsen; 2 months; $38,100

VILLANOVA UNIVERSITY, Villanova, Pa.; J. Bernard Hubbert; 2 months; $50,100

WAKE FOREST COLLEGE, Winston-Salem, N.C.; John W. Nowell; 2 months; $58,500

WASHBURN UNIVERSITY OF TOPEKA, Topeka, Kans.; Laura Z. Greene; 2 months; $64,800

WASHINGTON STATE UNIVERSITY, Pullman; Harry H. Batey, Jr.; 2 months; $92,800
Sidney G. Hacker; 2 months; $65,700

WAYNE STATE UNIVERSITY, Detroit, Mich.; Walter Chavin; 2 months; $19,000

WESLEYAN UNIVERSITY, Middletown, Conn.; Joseph S. Daltry; 2 months; $102,000

WEST VIRGINIA WESLEYAN COLLEGE, Buckhannon; William R. Willis; 2 months; $59,100

WESTERN MARYLAND COLLEGE, Westminster; Harwell P. Sturdivant; 2 months; $39,700

WESTERN MICHIGAN UNIVERSITY, Kalamazoo; George G. Mallinson; 2 months; $49,600

WESTERN RESERVE UNIVERSITY, Cleveland, Ohio; William M. Heston; 3 months; $78,100

WESTERN WASHINGTON STATE COLLEGE, Bellingham; Raymond R. McLeod; 2 months; $43,600
Sheldon T. Rio; 2 months; $61,000

WINONA STATE COLLEGE, Winona, Minn.; Ray T. Wendland; 2 months; $49,200

WISCONSIN STATE COLLEGE, River Falls; Richard J. Delorit; 2 months; $42,000

YALE UNIVERSITY, New Haven, Conn.; Stuart R. Brinkley; 2 months; $86,500

SUMMER INSTITUTES FOR ELEMENTARY SCHOOL PERSONNEL

ARIZONA STATE COLLEGE, Flagstaff; James R. Wick; 2 months; $35,300

BELOIT COLLEGE, Beloit, Wis.; John L. Biester; 2 months; $30,100

BIRMINGHAM-SOUTHERN COLLEGE, Birmingham, Ala.; Hoyt M. Kaylor; 2 months; $36,600

COLLEGE OF ST. TERESA, Winona, Minn.; Sister Mary Leontius; 2 months; $28,700

COLORADO STATE COLLEGE, Greeley; Louise A. Neal; 2 months; $39,500

DEPAUW UNIVERSITY, Greencastle, Ind.; Clinton B. Gass; 2 months; $19,800

EASTERN MICHIGAN UNIVERSITY, Ypsilanti; Albert W. Brown; 2 months; $34,900

EDINBORO STATE COLLEGE, Edinboro, Pa.; John T. Gatzy; 2 months; $27,700

FLORIDA AGRICULTURAL AND MECHANICAL UNIVERSITY, Tallahassee; Israel E. Glover; 2 months; $27,300

FLORIDA STATE UNIVERSITY, Tallahassee; Eugene D. Nichols; 2 months; $39,700

INTER AMERICAN UNIVERSITY OF PUERTO RICO, San German; Ismael Velez; 1 month; $25,500

LONG BEACH STATE COLLEGE FOUNDATION, Long Beach, Calif.; Owen M. Reince; 2 months; $29,600

NEW MEXICO STATE UNIVERSITY, University Park; Darrell S. Willey; 2 months; $32,500

NORTHERN ILLINOIS UNIVERSITY, DeKalb; Frederick W. Rolf; 2 months; $44,900

NORTHERN MICHIGAN COLLEGE, Marquette; Henry S. Heimonen; 2 months; $36,200

RHODE ISLAND COLLEGE, Providence; Renato E. Leonelli; 2 months; $26,800

RUTGERS, THE STATE UNIVERSITY, New Brunswick, N.J.; Guido G. Weigend; 2 months; $38,000

SAN JOSE STATE COLLEGE FOUNDATION, San Jose, Calif.; John L. Marks; 2 months; $20,000

SOUTHEASTERN STATE COLLEGE, Durant, Okla.; Leslie A. Dwight; 1 month; $21,700

STATE UNIVERSITY OF IOWA, Iowa City; T. R. Porter; 2 months; $35,900

State University of South Dakota, Vermillion; M. M. Hasse; 2 months; $41,800

Texas Woman's University, Denton; Dixie Young; 2 months; $19,200

University of Georgia, Athens; Charles L. Koelsche; 3 months; $26,400

University of Hawaii, Honolulu; Albert B. Carr; 2 months; $27,500

University of Maine, Orono; R. A. Struchtemeyer; 2 months; $33,700

University of North Dakota, Grand Forks; Bernt L. Wills; 2 months; $43,700

University of Oklahoma, Norman; Dora McFarland; 2 months; $28,400

University of Oregon, Eugene; James C. Stovall; 2 months; $43,500

University of Puerto Rico, Rio Piedras; Mariano Garcia; 2 months; $30,500

University of Southwestern Louisiana, Lafayette; James R. Oliver; 2 months; $24,700

University of Utah, Salt Lake City; L. Edwin Hirschi; 2 months; $37,000

University of Vermont, Burlington; N. James Schoonmaker; 2 months; $28,300

Virginia State College, Petersburg; Reuben G. Pierce; 2 months; $43,400

SUMMER SCIENCE TRAINING PROGRAM FOR SECONDARY SCHOOL STUDENTS

Academy of Science of St. Louis, Mo.; Donn P. Brazier; 1 year; $11,075

Agricultural and Mechanical College of Texas, College Station; William S. McCulley; 2 months; $8,585
 O. Dayle Sittler; 2 months; $9,085
 Fred E. Smith; 2 months; $11,285
 John J. Sperry; 2 months; $8,835

Albert Einstein Medical Center, Philadelphia, Pa.; Samuel J. Ajl; 2 months; $6,375

American Museum of Natural History, New York, N.Y.; Franklyn M. Branley; 1 month; $9,830

Appalachian State Teachers College, Boone, N.C.; F. Ray Derrick; 1 month; $15,405

Arizona State College, Flagstaff; J. H. Butchart; 1 month; $7,880

Arizona State University, Tempe; Howard G. Applegate; 2 months; $17,440

Asbury College, Wilmore, Ky.; J. Paul Ray; 2 months; $23,860

Assumption College, Worcester, Mass.; Alfons J. van der Linden; 2 months; $17,585

Auburn University, Auburn, Ala.; Joseph T. Hood; 2 months; $8,960

Augsburg College, Minneapolis, Minn.; Courtland L. Agre; 2 months; $10,125

Bennett College, Greensboro, N.C.; J. Henry Sayles; 2 months; $24,785

Bowling Green State University, Bowling Green, Ohio; Wilbert Hutton; 2 months; $7,920

Boyce Thompson Institute for Plant Research, Incorporated, Yonkers, N.Y.; Lawrence P. Miller; 2 months; $6,130

Brandeis University, Waltham, Mass.; Philip A. St. John; 2 months; $4,550

Bridgewater College, Bridgewater, Va.; John W. Martin; 1 month; $5,425

Brooklyn College, N.Y.; Meyer Jordan; 2 months; $11,310

Brown University, Providence, R.I.; Charles B. Mackay; 2 months; $25,100

Bucknell University, Lewisburg, Pa.; Lester Kieft; 2 months; $9,500

Butler University, Indianapolis, Ind.; William H. Bessey; 2 months; $7,435

Carnegie Institute of Technology, Pittsburgh, Pa.; Lawrence N. Canjar; 2 months; $10,540

Case Institute of Technology, Cleveland, Ohio; L. J. Green; 2 months; $6,795

Central State College, Wilberforce, Ohio; E. Oscar Woolfolk; 2 months; $4,170

City College, New York, N.Y.; Chester B. Kremer; 2 months; $15,085

Clark University, Worcester, Mass., Roy S. Anderson; 3 months; $1,260

Clarkson College of Technology, Potsdam, N.Y.; Harry S. Bingham; 2 months; $24,800

Coe College, Cedar Rapids, Iowa; Cloy J. Walter; 3 months; $14,890

College of Osteopathic Medicine and Surgery, Des Moines, Iowa; Ora E. Niffenegger; 2 months; $5,495

College of the Holy Names, Oakland, Calif.; Sister Mary Baptista; 2 months; $12,945

Colorado College, Colorado Springs; Richard G. Beidleman; 2 months; $14,275

Colorado School of Mines, Golden; James L. Hall; 2 months; $14,605

Committee for Advance Science Training, Los Angeles, Calif.; Harry Sobel; 3 months; $8,515

Cornell University, Ithaca, N.Y.; Thomas J. Peterson, Jr.; 2 months; $12,795

Emory University, Atlanta, Ga.; James G. Lester; 1 month; $31,295

Emory and Henry College, Emory, Va.; Marius Blesi; 1 month; $13,275

Fairleigh Dickinson University, Rutherford, N.J.; Dolores Elaine Keller, Teaneck; 1 month; $12,045

Florida State University, Tallahassee; Robert Kalin; 2 months; $11,705

Georgetown University, Washington, D.C.; Lawrence S. Lilienfield; 2 months; $9,400

Goucher College, Baltimore, Md.; Frederick G. Reuss; 1 month; $15,680

Grambling College, Grambling, La.; Emile C. Fonsworth; 2 months; $18,195

Grinnell College, Grinnell, Iowa; Neil D. Kent; 2 months; $24,890

Hiram College, Hiram, Ohio; Edward B. Rosser; 2 months; $13,995

Howard University, Washington, D.C.; H. V. Eagleson; 2 months; $14,900

Humboldt State College Foundation, Arcata, Calif.; John E. Butler; 1 month; $17,865

Hunter College, New York, N.Y.; Melvin S. Schwartz; 2 months; $7,460
 Henry D. Thompson; 1 month; $4,820

Illinois Institute of Technology, Chicago; Haim Reingold; 9 months; $18,955

INDIANA UNIVERSITY FOUNDATION, Bloomington; Paul Klinge; 2 months; $25,575
John B. Patton; 3 months; $3,840

INTER AMERICAN UNIVERSITY OF PUERTO RICO, San German; Ismael Velez; 1 month; $5,825
Ismael Velez; 1 month; $12,300

JACKSON STATE COLLEGE, Jackson, Miss.; Benjamin H. McLemore; 2 months; $14,300

JOINT BOARD ON SCIENCE EDUCATION, Washington, D.C.; Leo Schubert, American University; 2 months; $6,600

KANSAS STATE TEACHERS COLLEGE, Emporia; Robert J. Boles; 2 months; $14,775

KENTUCKY STATE COLLEGE, Frankfort; Lloyd E. Alexander; 2 months; $16,275

LA SALLE COLLEGE, Philadelphia, Pa.; John S. Penny; 2 months; $7,605

LEHIGH UNIVERSITY, Bethlehem, Pa.; Albert Wilansky; 2 months; $7,155

LEMOYNE COLLEGE, Memphis, Tenn.; W. W. Gibson; 2 months; $10,185

LIVINGSTON STATE COLLEGE, Livingston, Ala.; Lillian C. Manley; 2 months; $6,735

LOUISIANA POLYTECHNIC INSTITUTE, Ruston; William R. Higgs; 2 months; $17,160

LOUISIANA STATE UNIVERSITY, Baton Rouge; John F. Christman; 2 months; $24,930

LOWELL TECHNICAL INSTITUTE, Lowell, Mass.; Vasilis Lavrakas; 2 months; $8,300

LOYOLA UNIVERSITY, Chicago, Ill.; Kenichi Kenneth Hisaoka; 2 months; $10,655

LOYOLA UNIVERSITY OF LOS ANGELES, Calif.; Clarence J. Wallen; 8 months; $3,240

MANCHESTER COLLEGE, North Manchester, Ind.; Harry R. Weimer; 2 months; $9,410

MICHIGAN STATE UNIVERSITY, East Lansing; M. Isobel Blyth; 2 months; $24,325

MORGAN STATE COLLEGE, Baltimore, Md.; John W. King; 2 months; $20,460

MOUNT MERCY COLLEGE, Pittsburgh, Pa.; Cornelius W. Kreke; 2 months; $8,230

MURRAY STATE COLLEGE FOUNDATION, Murray, Ky.; W. E. Blackburn; 2 months; $23,550

NASSON COLLEGE, Springvale, Maine; Robert F. Callahan; 2 months; $19,675

NEWARK COLLEGE OF ENGINEERING RESEARCH FOUNDATION, Newark, N.J.; Joseph M. Fitzgerald; 2 months; $8,385

NEW MEXICO HIGHLANDS UNIVERSITY, Las Vegas; Lora M. Shields; 2 months; $14,000

NORTH DAKOTA STATE UNIVERSITY, Fargo; J. A. Callenbach; 3 months, $2,825
Donald Schwartz; 2 months; $4,105

NORTHEASTERN UNIVERSITY, Boston, Mass.; Charles M. Goolsby; 2 months; $21,755

NORTHERN ILLINOIS UNIVERSITY, DeKalb; John E. Bower; 2 months; $14,250

NORTHERN MICHIGAN COLLEGE, Marquette; John P. Farrell; 2 months; $14,265

NORTHWESTERN STATE COLLEGE OF LOUISIANA, Natchitoches; Richard E. Garth; 2 months; $8,330
James A. Noel; 2 months; $7,410

NORTHWESTERN UNIVERSITY, Evanston, Ill.; F. G. Seulberger; 1 month; $28,240

OHIO STATE UNIVERSITY, Columbus; Richard H. Bohning; 2 months; $18,175
Paul T. Yarrington; 2 months; $19,575

OHIO UNIVERSITY, Athens; James T. Shipman; 2 months; $12,620

OHIO WESLEYAN UNIVERSITY, Delaware; Thomas S. Oey; 3 months; $2,435

OKLAHOMA STATE UNIVERSITY, Stillwater; L. F. Sheerar; 2 months; $15,300

OREGON STATE UNIVERSITY, Corvallis; R. E. Gaskell; 2 months; $24,385
John F. Tatom; 2 months; $11,715

PAN AMERICAN COLLEGE, Edinburg, Tex.; Paul R. Engle; 2 months; $9,090

PENNSYLVANIA STATE UNIVERSITY, University Park; John S. Boyle; 2 months; $1,825

PRAIRIE VIEW AGRICULTURAL AND MECHANICAL COLLEGE, Prairie View, Tex.; Limone C. Collins; 2 months; $8,270
E. E. O'Banion; 2 months; $8,355

PURDUE UNIVERSITY, Lafayette, Ind.; James L. Ahlrichs; 2 months; $20,290

RESEARCH FOUNDATION OF STATE UNIVERSITY OF NEW YORK, Albany; Harriet F. Montague, Buffalo; 2 months; $4,980

ROLLINS COLLEGE, Winter Park, Fla.; Bruce B. Wavell; 2 months; $7,320

ROSCOE B. JACKSON MEMORIAL LABORATORY, Bar Harbor, Maine; John L. Fuller; 2 months; $16,465

ROSWELL PARK MEMORIAL INSTITUTE, Buffalo, N.Y.; Edwin A. Mirand; 3 months; $19,115

RUTGERS, THE STATE UNIVERSITY, New Brunswick, N.J.; Solomon Leader; 1 month; $11,705

ST. AUGUSTINE'S COLLEGE, Raleigh, N.C.; Prezell R. Robinson; 2 months; $15,490

ST. LOUIS UNIVERSITY, Mo.; John J. Andrews; 1 month; $5,690

ST. OLAF COLLEGE, Northfield, Minn.; Harold W. Hansen; 1 month; $18,000

SAN DIEGO STATE COLLEGE FOUNDATION, San Diego, Calif.; Edmund I. Deaton; 2 months; $8,905

SAN FERNANDO VALLEY STATE COLLEGE, Northridge, Calif.; Lorence G. Collins; 2 months; $12,840

SAN JOSE STATE COLLEGE FOUNDATION, San Jose, Calif.; Benjamin F. Naylor; 2 months; $14,915

SOUTH DAKOTA STATE COLLEGE, Brookings; Harlan L. Klug; 2 months; $8,145

SOUTHEASTERN STATE COLLEGE, Durant, Okla.; Leslie A. Dwight; 2 months; $7,250

SOUTHERN ILLINOIS UNIVERSITY, Carbondale; George H. Gass; 2 months; $19,675

SOUTHERN METHODIST UNIVERSITY, Dallas, Tex.; Frank J. Palas; 2 months; $8,260

SOUTHERN STATE COLLEGE, Magnolia, Ark.; John J. Chapman; 2 months; $5,475

SOUTHERN UNIVERSITY AND AGRICULTURAL AND MECHANICAL COLLEGE, Baton Rouge, La.; Vandon E. White; 2 months; $10,830

STATE UNIVERSITY OF IOWA, Iowa City; Robert E. Yager; 2 months; $9,265
Robert E. Yager; 2 months; $26,360

STATE UNIVERSITY OF SOUTH DAKOTA, Vermillion; Glen R. Driscoll; 2 months; $10,745

STEVENS INSTITUTE OF TECHNOLOGY, Hoboken, N.J.; L. Edwin Backer; 2 months; $12,125

SYRACUSE UNIVERSITY, Syracuse, N.Y.; Marvin Druger; 2 months; $15,870

TEMPLE UNIVERSITY, Philadelphia, Pa.; Walter S. Lawton; 2 months; $9,675

TENNESSEE AGRICULTURAL AND INDUSTRIAL STATE UNIVERSITY, Nashville; Rupert G. Seals; 2 months; $11,475

TEXAS COLLEGE, Tyler; Sekender A. Khan; 2 months; $11,280

TEXAS WOMAN'S UNIVERSITY, Denton; Robert W. Higgins; 2 months; $7,420

TOUGALOO SOUTHERN CHRISTIAN COLLEGE, Tougaloo, Miss.; A. A. Branch; 2 months; $17,310

TUFTS UNIVERSITY, Medford, Mass.; Gordon O. Thayer, Thayer Academy, Braintree, Mass.; 3 months; $27,985

UNIVERSITY OF ALASKA, College; William S. Wilson; 2 months; $18,245

UNIVERSITY OF ARIZONA, Tucson; Donald E. Myers; 2 months; $8,375

UNIVERSITY OF BRIDGEPORT, Conn.; William Garner; 2 months; $26,160

UNIVERSITY OF CALIFORNIA, Berkeley; Howard A. Shugart; 2 months; $28,325
Frantisek Wolf; 2 months; $10,985
Mendel Mazelis, Davis; 2 months; $17,070
Clifford Bell, Los Angeles; 2 months; $9,705
Ted Forbes, San Diego; 2 months; $7,365

UNIVERSITY OF COLORADO, Boulder; William S. Osburn; 2 months; $8,145

UNIVERSITY OF DELAWARE, Newark; William G. Fletcher; 2 months; $9,930

UNIVERSITY OF FLORIDA, Gainesville; Luther A. Arnold; 2 months; $12,950

UNIVERSITY OF GEORGIA, Athens; Carroll T. Clark; 2 months; $10,535

UNIVERSITY OF HARTFORD, Conn.; Malcolm W. Gordon, University of Connecticut, Storrs; 2 months; $13,500

UNIVERSITY OF HAWAII, Honolulu; Richard B. Hine; 2 months; $18,935

UNIVERSITY OF HOUSTON, Tex.; Rodolphe L. Motard; 2 months; $20,330

UNIVERSITY OF ILLINOIS, Urbana; Jerry S. Dobrovolny; 2 months; $12,570
F. A. Kummerow; 2 months; $3,890

UNIVERSITY OF KANSAS, Lawrence; Arnold A. Strassenburg; 2 months; $24,995

UNIVERSITY OF MARYLAND, College Park; James C. Armstrong; 3 months; $6,630

UNIVERSITY OF MIAMI, Coral Gables, Fla.; Herman Meyer; 2 months; $10,640

UNIVERSITY OF MICHIGAN, Ann Arbor; Leigh C. Anderson; 2 months; $20,250
Harold J. Blumenthal; 2 months; $16,565

UNIVERSITY OF MISSISSIPPI, University; Samuel F. Clark; 2 months; $15,160

UNIVERSITY OF MISSOURI, Columbia; Wesley J. Dale; 2 months; $17,990
Charles R. Remington, Jr., Rolla; 2 months; $12,880

UNIVERSITY OF NEVADA, Reno; Wendell A. Mordy; 2 months; $23,975

UNIVERSITY OF NORTH CAROLINA, Chapel Hill; Douglas G. Humm; 2 months; $2,235
Samuel B. Knight; 2 months; $22,580
Hollis J. Rogers, Greensboro; 1 month; $10,550

UNIVERSITY OF NORTH DAKOTA, Grand Forks; Paul B. Kannowski; 2 months; $13,520
Paul B. Kannowski; 2 months; $1,550

UNIVERSITY OF NOTRE DAME, Ind.; Arnold E. Ross; 2 months; $24,390

UNIVERSITY OF OKLAHOMA, Norman; Lloyd A. Iverson; 2 months; $26,000

UNIVERSITY OF PUERTO RICO, Rio Piedras; Francisco Garriga; 2 months; $9,315
Eddie Ortiz, Mayaguez; 2 months; $11,725

UNIVERSITY OF RHODE ISLAND, Kingston; James W. Cobble; 2 months; $4,800

UNIVERSITY OF TENNESSEE, Knoxville; J. H. Wood; 2 months; $10,930

UNIVERSITY OF TEXAS, Austin; Hyman J. Ettlinger; 2 months; $6,275
Irwin Spear; 2 months; $11,795

UNIVERSITY OF WISCONSIN, Madison; Harry L. Madison; 2 months; $8,535
George W. Sledge; 2 months; $15,505

VASSAR COLLEGE, Poughkeepsie, N.Y.; Joseph F. Mucci; 1 month; $5,940

VETERAN'S ADMINISTRATION HOSPITAL, Albuquerque, N. Mex.; Louise Leonard; 2 months; $970

VIRGINIA POLYTECHNIC INSTITUTE, Blacksburg; T. J. Horne; 2 months; $9,695
Hugh S. Miles, Jr.; 2 months; $9,895
Hugh S. Miles, Jr.; 2 months; $10,805

VIRGINIA UNION UNIVERSITY, Richmond; Walter O. Bradley; 2 months; $12,680

WESTERN KENTUCKY STATE COLLEGE, Bowling Green; Tate C. Page; 2 months; $22,535

WESLEYAN UNIVERSITY, Middletown, Conn.; Ernest Stabler; 2 months; $18,505

WEST VIRGINIA UNIVERSITY, Morgantown; O. J. Burger; 1 month; $4,015

WESTERN MICHIGAN UNIVERSITY, Kalamazoo; George G. Mallinson; 2 months; $14,265

WESTERN STATE COLLEGE OF COLORADO, Gunnison; Aubrey W. Lawrence; 2 months; $8,800

WHITWORTH COLLEGE, Spokane, Wash.; William G. Wilson; 2 months; $1,965

WILEY COLLEGE, Marshall, Tex.; Rufus L. McGee; 2 months; $6 590

WORCESTER FOUNDATION FOR EXPERIMENTAL BIOLOGY, Shrewsbury, Mass.; Frederick R. Avis, Southboro; 2 months; $17,435

YESHIVA UNIVERSITY, New York, N.Y.; M. D. Tendler; 2 months; $11,570

SUPPLEMENTARY STUDENT SCIENCE PROJECTS

AMERICAN PSYCHOLOGICAL ASSOCIATION, Washington, D.C.; Sherman Ross; *A Career in Psychology;* $6,900

AMERICAN STATISTICAL ASSOCIATION, Washington, D.C.; Donald C. Riley; *Careers in Statistics;* 2 years; $10,400

AMERICAN UNIVERSITY, Washington, D.C.; Sumner O. Burhoe; *Summer Program in Advanced Biology for Secondary School Students;* 6 weeks; $4,570

CALIFORNIA INSTITUTE OF TECHNOLOGY, Pasadena; Richard M. Sutton; *Summer Science Program for High School Juniors;* 10 months; $10,000

DARTMOUTH COLLEGE, Hanover, N.H.; William P. Davis, Jr.; *Supplementary Science Project for Students;* 1 year; $2,190

FLORIDA STATE UNIVERSITY, Tallahassee; Wallace A. Kennedy; *Psychological Study of Future Scientists;* 1 year; $1,000

OPTICAL SOCIETY OF AMERICA, Washington, D.C.; Mary E. Warga; *Careers in Optics;* 6 months; $5,735

PORTLAND STATE COLLEGE, Portland, Oreg.; Vernon Cheldelin, Oregon State University, Corvallis; *To Develop a High School Curriculum on Integrated Chemistry and Physics;* 6 weeks; $21,425

RESEARCH FOUNDATION OF THE CITY UNIVERSITY OF NEW YORK, N.Y.; Meyer Jordan, Brooklyn College, N.Y.; *Mathematics Training Program;* 30 weeks; $38,255

RUTGERS, THE STATE UNIVERSITY, New Brunswick, N.J.; Kenneth W. Iversen, Union Junior College, Cranford, N.J.; *A Project to Challenge High School Students of Superior Ability in the Field of Science;* 20 months; $1,610

ST. MARY'S COLLEGE OF CALIFORNIA, St. Mary's College; T. Brendan, St. Mary's College of California, and Rose Eleanor, College of the Holy Names, Oakland; *Program in Problem Solving for Secondary School Students in Mathematics;* 1 year; $2,735

UNIVERSITY OF VIRGINIA, Charlottesville; James W. Cole, Jr.; *School Science Program in Chemistry;* 6 weeks; $3,625

UNIVERSITY OF WISCONSIN, Madison; L. C. Young; *Mathematical Proficiency Encouragement for Gifted Students Prior to Entering College;* 18 months; $24,560

SUPPLEMENTARY TEACHING AIDS

BOSTON UNIVERSITY, Mass.; Charles K. Levy; *Development of Inexpensive Modern Laboratory Equipment for Biological Sciences;* 2½ years; $9,110

COLUMBIA UNIVERSITY, New York, N.Y.; Panagiotes Razelos; *Development of An Instructional Electrical Analog for Fluid and Heat Flow and Diffusional Processes;* 3 months; $5,350

EDUCATIONAL SERVICES INC., Watertown, Mass.; Michael Coe, Yale University, New Haven, Conn.; *Films on the Archeology and Ethnography of the Tehuacan Valley, Mexico;* 4 months; $91,440

Douglas L. Oliver, *Films on Eskimo Culture;* 14 months; $103,980

Ascher H. Shapiro, Massachusetts Institute of Technology, Cambridge; *Motion Pictures to Improve Instruction in Fluid Dynamics;* 14 months; $360,000

KENYON COLLEGE, Gambier, Ohio; Franklin Miller, Jr.; *The Production of a Series of Short Teaching Aid Films in Physics;* 6 months; $1,770

MATHEMATICAL ASSOCIATION OF AMERICA, Buffalo, N.Y.; Holbrook M. MacNeille, Case Institute of Technology, Cleveland, Ohio; *Films and Other Teaching Materials for College Mathematics;* 16 months; $80,000

MINNESOTA ACADEMY OF SCIENCE, St. Paul; Paul C. Rosenbloom, Minnesota State Department of Education; *Completion of Project for Production of Films for Education of Mathematics Teachers;* 1 year; $46,590

NEW MEXICO STATE UNIVERSITY, University Park; Melvin D. Daybell; *Development of Apparatus for the Stern-Gerlach Experiment;* 14 months; $3,480

NORTHWESTERN UNIVERSITY, Evanston, Ill.; Ali Bulent Cambel and Thomas P. Anderson; *Development of Apparatus and Experiments in Magnetogasdynamics;* 28 months; $63,935

George Herrmann and John F. Fleming; *Stability of Equilibrium in Structural Mechanics;* 1 year; $17,060

Robert L. Kondner and Jorj O. Osterberg; *Development of Experiments and Apparatus Illustrating Dimensional Analysis in Soil Mechanics;* 1 year; $26,060

OKLAHOMA STATE UNIVERSITY, Stillwater; Paul E. Torgersen; *Development of Electronic Queueing Simulators;* 1 year; $7,710

PRINCETON UNIVERSITY, Princeton, N.J.; Hubert N. Alyea; *Development of Tested Overhead Projection Series of Experiments;* 1 year; $26,390

RENSSELAER POLYTECHNIC INSTITUTE, Troy, N.Y.; Paul M. DeRusso; *Development of a Digital-Analog Controller for Sampled Data Systems;* 10 months; $610

RUTGERS, THE STATE UNIVERSITY, New Brunswick, N.J.; C. R. Grafly Dougherty; *Design of a Combustion Reactor;* 1 year; $8,085

ST. LOUIS UNIVERSITY, Mo.; Albert J. Frank, St. Louis University and Harold J. Zabsky, Fontbonne College; *The Construction and Description of Symmetry Models of the Principal Space Groups;* 1 year; $9,170

SAN FERNANDO VALLEY STATE COLLEGE FOUNDATION, Northridge, Calif.; Edmund Carpenter; *A Film on Eskimo Art;* 6 months; $7,700

STATE UNIVERSITY OF IOWA, Iowa City; Hunter Rouse; *Production of Instructional Motion Pictures in Fluid Mechanics;* 3 years; $57,500

UNIVERSITY OF ARIZONA, Tucson; John W. Harshbarger; *Development of Transparent Matrix System for Flow Models;* 1 year; $10,800

UNIVERSITY OF CALIFORNIA, Berkeley; Samuel A. Barrett; *Documentary Sound-Color Films and Sound Recordings of Indian Cultures in Western North America;* 1 year; $162,080

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; $29,120

Donald M. Reynolds, Davis; *Production of Short Motion Picture Films for University Instruction in Microbiology;* 6 months; $129,400

UNIVERSITY OF MICHIGAN, Ann Arbor; Samuel K. Clark; *Development of Equipment for a New Strength of Materials Laboratory;* 1 year; $13,160

UNIVERSITY OF NORTH CAROLINA, Chapel Hill; Arthur Waltner, Raleigh; *Development of Equipment for Nuclear Physics Experiments Using Solid State Radiation Detectors;* 2 years; $8,860

UNIVERSITY OF PENNSYLVANIA, Philadelphia; Thomas H. Wood; *Development of Apparatus to Examine Black Body Radiation and Optical Resonances;* 1 year; $12,420

UNIVERSITY OF WISCONSIN, Madison; Alwyn Scott; *Design and Development of Experiments for a Semi-conductor Device Laboratory;* 18 months; $33,930

WASHINGTON UNIVERSITY, St. Louis, Mo.; William D. Johns; *Development and Construction of Simple Two-Circle Goniometer;* 1 year; $3,450

SUPPLEMENTARY TRAINING FOR TEACHERS

AMERICAN ASSOCIATION OF PHYSICS TEACHERS, Minneapolis, Minn.; Joseph R. Dillinger; *Journal in Physics for High School Physics Teachers;* 2 years; $56,000

AMERICAN SOCIETY OF ZOOLOGISTS, New York, N.Y.; Theodosius Dobzhansky; *A Refresher Course in Behavior Genetics;* 12 months; $5,120

BELOIT COLLEGE, Beloit, Wis.; John L. Biester; *Conference on New Curricular Materials for Secondary School Science Teachers, Administrators, and School Board Members;* 10 months; $2,130

CREIGHTON UNIVERSITY, Omaha, Nebr.; Arnold J. Moore; *In-Service Training Program for High School Biology Teachers Correlated with the Biological Sciences Curriculum Study Materials;* 16 months; $11,300

DUKE UNIVERSITY, Durham, N.C.; J. J. Gergen; *Experimental Program in the Retraining of Armed Service Officers for Teaching Mathematics;* 11 months; $14,000

EMORY UNIVERSITY, Atlanta, Ga.; W. B. Baker; *Program Involving a Television Course on Science for Elementary School Teachers;* 2 years; $27,440

FISK UNIVERSITY, Nashville, Tenn.; Nelson Fuson; *Selected Academic Participants to Attend the Fourteenth Annual Fisk University Infrared Spectroscopy Institute;* 8 months; $5,875

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge; Arthur C. Smith; *Experimental Solid State Physics;* 8 months; $19,575

MICHIGAN COLLEGE OF MINING AND TECHNOLOGY, Houghton; E. A. Bourdo, Jr., Ford Forestry Center, L'Anse; *Chemical and Biological Laboratory Training for High School Teachers;* 1 year; $4,520

NEW YORK STATE SOCIETY FOR MEDICAL RESEARCH, INCOPORATED, New York, N.Y.; Frederic Kavaler, State University of New York, Brooklyn; *Modern Aspects of Biology: Laboratory Experiments in Physiology;* 7 months; $20,520

OCCIDENTAL COLLEGE, Los Angeles, Calif.; Frank L. Lambert; *A Conference on Recent Advances in Chemistry;* 10 months; $3,100

OREGON STATE UNIVERSITY, Corvallis; Vernon H. Cheldelin; *Biology Colloquium;* 45 months; $7,500

POLYTECHNIC INSTITUTE OF BROOKLYN, N.Y.; Albert D. Capuro; *Retraining Program for the Preparation of Emigrant Scientists and Engineers to Teach in United States Colleges and Universities;* 2 years; $32,790

POMONA COLLEGE, Claremont, Calif.; R. Nelson Smith; *Crisis: The Small College as a Source of Scientists;* 6 months; $7,150

PORTLAND STATE COLLEGE, Portland, Oreg.; Robert W. Rempfer; *Pioneering Graduate Course in Modern Mathematical Methods;* 16 months; $4,660

REED COLLEGE, Portland, Oreg.; Frederick D. Tabbutt; *Summer Program in Inorganic Chemistry;* 10 months; $43,505

RENSSELAER POLYTECHNIC INSTITUTE, Troy, N.Y.; Stephen E. Wiberley; *Summer Program In Instrumental Analysis for College Teachers;* 10 months; $26,400

STANFORD UNIVERSITY, Stanford, Calif.; Lawrence R. Blinks, Pacific Grove; *Summer Institute in Marine Biology for High School and Junior College Teachers;* 9 months; $25,680

SYRACUSE UNIVERSITY, Syracuse, N.Y.; W. R. LePage; *A Conference on Electrical Engineering Education;* 3 days; $3,800

UNIVERSITY OF MIAMI, Coral Gables, Fla.; Carl H. Oppenheimer, Miami; *Program in Marine Microbiology;* 8 months; $16,430

UNIVERSITY OF NORTH CAROLINA, Chapel Hill; Joseph W. Straley; *Conferences on Recent Advances in Physics;* 9 months; $2,180

UNIVERSITY OF WASHINGTON, Seattle; Roy Dubisch; *In-Service Institute in Elementary Mathematics for High School Teachers;* 10 months; $10,030

UNIVERSITY OF WISCONSIN, Madison; R. D. Wagner; *In-Service Project for High School Algebra Teachers by Use of Correspondence Study Materials;* 15 months; $33,670

SUPPLEMENTARY TRAINING FOR UNDERGRADUATES

ILLINOIS INSTITUTE OF TECHNOLOGY, Chicago; Andrew A. Fejer; *Conference on Undergraduate Research Participation in Engineering;* 18 months; $29,650

UNIVERSITY OF COLORADO, Boulder; Joseph W. Cohen; *Science Honors Information and Research Project;* 1 year; $89,100

Frank Kreith; *Summer Conference on Honors Programs in Colleges of Engineering;* 18 months; $28,980

TRAVELING SCIENCE LIBRARIES

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, Washington, D.C.; Hilary J. Deason; *Traveling Elementary School Science Library;* 18 months; $65,000

UNDERGRADUATE INSTRUCTIONAL SCIENTIFIC EQUIPMENT

ABILENE CHRISTIAN COLLEGE, Abilene, Tex.; H. Douglas Dean; 2 years; $12,060

Tommy J. McCord; 2 years; $7,460

ADELPHI COLLEGE, Garden City, Long Island, N.Y.; Alfred M. Vogel; 2 years; $12,200

AGRICULTURAL AND MECHANICAL COLLEGE OF TEXAS, College Station; Glen D. Hallmark; 2 years; $22,370

James G. Potter; 2 years; $23,120

Clifford M. Simmang; 2 years; $13,770

W. O. Trogdon; 2 years; $21,230

ALABAMA COLLEGE, Montevallo; Paul C. Bailey; 2 years; $4,640

ALBANY STATE COLLEGE, Albany, Ga.; William E. Johnson, Jr.; 2 years; $10,210

ALBION COLLEGE, Albion, Mich.; Robert L. Luttermoser; 2 years; $9,990

ALBRIGHT COLLEGE, Reading, Pa.; Mahlon H. Hellerich; 2 years; $6,300

ALFRED UNIVERSITY, Alfred, N.Y.; Peter S. Finlay; 2 years; $2,650
John L. Stull; 2 years; $1,050

ALLEGHENY COLLEGE, Meadville, Pa.; Robert E. Bugbee; 2 years; $8,170
Georgiana W. Scovil; 2 years; $15,830

ALMA COLLEGE, Alma, Mich.; Lester E. Eyer; 2 years; $7,930

AMHERST COLLEGE, Amherst, Mass.; L. Willard Richards; 2 years; $13,810

ANNA MARIA COLLEGE FOR WOMEN, Paxton, Mass.; Sister M. Rose Bernadette; 2 years; $1,600

ANDREWS UNIVERSITY, Berrien Springs, Mich.; Ariel A. Roth; 2 years; $10,000

ANTIOCH COLLEGE, Yellow Springs, Ohio; Edmund W. Samuel; 2 years; $10,000

APPALACHIAN STATE TEACHERS COLLEGE, Boone, N.C.; F. Ray Derrick; 2 years; $11,130

ARIZONA STATE COLLEGE, Flagstaff; Agnes M. Allen; 2 years; $7,120

ARIZONA STATE UNIVERSITY, Tempe; A. M. Dycus; 2 years; $20,000
LeRoy Eyring; 2 years; $25,000
Truet B. Thompson; 2 years; $20,000

ARKANSAS POLYTECHNIC COLLEGE, Russellville; Jack G. Dodd; 2 years; $4,000

ASHLAND COLLEGE, Ashland, Ohio; Milton P. Puterbaugh; 2 years; $6,660

BALDWIN-WALLACE COLLEGE, Berea, Ohio; T. C. Surrarrer; 2 years; $10,420

BALL STATE TEACHERS COLLEGE, Muncie, Ind.; Park A. Wiseman; 2 years; $10,000

BARRY COLLEGE, Miami, Fla.; Sister Agnes Louise, Stechschulte; 2 years; $2,120

BATES COLLEGE, Lewiston, Maine; John B. Annett; 2 years; $13,810

BELLARMINE COLLEGE, Louisville, Ky.; John M. Daly; 2 years; $7,340

BELOIT COLLEGE, Beloit, Wis.; Carl Welty; 2 years; $18,530

BEMIDJI STATE, Bemidji, Minn.; Wesley W. Winter; 2 years; $8,890

BETHEL COLLEGE, North Newton, Kans.; Albert J. Meyer; 2 years; $2,640

BIRMINGHAM-SOUTHERN COLLEGE, Birmingham, Ala.; Kenneth M. Gordon; 2 years; $5,170

BOSTON COLLEGE, Chestnut Hill, Mass.; William D. Sullivan; 2 years; $10,060
Frederick E. White; 2 years; $6,000

BOSTON UNIVERSITY, Boston, Mass.; Charles K. Levy; 2 years; $15,740
J. Gordon Stipe, Jr.; 2 years; $11,420

BOWDOIN COLLEGE, Brunswick, Maine; Alton H. Gustafson; 2 years; $20,000

BOWLING GREEN STATE UNIVERSITY, Bowling Green, Ohio; W. H. Hall; 2 years; $10,500

BRADLEY UNIVERSITY, Peoria, Ill.; Martin G. Abegg; 2 years; $23,000
H. A. Moore; 2 years; $10,000
C. E. Smith; 2 years; $7,270

BRANDEIS UNIVERSITY, Waltham, Mass.; Edgar Zwilling; 2 years; $11,310

BRESCIA COLLEGE, Owensboro, Ky.; Sister Martha Ann Cargile; 2 years; $3,500

BROOKLYN COLLEGE, N.Y.; George Gibson; 2 years; $8,000
Albert N. Guthrie; 2 years; $7,620
George S. Tulloch; 2 years; $4,580

BROWN UNIVERSITY, Providence, R.I.; Joseph F. Bunnett; 2 years; $8,280
Richard A. Fund; 2 years; $14,570
P. D. Richardson; 2 years; $13,770
Harold Schlosberg; 2 years; $13,550

BRYN MAWR COLLEGE, Bryn Mawr, Pa.; M. E. Bitterman; 2 years; $14,520

BUCKNELL UNIVERSITY, Lewisburg, Pa.; Robert A. Artman; 2 years; $20,810
Carl H. Kindig; 2 years; $15,150

CALIFORNIA INSTITUTE OF TECHNOLOGY, Pasadena; Richard M. Badger; 2 years; $22,830

CALIFORNIA STATE POLYTECHNIC COLLEGE, San Luis Obispo; Harold P. Hayes; 2 years; $20,000

CALVIN COLLEGE, Grand Rapids, Mich.; Bernard J. TenBroek; 2 years; $4,980

CANISIUS COLLEGE, Buffalo, N.Y.; Herman A. Szymanski; 2 years; $12,000

CAPITAL UNIVERSITY, Columbus, Ohio; Charles H. Oestreich; 2 years; $5,240

CARLETON COLLEGE, Northfield, Minn.; Richard W. Ramette; 2 years; $12,960

CARNEGIE INSTITUTE OF TECHNOLOGY, Pittsburgh, Pa.; Carl C. Monrad; 2 years; $18,440
M. C. Shaw; 2 years; $22,000
E. M. Williams; 2 years; $20,000

CARTHAGE COLLEGE, Carthage, Ill.; Kenneth L. Hamm; 2 years; $6,680

CASE INSTITUTE OF TECHNOLOGY, Cleveland, Ohio; Ray E. Bolz; 2 years; $24,990

CATAWBA COLLEGE, Salisbury, N.C.; Maurice C. Powers; 2 years; $7,020

CATHOLIC UNIVERSITY OF AMERICA, Washington, D.C.; James Brennan; 2 years; $25,000

CENTENARY COLLEGE, Shreveport, La.; Marvin Wayne Hanson; 2 years; $11,430

CENTRAL METHODIST COLLEGE, Fayette, Mo.; Leonard D. Flansburg; 2 years; $10,400

CENTRAL MICHIGAN UNIVERSITY, Mount Pleasant; LaVerne L. Curry; 2 years; $19,260

CENTRAL MISSOURI STATE COLLEGE, Warrensburg; Charles D. Heaton; 2 years; $5,490
Sam P. Hewitt; 2 years; $12,500

CENTRE COLLEGE OF KENTUCKY, Danville; Roy Ellis; 2 years; $17,500

CHATHAM COLLEGE, Pittsburgh, Pa.; Earl K. Wallace; 2 years; $8,000

CITY COLLEGE, New York, N.Y.; Kurt E. Lowe; 2 years; $16,170

CLARK UNIVERSITY, Worcester, Mass.; Roy S. Anderson; 2 years; $16,080

CLARKSON COLLEGE OF TECHNOLOGY, Potsdam, N.Y.; Milton Kerker; 2 years; $20,390
Edward T. Misiaszek; 2 years; $12,500

CLEMSON COLLEGE, Clemson, S.C.; L. D. Huff; 2 years; $12,520
G. C. Robinson; 2 years; $13,170

COLBY COLLEGE, Waterville, Maine; Dennison Bancroft; 2 years; $4,660

COLGATE UNIVERSITY, Hamilton, N.Y.; James A. Storing; 2 years; $18,900

COLLEGE OF CHARLESTON, Charleston, S.C.; Harry W. Freeman; 2 years; $6,000

COLLEGE OF THE HOLY CROSS, Worcester, Mass.; James K. Connolly; 2 years; $4,400
Joseph A. Martus; 2 years; $7,000

College of New Rochelle, New Rochelle, N.Y.; Mary Dora Rogick; 2 years; $3,030

College of Pharmacy of the City of New York, N.Y.; E. E. Leuallen; 2 years; $8,000

College of St. Elizabeth, Convent Station, N.J.; Sister Maria Carlita Boulton; 2 years; $9,220

College of St. Mary of the Springs, Columbus, Ohio; Sister M. Suzanne Uhrhane; 2 years; $3,880

College of St. Thomas, St. Paul, Minn.; Clarence B. Germain; 2 years; $25,000

College of William and Mary, Williamsburg, Va.; William G. Guy; 2 years; $10,430
  Melvin A. Pittman; 2 years; $12,500

College of Wooster, Wooster, Ohio; Henry Loess; 2 years; $19,770

Colorado School of Mines, Golden; V. Allan Long; 2 years; $4,630

Colorado State College, Greeley; John A. Beel; 2 years; $12,440

Colorado State University, Fort Collins; O. Wilford Olsen; 2 years; $17,170

Colorado State University Research Foundation, Fort Collins; Franklin A. Graybill; 2 years; $5,890

Concordia College, Moorhead, Minn.; Daryl L. Ostercamp; 2 years; $11,640

Connecticut College, New London; Otello L. Desiderato; 2 years; $4,020

Cornell College, Mount Vernon, Iowa; T. Edwin Rogers; 2 years; $8,250

Cornell University, Ithaca, N.Y.; Harlan P. Banks; 2 years; $15,000
  James J. Gibson; 2 years; $14,000
  L. G. Parratt; 2 years; $13,890
  H. A. Scheraga; 2 years; $19,560

Creighton University, Omaha, Neb.; Clarence M. Wagener; 2 years; $9,500

Dartmouth College, Hanover, N.H.; James F. Hornig; 2 years; $16,140
  William T. Jackson; 2 years; $9,710

David Lipscomb College, Nashville, Tenn.; William Everette Hunt; 2 years; $10,000

Davidson College, Davidson, N.C.; Locke White, Jr.; 2 years; $25,000

DePauw University, Greencastle, Ind.; Albert E. Reynolds; 2 years; $7,000

Drake University, Des Moines, Iowa; Leland P. Johnson; 2 years; $25,000

Drexel Institute of Technology, Philadelphia, Pa.; George E. Dieter, Jr.; 2 years; $15,000

Duke University, Durham, N.C.; E. Willard Berry; 2 years; $5,380
  Henry A. Fairbank; 2 years; $11,420

Dunbarton College of Holy Cross, Washington, D.C.; Sister M. Ann Elizabeth Waters; 2 years; $1,530

Earlham College, Richmond, Ind.; David Telfair; 2 years; $8,500

Eastern Baptist College, St. Davids, Pa.; Kingsley L. Greene; 2 years; $2,520

Eastern Illinois University, Charleston; Harris E. Phipps; 2 years; $5,500

Eastern Mennonite College, Harrisonburg, Va.; D. Ralph Hostetter; 2 years; $9,000

Eastern Nazarene College, Wollaston, Mass.; John S. Rigden; 2 years; $10,000

Eastern Washington State College, Cheney; Vincent L. Stevens; 2 years; $9,000

East Tennessee State University, Johnson City; Stanford H. Johnson; 2 years; $25,000

Edgewood College of the Sacred Heart, Madison, Wis.; Sister M. Elaine Feldballe; 2 years; $1,930

Elizabeth City State Teachers College, Elizabeth City, N.C.; Emily M. Horrington; 2 years; $6,000

Emory and Henry College, Emory, Va.; Cecil M. Nelson; 2 years; $5,000

Emory University, Atlanta, Ga.; James W. Simmons; 2 years; $20,000

Erskine College, Due West, S.C.; E. A. Sloan; 2 years; $5,020

Fenn College, Cleveland, Ohio; Frank J. Bockhoff; 2 years; $13,380

Findlay College, Findlay, Ohio; George C. Towe; 2 years; $2,490

Florida Presbyterian College, St. Petersburg; Dexter Squibb; 2 years; $6,760

Florida State University, Tallahassee; Robert A. Kromhout; 2 years; $24,950

Fordham University, New York, N.Y.; Charles A. Berger; 2 years; $9,450
  Joseph F. Mulligan; 2 years; $21,870

Fort Hays Kansas State College, Hays; Harold S. Choguill; 2 years; $6,000

Fort Lewis Agricultural and Mechanical College, Durango, Colo.; Herbert E. Owen; 2 years; $7,000

Franklin and Marshall College, Lancaster, Pa.; Fred H. Suydam; 2 years; $14,700

Geneva College, Beaver Falls, Pa.; Roy M. Adams; 2 years; $8,600

Georgian Court College, Lakewood, N.J.; Sister Mary Grace Burns; 2 years; $6,430

Georgia Institute of Technology, Atlanta; N. H. Barnette; 2 years; $25,000
  J. W. Williams; 2 years; $22,480

Georgia Southern College, Statesboro; John A. Boole, Jr.; 2 years; $1,250

Gettysburg College, Gettysburg, Pa.; Kenneth L. Smoke; 2 years; $5,000

Glassboro State College, Glassboro, N.J.; Charles H. Green; 2 years; $4,150

Gonzaga University, Spokane, Wash.; E. James Davis; 2 years.; $8,660

Good Counsel College, White Plains, N.Y.; Sister Mary Eugenia; 2 years; $950

Goucher College, Baltimore, Md.; Belle Otto; 2 years; $21,920

Grinnell College, Grinnell, Iowa; Joseph D. Danforth; 2 years; $17,960
  Roger J. Hanson; 2 years; $15,000

Gustavus Adolphus College, St. Peter, Minn.; Arne N. Langsjoen; 2 years; $5,200

Hamilton College, Clinton, N.Y.; James W. Ring; 2 years; $12,000
  Philip V. Rogers; 2 years; $10,940

Hamline University, St. Paul, Minn.; Walter A. Kenyon; 2 years; $3,080

Hampden-Sydney College, Hampden-Sydney, Va.; W. T. Joyner; 2 years; $4,960

Hanover College, Hanover, Ind.; Enos G. Pray; 2 years; $5,000

Hartwick College, Oneonta, N.Y.; F. W. Miller; 2 years; $15,000

Harvard University, Cambridge, Mass.; Donald R. Griffin; 2 years; $25,000

Ronald E. Vanelli; 2 years; $17,850

Harvey Mudd College, Claremont, Calif.; Alfred B. Focke; 2 years; $17,500

Hastings College, Hastings, Nebr.; Clyde C. Sachtleben; 2 years; $4,970

Haverford College, Haverford, Pa.; Robert I. Walter; 2 years; $13,150

Heidelberg College, Tiffin, Ohio; Arthur G. McQuate; 2 years; $8,000

Hobart and William Smith Colleges, Geneva, N.Y.; Sabinus H. Christensen; 2 years; $5,000

Hofstra College, Hempstead, Long Island, N.Y.; Richard R. Holmes; 2 years; $10,870

Hollins College, Hollins College, Va.; Ralph G. Steinhardt, Jr.; 2 years; $5,640

Hood College, Frederick, Md.; Phyllida M. Willis; 2 years; $5,280

Hope College, Holland, Mich.; Gerrit Van Zyl; 2 years; $13,560

Howard University, Washington, D.C.; Halson V. Eagleson; 2 years; $21,070

Hunter College, New York, N.Y.; Robert Berryman; 2 years; $6,940

Marcia D. Brody; 2 years; $7,410

Bernard Kramer; 2 years; $7,570

Illinois Institute of Technology, Chicago; C. H. Hoffman; 2 years; $13,180

Arthur E. Martell; 2 years; $14,820

Immaculate Heart College, Los Angeles, Calif.; Sister Agnes Ann Green; 2 years; $10,000

Indiana Institute of Technology, Fort Wayne; Warren E. Hoffman; 2 years; $12,000

Indiana State College, Indiana, Pa.; Dwight E. Sollberger; 2 years; $15,000

Indiana University Foundation, Bloomington; Harry G. Day; 2 years; $24,990

L. S. McClung; 2 years; $25,000

Iona College, New Rochelle, N.Y.; Viateur Rousseau; 2 years; $4,880

Iowa State University, Ames; William L. Larsen; 2 years; $13,430

Glen A. Russell; 2 years; $16,420

F. G. Smith; 2 years; $14,750

Thomas D. Wheelock; 2 years; $22,560

D. J. Zaffarano; 2 years; $8,000

Jacksonville University, Jacksonville, Fla.; Harold W. Barrett; 2 years; $6,560

John Carroll University, Cleveland, Ohio; Harry C. Nash; 2 years; $10,450

Juniata College, Huntingdon, Pa.; B. E. Blaisdell; 2 years; $22,090

Kansas State College of Pittsburg; Delta Warren Gier; 2 years; $16,200

Kansas State Teachers College, Emporia; Ted F. Andrews; 2 years; $25,000

Kansas State University, Manhattan; Warren W. Brandt; 2 years; $24,990

Charles V. Hall; 2 years; $9,840

Merrill E. Noble; 2 years; $10,330

Kansas Wesleyan University, Salina; Bernard L. Owen; 2 years; $5,000

Kent State University, Kent, Ohio; Glenn H. Brown; 2 years; $24,600

Kentucky Research Foundation, Lexington; Norman C. Small; 2 years; $10,000

Francis L. Yost; 2 years; $24,870

Kenyon College, Gambier, Ohio; James M. Pappenhagen; 2 years; $5,010

Keuka College, Keuka Park, N.Y.; Lydia Jahn Gambrell; 2 years; $9,000

King's College, Wilkes-Barre, Pa.; William H. Donahue; 2 years; $10,000

Knox College, Galesburg, Ill.; George H. Ward; 2 years; $10,000

Knoxville College, Knoxville, Tenn.; C. J. Hochanadel; 2 years; $1,680

Lafayette College, Easton, Pa.; J. R. Beerbower; 2 years; $6,900

LaGrange College, LaGrange, Ga.; John L. Shibley; 2 years; $2,680

Lake Forest College, Lake Forest, Ill.; John W. Coutts; 2 years; $20,180

La Moyne College, Memphis, Tenn.; W. W. Gibson; 2 years; $8,700

Le Moyne College, Syracuse, N.Y.; Robert O. Brennan; 2 years; $2,880

La Salle College, Philadelphia, Pa.; John S. Penny; 2 years; $10,000

La Sierra College, Arlington, Calif.; James W. Riggs, Jr.; 2 years; $10,500

Lawrence College, Appleton, Wis.; J. Bruce Brackenridge; 2 years; $5,000

Lehigh University, Bethlehem, Pa.; George R. Jenkins; 2 years; $25,000

George R. Jenkins; 2 years; $17,530

George R. Jenkins; 2 years; $20,000

Lincoln University, Jefferson City, Mo.; Walter R. Talbot; 2 years; $14,940

Lincoln University, Lincoln University, Pa.; Robert M. Chute; 2 years; $5,700

Little Rock University, Little Rock, Ark.; John I. Petz; 2 years; $13,500

Lock Haven State College, Lock Haven, Pa.; Mason Lee Fisher; 2 years; $7,890

Long Island University, Brooklyn, N.Y.; Shirley D. Kraus; 2 years; $3,240

Loras College, Dubuque, Iowa; George N. Schulte; 2 years; $9,000

Louisiana State University, Baton Rouge; Willie M. Reams, Jr.; 2 years; $22,700

Loyola University, New Orleans, La.; John F. Keller; 2 years; $24,170

Luther College, Decorah, Iowa; Adrian M. Docken; 2 years; $15,810

Macalester College, St. Paul, Minn.; O. T. Walter; 2 years; $17,500

MacMurray College, Jacksonville, Ill.; Richard E. Freiburg; 2 years; $4,780

Manchester College, North Manchester, Ind.; R. Emerson Niswander; 2 years; $2,500

Manhattan College, New York, N.Y.; John H. Fernandes; 2 years; $12,500

Brother C. James; 2 years; $12,580

Arthur B. Kemper; 2 years; $17,000

Mankato State College, Mankato, Minn.; G. M. Wissink; 2 years; $20,000

Marshall Foundation, Inc., Huntington, W. Va.; John H. Wotiz; 2 years; $4,720

Marycrest College, Davenport, Iowa; Sister Mary Benita Pieper; 2 years; $390

MARYGROVE COLLEGE, Detroit, Mich.; George E. F. Brewer; 2 years; $4,600

MARY WASHINGTON COLLEGE, Fredericksburg, Va.; Samuel O. Bird; 2 years; $2,110

MARYWOOD COLLEGE, Scranton, Pa.; Sister M. St. Anthony Radzikowski; 2 years; $5,120

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge; B. L. Averbach; 2 years; $25,000
Arthur C. Cope, 2 years; $25,000
E. L. Mollo-Christensen; 2 years; $24,940
Irwin W. Sizer; 2 years; $21,750

McMURRY COLLEGE, Abilene, Tex.; John R. Hilliard, Jr.; 2 years; $3,340

MERCY COLLEGE, Detroit Mich.; Sister Mary Mercy Gellenbeck; 2 years; $3,000

MERCYHURST COLLEGE, Erie, Pa.; Sister M. Fidelis O'Connor; 2 years; $5,200

MIAMI UNIVERSITY, Oxford, Ohio; Charles A. Sorrell; 2 years; $7,580

MICHIGAN COLLEGE OF MINING AND TECHNOLOGY, Houghton; Marriott W. Bredekamp; 2 years; $770
James D. Spain; 2 years; $5,400

MICHIGAN STATE UNIVERSITY, East Lansing; Abram M. Barch; 2 years; $6,740
Alexander I. Popov; 2 years; $20,000
C. E. Prouty; 2 years; $15,770
Charles S. Thornton; 2 years; $11,410

MISSISSIPPI STATE COLLEGE, FOR WOMEN, Columbus; James C. Wilkes, Jr.; 2 years; $9,070

MISSISSIPPI STATE UNIVERSITY, State College; J. C. McKee, Jr.; 2 years; $24,990

MONTANA STATE COLLEGE, Bozeman; Byron J. Bennett; 2 years; $15,000
Rod O'Connor; 2 years; $21,900

MONTANA STATE UNIVERSITY, Missoula; R. A. Diettert; 2 years; $4,790
C. R. Jeppesen; 2 years; $4,730

MOREHOUSE COLLEGE, Atlanta, Ga.; Henry C. McBay; 2 years; $24,930

MORGAN STATE COLLEGE, Baltimore, Md.; Clarence L. E. Monroe; 2 years; $10,000

MORNINGSIDE COLLEGE, Sioux City, Iowa; Robert Wood Green; 2 years; $8,920

MOUNT HOLYOKE COLLEGE, South Hadley, Mass.; Jytte Muus; 2 years; $24,960

MOUNT UNION COLLEGE, Alliance, Ohio; J. L. Blount; 2 years; $7,480
L. A. Pappenhagen; 2 years; $6,750

MUHLENBERG COLLEGE, Allentown, Pa.; Daniel C. Springer; 2 years; $7,660

NEBRASKA STATE TEACHERS COLLEGE, Chadron; Lyle V. Andrews; 2 years; $7,440

NEBRASKA WESLEYAN UNIVERSITY, Lincoln; Paul H. Laursen; 2 years; $9,900

NEWARK COLLEGE OF ENGINEERING, Newark, N.J.; Mauro Zambuto; 2 years; $12,200

NEW YORK UNIVERSITY, New York, N.Y.; Stuart W. Cook; 2 years; $12,090
James Michalos; 2 years; $6,750
James H. Mulligan; 2 years; $19,760
Robert E. Silverman; 2 years; $9,290

NIAGARA UNIVERSITY, Niagara University, N.Y.; John J. Reedy; 2 years; $15,000

NORTH CENTRAL COLLEGE, Naperville, Ill.; A. C. Buck; 2 years; $5,500

NORTH DAKOTA STATE UNIVERSITY, Fargo; James R. Dogger; 2 years; $6,000
Donald Schwartz; 2 years; $10,130
James P. Vacik; 2 years; $7,280

NORTHEASTERN UNIVERSITY, Boston, Mass.; Nathan W. Riser; 2 years; $16,000
Robert A. Shepard; 2 years; $12,500

NORTHERN ILLINOIS UNIVERSITY, De Kalb; Harold Feeny; 2 years; $9,880

NORTHERN MICHIGAN COLLEGE, Marquette; Roy E. Heath; 2 years; $8,740

NORTHROP INSTITUTE OF TECHNOLOGY, Inglewood, Calif.; Kenneth L. Strite; 2 years; $2,210

NORTH TEXAS STATE UNIVERSITY, Denton; L. F. Connell, Jr.; 2 years; $19,000
J. K. G. Silvey; 2 years; $15,310

NOTRE DAME COLLEGE, Cleveland, Ohio; Sister Mary Christopher Rohner; 2 years; $3,230

OAKLAND UNIVERSITY, Rochester, Mich.; Ralph C. Mobley; 2 years; $22,000

OBERLIN COLLEGE, Oberlin, Ohio; Luke E. Steiner; 2 years; $24,650

OCCIDENTAL COLLEGE, Los Angeles, Calif.; John W. McMenamin; 2 years; $17,700

OHIO NORTHERN UNIVERSITY, Ada; Lawrence H. Archer; 2 years; $25,000

OHIO STATE UNIVERSITY, Columbus; E. L. Jossem; 2 years; $25,000
Arthur D. Lynn, Jr.; 2 years; $23,720
Wayne B. Parrish; 2 years; $22,500
Howard J. Pincus; 2 years; $20,000
Garth W. Volk; 2 years; $20,000

OHIO UNIVERSITY, Athens; Carl A. Frey; 2 years; $4,310

OHIO WESLEYAN UNIVERSITY, Delaware; William F. Hahnert; 2 years; $9,000
Howard N. Maxwell; 2 years; $24,990

OKLAHOMA CITY UNIVERSITY, Okla.; Moody L. Coffman; 2 years; $1,890

OKLAHOMA STATE UNIVERSITY, Stillwater; James H. Boggs; 2 years; $24,790
O. C. Dermer; 2 years; $9,570
Walter W. Hansen; 2 years; $8,090
Robert N. Maddox; 2 years; $20,000
Marlowe D. Thorne; 2 years; $1,630

OLD DOMINION COLLEGE, Norfolk, Va.; Jacques S. Zaneveld; 2 years; $6,200

OLIVET NAZARENE COLLEGE, Kankakee, Ill.; W. E. Snowbarger; 2 years; $5,000

OREGON STATE UNIVERSITY, Corvallis; Bert E. Christensen; 2 years; $9,210
P. R. Elliker; 2 years; $6,840
Roger D. Olleman; 2 years; $14,970
Leonard J. Weber; 2 years; $14,750
Roy A. Young; 2 years; $9,880

OUR LADY OF CINCINNATI COLLEGE, Ohio; Mary Jane Showers; 2 years; $8,500

OUR LADY OF THE LAKE COLLEGE, San Antonio, Tex.; Sister Mary Clare Metz; 2 years; $2,530

PARSONS COLLEGE, Fairfield, Iowa; William A. DeMeester; 2 years; $9,440

PENNSYLVANIA MILITARY COLLEGE, Chester; Arthur T. Murphy; 2 years; $25,000

PENNSYLVANIA STATE UNIVERSITY, University Park; Thomas F. Bates; 2 years; $22,520
Alvin R. Grove; 2 years; $24,870
William H. Park; 2 years; $24,730
Carl Volz; 2 years; $21,230

PFEIFFER COLLEGE, Misenheimer, N.C.; J. O. Manly; 2 years; $6,220

PHILADELPHIA COLLEGE OF PHARMACY AND SCIENCE, Philadelphia, Pa.; Arthur Osol; 2 years; $17,000

POLYTECHNIC INSTITUTE OF BROOKLYN, Brooklyn, N.Y.; William B. Blesser; 2 years; $21,600
George J. Fischer; 2 years; $23,430
C. G. Overberger; 2 years; $20,000

PRINCIPIA CORPORATION, St. Louis, Mo.; Forbes Robertson; 2 years; $2,710

PRINCETON UNIVERSITY, Princeton, N.J.; Walter C. Johnson; 2 years; $3,600
Richard H. Wilhelm; 2 years; $6,700

PROVIDENCE COLLEGE, Providence, R.I.; Walter A. Murtaugh; 2 years; $3,890

PURDUE UNIVERSITY, Lafayette, Ind.; Gustav E. Cwalina; 2 years; $17,500
Brage Golding; 2 years; $25,000
Robert H. Kohr; 2 years; $25,000
Robert L. Livingston; 2 years; $25,000
Frederick C. Neidhardt; 2 years; $20,000

QUEEN'S COLLEGE, Charlotte, N.C.; Mildred McEwen; 2 years; $7,500

QUEENS COLLEGE, Flushing, Long Island, N.Y.; Daniel Marien; 2 years; $18,000
John S. Stamm; 2 years; $10,370

RADFORD COLLEGE, Radford, Va.; Floyd E. Jarvis, Jr.; 2 years; $8,000

REED COLLEGE, Portland, Oreg.; Marshall W. Cronyn; 2 years; $20,000

REGIS COLLEGE, Weston, Mass.; Sister Mary Emily; 2 years; $5,000

RESEARCH FOUNDATION OF STATE UNIVERSITY OF NEW YORK, Albany; Donald S. Allen; 2 years; $17,500
J. D. O'Rourke, Buffalo; 2 years; $17,500
Walter S. Bradfield, Stony Brook; 2 years; $7,500

RIDER COLLEGE, Trenton, N.J.; Thomas C. Mayer; 2 years; $16,740

RIPON COLLEGE, Ripon, Wis.; Jack W. Powers; 2 years; $12,360

ROCHESTER INSTITUTE OF TECHNOLOGY, N.Y.; Ralph L. Van Peursem; 2 years; $12,300

ROOSEVELT UNIVERSITY, Chicago, Ill.; Eugene Lieber; 2 years; $11,250
H. H. Sheldon; 2 years; $10,000

ROSARY COLLEGE, River Forest, Ill.; Sister Mary Brandon; 2 years; $5,000

ROSARY HILL COLLEGE, Buffalo, N.Y.; Sister M. Regina Lanigan; 2 years; $5,110

RUSSELL SAGE COLLEGE, Troy, N.Y.; Grace I. Van Dervoort; 2 years; $5,290

RUTGERS, THE STATE UNIVERSITY, New Brunswick, N.J.; William Rieman, III; 2 years; $17,850
George H. Smith; 2 years; $15,000
Roger S. Sweet; 2 years; $13,000
Henry C. Torrey; 2 years; $18,420

SACRED HEART DOMINICAN COLLEGE, Houston, Tex.; J. L. Laseter; 2 years; $2,420

ST. CLOUD STATE COLLEGE, St. Cloud, Minn.; Philip Youngner; 2 years; $5,000

ST. EDWARD'S UNIVERSITY, Austin, Tex.; Daniel Lynch; 2 years; $3,850

ST. FRANCIS COLLEGE, Brooklyn, N.Y.; John M. Burke; 2 years; $6,000

ST. JOHN'S UNIVERSITY, Collegeville, Minn.; Fintan A. Bromenshenkel; 2 years; $25,000

ST. JOSEPH COLLEGE, Emmitsburg, Md.; Sister Denise Eby; 2 years; $5,000

ST. JOSEPH COLLEGE, West Hartford, Conn.; Sister Maria Clare Markham; 2 years; $6,000

ST. LAWRENCE UNIVERSITY, Canton, N.Y.; Donald C. Peckham; 2 years; $1,660

ST. LOUIS UNIVERSITY, Mo.; Arthur G. Rouse; 2 years; $20,000

ST. MARTIN'S COLLEGE, Olympia, Wash.; Placidus Reischman; 2 years; $2,660

ST. MARY'S DOMINICAN COLLEGE, New Orleans, La.; Sister Mary Albert; 2 years; $3,330

ST. OLAF COLLEGE, Northfield, Minn.; Allen L. Hanson; 2 years; $11,740

ST. PETER'S COLLEGE, Jersey City, N.J.; George J. Hilsdorf; 2 years; $14,130

ST. VINCENT COLLEGE, Latrobe, Pa.; Bertin Emling; 2 years; $3,680

ST. XAVIER COLLEGE, Chicago, Ill.; Sister Mary Esther; 2 years; $2,400

SAN DIEGO STATE COLLEGE, Calif.; Harold Walba; 2 years; $4,150

SAVANNAH STATE COLLEGE, Savannah, Ga.; Charles Pratt; 2 years; $7,000

SEATTLE UNIVERSITY, Wash.; Francis P. Wood; 2 years; $9,180

SETON HALL UNIVERSITY, South Orange, N.J.; Alfred V. Celiano; 2 years; $16,200

SMITH COLLEGE, Northampton, Mass.; Adam H. Spees; 2 years; $7,500

SOUTHEASTERN LOUISIANA COLLEGE, Hammond; Jack W. Knight; 2 years; $12,000

SOUTHEASTERN STATE COLLEGE, Durant, Okla.; Ernest Sturch, Jr.; 2 years; $4,500

SOUTHERN ILLINOIS UNIVERSITY, Carbondale; J. W. Neckers; 2 years; $15,600

SOUTHERN UNIVERSITY AND AGRICULTURAL AND MECHANICAL COLLEGE, Baton Rouge, La.; Vandon E. White; 2 years; $10,000

SOUTHWESTERN AT MEMPHIS, Memphis, Tenn.; Clinton L. Baker; 2 years; $8,500

SOUTHWESTERN STATE COLLEGE, Weatherford, Okla.; F. W. Allen; 2 years; $10,000
Earl A. Reynolds; 2 years; $14,880

SOUTHWESTERN UNIVERSITY, Georgetown, Tex.; Eb C. Girvin; 2 years; $7,000

STATE TEACHERS COLLEGE, Minot, N. Dak.; Harry A. Robinson; 2 years; $6,260

STATE UNIVERSITY OF IOWA, Iowa City; Jerry J. Kollros; 2 years; $24,320
Arthur W. Melloh; 2 years; $24,980
Sherwood D. Tuttle; 2 years; $3,870
James A. Van Allen; 2 years; $24,740

STATE UNIVERSITY OF NEW YORK, Albany; Hinrich R. Martens, Buffalo; 2 years; $25,000

STATE UNIVERSITY OF NEW YORK COLLEGE OF AGRICULTURE AT CORNELL UNIVERSITY, Ithaca; B. V. Travis; 2 years; $14,500

STATE UNIVERSITY OF SOUTH DAKOTA, Vermillion; Theodore L. Reid; 2 years; $18,000

STETSON UNIVERSITY, DeLand, Fla.; John F. Conn; 2 years; $20,000

STEVENS INSTITUTE OF TECHNOLOGY, Hoboken, N.J.; Ajay K. Bose; 2 years; $25,000
Earl L. Koller; 2 years; $15,000

SWARTHMORE COLLEGE, Swarthmore, Pa.; Robert K. Enders; 2 years; $17,360

SWEET BRIAR COLLEGE, Sweet Briar, Va.; Phyllis W. Stevens; 2 years; $2,410

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Syracuse University, Syracuse, N.Y.; William R. Fredrickson; 2 years; $24,940
Wilbur R. LePage; 2 years; $24,930
William M. Merrill; 2 years; $18,500
Henry E. Wirth; 2 years; $24,970

Tarkio College, Tarkio, Mo.; Homer A. Smith, Jr.; 2 years; $5,380

Temple University, Philadelphia, Pa.; Jack V. Buerkle; 2 years; $23,840

Tennessee Agricultural and Industrial State University, Nashville; Samuel Anderson; 2 years; $5,800

Tennessee Wesleyan College, Athens; Carl Honaker; 2 years; $12,000

Texas College of Arts and Industries, Kingsville; John S. Westmoreland; 2 years; $3,340

Texas Lutheran College, Seguin; O. E. Weigang; 2 years; $3,940

Texas Southern University, Houston; Robert J. Terry; 2 years; $14,980

Texas Technological College, Lubbock; Henry C. Thomas; 2 years; $15,000

Tougaloo Southern Christian College, Tougaloo, Miss.; John B. Garner; 2 years; $1,870

Trinity College, Hartford, Conn.; Robert Lindsay; 2 years; $19,640

Trinity University, San Antonio, Tex.; Max C. Bolen; 2 years; $20,000

Tufts University, Medford, Mass.; Ashley S. Campbell; 2 years; $12,480
James D. Hume; 2 years; $7,400

Tulane University, New Orleans, La.; Hans B. Jonassen; 2 years; $10,000
Ralph M. Rotty; 2 years; $18,500

Union College, Lincoln, Nebr.; Richard G. Leffler; 2 years; $10,000

Union College and University, Schenectady, N.Y.; Leonard B. Clark; 2 years; $24,830
George H. Reed; 2 years; $7,000

University of Akron, Ohio; Robert T. Harris; 2 years; $3,350

University of Alabama, University; Eric Rodgers; 2 years; $19,890

University of Arizona, Tucson; Walter S. Phillips; 2 years; $5,610
Jay E. Treat, Jr.; 2 years; $20,430
Martin A. Uman; 2 years; $15,170

University of Arkansas, Fayetteville; Denys O. Akhurst; 2 years; $7,790
Philip E. Bocquet; 2 years; $7,030
Paul C. Sharrah; 2 years; $15,260

University of Bridgeport, Conn.; William Garner; 2 years; $15,000
Andrew I. Peterson; 2 years; $21,610

University of California, Berkeley; A. S. Foss; 2 years; $20,000
Leonard Machlis; 2 years; $11,650
D. O. Emerson, Davis; 2 years; $10,600
Milton A. Miller, Davis; 2 years; $11,860
Gordon H. Ball, Los Angeles; 2 years; $21,350

University of Chicago, Ill.; Norman H. Nachtrieb; 2 years; $23,390

University of Cincinnati, Ohio; Richard H. Durrell; 2 years; $20,250
William R. Wright; 2 years; $25,000

University of Colorado, Boulder; Bruce F. Curtis; 2 years; $23,780
George E. Gless; 2 years; $21,640
Martin E. Rickey; 2 years; $25,000

University of Connecticut, Storrs; Hugh Clark; 2 years; $20,770
Albert H. Cooper; 2 years; $25,000
William L. Masterton; 2 years; $20,000
Frederick E. Steigert; 2 years; $15,000

University of Delaware, Newark; Gorham Lane; 2 years; $24,950
Ferd E. Williams; 2 years; $18,000

University of Denver, Colo.; Arlie E. Paige; 2 years; $10,000

University of Detroit, Mich.; Everette L. Henderson; 2 years; $12,380
Paul M. Reinhard; 2 years; $11,790

University of Florida, Gainesville; Edgar W. Kopp; 2 years; $13,790
Howard K. Wallace; 2 years; $25,000
J. D. Winefordner; 2 years; $17,500

University of Georgia, Athens; J. J. Powers; 2 years; $19,000

University of Hawaii, Honolulu; David E. Contois; 2 years; $24,920
D. Elmo Hardy; 2 years; $9,950
Albert L. Tester; 2 years; $22,000

University of Houston, Tex.; H. T. Hudson; 2 years; $6,590
DeWitt C. Van Siclen; 2 years; $7,390

University of Illinois, Urbana; H. E. Carter; 2 years; $25,000
Don U. Deere; 2 years; $24,760
Lloyd G. Humphreys; 2 years; $24,980
H. H. Korst; 2 years; $25,000
C. Ladd Prosser; 2 years; $25,000

University of Kansas, Lawrence; William M. Bass; 2 years; $5,820
Kenneth C. Deemer; 2 years; $25,000
Charles A. Leone; 2 years; $23,160
Edward E. Smissman; 2 years; $24,160

University of Kansas City, Mo.; Leslie L. Eisenbrandt; 2 years; $6,200

University of Maine, Orono; R. J. Campana; 2 years; $11,000
G. L. Goglia; 2 years; $25,000
Frederick H. Radke; 2 years; $10,740

University of Maryland, College Park; Charles E. White; 2 years; $17,500

University of Massachusetts, Amherst; John H. Dittfach; 2 years; $10,000
Claude C. Neet; 2 years; $12,000

University of Michigan, Ann Arbor; Leigh C. Anderson; 2 years; $24,910
Wayne E. Hazen; 2 years; $19,860
Kenneth L. Jones; 2 years; $13,800
Robert H. Kadlec; 2 years; $19,120
James V. McConnell; 2 years; $10,000

University of Minnesota, Minneapolis; Benjamin J. Lazan; 2 years; $19,520
Francis B. Moore; 2 years; $12,680
W. G. Shepherd; 2 years; $21,120

University of Mississippi, University; Maeburn B. Huneycutt; 2 years; $17,770
John B. Wolfe; 2 years; $4,830

University of Missouri, Columbia; Wesley J. Dale; 2 years; $17,500
Clair L. Kucera; 2 years; $18,000
Roger E. Nolte, Rolla; 2 years; $15,000
Dudley Thompson, Rolla; 2 years; $25,000
C. M. Wallis; 2 years; $14,000

UNIVERSITY OF NEVADA, Reno; Cyrus O. Guss; 2 years; $9,750
R. E. Worley; 2 years; $5,430

UNIVERSITY OF NEW HAMPSHIRE, Durham; Alexander R. Amell; 2 years; $13,000
Harold E. Langley, Jr.; 2 years; $5,090

UNIVERSITY OF NEW MEXICO, Albuquerque; Roger Y. Anderson; 2 years; $19,500
Glenn A. Crosby; 2 years; $15,000
R. C. Dove; 2 years; $13,070

UNIVERSITY OF NORTH CAROLINA, Chapel Hill; C. R. Bell; 2 years; $12,500
John W. Cell; 2 years; $12,100
J. K. Ferrell; 2 years; $14,950
Roy L. Ingram; 2 years; $21,420
William P. Ingram, Jr.; 2 years; $19,000
H. E. Lehman; 2 years; $25,000
John M. Parker, III; 2 years; $4,530
Florence Schaeffer; 2 years; $7,190

UNIVERSITY OF NORTH DAKOTA, Grand Forks; John D. Dixon; 2 years; $5,530
Wilson M. Laird; 2 years; $17,500

UNIVERSITY OF NOTRE DAME, Ind.; Henry J. Bolger; 2 years; $8,230
Edward W. Jerger; 2 years; $13,390

UNIVERSITY OF OKLAHOMA, Norman; Cliff E. Hopla; 2 years; $24,500
Alfred J. Weinheimer; 2 years; $12,500

UNIVERSITY OF PENNSYLVANIA, Philadelphia; John G. Brainerd; 2 years; $24,160
Jacob Nachmias; 2 years; $7,500
Thomas H. Wood; 2 years; $21,620

UNIVERSITY OF PITTSBURGH, Pa.; J. Alfred Berger; 2 years; $20,000
James Coull; 2 years; $24,960
A. F. Frederickson; 2 years; $15,000

UNIVERSITY OF PORTLAND, Oreg.; Sheridan P. McCabe; 2 years; $1,940

UNIVERSITY OF PUERTO RICO, Rio Piedras; Rafael Arce; 2 years; $13,220
Manuel Garcia Morin; 2 years; $15,000

UNIVERSITY OF RHODE ISLAND, Kingston; Charles Polk; 2 years; $15,620

UNIVERSITY OF ROCHESTER, N.Y.; R. M. Blakney; 2 years; $22,440
Ernest W. Caspari; 2 years; $24,620

UNIVERSITY OF ST. THOMAS, Houston, Tex.; Patrick O. Braden; 2 years; $4,600

UNIVERSITY OF SCRANTON, Pa.; Umbay H. Burti; 2 years; $11,690

UNIVERSITY OF SOUTHERN CALIFORNIA, Los Angeles; C. R. Freberg; 2 years; $10,000
Paul D. Saltman; 2 years; $10,000
Paul R. Saunders; 2 years; $24,820

UNIVERSITY OF SOUTHERN MISSISSIPPI, Hattiesburg; C. E. Lane, Jr.; 2 years; $12,500

UNIVERSITY OF TAMPA, Fla.; Robert E. Wean; 2 years; $1,670

UNIVERSITY OF TENNESSEE, Knoxville; Norman Campbell; 2 years; $5,000

UNIVERSITY OF TEXAS, Austin; Robert E. Eakin; 2 years; $17,500
B. N. Gafford; 2 years; $15,000
Harold P. Hanson; 2 years; $10,000

UNIVERSITY OF THE SOUTH, Sewanee, Tenn.; David B. Camp; 2 years; $5,650

UNIVERSITY OF UTAH, Salt Lake City; Edward M. Eyring; 2 years; $7,090
L. David Hiner; 2 years; $14,000
Paul B. Porter; 2 years; $11,700
Milton E. Wadsworth; 2 years; $13,660

UNIVERSITY OF VIRGINIA, Charlottesville; Mark G. Foster; 2 years; $4,340
L. Starling Reid; 2 years; $17,450
W. D. Whitehead; 2 years; $22,500

UNIVERSITY OF WASHINGTON, Seattle; Austin V. Eastman; 2 years; $11,900
Eugene Galanter; 2 years; $23,440
Gordon D. Marckworth; 2 years; $16,160

UNIVERSITY OF WICHITA, Kans.; John B. Breazeale; 2 years; $7,050
Robert Christian, Jr.; 2 years; $1,990

UNIVERSITY OF WISCONSIN, Madison; John D. Ferry; 2 years; $25,000
Philip Lambert; 2 years; $24,280
C. G. Screven; 2 years; $13,250
J. F. Stauffer; 2 years; $18,330
Dale E. Wurster; 2 years; $25,000

UNIVERSITY OF WYOMING, Laramie; S. H. Knight; 2 years; $20,000
Edward M. Lonsdale; 2 years; $20,550

UPSALA COLLEGE, East Orange, N.J.; K. J. Schwing; 2 years; $6,290

UTAH STATE UNIVERSITY, Logan; Melvin C. Cannon; 2 years; $15,000
Larry S. Cole; 2 years; $7,920

VALPARAISO UNIVERSITY, Valparaiso, Ind.; Robert J. Hanson; 2 years; $5,250
William Shewan; 2 years; $8,960

VANDERBILT UNIVERSITY, Nashville, Tenn.; Lamar Field; 2 years; $13,000
Elsie Quarterman; 2 years; $17,500
W. D. Threadgill; 2 years; $25,000

VILLANOVA UNIVERSITY, Villanova, Pa.; Bernard J. Downey, Jr.; 2 years; $15,150
A. J. Mullen; 2 years; $10,720

VIRGINIA MILITARY INSTITUTE, Lexington; J. S. Jamison, Jr.; 2 years; $19,800

VIRGINIA POLYTECHNIC INSTITUTE, Blacksburg; C. E. Howes; 2 years; $10,390
G. W. Litton; 2 years; $8,120

VIRGINIA STATE COLLEGE, Petersburg; Bernard R. Woodson, Jr.; 2 years; $10,170

WAGNER COLLEGE, Staten Island, N.Y.; J. Trygve Jensen; 2 years; $3,000

WASHINGTON AND LEE UNIVERSITY, Lexington, Va.; Edward F. Turner, Jr.; 2 years; $16,000

WASHINGTON STATE UNIVERSITY, Pullman; William Band; 2 years; $7,000
Carl M. Stevens; 2 years; $12,480
Allen I. White; 2 years; $3,020

WASHINGTON UNIVERSITY, St. Louis, Mo.; Richard E. Norberg; 2 years; $12,850

WAYNE STATE UNIVERSITY, Detroit, Mich.; Ross Stagner; 2 years; $10,000

WEBB INSTITUTE OF NAVAL ARCHITECTURE, Glen Cove, Long Island, N.Y.; Edward V. Lewis; 2 years; $5,480

WELLESLEY COLLEGE, Wellesley, Mass.; Jean V. Crawford; 2 years; $10,200

WELLS COLLEGE, Aurora, N.Y.; C. M. Delaney; 2 years; $10,000

WESTERN CAROLINA COLLEGE, Cullowhee, N.C.; James H. Horton; 2 years; $2,390

WESTERN MARYLAND COLLEGE, Westminster; Harwell P. Sturdivant; 2 years; $5,620

WESTERN MICHIGAN UNIVERSITY, Kalamazoo; Lillian H. Meyer; 2 years; $20,000

Western Reserve University, Cleveland, Ohio; William M. Heston, Jr.; 2 years; $15,000
John K. Major; 2 years; $15,000

Western Washington State College, Bellingham; Raymond R. McLeod; 2 years; $18,500

West Virginia Institute of Technology, Montgomery; Huey Pledger, Jr.; 2 years $7,900

West Virginia University, Morgantown; James T. Anderson; 2 years; $3,460

Wheaton College, Wheaton, Ill.; Raymond H. Brand; 2 years; 5,820

Wheaton College, Norton, Mass.; Jane L. Chidsey; 2 years; $5,250

Wheeling College, Wheeling, W. Va.; Joseph B. Hanzely; 2 years; $5,750

Whitman College, Walla Walla, Wash.; Robert B. Bennett; 2 years; $17,000

Whitworth College, Spokane, Wash.; H. W. Johnston; 2 years; $2,690

Wilkes College, Wilkes-Barre, Pa.; Robert W. Soeder; 2 years; $3,400

Willamette University, Salem, Oreg.; Paul M. Duell; 2 years; $15,000

William Marsh Rice University, Houston, Tex.; Paul E. Pfeiffer; 2 years; $12,500

Wisconsin State College, Eau Claire; Floyd O. Krause; 2 years; $1,500

Wisconsin State College, Oshkosh; James W. Unger; 2 years; $5,000

Wisconsin State College, Stevens Point; Roland Trytten; 2 years; $23,440

Wisconsin State College, Superior; Nathan A. Coward; 2 years; $4,940

Wisconsin State College and Institute of Technology, Platteville; F. Duane Ingram; 2 years; $7,000

Wittenberg University, Springfield, Ohio; Paul K. Glasoe; 2 years; $7,840

Worcester Polytechnic Institute, Worcester, Mass.; Robert C. Plumb; 2 years; $12,230
Donald N. Zwiep; 2 years; $13,050

Xavier University, Cincinnati, Ohio; Harvey A. Dube; 2 years; $16,370

Xavier University, New Orleans, La.; Sister M. Veronica; 2 years; $10,000

Yale University, New Haven, Conn.; Philip A. Lyons; 2 years; $23,000
Donald F. Poulson; 2 years; $24,760

Yeshiva University, New York, N.Y.; Eli M. Levine; 2 years; $11,500

UNDERGRADUATE SCIENCE EDUCATION PROGRAM

Adelphi College, Garden City, N.Y., Richard J. Lacey; 12 months; $15,400

Agricultural and Mechanical College of Texas, College Station; Richard M. Adams; 3 months; $8,400
M. E. Bloodworth; 12 months; $8,100
Joe S. Ham; 12 months; $11,600

Agricultural and Technical College of North Carolina, Greensboro; Cecile H. Edwards; 11 months; $6,160

Allegheny College, Meadville, Pa.; Georgiana W. Scovil; 12 months; $5,200

Alma College, Alma, Mich.; Arlan L. Edgar; 12 months; $9,800

American Museum of Natural History, New York, N.Y.; Evelyn Shaw; 12 months; $49,000
Evelyn Shaw; 3 months; $2,800
Evelyn Shaw; 12 months; $13,300

American University, Washington, D.C.; Alfred B. Chaet; 12 months; $5,600

Amherst College, Amherst, Mass., Robert H. Koch; 3 months; $2,800

Antioch College, Yellow Springs, Ohio; James F. Corwin; 12 months; $12,600
Wladyslaw M. Lotkowski; 3 months; $4-200
Robert E. Warner; 12 months; $9,330

Arizona State University, Tempe; Robert D. Kersten; 12 months; $7,700
Robert D. Kersten; 12 months; $7,700
Carleton B. Moore; 21 months; $17,148

Asbury College, Wilmore, Ky.; Julian M. Pike; 12 months; $3.700

Augustana College, Sioux Falls, S. Dak.; Robert Roy Kintner; 12 months; $4,200

Ball State Teachers College, Muncie, Ind.; Russell E. Siverly; 12 months; $2,100

Barnard College, New York, N.Y.; Lucena Jaeger; 9 months; $2,160

Birmingham-Southern College, Birmingham, Ala.; Thomas J. Garrington; 1 year; $12,600
Wiley S. Rogers; 12 months; $12,600

Boston College, Chestnut Hill; Gerald G. Bilodeau; 3 months; $5,600
William G. Guindon; 3 months; $6,000
Robert F. O'Malley; 12 months; $12,600
James W. Skehan; 8 months; $6,375
James W. Skehan; 12 months; $8,570

Boston University, Mass.; Ronald M. Milburn; 12 months; $14,700
Robert F. Slechta; 12 months; $15,030

Bowdoin College, Brunswick, Maine; Reinhard L. Korgen; 12 months; $6,300

Bowling Green State University, Bowling Green, Ohio; W. H. Hall; 12 months; $5,700

Brandeis University, Waltham, Mass.; Milton R. Baker; 12 months; $8,000
David A. Buchsbaum; 3 months; $2,100
Morris Soodak; 3 months; $2,600

Brooklyn College, N.Y.; Milton J. Rosen; 21 months; $29,750

Brown University, Providence, R.I.; John A. Dillon, Jr.; 12 months; $10,500
Thomas A. Mutch; 3 months; $2,800
John F. Neumer; 3 months; $16,800
Harold Schlosberg; 12 months; $14,000

Bryn Mawr College, Bryn Mawr, Pa.; Robert L. Conner; 3 months; $7,800
M. E. Bitterman; 3 months; $4,000

Bucknell University, Lewisburg, Pa.; Meldrum B. Winstead; 3 months; $8,400

California Institute of Technology, Pasadena; James Bonner; 3 months; $19,320
Norman Davidson; 3 months; $9,000

Canisius College, Buffalo, N.Y.; Herman A. Szymanski; 3 months; $6,200

Carleton College, Northfield, Minn.; James E. Finholt; 3 months; $5,600
Eiler L. Henrickson; 12 months; $2,800
Donald H. Taranto; 3 months; $5,600
Thurlo B. Thomas; 3 months; $7,000

Carnegie Institute of Technology, Pittsburgh, Pa.; 12 months; $12,600
R. H. Lambert; 3 months; $6,000
Arthur G. Milnes; 12 months; $22,400
R. T. Schumacher; 3 months; $4,400

Case Institute of Technology, Cleveland, Ohio; Herbert B. Schultz, Jr.; 12 months; $63,700

Catholic University, Washington, D.C.; George E. McDuffie, Jr.; 3 months; $7,200

Central State College, Wilberforce, Ohio; L. Shelbert Smith; 12 months; $8,600

City College, New York, N.Y.; Frank Brescia; 12 months; $42,000
Bennington P. Gill; 9 months; $8,400
Sherwood B. Menkes; 21 months; $14,000

Clark University, Worcester, Mass.; Vernon Ahmadjian; 12 months; $11,600
Roy S. Anderson; 3 months; $2,700
Roy S. Anderson; 12 months; $5,600
Edward N. Trachtenberg; 12 months; $16,800
Seymour Wapner; 3 months; $5,600

Clarkson College of Technology, Potsdam, N.Y.; Charles A. Howe; 12 months; $10,500
Thomas J. Ward; 12 months; $8,400

Coe College, Cedar Rapids, Iowa; Gordon M. Harrington; 21 months; $4,900
Frank C. Pennington; 12 months; $4,200

Colby College, Waterville, Maine; James L. Fozard; 27 months; $1,860

Colgate University, Hamilton, N.Y.; Donald Keith Berkey; 12 months; $6,100

College of Pharmacy of the City of New York, Columbia University, New York; E. E. Leuallen; 1 year; $11,200

College of the Holy Cross, Worcester, Mass.; John W. Flavin; 9 months; $1,400
Patrick Shanahan; 9 months; $2,335
Patrick Shanahan; 9 months; $2,800

College of William and Mary, Williamsburg, Va.; Melvin A. Pittman; 20 months; $24,220

College of Wooster, Wooster, Ohio; John W. Chittum; 12 months; $7,600
Donald L. Wise; 3 months; $4,200

Colorado College, Colorado Springs; Robert Z. Brown; 9 months; $2,800

Colorado State University, Fort Collins; Edwin W. Mogren; 12 months; $6,300

Colorado State University Research Foundation, Fort Collins; F. Max Stein; 2 months; $8,280

Columbia University, New York, N.Y.; E. E. Leuallen; 12 months; $11,200
Charles Wagley; 12 months; $31,500

Concordia College, Moorhead, Minn.; Gerald A. Heuer; 3 months; $6,000

Cornell University, Ithaca, N.Y.; N. C. Brady; 12 months. $16,800
R. F. Holland; 12 months; $9,800

Cornell College, Mount Vernon, Iowa; T. Edwin Rogers; 9 months; $2,100

Dartmouth College, Hanover, N.H.; Donald L. Kreider; 12 months; $14,700
Thomas A. Spencer; 12 months; $16,800

DePauw University, Greencastle, Ind.; Donald J. Cook; 2 months; $6,720

Drexel Institute of Technology, Philadelphia, Pa.; George E. Dieter, Jr.; 3 months; $1,400
Frank A. Fletcher; 1 year; $9,015
Robert S. Hanson; 1 year; $6,555
F. B. Haynes; 3 months; $16,800
Richard E. Llorens; 1 year; $1,380
Corinne H. Robinson; 9 months; $2,800
John L. Rumpf; 3 months; $2,800

Duke University, Durham, N.C.; Jack W. Brehm; 12 months; $6,800
Earl I. Brown, II; 12 months; $11,200
F. G. Dressel; 3 months; $8,400
S. Duncan Heron, Jr.; 18 months; $1,400
Edward C. Horn; 12 months; $4,800
T. W. Johnson, Jr.; 12 months; $5,600
Pelham Wilder, Jr.; 12 months; $9,800

Duquesne University, Pittsburgh, Pa.; Kurt C. Schreiber; 3 months; $7,000

Earlham College, Richmond, Ind.; Gerald R. Bakker; 1 year; $16,725
Ansel M. Gooding; 27 months; $9,085
William K. Stephenson; 9 months; $3,680
William K. Stephenson; 9 months; $4,200

Emory University, Atlanta, Ga.; R. A. Day, Jr.; 12 months; $21,000

Fairfield University, Fairfield, Conn.; John A. Barone; $1,550
John A. Barone; 12 months; $7,000

Fairleigh Dickinson University, Rutherford, N.J.; Adam M. Aguiar; 3 months; $7,000
Peter J. Walsh; 12 months; $12,600

Florida Southern College, Lakeland; Margaret L. Gilbert; 12 months; $10,950

Fordham University, New York, N.Y.; Henry F. DeBaggis; 11 months; $20,100
Frederick J. Dillemuth; 12 months; $10,010
Joseph F. Mulligan; 2 months; $12,400

Franklin Institute, Philadelphia, Pa.; William E. Danforth; 3 months; $4,200

Franklin and Marshall College, Lancaster, Pa.; Frank D. Enck; 12 months; $8,400
John H. Moss; 12 months; $8,400
Donald W. Western; 3 months; $5,600

Georgetown University, Washington, D.C.; Matthew P. Thekaekara; 21 months; $15,215

George Washington University, Washington, D.C.; Richard D. Walk; 12 months; $8,400

Georgia Institute of Technology, Atlanta; John R. Dyer; 3 months; $11,200

Gettysburg College, Gettysburg, Pa.; John E. Benson; 12 months; $6,300

Gordon College, Beverly Farms, Mass; John W. Haas, Jr.; 12 months; $2,100

Grinnell College, Grinnell, Iowa; Givens L. Thornton; 12 months; $10,500

Gustavus Adolphus College, St. Peter, Minn.; Bernard E. Hoogenboom; 12 months; $3,200

Hamilton College, Clinton, N.Y.; L. E. Cratty, Jr.; 2 months; $5,600

Hamline University, St. Paul, Minn.; Dale E. Varberg; 9 months; $2,800

Hampden-Sydney College, Hampden-Sydney, Va.; G. Tyler Miller, Jr.; 12 months; $7,600

Harvard University, Cambridge, Mass.; I. Bernard Cohen; 12 months; $28,000
George W. Geothals; 12 months; $28,000
Byron Stookey, Jr.; 1 year; $32,980
Byron Stookey; 12 months; $11,000

Stephen Williams; 3 months; $11,200
Stephen Williams; 18 months; $18,050

HARVEY MUDD COLLEGE, Claremont, Calif. Tad Alan Beckman; 12 months; $18,200
John Greever; 12 months; $10,500

HAVERFORD COLLEGE, Haverford, Pa.; John P. Chesick; 12 months; $6,300
C. O. Oakley; 9 months; $1,800

HOLLINS COLLEGE, Hollins College, Va.; Richard E. Garrett; 1 year; $10,400
Ralph G. Steinhardt, Jr.; 12 months; $2,750

HOWARD UNIVERSITY, Washington, D.C.; Robert Percy Barnes; 18 months; $10,500
Harold E. Finley; 22 months; $39,135

HUNTER COLLEGE, New York, N.Y.; Frederic Kenny; 9 months; $575

IDAHO STATE COLLEGE, Pocatello; John V. Bergen; 12 months; $5,600

ILLINOIS INSTITUTE OF TECHNOLOGY, Chicago; Andrew A. Fejer; 12 months; $11,200
Leonard I. Grossweiner; $5,345
Lester C. Peach; 3 months; $8,400
H. Lennart Pearson; 12 months; $14,000
Bernet S. Swanson; 9 months; $3,500

IMMACULATE HEART COLLEGE, Los Angeles, Calif.; Sister Agnes Ann Green; 3 months; $8,400

INDIANA UNIVERSITY FOUNDATION, Bloomington; Paul Klinge; 11 months; $4,020
Judson Mead; 12 months; $10,850

IOWA STATE UNIVERSITY, Ames; Paul A. Hartman; 12 months; $8,565
Donald E. Hudson; 12 months; $8,400
Keith M. Hussey; 12 months; $4,500
Thomas D. McGee; 12 months; $2,800
Peter A. Peterson; 3 months; $4,200
Malcolm A. Rougvie; 12 months; $18,900
Thomas D. Wheelock; 12 months; $14,000

JACKSON STATE COLLEGE, Jackson, Miss.; Benjamin H. McLemore; 12 months; $5,600

JOHNS HOPKINS UNIVERSITY, Baltimore, Md.; Walter S. Koski; 12 months; $8,550

JUNIATA COLLEGE, Huntingdon, Pa.; David M. Hercules; 12 months; $12,600

KALAMAZOO COLLEGE, Kalamazoo, Mich.; Allen V. Buskirk; 9 months; $2,800

KANSAS STATE COLLEGE OF PITTSBURG; Horace A. Hays; 11 months; $7,280

KANSAS STATE UNIVERSITY, Manhattan; M. F. Hansen; 3 months; $7,000
Jack L. Lambert; 11 months; $19,600

KENT STATE UNIVERSITY, Kent, Ohio; Joseph H. Grosslight; 12 months; $12,600

KENTUCKY RESEARCH FOUNDATION, Lexington; Richard A. Chapman; 12 months; $4,200
Jacob R. Meadow; 12 months; $9,800

KENYON COLLEGE, Gambier, Ohio; Daniel T. Finkbeiner, II; 27 months; $13,755

KNOX COLLEGE, Galesburg, Ill.; Paul Shepard; 9 months; $3,625

LAFAYETTE COLLEGE, Easton, Pa.; William F. Hart; 12 months; $6,300
E. Lee McMillen; 9 months; $2,875
E. Lee McMillen; 9 months; $3,500
Louis T. Stableford; 9 months; $2,800

LAKE FOREST COLLEGE, Lake Forest, Ill.; Bailey L. Donnally; 12 months; $3,500
Charles D. Louch; 12 months; $4,200

LAWRENCE COLLEGE, Appleton, Wis.; Robert H. Becker; 3 months; $2,800

LEBANON VALLEY COLLEGE, Annville, Pa.; Robert Griswold; 3 months; $7,000

LEHIGH UNIVERSITY, Bethlehem, Pa.; Ferdinand P. Beer; 12 months; $9,800
George P. Conard, II; 11 months; $9,720
Jerome Daen; 12 months; $22,400
Arthur I. Larky; 12 months; $9,800
Everett Pitcher; 12 months; $23,100
Dale R. Simpson; 12 months; $8,400
Wesley R. Smith; 1 year; $4,900
Wesley R. Smith; 12 months; $4,200

LINFIELD RESEARCH INSTITUTE, McMinnville, Oreg.; Drannan C. Hamby; 12 months; $6,300
Drannan C. Hamby; 12 months; $4,200
Robert E. Jones; 9 months; $3,600

LONG ISLAND BIOLOGICAL ASSOCIATION, Cold Spring Harbor, N.Y.; H. E. Umbarger; 3 months; $14,000

LOS ANGELES STATE COLLEGE FOUNDATION, Los Angeles, Calif; Richard T. Keys; 12 months; $16,800

LOUISIANA STATE UNIVERSITY, Baton Rouge; Edwin R. Chubbuck; 11 months; $5,280
George C. Kent, Jr., 11 months; $7,700
Warren S. Thompson; 11 months; $10,710

LOYOLA COLLEGE, Baltimore, Md.; James L. Gumnick; 12 months; $6,300

MACALESTER COLLEGE, St. Paul, Minn.; Murray Braden; 18 months; $3,900

MANHATTAN COLLEGE, New York, N.Y.; Joseph B. Farrell; 9 months; $1,400
Donald J. O'Connor; 2 years; $5,475

MARIAN COLLEGE, Indianapolis, Ind.; Mary Rose Stockton; 12 months; $1,500

MARYCREST COLLEGE, Davenport, Iowa; Sister Helene Ven Horst; 12 months; $2,000

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge; Arthur C. Cope; 12 months; $49,000

MERCYHURST COLLEGE, Erie, Pa.; M. Leona Reagle; 18 months; $3,150

MICHIGAN STATE UNIVERSITY, East Lansing; Dorothy Arata; 9 months; $1,840
Abram M. Barch; 21 months; $16,100
Sherwood K. Haynes; 12 months; $21,000
Elmer Leininger; 12 months; $16,800
C. P. Wells; 12 months; $15,400

MILLIKIN UNIVERSITY, Decatur, Ill.; Carl Weatherbee; 22 months; $9,135

MILLSAPS COLLEGE, Jackson, Miss.; Donald Caplenor; 12 months; $6,700
Richard R. Priddy; 9 months; $5,600

MISSISSIPPI STATE UNIVERSITY, State College; Charles B. Cliett; 12 months; $8,400

MONTANA SCHOOL OF MINES, Butte; Vernon Griffiths; 9 months; $1,850
Vernon Griffiths; 9 months; $1,900

MONTANA STATE COLLEGE, Bozeman; E. W. Anacker; 1 year; $6,725
E. W. Anacker; 12 months; $11,900
Richard H. McBee; 3 months; $7,000

MONTANA STATE UNIVERSITY, Missoula; Mitsuru Nakamura; 12 months; $6,300
E. W. Pfeiffer; 9 months; $450

MORGAN STATE COLLEGE, Baltimore, Md.; Volodymyr Bohun-Chudyniv; 12 months; $8,400

MOUNT HOLYOKE COLLEGE, South Hadley, Mass.; Grace E. Bates; 9 months; $4,200

MUHLENBERG COLLEGE, Allentown, Pa.; G. N. Russell Smart; 12 months; $7,000

MUNICIPAL UNIVERSITY OF OMAHA, Omaha, Nebr.; John M. Newton; 9 months; $4,320

MUSKINGUM COLLEGE, New Concord, Ohio; Wilmer K. Fife; 12 months; $5,600

NEBRASKA WESLEYAN UNIVERSITY, Lincoln; Walter R. French, Jr.; 11 months; $10,920

NEWARK COLLEGE OF ENGINEERING RESEARCH FOUNDATION, Newark, N.J.; Kwei-Ping S. Kwei; 11 months; $1,775

NEW JERSEY MENTAL HEALTH RESEARCH AND DEVELOPMENT FUND, INC., Trenton; J. W. Bauman, Jr., Princeton; 12 months; $8,800

NEW MEXICO INSTITUTE OF MINING AND TECHNOLOGY, Socorro; Roshan B. Bhappu; 12 months; $1,300

Geoffrey Purcell; 12 months; $1,300
Joseph A. Schufle; 12 months; $3,900
Clay T. Smith; 12 months; $2,800

NEW MEXICO STATE UNIVERSITY, University Park; James E. Weiss; 1 year; $6,565

James E. Weiss; 12 months; $29,400

NEW YORK STATE DEPARTMENT OF HEALTH, Albany; Ray K. Brown; 3 months; $5,600

NEW YORK UNIVERSITY, New York; Robert F. Cotellessa; 2 years; $29,400

Robert C. Geldmacher; 12 months; $18,900
Alvin I. Kosak; 3 months; $8,400

NORTH CENTRAL COLLEGE, Naperville, Ill.; Barbara A. Doty; 18 months; $3,600

Mary Anice Seybold; 11 months; $1,395

NORTH DAKOTA STATE UNIVERSITY, Fargo; J. A. Callenbach; 12 months; $4,000

J. A. Callenbach; 12 months; $4,050
J. A. Callenbach; 9 months; $440
Donald Schwartz; $10,380
Donald Schwartz; 12 months; $20,400

NORTHEASTERN UNIVERSITY, Boston, Mass.; Ralph A. Troupe; 9 months; $4,200

NORTHERN MICHIGAN COLLEGE; Marquette; Gordon D. Gill; 1 year; $14,835

NORTH TEXAS STATE UNIVERSITY, Denton; L. F. Connell, Jr.; 12 months; $4,800

NORTHWESTERN UNIVERSITY, Evanston, Ill.; Richard C. Bowers; 12 months; $22,050

Robert W. Hull; 12 months; $16,200

NOTRE DAME COLLEGE OF STATEN ISLAND, Staten Island, N.Y.; Mother Saint Virginia Marie; 9 months; $1,660

Mother Saint Virginia Marie; 9 months; $2,000

OAKLAND UNIVERSITY, Rochester, Mich.; Paul Tomboulian; 9 months; $4,200

OBERLIN COLLEGE, Oberlin, Ohio; Fred Foreman; 11 months; $5,040

Norman D. Henderson; 9 months; $3,555
Robert Weinstock; 2 months; $5,600

OCCIDENTAL COLLEGE, Los Angeles, Calif.; Frank L. Lambert; 3 months; $2,600

OHIO STATE UNIVERSITY RESEARCH FOUNDATION, Columbus; Paul G. Gassman; 12 months; $16,000

OHIO WESLEYAN UNIVERSITY, Delaware; Thomas S. Oey; 12 months; $21,000

OKLAHOMA STATE UNIVERSITY, Stillwater; L. M. Henderson; 3 months; $5,600

W. O. Ree, 12 months; $3,900
John W. West; 12 months; $6,600
Leon H. Zalkow; 3 months; $9,800

OLD DOMINION COLLEGE, Norfolk, Va.; Jacques S. Zaneveld; 12 months; $8,400

OLIVET COLLEGE, Olivet, Mich.; Edward P. Speare; 11 months; $1,160

OREGON STATE UNIVERSITY, Corvallis; Fred W. Decker; 12 months; $8,400

James G. Knudsen; 9 months; $3,500

PACIFIC LUTHERAN UNIVERSITY, Tacoma, Wash.; Charles D. Anderson; 12 months; $8,750

PENNSYLVANIA STATE UNIVERSITY, University Park; Walter I. Goldburg; 12 months; $5,660

William F. Prokasy; 12 months; $12,000
Harold J. Read; 3 months; $8,400
Robert W. Stone; 12 months; $7,900

POLYTECHNIC INSTITUTE OF BROOKLYN, N.Y.; Jules P. Russell; 12 months; $78,400

POMONA COLLEGE, Claremont, Calif.; Alexander K. Baird; 12 months; $4,200

Alvin L. Beilby; 3 months; $14,000
Graham B. Bell; 9 months; $2,160
Lyman Benson; 12 months; $2,700
Charles A. Fowler; 12 months; $17,500
Paul B. Yale; 2 months; $5,600

PRINCETON UNIVERSITY, Princeton, N.J.; William E. Bonini; 3 months; $2,800

John T. Bonner; 3 months; $14,000
Richard K. Hill; 12 months; $6,300
Sheldon Judson; 3 months; $7,000
Hugo Rossi; 3 months; $2,880
Harold M. Schroder; 3 months; $5,600

PURDUE UNIVERSITY, Lafayette, Ind.; Durward L. Allen; 3 months; $8,400

Glenn B. Bergeson; 12 months; $10,500
Gustav E. Cwalina; 12 months; $10,500
George W. Hughes; 12 months; $52,500
Richard A Sneen; 12 months; $28,000
F. H. Wilt; 12 months; $42,000

QUEENS COLLEGE, Flushing, N.Y.; Gregory Razran; 12 months; $10,500

RADFORD COLLEGE, Radford, Va.; Donald H. Messersmith; 11 months; $1,820

REED COLLEGE, Portland, Oreg.; Hubert E. Chrestenson; 2 months; $6,100

Marshall W. Cronyn; 12 months; $16,800

RENSSELAER POLYTECHNIC INSTITUTE, Troy, N.Y.; Stephen E. Wiberley; 3 months; $9,800

Stephen E. Wiberley; 12 months; $12,600
Stephen E. Wiberley; 12 months; $12,600

RESEARCH FOUNDATION OF STATE UNIVERSITY OF NEW YORK, Albany; Richard F. Smith; 12 months; $7,000

William T. Snyder, Oyster Bay; 12 months; $14,700
T. Alexander Pond, Stony Brook; 3 months; $9,800
Ralph T. King, Syracuse; 3 months; $6,600

RIPON COLLEGE, Ripon, Wis.; Jack W. Powers; 12 months; $6,800

ROCKHURST COLLEGE, Kansas City, Mo.; Oscar L. Wright; 3 months; $5,600

ROSARY HILL COLLEGE, Buffalo, N.Y.; M. Regina Lanigan; 9 months; $2,100

ROSCOE B. JACKSON MEMORIAL LABORATORY, Bar Harbor, Maine; John L. Fuller; 3 months; $26,400

ROSWELL PARK MEMORIAL INSTITUTE, Buffalo, N.Y.; Edwin A. Mirand; 3 months; $24,000

Rutgers, The State University, New Brunswick, N.J.; Bernard W. Koft; 12 months; $3,940
Robert H. Page; 3 months; $5,600
Hyman J. Zimmerberg; 12 months; $8,400
Hyman J. Zimmerberg; 12 months; $13,300

St. Benedict's College, Atchison, Kans.; Conrad Pillar; 12 months; $4,200

St. Joseph's College for Women, Brooklyn, N.Y.; Sister Saint Francis Dilgen; 12 months; $7,280

St. Joseph College, Emmitsburg, Md.; Denise Eby; 9 months; $2,750

St. Joseph College, West Hartford, Conn.; Sister Maria Clare Markham; 11 months; $5,680

St. Lawrence University, Canton, N.Y.; Charles H. Stauffer; 9 months; $2,800

St. Louis University, Mo.; Dorothy J. Feir; 2 years; $25,200
Arthur S. Rouse; 2 years; $3,395
William Stauder; 12 months; $6,900

St. Mary's College, Winona, Minn,; Donald R. Morgan; 12 months; $8,400

St. Mary's University of San Antonio, Tex.; James F. Gray; 11 months; $5,880

St. Olaf College, Northfield, Minn.; Paul R. Burton; 3 months; $7,000
Richard S. Kleber; 3 months; $2,800
John C. Marshall; 3 months; $8,400
Thomas D. Rossing; 9 months; $2,100

St. Procopius College, Lisle, Ill.; Richard E. Dugan; 12 months; $5,570
Richard E. Dugan; 12 months; $6,100

San Diego State College Foundation, Calif.; R. Gordon Gastil; 12 months; $12,600
Burt Nelson; 11 months; $7,280
Merle B. Turner; 12 months; $14,700
Harold Walba; 12 months; $28,000

Sarah Lawrence College, Bronxville, N.Y.; Edward J. Cogan; 9 months; $4,275
Edward J. Cogan; 9 months; $1,400

Savannah State College, Savannah, Ga.; Charles Pratt; 12 months; $4,200

Seattle Pacific College, Seattle, Wash.; Donald D. Kerlee; 3 months; $5,600

Seton Hall University, South Orange, N.J.; Alfred V. Celiano; 11 months; $17,760

Smith College, Northampton, Mass., George W. de Villafranca; 12 months; $3,680

South Dakota School of Mines and Technology, Rapid City; George Rapp, Jr.; 3 months; $4,200

Southeast Missouri State College, Cape Girardeau; Albert L. Caskey; 11 months; $13,120

Southern Methodist University, Dallas, Tex.; Harold A. Blum; 9 months; $2,100

Southern University and Agricultural and Mechanical College, Baton Rouge, La.; Lewis L. White; 11 months; $10,920

Southwestern at Memphis, Memphis, Tenn.; Robert L. Amy; 3 months; $5,600
Richard D. Gilliom; 3 months; $4,200
Jack Howard Taylor; 3 months; $5,600

Southwest Missouri State College, Springfield; Robert T. Stevenson; 1 year; $5,300

Stanford University, Stanford, Calif.; William R. Dickinson; 11 months; $9,380
Albert H. Hastorf; 3 months; $4,800
David M. Mason; 12 months; $9,100
O. Cutler Shepard; 12 months; $18,900

State University of Iowa, Iowa City; Ronald T. Pflaum; 11 months; $10,920
Milton E. Rosenbaum; 9 months; $1,725
Milton E. Rosenbaum; 12 months; $16,800
Donald T. Witiak; 12 months; $8,400

State University of South Dakota, Vermillion; Roger T. Davis; 12 months; $10,500

Stevens Institute of Technology, Hoboken, N.J.; Sidney F. Borg; 2 years; $6,400
Henry Polowy; 12 months; $21,000
Salvatore S. Stivala; 12 months; $21,000
Rolf Weil; 12 months; $5,100

Swarthmore College, Swarthmore, Pa.; Robert K. Enders; 11 months; $13,280

Syracuse University, Syracuse, N.Y.; Darshan S. Dosanjh; 3 months; $5,600
D. S. Dosanjh; 12 months; $8,400
Hiram J. Evans; 12 months; $9,800
Paul W. Gilbert; 12 months; $10,500
Wilbur R. LePage; 12 months; $12,600
James A. Luker; 12 months; $15,400
Wallace R. McAllister; 12 months; $10,500
William M. Merrill; 12 months; $8,400

Texas Lutheran College, Seguin; Ronald D. Garrett; 20 months; $7,365

Texas Southern University, Houston; Robert J. Terry; 3 months; $21,000

Texas Woman's University, Denton; Waldemar M. Walter; 12 months; $8,400

Trinity College, Hartford, Conn.; Austin C. Herschberger; 12 months; $5,600

Tulane University, New Orleans, La.; Stuart S. Bamforth; 12 months; $5,600
Hans B. Jonassen; 12 months; $12,600
V. T. Kanareff; 9 months; $405
Ralph M. Rotty; 12 months; $4,200
A. L. Welden; 9 months; $775
A. L. Welden; 9 months; $2,800

Tuskegee Institute, Tuskegee, Ala.; G. T. Dowdy; 9 months; $5,295
G. T. Dowdy; 9 months; $3,500
G. T. Dowdy; 9 months; $700

University of Arkansas, Fayetteville; Denys O. Akhurst; 12 months; $18,900
George E. Templeton; 3 months; $2,800

University of California, Berkeley; Howell Daly; 12 months; $8,700
Bonham Campbell, Los Angeles; 2 years; $52,905
Donald Carlisle, Los Angeles; 3 months; $5,600
Edward C. Carterette, Los Angeles; 11 months; $36,400
M. John Pickett, Los Angeles; 2 months; $3,780
Ernest G. Straus, Los Angeles; 2 years; $41,190
Malcolm F. Smiley, Riverside; 12 months; $14,000

University of Chicago, Ill.; Belton M. Fleisher; 12 months; $13,470
Dorothea Starbuck Miller; 12 months; $25,200

University of Cincinnati, Ohio; Frank L. Koucky; 9 months; $4,200

UNIVERSITY OF COLORADO, Boulder; Frank Kreith; 3 months; $21,600
Robert H. Lister; 2 months; $8,960

UNIVERSITY OF CONNECTICUT, Storrs; Hugh Clark; 12 months; $18,500
John T. Stock; 12 months; $8,100

UNIVERSITY OF DELAWARE, Newark; Charles B. Cooper; 12 months; $6,300

UNIVERSITY OF DENVER, Colo.; Jack G. Hewitt, Jr.; 9 months; $700

UNIVERSITY OF GEORGIA, Athens; R. Barclay McGhee; 3 months; $9,800
Horace C. Morgan, Jr.; 21 months; $11,-200

UNIVERSITY OF HAWAII, Honolulu; D. Elmo Hardy; 2 years; $21,000
Kazutoshi Najita; 3 months; $7,500

UNIVERSITY OF IDAHO, Moscow; M. M. Renfrew; 11 months; $5,880

UNIVERSITY OF ILLINOIS, Urbana; D. E. Alexander; 3 months; $1,100
A. W. Burger; 3 months; $1,100
M. T. Davisson; 9 months; $7,000
Hiram Paley; 12 months; $21,000
Stanley G. Smith; 11 months; $18,200
Morton W. Weir; 11 months; $27,300

UNIVERSITY OF KANSAS, Lawrence; William M. Bass; 12 months; $11,400
Frederick E. Samson, Jr.; 12 months; $35,700
Edward E. Smissman; 12 months; $25,200
George Springer; 12 months; $15,680
Arnold A. Strassenburg; 12 months; $7,000

UNIVERSITY OF LOUISVILLE, Ky.; James E. Conkin; 21 months; $2,100
Calvin A. Lang; 3 months; $14,000
Kevin T. Potts; 12 months; $9,400

UNIVERSITY OF MARYLAND, College Park; John W. Brace; 12 months; $7,250
Joshua R. C. Brown; 12 months; $12,600
Gilbert Gordon; 12 months; $21,000
Howard Laster; 12 months; $25,200

UNIVERSITY OF MASSACHUSETTS, Amherst; Lawrence M. Bartlett; 2 years; $42,460
John A. Chandler; 3 months; $8,000
Arthur C. Gentile; 12 months; $14,800

UNIVERSITY OF MIAMI, Coral Gables, Fla.; Homer W. Hiser; 12 months; $4,800

UNIVERSITY OF MICHIGAN, Ann Arbor; Otto Graf; 11 months; $69,595
Otto G. Graf; 12 months; $52,520
J. B. Griffin; 12 months; $10,860
Orren C. Mohler; 3 months; $3,300
Robert C. Taylor; 3 months; $11,400
Russell T. Woodburne; 11 months; $5,880
Louis York; 11 months; $14,640

UNIVERSITY OF MINNESOTA, Minneapolis; L. E. Goodman; 12 months; $13,066
Irvin E. Liener; 21 months; $2,450
Wayland E. Noland; 3 months; $14,000
Theron O. Odlaug; 1 year; $2,000
Edward J. Cowles, Duluth; 12 months; $8,830

UNIVERSITY OF MISSOURI, Columbia; Ernest W. Carlton, Rolla; 12 months; $12,600
Ernest W. Carlton, Rolla; 18 months; $5,600
Wayne L. Decker; 3 months; $7,000
Harold Q. Fuller, Rolla; 12 months; $10,500

UNIVERSITY OF NEBRASKA, Lincoln; Gordon A. Gallup; 11 months; $11,590
Donald G. Hanway; 12 months; $8,400

UNIVERSITY OF NEVADA, Reno; Kenneth C. Kemp; 12 months; $5,600

UNIVERSITY OF NEW HAMPSHIRE, Durham; Robert Lyle; 3 months; $7,000
M. Evans Munroe; 12 months; $12,600

UNIVERSITY OF NEW MEXICO, Albuquerque; Glenn A. Crosby; 3 months; $1,300

UNIVERSITY OF NORTH CAROLINA, Chapel Hill; Carey H. Bostian; 12 months, $28,000
Jesse S. Doolittle; 12 months; $21,000
Samuel Fillenbaum; 3 months; $4,200
James C. Kellett, Jr., 12 months, $4,200
T. E. Maki; 12 months; $10,500
Richard L. Simpson; 3 months; $14,000
John J. McNeill, Raleigh; 3 months; $5,600
Alfred J. Stamm, Raleigh; 12 months; $6,150

UNIVERSIY OF NORTH DAKOTA, Grand Forks; George C. Wheeler; 12 months; $11,340
Vernon L. Yeager; 2 months; $3,840

UNIVERSITY OF NOTRE DAME, Ind.; Julius T. Banchero, 12 months; $7,000
Kenneth R. Lauer; 12 months; $5,400
E. A. Peretti; 12 months; $5,928

UNIVERSITY OF OKLAHOMA, Norman; Gene Levy; 11 months; $34,300

UNIVERSITY OF OREGON, Eugene; LeRoy H. Klemm; 12 months; $15,400
E. Novitski; 12 months; $31,500

UNIVERSITY OF PENNSYLVANIA, Philadelphia; William C. Cohen; 25 months; $42,460
Walter Isard; 12 months; $6,300
George E. Schweigert; 11 months; $8,680

UNIVERSITY OF PUERTO RICO, Mayagues; Noemi G. Martinez Nadal; 9 months; $3,500

UNIVERSITY OF RHODE ISLAND, Kingston; Charles Polk; 12 months; $14,700

UNIVERSITY OF ROCHESTER, N.Y.; M. Parker Givens; 12 months; $8,400
Everett M. Hafner; 12 months; $8,400
Daniel W. Healy, Jr.; 12 months; $8,400

UNIVERSITY OF SAN FRANCISCO, Calif.; William Maroney; 12 months; $8,400

UNIVERSITY OF SCRANTON, Pa.; Martin D. Appleton; 12 months; $14,700

UNIVERSITY OF SOUTH CAROLINA, Columbia; Reuben E. Alley, Jr.; 3 months; $3,000
Milton W. Davis, Jr.; 3 months; $2,000
Ronald D. Edge; 1 year; $10,400

UNIVERSITY OF SOUTH FLORIDA, Tampa; Jack E. Fernandez; 12 months; $18,900
Robert W. Long; 20 months; $2,195

UNIVERSITY OF SOUTHWESTERN LOUISIANA, Lafayette; James R. Oliver; 11 months; $7,840

UNIVERSITY OF TENNESSEE, Knoxville; N. S. Bowman; 3 months; $8,400
Arthur W. Jones; 12 months; $10,500
Alvin H. Nielsen; 12 months; $12,600
Fred H. Norris; 12 months; $8,400
Seldon D. Feurt, Memphis; 12 months; $12,600
William E. Jefferson, Jr., Memphis; 12 months; $11,900

UNIVERSITY OF TEXAS, Austin; Walter V. Brown; 3 months; $5,000
Arwin A. Dougal; 12 months; $6,300
William H. Hartwig; 12 months; $7,350
Leonardt F. Kreisle; 12 months; $4,800
Fillmore H. Sanford; 9 months; $7,000

UNIVERSITY OF THE SOUTH, Sewanee, Tenn.; David B. Camp; 3 months; $5,600
Stephen Puckette; 1 year; $42,000

UNIVERSITY OF UTAH, Salt Lake City; Don M. Rees; 12 months; $8,400
James M. Sugihara; 3 months; $12,000

UNIVERSITY OF VERMONT, Burlington; Clinton D. Cook; 12 months; $9,600
Albert D. Crowell; 12 months; $4,800
Paul A. Moody; 2 years; $20,720

UNIVERSITY OF WASHINGTON, Seattle; Nathan A. Hall; 12 months; $10,500
A. S. Kobayashi; 11 months; $3,715
Albert S. Kobayashi; 12 months; $4,200
William B. Woolf; 11 months; $22,650

UNIVERSITY OF WISCONSIN, Madison; Robert M. Gates; 3 months; $4,500
Harry L. Madison, Milwaukee; 11 months; $12,740
William L. Walters, Milwaukee; 12 months; $7,980

VALPARAISO UNIVERSITY, Valparaiso, Ind.; Robert J. Hanson; 9 months; $4,200

VANDERBILT UNIVERSITY, Nashville, Tenn.; Glen F. Clanton; 3 months; $7,000
John Mogey; 12 months; $7,600
William H. Rowan; 12 months; $8,400
W. Dennis Threadgill; 12 months; $8,400
W. Dennis Threadgill; 12 months; $8,400
Leland E. Thune; 12 months; $10,500
James J. Wert; 12 months; $8,400

VILLA MADONNA COLLEGE, Covington, Ky.; John F. Schuler; 12 months; $8,400

VILLANOVA UNIVERSITY, Villanova, Pa.; Lucien R. Roy; 9 months; $1,200
R. E. White; 12 months; $12,000

VIRGINIA INSTITUTE OF MARINE SCIENCE, Gloucester Point; Robert S. Bailey; 3 months; $14,000

VIRGINIA POLYTECHNIC INSTITUTE, Blacksburg; C. E. Howes; 12 months; $6,300

VIRGINIA STATE COLLEGE, Petersburg; Bernard R. Woodson, Jr.; 12 months; $5,600

WABASH COLLEGE, Crawfordsville, Ind.; Willis H. Johnson; 12 months; $11,400

WALDEMAR MEDICAL RESEARCH FOUNDATION, INC., Port Washington, N.Y.; Norman Molomut; 3 months; $8,400

WASHINGTON AND LEE UNIVERSITY, Lexington, Va.; Leonard E. Jarrard; 21 months; $8,400
Samuel J. Kozak; 12 months; $3,680
J. Thomas Ratchford; 3 months; $7,000
William J. Watt; 12 months; $12,600

WASHINGTON STATE UNIVERSITY, Pullman; Vishnu N. Bhatia; 12 months; $21,840
Sidney G. Hacker; 11 months; $22,105
Theodore G. Ostrom; 11 months; $42,550
H. A. Sorensen; 9 months; $2,300

WASHINGTON UNIVERSITY, St. Louis, Mo.; Nathan C. Burbank; 9 months; $20,300
Don A. Fischer; 12 months; $6,300
Don A. Fischer; 12 months; $4,200
Don A. Fischer; 12 months; $3,500
Don A. Fischer; 9 months; $6,300
Don A. Fischer; 9 months; $1,400
Don A. Fischer; 12 months; $4,200

WAYNE STATE UNIVERSITY, Detroit, Mich.; Henry V. Bohm; 12 months; $19,600
David Felix; 12 months; $12,600
Samuel S. Komorita; 12 months; $16,800

WELLESLEY COLLEGE, Wellesley, Mass.; Jean V. Crawford; 2 months; $8,960

WESLEYAN UNIVERSITY, Middletown, Conn.; Thomas A. Green; 12 months; $8,400

WEST VIRGINIA UNIVERSITY, Morgantown; Horace L. Barnett; 12 months; $10,400
Jack D. Graybeal; 12 months; $14,700
R. D. Slonneger; 12 months; $10,500

WESTERN MICHIGAN UNIVERSITY, Kalamazoo; Lillian H. Meyer; 11 months; $13,160
Paul Rood; 12 months; $7,700

WESTERN RESERVE UNIVERSITY, Cleveland, Ohio; James D. Crum; 12 months; $21,000
John K. Major; 12 months; $16,800
Howard A. Schneiderman; 12 months; $19,600

WHEATON COLLEGE, Norton, Mass.; Bojan H. Jennings; 12 months; $10,580

WHEELING COLLEGE, Wheeling, W. Va.; Jack L. Pinkus; 9 months; $4,200

WHITTIER COLLEGE, Whittier, Calif.; F. Beach Leighton; 11 months; $5,460

WILKES COLLEGE, Wilkes-Barre, Pa.; Charles B. Reif; 12 months; $14,700

WILLAMETTE UNIVERSITY, Salem, Oreg.; Paul M. Duell; 12 months; $8,400
Robert L. Purbrick; 12 months; $8,400

WILLIAM JEWELL COLLEGE, Liberty, Mo.; Wallace A. Hilton; 9 months; $2,000

WILLIAM MARSH RICE UNIVERSITY, Houston, Tex.; Roy V. Talmage; 12 months; $14,000

WILLIAMS COLLEGE, Williamstown, Mass.; Fielding Brown; 9 months; $5,000
William C. Grant, Jr.; 3 months; $5,600
Thomas C. McGill; 3 months; $2,800

WILMINGTON COLLEGE, Wilmington, Ohio; Harry H. Johnston; 2 months; $2,430

WORCESTER FOUNDATION FOR EXPERIMENTAL BIOLOGY, Shrewsbury, Mass.; Melvin M. Ketchel; 3 months; $21,000

XAVIER UNIVERSITY, Cincinnati, Ohio; John B. Hart; 3 months; $2,800

YALE UNIVERSITY, New Haven, Conn.; Ralph Norman Haber; 12 months; $15,500
Harlan J. Smith; 3 months; $7,000
Bruce B. Stowe; 12 months; $10,500
Horace D. Taft; 12 months; $23,100

UNIVERSITY—ASSOCIATED SMALL COLLEGE PROGRAM

BOSTON UNIVERSITY, Mass.; Robert S. Cohen; *Inter-Institutional Cooperative Association in the Philosophy of Science;* 15 months; $8,325

OKLAHOMA STATE UNIVERSITY, Stillwater; Robert D. Freeman; *Inter-Institutional Conference on the Teaching of Physical Chemistry in Oklahoma Colleges*; 5 months; $7,860

UNIVERSITY OF KANSAS, Lawrence; John S. McNown; *Two Conferences for the Engineering Faculties of Members of the Mid-America State Universities Association;* 8 months; $11,140

VISITING SCIENTISTS TO SECONDARY SCHOOLS PROGRAM

AMERICAN CHEMICAL SOCIETY, Washington, D.C.; Donald J. Cook, DePauw University, Greencastle, Ind; 15 months; $24,300

AMERICAN ASTRONOMICAL SOCIETY, Princeton, N.J.; Paul M. Routly; 13 months; $31,485

AMERICAN INSTITUTE OF PHYSICS, New York, N.Y.; Elmer Hutchisson; 12 months; $27,-390

VISITING SCIENTISTS TO COLLEGES PROGRAM

AMERICAN ANTHROPOLOGICAL ASSOCIATION, Washington, D.C.; Betty J. Meggers; 13 months; $18,870

AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY, Washington, D.C.; Charles W. Bliven; 13 months; $11,870

AMERICAN CHEMICAL SOCIETY, Washington, D.C.; Donald J. Cook, DePauw University, Greencastle, Ind.; 13 months; $28,460
Donald J. Cook, DePauw University, Greencastle, Ind.; 13 months; $41,000

AMERICAN GEOLOGICAL INSTITUTE, Washington, D.C.; John L. Snyder; 1 year; $39,065
John L. Snyder; 13 months; $35,320

AMERICAN GEOPHYSICAL UNION, Washington, D.C.; Norris W. Rakestraw, University of California, San Diego; 1 year; $12,225.
Waldo E. Smith; 13 months; $25,075

AMERICAN INSTITUTE OF PHYSICS, New York, N.Y.; Elmer Hutchisson; $6,300
Elmer Hutchisson; 12 months; $29,980
Elmer Hutchisson; 12 months; $33,720

AMERICAN METEOROLOGICAL SOCIETY, Boston, Mass.; Kenneth C. Spengler, 12 months; $17,200

AMERICAN PSYCHOLOGICAL ASSOCIATION, Washington, D.C.; Sherman Ross; 13 months; $23,875; 12 months; $17,770

AMERICAN SOCIETY OF AGRONOMY, Madison, Wis.; Matthias Stelly; 13 months; $7,680

AMERICAN SOCIOLOGICAL ASSOCIATION, New York, N.Y.; Gresham M. Sykes; 1 year; $11,850
Gresham M. Sykes; 13 months, $15,735

ASSOCIATION FOR COMPUTING MACHINERY, New York, N.Y.; Jack Moshman; 1 year; $10,700
James R. Oliver; 13 months, $9,780

INSTITUTE OF MATHEMATICAL STATISTICS, Stanford, Calif.; Gerald J. Lieberman; 3 years; $40,000

MATHEMATICAL ASSOCIATION OF AMERICA, Buffalo, N.Y.; Rothwell Stephens, Knox College, Galesburg, Ill.; 13 months; $47,065

NATIONAL ACADEMY OF SCIENCES—NATIONAL RESEARCH COUNCIL, Washington, D.C.; Robert C. Stephenson; 1 year; $32,315; 12 months; $42,615

SOCIETY FOR INDUSTRIAL AND APPLIED MATHEMATICS, Philadelphia, Pa.; G. Stephen Jones; 13 months; $18,615

SOCIETY OF AMERICAN FORESTERS, Washington, D.C.; Henry Clepper; 13 months, $14,860

SOCIETY OF WOOD SCIENCE AND TECHNOLOGY, Madison, Wis.; Stephen B. Preston, University of Michigan, Ann Arbor; 13 months; $5,100

ECONOMIC AND STATISTICAL STUDIES

BUREAU OF THE CENSUS, U.S. DEPARTMENT OF COMMERCE, Washington, D.C.; Maxwell R. Conklin; *Survey of Funds for Performance and Financing of Research and Development in Industrial Firms During 1962;* 4 months; $34,660

U.S. DEPARTMENT OF LABOR, BUREAU OF LABOR STATISTICS, Washington, D.C.; Ewan Clague; *Cost Index Applicable to Research and Development Budgets;* 1 year; $33,000

INSTITUTIONAL PROGRAMS

GRADUATE-LEVEL RESEARCH FACILITIES

AGRICULTURAL AND MECHANICAL COLLEGE OF TEXAS, College Station; J. G. Potter; *Development of Enlarged Modernized Service Shop in Physics Building Renovation;* 1 year; $4,500

ARIZONA STATE UNIVERSITY, Tempe; Lee P. Thompson; *Construction and Renovation of Facilities for Graduate Research in the Engineering Center;* 1 year; $130,500

AUBURN UNIVERSITY, Auburn, Ala.; W. B. DeVall; *Renovation of Forest Ecology and Forest-Soils Physiology Research Laboratories;* 1 year; $16,700

BRANDEIS UNIVERSITY, Waltham, Mass.; Louis Levin; *Expansion of Electrical Power Supply to Science Research Buildings;* 1 year; $2,800

BROWN UNIVERSITY, Providence, R.I.; H. E. Farnsworth; *Conversion of an Existing Building into a Research Laboratory for the Department of Physics;* 1 year; $11,900
R. W. Morse and P. F. Maeder; *Construction of New Research Facilities in a Physics-Engineering Building;* 3 years; $750,000

BUCKNELL UNIVERSITY, Lewisburg, Pa.; Emil J. Polak; *Construction of a New Astronomical Observatory;* 1 year; $50,000

CALIFORNIA INSTITUTE OF TECHNOLOGY, Pasadena; Ray D. Owen; *Conversion of Available Space into Research Laboratories for Study of the Physical and Chemical Properties of Protein Molecules;* 1 year; $40,000
Cornelius J. Pings; *Improvement of Facilities for Research in Liquid State Physics;* 1 year; $5,000

CARNEGIE INSTITUTE OF TECHNOLOGY, Pittsburgh, Pa.; M. C. Shaw; *Renovation of Three Areas in Machinery Hall for Research Facilities for Technical Engineering;* 1 year; $26,100
E. M. Williams; *Renovation of Space to Expand Facilities for Research in Microwave Measurements;* 1 year; $14,600

CASE INSTITUTE OF TECHNOLOGY, Cleveland, Ohio; J. B. Reswick; *Construction of a Controlled Atmosphere Laboratory;* 1 year; $7,500
R. H. Thomas; *Modification of Existing Space to Research Laboratories in Physics;* 1 year; $12,100

CLARKSON COLLEGE OF TECHNOLOGY, Potsdam, N.Y.; H. L. Shulman; *Expansion of Chemical Engineering and Chemistry Research Laboratory Facilities;* 1 year; $26,800

COLORADO STATE UNIVERSITY RESEARCH FOUNDATION, Fort Collins; H. E. Bredeck; *Construction of a New Research Training Laboratory for the Department of Physiology;* 2 years; $210,900

CORNELL UNIVERSITY, Ithaca, N.Y.; H. A. Scheraga; *Modification of Laboratory to Provide Research Space in Chemistry;* 1 year; $29,000

DARTMOUTH COLLEGE, Hanover, N.H.; R. C. Fuller; *Construction of Research Facilities for Electron Microscopy for Departments of Microbiology and Pathology;* 2 years; $125,000

Leonard M. Rieser; *A New Laboratory for Research and Teaching in the Biological Sciences;* 3 years; $740,300

DUKE UNIVERSITY, Durham, N.C.; Frank T. de Vyver; *Remodeling and Renovation of Building No. 10 for Research in Economics;* 1 year; $58,200

Harold W. Lewis; *Construction and Conversion of Physics Research Facilities;* 2 years; $500,000

FLORIDA STATE UNIVERSITY, Tallahassee; R. K. Sheline; *Addition of a Third and Second Floor to the Nuclear Research Building;* 2 years; $244,700

H. L. Waskom; *Construction of a New Building for Basic Research and Graduate Instruction in Psychology;* 2 years; $197,100

GEORGIA INSTITUTE OF TECHNOLOGY, Atlanta; C. W. Gorton; *Expansion of Research Facilities of the School of Mechanical Engineering;* 1 year; $86,900

HARVARD UNIVERSITY, Cambridge, Mass.; Eugene P. Kennedy, Boston; *Renovation and Modernization of Available Space for Research in Biological Chemistry;* 2 years; $120,500

J. T. Shaplin; *Construction of New Laboratory Facilities for Research in the Social Sciences;* 2 years; $216,200

HUNTER COLLEGE, New York, N.Y.; A. Willis Dearing; *Conversion of Facilities into a Graduate Research Laboratory for Chemistry;* 1 year; $2,500

ILLINOIS INSTITUTE OF TECHNOLOGY, Chicago; Arthur E. Martell; *Renovation of Facilities for Research in the Department of Chemistry;* 1 year; $10,400

ILLINOIS STATE NORMAL UNIVERSITY, Normal; R. O. Rilett; *Construction of Research Facilities for the Department of Biological Sciences;* 1 year; $11,000

IOWA STATE UNIVERSITY, Ames; Clayton A. Swenson; *An Addition to the Physics Building;* 2½ years; $1,106,000

INDIANA UNIVERSITY, Bloomington; J. A. Franklin; *Construction of a Research Wing to the Chemistry Building;* $100,000

Douglas A. MacFadyen; *Renovation of Space to Provide Research Facilities for the School of Medicine;* 2 years; $50,000

JOHNS HOPKINS UNIVERSITY, Baltimore, Md.; Walter S. Koski; *Construction of New Research Facilities in an Annex to the Chemistry Laboratory;* 2 years; $451,000

KANSAS STATE UNIVERSITY, Manhattan; Herbert Knutson; *Support of Remodeling and Equipping of Graduate-Level Laboratories for Basic Research and Research Training in Entomology;* 2 years; $29,200

KENT STATE UNIVERSITY, Kent, Ohio; Glenn H. Brown; *Renovation of Three Rooms in McGilvrey Hall for Research Facilities for Organic and Inorganic Chemistry;* 1 year; $8,000

LOUISIANA STATE UNIVERSITY, Baton Rouge; H. B. Williams; *Air Conditioning and Renovation of Graduate Level Research Space in the Department of Chemistry;* 1 year; $37,600

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge; Howard W. Johnson; *Construction of a Social Science and Management Research Center;* 3 years; $1,000,000

MICHIGAN STATE UNIVERSITY, East Lansing; H. J. Carew; *Modernization and Expansion of Facilities for Research in Plant Physiology and Biochemistry;* 2 years; $40,000

William B. Drew; *Conversion of Existing Space Into Facilities for Research in Plant Physiology and Ecology;* 1 year; $22,900

R. G. Hansen; *Construction of New Research Facilities for the Department of Biochemistry;* 3 years; $1,213,000

NEW YORK UNIVERSITY, New York; Morris H. Shamos; *Alterations to Provide New Research Facilities for the Physics Department;* 2 years; $177,925

James J. Stoker; *Construction of New Research Facilities for the Courant Institute of Mathematical Sciences;* 3 years; $900,000

NORTH DAKOTA STATE UNIVERSITY, Fargo; F. L. Minnear; *Construction of a New Research Building for the College of Chemical Technology;* 2 years; $100,000

NORTH TEXAS STATE UNIVERSITY, Denton; J. K. G. Silvey; *Completion of Basement Area of Master Hall for Research Facilities for Biology and Biochemistry;* 1 year; $23,550

NORTHWESTERN UNIVERSITY, Evanston, Ill.; D. S. Berry; *Renovation and Expansion of Research Facilities in the Department of Civil Engineering;* 1 year; $50,000

L. G. Mitten; *Construction of Facilities for Research in Industrial Engineering;* 1 year; $7,500

OHIO STATE UNIVERSITY, Columbus; E. E. Dreese; *Construction of Facilities for Graduate-Level Research in Electrical Engineering;* 2 years; $384,800

OHIO WESLEYAN UNIVERSITY, Delaware; Arne Slettebak; *Renovation of Available Space to Provide Additional Research Facilities at the Perkins Observatory;* 1 year; $7,000

OKLAHOMA STATE UNIVERSITY, Stillwater; O. C. Dermer; *Laboratory Furniture for Chemistry Research Laboratories;* 1 year; $39,000

R. N. Maddox and J. H. Boggs; *Construction of Research Facilities in a New Engineering Building;* 1 year; $225,000

OREGON STATE UNIVERSITY, Corvallis; Kim K. Ching; *Remodeling of Facilities for Forest Research;* 1 year; $2,100

Bert E. Christensen; *Renovation of Obsolete Facilities to Provide Adequate Research Space for the Department of Chemistry;* 1 year; $28,000

Ernst J. Dornfeld; *Construction of Graduate-Level Research Facilities in the First Addition of Cordley Hall;* 3 years; $425,000

P. R. Elliker; *Construction of Graduate-Level Research Facilities;* 3 years; $227,700

PENNSYLVANIA STATE UNIVERSITY, University Park; F. G. Brickwedde; *Expansion of Chemistry Research Facilities;* 3 years; $675,000

PRINCETON UNIVERSITY, Princeton, N.J.; H. H. Hess; *Construction of a New Research Wing and Alterations to Existing Building for the Department of Geology;* 2 years; $277,200

J. M. Notterman; *Renovation and Equipping of Green Building and Construction of Additional Auditory Research Facilities at Forrestal Research Center;* 2 years; $429,100

PURDUE UNIVERSITY, Lafayette, Ind.; Raymond Cohen; *Construction of Sound Facilities for Graduate Research;* 1 year; $11,100

R. L. Stucky; *Construction of a New Building for Research in Economics and Agricultural Economics;* 2 years; $542,100

G. H. Toebes; *Construction of a Hydromechanics Research Laboratory;* 1 year; $200,000

RENSSELAER POLYTECHNIC INSTITUTION, Troy, N.Y.; E. R. Gaerttner; *Construction of Facilities for Graduate Research in Nuclear Engineering and Science;* 2 years; $120,000

G. H. Handelman; *Conversion of Amos Eaton Hall into a Methematics Center;* 2 years; $142,000

ST. LOUIS UNIVERSITY, Mo.; Ross R. Heinrich; *Construction of Research Facilities in the Department of Geophysics and Geophysical Engineering;* 2 years; $100,000

SOUTH DAKOTA STATE COLLEGE OF AGRICULTURE AND MECHANIC ARTS, Brookings; Edward C. Berry; *Completion of Facilities in the Research Laboratories in the Dairy Technology and Bacteriology Building;* 2 years; $11,100

V. S. Webster; *Addition to Chemistry Building for Graduate Research Facilities;* 1 year; $50,000

STANFORD UNIVERSITY, Stanford, Calif.; Eric Hutchinson; *Construction of A New Building for Research Training in Physical Chemistry;* 2½ years; $450,000

Nevitt Sanford; *Renovation of Laboratories for the Institute for the Study of Human Problems;* 1 year; $7,500

STATE UNIVERSITY OF IOWA, Iowa City; K. W. Spence; *Construction of a Psychology Research Building;* 2 years; $705,000

James A. Van Allen; *Construction of a Physics Research Building;* 2 years; $650,000

STATE UNIVERSITY OF NEW YORK COLLEGE OF AGRICULTURE AT CORNELL UNIVERSITY, Ithaca; Charles E. Palm; *Expansion of Facilities for Basic Research in the Biological Sciences;* 4 years; $1,200,000

STATE UNIVERSITY OF SOUTH DAKOTA, Vermillion; George P. Scott; *Renovation of Laboratory Room for Research in Chemistry;* 1 year; $7,600

SWARTHMORE COLLEGE, Swarthmore, Pa.; Peter van de Kamp; *Addition to and Renovation of Sproul Observatory;* 18 months; $46,520

TUFTS UNIVERSITY, Medford, Mass.; M. Kent Wilson; *Construction of a New Research Wing for the Department of Chemistry;* 2 years; $130,000

UNIVERSITY OF ARIZONA, Tucson; William P. Bemis; *Renovation and Furnishing Research Facilities for Department of Horticulture;* 2 years; $10,000

A. L. McComb; *Renovation and Furnishing of Three Existing Rooms for Research Laboratories for the Department of Watershed Management;* 2 years; $16,900

UNIVERSITY OF ARKANSAS, Fayetteville; Virgil W. Adkisson; *Construction of Research Facilities in a New Science-Engineering Building;* 3 years; $217,900

UNIVERSITY OF CALIFORNIA, Berkeley; Leonard Machlis; *Renovation of Three Rooms in the Life Sciences Building for Research Facilities for the Department of Botany;* 2 years; $20,000

Julian C. Crane, Davis; *Controlled Environmental Rooms for Research in the Department of Pomology;* 1 year; $16,000

Donald G. Crosby, Davis; *Construction of a New Laboratory Building for Basic Research in Toxicology;* 2 years; $175,000

John L. Ingraham, Davis; *Laboratory Animal Building for Biological Sciences;* 2 years; $30,200

A. W. Lawson, Riverside; *Construction of Research Facilities in the New Physics Building;* 3 years; $545,800

UNIVERSITY OF CHICAGO, Ill.; Benson E. Ginsburg; *Life Sciences Facility for Staff Research in the College Biology Section;* 1 year; $64,700

E. H. Hess; *Alteration and Modernization of a Central Building for the Department of Psychology;* 1 year; $490,800

Clyde A. Hutchison, Jr.; *Construction of A New Research Laboratory for the Department of Chemistry;* 3 years; $1,000,000

UNIVERSITY OF COLORADO, Boulder; David Arthur Lind; *Construction of an Additional Building for Research in Nuclear Physics;* 2 years; $123,300

Donald J. Mason; *Construction of a Life Sciences Research Laboratory;* 1 year; $99,000

UNIVERSITY OF DAYTON, Ohio; Paul P. Machowicz; *Development of Graduate-Level Research Facility in the Department of Biology;* 1 year; $12,600

UNIVERSITY OF DELAWARE, Newark; J. P. Hartnett; *Modernization and Renovation of Graduate-Level Research Facilities in the Department of Mechanical Engineering;* 2 years; $187,400

UNIVERSITY OF FLORIDA, Gainesville; Alan D. Conger; *Plant-Growth Facilities for Radiation Botany and Biology;* 2 years; $47,100

UNIVERSITY OF GEORGIA, Athens; Curtis R. Jackson; *Construction of Plant Pathology Research Facilities;* 1 year; $20,000

UNIVERSITY OF HOUSTON, Tex.; J. R. Crump; *Construction of Additional Facilities for the Departments of Chemical, Electrical, and Mechanical Engineering;* 1 year; $34,300

UNIVERSITY OF ILLINOIS, Urbana; H. E. Carter and H. A. Laitinen; *Construction of Research Facilities in an Addition to the East Chemistry Building;* 3 years; $1,600,000

John R. Pasta; *Construction of Second Addition to the Digital Computer Laboratory Building;* 2 years; $483,500

UNIVERSITY OF LOUISVILLE, Ky.; Warren H. Dennis; *Renovation of Existing Space for Laboratories for Basic Research and Research Training in Ophthalmology;* 1 year; $16,000

Ulrich Westphal; *Remodeling of Research Facilities for Part of the Biochemistry Department;* 1 year; $16,000

UNIVERSITY OF MASSACHUSETTS, Amherst; Donald Fairbairn; *New Facilities for Research and Graduate Training in the Morrill Science Center;* 2 years; $239,825

George R. Richason, Jr.; *Modification and Renovation of Selected Areas of the Goessmann Chemistry Laboratory;* 2 years; $150,000

UNIVERSITY OF MIAMI, Coral Gables, Fla.; J. W. McDavid; *Development of the Psychological Human Research Laboratories;* 1 year; $29,000

UNIVERSITY OF MICHIGAN, Ann Arbor; Leigh C. Anderson; *A New Air Supply System for the Chemistry-Pharmacy Building;* 18 months; $89,500

Reynolds M. Denning; *Remodeling and Refurbishment of Existing Space for Research in Geology and Mineralogy;* 1 year; $17,300

UNIVERSITY OF MINNESOTA, Minneapolis; W. J. Breckenridge; *Construction of Research Laboratories in a New Wing of the Museum of Natural History;* 3 years; $50,000

John A. Buttrick; *Construction of a Center for Economic Research;* 2 years; $104,200

Kenneth MacCorquodale; *Space Alterations to Provide Laboratory for Physiological Psychology;* 1 year; $20,500

W. M. Myers; *Renovation and Modernization of an Existing Laboratory to Facilitate Its Use as a Radiation Genetics Graduate-Research Laboratory;* 2 years; $23,600

Alfred O. C. Nier; *Addition to Physics Facilities;* 2 years; $600,200

Gerald B. Ownbey; *Construction of Laboratory for Cytotaxonomic Research;* 1 year; $2,500

W. G. Shepherd; *Construction of an Addition to Research Facilities in Electrical Engineering Building;* 1 year; $137,400

UNIVERSITY OF MISSOURI, Columbia; A. G. Unklesbay; *Construction of Research Facilities in a New Geology Building;* 2 years; $319,700

UNIVERSITY OF NEW MEXICO, Albuquerque; G. A. Crosby; *Conversion of Available Space into a Graduate Research Laboratory for the Department of Chemistry;* 1 year; $7,500

UNIVERSITY OF NORTH CAROLINA, Chapel Hill; J. Logan Irvin; *Remodeling and Furnishing of Additional Space for Research Laboratories for the Department of Biochemistry and Nutrition;* 2 years; $40,200

T. E. Maki, Raleigh; *Construction of Laboratory Facilities in the New Forestry Building;* 3 years; $85,000

UNIVERSITY OF NOTRE DAME, Ind.; Thomas E. Stewart; *Construction of New Facilities for Research for Department of Mathematics;* 1 year; $215,100

UNIVERSITY OF OKLAHOMA, Norman; Sherril D. Christian; *Renovation of Chemistry Research Facilities;* 1 year; $71,200

Raymond Daniels; *Construction of New Facilities for Research in Chemical Engineering;* 2 years; $277,500

R. D. Daniels; *Construction of New Facilities for Research in Material Sciences;* 2 years; $80,000

Howard W. Larsh; *Construction of Research Facilities in a New Building for Botany and Microbiology;* 3 years; $300,000

UNIVERSITY OF PENNSYLVANIA, Philadelphia; Britton Chance; *Addition of a Sixth Floor on a New Biology Building;* 3 years; $171,000

Ralph O. Erickson; *Construction of Plant Growth Rooms for Division of Biology;* 2 years; $81,350

UNIVERSITY OF PITTSBURGH, Pa.; A. F. Frederickson; *Research Facilities for the Department of Geology;* 1 year; $11,000

David Halliday; *Renovation of Facilities in a Physics Research Building;* 1 year, $34,600

UNIVERSITY OF ROCHESTER, N.Y.; John W. Graham, Jr.; *Renovation and Expansion of Graduate-Level Research Facilities in Engineering;* 1 year; $118,800

UNIVERSITY OF TENNESSEE, Knoxville; Hilton A. Smith; *Construction of Research Facilities in a New Engineering Building;* 1 year; $180,000

Hilton A. Smith; *Construction of a New Wing Providing Research Facilities for Biology;* 2 years; $425,400

UNIVERSITY OF TEXAS, Austin; A. A. Toprac; *Expansion of Structures Research Laboratory;* 1 year; $20,000

UNIVERSITY OF UTAH, Salt Lake City; J. M. Sugihara; *Construction of Research Facilities in a New Chemistry Building;* 2½ years; $260,000

UNIVERSITY OF VIRGINIA, Charlottesville; Nicholas Cabrera; *Construction of a Nuclear Physics Research Laboratory With Facilities to House a New Van de Graaff Accelerator;* 2 years; $179,000

UNIVERSITY OF WASHINGTON, Seattle; George H. Cady; *New Research Facilities in the Chemistry Laboratory;* 1 year; $96,300

Arthur W. Martin; *Construction of Graduate Research Laboratories in the Burke Memorial Museum;* 2 years, $95,500

James I. Mueller; *Construction of Research Facilities for Ceramic Engineering;* 2 years; $30,000

UNIVERSITY OF WISCONSIN, Madison; John D. Ferry; *Construction of Research Facilities for the Department of Chemistry;* 3 years; $1,200,000

UTAH STATE UNIVERSITY, Logan; T. W. Daniel; *Construction of Controlled Environment Facilities in the Department of Forest Management;* 1 year; $4,000

VIRGINIA POLYTECHNIC INSTITUTE, Blacksburg; R. E. Blaser; *Establishment of an Environmental Control Laboratory;* 1 year; $14,400

R. C. Krug; *Expansion of Research Facilities for the Department of Chemistry;* 1 year; $15,000

WASHINGTON STATE UNIVERSITY, Pullman; Arthur L. Cohen; *An Electron Microscope Laboratory for Research and Training in the Biological Sciences;* 1 year; $16,800

WASHINGTON UNIVERSITY, St. Louis, Mo.; Marion E. Bunch; *Remodeling of Facilities for Research Laboratories in the Department of Psychology;* 1 year; $22,000

Robert L. Hamblin; *Renovation of Part of MacMillan Hall for Research Facilities for the Department of Sociology-Anthropology;* 1 year; $24,800

Florence Moog; *Construction of a New Laboratory Building for Experimental Biology;* 2 years; $152,500

WAYNE STATE UNIVERSITY, Detroit, Mich.; Henry V. Bohm; *Construction of New Facilities for Research in Physics;* 2 years; $550,000

WEST VIRGINIA UNIVERSITY, Morgantown; Homer Patrick; *Construction and Equipping of a Controlled Temperature Laboratory;* 1 year; $11,000

WESTERN RESERVE UNIVERSITY, Cleveland, Ohio; Frank Hovorka; *Renovation of Space to Provide Additional Graduate Research Facilities for the Department of Chemistry;* 1 year; $7,900

Howard A. Schneiderman; *Conversion of Available Space into Research Facilities for the Department of Biology;* 2 years; $66,000

WILLIAM MARSH RICE UNIVERSITY, Houston, Tex.; Richard B. Turner; *Renovation and Expansion of Research Facilities in Chemistry;* 2 years; $300,000

YALE UNIVERSITY, New Haven, Conn.; D. Allan Bromley; *Construction of Facilities to House a 20–MeV Tandem Van de Graaff Accelerator;* 2 years; $500,000

Claude E. Buxton; *Remodeling of Physiological Psychology Laboratories;* 1 year; $34,000

S. Dillon Ripley; *Renovation of Available Space for Graduate Research Facilities for Invertebrate Paleontology;* 1 year; $24,800

J. M. Sturtevant; *Construction of New Research Facilities in the Department of Chemistry;* 2 years; $250,000

INSTITUTIONAL GRANTS PROGRAM

ADELPHI COLLEGE, Garden City, N.Y.; $13,759

AGRICULTURAL AND MECHANICAL COLLEGE OF TEXAS, College Station; $31,471

AGRICULTURAL AND TECHNOLOGY COLLEGE OF NORTH CAROLINA, Greensboro; $10,047

ALABAMA COLLEGE, Montevallo; $10,160

ALAMEDA COUNTY STATE COLLEGE, Hayward, Calif; $3,500

ALBION COLLEGE, Albion, Mich.; $10,469

ALFRED UNIVERSITY, Alfred, N.Y.; $11,000

ALLEGHENY COLLEGE, Meadville, Pa.; $5,200

ALMA COLLEGE, Alma, Mich.; $9,800

AMERICAN UNIVERSITY, Washington, D.C.; $11,946

AMHERST COLLEGE, Amherst, Mass.; $12,248

ANTIOCH COLLEGE, Yellow Springs, Ohio; $11,192

ARIZONA STATE COLLEGE, Flagstaff; $5,200

ARIZONA STATE UNIVERSITY, Tempe; $20,575

ARLINGTON STATE COLLEGE, Arlington, Tex.; $10,524

ASHEVILLE-BILTMORE COLLEGE, Asheville, N.C.; $7,000

ATLANTIC UNION COLLEGE, South Lancaster, Mass.; $8,000

AUBURN UNIVERSITY FOUNDATION, Auburn, Ala.; $3,652

AUGSBURG COLLEGE AND THEOLOGICAL SEMINARY, Minneapolis, Minn.; $3,100

AUGUSTANA COLLEGE, Sioux Falls, S. Dak.; $4,200

BAYLOR UNIVERSITY, Waco, Tex.; $19,750

BENNINGTON COLLEGE, Bennington, Vt.; $17,640

BEREA COLLEGE, Berea, Ky.; $3,400

BIRMINGHAM-SOUTHERN COLLEGE, Birmingham, Ala.; $10,260

BOSTON COLLEGE, Chestnut Hill, Mass.; $13,194

BOSTON UNIVERSITY, Boston, Mass.; $21,845

BOWDOIN COLLEGE, Brunswick, Maine; $11,303

BOWLING GREEN STATE UNIVERSITY, Bowling Green, Ohio; $11,242

BRADLEY UNIVERSITY, Peoria, Ill.; $11,000

BRANDEIS UNIVERSITY, Waltham, Mass.; $62,205

BRIGHAM YOUNG UNIVERSITY, Provo, Utah; $32,145

BROOKLYN COLLEGE, Brooklyn, N.Y.; $20,187

BROWN UNIVERSITY, Providence, R.I.; $64,-445

BRYN MAWR COLLEGE, Bryn Mawr, Pa.; $17,750

BUCKNELL UNIVERSITY, Lewisburg, Pa.; $11,115

CALIFORNIA INSTITUTE OF TECHNOLOGY, Pasadena; $75,000

CANISIUS COLLEGE, Buffalo, N.Y.; $10,823

CARDINAL STRITCH COLLEGE, Milwaukee, Wis.; $1,665

CARLETON COLLEGE, Northfield, Minn.; $12,-203

CARNEGIE INSTITUTE OF TECHNOLOGY, Pittsburgh, Pa.; $35,750

CASE INSTITUTE OF TECHNOLOGY, Cleveland, Ohio; $34,272

CATHOLIC UNIVERSITY OF AMERICA, Washington, D.C.; $28,659

CENTRAL STATE COLLEGE, Wilberforce, Ohio; $8,600

COLLEGE OF CHARLESTON, Charleston, S.C.; $2,200

CHICAGO COLLEGE OF OSTEOPATHY, Ill.; $11,390

CHICAGO MEDICAL SCHOOL, Ill.; $12,750

CHICO STATE COLLEGE FOUNDATION, Chico, Calif.; $11,780

CHRISTIAN BROTHERS COLLEGE, Memphis, Tenn.; $11,000

CITY COLLEGE, New York, N.Y.; $25,955

CLARK UNIVERSITY, Worcester, Mass.; $12,990

CLARKSON COLLEGE OF TECHNOLOGY, Potsdam, N.Y.; $13,120

CLEMSON COLLEGE, Clemson, S.C.; $11,554

COE COLLEGE, Cedar Rapids, Iowa; $9,100

COLBY COLLEGE, Waterville, Maine; $4,450

COLGATE UNIVERSITY, Hamilton, N.Y.; $6,769

COLLEGE OF THE HOLY CROSS, Worcester, Mass.; $12,866

COLLEGE OF MOUNT ST. VINCENT, New York, N.Y.; $3,300

COLLEGE OF WILLIAM AND MARY, Williamsburg, Va.; $12,915

COLLEGE OF WOOSTER, Wooster, Ohio; $10,848

COLORADO COLLEGE, Colorado Springs; $7,235

COLORADO SCHOOL OF MINES, Golden; $8,796

COLORADO STATE UNIVERSITY, Fort Collins; $30,951

COLUMBIA UNIVERSITY, New York, N.Y.; $75,000

CONCORDIA COLLEGE, Moorhead, Minn.; $6,000

CORNELL COLLEGE, Mount Vernon, Iowa; $2,834

CORNELL UNIVERSITY, Ithaca, N.Y.; $75,000

DARTMOUTH COLLEGE, Hanover, N.H.; $37,430

DENISON UNIVERSITY, Granville, Ohio; $10,190

DEPAUL UNIVERSITY, Chicago, Ill.; $10,515

DEPAUW UNIVERSITY, Greencastle, Ind.; $800

DICKINSON COLLEGE, Carlisle, Pa.; $4,500

DREXEL INSTITUTE OF TECHNOLOGY, Philadelphia, Pa.; $11,644

DUKE UNIVERSITY, Durham, N.C.; $55,799

DUNBARTON COLLEGE OF HOLY CROSS, Washington, D.C.; $2,400

DUQUESNE UNIVERSITY, Pittsburgh, Pa.; $13,770

EARLHAM COLLEGE, Richmond, Ind.; $14,129

EMORY UNIVERSITY, Atlanta, Ga.; $8,346

FAIRFIELD UNIVERSITY, Fairfield, Conn.; $1,550

FAIRLEIGH DICKINSON UNIVERSITY, Rutherford, N.J.; $7,000

FLORIDA AGRICULTURAL AND MECHANICAL UNIVERSITY, Tallahassee; $10,100

FLORIDA PRESBYTERIAN COLLEGE, St. Petersburg; $10,200

FLORIDA SOUTHERN COLLEGE, Lakeland; $10,095

FLORIDA STATE UNIVERSITY, Tallahassee; $42,174

FORDHAM UNIVERSITY, New York, N.Y.; $21,117

FRANKLIN AND MARSHALL COLLEGE, Lancaster, Pa,; $12,277

FREDERIC BURK FOUNDATION FOR EDUCATION, San Francisco, Calif.; $17,280

FRESNO STATE COLLEGE, Fresno, Calif.; $14,210

GALLAUDET COLLEGE, Washington, D.C.; $11,320

GEORGE WASHINGTON UNIVERSITY, Washington, D.C.; $25,002

GEORGE WASHINGTON CARVER FOUNDATION, Tuskegee Institute, Ala.; $12,340

GEORGETOWN UNIVERSITY, Washington, D.C.; $19,589

GEORGIA INSTITUTE OF TECHNOLOGY, Atlanta; $24,994

GETTYSBURG COLLEGE, Gettysburg, Pa.; $6,300

GOUCHER COLLEGE, Baltimore, Md.; $13,521

GRAMBLING COLLEGE, Grambling, La.; $4,900

GRINNELL COLLEGE, Grinnell, Iowa; $11,090

GUSTAVUS ADOLPHUS COLLEGE, St. Peter, Minn.; $3,200

HAHNEMANN MEDICAL COLLEGE AND HOSPITAL, Philadelphia, Pa.; $11,560

HAMILTON COLLEGE, Clinton, N.Y.; $5,600

HAMLINE UNIVERSITY, St. Paul, Minn.; $4,600

HAMPDEN-SYDNEY COLLEGE, Hampden-Sydney, Va.; $7,600

HARTNELL COLLEGE, Salinas, Calif; $10,510

HARVARD UNIVERSITY, Cambridge, Mass.; $75,000

HARVEY MUDD COLLEGE, Claremont, Calif.; $19,225.

HAVERFORD COLLEGE, Haverford, Pa.; $8,446

HOLLINS COLLEGE, Hollins College, Va.; $13,250

HOWARD UNIVERSITY, Washington, D.C.; $18,959

HUNTER COLLEGE, New York, N.Y.; $13,618

IDAHO STATE COLLEGE, Pocatello; $11,210

ILLINOIS INSTITUTE OF TECHNOLOGY, Chicago; $22,735

ILLINOIS STATE NORMAL UNIVERSITY, Normal; $7,000

ILLINOIS WESLEYAN UNIVERSITY, Bloomington; $3,300

IMMACULATE HEART COLLEGE, Los Angeles, Calif.; $10,356

INDIANA UNIVERSITY FOUNDATION, Bloomington; $64,751

IOWA STATE UNIVERSITY, Ames; $34,432

JACKSON STATE COLLEGE, Jackson, Miss.; $10,610

JOHNS HOPKINS UNIVERSITY, Baltimore, Md.; $73,622

JUNIATA COLLEGE, Huntingdon, Pa.; $10,260

KALAMAZOO COLLEGE, Kalamazoo, Mich.; $2,800

KANSAS STATE COLLEGE of Pittsburg; $11,033

KANSAS STATE UNIVERSITY, Manhattan; $23,529

KENT STATE UNIVERSITY, Kent, Ohio; $11,929

KENTUCKY RESEARCH FOUNDATION, Lexington; $15,902

KENYON COLLEGE, Gambier, Ohio; $10,373

KING COLLEGE, Bristol, Tenn.; $10,200

KNOX COLLEGE, Galesburg, Ill.; $3,614

LAFAYETTE COLLEGE, Easton, Pa.; $11,348

LAKE FOREST COLLEGE, Lake Forest, Ill.; $5,285

LAWRENCE COLLEGE, Appleton, Wis.; $11,880

LE MOYNE COLLEGE, Syracuse, N.Y.; $3,200

LEBANON VALLEY COLLEGE, Annville, Pa.; $7,000

LEHIGH UNIVERSITY, Bethlehem, Pa.; $35,-324

LINCOLN UNIVERSITY, Jefferson City, Mo.; $5,000

LINFIELD COLLEGE, McMinnville, Oreg.; $9,728

LONG BEACH STATE COLLEGE FOUNDATION, Long Beach, Calif.; $13,260

LONGWOOD COLLEGE, Farmville, Va.; $3,600

LOS ANGELES STATE COLLEGE, Calif.; $16,430

LOUISIANA POLYTECHNIC INSTITUTE, Ruston; $15,420

LOUISIANA STATE UNIVERSITY, Baton Rouge; $34,066

LOYOLA COLLEGE, Baltimore, Md.; $6,300

LOYOLA UNIVERSITY, Chicago, Ill.; $4,645

LOYOLA UNIVERSITY, New Orleans, La.; $14,076

LYNCHBURG COLLEGE, Lynchburg, Va.; $10,500

MACALESTER COLLEGE, St. Paul, Minn.; $3,900

MANCHESTER COLLEGE, North Manchester, Ind.; $3,900

MANHATTAN COLLEGE, New York, N.Y.; $21,611

MARIAN COLLEGE, Indianapolis, Ind.; $1,500

MARLBORO COLLEGE, Marlboro, Vt.; $10,000

MARQUETTE UNIVERSITY, Milwaukee, Wis.; $13,665

MARSHALL FOUNDATION, INC., Huntington, W. Va.; $4,600

MARYCREST COLLEGE, Davenport, Iowa; $2,000

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge; $75,000

MEDICAL COLLEGE OF SOUTH CAROLINA, Charleston; $14,360

MEDICAL COLLEGE OF VIRGINIA, Richmond; $10,270

MERCYHURST COLLEGE, Erie, Pa.; $3,150

MIAMI UNIVERSITY, Oxford, Ohio; $10,488

MICHIGAN STATE UNIVERSITY, East Lansing, $54,893

MIDWESTERN UNIVERSITY, Wichita Falls, Tex.; $10,000

MILLIKIN UNIVERSITY, Decatur, Ill.; $9,135

MILLS COLLEGE, Oakland, Calif.; $2,600

MILLSAPS COLLEGE, Jackson, Miss.; $7,400

MISSISSIPPI STATE UNIVERSITY, State College; $17,355

MONTANA SCHOOL OF MINES, Butte; $14,185

MONTANA STATE COLLEGE, Bozeman; $18,594

MONTANA STATE UNIVERSITY, Missoula; $10,514

MOREHOUSE COLLEGE, Atlanta, Ga.; $10,119

MORGAN STATE COLLEGE, Baltimore, Md.; $9,255

MOUNT HOLYOKE COLLEGE, South Hadley, Mass.; $10,275

MOUNT ST. MARY'S COLLEGE, Los Angeles, Calif.; $10,500

MOUNT ST. SCHOLASTICA COLLEGE, Atchison, Kans.; $1,895

MUHLENBERG COLLEGE, Allentown, Pa.; $7,000

MUNICIPAL UNIVERSITY OF OMAHA, Nebr.; $4,320

MUSKINGUM COLLEGE, New Concord, Ohio; $8,795

NEBRASKA STATE TEACHERS COLLEGE, Chadron; $1,989

NEW MEXICO HIGHLANDS UNIVERSITY, Las Vegas; $12,745

NEW MEXICO INSTITUTE OF MINING AND TECHNOLOGY, Socorro; $16,642

NEW MEXICO STATE UNIVERSITY, University Park; $22,404

NEW YORK UNIVERSITY, New York; $55,012

NEWARK COLLEGE OF ENGINEERING RESEARCH FOUNDATION, Newark, N.J.; $1,750

NORTH CENTRAL COLLEGE, Naperville, Ill.; $4,995

NORTH DAKOTA STATE UNIVERSITY, Fargo; $14,629

NORTH GEORGIA COLLEGE, Dahlonega; $2,800

NORTH TEXAS STATE UNIVERSITY, Denton; $8,347

NORTHEASTERN UNIVERSITY, Boston, Mass.; $25,410

NORTHERN ILLINOIS UNIVERSITY, DeKalb; $7,500

NORTHERN MICHIGAN COLLEGE, Marquette; $10,484

NORTHWEST NAZARENE COLLEGE, Nampa, Idaho; $10,400

NORTHWESTERN UNIVERSITY, Evanston, Ill.; $75,000

NOTRE DAME COLLEGE OF STATEN ISLAND, Staten Island, N.Y.; $1,660

OBERLIN COLLEGE, Oberlin, Ohio; $16,679

OCCIDENTAL COLLEGE, Los Angeles, Calif.; $2,600

OHIO STATE UNIVERSITY, Columbus, $75,000

OHIO UNIVERSITY, Athens; $15,754

OHIO WESLEYAN UNIVERSITY, Delaware; $19,440

OKLAHOMA STATE UNIVERSITY, Stillwater; $27,211

OLD DOMINION COLLEGE, Norfolk, Va.; $5,100

ORANGE COUNTY STATE COLLEGE FOUNDATION, Fullerton, Calif.; $8,000

OREGON STATE UNIVERSITY, Corvallis; $53,833

PACIFIC LUTHERAN UNIVERSITY, Tacoma, Wash.; $8,750

PAN AMERICAN COLLEGE, Edinburg, Tex.; $10,270

PENNSYLVANIA STATE UNIVERSITY, University Park; $75,000

PFEIFFER COLLEGE, Misenheimer, N.C.; $4,600

POLYTECHNIC INSTITUTE OF BROOKLYN, Brooklyn, N.Y.; $34,860

POMONA COLLEGE, Claremont, Calif.; $16,460

PRINCETON UNIVERSITY, Princeton, N.J.; $75,000

PRINCIPIA COLLEGE, Elsah, Ill.; $1,500

PURDUE RESEARCH FOUNDATION, Lafayette, Ind.; $75,000

QUEENS COLLEGE, Flushing, N.Y.; $19,480

REED COLLEGE, Portland, Oreg.; $11,712

RENSSELAER POLYTECHNIC INSTITUTE, Troy, N.Y.; $31,928

RESEARCH FOUNDATION OF STATE UNIVERSITY OF NEW YORK, Albany; $17,790

RESEARCH FOUNDATION OF UNIVERSITY OF TOLEDO, Ohio; $11,000

RIPON COLLEGE, Ripon, Wis.; $10,240

ROCKEFELLER INSTITUTE, New York, N.Y.; $27,377

ROCKHURST COLLEGE, Kansas City, Mo.; $5,600

ROLLINS COLLEGE, Winter Park, Fla.; $12,000

ROOSEVELT UNIVERSITY, Chicago, Ill.; $10,580

ROSARY HILL COLLEGE, Buffalo, N.Y.; $2,100

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Rose Polytechnic Institute, Terre Haute, Ind.; $6,400
Rutgers, The State University, New Brunswick, N.J.; $61,333
Sacramento State College Foundation, Sacramento, Calif.; $12,420
St. John's University, Jamaica, N.Y.; $10,170
St. Joseph College, West Hartford, Conn.; $5,680
St. Joseph College, Emmitsburg, Md.; $2,750
St. Lawrence University, Canton, N.Y.; $4,240
St. Louis University, Mo.; $19,286
St. Mary's College, St. Mary's College, Calif.; $10,870
St. Mary's College, Winona, Minn.; $11,048
St. Mary's University, San Antonio, Tex.; $5,880
St. Peter's College, Jersey City, N.J.; $10,300
St. Olaf College, Northfield, Minn.; $11,004
St. Procopius College, Lisle, Ill.; $5,570
San Diego State College Foundation, San Diego, Calif.; $26,984
San Fernando Valley State College Foundation, Northridge, Calif.; $5,500
San Jose State College Foundation, San Jose, Calif.; $12,230
Sarah Lawrence College, Bronxville, N.Y.; $4,275
Savannah State College, Savannah, Ga.; $7,400
Seattle Pacific College, Seattle, Wash.; $12,560
Seattle University, Wash.; $4,043
Seton Hall University, South Orange, N.J.; $19,189
Simpson College, Indianola, Iowa; $10,070
Smith College, Northampton, Mass.; $13,306
South Dakota School of Mines and Technology, Rapid City; $11,891
South Dakota State College, Brookings; $11,250
Southern Illinois University, Carbondale; *$15,908
Southern Methodist University, Dallas, Tex.; $19,429
Southern Missionary College, Collegedale, Tenn.; $11,520
Southern Oregon College, Ashland; $10,051
Southern University and Agricultural and Mechanical College, Baton Rouge, La.; $11,602
Southwest Missouri State College, Springfield, Mo.; $10,510
Southwestern at Memphis, Tenn.; $10,540
Stanford University, Stanford, Calif.; $75,000
State University of Iowa, Iowa City; $38,249
State University of New York at Buffalo; $25,770
State University of New York, Harpur College, Binghamton; $7,255
State University of New York At Stony Brook; $28,025
State University of New York, Downstate Medical Center, Brooklyn; $11,830
State University of New York, Upstate Medical Center, Syracuse; $14,970
State University of New York College of Forestry at Syracuse University, Syracuse; $14,332
State University of South Dakota, Vermillion; $13,217
Stephen F. Austin State College, Nacogdoches, Tex.; $12,565
Stevens Institute of Technology, Hoboken, N.J.; $21,360
Sul Ross State College, Alpine, Tex.; $10,750
Swarthmore College, Swarthmore, Pa.; $19,986
Syracuse University, Syracuse, N.Y.; $46,721
Temple University, Philadelphia, Pa.; $21,078
Tennessee Wesleyan College, Athens; $3,280
Texas Lutheran College, Sequin; $7,365
Texas Southern University, Houston; $11,100
Texas Technological College, Lubbock; $12,554
Texas Woman's University, Denton; $5,037
Thiel College, Greenville, Pa.; $1,900
Trinity College, Hartford, Conn.; $5,221
Tufts University, Medford, Mass.; $27,931
Tulane University, New Orleans, La.; $35,356
Union College and University, Schenectady, N.Y.; $11,520
University of Akron, Ohio; $13,370
University of Alabama, University; $10,599
University of Alaska, College; $45,024
University of Arizona, Tucson; $55,541
University of Arkansas, Fayetteville; $23,650
University of Bridgeport, Conn.; $7,400
University of California, Berkeley; $75,000
University of California, Davis; $34,687
University of California, Los Angeles; $75,000
University of California, Riverside; $40,970
University of California, San Diego; $75,000
University of California, San Francisco; $19,335
University of California, Santa Barbara; $24,101
University of Chicago, Ill.; $75,000
University of Cincinnati, Ohio; $12,096
University of Colorado, Boulder; $66,891
University of Connecticut, Storrs; $20,872
University of Dayton, Ohio; $10,100
University of Delaware, Newark; $26,559

UNIVERSITY OF DENVER, Colo.; $7,800
UNIVERSITY OF FLORIDA, Gainesville; $58,083
UNIVERSITY OF GEORGIA, Athens; $26,483
UNIVERSITY OF HAWAII, Honolulu; $38,450
UNIVERSITY OF HOUSTON, Tex.; $13,990
UNIVERSITY OF IDAHO, Moscow; $20,338
UNIVERSITY OF ILLINOIS, Urbana; $75,000
UNIVERSITY OF KANSAS, Lawrence; $52,915
UNIVERSITY OF KANSAS CITY, Mo.; $1,058
UNIVERSITY OF LOUISVILLE, Ky.; $24,721
UNIVERSITY OF MAINE, Orono; $14,689
UNIVERSITY OF MARYLAND, College Park; $55,115
UNIVERSITY OF MASSACHUSETTS, Amherst; $27,855
UNIVERSITY OF MIAMI, Coral Gables, Fla.; $34,348
UNIVERSITY OF MICHIGAN, Ann Arbor; $75,000
UNIVERSITY OF MINNESOTA, Minneapolis; $75,000
UNIVERSITY OF MISSISSIPPI, University; $17,749
UNIVERSITY OF MISSOURI, Columbia; $43,526
UNIVERSITY OF NEBRASKA, Lincoln; $25,891
UNIVERSITY OF NEVADA, Reno; $19,784
UNIVERSITY OF NEW HAMPSHIRE, Durham; $20,165
UNIVERSITY OF NEW MEXICO, Albuquerque; $20,583
UNIVERSITY OF NORTH CAROLINA, Chapel Hill; $30,120
UNIVERSITY OF NORTH CAROLINA, Greensboro; $4,300
UNIVERSITY OF NORTH CAROLINA, Raleigh; $29,081
UNIVERSITY OF NORTH DAKOTA, Grand Forks; $11,710
UNIVERSITY OF NOTRE DAME, Ind.; $26,174
UNIVERSITY OF OKLAHOMA RESEARCH INSTITUTE, Norman; $41,890
UNIVERSITY OF OREGON, Eugene; $48,826
UNIVERSITY OF THE PACIFIC, Stockton, Calif.; $10,820
UNIVERSITY OF PENNSYLVANIA, Philadelphia; $75,000
UNIVERSITY OF PITTSBURGH, Pa.; $34,026
UNIVERSITY OF PORTLAND, Oreg.; $9,184
UNIVERSITY OF PUERTO RICO, Rio Piedras; $12,981
UNIVERSITY OF PUGET SOUND RESEARCH INSTITUTE, Tacoma, Wash.; $11,280
UNIVERSITY OF RHODE ISLAND, Kingston; $14,500
UNIVERSITY OF ROCHESTER, N.Y.; $55,717
UNIVERSITY OF SAN FRANCISCO, Calif.; $8,315
UNIVERSITY OF SCRANTON, Pa.; $10,470
UNIVERSITY OF THE SOUTH, Sewanee, Tenn.; $11,660
UNIVERSITY OF SOUTH CAROLINA, Columbia; $19,045
UNIVERSITY OF SOUTH FLORIDA, Tampa; $11,110
UNIVERSITY OF SOUTHERN CALIFORNIA, Los Angeles; $46,279
UNIVERSITY OF SOUTHWESTERN LOUISIANA, Lafayette; $11,464
UNIVERSITY OF TENNESSEE, Knoxville; $24,373
UNIVERSITY OF TEXAS, Austin; $63,387
UNIVERSITY OF TEXAS, DENTAL BRANCH, Houston; $4,700
UNIVERSITY OF TEXAS, MEDICAL BRANCH, Galveston; $12,200
UNIVERSITY OF TEXAS, SOUTHWESTERN MEDICAL SCHOOL, Dallas; $805
UNIVERSITY OF TEXAS, TEXAS WESTERN COLLEGE, El Paso; $24,390
UNIVERSITY OF TULSA, Okla.; $9,300
UNIVERSITY OF UTAH, Salt Lake City; $39,121
UNIVERSITY OF VERMONT, Burlington; $19,121
UNIVERSITY OF VIRGINIA, Charlottesville; $28,315
UNIVERSITY OF WASHINGTON, Seattle; $75,000
UNIVERSITY OF WICHITA, Kans.; $13,103
UNIVERSITY OF WISCONSIN, Madison; $75,000
UNIVERSITY OF WYOMING, Laramie; $16,689
UTAH STATE UNIVERSITY, Logan; $18,277
VALPARAISO UNIVERSITY, Valparaiso, Ind.; $11,530
VANDERBILT UNIVERSITY, Nashville, Tenn.; $30,855
VILLA MADONNA COLLEGE, Covington, Ky.; $10,335
VILLANOVA UNIVERSITY, Villanova, Pa.; $10,320
VIRGINIA POLYTECHNIC INSTITUTE, Blacksburg; $19,435
VIRGINIA STATE COLLEGE, Petersburg; $5,600
WABASH COLLEGE, Crawfordsville, Ind.; $13,150
WAKE FOREST COLLEGE, Winston-Salem, N.C.; $6,092
WALLA WALLA COLLEGE, College Place, Wash.; $10,390
WASHINGTON AND LEE UNIVERSITY, Lexington, Va.; $12,114
WASHINGTON STATE UNIVERSITY, Pullman; $32,007
WASHINGTON UNIVERSITY, St. Louis, Mo.; $58,412
WAYNE STATE UNIVERSITY, Detroit, Mich.; $34,429
WELLS COLLEGE, Aurora, N.Y.; $6,500
WELLESLEY COLLEGE, Wellesley, Mass.; $10,630
WESLEYAN UNIVERSITY, Middletown, Conn.; $18,712
WEST VIRGINIA UNIVERSITY, Morgantown; $21,899
WESTERN CAROLINA COLLEGE, Cullowhee, N.C.; $600
WESTERN ILLINOIS UNIVERSITY, Macomb; $4,300
WESTERN MICHIGAN UNIVERSITY, Kalamazoo; $11,023

WESTERN RESERVE UNIVERSITY, Cleveland, Ohio; $43,410

WESTERN WASHINGTON STATE COLLEGE, Bellingham; $10,000

WHEATON COLLEGE, Norton, Mass.; $10,058

WHEELING COLLEGE, Wheeling, W. Va.; $4,200

WHITMAN COLLEGE, Walla Walla, Wash.; $566

WHITTIER COLLEGE, Whittier, Calif.; $5,460

WHITWORTH COLLEGE, Spokane, Wash.; $11,020

WILKES COLLEGE, Wilkes-Barre, Pa.; $14,069

WILLAMETTE UNIVERSITY, Salem, Oreg.; $11,175

WILLIAM JEWELL COLLEGE, Liberty, Mo.; $1,440

WILMINGTON COLLEGE, Wilmington, Ohio; $2,430

WILLIAM MARSH RICE UNIVERSITY, Houston, Tex.; $28,615

WILLIAMS COLLEGE, Williamstown, Mass.; $12,755

WILSON COLLEGE, Chambersburg, Pa.; $10,300

WINONA STATE COLLEGE, Winona, Minn.; $2,150

WITTENBERG UNIVERSITY, Springfield, Ohio; $3,500

WOMAN'S MEDICAL COLLEGE OF PENNSYLVANIA, Philadelphia; $14,810

WOODSTOCK COLLEGE, Woodstock, Md.; $10,200

WORCESTER POLYTECHNIC INSTITUTE, Worcester, Mass.; $12,135

XAVIER UNIVERSITY, Cincinnati, Ohio; $2,800

YALE UNIVERSITY, New Haven, Conn.; $75,000

YESHIVA UNIVERSITY, New York, N.Y.; $47,180

INTERNATIONAL SCIENCE ACTIVITIES

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, Washington, D.C.,; Hans Nussbaum; *Administration of Panels and Seminars in Assistance to the U.S.-Japan Committee on Scientific Cooperation;* 1 year; $50,000

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; $18,650

AMERICAN FRIENDS OF THE MIDDLE EAST, INCORPORATED, Washington, D.C.; Virgil C. Crippin; *Travel of Foreign Participants in Summer Institutes, 1963;* 5 months; $6,200

ASIA FOUNDATION, San Francisco, Calif.; Robert S. Schwantes; *Participation of Asian Educators in NSF Supplementary Training Programs, 1963;* 5 months; $19,633

BERNICE P. BISHOP MUSEUM, Honolulu, Hawaii; J. L. Gressitt; *Systematic Studies of Pacific Area Insects;* 1 year; $37,100

CASE INSTITUTE OF TECHNOLOGY, Cleveland, Ohio; T. Keith Glennan; *Inter-American Seminar on Engineering Education;* 1 year; $48,520

ENGINEERS JOINT COUNCIL, New York, N.Y.; Ralph Morgan; *U.S. Engineering Education Delegation to the UPADI Convention in Puerto Rico;* 3 years; $2,000

MEDICAL COLLEGE OF VIRGINIA, Richmond; Herbert McKennis, Jr.; *Synthesis of Insulin and Other Proteins by the Pancreas in Vivo;* 4 months; $7,240

NATIONAL ACADEMY OF SCIENCES—NATIONAL RESEARCH COUNCIL, Washington, D.C.; Harrison Brown; *Exchange of Scientists Between the National Academy of Sciences, U.S.A. and the Academy of Sciences, U.S.S.R.;* 1 year; $260,100

Harrison Brown; *International Organizations and Programs Project;* 1 year; $110,700

ORGANIZATION OF AMERICAN STATES, Washington, D.C.; Jesse D. Perkinson; *Cooperative Program for Inter-American Exchange of Scientists;* 2 years; $66,400

STANFORD UNIVERSITY, Stanford, Calif.; Edward G. Begle; *School Mathematics Study Group (SMSG);* 13 months; $37,640

Richard Doell, Allan Cox and Norman D. Watkins; *Paleomagnetic Studies of Selected Miocene-through-Recent and Historic Rocks of the Eastern Pacific Basin Area;* 3 years; $70,000

U.S. DEPARTMENT OF AGRICULTURE, Washington, D.C.; John G. Atkins, Beaumont, Tex.; *The Establishment of a Uniform Set of Varieties of Rice for Differentiating Strains of Rice Blast Fungus;* 3 years; $36,800

U.S. DEPARTMENT OF THE INTERIOR, GEOLOGICAL SURVEY, Washington, D.C.; Andrew Griscom; *Combined Aeromagnetic-Gravity Studies of Calderas in Japan;* 18 months; $82,700

Richard Doell, Allan Cox and Brent Dalrymple, Rock Magnetics Laboratory, Menlo Park, Calif.; *Paleomagnetic Studies of Selected Miocene-through-Recent and Historic Rocks of the Eastern Pacific Basin Area;* 3 years; $120,000

Jerry P. Eaton; *Geophysical Studies of Pacific Volcanoes (Hawaii and Japan);* 2 years; $11,660

UNIVERSITY OF CALIFORNIA, Berkeley; John H. Reynolds; *Cooperative Program with the University of Sao Paulo, Brazil, in Research in Geochronology of South America;* 2 years; $104,435

John Verhoogen; *Paleomagnetism of Cretaceous Intrusives;* 3 years; $76,000

UNIVERSITY OF COLORADO, Boulder; Arnold B. Grobman; *Biological Sciences Curriculum Study Activities With The Superior Council of Central American Universities;* 18 months; $30,590

UNIVERSITY OF HAWAII, Honolulu; Henry A. Bess and Toshiyuki Nishida; *Biological Control of the Asiatic Rice Stem Borer;* 2 years; $72,100

Henry Birnbaum; *Administration of Meetings and Seminars Held in Assistance to the U.S.-Japan Committee on Scientific Cooperation;* 2 years; $10,000

Maxwell S. Doty; *A study of the Botanical Research Resources and Facilities of Indonesia;* 9 months; $9,935

University of Pittsburgh, Pa.; Takesi Nagata and A. F. Frederickson; *Natural Remanent Magnetism of Rocks in the Pacific Basin Area;* 2 years; $58,000

University of Wisconsin, Madison; R. G. Herb; *Experimental Nuclear Physics;* 3 years; $90,000

Vanderbilt University, Nashville, Tenn.; R. B. Channell; *Cytotaxonomic and Biochemical Studies of the Origin, Distribution and Relationships of Species of Trillium;* 2 years; $37,100

Washington University, St. Louis, Mo.; LeRoy Scharon; *Paleomagnetic Investigations of Miocene-to-Recent Rocks in Taiwan, South Korea or the Philippines;* 3 years; $56,000

SCIENCE RESOURCES PLANNING

National Academy of Sciences—National Research Council, Washington, D.C.; G. B. Kistiakowsky; *Special Studies of Research Needs—The Use of Electronic Computers for Purposes of Education and Research in Science;* 21 months; $112,460

University of Lund, Sweden; Stevan Dedijer; *Social Engineering of Science;* 2 years; $12,000

DISSEMINATION OF SCIENTIFIC INFORMATION

Library of Congress, Washington, D.C.; L. Quincy Mumford; *Support of Conference on Library Mechanization;* 1 year; $28,360

University of Montreal, Quebec, Canada; Hans Selye; *Reconstruction and Improvement of Library and Filing Card System;* 2 years; $30,000

DOCUMENTATION RESEARCH

American Institute of Physics, New York, N.Y.; Hugh C. Wolfe and Pauline Atherton; *Documentation Research Project;* 1 year; $94,185

American Meteorological Society, Boston, Mass.; Malcolm Rigby; *Pilot Project to Further Explore Possibilities for Mechanization of Universal Decimal Classification (UDC) Schedules;* 5 months; $17,250

American Psychological Association, Washington, D.C.; William D. Garvey; *Coordinated Study of Information Exchange in Psychology;* 2 months; $69,900

Cambridge Language Research Unit, Cambridge, England; Roger M. Needham; *New Techniques for Classification: The Theory of Clumps;* 1 year; $20,500

Drexel Institute of Technology, Philadelphia, Pa.; Richard A. Davis; *Research on Engineers' Use of Information Sources;* 1 year; $48,600

Engineers Joint Council, New York, N.Y.; L. K. Wheelock; *Study of Engineering Terminology and Relationships Among Engineering Terms;* 1 year; $4,148

Harvard University, Cambridge, Mass.; Gerard Salton; *Research on and Evaluation of Some Models for Automatic Document Retrieval Systems;* 1 year; $36,149

Anthony G. Oettinger; *Automatic Translation and Mathematical Linguistics;* 16 months, $235,450

Lehigh University, Bethlehem, Pa.; Donald J. Hillman; *Mathematical Theories of Relevance with Respect to the Problems of Indexing*; 2 years; $16,200

Francis J. Wuest; *Studies in the Methodology of Measuring Information Requirements and Use Patterns*; 2 years; $34,100

Massachusetts Institute of Technology, Cambridge; William N. Locke and Myer M. Kessler, Lexington; *Technical Information System: Phase Two*; 1 year; $74,746

Ohio State University Research Foundation, Columbus; William S-Y. Wang; *Research on Synactic Analysis*; 30 months; $100,000

System Development Corporation, Santa Monica, Calif.; Harold Borko; *Steps Toward the Establishment of Computer-Derived Classification System for Scientific Documentation*; 1 year; $24,048

U.S. Department of Commerce, National Bureau of Standards, Washington, D.C.; Samuel N. Alexander; *Research Information Center and Advisory Service on Information Processing;* 1 year; $95,000

Russell A. Kirsch; *Research on Picture and Language Processing;* 1 year; $75,000

U.S. Department of Commerce, Patent Office, Washington, D.C.; Harold Pfeffer; *Foreign Research Associates Program;* 1 year; $53,250

U.S. Department of Commerce, Office of Technical Services, Washington, D.C.; John C. Green; *Service to Assure Availability of Publications Listed in Current Research and Development in Scientific Documentation*; 1 year; $11,000

University of California, Berkeley; Sydney M. Lamb; *Research on Machine Translation and Related Information Systems;* 18 months; $249,000

University of Pennsylvania, Philadelphia; Zellig S. Harris; *Analysis of Chemical Notations;* 2 years; $141,800

University of Texas, Austin; Winfred P. Lehmann; *Development of a Linguistic Computer System;* 1 year; $200,000

Wayne State University, Detroit, Mich.; Harry H. Josselson; *Comprehensive Electronic Data Processing of Two Russian Lexicons;* 2 years; $200,000

Western Reserve University, Cleveland, Ohio; Jessica S. Melton; *Automatic Processing of Metallurgical Abstracts for the Purpose of Information Retrieval;* 1 year; $59,900

FOREIGN SCIENCE INFORMATION

Acta Metallurgica, Schenectady, N.Y.; Walter R. Hibbard, Jr.; *Translation and Publication of the 1962 Issues of Four Russian Journals;* Mettalurg; MiTom; Ogneupory; and Physics of Metals and Metallography; 1 year; $49,071

American Geographical Society, New York, N.Y.; Charles B. Hitchcock; *Translation and Publication of* Soviet Geography; Review and Translation *for Calendar Year 1963*; 1 year; $23,980

AMERICAN GEOLOGICAL INSTITUTE, Washington, D.C.; Robert C. Stephenson; *Publication of, (A) Vol. V, 1963,* International Geology Review; *(B) Translation of 3 Russian Journals,* Izvestiya-Geology Series, Soviet Geology, *and* Paleontological Journal, *for Publication of Selected Articles in IGR, Including Selective Translations and Abstracts from Geological Materials of Other Foreign Languages; and (C) Translations Screening and Information Services;* 1 year; $115,685

AMERICAN GEOPHYSICAL UNION, Washington, D.C.; Waldo E. Smith; *Translation and Publication of Russian Works in Oceanography;* The Oceanology Sections of Doklady *and the* Trudy of the Marine Hydrophysical Institute; 2 years; $32,000

Waldo E. Smith; *Translation and Publication of the 1963 Issues of* Izvestiya, Geophysics Series; 1 year; $49,000

Waldo E. Smith; *Translation and Publication of Vol. 2, Nos. 4–6, 1962, and Vol. 3, Nos. 1–6, 1963, of the Journal,* Geomagnetism and Aeronomy, *USSR;* 18 months; $34,830

Waldo E. Smith; *Translation and Publication of* Soviet Hydrology: Selected Papers; 15 months; $19,235

Waldo E. Smith; *Translation and Publication of the 1963 Issues of the Russian Journal,* Geodesy and Aerophotography; 1 year; $23,870

AMERICAN INSTITUTE OF BIOLOGICAL SCIENCES; Washington, D.C.; John R. Olive; *Dissemination of the English Version of the* Japanese Journal of Plant and Cell Physiology *in the United States;* 1 year; $6,266

AMERICAN INSTITUTE OF CHEMICAL ENGINEERS, New York, N.Y.; F. J. Van Antwerpen; *Translation and Publication of the* International Chemical Engineering Journal; 1 year; $41,620

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS, New York, N.Y.; N. S. Hibshman; *Translation and Publication of the 1962 Issues of Three Russian Journals:* Radio Engineering, Radio Engineering and Electronic Physics *and* Telecommunications; 1 year; $128,577

AMERICAN INSTITUTE OF PHYSICS, New York, N.Y.; Elmer Hutchisson; *Establishment of an Information Center of International Physics Activities;* 1 year; $29,440

Wallace Waterfall; *Translation and Publication of the 1962 Issues of Eight Russian Journals:* Acoustics; Astronomy; Technical Physics: Solid State Physics; JETP; Uspekhi; Crystallography; *and* Doklady, Physics Sections; 1 year; $139,200

Wallace Waterfall; *Translation and Publication of the 1963 Issues of the Same Eight Russian Journals;* 1 year; $129,500

AMERICAN MATHEMATICAL SOCIETY, Providence, R.I.; Gordon L. Walker; *Provide Russian and Related Mathematical Literature for Abstracting and Research Libraries;* 1 year; $35,031

Gordon L. Walker; *Translation and Publication of Volume III, 1962 Issues, of the Russian Journal,* Soviet Mathematics—Doklady; 18 months; $47,651

Gordon L. Walker; *Program for Selected Translations of Mathematical Research Articles from the Russian and Other Languages;* 1 year; $68,724

Gordon L. Walker; *Translation of Six Russian Mathematical Books;* 1 year; $34,067

Gordon L. Walker; *Translation and Publication of the 1962 Issues of the Journal,* Chinese Mathematics—Acta; 1 year; $23,267

AMERICAN METEOROLOGICAL SOCIETY, Boston, Mass.; Kenneth C. Spengler; *Translation and Publication of the Russian Book,* Investigation of Clouds, Precipitation and Thunderstorm Electricity; 6 months; $12,213

AMERICAN ROCKET SOCIETY, New York, N.Y.; James J. Harford; *Selected Translations of Russian Material in the Field of Astronautics;* 1 year; $75,090

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, New York, N.Y.; Joseph Sansone; *Publication in English of Vols. 15 and 16, Russian Serial,* Friction and Wear in Machinery; 1 year; $12,554

BERNICE P. BISHOP MUSEUM, Honolulu, Hawaii; Edwin H. Bryan, Jr.; *Operation of the Pacific Science Information Center;* 1 year; $15,738

Ronald W. Force; *Partial Support of the Permanent Secretariat of the Pacific Science Association;* 5 years; $15,000

COLUMBIA UNIVERSITY, New York, N.Y.; Charles H. Behre; *Review and Translation of Articles Published in Russian, Geology of Ore Deposits;* 3 years; $2,415

COLUMBIA UNIVERSITY PRESS, New York, N.Y.; Robert J. Tilley; *Publication of Two Studies:* Science in Czechoslovakia, *and* Science in East Germany; 1 year; $6,804

GEOCHEMICAL SOCIETY, Austin, Tex.; David B. Stewart; *Translation and Publication of the 1962 Issues of the Russian Journal,* Geokhimiya; 1 year; $27,078

INDIANA UNIVERSITY FOUNDATION, Bloomington; Thomas A. Sebeok; *Preparation and Publication of a Volume on Current Trends in Far Eastern Linguistics*; 2 years; $17,825

INTERNATIONAL UNION OF SCIENTIFIC PSYCHOLOGY, New York, N.Y.; Roger W. Russell, Indiana University, Bloomington; *Preparation and Publication of a Second Edition of the* International Directory of Psychologists; 1 year; $27,007

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC., New York, N.Y.; N. S. Hibshman; *Translation and Publication of the 1963 Issues of Two Japanese Journals:* Proceedings of Electrical Engineers of Japan *and* Proceedings of Electrical Communications Engineers of Japan; 1 year; $94,435

INSTRUMENT SOCIETY OF AMERICA, Pittsburgh, Pa.; William H. Kushnick; *Translation and Publication of the 1963 Issues of Four Russian Journals:* Automation and Remote Control; Industrial Laboratory; Instruments and Experimental Techniques; *and* Measurement Techniques; 1 year; $56,701

JAPAN DOCUMENTATION SOCIETY, Tokyo; Haruo Ootuka; *Revision and Updating of the Kerr Report,* Science Information Services in Japan; 3 months; $600

JAPAN SOCIETY FOR THE PROMOTION OF SCIENCE, Tokyo; Torajiro Takagaki; *Translation and Publication of a* Directory of Research Institutions in Japan Natural and Applied Sciences; 1 year; $6,830

JOHNS HOPKINS UNIVERSITY, Baltimore, Md.; Robert H. Roy; *An Operations Research and Systems Engineering Study of a University Library*; 9 months; $15,833

LIBRARY OF CONGRESS, Washington, D.C.; Charles M. Gottschalk; *Preparation and Publication of a Census of World-Wide Scientific Serials*; 1 year; $20,988

Robert H. Land; *Preparation and Publication of a* Guide to Library Information, and Documentation Services of International Organizations in Science, Technology, Agriculture, and Medicine; 1 year; $10,000

Robert H. Land; *Publication of Part I of a* Monthly World List of Future International Meetings; $6,997

John Sherrod; *Preparation and Publication of an Analytical Survey and Bibliography of Directories in the Sciences Throughout the World*; $840

Rudolph Smits; *Publication of the Monthly Index of Russian Accessions*; 2 months; $30,000

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge; William N. Locke; *Acquisition and Compilation of a Current Union List of Communist Chinese Serials*; 1 year; $21,070

William N. Locke; *Acquisitions and Servicing of Current Communist Chinese Serials*; 1 year; $23,425

W. N. Locke; *Study Into the Dissemination of Scientific and Technical Information in the U.S.S.R.,* 1 year; $23,958

MIDWEST INTER-LIBRARY CENTER, Chicago, Ill.; Gordon R. Williams; *Partial Support of Operation of the Scientific Journals Center*; 1 year; $36,540

NATIONAL ACADEMY OF SCIENCES—NATIONAL RESEARCH COUNCIL, Washington, D.C.; Karl F. Heumann; *Office of Documentation;* 1 year; $114,380

C. W. de Kiewiet; *Study of Science Research and Information Services in East Africa*; 1 year; $12,480

NATIONAL DIET LIBRARY OF JAPAN, Tokyo, Haruki Amatsuchi; *Publication and Distribution of the* Directory of Japanese Learned Periodicals, 1962—Natural and Medical Sciences; 1 year; $1,223

Takao Suzuki; *Compilation and Printing of the English Version of the Japanese Periodicals Index, Natural Science Section*; 1 year; $21,060

NEW YORK PUBLIC LIBRARY, New York; Robert E. Kingery; *Development of U.S. Standards in Library Work and Documentation;* 1 year; $8,470

OPTICAL SOCIETY OF AMERICA, Washington, D.C.; Mary E. Warga; *Translation and Publication of the Cumulative Index Volumes I–X (1956–61) for the Russian Journal,* Optika I Spektroskopiya; 1 year; $4,000

PRINCETON UNIVERSITY, Princeton, N.J.; John Turkevich; *Preparation of a Guide to Soviet Sciences;* 1 year; $23,403

SPECIAL LIBRARIES ASSOCIATION, New York, N.Y.; Ildiko D. Nowak; *Collateral Support of the Operation of the Translations Center;* 1 year; $45,678

SYRACUSE UNIVERSITY RESEARCH INSTITUTE, Syracuse, N.Y.; Warren B. Walsh; *User Study of Translated Soviet Scientific Journals;* 3 years; $16,462

UNION OF INTERNATIONAL ASSOCIATIONS, Brussels, Belgium; G. P. Speeckaert; *Compilation and Publication of (1) A Monthly Current List and (2) An Annual Bibliography of International Conference Proceedings;* 1 year; $13,225

U.S. DEPARTMENT OF COMMERCE, BUREAU OF THE CENSUS, Washington, D.C.; Frederick A. Leedy; *Preparation and Publication of a Bibliographical Survey on Social Science Literature Published in Communist Bloc and Other Difficult Languages;* 1 year; $55,300

U.S. DEPARTMENT OF COMMERCE, OFFICE OF TECHNICAL SERVICES, Washington, D.C.; John C. Green; *Operational Phase of the P.L. 480 Translation Program;* 1 year; $31,235

U.S. DEPARTMENT OF COMMERCE, WEATHER BUREAU, Washington, D.C.; F. W. Reichelderfer; *Editorial and Abstracting Service for AGU's Project of Translating Soviet Hydrology Literature for 1963;* 15 months; $6,100

UNIVERSITY OF NOTRE DAME, Ind.; A. L. Gabriel; *Microfilming of Scientific Manuscripts from the Ambrosiana Library in Milan, Italy;* 1 year; $65,000

YALE UNIVERSITY, New Haven, Conn.; E. J. Boell; *Purchase of a Collection of Scientific Papers,* the Harrison Reprint Collection; 1 year; $7,500

RESEARCH DATA AND INFORMATION SERVICES

AMERICAN LIBRARY ASSOCIATION, Chicago, Ill., Joel Williams; *Preparation of a Report on the Development of an Operating Program of Library Statistics;* 1 year; $5,000

AMERICAN SCIENCE FILM ASSOCIATION, Detroit, Mich.; Randall M. Whaley; *Central Office for the American Science Film Association;* 18 months; $47,300

AMERICAN SOCIETY FOR METALS, Metals Park, Ohio; Robert D. Freeman; *Cooperative Support of the Information Searching Service of the American Society for Metals;* 1 year; $142,000

CARNEGIE LIBRARY OF PITTSBURGH, Pa.; Ralph Munn; *Establishment and Operation of a Regional Reference Center for Unclassified U.S. Government Scientific and Technical Reports;* 1 year; $100

Daniel R. Pfoutz; *Continued Operation of a Regional Technical Report Center;* 1 year; $14,821

COLUMBIA UNIVERSITY, New York, N.Y.; Richard H. Logsdon; *Regional Reference Center for Unclassified U.S. Government Scientific and Technical Reports;* 1 year; $17,528

GEORGIA INSTITUTE OF TECHNOLOGY, Atlanta; J. Henley Crosland; *Establishment and Operation of a Regional Reference Center for Unclassified U.S. Government Scientific and Technical Reports;* 1 year; $21,494

J. Henley Crosland; *Regional Reference Center for Unclassified U.S. Government Scientific and Technical Reports;* 1 year; $13,882

JOHN CRERAR LIBRARY, Chicago, Ill.; Herman H. Henkle; *Establishment and Operation of a Regional Reference Center for Un-*

classified U.S. Government Scientific and Technical Reports; 14 months; $175

Herman H. Henkle; *Regional Reference Center for Unclassified U.S. Government Scientific and Technical Reports;* 1 year; $10,672

LIBRARY OF CONGRESS, Washington, D.C.; L. Quincy Mumford; *National Referral Center for Science and Technology;* 15 months; $261,080

LINDA HALL LIBRARY, Kansas City, Mo.; Joseph C. Shipman; *Regional Reference Center for Unclassified U.S. Government Scientific and Technical Reports;* 1 year; $6,150

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge; William N. Locke; *Regional Reference Center for Unclassified U.S. Government Scientific and Technical Reports;* 1 year; $17,278

SMITHSONIAN INSTITUTION, Washington, D.C.; Monroe E. Freeman; *Partial Support for the Annual Operating Expenses of the Science Information Exchange;* 1 year; $225,000

SOUTHERN METHODIST UNIVERSITY, Dallas, Tex.; Robert M. Trent; *Regional Reference Center for Unclassified U.S. Government Scientific and Technical Reports;* 1 year; $15,123

TUFTS UNIVERSITY, Medford, Mass.; Paul Ronco; *Behavioral Analysis of Technical Writing;* 1 year; $25,711

UNIVERSITY OF CALIFORNIA, Berkeley; Donald Coney; *Regional Reference Center for Unclassified U.S. Government Scientific and Technical Reports;* 1 year; $13,260

Robert Vosper, Los Angeles; *Regional Reference Center for Unclassified U.S. Government Scientific and Technical Reports;* 1 year; $18,825

UNIVERSITY OF COLORADO, Boulder; Ralph E. Ellsworth; *Regional Reference Center for Unclassified U.S. Government Scientific and Technical Reports;* 1 year; $13,139

UNIVERSITY OF ILLINOIS, Urbana; Don S. Culbertson; *Programming, Testing, and Evaluation of a Computerized and Integrated Data Processing System for University Library Procedures;* 1 year; $45,033

UNIVERSITY OF WASHINGTON, *Seattle;* Marion A. Milczewski; *Regional Reference Center for Unclassified U.S. Government Scientific and Technical Reports;* 1 year; $14,803

U.S. DEPARTMENT OF COMMERCE, OFFICE OF TECHNICAL SERVICES, Washington, D.C.; John C. Green; *An Analysis of the Needs of the Textile Industry for Technical Information;* 6 months; $44,000

John C. Green; *Keywords Index to U.S. Government Technical Reports;* 1 year; $97,400

John Weber; *Twelve Regional Reference Centers for Unclassified U.S. Government Scientific and Technical Reports;* 2 years; $53,200

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; $5,290

SUPPORT OF SCIENTIFIC PUBLICATIONS

ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA, Philadelphia, Pa.; Horace G. Richards and Rhodes W. Fairbridge, Columbia University, New York, N.Y.; *Support for Preparation and Publication of an* Annotated Bibliography on Quaternary Shorelines; 2 years; $17,500

ACTA METALLURGICA, Schenectady, N.Y.; Bruce Chalmers; *Study of the Optimum Method of Publication of the Translations of the Russian* Journal of Abstracts-Metallurgy; 3 months; $3,700

AMERICAN ANTHROPOLOGICAL ASSOCIATION, Washington, D.C.; Edward H. Spicer; *A Study of Publishing Needs in the Field of Anthropology;* 1 year; $5,500

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, Washington, D.C.; E. G. Sherburne, Jr.; *Partial Support of a Project to Develop the Use of Broadcast Television for Communication Among Scientists and Engineers;* 1 year; $60,800

AMERICAN ASTRONOMICAL SOCIETY, Princeton, N.J.; Margaret Harwood; *Continued Support for the Preparation of the U.S. Portion of the International Astronomical Union Bibliography for 1881–1898;* 2 years; $37,000

AMERICAN CHEMICAL SOCIETY, Washington, D.C.; Joseph H. Kuney; *Analysis of the Role of the Computer in Scientific Publication;* 2 years; $171,000

AMERICAN CRYSTALLOGRAPHIC ASSOCIATION, Tarrytown, N.Y.; J. D. H. Donnay; *Publication of the Second Edition of* Crystal Data; 1 year; $12,650

AMERICAN GENETIC ASSOCIATION, Washington, D.C.; Samuel L. Emsweller; *Partial Support for the* Journal of Heredity; 1 year; $10,810

AMERICAN GEOGRAPHICAL SOCIETY, New York, N.Y.; Herman R. Friis; *Support for the Publication of* A History of Scientific Geographical Exploration of the Pacific Basin; 1 year; $17,290

AMERICAN GEOLOGICAL INSTITUTE, Washington, D.C.; Robert C. Stephenson; *Continued Support for the Publication of* GeoScience Abstracts; 2 years; $71,500

AMERICAN GEOPHYSICAL UNION, Washington, D.C.; Thomas F. Malone; *Partial Support of the Establishment of* Reviews of Geophysics; 3 years; $36,730

Waldo E. Smith; *Support for Preparation and Publication of a Report on U.S. Geophysics for the 13th General Assembly of the International Union of Geodesy and Geophysics;* 1 year; $11,615

Waldo E. Smith; *Publication of a Series* Antarctic Monographs; 5 years; $57,800

AMERICAN INSTITUTE OF BIOLOGICAL SCIENCES, Washington, D.C.; Frank Fremont-Smith; *Publication Support of the Proceedings of the* Second Conference on Brain and Behavior; 1 year; $16,990

AMERICAN INSTITUTE OF PHYSICS, New York, N.Y.; Elmer Hutchisson; *Support for the Establishment* of Applied Physics Letters; 2 years; $61,885

AMERICAN MATHEMATICAL SOCIETY, Providence, R.I.; Gordon L. Walker; *Continued Support for the Operation and Expansion of* Mathematical Reviews; 18 months; $36,000

Gordon L. Walker; *Support for a Study of Ways to Develop Additional Means of Support for Mathematical Publications;* 18 months; $7,200

AMERICAN METEOROLOGICAL SOCIETY, Boston, Mass.; Malcolm Rigby; *Continuation of Compilation and Publication of Bibliography on Weather Modification and Cloud Physics;* 3 years; $71,000

Malcolm Rigby, Washington, D.C.; *Study of the Universal Decimal Classification System for the Mechanical Indexing, Exchange, Publication or Retrieval of Titles of Scientific Articles;* 2 years; $146,000

AMERICAN MUSEUM OF NATURAL HISTORY, New York, N.Y.; James A. Oliver; *Publication Support for the* Miocene Faunas from Wounded Knee, South Dakota; 1 year; $2,355

AMERICAN ROCKET SOCIETY, New York, N.Y.; Irwin Hersey; *Partial Publication Support for the* American Rocket Society Journal; 18 months; $52,000

AMERICAN SOCIETY OF LUBRICATION ENGINEERS, Chicago, Ill.; Donald B. Sanberg; *Temporary Support for the Journal,* ASLE Transactions; 1 year; $8,740

ANNUAL REVIEWS, INCORPORATED, Stanford, Calif.; Windsor Cutting; *Partial Support for the* Annual Review of Phytopathology; 3 years; $15,000

ARCTIC INSTITUTE OF NORTH AMERICA, Washington, D.C.; Francis Harper; *Support to Publish Four Papers on Biological Investigations in the Keewatin District and the Ungava Peninsula;* 1 year; $4,200

ASSOCIATION FOR APPLIED SOLAR ENERGY, Tempe, Ariz.; Harold Walmsley; *Continued Support for the* Journal Solar Energy; 3 years; $16,500

BERNICE P. BISHOP MUSEUM, Honolulu, Hawaii; Roland W. Force; *Partial Publication Support for* Insects of Micronesia; 1 year; $11,140

BIOGEOGRAPHICAL SOCIETY OF JAPAN, Tokyo; Yaichiro Okada; *Partial Publication Support of Volumes IV (Rajidae) and V (Tabanidae) of* Fauna Japonica; 1 year; $4,624

BIOLOGICAL ABSTRACTS, INCORPORATED, Philadelphia, Pa.; G. Miles Conrad; *Continued Support of* Biological Abstracts; 1 year; $210,000

G. Miles Conrad; *Experiment in Prepackaging of Biological Research Information;* 3 years; $45,700

BOARD OF GOVERNORS FOR AN INTERNATIONAL JOURNAL OF THE SCIENCE OF METALS, INC. Schenectady, N.Y.; Walter R. Hibbard, Jr.; *Translation and Publication of the 1963 Issues of the* Journal of Abstracts-Metallurgy, Parts A and B; 1 year; $59,000

BOYCE THOMPSON INSTITUTE FOR PLANT RESEARCH, INC., Yonkers, N.Y.; Lela V. Barton; *Support for the Publication of the* Bibliography of Seeds; 18 months; $20,000

BROWN UNIVERSITY, Providence, R.I.; O. E. Neugebauer and Richard A. Parker; *Publication* Support for Egyptian Astronomical Texts: The Ramesside Star Clorks; 1 year; $9,100

CASE INSTITUTE OF TECHNOLOGY, Cleveland, Ohio; Russell Ackoff; *Operations Research Study of Publication Costs of Scientific Journals;* 6 months; $500

CENTRAL INSTITUTE FOR THE DEAF, St. Louis, Mo.; Hallowell Davis; *Publication of an English Translation of a Russian Monograph,* Corti's Organ; 1 years; $6,570

CHEMICAL ABSTRACTS SERVICE, Columbus, Ohio; G. Malcolm Dyson; *Development and Initiation of a Mechanized File of Chemical Information;* 1 year; $219,000

CHICAGO NATURAL HISTORY MUSEUM, Chicago, Ill.; E. Leland Webber; *Support for Illustrations for a Monograph,* The Giant Panda; 1 year; $6,000

CORNELL UNIVERSITY, Ithaca, N.Y.; Martha Stahr Carpenter; *Support for Preparation and Publication of* Bibliography of Natural Radio Emission from Astronomical Sources; 27 months; $68,000

DUQUESNE UNIVERSITY, Pittsburgh, Pa.; Henry J. Koren; *Partial Publication Support for the English Translation of* The Field of Consciousness *by Aron Gurwitsch;* 1 year; $9,840

ENGINEERING INDEX, INC., New York, N.Y.; Carolyn Flanagan; *Continued Expansion of* Engineering Index; 1 year; $178,000

FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY, Washington, D.C.; Milton O. Lee; *Support for Publication of Abstracts and Proceedings of the International Symposium on Temperature Acclimation;* 1 year; $10,070

FORT BURGWIN RESEARCH CENTER, Taos, N. Mex.; James J. Hester; *Publication of the Proceedings of the Fort Burgwin Conference on Paleoecology;* 6 months; $2,320

THE GLACIOLOGICAL SOCIETY, Cambridge, England; Hilda Richardson; *Partial Support of the* Journal of Glaciology; 1 year; $5,700

HARVARD UNIVERSITY, Cambridge, Mass.; Rolla M. Tryon; *Partial Support for Publication of* The Fern Flora of Peru; 1 year; $2,911

H. B. Whittington; *Partial Publication Support for the Proceedings of the Conference on Crustacea;* 1 year; $4,600

HUMAN RELATIONS AREA FILES, New Haven, Conn; Frank M. LeBar; *Publication of an Outline and Atlas,* Ethnic Groups of Mainland Southeast Asia; 4 months; $12,500

INDIANA UNIVERSITY FOUNDATION, Bloomington; Thomas Sebeok; *Partial Support of Publication of* Peoples of Central Asia; 1 year; $1,500

Denis Sinor; *Partial Support for Publication of* Aspects of Altaic Civilization; 1 year; $1,610

INTERNATIONAL COUNCIL OF SCIENTIFIC UNIONS, Paris, France; G. A. Boutry; *Continued Partial Support of the ICSU Abstracting Board;* 1 year; $9,000

MACALESTER COLLEGE, St. Paul, Minn.; Waldo S. Glock; *Preparation of an Annotated Bibliography on* Tree Growth and Climate (1950–1962); 6 months; $1,700

MINERALOGICAL SOCIETY OF AMERICA, San Francisco, Calif.; Ian Campbell and Marjorie Hooker, Washington, D.C.; *Publication of the Proceedings of the Third General Meeting of the International Mineralogical Association;* 1 year; $11,000

NATIONAL FEDERATION OF SCIENCE ABSTRACTING AND INDEXING SERVICES, Washington, D.C.; Raymond A. Jensen; *Partial Support of the Federation Secretariat for Fiscal Year 1963;* 1 year; $59,000

Raymond Jensen; *Publication of* Bibliography of the World's Significant A&I Services of Scientific Interest; 1 year; $15,500

NEW YORK BOTANICAL GARDEN, N.Y.; Rupert C. Barneby; *Support of Publication of an* Atlas of North American Astragalus; 1 year; $31,600

Howard S. Irwin, Jr.; *Publication of the Monograph, Cassia;* 1 year; $3,700

OPERATIONS RESEARCH SOCIETY OF AMERICA, Cambridge, Mass.; James H. Batchelor; *Preparation of an Annotated Bibliography* Operations Research, 1958–1960; 1 year; $10,000

PALEONTOLOGICAL RESEARCH INSTITUTE, Ithaca, N.Y.; Katherine V. W. Palmer; *Partial Support for Publication of* Eocene and Miocene Foraminifera from Two Localities in Duplin County, North Carolina; 1 year; $775

PENNSYLVANIA STATE UNIVERSITY, University Park; C. R. Carpenter; *Partial Publication Support of* Naturalistic Behavior of Non-Human Primates; 1 year; $9,660

SEISMOLOGICAL SOCIETY OF AMERICA, San Francisco, Calif.; William M. Adams; *Study and Evaluation of Indexing Techniques in the Preparation and Publication of a Fifty-Two Year Cumulative Index to the* Bulletin; 1 year; $19,000

SMITHSONIAN INSTITUTION, Washington, D.C.; Paul E. Oehser; *Support of Publication of an English Translation of* Flora of Japan *by Jisaburo Ohwi;* 1 year; $40,200

SOCIOLOGICAL ABSTRACTS, INC., New York, N.Y.; Leo P. Chall; *Continued Expansion of* Sociological Abstracts; 2 years; $96,200

Leo P. Chall; *Continued Support* of Sociological Abstracts; 6 months; $30,000

STANFORD UNIVERSITY, Stanford, Calif.; Richard C. Atkinson; *Partial Support for the Publication of* Studies in Mathematical Psychology; 3 years; $10,350

Leon E. Seltzer; *Publication Support for* Vegetation and Flora of the Sonoran Desert; 1 year; $13,225

Leon E. Seltzer; *Publication Support for* Manual of the Vascular Plants of Alaska and Neighboring Territory; 18 months; $19,378

Bernard J. Siegel; *Partial Publication Support for* Biennial Review of Anthropology; 5 years; $13,500

UNIVERSITY OF CALIFORNIA, Berkeley; Charles L. Camp; *Compilation of Volume VII of the* World Bibliography of Fossil Vertebrates and Paleolithic Anthropology; 23 months; $22,500

Hamilton M. Jeffers, Mt. Hamilton; *Publication of an* Index Catalogue of Double Stars; 1 year; $8,500

E. Brinton, San Diego; *Support for Publication of the* Scientific Results of the NAGA Expedition to the Gulf of Thailand and South-China Sea, 1959–61; 2 years; $22,000

UNIVERSITY OF CONNECTICUT, Storrs; James A. Slater; *Completion and Publication of a* World Catalogue of the Family Lygaeidae; 15 months; $33,478

UNIVERSITY OF HAWAII, Honolulu; Thomas Austin; *Publication of an* Atlas of Charts for EQUAPAC; 1 year; $6,960

Thomas Nickerson; *Publication of Volumes XI and XII of* Insects of Hawaii; 2 years; $23,875

UNIVERSITY OF LOUISVILLE, Ky.; Steven G. Vandenberg; *Continued Publications Support for* Computers in Behavioral Science; 3 years; $12,100

UNIVERSITY OF NORTH CAROLINA, Chapel Hill; David A. Young; *Continuation of Support for the Publication of* The Catalogue of the Homoptera Auchenorhyncha of the World; 2 years; $49,250

UNIVERSITY OF NOTRE DAME, Ind.; Ernan McMullin; *Partial Publication Support for* The Concept of Matter; 1 year; $4,000

UNIVERSITY OF PENNSYLVANIA, Philadelphia; Ida K. Langman; *Support of Publication of* A Selected Guide to the Literature on the Flowering Plants of Mexico; 1 year; $30,100

Hui-Lin Li; *Support for the Publication of the Monograph* The Woody Flora of Taiwan; 1 year; $11,025

Frank B. Wood; *Support for the Compilation and Publication of a Fourth Edition of* A Finding List for Observers of Eclipsing Variables; 6 months; $800

UNIVERSITY OF PITTSBURGH, Pa.; A. F. Frederickson; *Publication of the Proceedings of the Benedum Symposium on Earth Magnetism;* 1 year; $2,000

UNIVERSITY OF TEXAS, Austin; F. H. Wardlaw; *Partial Editorial Support for the Preparation of the Publication,* The Bird Life of Texas; 2 years; $23,036

UNIVERSITY OF WISCONSIN, Madison; George P. Wollard; *Support for the Publication of a Bilingual Report of* Gravity Standardization Measurements in Central and South America; 1 year; $7,570

WILSON, DOUGLAS F., Belle Glade, Fla.; *Publication in the Journal* Brittonia, *of* A Taxonomic Revision of the Genus Sitanion; 6 months; $200

YAMAGUCHI UNIVERSITY, Tyosu, Simonoseki, Japan; Jozo J. Murayama; *Publication Support for the Fifth Volume (Hylesininae) of* Scolytidae of the Northern Half of the Far East; 1 year; $575

CONFERENCES

AMERICAN GEOPHYSICAL UNION, Washington, D.C.; William C. Ackermann; *Conferences to Advance the Science of Hydrology;* 1 year; $10,200

AMERICAN INSTITUTE OF PHYSICS, New York, N.Y., Elmer Hutchisson; *Conference on Fluid Dynamics in Geophysics;* 1 year; $11,000

AMERICAN MATHEMATICAL SOCIETY, Providence, R.I., Gordon L. Walker; *A Symposium on the Theory of Numbers;* 1 year; $15,100

AMERICAN METEOROLOGICAL SOCIETY, Boston, Mass.; Kenneth C. Spengler; *Third Conference on Hurricanes and Tropical Meteorology;* 1 year; $2,400

AMERICAN SOCIETY OF ANIMAL SCIENCE, UNIVERSITY OF CALIFORNIA, Davis; H. H. Cole; *Animal Reproduction Symposium;* 1 year; $2,700

AMERICAN SOCIETY OF ICHTHYOLOGISTS AND HERPETOLOGISTS, Honolulu, Hawaii; Carl L. Hubbs, Scripps Institution of Oceanography, University of California, La Jolla; *Semicentennial Meeting of the American Society of Ichthyologists and Herpetologists;* 6 months; $10,000

AMERICAN SOCIETY OF ZOOLOGISTS, New York, N.Y.; Berta Scharrer; *Regional Conferences in Comparative Endocrinology;* 6 months; $6,900

Edgar Zwilling, Brandeis University, Waltham, Mass.; *Heterosynthetic and Autosynthetic Molecules in Developmental Processes;* 1 year; $3,600

AMERICAN SOCIETY FOR MICROBIOLOGY, Detroit, Mich.; J. L. Stokes; *Symposium on Growth;* 6 months; $2,000

ASSOCIATION FOR SYMBOLIC LOGIC, Berkeley, Calif.; Leon Henkin; *International Symposium on The Theory of Models;* 1 year; $40,000

BROWN UNIVERSITY, Providence, R.I.; H. Kolsky; *A Symposium on Stress Waves in Anelastic Solids;* 1 year, $19,000

R. S. Rivlin: *Fourth International Congress on Rheology;* 18 months; $18,000

CALIFORNIA INSTITUTE OF TECHNOLOGY, Pasadena; James Bonner and Paul O. P. Ts'o; *International Conference on Histone Biology;* 1 year; $9,000

CANADIAN MATHEMATICAL CONGRESS, Montreal, Canada; Leland F. S. Ritcey; *Biennial Seminar and Congress;* 6 months; $3,000

CARNEGIE INSTITUTION OF WASHINGTON, Washington, D.C.; James D. Ebert, Johns Hopkins University; *Organization of an International Conference on Organogenesis;* 2 years; $4,800

CARNEGIE INSTITUTE OF TECHNOLOGY, Pittsburgh, Pa.; Milton C. Shaw; *International Conference on Production Engineering Research;* 18 months; $12,000

COLORADO STATE UNIVERSITY RESEARCH FOUNDATION, Fort Collins; Tyler A. Woolley; *First International Conference in Acarology;* 1 year; $12,500

ELECTROCHEMICAL SOCIETY, INC., New York, N.Y.; Robert K. Shannon; *Electrochemical Effects on the Mechanical Properties of Metals;* 1 year; $1,162

GENETICS SOCIETY OF AMERICA, Pasadena, Calif.; Francis J. Ryan; *The Eleventh International Congress of Genetics;* 18 months; $2,900

GEORGIA INSTITUTE OF TECHNOLOGY, Atlanta; M. W. Long; *Engineering for Major Scientific Programs;* 6 months; $3,000

GORDON RESEARCH CONFERENCES, INC., Kingston, R.I.; W. George Parks; *Gordon Conference on Nucleic Acids;* 1 year; $4,000

W. George Parks; *Gordon Research Conference on Cell Structure and Metabolism;* 6 months; $3,000

W. George Parks; *Gordon Research Conference on Proteins;* 1 year; $5,000

W. George Parks; *1963 Gordon Research Conference on Photonuclear Reactions;* 1 year; $6,000

INSTITUTE OF MATHEMATICAL STATISTICS, Stanford, Calif.; Gerald J. Lieberman; *Inference in Stochastic Processes;* 1 year; $33,700

LONG ISLAND BIOLOGICAL ASSOCIATION, Cold Spring Harbor, N.Y.; H. Edwin Umbarger; *Morphogenesis of Macromolecules;* 1 year; $8,500

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge; Bernard T. Feld; *Conference on Photon Interactions in the BeV-Energy Range;* 1 year; $7,000

S. E. Luria and P. W. Robbins; *Genetic Control and Chemical Structure of the Macromolecular Components of the Cellular Surface;* 2 years; $20,000

MEDICAL LIBRARY ASSOCIATION, INC., Washington, D.C.; Frank B. Rogers; *Second International Congress of Medical Librarianship;* 11 months; $16,200

METALLURGICAL SOCIETY OF AIME, New York, N.Y.; Karl L. Fetters; *Deformation Twinning;* 6 months; $1,900

Karl L. Fetters; *Unit Processes in Hydrometallurgy;* 1 year; $2,700

MICROCIRCULATORY CONFERENCE, INC., Boston, Mass.; Herbert J. Berman; *Microcirculatory Conference;* 6 months; $6,000

MISSOURI BOTANICAL GARDEN, St. Louis; Robert L. Dressler; *A Symposium on Systematics; Pollination Relationships and Systematics;* 6 months; $2,050

NATIONAL ACADEMY OF SCIENCES—NATIONAL RESEARCH COUNCIL, Washington, D.C.; Frank L. Campbell; *XVIth International Congress of Zoology;* 2 years; $45,000

Frank L. Campbell; *Symposium on Molecular Mechanisms in Photobiology;* 1 year; $15,000

Frank L. Campbell; *Symposium on Photosynthesis;* 1 year; $30,000

Robert M. Dillon; *First American Conference on Frozen Ground;* 1 year; $11,000

Linn Hoover; *Internatioanl Conference on Saline Deposits;* 1 year; $22,000

G. D. Meid and Waldo E. Smith; *XIIIth General Assembly of the International Union of Geodesy and Geophysics;* 30 months; $150,000

Richard C. Vetter; *Oceanic Biogeachemistry Symposium;* 4 months; $8,600

NATIONAL ASSOCIATION OF CORROSION ENGINEERS, *Houston, Tex.;* Edward C. Greco; *Second International Congress on Metallic Corrosion;* 1 year; $2,700

NEW YORK ACADEMY OF SCIENCE, N.Y.; Josef Brozek, Lehigh University, Bethlehem, Pa.; *Conference on Body Composition;* 1 year; $2,500

Thomas C. Cheng, Lafayette College, Easton, Pa.; *Some Biochemical and Immunological Aspects of Host-Parasite Relationships;* 6 months; $6,800

OHIO WESLEYAN UNIVERSITY, Delaware; Elwood B. Shirling; *Prospects for Experimental Control of Human Evolution;* 6 months; $4,600

William F. Prokasy; *Symposium on Developments in Classical Conditioning;* 1 year; $5,400

PENNSYLVANIA STATE UNIVERSITY, University Park; Robert H. Essenhigh; *Dust Explosions;* 6 months; $1,150

THE RAND CORPORATION, Santa Monica, Calif.; Richard Bellman; *Conference in Modern Control Theory;* 9 months; $42,950

W. R. Judd; *State of Stress in the Earth's Crust;* 6 months; $13,600

RUTGERS, THE STATE UNIVERSITY, New Brunswick, N.J.; Werner Braun; *Symposium on Bacterial Endotoxins;* 1 year; $15,300

Theodore C. Hines and Paul S. Dunkin; *Seminars on Systems for the Organization of Information;* 1 year; $23,550

ST. LOUIS UNIVERSITY, Mo.; Karl G. Lark, St. Louis, and Daniel Billen, University of Texas, Austin; *Conference on Cellular Control of DNA Biosynthesis;* 1 year; $7,600

SOCIAL SCIENCE RESEARCH COUNCIL, New York, N.Y.; Francis H. Palmer; *Learned and Nonlearned Behavior in Immature Organisms;* 1 year; $8,400

SOCIETY FOR INDUSTRIAL AND APPLIED MATHEMATICS, Philadelphia, Pa.; A. S. Householder; *Symposium on Approximations;* 1 year; $16,100

SOUTHERN FOREST TREE IMPROVEMENT COMMITTEE, Savannah, Ga.; John W. Johnson; *Forest Genetics Workshop;* 5 months; $2,600

SOUTHERN METHODIST UNIVERSITY, Dallas, Tex.; Claude C. Albritton, Jr.; *Balanced Research in Mineral Deposits;* 6 months; $1,650

STANFORD RESEARCH INSTITUTE, Menlo Park, Calif.; Nevin K. Hiester; *International Symposium on High Temperature Technology;* 1 year; $7,200

STANFORD UNIVERSITY, Stanford, Calif.; Robert Hofstadter; *International Conference on Nucleon Structure;* 1 year; $7,000

SYRACUSE UNIVERSITY RESEARCH INSTITUTE, Syracuse, N.Y.; Warren B. Walsh; *The Third Conference of Translation Editors;* 3 months; $2,650

TERATOLOGY SOCIETY, Bar Harbor, Maine; Charles P. Dagg; *Effects of a Chromosome Section Controlling Abnormal Development in the Mouse;* 6 months; $400

UNIVERSITY OF ARIZONA, Tucson; A. B. Meinel; *Symposium on Astronomical Instrumentation;* 1 year; $6,000

UNIVERSITY OF BUFFALO FOUNDATION, INC., N.Y.; S. Mrozowski, State University of New York at Buffalo; *Sixth Biennial Conference on Carbon;* 1 year; $2,500

UNIVERSITY OF CALIFORNIA, Berkeley; Arno P. Schniewind; *Conference on the Mechanical Behavior of Wood;* 1 year; $1,320

UNIVERSITY OF HAWAII, Honolulu; Howard F. Mower and Theodore Winnick; *Symposium on Ferredoxins and Other Non-Heme Iron-Containing Enzymes;* 1 year; $4,150

UNIVERSITY OF NORTH CAROLINA, Chapel Hill; Eugen Merzbacher; *Second Eastern Theoretical Physics Conference;* 1 year; $2,500

UNIVERSITY OF NOTRE DAME, Ind.; Charles J. Mullin; *Midwest Conference on Theoretical Physics;* 1 year; $5,000

Wilhelm Stoll; *Conference on Complex Manifolds and Several Complex Variables;* 1 year; $9,000

UNIVERSITY OF PENNSYLVANIA, Philadelphia; Elias Burstein; *International Conference on Lattice Dynamics;* 1 year; $2,500

UNIVERSITY OF SOUTHERN CALIFORNIA, Los Angeles; Jay M. Savage; *Conference on Problems in Education and Research in Tropical Biology;* 6 months; $1,500

UNIVERSITY OF THE WEST INDIES, Andrew, Jamaica; John W. Purseglove; *Neotropical Botany Conference;* $1,400

YALE UNIVERSITY, New Haven, Conn.; Dirk Brouwer; *Symposium on Astrometry;* 6 months; $3,300

INTERNATIONAL TRAVEL

First Australian Conference on Electrochemistry, Sydney and Hobart, Australia; February 13 to 20, 1963:
- Paul Delahay; Louisiana State University; $1,225
- William H. Reinmuth; Columbia University; $1,300

First Chilean Conference on Earthquake Engineering, Santiago, Chile; July 15 to July 19, 1963:
- Glen V. Berg; University of Michigan; $624

First Congress of the International Society for Stereology, Vienna, Austria; April 17 to April 20, 1963; The European Anatomists Congress, Munich, Germany; April 21 to April 25, 1963; and for Consultation in Stuttgart, Germany; March to June 1963:
- Robert T. DeHoff; University of Florida; $600
- Hans Elias; Chicago Medical School; $780

First European Malacological Congress, London, England; September 17 to September 22, 1962:
- Elizabeth Alison Kay; University of Hawaii; $745

First International Africanists Congress, Accra, Ghana; December 12 to December 17, 1962:
- Anthony S. Reyner; Howard University; $985

First International Industrial Lubrication Exhibition and Conference, London, England; February 11 to February 14, 1963:
- William F. Hughes; Carnegie Institute of Technology; $400

First International Symposium of Histochemistry and Cytochemistry, Warsaw, Poland; May 12 to May 16, 1963:
- George G. Berg; The University of Rochester; $725

First National Conference on Aerosols, Prague, Czechoslovakia; October 8 to October 13, 1962:
- Frank T. Gucker; Indiana University; $700

The First Pan-American Congress of Neurology, Lima, Peru; October 21 to October 25, 1963:
- Victor H. Auerbach; St. Christopher's Hospital for Children; $500

Second Asia and Oceania Congress of Endocrinology, Sydney, Australia; May 28 to June 2, 1963:
- Roberto F. Escamilla; University of California; $1,000

Second Asian Regional Conference-International Society of Soil Mechanics and Foundation Engineering; Tokyo, Japan; May 1 to May 4, 1963:
- Eben Vey; Illinois Institute of Technology; $1,000

Second Colloquium on Variable Stars, Bamberg, Germany; September 5 to September 8, 1962:
Margaret W. Mayall; American Association of Variable Star Observers; $665

Second Conference on Nonlinear Vibrations, Warsaw, Poland; September 18 to September 21, 1962:
Walter W. Soroka; University of California; $960

Second General Meeting, Commission on Methods of Economic Regionalization, Lancut, Poland; September 9 to September 13, 1963:
Chauncy D. Harris; University of Chicago; $495

Second Instructional Conference of the London Mathematical Society, Durham, England; March 28 to April 11, 1963:
Patrick Billingsley; University of Chicago; $550

Second International Conference on Nuclidic Masses, Vienna, Austria; July 15 to July 19, 1963:
Jesse W. M. DuMond; California Institute of Technology; $925
Jerry B. Marion; University of Maryland; $675
Douglas M. Van Patter; Bartol Research Foundation of the Franklin Institute; $650

Second International Federation of Automatic Control Congress, Basle, Switzerland; August 27 to September 4, 1963:
George A. Bekey; University of Southern California; $840
Robert H. Flake; Washington University; $475
Eliahu I. Jury; University of California; $840
Rudolf E. Kalman; Reserach Institute for Advanced Studies; $610
Louis F. Kazda; University of Michigan; $362
Ralph J. Kochenburger; University of Connecticut; $580
Joseph P. LaSalle; Research Institute for Advanced Studies; $610
E. Bruce Lee; University of Minnesota; $700
Ching-Chung Li; University of Pittsburgh; $621
Mihajlo D. Mesarovic; Case Institute of Technology; $622
George C. Newton, Jr.; Massachusetts Institute of Technology; $570
Philip E. Sarachik; Columbia University; $561
J. Lowen Shearer; Massachusetts Institute of Technology; $570
Chi-Neng Shen; Rensselaer Polytechnic Institute; $430
Laurence R. Young; Massachusetts Institute of Technology; $570

2nd International Peat Congress, Leningrad, U.S.S.R.; August 15 to August 22, 1963:
Rouse S. Farnham; University of Minnesota; $850

Second International Pharmacological Meeting, Prague, Czechoslovakia; August 19 to August 24, 1963:
E. W. Maynert; Johns Hopkins University; $600
Allan F. Mirsky; Boston University; $400
Alan Mark Poisner; Albert Einstein College of Medicine; $200
Isabel Wajda; New York State Psychiatric Institute; $500

Second International Symposium on the Theory of Road Traffic Flow, London, England; June 25 to June 27, 1963:
Adolf D. May, Jr.; Northwestern University; $560
George H. Weiss; University of Maryland; $500

Second Pan-American Conference on Soil Mechanics and Foundation Engineering, Sao Paulo, Rio de Janeiro and Belo Horizonte, Brazil; July 14 to July 24, 1963:
Jorg O. Osterberg; Northwestern University; $660

Third International Conference on Atmospheric and Space Electricity, Montreux, Switzerland; May 6 to May 10, 1963, and Fifth International Symposium on Condensation Nuclei, Toulouse, France; May 13 to May 19, 1963:
George D. Freier; University of Minnesota; $725
Lothar H. Ruhnke; General Mills, Inc.; $725
Vincent J. Schaefer; $825

Third International Conference on Operations Research, Oslo, Norway; July 1 to July 5, 1963:
Russell L. Ackoff; Case Institute of Technology; $605
John Joseph Coleman; Space Technology Laboratories; $805
Daniel Howland; Ohio State University; $560
Albert H. Rubenstein; Northwestern University; $635
Leon Wester; Armour Research Foundation of Illinois Institute of Technology; $635

Third International Conference on the Physics of Electronic and Atomic Collisions, London, England; July 22 to July 26, 1963:
Robert C. Amme; University of Denver; $600
Ernst G. Bauer; U.S. Naval Ordnance Test Station; $850
Richard B. Bernstein; University of Michigan; $650
J. William McGowan; General Dynamics Corporation; $850
E. E. Muschlitz, Jr.; University of Florida; $515
Frank R. Pomilla; St. John's University; $600
Erhard W. Rothe; General Dynamics/Astronautics; $850
Walter R. Thorson; Massachusetts Institute of Technology; $350
Harry M. Schey; University of California; $800

3rd International Congress of the International Society of Biometeorology, Pau, France; September 2 to September 7, 1963:
Franklyn Field; Albert Einstein College of Medicine; $600
Harold D. Johnson; University of Missouri; $590
Robert A. Ragotzkie; University of Wisconsin, $685
William E. Reifsnyder; Yale University; $605

Robert E. Stewart; Ohio State University; $660
C. E. Yarwood; University of California; $350

Third International Symposium on Quantum Electronics, Paris, France; February 11 to February 15, 1963:
James M. Feldman; Carnegie Institute of Technology; $435
Roy J. Glauber; Harvard University; $450
Norman Foster Ramsey; Harvard University; $450
Arthur L. Schawlow; Stanford University; $825

Third West African Languages Congress, Freetown, Sierra Leone; March 26 to April 1, 1963:
Charles H. Kraft; Hartford Seminary Foundation; $955
Roger W. Wescott; Southern Connecticut State College; $980

4th Annual Meeting of the Brazilian Association of Chemistry, Rio de Janeiro, Brazil; November 10 to November 23, 1962:
Hugh J. McDonald; Loyola University; $675

4th Congress of the International Federation of Translators (FIT), Dubrovnik, Yugoslavia; August 31 to September 7, 1963:
Kurt Gingold; American Cyanamid Company, $1,152

Fourth International Congress on Microwave Tubes, Delft, Netherlands; September 3 to September 7, 1962:
Robert M. Bevensee; University of California; $525
George E. Dombrowski; University of Connecticut; $525

4th Congress, International Mineralogical Association, Rome, Italy; September 9 to September 18, 1963:
Thomas F. Bates; Pennsylvania State University; $700

Fourth International Space Science Symposium, Warsaw, Poland; June 3 to June 11, 1963:
Carl W. Bruch; Schwarz Laboratories, Inc.; $700
Thomas M. Donahue; University of Pittsburgh; $725
Solon A. Gordon; Argonne National Laboratory; $745
Curtis L. Hemenway; Dudley Observatory; $700
Norman H. Horowitz; California Institute of Technology; $913
Hilde Kallmann-Bijl; University of California; $913
William W. Kellogg; RAND Corporation; $702
Gilbert V. Levin; Resources Research, Inc.; $702
Arthur E. Lilley; Harvard University; $700
Stanley L. Miller; University of California; $913
John E. Myers; University of Texas; $815
William F. Neuman; University of Rochester Medical Center; $700
Brian J. O'Brien; State University of Iowa; $790
John B. Opfell; Dynamic Science Corporation; $923
Gerald Silverman; Massachusetts Institute of Technology; $700
Philip C. Trexler; Albert Einstein College of Medicine; $700
Wolf Vishniac; University of Rochester; $700

Fifth International Biometric Conference, Cambridge, England; September 1963:
American Society of Plant Physiologists; $11,000
American Statistical Association; $10,000

Fifth International Conference on Medical Electronics, Liege, Belgium; July 22 to July 26, 1963:
Carl Berkley; Foundation for Medical Technology; $600
Dean L. Franklin; Scripps Clinic and Research Foundation; $900
Jacob Kline; University of Rhode Island; $570
Edwin C. Lowenberg; University of Texas; $570
R. Stuart Mackay; University of California; $900

Fifth International Congress of Slavists, Sofia, Bulgaria; September 17 to September 23, 1963:
Henrik Birnbaum; University of California; $250
Morris Halle; Massachusetts Institute of Technology; $700
Henry Kucera; Brown University; $300
George Y. Shevelov; Columbia University; $350
Joseph A. Van Campen; Harvard University; $700
C. H. van Schooneveld; Stanford University; $650
Uriel Weinreich; Columbia University; $225
Gerta G. Worth; University of California; $200

Fifth International Pesticides Congress, London, England; July 17 to July 23, 1963:
Albert E. Dimond; Connecticut Agricultural Experiment Station; $600

Sixth Annual Meeting of the Japanese Neurochemical Society, Tokyo, Japan; October 4 to October 5, 1963:
J. Folch-Pi; McLean Hospital, Belmont, Mass.; $1,074

Sixth General Assembly and International Congress: International Union of Crystallography, Rome, Italy; September 9 to September 18, 1963:
Edward R. Boyko; Providence College; $400
Lawrence O. Brockway; University of Michigan; $660
Charles N. Caughlan; Montana State College; $800
Michael I. Davis; University of Texas; $840
Gabrielle Donnay; Johns Hopkins University; $675
Joseph D. H. Donnay; Johns Hopkins University; $675
Agerico L. Esquivel; Woodstock College; $675
Isidor Fankuchen; Polytechnic Institute of Brooklyn; $750
George A. Jeffrey; University of Pittsburgh; $665
James D. McCullough; University of California; $940

Erwin W. Mueller; Pennsylvania State University; $620
Christer E. Nordman; University of Michigan; $620
Joseph A. Pask; University of California; $620
Selmer W. Peterson; Washington State University; $800
Robert A. Sparks; University of California; $940
Hugo Steinfink; University of Texas; $800
Kenneth N. Trueblood; University of California; $700
Philip A. Vaughan; Rutgers, The State University; $650
R. A. Young; Georgia Institute of Technology; $750
Tibor Zoltai; University of Minnesota; $740

Sixth International Conference on Ionization Phenomena in Gases, Paris, France; July 8 to July 13, 1963:
Isadore Amdur; Massachusetts Institute of Technology; $600
Manfred A. Biondi; University of Pittsburgh; $650
Howard H. Brown, Jr.; New York University; $600
Morton A. Fineman; General Dynamics Corporation; $818
Zohrab A. Kaprielian; University of Southern California; $850
Jacob Neufeld; Oak Ridge National Laboratory; $700
James R. Peterson; Stanford Research Institute; $850
Manuel Rotenberg; University of California; $850
Hans Schluter; University of Texas; $725
Aldert van der Ziel; University of Minnesota; $700
Robert N. Varney; Washington University; $650
Thomas D. Wilkerson; University of Maryland; $600

Sixth International Congress on High Speed Photography, Scheveningen, Netherlands; September 17 to September 22, 1962:
John K. Crosby; Stanford Research Institute; $830

Sixth International Congress of Nutrition, Edinburgh, Scotland; August 9 to August 15, 1963:
American Institute of Nutrition, Davis, Calif.; $17,500

Sixth International Embryological Conference, Helsinki, Finland; During July 1963:
Joseph C. Daniel, Jr.; University of Colorado; $860
Louis E. DeLanney; Wabash College; $840
Ronald C. Fraser; University of Tennessee; $745
Viktor Hamburger; Washington University; $795
Elizabeth Dexter Hay; Harvard Medical School; $700
Johannes Holtfreter; University of Rochester; $710
Antone G. Jacobson; University of Texas; $830
Ronald A. Malt; Massachusetts Institute of Technology; $700
John Papaconstantinou; University of Connecticut; $690
Ruth Sager; Columbia University; $820
Marcus Singer; Western Reserve University; $200
Malcolm S. Steinberg; Johns Hopkins University; $700
Vance Tartar; University of Washington; $960
Charles E. Wilde, Jr.; University of Pennsylvania; $690
Saul Wischnitzer; New York Medical College; $670
Edgar Zwilling; Brandeis University; $225

Sixth International Mineral Processing Congress, Cannes, France; May 26 to June 1, 1963:
Douglas W. Fuerstenau; University of California; $865

Sixth International Sedimentological Congress, Amsterdam, Netherlands, and Antwerp, Belgium; May 27 to June 8, 1963:
Robert H. Dott, Jr.; University of Wisconsin; $100
George deVries Klein; University of Pittsburgh; $700

Sixth International Symposium on Free Radicals, Cambridge, England; July 2 to July 5, 1963:
Francis O. Rice; University of Notre Dame; $600

Sixth World Petroleum Congress, Frankfurt, Germany; June 19 to June 26, 1963:
Robert J. Adler; Case Institute of Technology; $605
Bartholomew Nagy; Fordham University; $560
Robert L. Whiting; Agricultural and Mechanical College of Texas; $370

Seventh European Molecular Spectroscopy Congress, Budapest, Hungary; July 22 to July 27, 1963:
Erwin Fishman; Syracuse University; $675

Seventh International Nematology Symposium, Auchincruive, Scotland; September 9 to September 13, 1963:
William R. Jenkins; Rutgers, the State University; $459
Lorin R. Krusberg; University of Maryland; $486

Eighth Annual Biological Conference, Oholo, Israel; March 27 to March 30, 1963:
Luigi Gorini; Harvard Medical School; $900
H. Edwin Umbarger; Long Island Biological Association; $900

Eighth Inter-American Congress of Psychology, Mar del Plata, Argentina; April 2 to April 6, 1963:
American Psychological Association; $5,000

Eighth International Conference on Low Temperature Physics, London, England; September 16 to September 22, 1962:
Ferdinand G. Brickwedde; Pennsylvania State University; $950
Paul L. Donoho; William Marsh Rice University; $675
Rudolf Frerichs; Northwestern University; $620
Myron P. Garfunkel; University of Pittsburgh; $560
Edward H. Jacobsen; University of Rochester; $550

Eighth International Ethological Congress, The Hague, Netherlands; September 12 to September 22, 1963:

Lester R. Aronson; American Museum of Natural History; $540
Nicholas E. Collias; University of California; $830
Benjamin Dane; New York University School of Medicine; $810
John T. Emlen; University of Wisconsin; $640
Robert W. Ficken; University of Maryland; $580
Daniel G. Freedman; University of California; $180
Beatrice T. Gardner; Tufts University; $530
Benson E. Ginsburg; University of Chicago; $630
Edward S. Hodgson; Columbia University; $540
Donald Dale Jensen; Indiana University; $610
Erich Klinghammer; University of Chicago; $630
Sol Kramer; State University of New York; $560
Peter R. Marler; University of California; $810
Donald M. Maynard; Bermuda Biological Station; $590
James V. McConnell; University of Michigan; $590
Howard Moltz; Brooklyn College; $540
Jay S. Rosenblatt; Rutgers, the State University; $530
Richard L. Solomon; University of Pennsylvania; $570
Donald Melvin Wilson; University of California; $810

Tenth International Congress of Surveyors, Vienna, Austria; August 24 to September 1, 1962:

American Congress on Surveying and Mapping; $1,965

10th International Meeting of The Institute of Management Sciences, Tokyo, Japan; August 21 to August 24, 1963:

Kenneth J. Arrow; Stanford University; $830
C. West Churchman; University of California; $830
Harvey M. Wagner; Stanford University; $830

Eleventh International Congress of Refrigeration, Munich, Germany; August 27 to September 4, 1963:

Ferdinand G. Brickwedde; Pennsylvania State University; $1,030
Burgess H. Jennings; Northwestern University; $675
Richard C. Jordan; University of Minnesota; $695
Carl F. Kayan; Columbia University; $600

The Eleventh International Congress of Genetics, The Hague, Netherlands; September 2 to September 10, 1963:

Genetics Socity of America, Pasadena, Calif.; $60,000

12th International Astrophysical Symposium, Liege, Belgium; June 24 to June 26, 1963:

Martin Harwit; Cornell University; $585
Gerard P. Kuiper; University of Arizona; $815
Bruce C. Murray; California Institute of Technology; $585
Peter van de Kamp; Swarthmore College; $585

Twelfth International Solvay Conference in Chemistry, Brussels, Belgium; November 5 to November 10, 1962:

John Ross; Brown University; $550

13th Colloquim, International Society of Rock Mechanics, Salzburg, Austria; October 4 to October 5, 1962:

Don U. Deere; University of Illinois; $650

Thirteenth International Astronautical Congress, Sofia, Bulgaria; September 24 to September 29, 1962:

Antoni K. Oppenheim; University of California; $1,056

Thirteenth International Committee of Electrochemical Thermodynamics and Kinetics, Rome, Italy; September 24 to September 29, 1962:

Leonard Nanis; Columbia University; $620

14th General Assembly, International Scientific Radio Union, Tokyo, Japan; September 9 to September 20, 1963:

Alexander J. Dessler; William Marsh Rice University; $954
Laurence A. Manning; Stanford University; $783
Arthur H. Waynick; Pennsylvania State University; $1,021
Lotfi A. Zadeh; University of California; $783

15th Session, International Commission on Illumination, Vienna, Austria; June 16 to June 26, 1963:

James W. Griffith; Southern Methodist University; $760
Philip F. O'Brien; University of California; $885
Russell C. Putnam; Case Institute of Technology; $645

16th Congress of the International Scientific Film Association, Warsaw, Poland; September 23 to September 30, 1962:

Richard A. Boolootian; University of California; $1,463
Robert E. Green; National Academy of Sciences; $1,156
Willard Webb; American Science Film Association; $1,156
Randall M. Whaley; Wayne State University; $1,196

16th Assembly, International Institute of Welding, Helsinki, Finland; July 7 to July 14, 1963:

Myron L. Begeman; University of Texas; $830

Sixteenth General Assembly of the Japan Medical Congress, and Visit Research Laboratories, Scientists, and Educators in Japan; March and April 1963:

H. W. Magoun; University of California; $1,005

19th All-Union Scientific Sessions Connected with Radio Day, Moscow, U.S.S.R.; May 7 to May 15, 1963:

David A. Huffman; Massachusetts Institute of Technology; $790

XIXth International Congress of Pure and Applied Chemistry, London, England; July 10 to July 17, 1963:

Paul I. Abell; University of Rhode Island; $535
Laurens Anderson; University of Wisconsin; $700
Ivan Bernal; Columbia University; $510
Jacob J. Bikerman; Massachusetts Institute of Technology; $500
George Blyholder; University of Arkansas; $675
Theodore L. Brown; University of Illinois; $500
Joseph F. Bunnett; Brown University; $483
Norman H. Cromwell; University of Nebraska; $670
Ernest L. Eliel; University of Notre Dame; $600
William G. Fateley; Mellon Institute; $530
Henry Feuer; Purdue University; $580
C. David Gutsche; Washington University; $620
Rolfe H. Herber; Rutgers, The State University; $520
John W. Huffman; Clemson College; $600
Robert E. Ireland; University of Michigan; $550
George J. Janz; Rensselaer Polytechnic Institute; $535
A. William Johnson; University of North Dakota; $670
Thomas J. Katz; Columbia University; $510
Henry G. Kuivila; University of New Hampshire; $400
Nelson J. Leonard; University of Illinois; $610
Robert E. Lyle, Jr.; University of New Hampshire; $500
M. Neeman; Roswell Park Memorial Institute; $535
Fausto Ramirez; State University of New York; $510
Kenneth L. Rinehart, Jr.; University of Illinois; $610
William H. Saunders, Jr.; University of Rochester; $550
John P. Schaefer; University of Arizona; $750
Dietmar Seyferth; Massachusetts Institute of Technology; $500
Philip S. Skell; Pennsylvania State University; $550
Peter A. S. Smith; University of Michigan; $550
Robert D. Stolow; Tufts University; $500
Roland Ward; University of Connecticut; $500
Edgar F. Westrum, Jr.; University of Michigan; $550

22nd Conference, International Union of Pure and Applied Chemistry, London, England; July 5 to July 9, 1963:

F. F. Nord; Fordham University; $900

28th Conference, International Federation of Documentation, The Hague, Netherlands; September 24 to September 29, 1962:

Milton O. Lee; Federation of American Societies for Experimental Biology; $940

Fiftieth Statutory Meeting of the Bureau of International Council for the Exploration of the Sea and Special Meeting to Consider Problems in the Exploitation and Regulation of Fisheries for Crustacea, Copenhagen, Denmark; September 28 to October 10, 1962:

Edward C. Raney; Cornell University; $600

Ad Hoc Committee for ICIREPAT, Munich, Germany; September 3 to September 8, 1962:

Ruth E. Suse; General Electric Company; $729

Annual Meeting of the Brazilian Society for Metals, Belo Horizonte, Brazil; July 15 to July 20, 1963:

Richard A. Oriani; United States Steel Corporation; $660

Annual Meeting of Mathematical Society of Japan, Tokyo, Japan; May 27 to May 31, 1963:

Einar Hille; Yale University; $1,000

Brazilian Association of Chemistry, Rio de Janeiro, Brazil; July 8 to July 12, 1963:

Carl S. Marvel; University of Arizona; $875

CEB Symposia on Slabs and Shear Strength, Wiesbaden, Germany; April 8 to April 10, 1963:

Phil M. Ferguson; University of Texas; $725
Mete A. Sozen; University of Illinois; $640

C.N.R.S. International Symposium on Mechanisms of Cellular Regulation in Bacteria, Marseilles, France; July 22 to July 27, 1963:

Clarke T. Gray; Dartmouth Medical School; $659
John Imsande; Western Reserve University; $672

Colloque International de 1963: The Sun in the Renaissance, Brussels, Belgium; April 6 to April 11, 1963:

Allen G. Debus; University of Chicago; $600
S. K. Heninger, Jr.; Duke University; $70
Charles D. O'Malley; University of California Medical Center; $835

Colloque International sur l'histoire de la Biologie marine, Banyuls-sur-Mer, France; September 2 to September 6, 1963:

William Coleman; Johns Hopkins University; $530

Colloquium on the Applications of Mathematics in Economics, Budapest, Hungary; June 18 to June 22, 1963:

Harold W. Kuhn; Princeton University; $645

1963 Conference of the International Association for Research in Income and Wealth, Corfu, Greece; June 23 to June 30, 1963:

Hendrik S. Houthakker; Harvard University; $820

Colloquium on the Physics of Ice Crystals, Zurich, Switzerland; August 28 to August 30, 1962:

W. Barclay Kamb; California Institute of Technology; $850
Johannes Weertman; Northwestern University; $675

Commission on Publications, International Union of Pure and Applied Physics, Paris, France; October 26 to October 27, 1962:

Walter C. Michels; Bryn Mawr College; $851
Simon Pasternack; American Physical Society; $832

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Conference on Approximation Theory, Oberwolfach, Germany; August 4 to August 10, 1963:
Jacob Korevaar; Stanford University; $875

Conference on Engineering Design Tuition, Johannesburg, South Africa; July 15 to July 18, 1963:
Joseph Modrey; Union College; $729

Conference on Finite Structures, Lorenzhof, Oberwolfach, Germany; June 4 to June 8, 1963:
Theodore G. Ostrom; Washington State University; $760

Conference on High Magnetic Fields, Oxford, England; July 10 to July 12, 1963:
B. S. Chandrasekhar; Western Reserve University; $550
J. M. Reynolds; Louisiana State University; $675

Conference on the Analysis of Meteorites, London, England; September 5 to September 6, 1962:
Carleton B. Moore; Arizona State University; $800

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; $101

Conference on the Theory of Functions of a Single Variable, Oberwolfach, Germany; March 24 to March 29, 1963:
Frederick Bagemihl; Wayne State University; $800
Frederick W. Gehring; University of Michigan; $600

Conference on Ultra-High-Energy Physics, Bristol, England; January 7 to January 10, 1963:
R. W. Huggett; Louisiana State University; $600
C. H. Tsao; University of Chicago; $500

Conferring with the Project on Sources for the History of Quantum Physics, Copenhagen, Denmark: June 1 to June 15, 1963:
Alfred E. Miller; Harvard University; $565

Congress of the Latin-American Association of Physiological Sciences, Caracas, Venezuela; August 24 to August 31, 1963:
Peter H. Lowy; California Institute of Technology; $500

Consultation on Abstracts in the Field of Applied Economics, Paris, France; January 28 to January 30, 1963:
Charles B. Warden, Jr.; Harvard University; $390

Course on Alpine and Glacier Research; Kauns Valley, Austria; July 1 to September 30, 1963:
Arthur E. Harrison; University of Washington; $768

Cybernetics Council of the Academy of Sciences, Moscow, U.S.S.R; August–September, 1963:
Wassily W. Leontief; Harvard University; $850

Czechoslovak Medical Congress, Prague, Czechoslovakia; November 12 to November 17, 1962:
James D. Block; Albert Einstein College of Medicine; $610
Dominick P. Purpura; Columbia University; $600
Curt Stern; University of California; $920

Delivering a One Month Lecture Course in Electrophysiology, Belgrade University; October 1963:
Alexander Mauro; Rockefeller Institute; $1,000

Enrico Fermi School of Physics, Varenna, Italy; August 16 to August 31, 1963:
Nicolaas Bloembergen; Harvard University; $576

Europaischen Mikropalaontologischen Kolloquium, Vienna, Austria; September 16 to September 22, 1963:
Orville L. Bandy; University of Southern California; $883

Executive Committee of the International Union of Prehistoric and Protohistoric Sciences, Belgrade, Yugoslavia; June 10 to June 16, 1963:
James B. Griffin; University of Michigan; $750

Executive Committee Meeting of the International Brain Research Institute, Paris, France; June 14 to June 16, 1963:
Ralph W. Gerard; University of Michigan; $830
Horace W. Magoun; University of California; $830
Walter A. Rosenblith; Massachusetts Institute of Technology; $520

Faraday Society Discussions on the Structures of Electronically-Excited Species in the Gas Phase, Dundee, Scotland; April 2 to April 3, 1963:
K. Keith Innes; Vanderbilt University; $575
Lionel M. Raff; University of Illinois; $550

Gamma-gamma Angular Correlations, Uppsala, Sweden; May 27 to May 30, 1963:
Hans J. Leisi; Bartol Research Foundation of The Franklin Institute; $650
P. J. Ouseph; University of Louisville; $750

German Metallurgical Society, General Assembly, Berlin, Germany; June 10 to June 13, 1963:
William H. Robinson; Carnegie Institute of Technology; $635

Global Impacts of Applied Microbiology Symposium, Stockholm, Sweden; July 29 to August 3, 1963:
Martin Alexander; Cornell University; $688
Elmer L. Gaden, Jr.; Columbia University; $650
Robert N. Goodman; University of Missouri; $778
Mortimer P. Starr; University of California; $891

To Visit Harvard-Florence Research Project, Florence, Italy; between May 5 and May 30, 1963:
Norman Livson; University of California; $200

IASS Symposium on Non-Classical Shell Problems, Warsaw, Poland; September 2 to September 9, 1963:
John E. Goldberg; Purdue University; $790

Indian Science Congress (Golden Jubilee) and the Convention of Spectroscopists, New Delhi, India; January 1 to February 5, 1963:
Gerhard H. Dieke; Johns Hopkins University; $1,300

Individual Visit to Soviet Scientific Institutes, Moscow, Leningrad, Russia, June 17–29, 1963:
Manfred R. Schroeder; Bell Telephone Laboratories, Inc.; $845

Information Theory Symposium, Brussels, Belguim; September 3 to September 7, 1962:
Richard A. Johnson; Syracuse University; $555

Institute of Mathematical Statistics: Second European Regional Meeting, Copenhagen, Denmark; July 8 to July 10, 1963:
Albert H. Bowker; Stanford University; $850

International Astronomical Union Symposium No. 19, 'Site Testing', Rome, Italy; October 1 to October 6, 1962:
Aden B. Meinel; University of Arizona; $932
William M. Protheroe; University of Pennsylvania; $715

International Astronomical Union, 20th Symposium, The Galaxy and the Magellanic Clouds, Sydney and Canberra, Australia; March 17 to March 28, 1963:
Halton C. Arp; Mount Wilson and Palomar Observatories; $1,008
Olin J. Eggen; California Institute of Technology; $570
Guido Munch; California Institute of Technology; $570
Maarten Schmidt; California Institute of Technology; $710
William G. Tifft; Lowell Observatory; $680
Gerard H. de Vaucouleurs; University of Texas; $1,175
Gart Westerhout; University of Maryland; $1,400

International Astronomical Union Symposium No. 21, The System of Astronomical Constants, Paris, France; May 27 to May 31, 1963:
Samuel Herrick; University of California; $835
Eugene K. Rabe; University of Cincinnati; $685

International Astronomical Union, Symposium No. 22, Tegernsee, Germany; September 2 to September 11, 1963:
Armin J. Deutsch; Mount Wilson and Palomar Observatories; $880
Jesse L. Greenstein; California Institute of Technology; $880

International Clay Conference, Stockholm, Sweden; August 12 to August 16, 1963:
George W. Brindley; Pennsylvania State University; $750
James W. Earley; Gulf Research and Development Company; $750
George T. Faust; U.S. Department of Interior; $750
Friedrich F. Koczy; University of Miami; $800
B. N. Rolfe; Sinclair Research, Inc.; $750
Joe L. White; Purdue University; $700

International Colloquium on Insect Pathology and Microbial Control, Paris, France; October 17 to October 20, 1962:
John D. Briggs; Bioferm Corporation; $900

International Colloquium on Micropaleontology, Dakar, Senegal, Africa; May 6 to May 11, 1963:
Angelina R. Messina; American Museum of Natural History; $729

International Committee for Coal Petrographic Analysis, Cheltenham, England; May 26 to May 30, 1963:
John A. Harrison; Illinois State Geological Survey; $750

International Committee for Social Science Documentation, Geneva, Switzerland; April 1 to April 3, 1963:
Lawrence Krader; Boston University; $1,012

International Conference on Crystal Lattice Defects, Kyoto, Japan; September 7 to September 12, 1962:
Michael O'Keeffe; Indiana University; $780
John M. Roberts; William Marsh Rice University; $800
George Sines; University of California; $800
John E. Wertz; University of Minnesota; $1,010

International Conference on Direct Interactions and Nuclear Reaction Mechanisms, Padua, Italy; September 3 to September 8, 1962:
Luisa F. Hansen; University of California; $850
Derek J. Prowse; University of California; $850
Howard J. Schnitzer; Brandeis University; $635

International Conference on Lattice Dynamics, Copenhagen, Denmark; August 5 to August 9, 1963:
Gordon Baym; University of California; $300
B. Gale Dick; University of Utah; $250
A. T. Stewart; University of North Carolina; $75

International Conference on Light and Vision, Baden, Austria; June 12 to June 18, 1963 and Meeting of the International Commission on Illumination, Vienna, Austria; June 18 to June 26, 1963:
H. Richard Blackwell; Ohio State University Research Center; $670
Robert M. Boynton; University of Rochester; $640
Harry Helson; Kansas State University; $750
Leonard C. Mead; Tufts University; $595
Everett M. Strong; Cornell University; $565

International Conference on Mediterranean Peoples, Athens, Greece; July 14 to July 21, 1963:
Joel M. Halpern; University of California; $1,035
Michael Kenny; Catholic University of America; $840

International Conference on Nonlinear Magnetics, Washington, D.C.; April, 1963:
- American Institute of Electrical Engineers, New York, N.Y.; $5,800

International Conference on Nuclidic Masses, Vienna, Austria; July 15 to July 19, 1963:
- Ernst Breitenberger; University of South Carolina; $710
- Gerald C. Phillips; William Marsh Rice University; $800

International Congress on Stratigraphy and Carboniferous Geology, Paris, France; September 9 to September 12, 1963:
- Gilbert H. Cady; Illinois State Geological Survey; $750

International Conference on the Biochemistry of Lipids, Stockholm, Sweden; August 5 to August 7, 1963:
- Ezra Staple; University of Pennsylvania; $650

International Economic Association Conference on Activity Analysis, Cambridge, England; June 29 to July 7, 1963:
- Earl O. Heady; Iowa State University; $660
- Tjalling C. Koopmans; Yale University; $555
- Lionel W. McKenzie; The University of Rochester; $565
- Roy Radner; University of California; $805

International Federation of Documentation, The Hague, Netherlands; January 28 to February 1, 1963:
- Malcolm Rigby; Weather Bureau, U.S. Dept. of Commerce; $976

International Federation for Information Processing Congress, Munich, Germany; August 27 to September 1, 1962:
- Gene H. Golub; Stanford University; $850
- Thomas H. Mott, Jr.; International Research Institute; $570
- Roy Weinstein; Northeastern University; $560

International Gravimetric Bureau, Paris, France; September 10 to September 15, 1962:
- Walter D. Lambert; Ohio State University; $550
- George P. Woollard; University of Wisconsin; $700

International Institute of Refrigeration, Executive Committee Meeting, Paris, France; November 27 to November 28, 1962:
- Ferdinand G. Brickwedde; Pennsylvania State University; $440

International Jubilee Meeting of the British Ecological Society, London, England; March 28 to March 30, 1963:
- Hugh M. Raup; Harvard University; $500

International Meeting on Organic Processes in Geochemistry, Milan, Italy; September 10 to September 12, 1962:
- Irving A. Berger; U.S. Geological Survey; $715

International Road Federation Fourth World Meeting, Madrid, Spain; October 14 to October 20, 1962:
- Siegfried M. Breuning; Michigan State University; $350

International Round-Table Conference on the Structure and Function of the Epiphysis Cerebri, Amsterdam, The Netherlands; July 10 to July 13, 1963:
- Joseph T. Bagnara; University of Arizona; $600
- Virginia Mayo Fiske; Wellesley College; $300
- Gerald F. Hungerford; University of Southern California; $600
- Douglas E. Kelly; University of Washington School of Medicine; $500
- Willard D. Roth; Harvard Medical School; $400
- David Emery Wolfe; Harvard Medical School; $400
- Richard J. Wurtman; National Institute of Mental Health; $400

International Social Science Council Conference on Data Archives, Cologne, Germany; June 28 to June 29, 1963:
- Erwin K. Scheuch; Harvard University; $775

International Standards Association, Technical Committee 97, Working Group A (Information Processing Glossary) Meeting, Paris, France; October 8 to October 12, 1962:
- Albrecht J. Neumann; Engineering Raytheon Company; $607

International Symposium for the History of Science and Technology, Jablonna, Poland; September 17 to September 21, 1963:
- Robert S. Cohen; Boston University; $700
- Derek J. de Solla Price; Yale University $685
- Dirk J. Struik; Massachusetts Institute of Technology; $700

International Symposium of Plecopterology, Plon, Holstein, Germany; September 21 to September 23, 1963:
- Arden R. Gaufin; University of Utah; $800

International Symposium on Antarctic Biology, Paris, France; September 2 to September 8, 1962:
- Carroll W. Dodge; Washington University; $500
- William G. Fry; University of the Pacific; $90
- J. Linsley Gressitt; Bernice P. Bishop Museum; $689
- Laurence Irving; Arctic Health Research Center; $831
- Robert C. Murphy; American Museum of Natural History; $160
- George F. Papenfuss; University of California; $435
- William J. L. Sladen; Johns Hopkins University; $744
- Donald E. Wohlschlag; Stanford University; $725

International Symposium on Mass Transfer, Calcutta, India; December 28 to December 31, 1962:
- Ju Chin Chu; Polytechnic Institute of Brooklyn; $430

International Symposium on the Control of Cell Division and Induction of Cancer; Lima, Peru and Cali, Colombia; During July, 1963:
- Henry S. Kaplan; Stanford Medical Center; $720
- S. E. Luria; Massachusetts Institute of Technology; $650

Daniel Mazia; University of California; $720
Arthur B. Pardee; Princeton University; $555
Robert P. Perry; Institute for Cancer Research; $550
Stanfield Rogers; University of Tennessee; $610
Albert Tannenbaum; Michael Reese Hospital and Medical Center; $565

International Symposium on Equatorial Aeronomy, Huaychulo, Peru; September 18 to September 26, 1962:
Wynne Calvert; Montana State College; $770
William Bert Hanson; Graduate Research Center. Dallas; $575

International Symposium on Numerical Weather Forecasting, Oslo, Norway; March 11 to March 15, 1963:
George W. Platzman; University of Chicago; $650
Yoshikazu Sasaki; University of Oklahoma; $700

International Symposium on Pollen Physiology and Fertilization, Nijmegen, Netherlands; August 29 to August 31, 1963:
John R. Rowley; University of Massachusetts; $600
I. K. Vasil; University of Illinois; $650

International Symposium on Protein Structure and Crystallography, Madras, India; January 13 to January 25, 1963:
Leonard Derwent Hamilton; Sloan-Kettering Institute for Cancer Research and Memorial Hospital; $1,200
Alan J. Hodge; California Institute of Technology; $1,200
Gopinath Kartha; Roswell Park Memorial Institute; $1,200
Dorita A. Norton; Roswell Park Memorial Institute; $1,200

International Symposium on Relay Systems Theory and Finite Automata, Moscow, U.S.S.R.; September 24 to October 2, 1962:
David A. Huffman; Massachusetts Institute of Technology; $790
Edward J. Smith; Polytechnic Institute of Brooklyn; $800

International Symposium on the Relation Between the Structure and the Mechanical Properties of Metals, Teddington, England; January 7 to January 9, 1963:
W. H. Robinson; Carnegie Institute of Technology; $395

International Symposium on the Relation of Properties to Structure, Melbourne, Australia; May 20 to May 24, 1963:
Bruce Chalmers; Harvard University; $1,430
Gareth Thomas; The University of California; $1,110

International Symposium on Stratospheric and Mesospheric Circulation, Berlin, Germany; August 20 to August 31, 1962:
Walter J. Saucier; University of Oklahoma; $340

International Symposium on the Role of Cellular Reactions in Adaptation of Multicellular Organisms to Environmental Temperature, Leningrad, U.S.S.R.; May 31 to June 5, 1963:
Clifford L. Prosser; University of Illinois; $900

International Technical Colloquium of the Research Association on Drilling and Production Techniques, Rueil-Malmaison, France; June 10 to June 14, 1963:
M. Rasin Tek; University of Michigan; $590

International Vitamin Congress, Prague, Czechoslovakia; June 3 to June 5, 1963:
B. Connor Johnson; University of Illinois; $738
George Wolf; Massachusetts Institute of Technology; $670

Intracellular Membranous Structure, Kyoto, Japan; March 28 to March 31, 1963:
H. Stanley Bennett; University of Chicago; $1,025
E. V. Cowdry; Washington University; $1,610
Don W. Fawcett; Harvard University Medical School; $1,100
David E. Green; University of Wisconsin; $1,050
Lawrence Herman; State University of New York; $1,100
Alex B. Novikoff; Yeshiva University; $1,100
Keith R. Porter; Harvard University; $1,100
J. David Robertson; McLean Hospital; $1,100
Fritiof S. Sjostrand; University of California; $830

IRE Symposium on Information Theory and the Symposium on Information et Prevision dans les differentes Sciences, Brussels, Belgium; September 3 to September 8, 1962 and Symposium on Foundation of Mathematics, Mathematical Machines, and Their Applications, Tihany, Hungary; September 11 to September 15, 1962:
Michael Satosi Watanabe; Thomas J. Watson Research Center; $560

Joint Meeting of the American Psychiatric Association with the Japanese Society of Psychiatry and Neurology, Tokyo, Japan; May 12 to May 19, 1963:
Daniel G. Freedman; Langley Porter Neurosychiatric Institute; $800

Joint Session of the I.G.U. Committee on Applied Geomorphology and the PAIGH Committee on Basic Natural Resources, Merida, Venezuela; July 1963;
E. Willard Miller; Pennsylvania State University; $450

Jubilee Congress of the Australian and New Zealand Association for the Advancement of Science, Sydney, Australia; August 20 to August 24, 1962:
Donald S. Farner; Washington State University; $1,100

Latin American Congress of Chemistry and Visit to Educational Institutions in Brazil, Chile, Peru and Venezuela; August 19 to September 22, 1962:
Jose D. Gomez-Ibanez; Wesleyan University; $1,430

Mathematical Workshop, Bonn, Germany; June 14 to June 21, 1963:
Richard S. Palais; Brandeis University; $600

Logic Colloquium, Oxford, England; July 15 to July 18, 1963:
Richard Montague; University of California; $800

Mechanisms of Cellular Regulation in Bacteria, Marseille, France; during July 1963:
Franklin M. Harold; National Jewish Hospital; $615
Annamaria Torriani-Gorini; Massachusetts Institute of Technology; $615

Meeting of Ad Hoc Group B (Ionosphere and Aurora), Paris, France; January 1963:
Arthur H. Waynick; Pennsylvania State University; $570

Meeting of Human Geneticists, Cologne, Germany; September 12 to September 14, 1963:
Susumu Ohno; City of Hope Medical Center; $900

Meeting of the Committee on Language Information, Paris, France; June 19 to June 21, 1963:
Charles A. Ferguson; Center of Applied Linguistics; $557

Meeting of the International Commission on Illumination, Vienna, Austria; June 18 to June 26, 1963:
Glenn A. Fry; Ohio State University; $670

Meeting of the Polish Mathematical Society, Warsaw, Poland; May 20 to June 5, 1963:
W. A. J. Luxemburg; California Institute of Technology; $915

Meeting on Abstract Differential Equations, Varenna, Italy; May 30 to June 8, 1963:
Tosio Kato; University of California; $900
Louis Nirenberg; New York University; $700

Meeting with Top Officials of the Japanese Chemical Society, Tokyo, Japan; July 20 to July 25, 1962:
C. J. Huang; University of Houston; $1,500
J. J. McKetta; American Institute of Chemical Engineers; $1,534
Lawrence Resner; American Institute of Chemical Engineers; $1,646

NATO Advanced Study Institute: Air/Sea Interaction, London, England; September 3 to September 14, 1962:
Robert M. Basile; Ohio State University; $560
Leonard O. Myrup; University of California; $770
Roger T. Williams; Woods Hole Oceanographic Institute; $480

NATO Advanced Study Institute: Animal Production, Wageningen, The Netherlands; August 26 to September 8, 1962:
Solon A. Ewing; Iowa State University; $710
Odis W. Robison; North Carolina State College; $640

NATO Advanced Study Institute: Applications of Wave Mechanics to Molecular Physics and Chemistry, Menton, France; July 1 to July 14, 1963;
Frank Franz; University of Illinois; $396
Judith R. Franz; University of Illinois; $396
Samson A. Marshall, Jr.; Armour Reserve Foundation; $629

NATO Advanced Study Institute: Automatic Documentation, Venice, Italy; July 7 to July 20, 1963:
Donald J. Hillman; Lehigh University; $643
Joseph Jaffe; Columbia University; $632

NATO Advanced Study Institute: The Biliary System, Newcastle-upon-Tyne, England; September 3 to September 14, 1963:
Roger Lester; University of Chicago; $590

NATO Advanced Study Institute: Biochemistry and Biophysics in Food Research, Cambridge, England; September 23 to September 29, 1962;
William D. Brown; University of California; $800
Keith H. Steinkraus; Cornell University; $550
John R. Whitaker; University of California; $770

NATO Advanced Study Institute: Biometeorology and Epidemiology of Fungal Diseases of Plants, Pau, France; September 2 to September 13, 1963:
Jean A. Snow; Pennsylvania State University; $619
Francis A. Wood; Pennsylvania State University; $574

NATO Advanced Study Institute: Brain Research, Amsterdam, Netherlands; July 15 to July 26, 1963:
Karl Kornacker; Massachusetts Institute of Technology; $550
Theodore J. Voneida; Western Reserve Universtiy; $569

NATO Advanced Study Institute: Casualty and Dispersion Relations, Varenna, Italy; July 15 to August 3, 1963;
Max Luming; University of California; $906

NATO Advanced Study Institute: Dosimetry, Varenna, Italy; August 5 to August 17, 1963:
Ralph M. Baltzo; University of Washington; $794
Philip E. Gustafson; Argonne National Laboratory; $670
Dennis R. Johnson; Oak Ridge National Laboratory; $680

NATO Advanced Study Institute: Dynamics of Rockets and Satellites, Cambridge, England; July 14 to July 27, 1963:
David B. Clinton; General Electric Company; $513
Jerome H. Hutcheson; The RAND Corporation; $792
Louis N. Rowell; The RAND Corporation; $792

NATO Advanced Study Institute: Electron Density Profiles in the Ionosphere and Exosphere, Skeikampen, Norway; April 17 to April 26, 1963:
Donald D. Briglia; University of California; $846
Fred L. Smith, III; Stanford University; $838

NATO Advanced Study Institute: Elementary Particle Physics, Newbattle Abbey, Scotland; July 28 to August 17, 1963:
Ronald J. Adler; Stanford University; $786
Edward S. Ginsberg; Stanford University; $792
H. Lee Watson; University of California; $774

NATO Advanced Study Institute: The Experimental Animal in Research, Harrogate, England; September 9 to September 20, 1963:

Bennett J. Cohen; University of Michigan; $573

Berton F. Hill; National Academy of Sciences—National Research Council; $566

Charles W. Riggs; University of California Medical Center, Vivarium; $786

NATO Advanced Study Institute: Low Frequency Electromagnetic Radiation, Bad Homburg, Germany; July 22 to August 2, 1963:

Warren L. Flock; University of Alaska; $844

Harold W. Smith; University of Texas; $776

NATO Advanced Study Institute: Many Body Problems, Ravello, Italy; April 17 to May 4, 1963:

Ugo Fano; National Bureau of Standards; $670

NATO Advanced Study Institute: Mathematical Logics, Oxford, England; July 15 to July 19, 1963:

Arthur W. Skidmore; University of Texas; $669

NATO Advanced Study Institute: Mathematical Probability, Durham, England; March 28 to April 11, 1963:

William A. Veech; Princeton University; $503

John A. Williamson; University of Minnesota; $623

NATO Advanced Study Institute: Metabolism and Physiological Significance of Lipids, Cambridge, England; September 15 to September 21, 1963:

Harold S. Olcott; University of California; $800

NATO Advanced Study Institute: Nuclear Spectroscopy, Breukelen, Netherlands; August 1 to August 16, 1963:

Charles H. Holbrow; University of Wisconsin; $625

Robert L. McGrath; State University of Iowa; $675

NATO Advanced Study Institute: Paleoclimatology Conference, Newcastle-upon-Tyne, England; January 7 to January 11, 1963:

Robert Lee DuBois; University of Arizona; $850

David R. Lawrence; Princeton University; $393

Heinz A. Lowenstam; California Institute of Technology; $580

Matthew H. Nitecki; University of Chicago; $550

Frederick E. Simms, Jr.; University of Cincinnati; $560

Edward L. Winterer; University of California; $590

NATO Advanced Study Institute: Phonons and Phonon Interactions, Aarhus, Denmark; August 12 to August 24, 1963:

Gerald P. Alldredge; Michigan State University; $643

Donald H. Kobe; Ohio State University; $595

Carlton W. Ulbrich; University of Connecticut; $608

NATO Advanced Study Institute: Plasma Physics, Orsay, France; September 10 to September 21, 1962:

Leonard S. Wagner; Cornell University; $530

NATO Advanced Study Institute: Protein Analysis, Gottingen, Germany; September 2 to September 16, 1962:

Robert R. Becker; Oak Ridge National Laboratory; $550

Laurence M. Weiner; Wayne State University College of Medicine; $620

NATO Advanced Study Institute: Radiation Chemistry, Rocamadour, France; April 22 to April 26, 1963:

J. Douglas Mitchell; University of Notre Dame; $621

Richard Povinelli; University of Notre Dame; $621

NATO Advanced Study Institute: Relativity and Topology, Les Houches, France; July 1 to August 24, 1963:

Edward A. Remler; University of North Carolina; $620

Jonathan L. Rosner; Princeton University; $373

Kip S. Thorne; Princeton University; $572

Marvin Weinstein; Columbia University; $577

NATO Advanced Study Institute: Semiconductors, Athens, Greece; August 5 to August 29, 1963:

Robert G. Fuller; University of Illinois; $900

NATO Advanced Study Institute: Sound Dispersion, Varenna, Italy; August 6 to August 18, 1962:

George E. McDuffie, Jr.; Catholic University; $670

NATO Advanced Study Institute: Stellar Evolution, Varenna, Italy; August 20 to September 1, 1962:

Jerome Kristian; University of Chicago; $680

NATO Advanced Study Institute: Stratospheric and Mesospheric Circulation held in Berlin from August 20–31, 1962:

Kenneth H. Jehn; University of Texas; $760

Norman K. Wagner; University of Texas; $800

NATO Advanced Study Institute: The Structure of Stellar Systems, Ankara, Turkey; August 26 to September 20, 1963:

William H. Jefferys, III; Yale University; $800

David D. Morrison; Harvard College Observatory; $780

Gerald H. Newsom; Harvard University; $827

NATO Advanced Study Institute: Surface Properties of Crystals, Ghent, Belgium; July 29 to August 9, 1963:

Gordon W. Anderson; University of Illinois; $673

Frederic J. Kahn; Harvard University; $530

NATO Advanced Study Institute: Techniques in Endocrine Research, Stratford-upon-Avon, England; September 2 to September 12, 1962:

Harry N. Antoniades; Protein Foundation, Inc.; $390

Philip F. Mulvey, Jr.; Veterans Administration Hospital; $400

NATO Advanced Study Institute: Theoretical Chemistry, Konstanz, Germany; September 10 to September 28, 1962:
- Herbert A. Weakliem; R.C.A. Laboratories; $570

NATO Advanced Study Institute: Theoretical Physics, Istanbul, Turkey; July 16 to August 4, 1962:
- Oscar W. Greenberg; University of Maryland; $390

NATO Advanced Study Institute: Use of Computers in Civil Engineering, Lisbon, Portugal; September 16 to October 6, 1962:
- Harold W. Conner; Portland Cement Association; $580
- John W. Fisher; Lehigh University; $510
- William R. Hudson; Texas Highway Department; $700
- K. L. Wen; Michigan State University; $486
- Merit P. White; University of Massachusetts; $510
- Edward L. Wilson; University of California; $810

OECS Seminar on The Reform of the Teaching of Biology to be held in Lausanne, Switzerland; September 3–14, 1962:
- Marston Bates; University of Michigan; $900

Organizational Meeting of the International Federation of Parasitologists, Rome, Italy; September 22 to October 6, 1962:
- American Institute of Biological Sciences; $1,600

Preparatory Meeting of Experts in Seismology and Earthquake Engineering, Paris, France; March 26–27; 1963:
- Donald E. Hudson; California Institute of Technology; $1,100

Research Centers of Population Genetics, Japan and Europe; June to September, 1963:
- Ken-ichi Kojima; North Carolina State College of Agriculture and Engineering; $1,500

Session of Janos Bolyai Mathematical Society, Budapest, Hungary; June 3 to June 7, 1963:
- Paul R. Halmos; University of Michigan; $775

Special Meeting to Formulate International Gravity Standardization Program, London, England; January 5 to January 8, 1963;
- George P. Woollard; University of Wisconsin; $600

Symposium on Abnormal Hemoglobins, Ibadan, Nigeria; March 17 to March 23, 1963:
- Arno G. Motulsky; University of Washington; $850

Symposium on Animal Orientation, Munich, Germany; September 17 to September 19, 1962:
- Helmut E. Adler; American Museum of Natural History; $570
- Archie Carr; University of Florida; $690
- E. Lendell Cockrum; University of Arizona; $810
- Denzel E. Ferguson; Mississippi State University; $710
- James M. Moulton; Bowdoin College; $440
- Alvin Novick; Yale University; $440
- E. G. F. Sauer; University of Florida; $420
- Klaus Schmidt-Koenig; Duke University; $630

Symposium on Antarctic Biology and Medicine, Paris, France; September 2 to September 8, 1962:
- Frederick A. Milan; University of Wisconsin; $650

Symposium on Degeneration and Regeneration of Nervous Tissue, Amsterdam, Netherlands; July 15 to July 19, 1963:
- Henry de Forest Webster; Massachusetts General Hospital; $600

Symposium on Disorders of Language, London, England; May 21 to May 23, 1963 and To Visit Laboratories in Cambridge, England, Brussels, Belgium and Paris, France During May and June, 1963:
- William D. Neff; Bolt, Beranek and Newman, Inc.; $520

Symposium on Flicker-Physiology, Amsterdam, Netherlands; September 9 to September 14, 1963:
- Mary A. B. Brazier; University of California Medical Center; $830
- Hermann M. Burian; State University of Iowa; $660
- Carl Richard Cavonius; Brown University; $590
- Donald H. Kelley; Itek Corporation; $540

Symposium on Neutron Detection, Dosimetry, and Standardization, Harwell, England; December 10 to December 14, 1962:
- Ernest D. Klema; Northwestern University; $575

Symposium on Nucleic Acids, Newcastle upon Tyne, England; April 2 to April 4, 1963:
- Jon B. Applequist; Columbia University; $550

Symposium on Partial Differential Equations, Oberwolfach, West Germany; March 18 to March 23, 1963:
- Charles R. DePrima; New York University; $700

Symposium on Punched Tape Application in Documentation, Ispra, Italy; May 28 to May 30, 1963:
- Seymour I. Taine; U.S. Department of Health, Education, and Welfare; $790

Symposium on Reproduction in Insects, London, England; September, 1963.
- Richard Dale Alexander; University of Michigan; $545

Symposium on Sperm Abnormalities, Nervous System Diseases and Genetics, Marseille, France; During June 1963:
- Klaus Patau; University of Wisconsin; $700

Symposium on Symbiotic Associations, London, England; April 8 to April 10, 1963:
- Leonard Muscatine; Scripps Institution of Oceanography; $790

Symposium on the Biology of Survival, London, England; May 7 to May 8, 1963:
- Loren Carlson; University of Kentucky; $400
- Laurence Irving; University of Alaska; $800
- Peter Morrison; University of Alaska; $800

Symposium on the Role of Cellular Reactions in Adaptation of Multicellular Organisms to Environmental Temperature, Leningrad, U.S.S.R.; May 31 to June 5, 1963:
Jacob Levitt; University of Missouri; $900

Symposium on the Variation of the Regime of Existing Glaciers, Obergurgl, Austria; September 10 to September 20, 1962:
Charles R. Bentley; Geophysical and Polar Research Center; $712

Task Order for Travel Grants for a Conference on the Basic Mechanisms in the Radiation Chemistry of Aqueous Media Oxygen in the Animal Organism, London, England; September 1 to September 5, 1963:
International Union of Physiological Sciences; $3,757

The 1963 International Conference on Sector Focused Cyclotrons and Meson Factories, Geneva, Switzerland; April 23 to April 26, 1963:
Donald W. Kerst; University of Wisconsin; $700
Harry D. Holmgren; University of Maryland; $650

The Relations Between the Structure and Mechanical Properties of Metals, Teddington, England; January 10 to January 12, 1963:
John P. Hirth; Ohio State University; $575

The School and Italian Society in Transformation, Milan, Italy; October, 1963:
Harry Levin; Cornell University; $500

The Solar Spectrum, Utrecht, The Netherlands; August 26 to August 31, 1963:
Alan Maxwell; Harvard University; $760
Elske v. P. Smith; Joint Institute for Laboratory Astrophysics; $700

International Astronomical Union, Symposium #22, Tegernsee, Germany; September 2 to September 11, 1963:
Robert F. Howard; Mt. Wilson and Palomar Observatories; $880
Mukul Ranjan Kundu; Cornell University; $650

Thermodynamics and Fluid Mechanics Group Convention, Cambridge, England; April 8 to April 9, 1964:
Ascher H. Shapiro; Massachusetts Institute of Technology; $510

To Study British Methods of Preparing Applied Scientific Papers, London, England; November 1962:
Donald Q. Kern; D. Q. Kern Associates; $854

Travel of Foreign Participants to the Gordon Research Conference on Scientific Information Problems in Research, New Hampton, New Hampshire; July, 1963:
American Institute of Physics; New York, N.Y.; $4,600

Two Symposia on the Physiology of Reproduction, Singapore and Bombay; February 10 to March 1, 1963:
Seymour Katsh; University of Colorado Medical Center; $1,300

UNESCO Symposium on Arid Lands, Tashkent, Uzbek S.S.R., U.S.S.R; August 3 to August 14, 1962:
Harold A. Thomas, Jr.; Harvard University; $2,210

UNESCO Symposium on Arid Zones, Lucknow, India; December 7 to December 13, 1962:
Francisco Grande; University of Minnesota; $1,350
Frederick Sargent II; University of Illinois; $650
Knut Schmidt-Nielsen; Duke University; $1,240

U.S.-British Conference on New Approaches to the Study of Social Anthropology, Cambridge, England; June 25 to June 30, 1963:
American Anthropological Association, Washington, D.C.; $5,525

Vernadsky Centennial Jubilee Celebrations, Moscow, U.S.S.R.; March 12 to March 16, 1963:
Elburt F. Osborn; Pennsylvania State University; $950

Working Party on Materials Science and Technology of the British Institution of Chemical Engineers, Banbury, England; May 18 to May 19, 1963:
Robert L. Sproull; Cornell University; $534

World Association of Veterinary Anatomists, Hannover, Germany; August 1963;
L. E. St. Clair; University of Illinois; $665

World Consultation on Forest Genetics, Stockholm, Sweden; August 1963:
J. P. van Buijtenen; Texas Forest Service; $850
Henry D. Gerhold; Pennsylvania State University; $690
Jonathan W. Wright; Michigan State University; $735
Bruce Zobel; North Carolina State College; $720

World Power Conference, 6th Plenary Meeting, Melbourne, Australia; October 20 to October 26, 1962:
Manson Benedict; Massachusetts Institute of Technology; $1,385
John A. Duffie; University of Wisconsin; $1,200

APPENDIX E

Fellowship Awards Offered

National Science Foundation Fellowship Awards by Program and Field, Fiscal Year 1963

Field	Graduate	Cooperative graduate	Graduate teaching assists.	Postdoctoral	Senior postdoctoral	Science faculty	Secondary school teachers	Senior foreign scientists	Total
Life Sciences:									
Agriculture	6	4	2	2	0	0	0	0	14
Anthropology	38	12	8	6	2	5	0	0	71
Biochemistry	75	17	10	11	10	2	5	2	132
Biophysics	32	9	3	9	1	5	1	2	62
Botany	34	16	45	5	1	5	12	4	122
General Biology	33	20	24	8	2	13	67	1	168
Genetics	24	7	3	4	8	6	2	0	54
Medical Sciences	3	0	3	9	3	1	—	—	19
Microbiology	15	7	15	5	2	5	7	2	58
Pathology	1	0	0	0	0	2	—	—	3
Physiology	33	17	20	7	4	4	—	1	86
Psychology	84	57	33	10	5	6	0	0	195
Zoology	59	34	41	7	0	9	24	3	177
Subtotal	437	200	207	83	38	63	118	15	1,161
Physical Sciences:									
Astronomy	21	8	3	1	0	1	0	0	34
Chemistry	252	212	194	54	14	26	18	7	777
Earth Sciences	76	33	81	15	4	6	8	12	235
Engineering	297	286	126	15	7	108	—	6	845
Mathematics	332	227	137	29	5	76	125	5	936
Meteorology	1	1	1	1	0	2	—	0	6
Oceanography	4	4	0	0	0	1	—	0	9
Physics	365	274	105	38	20	30	12	8	852
General Science	—	—	—	—	—	3	7	—	10
Subtotal	1,348	1,045	647	153	50	253	170	38	3,704
Social Sciences:									
Economics	42	28	30	6	5	4	—	—	115
Geography	1	1	5	0	0	1	—	—	8
History and Philosophy of Science	26	7	1	1	1	2	—	—	38
Linguistics	5	1	—	2	0	0	—	—	8
Sociology	19	13	15	0	0	1	—	—	48
Social Sciences, other	2	5	1	0	1	1	—	—	10
Subtotal	95	55	52	9	7	9	—	—	227
Total	1,880	1,300	906	245	95	325	288	53	5,092

Names, Residences, and Fields of Study of Individuals Offered National Science Foundation Fellowships

ALABAMA

Graduate

COULTER, PHILIP W., Phenix City, Physics
GUNTER, THOMAS E., Jr., Tuscumbia, Physics
McDERMOTT, PATRICK P., Mobile, Biophysics
ROGERS, CHARLES L., Birmingham, Engineering
SMITH, DONALD R., Sylacauga, Mathematics
SMITH, STEPHEN R., Fayette, Physics

Cooperative Graduate

COOPER, THOMAS E., Auburn, Engineering
CRANFORD, KENNETH H., Huntsville, Mathematics
LANDERS, KENNETH E., Leighton, Biology
McCORMACK, FRANCIS J., Mobile, Physics
STANSELL, KITTY L., Montevallo, Physics
VANCLEAVE, ALBERT R., Wadley, Mathematics

Summer Fellowships for Graduate Teaching Assistants

BAILEY, ESCAR L., Anderson, Engineering
BAUM, LAWRENCE S., Birmingham, Botany
CHRISTENSEN, CHARLES R., Athens, Chemistry
FEARN, RICHARD L., Mobile, Physics
FULP, RONALD O., Auburn, Mathematics
MOSLEY, WILBUR C., Jr., Tuscaloosa, Physics
STARK, JOHN, Tuscaloosa, Engineering

TEMPLE, HERBERT L., Auburn, Mathematics
VANCLEAVE, ALBERT R., Jr., Wadley, Mathematics
WALTON, DAN W., Jemison, Zoology
WILLS, EDWARD L., Birmingham, Physics

Postdoctoral

WATSON, JAMES R., Jr., Anniston, Botany

Science Faculty

CHRISTIAN, WILLIE H., Tuskegee Institute, Mathematics
GROTH, AARON H., Jr., Auburn, Medical Sciences
JONES, ALICE S., Livingston, Botany
MCDUFF, ODIS P., University, Engineering
NICHOLS, JAMES O., Auburn, Engineering
OLIVER, CALVIN C., Atlanta, Engineering
RAULERSON, LYNN, Birmingham, Biology

Summer Fellowships for Secondary School Teachers

WHEELER, JOHN F., Indian Springs, Mathematics

ALASKA

Graduate

LENT, PETER C., College, Zoology

Science Faculty

FORBES, ROBERT B., College, Earth Sciences

ARIZONA

Graduate

COLLINS, DONALD J., Tucson, Engineering
KREISLER, MICHAEL N., Tucson, Physics
LOVEJOY, EARL M., Tucson, Earth Sciences
MCARTHUR, DAVID A., Tucson, Physics
MCCOY, BARRY M., Tucson, Physics
MERCER, GENE A., Tucson, Psychology
NEVILLE, MELVIN K., Tucson, Anthropology
WILLIS, BYRON H., Winslow, Engineering
YOUNG, JON N., Florence, Anthropology

Cooperative Graduate

AZCUENAGA, JOANNE I., Williams, Chemistry
ERICKSON, ROLFE C., Tucson, Earth Sciences
HALL, RAYMOND G., Jr., Scottsdale, Physiology
MICKLE, DAVID G., Tucson, Earth Sciences
SAMPLE, SHELIA D., Tempe, Chemistry
SANDERS, ROBERT W., Tempe, Mathematics

Graduate Teaching Assistant

COOPER, RICHARD K., Tucson, Physics
DELISE, DONALD A., Tucson, Physics
HENSLEY, DAVID C., Flagstaff, Physics
KERR, DONALD R., Jr., Tucson, Mathematics
PROCTOR, SHARON J., Phoenix, Zoology
PYPER, WALTER R., Tempe, Mathematics

Postdoctoral

LANGE, ROBERT V., Phoenix, Physics
MOORES, ELDRIDGE M., Globe, Earth Sciences

Senior Postdoctoral

SPICER, EDWARD H., Tucson, Anthropology

Science Faculty

ARONSON, JOHN N., Tempe, Microbiology
HILL, LOUIS A., Jr., Tempe, Engineering
KRIEGH, JAMES D., Tucson, Engineering

Secondary School Teachers

BARTON, WILLIAM B., Phoenix, Mathematics
BRODERICK, ROBERT V., Phoenix, Mathematics
BUCHALTER, BARBARA D., Tucson, Mathematics
HITCHCOCK, C. M., Jr., Tucson, Botany

ARKANSAS

Graduate

FULLER, ROY J., Malvern, Mathematics
GRAMLICH, JIM V., Charleston, Botany
LANE, FORREST E., Fayetteville, Botany
PARCHMAN, LONNIE G., Brinkley, Genetics

Cooperative Graduate

GODWIN, WALTER E., Hot Springs, Chemistry
GRIFFIS, CARL L., Little Rock, Engineering
WEATHERFORD, WENDELL L., Newport, Physics

Postdoctoral

MANUEL, OLIVER K., Fayetteville, Physics

Science Faculty

CANGELOSI, VINCENT E., Fayetteville, Economics
COGBURN, CECIL O., Fayetteville, Engineering
DEAVER, FRANKLIN K., Fayetteville, Engineering
HEIPLE, LOREN R., Fayetteville, Engineering

Secondary School Teachers

CORDER, OLGA B., Mountainview, General Science
MELTON, PATSY J., Poyen, Mathematics

CALIFORNIA

Graduate

ABARBANEL, HENRY D. I., Beverly Hills, Physics
AGOSTON, MAX K., Atherton, Mathematics
AHUMADA, ALBERT J., Jr., Los Angeles, Psychology
ALDERMAN, DONALD W., Lancaster, Physics
ALDERSON, Daniel J., Tujunga, Astronomy
ANKENBRANDT, CHARLES M., Albany, Physics
ARING, KENNETH B., Mentone, Physics
BACHELIS, GREGORY F., Sausalito, Mathematics
BAGGEROER, ARTHUR B., Carmichael, Engineering
BARKER, DAVID L., Pasadena, Biochemistry
BARNES, LYNNE R., Los Angeles, Mathematics
BEATTY, KENNETH W., Weed, Zoology
BECK, BARBARA H., Berkeley, Chemistry
BENNETT, LARRY E., San Diego, Chemistry
BLAKE, JOHN T., Los Angeles, Engineering
BLASGEN, MICHAEL W., Santa Monica, Engineering
BLUE, JAMES L., Pasadena, Physics
BOLLINGER, JOHN A., San Diego, Physiology
BRADBURY, JACK W., Balboa, Physiology
BRADLEY, GERALD L., Tulare, Mathematics
BRICMONT, ODETTE F., Los Gatos, Earth Sciences

Brown, Jerome R., Hillsborough, Astronomy
Brown, Lawrence D., Beverly Hills, Mathematics
Bryant, Donald G., Stanford, Earth Sciences
Burch, Stephen H., Stanford, Earth Sciences
Carter, Benjamin P., Berkeley, Physics
Castor, John I., Fresno, Astronomy
Causey, Robert L., San Gabriel, History and Philosophy of Science
Chester, Arthur N., Pasadena, Physics
Christensen, Douglas A., Oildale, Engineering
Clark, Alan R., San Jose, Physics
Clauser, Milton J., Altadena, Physics
Cocchiarella, Nino B., Los Angeles, History and Philosophy of Science
Cole, Carl P., Oakland, Chemistry
Collins, Curtis A., San Luis Obispo, Oceanography
Cool, Terrill A., Pasadena, Engineering
Cooper, James A., Palo Alto, Engineering
Cottrell, Calvert B., Menlo Park, Anthropology
Coutts, Stephen M., San Diego, Biochemistry
Crapo, Lawrence M., Porterville, Chemistry
Dalton, Edward K., Riverside, Physics
Daniel, James W., Palo Alto, Mathematics
Dauber, Philip M., Los Angeles, Physics
Davis, Lary V., Berkeley, Zoology
Davis, Thomas J., Fresno, Earth Sciences
Deforest, Taber, Jr., Stanford, Physics
Delamater, John D., Goleta, Psychology
Delany, Vincent M., Berkeley, Physics
Dewitt, Walter G., III, Oakland, Chemistry
Drake, Daniel L., Oakland, Biochemistry
Dudley, Priscilla P., Berkeley, Earth Sciences
Duncan, John R., Jr., Los Angeles, Earth Sciences
Duncan, Tyrone E., Los Angeles, Engineering
Elliott, Raymond L., La Mesa, Earth Sciences
Ellis, David J., Whittier, Chemistry
Faia, Michael A., Los Angeles, Sociology
Fickes, Garry N., Oakland, Chemistry
Flatte, Stanley M., Los Angeles, Physics
Francis, William J., Berkeley, Zoology
Frankel, Richard B., Berkeley, Chemistry
Getzinger, Richard W., Oakland, Engineering
Ginsberg, Edward S., Sunnyvale, Physics
Goddard, William A., III, Pasadena, Engineering
Gold, Vivian J., Los Angeles, Psychology
Grant, Robert B., Albany, Genetics
Graue, Dennis J., Pasadena, Engineering
Griffin, William L., San Gabriel, Earth Sciences
Griffith, O. Hayes, La Verne, Chemistry
Gross, Deanne H., Los Angeles, Mathematics
Gunn, James E., Pasadena, Astronomy
Hall, Elizabeth J., Los Angeles, Mathematics
Hamilton, Gordon W., Berkeley, Physics
Harris, David O., Berkeley, Chemistry
Hart, Joe T., Palo Alto, Psychology
Hartwell, Leland H., Arlington, Biochemistry
Haymaker, Richard W., Los Gatos, Physics
Hechler, Stephen H., San Leandro, Mathematics
Hendricks, Tareah J., La Jolla, Physics
Hendry, William L., Pasadena, Engineering
Herm, Ronald R., Berkeley, Chemistry
Hess, Richard I., Albany, Physics
Hesse, Robert H., Concord, Chemistry
Hill, Jane H., Los Angeles, Anthropology
Hill, Roger C., Pasadena, Physics
Holtzman, Stephen F., Berkeley, Anthropology
Hornell, James M., Manhattan Beach, Mathematics
Horowitz, Joel L., Pasadena, Physics
Hosea, Joel C., Palo Alto, Engineering
Hufbauer, Karl G., Berkeley, History and Philosophy of Science
Hughes, Evan E., Jr., Los Angeles, Physics
Huld, Bent, Monrovia, Physics
Ivanetich, Richard J., San Francisco, Physics
Janzen, Daniel H., Berkeley, Zoology
Johnson, Clarence D., Fresno, Zoology
Jordan, Jo R., La Jolla, Chemistry
Josephson, Nora S., Riverside, Physics
Kabat, David, Pasadena, Biochemistry
Kahan, Linda B., Los Angeles, Zoology
King, Jack L., Concord, Genetics
Klarner, David A., Eureka, Mathematics
Koonce, Calvin S., Oakland, Physics
Krubiner, Alan M., Albany, Chemistry
Kula, Richard J., Riverside, Chemistry
Kuntz, Irwin D., Jr., Berkeley, Chemistry
Larson, Edwin E., Big Bear Lake, Earth Sciences
Larson, Geraldine B., Berkeley, Agriculture
Leaver, Sherie L., Concord, Physiology
Letourneau, John J., Berkeley, Mathematics
Lewis, Richard A., Tarzana, Engineering
Loveday, Douglas F., Santa Monica, Economics
Lutes, Loren D., Pasadena, Engineering
Macomber, James D., Modesto, Chemistry
Mandell, Richard L., Rosemead, Engineering
Marchand, Denis E., Arcadia, Earth Sciences
Masters, Gilbert M., Los Angeles, Engineering
Mather, Lauren R., Santa Ana, Physics
Matovich, Mark A., Jr., San Jose, Engineering
Maurer, Charles J., Stockton, Engineering
McCloskey, David J., Pasadena, Engineering
McColl, James R., Oakland, Physics
Medaris, Levi G., Jr., Los Angeles, Earth Sciences
Merz, Martin D., Wasco, Engineering
Miller, Edward S., Berkeley, Physics
Miller, Walter B., Malibu, Chemistry
Mills, Douglas L., Albany, Physics
Mintz, Leigh W., Berkeley, Earth Sciences
Moler, Cleve B., Woodside, Mathematics
Monti, Stephen A., San Rafael, Chemistry
Moonitz, David A., Van Nuys, Mathematics
Morley, Samuel A., Berkeley, Economics
Morris, William G., Oakland, Engineering
Morse, Richard L., San Bernardino, Physics
Murov, Steven L., Redwood City, Chemistry
Nieto, Michael M., Los Angeles, Physics
Nolfi, George J., Jr., Hollywood, Chemistry
Noll, Roger G., Oceanside, Economics
Nulton, James D., San Diego, Mathematics
O'Connell, John P., Los Angeles, Engineering
Ogan, Eugene, Santa Barbara, Anthropology
Oglesby, Larry C., Atascadero, Zoology
Olson, Richard G., Walnut Creek, History and Philosophy of Science
Omura, Jimmy K., San Martin, Engineering
Palmiter, Michael T., Alhambra, Mathematics

PATTERSON, RICHARD R., Berkeley, Mathematics
PEABODY, GERALD E., Berkeley, Physics
PEARSON, GERALD A., Manhattan Beach, Chemistry
PESHETTE, SUZANNE M., El Cerrito, Psychology
PIERSON, SR. MARY B., Belmont, Physiology
PLAUT, RAYMOND H., Los Angeles, Engineering
POLIS, DENNIS F., Van Nuys, Physics
PRATA, STEPHEN W., Sacramento, Astronomy
PRATT, LEE H., Oakland, Botany
QUINN, DANIEL J., San Jose, Physics
REGAS, JAMES L., San Lorenzo, Astronomy
REIN, ALAN R., Mill Valley, Microbiology
RICHIE, KENNETH E., Los Angeles, Physics
RICKLEFS, ROBERT E., Pebble Beach, Biology
RILES, JAMES B., Huntington Park, Mathematics
ROCHKIND, MARK M., Albany, Chemistry
RONY, PETER R., Albany, Engineering
ROOT, RICHARD B., Albany, Biology
ROSENBERG, BARR M., El Cerrito, Economics
ROSS, ROBERT T., Albany, Chemistry
ROTHSCHILD, BRUCE L., Los Angeles, Mathematics
ROYALL, RICHARD M., Palo Alto, Mathematics
RUBEN, GEORGE C., Berkeley, Chemistry
RUBIN, MERRY M., Berkeley, Biophysics
RYAVEC, CHARLES A., Santa Monica, Mathematics
SARGENT, MALCOLM L., Redwood City, Microbiology
SCHLAUG, ROBERT N., Albany, Engineering
SCHMIDT, CLIFFORD L., San Jose, Biology
SCHROT, SR. MARIS S., Los Angeles, Mathematics
SCHULZ, SR. M. RICHARDIS, Oakland, Botany
SCHWARTZ, MARTIN A., Mountain View, Chemistry
SECOR, GLENN A., Sacramento, Engineering
SEIDMAN, JOEL B., Los Angeles, Physics
SHORACK, GALEN R., Mountain View, Mathematics
SIEGEL, PAUL M., Los Angeles, Sociology
SILVERMAN, DENNIS J., Los Angeles, Physics
SINGMASTER, DAVID B., Berkeley, Mathematics
SKIDMORE, LIONEL J., Inglewood, Engineering
SMITH, JAMES G., Culver City, Earth Sciences
SMITH, JEROME A., Pasadena, Engineering
SMOLLER, CAROLYN G., Berkeley, Physiology
SNEED, JOSEPH D., Palo Alto, History and Philosophy of Science
STEA, DAVID, Menlo Park, Psychology
STEVENSON, PHILIP E., Menlo Park, Chemistry
STIFFLER, PRICE E., Jr., Berkeley, Mathematics
STOLARSKY, KENNETH B., San Diego, Mathematics
STRATHMANN, RICHARD R., Claremont, Biology
SUELZLE, LARRY R., Stanford, Physics
TAYLOR, HOWARD M., Stanford, Mathematics
TAYLOR, ROBERT W. W., Torrance, Mathematics
TELLER, DAVID C., Berkeley, Biochemistry
TELLER, DAVIDA Y., Berkeley, Psychology
THIELE, ALAN G., Sherman Oaks, Engineering
THOMAS, DONAL D., Morgan Hill, Chemistry
TREIMAN, DONALD J., Los Angeles, Sociology
TRIBE, LAURENCE H., San Francisco, Mathematics
ULRICH, JAMES W., Los Angeles, Mathematics
ULRICH, ROGER K., El Cerrito, Astronomy
VANTILL, HOWARD J., Ripon, Physics
VIALE, RICHARD O., Davis, Biophysics
VICTOR, JUDITH C., Los Angeles, History and Philosophy of Science
WALLACH, DANIEL, Los Angeles, Chemistry
WASHBURN, SHERWOOD, Berkeley, Mathematics
WATTERS, GARY Z., Menlo Park, Engineering
WEBSTER, DALE A., Albany, Biochemistry
WEIR, WILLIAM D., Arcadia, Chemistry
WERSEL, ORTWIN A., Los Angeles, Chemistry
WHITNEY, THOMAS A., Los Angeles, Chemistry
WIESNER, JOHN C., Daly City, Engineering
WILSON, WALTER D., Berkeley, Engineering
WOLF, JOSEPH A., Jr., Los Angeles, Engineering
WOLFF, RICHARD J., Berkeley, Physics
WOLVERTON, FRANKLIN B., Pasadena, Physics
WOOD, LOWELL L., Jr., Simi, Chemistry
YELLIN, STEVEN J., Los Angeles, Physics
ZACHER, ALBERT R., Fresno, Physics
ZIMMERMAN, PETER D., Los Angeles, Physics
ZUPP, RICHARD R., Stanford, Engineering

Cooperative Graduate

ADAMS, WILLIAM W., Hawthorne, Mathematics
ALBERT, HARRISON B., St. Helena, Chemistry
ARNOLD, DAVID O., Oakland, Sociology
ARNQUIST, CLIFFORD W., Playa del Rey, Mathematics
BARRETT, JAMES T., Mountain View, Engineering
BENDER, EDWARD A., Sacramento, Mathematics
BERICK, ALAN C., Santa Monica, Physics
BLUM, ROBERT A., Berkeley, Economics
BRACHER, KATHERINE, Claremont, Astronomy
BROOKES, JOHN A., Los Angeles, Microbiology
BROWN, DONALD E., Torrance, Anthropology
CHALMERS, JOHN H., Jr., La Jolla, General Biology
CLIFTON, CHARLES E., Jr., Los Altos, Psychology
COVER, THOMAS M., San Bernardino, Engineering
CRAIG, THEODORE W., Sacramento, Chemistry
CROW, STEVEN C., Arcadia, Engineering
DAETZ, DOUGLAS, Redwood City, Engineering
DASHEN, ROGER F., Redding, Physics
DAVIDSON, JON R., Palo Alto, Psychology
DAVIS, DONALD R., Ridgecrest, Chemistry
DAVIS, STEPHEN L., Oakland, Biophysics
DAY, ROBERT J., Pomona, Chemistry
DEGASTON, ALEXIS N., Los Angeles, Physics
DOKKEN, RODNEY D., Sacramento, Engineering
DONER, JOHN E., Monterey Park, Mathematics.
DOYEN, JOHN T., Berkeley, Zoology
DYER, MICHEAL N., Hollywood, Mathematics
ELLIGER, CARL A., Sacramento, Chemistry
EMERSON, DAVID N., Dos Palos, Zoology
EMERSON, WILLIAM R., Los Angeles, Mathematics
ENGLEMAN, VICTOR S., Los Angeles, Engineering
FITTS, AMELIA, Malibu, Sociology
FLYNN, CHARLES M., Jr., Sherman Oaks, Chemistry
FOSTER, LORRAINE L., Pasadena, Mathematics
FRITSCH, FREDERICK N., Berkeley, Mathematics
GALLIN, DANIEL, Los Angeles, Mathematics
GATES, BRUCE C., El Cerrito, Engineering
GIVER, LAWRENCE P., San Jose, Astronomy
GOULD, HARVEY A., Walnut Creek, Physics

Grant, Alva D., Claremont, Botany
Greene, Michael P., La Jolla, Physics
Gref, Lynn G., El Cajon, Mathematics
Grether, David M., Palo Alto, Economics
Hain, Donna D., San Diego, Mathematics
Hainline, Lydia J., San Bernardino, Anthropology
Haley, Kenneth W., Oakland, Engineering
Handel, Sidney S., Berkeley, Economics
Henyey, Frank S., El Cerrito, Physics
Hoffmann, Margaret S., Berkeley, Linguistics
Holland, Paul W., Mountain View, Mathematics
Horton, Fenn C., Covina, Economics
James, Leonard D., Palo Alto, Engineering
Jenkins, Edward B., Berkeley, Physics
Jensen, Carl A., Los Angeles, Chemistry
Johnson, Robert P., San Diego, Mathematics
Kamins, Theodore I., San Francisco, Engineering
Kendig, Keith M., Santa Monica, Mathematics
Kiger, John A., Jr., Pasadena, General Biology
Kirkpatrick, Kim A., San Diego, Physics
Kirschenbaum, Jack, La Puente, Psychology
Klein, Stanley A., Ontario, Physics
Knudsen, Mark F., Berkeley, Zoology
Kocher, Carl A., Stanford, Physics
Kruse, Robert L., Pasadena, Mathematics
Lampton, Michael L., Santa Monica, Physics
Levy, Donald J., Hollywood, Physics
Lynch, Harvey L., Palo Alto, Physics
Lynch, Richard W., Corcoran, Engineering
Machina, Kenton F., Redwood City, Mathematics
Mann, Michael M., Hawthorne, Engineering
Marshall, Robert E., Sacramento, Physics
Matthews, John W., Pasadena, Engineering
Maxwell, Douglas L., Berkeley, Mathematics
McAfee, John R., Long Beach, Physics
McCready, Thomas A., Sonora, Mathematics
Merrill, Albert W., La Canada, Engineering
Milman, Gregory, Los Angeles, Biophysics
Morris, Carl N., San Diego, Mathematics
Morse, Garth E., Riverside, Physics
Morse, Joseph G., Novato, Chemistry
Mullin, Frank E., Los Gatos, Mathematics
Murphy, Collin G., Berkeley, Genetics
Myers, William D., Berkeley, Physics
Nearing, James C., Inglewood, Physics
Nelson, Patricia A., Los Alamitos, Sociology
Newmark, Richard A., Berkeley, Chemistry
Norris, Carroll B., Jr., Los Altos, Engineering
Oates, Wallace E., Stanford, Economics
Orentlicher, Morton, Berkeley, Engineering
Osgood, Charles F., Berkeley, Mathematics
Pearson, Charles J., Anaheim, Physics
Raugh, Michael R., Van Nuys, Mathematics
Reyhner, Theodore A., Chico, Engineering
Richards, William R., Atascadero, Chemistry
Rider, Daniel G., Santa Ana, Mathematics
Ripka, William C., Long Beach, Chemistry
Robbins, Lee P., Van Nuys, Economics
Robinson, Norman F., Riverside, Mathematics
Robinson, Norman O., Jr., San Pedro, Engineering
Rock, Peter A., Albany, Chemistry
Rodriguez, Sergio E., West Covina, Engineering
Rohrer, Ronald A., Berkeley, Engineering
Russell, Ralph R., Santa Barbara, Economics
Salamon, Myron B., Oakland, Physics
Schaffer, Michael J., Encino, Engineering
Schimbor, Richard F., Walnut Creek, Chemistry
Shapiro, Robert H., Stanford, Chemistry
Sheeler, Phillip, Los Angeles, Zoology
Sherrill, Thomas J., Berkeley, Astronomy
Sherwood, Arnold I., La Jolla, Physics
Shipsey, Edward J., Red Bluff, Chemistry
Slobin, Stephen D., San Marino, Engineering
Smart, Wesley M., Oakland, Physics
Smith, David A., Los Angeles, Biochemistry
Smith, Lester V., Jr., Stockton, Chemistry
Smith, Preston G., Jr., La Crescenta, Engineering
Snyder, Russell L., La Jolla, Oceanography
Soohoo, Keith M., Los Angeles, Engineering
Spalding, Joan N., Los Angeles, Genetics
Sperry, Willard C., Davis, Physics
Spilerman, Seymour, Los Angeles, Engineering
Stomp, Michael J., Sacramento, Physics
Storer, Thomas F., Sherman Oaks, Mathematics
Tankersley, Donald L., Orland, Chemistry
Taylor, James G., West Covina, Engineering
Teague, Calvin C., Los Altos, Engineering
Thomas, Edward S., Jr., Riverside, Mathematics
Thomson, Michael R., Santa Monica, Economics
Trager, George W., Berkeley, Microbiology
Travis, Michael R., Oakland, Physics
Ward, Calvin B., Venice, Physics
Warner, Kenneth K., Bakersfield, Mathematics
Waters, James F., Santa Barbara, Zoology
Watson, H. Lee, Jr., San Diego, Physics
Watson, Priscilla, San Francisco, Physics
Whittier, Ronald J., Mountain View, Engineering
Wilder, Patricia A., Upland, Botany
Wiley, Michael D., Long Beach, Chemistry
Williamson, Stanley G., Santa Barbara, Mathematics
Yale, Irl K., Berkeley, Mathematics
Yeaton, Mary A., Berkeley, Mathematics
Zelver, Jack S., Berkeley, Mathematics

Graduate Teaching Assistant

Akasaki, Takeo, Monterey Park, Mathematics
Alvarez, Walter S., Berkeley, Earth Sciences
Bachelis, Gregory F., Sausalito, Mathematics
Beckwith, Howard B., Long Beach, Mathematics
Berry, Sara S., Pasadena, Economics
Bishop, Lewis G., Santa Monica, Biophysics
Bottger, Gary L., South Gate, Chemistry
Braun, Donald E., Stockton, Chemistry
Brown, Larry C., San Diego, Chemistry
Campbell, Howard W., Los Angeles, General Biology
Chase, Phillip J., Pasadena, Mathematics
Cocchiarella, Nino B., Los Angeles, History and Philosophy of Science
Currey, Donald R., Banning, Earth Sciences
Dixon, Marlène D., Venice, Sociology

DOLBEAR, GEOFFREY E., Redwood City, Chemistry
DUNCAN, JOHN R., Jr., Los Angeles, Earth Sciences
ELINSON, HOWARD, Los Angeles, Sociology
ELLIOTT, RAYMOND L., La Mesa, Earth Sciences
EVANS, DAVID H., Menlo Park, General Biology
EVANS, KENNETH J., Riverside, Zoology
GAUDET, JOHN J., Berkeley, Botany
GHENT, EDWARD D., Berkeley, Earth Sciences
GOGERTY, DAVID C., La Crescenta, Economics
GORDON, DUDLEY C., II, Los Angeles, Sociology
GRANEY, DANIEL O., San Francisco, Zoology
GRETHER, DAVID M., Palo Alto, Economics
HARDHAM, WILLIAM M., Pasadena, Chemistry
HEINSOHN, GEORGE E., Orinda, General Biology
HILL, HENRY H., Pasadena, Physics
HOBSON, RICHARD D., Sierra Madre, Earth Sciences
HOLLISTER, LINCOLN S., Pasadena, Earth Sciences
HYATT, RONALD C., Palo Alto, Engineering
JORDAN, BERNARD W., Jr., Anaheim, Engineering
KINSEY, ROBERT R., Albany, Physics
KRAY, LOUIS R., Riverside, Chemistry
KROEZE, MADELEINE A., Whittier, Psychology
LANDOLFI, JOHN G., San Francisco, Mathematics
LARSEN, RONALD J., Palo Alto, Mathematics
LENN, ROBIN C., San Francisco, Zoology
LOEB, PETER A., El Cerrito, Mathematics
LYNCH, HARVEY L., Palo Alto, Physics
MCCAFFREY, JOHN D., San Francisco, Anthropology
MIHALAS, DIMITRI M., Los Angeles, Astronomy
MORSE, JOSEPH G., Novato, Chemistry
MORTON, LINDA L., Alhambra, Microbiology
MOSHER, LOREN C., Santa Barbara, Earth Sciences
NORWOOD, FREDERICK R., Los Angeles, Engineering
NOWER, LEON, Palo Alto, Mathematics
PARSONS, RONALD G., Stanford, Physics
PIPPIN, WALLACE H., Davis, Chemistry
PLATT, GERALD M., Los Angeles, Sociology
PURELIS, GINA A., Berkeley, Botany
ROSE, CHARLES B., Berkeley, Chemistry
SARGIS, DAVID A., Berkeley, Engineering
SCHMID, STUART G., Santa Monica, Economics
SCOTT, JOHN F., Berkeley, Sociology
SCOTT, NORMAN J., Jr., Los Angeles, General Biology
SHARP, ROBERT V., Pasadena, Earth Sciences
SHLEMON, ROY J., Berkeley, Earth Sciences
STARR, JOHN E., Stanford, Chemistry
STAVROU, HELEN, Riverside, Zoology
SURDAM, RONALD C., Temple City, Earth Sciences
SYLVESTER, ARTHUR G., South Pasadena, Earth Sciences
TANKERSLEY, DONALD L., Orland, Chemistry
THAYER, SANFORD B., Atherton, Engineering
TROUTMAN, JOHN L., Los Altos, Mathematics
TRUE, DELBERT L., Fallbrook, Anthropology
TYSON, GRETA E., Berkeley, Zoology
TYSON, JOHN A., Carlsbad, Physics
UREY, JOHN C., Pasadena, Biochemistry
VANHECKE, GERALD R., Rosemead, Chemistry
WAKE, MARVALEE H., Los Angeles, Zoology
WATERBURY, RONALD G., Venice, Anthropology
WATSON, PRISCILLA, San Francisco, Physics
WEBB, SAWNEY D., Thermal, Earth Sciences
WEIST, KATHERINE M., Los Altos, Anthropology
WERTHEIM, GEORGE A., Menlo Park, Psychology
WHITESIDE, DONALD, Stanford, Sociology
WIBERG, DONALD M., Pasadena, Engineering
WILEY, MICHAEL D., Long Beach, Chemistry
WILLIAMSON, STANLEY G., Santa Barbara, Mathematics
WILLIS, EDWIN O., Berkeley, Zoology
WINSTON, GORDON C., Stanford, Economics

Postdoctoral

ALLARA, DAVID L., Los Angeles, Chemistry
APPLEMAN, M. MICHAEL, Pacific Palisades, Biochemistry
BRANDOW, BAIRD H., Valley Center, Physics
BURNETT, DONALD S., El Cerrito, Earth Sciences
CARLTON, TERRY S., Berkeley, Chemistry
CLOUGH, RAY W., El Cerrito, Engineering
COHEN, DAVID H., Walnut Creek, Psychology
CURRENT, JERRY H., Albany, Chemistry
DUNN, IRVING J., Orinda, Engineering
EDELSTEIN, ALAN S., Stanford, Physics
FRANKLIN, STANLEY P., Los Angeles, Mathematics
GLAESER, ROBERT M., Berkeley, Biophysics
GRIFFIN, DAVID H., Berkeley, Biology
HAMILTON, WILLIAM O., Mountain View, Physics
HONEYWELL, WALLACE I., San Gabriel, Chemistry
JANTSCHER, GERALD R., Fontana, Economics
KALB, AARON J., Davis, Biophysics
KIRZ, JANOS, Berkeley, Physics
KONRAD, MICHAEL W., Berkeley, Biophysics
LAMBERT, BERND, Berkeley, Anthropology
LAWLER, RONALD G., Selma, Chemistry
LIGHTNER, DAVID A., Bakersfield, Chemistry
MCCALL, JOHN J., Canoga Park, Economics
MCNIVEN, HUGH D., Berkeley, Mathematics
MOTE, CLAYTON D., Jr., Berkeley, Engineering
MURRAY, CHARLES L., Menlo Park, Medical Sciences
ORLOSKI, RAYMOND F., Los Angeles, Chemistry
PEDERSON, DONALD O., Berkeley, Engineering
POIRIER, JOHN A., Berkeley, Physics
PRYOR, GORDON T., Richmond, Mathematics
RALSTON, HENRY J., III, San Francisco, Zoology
SALANS, LESTER B., Menlo Park, Medical Sciences
SALTIEL, JACK, Inglewood, Chemistry
SCHNIEWIND, ARNO P., El Cerrito, Agriculture
SHAPIRO, KENNETH A., Los Angeles, Physics
SHARP, DAVID H., Pasadena, Physics
SILVERSTONE, HARRIS J., Pasadena, Chemistry
SIMPSON, KENNETH L., Monterey, Biochemistry
SIMPSON, PAUL G., Wilmington, Chemistry
SIMS, JAMES J., Los Angeles, Chemistry
SMITH, GERALD J., Jr., Berkeley, Mathematics
SOSNICK, STEPHEN H., Davis, Mathematics
TAYLOR, PETER B., La Jolla, Chemistry
TUCKER, VANCE A., Los Angeles, Physiology
WILLEY, FREDERICK G., Berkeley, Chemistry
WILLIAMS, JOHN A., Berkeley, Astronomy

WOJCICKI, STANLEY G., Berkeley, Physics
YEE, KANE S., San Francisco, Mathematics

Senior Postdoctoral

AITKEN, HUGH G. J., Riverside, Economics
ALDER, BERNI J., Livermore, Physics
FEIGEN, GEORGE A., Palo Alto, Medical Sciences
GIBBONS, JAMES F., Palo Alto, Physics
GOULD, ROY W., Pasadena, Physics
GREEN, MELVIN M., Davis, Genetics
HILDEMANN, WILLIAM H., Los Angeles, Genetics
HOWELL, JAMES E., Palo Alto, Economics
LAURITSEN, THOMAS, Pasadena, Physics
LIDICKER, WILLIAM Z., Jr., Berkeley, Biology
NOYCE, DONALD S., Berkeley, Chemistry
REYNOLDS, JOHN H., Berkeley, Physics
SCHWARZ, WILLIAM H., Palo Alto, Engineering
SELVIN, HANAN C., Berkeley, History and Philosophy of Science
STOCKING, C. RALPH, Davis, Botany
VAUGHT, ROBERT L., Berkeley, Mathematics
WEMPNER, GERALD A., Berkeley, Engineering

Science Faculty

ALCORN, CAROL R., Bakersfield, Mathematics
ANDERSON, CLYDE L., San Bernadino, Chemistry
AUERBACH, MILTON I., Van Nuys, Mathematics
BENTON, CLIFFORD S., Santa Barbara, Chemistry
CAMPBELL, JAMES A., El Camino, Chemistry
CARTER, ALAN B., Fullerton, Mathematics
COGSWELL, HOWARD L., Oakland, Zoology
DEMPSEY, WESLEY H., Chico, Genetics
FREY, WALTER C., San Pablo, Mathematics
GECHTMAN, MURRAY, Los Angeles, Mathematics
HERBST, ALBERT F., La Verne, Mathematics
HUANG, FRANCIS F., San Jose, Engineering
HURT, HUGH H., Jr., Los Angeles, Engineering
JONES, LINCOLN D., San Jose, Engineering
KERRI, KENNETH D., Sacramento, Engineering
LIEBERMAN, LEONARD, Bakersfield, Anthropology
LINT, HAROLD L., San Luis, Botany
MARA, WALTER T., Monterey, Mathematics
MERRIELL, DAVID M., Santa Barbara, Mathematics
MERTES, DAVID H., Stockton, Zoology
NEWMAN, DONALD G., San Jose, Engineering
PALMER, BERNARD, Farmingdale, Anthropology
PAYNE, JAMES R., Monterey, Mathematics
PIERCE, ALBERT, Northridge, Mathematics
ROBINSON, STANLEY F., Pasadena, Mathematics
SANBORN, HOWARD P., San Leandro, Biology
SANKS, ROBERT L., Spokane, Engineering
SMITH, DEBOYD L., Monterey, Physiology
WHITEKER, ROY A., Claremont, Chemistry
WILLIAMS, FLOYD J., Redlands, Earth Sciences
WOODBURY, RICHARD C., Provo, Engineering
WULFF, JOHN L., Sacramento, Mathematics

Summer Fellowships for Secondary School Teachers

BAIR, WILLIAM P., Pasadena, Mathematics
EDMONDS, VAUGHAN W., Long Beach, Biology
EMERSON, DAVID N., Dos Palos, Zoology
ENYART, JESSIE J., Fresno, Mathematics
ESSEL, DAVID H., Ojai, Botany
FIELDS, LORRAINE S., Fresno, Mathematics
FLANIGAN, GEORGE E., San Diego, Biology
GAUDIN, ANTHONY J., Los Angeles, Zoology
GAWLIK, SR. M. EVELYN, Santa Fe Springs, Microbiology
GOOKIN, WILLIAM E., San Diego, General Science
HARDEN, WILLARD W., El Segundo, Zoology
HEINZE, ARLEY W., Morgan Hill, Biology
HUNTER, WHITEFORD L., Barstow, Biology
JENKINS, DON L., Santa Fe Springs, Botany
JONES, JIMMIE N., Yuba City, Mathematics
KARAZISSIS, NICOLAS, Sherman Oaks, Biology
KNAUPP, JONATHAN E., Crescent City, Mathematics
KOBAN, JOHN J., Jr., Banning, Biology
LAZANSKY, ELENORE M., Oakland, Mathematics
LINDSAY, EVERETT H., Yuba City, Earth Sciences
NAKAMURA, KAZUKO, Los Angeles, Biology
NELSON, DALE D., San Jose, Chemistry
RANDOL, DONALD L., Garden Grove, Mathematics
RUSSELL, ROBERT G., Union City, Mathematics
SPENCER, ROBERT D., Lakewood, Mathematics
TEMMINS, ALBERT, Redondo Beach, Mathematics
WAITE, MERWIN L., Gardena, Mathematics
WALKER, JAMES W., Lawndale, Mathematics

COLORADO

Graduate

ANDERSEN, ALICE L., Lakewood, Biology
BARTH, THEODORE J., Colorado Springs, Mathematics
BERKELEY, PETER J., Jr., Boulder, Chemistry
CHAPPELL, WILLARD R., Colorado Springs, Physics
DULK, GEORGE A., Golden, Earth Sciences
ELSBERRY, RUSSELL L., Platteville, Engineering
HEIDGER, PAUL M., Jr., Lakewood, Zoology
HOLLAND, RICHARD L., Boulder, Zoology
IRWIN, HENRY J., Morrison, Anthropology
JESSUP DAVID M., Greeley, Biology
KJELDGAARD, EDWIN A., Brush, Chemistry
KRIEGER, HENRY A., Denver, Mathematics
MANNING, DEAN D., Grand Junction, Microbiology
MORGAN, BARBARA J., Fort Collins, Psychology
NAYLOR, RICHARD S., Denver, Earth Sciences
PRICE, RICHARD M., Manitou Springs, Astronomy
ROBERTS, JOEL L., Englewood, Mathematics
SCHLEIF, ROBERT F., Denver, Physics
SHIER, GEORGE D., Golden, Chemistry
SOWARDS, JACK W., Morrison, Engineering
STONE, GEORGE T., Cowdrey, Earth Sciences
TAUSSIG, MICHAEL K., Pueblo, Economics
VOGEL, BEATRICE R., Boulder, Zoology
WATERHOUSE, WILLIAM C., Denver, Mathematics
WISEMAN, JOHN R., Boulder, Chemistry
YOUNG, CHAPMAN, III, Castle Rock, Earth Sciences

Cooperative Graduate

BEM, DARYL J., Denver, Psychology
BINDER, FRANK H., III, Boulder, Mathematics
DEWEY, FRED M., Boulder, Chemistry

DEYOUNG, DAVID S., Colorado Springs, Physics
GREENE, DAVID L., Boulder, Anthropology
HEWETT, LIONEL D., Denver, Physics
KERST, AL F., Fort Collins, Chemistry
KLODT, DONALD T., Denver, Engineering
LEHMAN, JOHN W., Boulder, Chemistry
MARSTON, NORMAN L., Hartman, Zoology
ROBINSON, CLARENCE W., Jr., Pueblo, Engineering
SHIER, JOHN S., Golden, Physics
WIESELMANN, PAUL A., Colorado Springs, Engineering

Graduate Teaching Assistant

BARR, DONALD R., Fort Collins, Mathematics
BOGGS, SAM, Jr., Boulder, Earth Sciences
DOUGHERTY, MARGARET A., Fort Collins, Microbiology
ECKHARDT, CRAIG J., Broomfield, Biochemistry
ESCH, GARY F., Colorado Springs, Mathematics
FENDRICH, JOHN W., Boulder, Mathematics
FINE, LOUIS A., Denver, Mathematics
GIBSON, ARCHIE G., Greeley, Mathematics
GOLD, ANN, Greeley, Zoology
GREENE, DAVID L., Boulder, Anthropology
GUERTIN, CAROL J., Boulder, Psychology
HARPER, MELVIN L., Boulder, Earth Sciences
HAY, ARTHUR J., Denver, Chemistry
HELMAN, WILLIAM P., Grand Junction, Chemistry
JUDY, MILLARD M., Golden, Physics
LEE, DONALD E., Denver, Engineering
PAIST, DONALD A., Denver, Earth Sciences
RAMALEY, WILLIAM C., Denver, Mathematics

Postdoctoral

BIRKY, CARL W., Jr., Fort Collins, Genetics
JAFFE, ROBERT B., Littleton, Medical Sciences
PEERCY, CAROL L., Montrose, Mathematics
SHARP, JOHN V., Boulder, Earth Sciences

Science Faculty

BRADT, ALBERT J., Boulder, Engineering
BROWN, ROBERT Z., Colorado Springs, Biology
BUDAK, ARAM, Fort Collins, Engineering
EAGER, WILLIAM R., Boulder, Engineering
HULTQUIST, PAUL F., Boulder, Mathematics

Summer Fellowships for Secondary School Teachers

BANK, EVELYN R., Westminster, Chemistry
CONKLIN, AUGUST, Boulder, Biology
GILKEY, CHARLES G., Denver, Biology
SCHLUP, DON D., Denver, Biology
STEEN, MARSHALL T., Meeker, Biology

CONNECTICUT

Graduate

ANDEEN, GERRY B., New Canaan, Engineering
ASH, J. MARSHALL, Stamford, Mathematics
BARKENTIN, ELIZABETH L., Cos Cob, Psychology
BRITTON, JOHN P., Bloomfield, History and Philosophy of Science
CARLSON, RAYMOND G., New Haven, Engineering
DEFOE, JOHN D., West Hartford, Biochemistry
DOWNS, HELEN H., Pine Orchard, Engineering
DUNNING, JOHN R., Jr., Sherman, Physics
EVANSON, JACOB T., New Haven, Psychology
FANNING, ANTHONY D., Middlebury, Mathematics
FERRAR, JOSEPH C., North Branford, Mathematics
FLYNN, GEORGE W., Jr., Hartford, Chemistry
FULTON, WILLIAM E., Darien, Mathematics
GOWDY, ROBERT H., Rockville, Physics
JOHNSTON, JOAN E., Ansonia, Zoology
KOWALSKI, ROBERT A., Milford, Mathematics
KOZLOWSKI, GEORGE A., Jr., Middletown, Mathematics
LABINE, PATRICIA A., Somers, Biology
LASKER, BARRY M., West Hartford, Astronomy
NICHOLS, DONALD A., Hamden, Economics
NORTH, DANIEL W., Wilton, Physics
OAKS, EMILY C., New Haven, Zoology
PENCZER, RUDOLF E., Fairfield, Physics
PFEFFER, ALLEN M., Portland, Mathematics
PROKOSCH, ERIC, Old Greenwich, Anthropology
REA, MARGARET J., West Hartford, Physics
RHINES, PETER B., Glastonbury, Engineering
SCHWENK, HAROLD S., Jr., Storrs, Mathematics
SEIDMAN, ABRAHAM N., Plainfield, Physics
SHAMROTH, STEPHEN J., West Hartford, Engineering
SPERA, ANNETTE J., Glenbrook, Psychology
STEYN, RUTH, Ridgefield, Biochemistry
TSCHINKEL, WALTER R., Glastonbury, Biochemistry
WEHMANN, ALAN A., Darien, Physics

Cooperative Graduate

BERKA, LADISLAV H., Storrs, Chemistry
DENEUFVILLE, RICHARD L., West Hartford, Engineering
EBNER, CHARLES A., Mansfield Center, Physics
FREEDMAN, DANIEL Z., West Hartford, Physics
JARVIS, HAROLD F., Polton, Engineering
KERBER, ROBERT C., Wethersfield, Chemistry
KLINMAN, CYNTHIA S., Hartford, Psychology
KMETZO, JOHN W., Fairfield, Engineering
MUELLER, JOHN J., Thomaston, Chemistry
ULBRICH, HOLLEY H., Storrs, Economics
WILLIAMS, WILLIAM L., New Haven, Physics
WOODSON, JAMES L., Hartford, Zoology

Graduate Teaching Assistant

BARRANTE, JAMES R., Torrington, Chemistry
BAUM, JAMES H., West Hartford, Physics
BERKA, LADISLAV H., Storrs, Chemistry
BERKI, SYLVESTER E., New Haven, Economics
EISENSTADT, AUDREY F., New Haven, Zoology
GODFREY, ARTHUR W., Storrs, Chemistry
GOLUB, ALLYN L., Wallingford, Physiology
GRAY, GARLAND A., Jr., Wallingford, Earth Sciences
GUETHS, JAMES E., Storrs, Physics
LANGLEY, THEODORE D., Bridgeport, Psychology
LONGO, JOHN M., Windsor, Chemistry
RUTTER, EDGAR A., Jr., West Haven, Mathematics
WEINBERG, MICHAEL C., New Haven, Chemistry
WENTLAND, STEPHEN H., New Britain, Chemistry

Postdoctoral

MAGID, RONALD M., New Haven, Chemistry
POMERANTZ, MARTIN, New Haven, Chemistry
STANLEY, ROLFE S., Cheshire, Earth Sciences
TURRO, NICHOLAS J., Middletown, Chemistry

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Senior Postdoctoral

BERNSTEIN, EMIL O., Storrs, Physiology
ZUCKER, MILTON L., New Haven, Biochemistry

Science Faculty

BRAND, RONALD S., Storrs, Engineering
BRIGGS, JAMES W., Provo, Mathematics
COOPERSMITH, STANLEY, Middletown, Psychology
HILDING, WINTHROP E., Storrs, Engineering

Summer Fellowships for Secondary School Teachers

DIBLASI, M. ANTONY, Sr., Stamford, Biology
FANUCCI, ARLENE J., Amity, Genetics

DELAWARE

Graduate

WORTMAN, DENNIS H., Wilmington, Mathematics

Cooperative Graduate

FARNUM, BRUCE W., Newark, Chemistry
GINN, ROBERT F., Newark, Engineering
HYNES, THOMAS V., Wilmington, Physics
INNES, JOHN E., Newark, Chemistry
KIRKPATRICK, EDWARD S., Wilmington, Physics
TOOTHILL, RICHARD B., Wilmington, Chemistry
WILLIAMS, JOHN M., Newark, Engineering

Graduate Teaching Assistant

FARNUM, BRUCE W., Newark, Chemistry
HYNES, THOMAS V., Wilmington, Physics
KENYON, GEORGE L., Wilmington, Chemistry
LEINBACH, LEWIS C., Newark, Mathematics

Postdoctoral

HEINDEL, NED D., Newark, Chemistry
LORAND, JOHN P., Wilmington, Chemistry

Science Faculty

AMES, WILLIAM F., Newark, Engineering

Summer Fellowships for Secondary School Teachers

DZURANIN, STEPHEN, New Castle, Chemistry

DISTRICT OF COLUMBIA

Graduate

ACKERMANN, JOHN M., Biology
BELSLEY, DAVID A., Economics
CLAGUE, CHRISTOPHER K., Economics
EASTON, WILLIAM B., Mathematics
GOOR, RONALD S., Biochemistry
GRAY, CHARLES A., Engineering
HECK, HENRY D., Biochemistry
HILL, HOWARD T., Engineering
JOHNSON, ELEANOR A., Zoology
MACNAMARA JOHN P., Zoology
MUNROE, MARIAN H., Botany
RICE, JERRY M., Biochemistry
SENTURIA, STEPHEN D., Physics
SHEPLEY, LAWRENCE C., Physics

Cooperative Graduate

BETTICE, GERALD J., Biochemistry
DESJARDINS, RICHARD L., Physics
ELIOT, FRANK C., Engineering
GERRITY, THOMAS P., Jr., Engineering
GILMER, LUDWELL H., Engineering
JANNEY, GARETH M., Physics
KAMINETZKY, LEE, Mathematics
KEELER, THOMAS L., Jr., Biophysics
MINICHIELLO, JOHN K., Physiology
OLIVER, RICHARD K., Mathematics
SOMMERFELDT, EDWARD E., Physics
SUSSMANN, ROSALINA, Chemistry

Postdoctoral

SCHOT, STEVEN H., Mathematics

Senior Postdoctoral

RUBIN, ROBERT J., Physics

Science Faculty

DOUGLASS, MATTHEW M., Engineering
HAKALA, REINO W., Chemistry
WEINBERGER, MORRIS A., Pathology

Summer Fellowships for Secondary School Teachers

HANRAHAN, PAMELA E., Biology
KAVULA, SR., M. VERNE, Earth Sciences

FLORIDA

Graduate

ALEXANDER, CHARLES N., Jr., Clearwater, Sociology
ANDERSON, LESLIE B., III, Winter Haven, Engineering
BARNES DONALD G., Tallahassee, Chemistry
BARNES, KAREN K., Tallahassee, Chemistry
BURKHARDT, THEODORE W., Nokomis, Physics
CALHOUN, MYRON A., Milton, Engineering
CARGO, DAVID P., St. Cloud, Mathematics
DAVIS, JON A., Jacksonville, Engineering
DOVER, CARL B., Orlando, Physics
ELSON, MARK A., Surfside, Mathematics
FEDDERS, PETER A., St. Petersburg, Physics
GRESENS, RANDALL L., Tallahassee, Earth Sciences
GUNTER, KARLENE K., Fort Lauderdale, Physics
HAMILTON, ROBERT B., St. Petersburg, Zoology
HARVEY, CHARLES M., Atlantic Beach, Mathematics
JASANOFF, JAY H., St. Petersburg, Linguistics
LAMBERT, JERRY R., Live Oak, Engineering
MORRIS, ROBERT W., Eau Gallie, Biology
ROGERS, ARTHUR H., Jr., Lockhart, Physics
ROGERS, JUDITH L., Clearwater, Botany
RUCKLE, WILLIAM H., Tallahassee, Mathematics
SCHWARCZ, ROBERT M., Coral Gables, Physics
STRASEN, STEPHEN M., Sarasota, Mathematics
SULZER, JEFFERSON L., Gainesville, Psychology
WAGONER, JOHN B., Jacksonville, Mathematics
ZAME, ALAN, Coral Gables, Mathematics

Cooperative Graduate

BASCH, JERRE L., Miami, Psychology
BENT, GARY D., Orlando, Physics
BRODSKY, MARC H., Coral Gables, Physics
BURKE, WILLIAM L., St. Petersburg, Physics
DAY, B. JANE M., Gainesville, Mathematics
DIMMICK, CHARLES W., Jacksonville, Earth Sciences

FREEMAN, NEIL J., Coral Gables, Engineering
HEAD, RONALD A., Pensacola, Chemistry
HODGSON, JEFFREY W., Lakeland, Engineering
HOWARD, JAMES H., III, Daytona Beach, Earth Sciences
JONES, GRANT D., Clearwater, Anthropology
LIEBERMAN, MICHAEL A., Miami, Engineering
MEYER, JAMES W., Coral Gables, Physics
NUDELMAN, ARTHUR E., Orlando, Sociology
PARRISH, JAN T., Miami, Psychology
PAULS, DAVID E., Lakeland, Engineering
PAYNE, STANLEY E., Tallahassee, Mathematics
RIGBY, ROBERT N., Tallahassee, Physics
ROBERTSON, PHILIP B., Miami, General Biology
SHAMPINE, LAWRENCE F., Ocala, Mathematics
SHOLAR, MAURICE A., Miami, Engineering
SMITH, DOUGLAS B., Gainesville, Engineering
ST. JOHN, PETER A., Eustis, Chemistry
STARCK, WALTER A., II, Miami, Zoology
TEITELMAN, WARREN, Miami, Mathematics
UPHAM, WILLIAM K., Gainesville, Sociology
VICKERS, THOMAS J., Miami, Chemistry
WEINBERG, JACOB M., Miami, Physics

Graduate Teaching Assistant

BELZ, Donald J., Gainesville, Engineering
CHAMPION, ROY L., Gainesville, Physics
EDMUNDS, LELAND N., Jr., North Miami, Biochemistry
FACKLAM, RICHARD R., Tallahassee, Microbiology
GULKIS, SAMUEL, Miami, Physics
HERGENRODER, JOHN D., Jacksonville, Earth Sciences
JUSICK, ANTHONY T., Gainesville, Physics
KRISCHER, KENNETH N., Miami, Biochemistry
MALABY, JOHN E., Miami, Psychology
MARCUS, ALVIN B., Miami Beach, Chemistry
MEYER, JAMES W., Coral Gables, Physics
O'NEILL, PATRICIA A., Gainesville, Chemistry
PAULSON, DENNIS R., Miami, Zoology
POLLARD, CHARLES O., Jr., Tallahassee, Earth Sciences
STAAB, ROBERT A., West Palm Beach, Chemistry

Postdoctoral

GOODMAN, ROE W., Lakeland, Mathematics
HREN, JOHN J., St. Petersburg, Engineering
NEALY, DAVID L., Sarasota, Chemistry

Senior Postdoctoral

ANDREWS, JAMES J., Tallahassee, Mathematics
MUSCHLITZ, EARLE E., Jr., Gainesville, Chemistry

Science Faculty

CLINTON, JAMES H., Mariana, Biology
CRANE, BETTYE R., Tampa, Mathematics
FOGARTY, WILLIAM J., Miami, Engineering

Summer Fellowships for Secondary School Teachers

DATES, ROBERTA M., Miami, Biology
HERNDON, JULIA J., Orlando, Zoology
MARSHALL, EDDIE B., Jacksonville, Zoology
NANNEY, JAMES L., Miami, Mathematics

GEORGIA

Graduate

ANDERSON, ALBERT S., III, Atlanta, Physics
BOWDEN, SANDRA T., Arlington, Botany
BRAMBLETT, JERRY E., Smyrna, Mathematics
CORNWELL, JOSEPH D., III, Conyers, Physics
FLOYD, MIDDLETON B., Decatur, Chemistry
HARRIS, GRADY W., Atlanta, Engineering
HUGHES, CAROLINE A., Atlanta,, Microbiology
LONGSHORE, JOHN D., Atlanta, Earth Sciences
LOWE, JOHN T., La Grange, Chemistry
MONCRIEF, JOHN W., Rabun Gap, Chemistry
SHEATS, JOHN E., East Point, Chemistry
SIMMONS, HARRY D., Jr., Athens, Chemistry
TERRY, CLAUDE E., Jr., Cumming, Genetics
WHITMAN, MELINDA, Atlanta, Mathematics
WOODS, ROBERT C., III, Atlanta, Chemistry

Cooperative Graduate

BRYANT, JOHN L., Athens,, Mathematics
BURDICK, ROBERT O., Decatur, Mathematics
CRAMER, ARDIS L., Atlanta, Zoology
DENNIS, TOM R., Macon, Astronomy
HALL, ZACH W., Atlanta, Biochemistry
HOLLIDAY, JAMES C., Milledgeville, Physics
MALONE, THOMAS J., Atlanta, Engineering
RUTLEDGE, RONALD M., Decatur, Chemistry
SCHILD, MARY E., Americus, Psychology
SLOAN, BEN L., Athens, Zoology
SOLOMON, PHYLLIS, Nashville, Chemistry
WILSON, HOWELL K., Savannah, Mathematics

Graduate Teaching Assistant

BOSARGE, WILBUR E., Jr., Atlanta, Mathematics
BOWERS, EMMIE V., Hopeville, Zoology
BREWER, JOHNNY G., Harlem, Chemistry
BRIANT, ROBERT L., Decatur, Engineering
ELDER, LONZY E., Jr., Bishop, Mathematics
HARPER, JUDSON M., Decatur, Chemistry
JONES, SAMUEL B., Jr., Athens, Botany
LONGSHORE, JOHN D., Decatur, Earth Sciences
MARSHALL, ALLINE B., Albany, Zoology
PYLE, JOHN T., Atlanta, Chemistry
SPARKS, ARTHUR G., Brooklet, Mathematics
TREASH, CHRISTINE C., Atlanta, Mathematics

Postdoctoral

PROSSER, FRANKLIN P., Atlanta, Chemistry

Science Faculty

BOLDEN, WILEY S., Atlanta, Psychology
CASH, DEWEY B., Talbotton, Mathematics
DAVIS, HERBERT L., Jr., Mount Berry, Biology
POOLE, DONALD H., Athens, Earth Sciences
RIVERS, PRINCE, Nashville, Chemistry
ROBINSON, DANIEL A., Atlanta, Mathematics

Summer Fellowships for Secondary School Teachers

CURLEY, AUGUST, Atlanta, Chemistry
VAUGHN, JAMES B., Savannah, Mathematics

HAWAII

Graduate

CRAIG, NESSLY C., Kailua, Biology
ELLSWORTH, BARBARA H., Honolulu, Microbiology
HENDERSON, NANINE S., Honolulu, Zoology
WAT, EDWARD K. W., Honolulu, Chemistry

Cooperative Graduate

OKIISHI, THEODORE H., Honolulu, Engineering
SPRING, C. THOMAS, Honolulu, Mathematics
TSUNODA, JOYCE S., Honolulu, Biochemistry

Graduate Teaching Assistant

BOSCH, HERMAN F., Honolulu, Zoology
GARDNER, LOUISE C., Honolulu, Anthropology
MILLER, EARL E., Honolulu, Physics

Science Faculty

LAVOIE, RONALD L., Honolulu, Meteorology

Summer Fellowships for Secondary School Teachers

PLEIMANN, BERNARD T., Honolulu, Mathematics

IDAHO

Graduate

BLOOMSBURG, GEORGE L., Moscow, Engineering
BOWMAN, WALLACE N., Dietrich, Earth Sciences
DAVISON, LEE W., Boise, Engineering
EVANS, DENNIS R., Pocatello, Engineering
PACK, RUSSELL T., Grace, Chemistry
TAYLOR, LANCE J., Montpelier, Economics

Cooperative Graduate

KINTNER, JUDITH A. B., Idaho Falls, Chemistry
OTTESON, OTTO H., St. Anthony, Physics
WALL, ROBERT G., Boise, Chemistry

Graduate Teaching Assistant

HANKS, DAVID L., Tetonia, Botany
SMITH, CLYDE L., Moscow, Earth Sciences

Postdoctoral

BARNES, BURTON V., Moscow, Agricultural Sciences
BRIGHT, ROBERT C., Preston, Earth Sciences
PEARSON, LORENTZ C., Rexburg, Botany
VERNER, JARED, Moscow, Zoology

ILLINOIS

Graduate

AKEMANN, CHARLES A., Elgin, Mathematics
ALBERTS, BRUCE M., Highland Park, Biophysics
ALTMAN, LAWRENCE J., Chicago, Chemistry
ANDERSON, THOMAS F., Chicago, Earth Sciences
APPELQUIST, THOMAS W., Calumet City, Physics
ARCHER, MYLA M., Champaign, Mathematics
ASH, ROBERTA T., Chicago, Sociology
AUMAN, JASON R., Jr., Evanston, Astronomy
AUST, RICHARD B., Elmhurst, Engineering
BAER, WALTER S., Glencoe, Physics
BIELAWA, RICHARD L., Chicago, Engineering
BISCHOFF, CHARLES W., Wilmette, Economics
BOOSTROM, EUGENE R., Moline, Psychology
BORISY, GARY G., Chicago, Biophysics
BRANDT, KARL G., Park Forest, Chemistry
BRODY, LINDA J., Chicago, Biology
BROWN, BARRY W., Riverside, Mathematics
BRUCH, LUDWIG W., Winnebago, Physics
BUHL, ALBERT J., La Grange Park, Chemistry
BURMEISTER, EDWIN D., Park Ridge, Economics
BURNHAM, WILLETS M., Highland Park, Psychology
BURROUGHS, JOHN E., Chicago, Mathematics
BYRNE, ROBERT J., Chicago, Oceanography
CARLSON, WAYNE R., Rockford, Genetics
CARTER, ANTHONY T., Champaign, Anthropology
CARTER, JEAN E., Urbana, Anthropology
COHN, STEVEN F., Highland Park, Sociology
CONNOLLY, YVONNE I., Evanston, Biochemistry
COOKE, ROGER L., Godfrey, Mathematics
CORY, ROBERT P., Champaign, Biochemistry
CRONIN, JEREMIAH A., Chicago, Physics
DAVIS, MICHAEL M., Peoria, Astronomy
DAY, M. MICHAEL, Urbana, Mathematics
DESPER, CLYDE R., Taylorville, Chemistry
DOOLITTLE, WARREN F., III, Urbana, Microbiology
DYROFF, DAVID R., Dupo, Chemistry
FELDMAN, ALBERT, Chicago, Physics
FOZZY, PAULA J., Chicago, History and Philosophy of Science
FRYXELL, REDWOOD, T. W., Rock Island, Earth Sciences
GAINES, ROBERT E., Villa Grove, Mathematics
GARRETT, VIRGINIA W., Champaign, Mathematics
GENTLE, KENNETH W., La Grange Park, Physics
GILMOUR, STEPHEN C., Chicago, Mathematics
GISLASON, ERIC A., Oak Park, Chemistry
GOLD, JERROLD M., Chicago, Mathematics
GOODMAN, HARRY E., Morton Grove, Medical Sciences
GRAY, BRAYTON I., Chicago, Mathematics
GROSSHANS, FRANK D., Park Ridge, Mathematics
HAGER, DONELLA, Prospect Heights, Biophysics
HARPER, JOHN R., Wilmette, Mathematics
HELMICH, DARLENE E., Edwardsville, Botany
HENNEIKE, HENRY F., Champaign, Chemistry
HETTINGER, THOMAS P., Aurora, Biochemistry
HINES, WILLIAM D., Chicago, Microbiology
HOFFMAN, ALAN B., Charleston, Chemistry
HOFFMAN, BRIAN M., Chicago, Chemistry
HOLT, CRAIG W., Chicago, Chemistry
HOLT, DONALD A., Minooka, Agriculture
HOWE, ROBERT K., Kewanee, Chemistry
HUCK, MORRIS G., Nashville, Biochemistry
HURST, DAVID O., Chicago, Chemistry
JOHNSON, ANNE C., Park Ridge, Economics
JONES, ROBERT B., Raleigh, Physics
JOSEPHSON, KEITH B., Wheaton, Mathematics
KANE, JAMES M., Hazelcrest, Botany
KAPCHE, ROBERT W., Chicago, Psychology
KASKI, BARBARA A., Cicero, Chemistry
KATZ, PHILIP L., Chicago, Engineering
KEARNS, THOMAS J., NORTHBROOK, Mathematics
KEATING, JAMES T., Chicago, Chemistry
KOPPEL, LEWIS M., Morton Grove, Chemistry
KORENJAK, ALLEN J., Chicago, Engineering
KREINICK, DAVID L., Lincolnwood, Physics
KULIK, JAMES A., Chicago, Psychology
LANG, JAMES D., Chicago, Engineering
LANG, NORTON D., Chicago, Physics
LARSON, RICHARD G., Chicago, Mathematics
LAUGHLIN, PATRICK R., Chicago, Psychology
LEWIS, GENE L., Urbana, Mathematics
LIBIT, LAWRENCE, Glencoe, Chemistry
LIEB, WILLIAM R., Urbana, Physics
LOHMAR, PHOEBE H., Galesburg, Biochemistry

MADIX, ROBERT J., Berkeley, Engineering
MAIER, WILLIAM B., II, Chicago, Physics
MCDONNELL, ROBERT N., Park Ridge, Physics
MCNAMARA, JAMES N., Chicago, Mathematics
MEREL, MICHAEL H., Chicago, Engineering
MERTZ, DAVID B., Chicago, Biology
MIDDAUGH, RICHARD L., Urbana, Chemistry
MILES, JOSEPH B., Urbana, Mathematics
MODLER, ROBERT F., Chicago, Chemistry
MOORE, JOHN W., Chicago, Chemistry
MORRISON, DAVID D., Danville, Astronomy
MUIR, MARIEL M., Cold Springs, Chemistry
MURPHY, M. NADINE, Sr., Chicago, Botany
NANCE, JON R., Urbana, Physics
NELSEN, STEPHEN F., Chicago, Chemistry
NELSON, WAYNE B., Chicago, Mathematics
NICO, WILLIAM R., Oglesby, Mathematics
O'LEARY, MARION H., Barry, Chemistry
OLIVIER, DONALD C., Rockford, Mathematics
PARKINSON, MICHAEL T., Chicago, Physics
PARKMAN, MARGARET A., Chicago, Sociology
PATTERSON, DENNIS B., Chicago, Chemistry
PAULSON, GLENN L., Sycamore, Biochemistry
PERLMAN, MICHAEL D., Chicago, Mathematics
PICTON, HAROLD D., Evanston, Zoology
POWERS, RICHARD J., Oak Park, Physics
RAPPE, DONALD E., Chicago, Mathematics
READ, THOMAS T., Urbana, Mathematics
RECTOR, DAVID L., Carbondale, Mathematics
REILLY, MATTHEW J., Urbana, Engineering
RENO, RICHARD W., Galesburg, Physics
RICE, JAMES K., Harvey, Chemistry
RINDFLEISCH, THOMAS C., Glencoe, Physics
ROBBIN, JOEL W., Chicago, Mathematics
ROWE, ROBERT R., Niles, Engineering
RUST, MILBERN J., Chicago, Mathematics
SAMPLE, STEVEN B., Urbana, Engineering
SCARGLE, JEFFREY D., Glenview, Astronomy
SERAUSKAS, ROBERT V., Chicago, Chemistry
SHAND, SHERMAN M., Barrington, Mathematics
SHEPARD, HARVEY K., Chicago, Physics
SNYDER, NANCY S., La Grange, Physics
SPROUSE, GENE D., Raymond, Physics
STALLARD, BARRY W., Freeport, Engineering
STANGELAND, BRUCE E., Joliet, Engineering
STANKO, JOSEPH A., Urbana, Chemistry
STEINHARDT, MARY DELL M., Urbana, Biochemistry
STELLWAGEN, ROBERT H., Tinley Park, Biochemistry
STEVENS, WILLIAM G., Urbana, Chemistry
STRUEVER, STUART M., Chicago, Anthropology
STRUNK, JACQUELINE D., Evanston, Psychology
STUART, GARY M., Normal, Economics
SWEENEY, WILLIAM J., Oak Park, Mathematics
SWITZER, ROBERT L., Orangeville, Biochemistry
TANNER, DAVID J., Chicago, Physics
TAYLOR, DIANA, Chicago, Mathematics
TIDEMAN, SUSAN C., Lake Forest, Biophysics
TREFIL, JAMES S., Berwyn, Physics
TUNICK, ALLEN A., Cambridge, Chemistry
UEBBING, JOHN J., Chicago, Engineering
WALTER, THEODORE A., Elmwood Park, Chemistry
WARD, CHARLES E. W., Wilmette, Physics
WEBB, JANICE H., Chicago, Genetics
WERNER, BARRY L., Glencoe, Physics
WHITAKER, SIDNEY H., Granville, Earth Sciences
WIEDEMANN, ALFRED M., Naperville, Botany
WILOE, GEORGE R., West Chicago, Engineering
WILSON, ROBERT G., River Forest, Medical Sciences
WINDMILLER, LEE R., Skokie, Physics
WOBUS, REINHARD A., Belleville, Earth Sciences
WYATT, ROBERT E., Berwyn, Chemistry

Cooperative Graduate

ARENDT, RONALD H., Chicago, Chemistry
ARENSON, SIDNEY J., Chicago, Psychology
ASIK, JOSEPH R., Champaign, Physics
BENDER, LARRY S., Newman, Engineering
BINFORD, LAURENCE C., Glencoe, Zoology
BRITTAIN, THOMAS M., Urbana, Engineering
CARLSON, DUANE G., Bensenville, Engineering
CAULTON, KENNETH G., Chicago, Chemistry
COHEN, NOAL, Evanston, Chemistry
COOK, THOMAS T., Chicago, Physics
COOPER, JEFFERY M., Downer's Grove, Mathematics
CROSLEY, PHILLIP B., Chicago, Engineering
CURTIS, ELLWOOD C., Moline, Mathematics
DEROSIER, DAVID J., Chicago, Biophysics
DIXON, DAVID A., Gurnee, Engineering
FEIGL, FRANK J., Chicago, Physics
FEISTEL, GERALD R., Champaign, Chemistry
FOSTER, CHARLOTTE M., Harrisburg, Mathematics
FRADIN, FRANK Y., Chicago, Engineering
GASSNER, RONALD L., Des Plaines, Engineering
GILMORE, HAL M., Normal, Mathematics
GORDON, ALAN, Chicago, Physics
HAGGSTROM, GUS W., Urbana, Mathematics
HALLER, RICHARD W., La Grange, Psychology
HART, TIMOTHY R., Mundelein, Physics
HELFINSTINE, ROBERT A., Champaign, Engineering
HEUER, RONALD E., Lexington, Earth Sciences
HOYT, RONNIE A., Joliet, Engineering
IMHOF, VIOLET I., Urbana, Chemistry
ISRAEL, MARTIN H., Chicago, Physics
JONES, WALTER L., La Grange, Meteorology
KEISER, VICTOR H., Jr., Glen Ellyn, Mathematics
KENNEDY, JAMES E., Park Forest, Engineering
KLEMM, ROBERT D., Carterville, Zoology
KULIS, JOSEPH C., Cicero, Psychology
KUNZE, BARBARA A., Elmhurst, Mathematics
LEIPZIGER, STUART, Chicago, Engineering
MACCABEE, HOWARD D., Highland Park, Engineering
MAGILL, CLINT W., Newman, Genetics
MCCLAIN, ROSEMARY E., Rosamond, Botany
MCCORMICK, JAMES L., Urbana, Engineering
MCGLAMERY, MARSHAL D., Urbana, Agriculture
MESSE, LAWRENCE A., Evanston, Psychology
MILES, FRANK B., Urbana, Chemistry
MINKIN, ANNE S., Oak Park, Physics
MORRIS, CHARLES G., II, Champaign, Psychology
MORTON, RICHARD A., Chicago, Biophysics
MOSCOVITCH, EDWARD H., Chicago, Economics
MURPHY, THOMAS A., Kewanee, Biochemistry
O'DONOVAN, PATRICK J., Rockford, Physics
O'NEILL, WILLIAM P., Urbana, Chemistry
OPFER, JAMES E., Shobonier, Physics
ORZECH, CHESTER E., Jr., Chicago, Chemistry
OSBORN, THOMAS R., Urbana, Physics
OSTRAND, PHILLIP A., Lincolnwood, Mathematics
PAYNE, HAROLD J., Chicago, Mathematics
PETROVICH, JOHN P., Champaign, Chemistry
PETTIT, BARBARA J., Chicago, Physiology
PHILLIPS, JAMES L., Carbondale, Psychology

PICKARD, ORREN T., Jr., Rantoul, Engineering
PISZKIEWIEZ, LEONARD W., Chicago, Chemistry
PRASTEIN, SOLOMON M., Chicago, Physics
ROCHESTER, LEON S., Chicago, Physics
ROTH, SUSAN B., Chicago, Psychology
SCHORI, RICHARD M., Evanston, Mathematics
SCHWARTZ, MELVYN H., Chicago, Mathematics
SCOTT, WARNER C., Macomb, Physics
SHERMAN, MALCOLM J., Chicago, Mathematics
SILBEY, ROBERT J., Chicago, Chemistry
SPICER, LARRY D., Urbana, Chemistry
STANCL, DONALD L., Berwyn, Mathematics
STEIN, JAMES D., Jr., Winnetka, Mathematics
STEPHENS, JOHN K., Galesburg, Mathematics
STOLL, CHARLES H., Chestnut, Engineering
STRITAR, JEFFREY A., Homewood, Chemistry
TINGLEY, PATRICIA A., Urbana, Genera Biology
UNDERBRINK, ALAN G., Quincy, Botany
VALANCE, WILLIAM G., Oak Park, Chemistry
WALSH, JOHN B., Urbana, Mathematics
WARDROP, JAMES L., Collinsville, Psychology
WEINER, HOWARD J., Chicago, Mathematics
WELCH, JOHN N., Chicago, Mathematics
WILSON, PAUL R., Urbana, Mathematics
WINTERBAUER, WILLIAM, Jr., Fancy Prairie, Engineering
YINGLING, RICHARD T., Chicago, Biophysics
ZIPSE, PHILIP W., Chicago, Mathematics

Graduate Teaching Assistant

ALLMAN, WILLIAM P., Evanston, Engineering
BERNETT, WILLIAM A., Champaign, Chemistry
BOLLES, THEODORE F., Urbana, Chemistry
BORLIN, DAVID D., Carrollton, Physics
BROWN, ROBERT B., Chicago, Mathematics
CAULTON, KENNETH G., Chicago, Chemistry
CLARK, HERBERT J., Champaign, Psychology
CRALLEY, JOHN C., Carmi, Zoology
CURTIS, ELLWOOD C., Moline, Mathematics
DAVIS, ROBERT D., Evanston, Engineering
DOMINSWSKI, ROGER L., Chicago, Psychology
DRUMKE, JOHN S., Chicago, Botany
DUBOIS, JOHN L., Chicago, Engineering
FEIL, RICHARD N., Oaklawn, Psychology
FLEMING, ROBERT W., Colchester, Earth Sciences
GOLDSTEIN, GARY R., Chicago, Physics
GOODFELLOW, NANCY S., Evanston, Physiology
GRAHAM, DAVID W., Chicago, Earth Sciences
GREENBERG, DAVID F., Chicago, Physics
GURNEY, DONALD P., Jr., Chicago, Engineering
GUTMAN, DAVID, Champaign, Chemistry
HECKERT, DAVID C., Elgin, Chemistry
HOWELL, JAMES A., Chester, Chemistry
HULETT, DAVID T., Urbana, Economics
HUNGERFORD, THOMAS W., Chicago, Mathematics
KAPLAN, DONALD R., Evanston, Botany
LABACH, WILLIAM A., Urbana, Mathematics
LARSON, CARL S., Urbana, Engineering
LATTA, THOMAS M., Champaign, Chemistry
LEEMING, FRANK C., Chicago, Psychology
LEIPZIGER, STUART, Chicago, Engineering
LELLINGER, DAVID B., Wheeling, Botany
LEMOS, ANTHONY M., Lake Forest, Physics
LENCIONI, DONALD E., Chicago, Physics
LEWIS, JOHN B., Evanston, Mathematics
MARTIN, SANFORD M., Jr., Urbana, Economics
MENKE, JOHN R., Carbondale, Chemistry
MISHKIN, DAVID J., Urbana, Economics
MUKATIS, WERNER A., Chicago, Chemistry
NEWMAN, L. MICHAEL, Urbana, Psychology
PALMQUIST, ROBERT C., Glenview, Earth Sciences
PERFETTI, CHARLES A., Collinsville, Psychology
PIPPENGER, JOHN E., Chicago, Economics
PISZKIEWICZ, LEONARD W., Chicago, Chemistry
PRANGER, WALTER A., Cicero, Mathematics
REHM, ALLAN S., Champaign, Mathematics
RUSSO, JOHN P., Northbrook, Mathematics
SCOTT, ALAN N., Park Ridge, Chemistry
SHAFER, CARL R., Polo, Physics
STEEN, VIRGINIA C., Chicago, Earth Sciences
STRAWN, MARTHA A., Centralia, Zoology
STRITAR, JEFFREY A., Homewood, Chemistry
SULLIVAN, MICHAEL J., Chicago, Mathematics
SYNOWIEC, JOHN A., Chicago, Mathematics
THOMAS, JOHN H., Glenview, Engineering
TUERCK, DAVID G., Belleville, Economics
WALLER, THOMAS R., Elmwood Park, Earth Sciences
WEIK, KENNETH L., Carbondale, Botany
WEINER, HOWARD J., Chicago, Mathematics
WOZNIAK, LOUIS, Benton, Engineering
ZALEWSKI, EDWARD F., Chicago, Chemistry
ZIPSE, PHILIP W., Chicago, Mathematics

Postdoctoral

ANDERSON, JOHN F., Urbana, Zoology
BECKER, EDMUND F., Jr., Chicago, Biophysics
BROOKS, PHILIP R., Hazel Crest, Chemistry
CALNEK, EDWARD E., Skokie, Anthropology
CROOK, JOSEPH R., Chicago, Chemistry
CUSHING, JAMES T., Chicago, Physics
EDIDIN, MICHAEL A., Chicago, Zoology
FAHEY, ROBERT C., Chicago, Chemistry
FLEISHER, BELTON M., Chicago, Economics
HUNT, RICHARD L., Chicago, Chemistry
INGLE, DAVID J., Chicago, Psychology
INTERRANTE, LEONARD V., Urbana, Chemistry
KOVACH, JOSEPH K., Chicago, Psychology
McCARTY, CHARLES G., Urbana, Chemistry
MICHEJDA, CHRISTOPHER J., Chicago, Chemistry
MILLER, WILLARD, Jr., Dundee, Mathematics
MULLIN, MICHAEL M., Mt. Carroll, Biology
O'CONNELL, DANIEL C., Decatur Psychology
PALMER, JOHN D., Evanston, Biology
RAFF, LIONEL M., Urbana, Chemistry
RIBBE, PAUL H., Park Ridge, Earth Sciences
SCHWARTZ, LYLE H., Chicago, Engineering
SNIDER, NEIL S., Park Forest, Chemistry
WEKSEL, WILLIAM, Urbana, Linguistics
WILKINS, JOHN W., Oak Park, Physics
WITT, GERALD L., Alton, Physics

Senior Postdoctoral

ANDERS, EDWARD, Chicago, Chemistry
BAKER, WILLIAM K., Chicago, Genetics
BOHANNAN, PAUL J., Evanston, Anthropology
GRILICHES, HIRSCH Z., Chicago, Social Sciences
HODGE, PHILIP G., Jr., Chicago, Engineering
KHACHATURIAN, NARBEY, De Kalb, Engineering
KING, ROBERT C., Evanston, Genetics
LEVENSPIEL, OCTAVE, Chicago, Engineering
MILLER, SIDNEY I., Chicago, Chemistry
RAVENHALL, DAVID G., De Kalb, Physics
WYLD, HENRY W., Jr., De Kalb, Physics

Science Faculty

BATHIE, WILLIAM W., Ames, Engineering
CONLON, HELEN M., Chicago, Microbiology
HARMON, S. ANNE, Beaumont, Chemistry

Marcus, Ruth B., Chicago., Mathematics
McLaughlin, Donald E., Rock Island, Mathematics
McMahon, Walter W., Urbana, Mathematics
Mock, Gordon D., Macomb, Mathematics
Smoot, Ronald L., Urbana, Engineering
Southern, William E., De Kalb, Zoology
Warren, Charles P., Chicago, Anthropology
Weiser, David W., Mount Carroll, Chemistry
Wills, Donald L., Monmouth, Earth Sciences
Yarborough, Keith A., Reno, Engineering

Summer Fellowships for Secondary School Teachers

Bartholomew, Bernard R., Freeport, Mathematics
Bennoon, Carmel, Chicago, Mathematics
Brady, Richard J., Chicago, Biology
Buckler, William F., Aurora, Mathematics
Ekstrom, Janice A., Galesburg, Mathematics
Hildebrandt, Daniel P., Medinah, Mathematics
Kremer, Philip L., Aurora, Botany
Lindley, Austin F., Winnetka, Mathematics
Miller, Sr. Mary Ivo, Chicago, Biochemistry
Montgomery, Forest E., La Grange, Mathematics
Moser, Arthur L., Peoria Heights, Mathematics
Muelder, Richard H., Chicago, Mathematics
Nelson, Richard F. Aurora, Mathematics
Owens, Gerald H., Rockford, Biology
Pyle, Walter E., Wood River, Biology
Vandevender, Wilford H., Champaign, Mathematics
Wenzelman, Laverne H., Harvey, Mathematics
Wikman, Sr. Joan, Chicago, Biology
Zimmerman, Robert M., Oak Park, Mathematics

IOWA

Graduate

Barth, Donald E., Marble Rock, Chemistry
Berryhill, John R., Chicago, Physics
Breuer, Max E., Mount Pleasant, Engineering
Burke, Barry E., Anita, Physics
Daugherty, Jack D., Ottumwa, Engineering
Davis, Lloyd C., Oakland, Physics
Deboer, Charles D., Ledyard, Chemistry
Griffith, Ronald J., Cherokee, Engineering
Hansen, Mary K,, Iowa City, Mathematics
Hanson, F. Allan, Des Moines, Anthropology
Hanson, Frank E., Jr., Hawarden, Zoology
Hodson, Harold H., Jr., Ames, Agriculture
Hoffman, Jack A., Lemars, Engineering
Kime, Charles R., Clinton, Engineering
Levy, Hiram II, Bettendorf, Chemistry
Lillehoj, Eivind B., Ames, Botany
Lokensgard, Jerrold P., Marshalltown, Chemistry
McKee, Harris B., Carusle, Engineering
Miller, Don H., Cedar Rapids, Mathematics
Miller, Richard K., Clarinda, Mathematics
Moses, Ronald W., Jr., Ames, Physics
Newhouse, Joseph P., Waterloo, Economics
Ogren, Paul J., Des Moines, Chemistry
Phillips, David T., Algona, Physics
Thomas, Bruce R., Guthrie Center, Physics
Wemple, Quincy A., Jr., Ames, Botany

Cooperative Graduate

Axford, Mary F., Keokuk, Chemistry
Baker, Allan E., Libertyville, Engineering
Benning, Roger D., Waverly, Engineering
Boes, Eldon C., Wall Lake, Mathematics
Clark, Ronald L., Delhi, Engineering
Clark, Sandra H., Manchester, Earth Sciences
Dutcher, Gerald L., Ankeny, Physics
Farley, Roger D., Rippey, Physiology
Fugate, Joseph B., Iowa City, Mathematics
Gabrielson, James E., Ames, Engineering
Goodman, Major M., Des Moines, Genetics
Hendrickson, Howard T., Davenport, Engineering
Hoffman, Anthony E., Storm Lake, Mathematics
Jepsen, Charles H., Dumont, Mathematics
Johnson, Robert W., Marathon, Engineering
Kerr, Gerald L., South English, Mathematics
Lorimor, Orval G., Davenport, Engineering
Mathews, Robert D., Miles, Physics
McIntosh, James R., Keosauqua, Engineering
Rathke, Michael W., Humboldt, Chemistry
Romig, Bernard E., Villisca, Engineering
Rost, Duane F., Lake City, Engineering
Steinwand, Paul J., Dubuque, Chemistry
Tennant, Jerry R., Burnside, Engineering
Wiegand, Gayl H., Marshalltown, Chemistry
Winston, Jerome A., Marshalltown, Physics

Graduate Teaching Assistant

Anderson, Wayne I., Iowa City, Earth Sciences
Cook, William J., Ames, Engineering
Cunning, Joe D., Mount Ayr, Engineering
Eickstaedt, Lawrence L., Storm Lake, General Biology
Farley, Roger D., Rippey, Physiology
Fugate, Joseph B., Iowa City, Mathematics
Guenther, Raymond R., Ames, Mathematics
Hoffman, Anthony E., Storm Lake, Mathematics
Holte, Karl E., Iowa City, Botany
Johnson, Herbert A., Alta, Engineering
Kemper, Gene A., Ames, Mathematics
Knudson, David W., Jewell, Mathematics
Lavalle, Placido D., Iowa City, Earth Sciences
Payton, Charles E., Minburn, Earth Sciences
Secrest, Bruce G., West Branch, Mathematics
Shipley, Jerry J., Ames, Economics
Steinwand, Paul J., Dubuque, Chemistry
Strohmeier, Elizabeth M., Sioux City, Mathematics
Vanmeter, Delmar B., Ames, Engineering
Washenberger, James K., Ames, Mathematics

Postdoctoral

Guralnik, Gerald S., Cedar Falls, Physics

Science Faculty

Jensen, Jens A., Iowa City, Mathematics
Judd, Floyd L., Orange City, Physics
Leonard, Sr. Mary J. C., Dubuque, Psychology
Luckett, Dudley G., Ames, Economics
Real, Sr. Mary A., Davenport, Mathematics
Thomas, Philip S., Grinnell, Economics

Summer Fellowships for Secondary School Teachers

De Prenger, Donald K., Vinton, Biochemistry
Huberty, Sr. M. Bernice A., Dubuque, Genetics
Lemmon, Robert D., Sioux City, Earth Sciences
Pint, Robert F., Nashua, Zoology
Schmidt, Donald J., Keokuk, Biology
Trump, Richard F., Ames, Zoology

INDIANA

Graduate

Anderson, Gerald H., Hobart, Economics
Arnold, Edouard P., South Bend, Earth Sciences
Beineke, Lowell W., Decatur, Mathematics
Cooper, Michael T., Evansville, Physics
Cuffey, Roger J., Bloomington, Earth Sciences
Cushman, David W., Indianapolis, Biochemistry
Dowling, James B., Connersville, Mathematics
Dygert, Stephen L., Fort Wayne, Biochemistry
Eidswick, John A., West Lafayette, Mathematics
Fan, David P., West Lafayette, Biophysics
Fisch, Michael H., Indianapolis, Chemistry
Flannery, David L., Indianapolis, Engineering
Halley, James W., Jr., Chesterton, Physics
Kutlich, Eleanor S., Evansville, Biochemistry
Lebo, Jerry A., Winamac, Engineering
Linden, Theodore A., West Baden Springs, Mathematics
Lipps, Bennie J., Jr., Connersville, Engineering
Martin, Edward S., Terre Haute, Chemistry
Martz, Eric, Bloomington, Biology
Matthews, Rowena G., Boonville, Biology
McCoy, Joan K., Gary, Microbiology
Menninga, Clarence, Lafayette, Chemistry
Mills, James W., Centerville, Chemistry
Mixon, William W., Hammond, Physics
Monroe, Bruce M., Indianapolis, Chemistry
Moyer, Norman E., South Bend, Physics
Oexmann, Dale F., Vincennes, Mathematics
Omilianowski, Daniel R., East Chicago, Biochemistry
Osborn, Thomas A., Marion, Physics
Owens, Frank W., South Bend, Mathematics
Pechukas, Philip, Fort Wayne, Chemistry
Pendleton, Robert L., Bloomington, Mathematics
Peters, Philip C., Chesterton, Physics
Pogue, Russell W., Jr., Kokomo, Engineering
Pursley, Stephen A., West Lafayette, Engineering
Rain, Don W., La Porte, Engineering
Rea, David R., Russiaville, Engineering
Reeves, Alvin F., II, Richmond, Genetics
Rettig, Michael F., Richmond, Chemistry
Rogers, Marion A., Lewisville, Earth Science
Root, Forrest K., Bedford, Earth Science
Rossini, Frederick A., South Bend, Physics
Seifert, Ralph L., Jr., Bloomington, Mathematics
Sherwood, Bruce A., West Lafayette, Physics
Skelton, Jerry P., Elberfeld, Engineering
Thoren, Victor E., Bloomington, History and Philosophy of Science
Trimble, Joanne R., West Lafayette, Mathematics
Whitcomb, Albert R., Chicago, Mathematics
Wickelgren, Warren O., Munster, Psychology
Williams, Absalom F., Mitchell, Botany
Wright, Gene R., South Bend, Biochemistry

Cooperative Graduate

Agness, Jay B., Bunker Hill, Agriculture
Akers, Ronald L., New Albany, Sociology
Alexander, John J., Indianapolis, Chemistry
Allen, Robert T., West Lafayette, Engineering
Bertram, Lee A., Morocco, Engineering
Cleland, Charles F., Bloomington, Botany
Cohen, Lawrence B., Indianapolis, Physiology
Coulter, Lawrence J., Frankfort, Engineering
Criswell, Michael L., South Bend, Engineering
Doolen, Gary D., West Lafayette, Physics
Ellis, Robert L., Richmond, Mathematics
Gaunt, John T., Evansville, Engineering
Greckel, Fay E., Bloomington, Economics
Hackett, William H., Jr., Speedway, Engineering
Hatfield, Craig B., Michigan City, Earth Sciences
Ice, Malcolm W., West Lafayette, Engineering
Lindberg, David C., Bloomington, History and Philosophy of Science
Marlin, Marjorie J., West Lafayette, Psychology
Mellichamp, Duncan A., Jr., West Lafayette, Engineering
Mosby, James F. Indianapolis, Engineering
Muench, Thomas J., West Lafayette, Economics
Noe, James L., West Lafayette, Chemistry
Pav, Peter A., Bloomington, History and Philosophy of Science
Peters, James G., New Albany, Astronomy
Raab, Jacob L., Elkhart, Physiology
Roberts, Roy J., West Lafayette, Psychology
Sonnenschein, Hugo F., Lafayette, Economics
Spejewski, Eugene H., East Chicago, Physics
Stevens, Ralph R., Jr., Indianapolis, Physics
Stroup, Dorothy A., Bloomington, Botany

Graduate Teaching Assistant

Ake, Robert L., Richmond, Chemistry
Alexander, John J., Indianapolis, Chemistry
Bromels, Edward, Hammond, Chemistry
Burke, Daniel E., Jeffersonville, Engineering
Calkins, James L., Lafayette, Psychology
Charles, Richard L., Lafontaine, Chemistry
Coleman, James R., Bloomington, Botany
Detchmendy, David M., West Lafayette, Engineering
Eshbaugh, William H., Bloomington, Botany
Hatfield, Craig B., Michigan City, Earth Sciences
Hoke, David O., Goshen, Mathematics

JEWELL, DONALD O., Gary, Psychology
LUETZELSCHWAB, JOHN W., Highland, Physics
OPPELT, JOHN A., South Bend, Mathematics
PLANK, BARBARA A., West Lafayette, Mathematics
RAYMO, CHESTER T., Notre Dame, Physics
ROGERS, MARION A., Lewisville, Earth Sciences
SCHROEDER, LEE S., Bloomington, Physics
SEIBER, JAMES N., New Albany, Chemistry
SERVIS, KENNETH L., Lafayette, Chemistry
SONNENSCHEIN, HUGO F., Lafayette, Economics
STEVENSON, RALPH G., Jr., Bloomington, Earth Sciences
THOMPSON, JOSEPH G., West Lafayette, Engineering
WOODS, PHYLLIS A., Bloomington, Physiology

Postdoctoral

BLIEDEN, HARRY R., Michigan City, Physics
DENENBERG, VICTOR H., West Lafayette, Biology
DERWENT, JOHN E., South Bend, Mathematics
FREVERT, PETER W., Greencastle, Economics
HAGSTROM, ELAINE R., Bloomington, Linguistics
KAHL, MARVIN P., Jr., Indianapolis, Biology
MANIOTES, JOHN, East Chicago, Engineering
SANDERS, WILLIAM A., Oxford, Chemistry
WAINWRIGHT, STEPHEN A., Indianapolis, Zoology
WELLNER, MARCEL N., Bloomington, Physics
WERNER, OSWALD, Bloomington, Anthropology

Senior Postdoctoral

BEEVERS, HARRY, Lafayette, Biology
CRANE, FREDERICK L., Lafayette, Biochemistry
MARGERUM, DALE W., Lafayette, Chemistry
OCHS, SIDNEY, Bloomington, Physiology
SMOCK, CHARLES D., Lafayette, Psychology

Science Faculty

BROOKS, GEORGE H., Lafayette, Engineering
GOLDING, HARRY L., Greencastle, Chemistry
LEE, NORMAN K., Muncie, Physics
LEE, ROBERT H., Lafayette, Engineering
MATTHEWS, JAMES B., Terra Haute, Engineering
MERTENS, THOMAS R., Muncie, Genetics
ROSS, ARNOLD E., Notre Dame, Mathematics
SMUCKER, ARTHUR A., Goshen, Biochemistry
WAGNER, MORRIS, Notre Dame, Microbiology

Summer Fellowships for Secondary School Teachers

BUZZARD, GENE P., Fort Wayne, Chemistry
CARBAUGH, BLAIR T., Converse, Biology
COLEMAN, LEONARD L., Muncie, Biology
FAW, PHYLLIS J., Gary, Mathematics
FOSS, DONALD C., Muncie, Mathematics
GULLIFOR, PATRICK E., South Bend, General Science
HATHAWAY, THOMAS J., Indianapolis, Biology
LANDING, JAMES E., Michigan City, Earth Sciences
PAYNE, KENNETH E., Terre Haute, Zoology
PHILLIPS, JERRY W., Holland, Mathematics
ROGGE, SUSANNE, South Bend, Mathematics
SCHOFF, EDWARD L., New Market, Biology
SCHROER, SR., M. MICHEL, Lafayete, Biology

KANSAS

Graduate

BARRETT, BRUCE R., Kansas City, Physics
BRECKENRIDGE, WILLIAM H., Louisburg, Chemistry
BROOKS, LOWELL W., Jr., Wellington, Mathematics
BUTEL, JANET S., Overbrook, Microbiology
CORNELIUS, ARCHIE J., Manhattan, Engineering
CRAWFORD, ROY K., Luray, Physics
FEARING, HAROLD W., Lawrence, Physics
GUSTAVSON, DAVID B., Clay Center, Physics
HALL, ROBERT E., Pittsburg, Physics
HAYES, DENNIS E., Mission, Earth Sciences
HEIDER, KARL G., Lawrence, Anthropology
HOY, MARJORIE A., Kansas City, Zoology
JEFFREY, JOHN R., Lawrence, Chemistry
JENKINS, THOMAS M., Lawrence, Chemistry
JOHNSON, GARY L., Osage City, Engineering
KAUFMAN, DALE E., Gridley, Engineering
KERSTETTER, REX E., Hays, Botany
KITTRELL, JAMES R., Arkansas City, Engineering
KOELLING, DALE D., Great Bend, Physics
LESSOR, DELBERT L., Wakeeney, Physics
NELSON, CRAIG E., Mankato, Zoology
PANCAKE, SAMUEL J., Atwood, Biochemistry
ROSS, HAROLD M., Shawnee Mission, Anthropology
RUPF, JOHN A., Wichita, Engineering
SIMMONS, GERALD M., Parsons, Engineering
SLOAN, ELIZABETH M., Emporia, Physiology
SPENCER, JOHN B., Topeka, Chemistry
WAGNER, NEAL R., Topeka, Mathematics
WIENS, ALVIN W., Hillsboro, Physiology
WILLIS, HAROLD L., Shawnee Mission, Anthropology
WOODHEAD, JACK C., Pleasanton, Biology
WRAY, JERALD J., Norton, Physics

Cooperative Graduate

BARRETT, JON H., Wichita, Psychology
BISSELL, JULIA L., Manhattan, Microbiology
BRYAN, JON B., Scott City, Physics
BURCH, WENDELL D., Roxbury, Chemistry
CHADWICK, CURT H., Manhattan, Physics
ERICKSON, LARRY E., Manhattan, Engineering
FUNKE, BERDELL R., Manhattan, Microbiology
GRIFFITH, SUSAN J., Shawnee Mission, General Biology
HYSLOP, ROBERT S., Jr., Kansas City, Engineering
KELLOGG, RICHARD M., Arlington, Chemistry
LONG, JOHN A., Winfield, Zoology
MARSTON, BARBARA P., Liberty, Zoology
MERRITT, PHILIP N., Kansas City, Mathematics
REMPLE, ROBERT K., Lawrence, Mathematics
SALSER, WINSTON A., Wichita, Biophysics
SMITH, DEAN L., Jr., Topeka, Engineering
SMITH, EDWIN B., Halstead, Botany
SPEAR, KARL E., Lawrence, Chemistry
STRAHM, NORMAN D., Wichita, Engineering
SWENSON, DONALD O., Clay Center, Engineering
TAYLOR, BERT A., Plainville, Mathematics
VANDERVOORN, PETER C., Wichita, Chemistry

Graduate Teaching Assistant

BAALMAN, ROBERT J., Grinnell, Botany
BUSCHER, HENRY N., Savonburg, Zoology
CARLSON, GORDON E., Manhattan, Engineering

DRELLING, MARK J., Topeka, Physics
ENOS, PAUL P., Perry, Earth Sciences
HOYT, DALE L., Shawnee Mission, Zoology
KAESLER, ROGER L., Lawrence, Earth Sciences
LARSON, LOREN C., Lawrence, Mathematics
LITTLE, JAMES N., Prairie Village, Chemistry
MADDOCKS, ROSALIE F., Lawrence, Earth Sciences
MALONE, LEO J., Jr., Wichita, Chemistry
MCCUNE, RONALD W., Beloit, Biochemistry
PIERCE, JACK W., Lawrence, Earth Sciences
RAPP, JAMES R., Wichita, Chemistry
SALSER, WINSTON A., Wichita, Biophysics
SINCLAIR, DEAN L., Manhattan, Chemistry
TAYLOR, BERT A., Plainville, Mathematics
WEATHERS, BENTON D., Manhattan, Engineering

Postdoctoral

POOL, JAMES C., Wellsville, Physics
UNZ, HILLEL, Lawrence, Physics.

Senior Postdoctoral

LICHTWARDT, ROBERT W., Lawrence, Microbiology

Science Faculty

BAILIE, RICHARD C., Manhattan, Engineering
BORG, ALFRED F., Manhattan, Microbiology
FORMAN, GEORGE W., Lawrence, Engineering
GOWDY, KENNETH K., Manhattan, Engineering
KILLIAN, DONALD G., Wichita, Mathematics
KIPP, JOHN E., Manhattan, Engineering
SNYDER, MELVIN H., Jr., Wichita, Engineering
UMHOLTZ, ROBERT C., Lawrence, Engineering
WEDEL, ARNOLD M., North Newton, Mathematics

Summer Fellowships for Secondary School Teachers

ALDRIDGE, BILLY G., Bethel, Physics
SCHAFF, SR. M. JOANNES, Walnut, Biology
WELLS, MARTIN H., Kismet, Mathematics

KENTUCKY

Graduate

BAGBY, STEADMAN T., Lexington, Mathematics
BALDWIN, JON M., Covington, Chemistry
BURCKEL, ROBERT B., Louisville, Mathematics
COLLINS, LEWIS D., Maysville, Engineering
DIERCKES, ALBERT C. J., Covington, Engineering
FALLER, JOHN W., Jr., Louisville, Chemistry
FANGMAN, WALTON L., Louisville, Microbiology
MALONE, PHILIP G., Louisville, Earth Sciences
MITTENTHAL, JAY E., Louisville, Biophysics
RODGERS, GEORGE C., Jr., Louisville, Chemistry
ROWLETTE, RALPH M., London, Anthropology
SALLEE, WILLIAM C., Louisville, Mathematics
SKILES, DURWARD D., Lexington, Physics
STROUD, CARLOS R., Owensboro, Physics
TAYLOR, WALTER F., Louisville, Mathematics
THOMAS, JESS B., Jr., Frankfort, Physics
WARFIELD, ROBERT B., Lexington, Mathematics
WELL, BENJAMIN F., III, Lexington, Mathematics
WHITESIDES, THOMAS H., Anchorage, Chemistry

Cooperative Graduate

ASHLEY, CARL T., Nicholasville, Chemistry
BEINEKE, THOMAS A., Fort Thomas, Chemistry
BERLEKAMP, ELWYN R., Fort Thomas, Engineering
CANON, ARDATH B., Murray, Chemistry
GORDON, PETER E., Louisville, Physics
GUFFEY, CHARLES G., Central City, Engineering
HARBISON, KENNETH G., Louisville, Chemistry
MAYHEW, MARY L., Lexington, Mathematics
MAYNE, ARLOE W., Jr., Ashland, Engineering
MINER, GEORGE K., Covington, Physics
MONROE, BURT L., Jr., Anchorage, Zoology
MORRIS, BILLY M., Fulton, Physics
NORMAN, JUDY M., Louisville, General Biology
PLOWMAN, KENT M., Glasgow, Physiology
PREWITT, GERALD B., Covington, Physics
RICHARDSON, MARY F., Barbourville, Chemistry
RUPARD, EVELYN F., Winchester, Mathematics
SCHWEITZER, JOHN W., Covington, Physics

Graduate Teaching Assistant

AYRES, JOHN J. B., Lexington, Psychology
DENNER, MELVIN W., Lexington, Zoology
DRACH, JOHN C., Fort Thomas, Biochemistry
HARPER, GOIN N., Hopkinsville, Engineering
HIRSCH, JERRY A., Louisville, Chemistry
PEERCY, PAUL S., Monticello, Physics
PETWAY, JON W., Paducah, Engineering
PFALTZGRAFF, JOHN A., Lexington, Mathematics
REKER, JOSEPH R., Louisville, Engineering
SANDERS, JOHN D., Louisville, Engineering

Postdoctoral

CALDWELL, DOUGLAS R., Newport, Physics
HARPER, GOIN N., Hopkinsville, Engineering

Science Faculty

ADAMS, STALEY F., Lexington, Engineering
HICKS, DONALD G., Murray, Chemistry
PHILLIPS, JOHN P., Louisville, History and Philosophy of Science
SCHEER, DONALD J., Louisville, Engineering
SCHNEIDER, JAMES R., Covington, Physics

Summer Fellowships for Secondary School Teachers

BAKER, FRANCES B., Paducah, Biology
CRAFTON, ARVIN D., Elkton, Chemistry
MADDEN, SR. M. CAECILIA, Covington, Physics
TEA, BARBARA F., Nicholasville, Biology

LOUISIANA

Graduate

BAYLESS, LAURENCE E., New Orleans, Biology
BLANCHARD, PAUL A., New Orleans, Astronomy
CARROLL, KEITH J., New Iberia, Physics
CONWAY, JOHN B., New Orleans, Mathematics

DUCHAMP, DAVID J., St. Martinville, Chemistry
EGGLER, DAVID H., New Orleans, Earth Sciences
GLASER, GERALD C., New Orleans, Earth Sciences
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
PATTERSON, GARY K., Baton Rouge, Engineering
SANDBERG, PHILIP A., Baton Rouge, Earth Sciences
SMITH, CARL R., Paradis, Physics
STOESSELL, ALFRED L., Crowley, Physics
TALBOT, RAYMOND J., Jr., Metairie, Physics
THEALL, GARY E., Abbeville, Mathematics
WEISMAN, CARL S., Shreveport, Mathematics
WEISS, MARY C., New Orleans, Genetics

Cooperative Graduate

CHRISTY, EDMUND H., Jr., New Orleans, Physics
FOX, PAUL W., New Orleans, Psychology
GREENE, JAMES M., Baton Rouge, Chemistry
HERNANDEZ, WALTER C., Jr., Laplace, Physics
HERRON, EDWIN H., Jr., New Orleans, Engineering
HOWE, ROBERT C., Baton Rouge, Earth Sciences
LARKIN, JOEL M., New Orleans, Chemistry
RAMIREZ, DONALD E., New Orleans, Mathematics
RICKEY, FRANK A., Jr., Baton Rouge, Physics
ROBERT, JOHN M., Pineville, Physics
SETTLES, RONALD D., Baton Rouge, Physics
THERIOT, EDWARD D., Jr., Baton Rouge, Physics
VORHABEN, JEAN E., New Orleans, Biochemistry
WELCH, ROBERT C. W., Lake Charles, Engineering

Graduate Teaching Assistant

BREITENBACH, EUGENE A., Lafayette, Engineering
FOSTER, CHARLES C., New Orleans, Physics
GLASER, GERALD C., New Orleans, Earth Sciences
MARX, MORRIS L., Metairie, Mathematics
MCCARTER, BOBBYE L., New Orleans, Sociology
SCHROEDER, RONDON L., Shreveport, Physics
SOUTH, DONALD R., Baton Rouge, Sociology
THOMPSON, DORIS M., Baton Rouge, Chemistry
WEBSTER, RONALD L., Baton Rouge, Psychology
WILLARD, THOMAS M., New Orleans, Chemistry

Senior Postdoctoral

REISSMAN, LEONARD, New Orleans, Economics

Science Faculty

BRYAN, SARA E., Baton Rouge, Biochemistry
DRAKE, ROBERT L., New Orleans, Engineering
KENNEDY, AMOS P., Gramling, Chemistry
MANN, LAWRENCE, Jr., Baton Rouge, Engineering
MCCARTHY, CHARLES B., New Orleans, Engineering
OLIVER, JAMES M., Baton Rouge, Mathematics

Summer Fellowships for Secondary School Teachers

BERTRAND, JOHN E., Gueydan, Mathematics
CRAIN, JAMES L., Varnado, Zoology
HAW, LARRY S., Morrow, Mathematics
HENSON, HARRY L., Jr., Baton Rouge, Zoology
HOUGH, MARSHALL V., Saline, Zoology
JANIES, LEROY, Eunice, Biology
PORTER, WILLIS B., New Iberia, Mathematics
WATKINS, COY H., Houma, Botany

MAINE

Graduate

BROWER, JOHN H., Augusta, Zoology
EVANS, JAMES S., Bridgton, Chemistry
HODGKIN, BRIAN C., Lewiston, Agriculture
MAGUE, JOEL T., Milbridge, Chemistry
O'CONNOR, BRIAN R., Lewiston, Chemistry
STOKOWSKI, STAN E., Lewiston, Physics

Cooperative Graduate

MCCOMBE, BRUCE D., Sanford, Physics
SMALL, DONALD A., Orono, Engineering

Graduate Teaching Assistant

EVANS, JAMES S., Bridgton, Chemistry
FOWLES, BRUCE E., Belfast, Botany

Postdoctoral

SLAYMAN, CAROLYN W., Portland, Biochemistry

Science Faculty

PAGE, ROBERT L., Springvale, Mathematics
WHITTEN, MAURICE M., Gorham, General Science

Summer Fellowships for Secondary School Teachers

VAUGHAN, JOSEPH P., Brunswick, Biology

MARYLAND

Graduate

BLUM, EDWARD H., Silver Spring, Engineering
BROWN, STANLEY G., Kensington, Physics
BROWN, STEPHEN C., Silver Spring, Zoology
BURDICK, MORTON L., Baltimore, Zoology
CARBAUGH, DONOVAN C., Clear Spring, Engineering
COFFIN, STEPHEN A., Chevy Chase, Mathematics
CUMMINGS, FRANK E., Silver Spring, Chemistry
DOBSON, PETER N., Jr., Baltimore, Physics
FARRELL, F. THOMAS, Chevy Chase, Mathematics
FENTRESS, JOHN C., Cambridge, Zoology
FEREBEE, JOHN B., Chevy Chase, Mathematics
FRIEDMAN, WILLIAM A., Silver Spring, Physics
GOSS, BETTE J., Chevy Chase, Zoology
HALL, BARBARA C., Baldwin, Linguistics
HARRISON, STEPHEN C., Baltimore, Biophysics

HAUSER, MICHAEL G., Silver Spring, Physics
HEBB, MATHILDE J., Butler, Physics
HOLLAND, NICHOLAS D., Chevy Chase, Physiology
HOROWITZ, JOSEPH, Silver Spring, Mathematics
HUGHES, ANTHONY C., Catonsville, Mathematics
JOHNSON, JOSEPH A., Baltimore, Biochemistry
KEFFER, CHARLES J., Hyattsville, Physics
KNAPP, ANTHONY W., Baltimore, Mathematics
KOSTINSKY, ALAN L., Baltimore, Mathematics
LANGLEY, SUSAN I., Bethesda, Psychology
LITT, FREDRIC A., Baltimore, Chemistry
LLOYD, WAYNE B., Baltimore, Engineering
MAX, NELSON L., Baltimore, Mathematics
MELSON, WILLIAM G., East Riverdale, Earth Sciences
MOCKUS, JOSEPH, Silver Spring, Chemistry
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
SEARLES, RICHARD B., Frederick, Botany
SINGLETERRY, ANN M., Bethesda, Mathematics
STERN, RICHARD C., Bethesda, Chemistry
STRATHDEE, JOHN A., Army Chem. Ctr., Physics
TEITELBAUM, JOEL M., Silver Spring, Anthropology
THORNTON, ROY F., Beltsville, Engineering
WILSON, RAYMOND B., Kensington, Mathematics
WOLF, ROBERT A., Chillum, Mathematics
ZIMMERMANN, ROBERT C., Baltimore, Earth Science

Cooperative Graduate

CANNON, GLENN A., Baltimore, Oceanography
CRONE, LAWRENCE J., Jessup, Physics
FINKLEMAN, DAVID, Silver Spring, Engineering
GEOGHEGAN, WILLIAM H., Baltimore, Anthropology
GRISCOM, HILDA A., Annapolis, Physiology
HERTZ, KENNETH J., Silver Spring, Mathematics
HESS, MILTON S., Baltimore, Engineering
KAPLAN, LEONARD M., Hyattsville, Physics
LAMACCHIA, JOHN T., Berwyn Heights, Physics
LEVIN, SIMON A., Baltimore, Mathematics
LEVY, EDWARD K., Baltimore, Engineering
LICHTENSTEIN, MARTIN G., Baltimore, Engineering
McDOWELL, EUGENE C., Silver Spring, History and Philosophy of Science
McLAUGHLIN, PATRICIA J., Brentwood, Zoology
PARKE, WILLIAM C., Bethesda, Physics
RICE, JAMES R., Frederick, Engineering
RIFMAN, SAMUEL S., Baltimore, Engineering
ROACH, WILLIAM R., Baltimore, Physics
ROBERTS, WILLIAM A., Silver Spring, Psychology
SILVERMAN, ROBERT A., Takoma Park, Chemistry
TRUNK, GERARD V., Baltimore, Engineering
WAGNER, TIMOTHY K., Hyattsville, Physics
WARD, WILLIAM C., Jr., Baltimore, Psychology

Graduate Teaching Assistant

ANDERSON, RICHARD L., Jr., Adelphi, Physics
COLE, FRANCES E., Jr., Mount Rainier, Microbiology
COONCE, HARRY B., College Park, Mathematics
DOUGHERTY, HUGH J., Baltimore, Engineering
HERTEL, GEORGE R., Baltimore, Chemistry
HETTCHE, LEROY R., Baltimore, Engineering
HOENACK, STEPHEN A., Bethesda, Economics
LARSEN, LAWRENCE H., Baltimore, Meteorology
McLAUGHLIN, PATRICIA J., Brentwood, Zoology
POLLAK, ROBERT A., Chevy Chase, Economics
ROVNER, JEROME S., College Park, Zoology
SCHULTZ, MICHAEL E., Mount Rainier, Engineering
SOLOMON, GENE B., Baltimore, Zoology
WARD, THOMAS G., Jr., La Vale, Engineering
WATT, WARD B., Hyattsville, General Biology

Postdoctoral

DUDLEY, KENNETH H., Hagerstown, Chemistry
LAGNESE, JOHN E., Silver Spring, Mathematics
MASERICK, PETER H., Silver Spring, Mathematics

Senior Postdoctoral

GRIEM, HANS R., College Park, Physics
NICKON, ALEX, Baltimore, Chemistry
PEVSNER, AIHUD, Baltimore, Physics
SUCHER, JOSEPH, College Park, Physics
YARMOLINSKY, MICHAEL B., Baltimore, Biochemistry

Science Faculty

GRAHAM, BILLIE J., Annapolis, Physics
JOHNSTON, RICHARD L., Annapolis, Physics

Summer Fellowships for Secondary School Teachers

FRITTS, LOWELL R., Rockville, Zoology
HAUGHT, JAMES C., Hagerstown, Zoology
LARUE, CHARLES J., Jr., Wheaton, Biology
SEBURN, CAROLYN J., Hagerstown, Mathematics
WEBER, WALTER I., Baltimore, Mathematics

MASSACHUSETTS

Graduate

ABULUGHOD, JANET L., Northampton, Sociology
ALBERT, RICHARD H., Dorchester, Chemistry
AURYANSEN, MARY S., Newtonville, Economics
BAINBRIDGE, MARGARET T., Watertown, History and Philosophy of Science
BAKER, KIRBY A., Winchester, Mathematics
BARSHAY, JACOB, Waltham, Mathematics
BERGER, EDMOND L., Salem, Physics
BERGER, PAUL J., Salem, Physics
BUDNITZ, ROBERT J., Pittsfield, Physics
BUFFINGTON, ANDREW, East Walpole, Physics
CHASE, THEODORE Jr., Dover, Biochemistry
CHASIN, LAWRENCE A., Allston, Biochemistry
CHERKOFSKY, SAUL C., Boston, Chemistry

Christian, John T., West Newton, Engineering
Cocks, Franklin H., Seekonk, Engineering
Coffey, John J., Watertown, Zoology
Collins, Edward J., Watertown, History and Philosophy of Science
Covitz, Frank H., Malden, Chemistry
Davidson, Gerald C., Brookline, Psychology
Denoyer, Linda K., Sterling Junction, Physiology
Dunlap, Helen L., Dracut, Zoology
Eikenberry, Eric F., Arlington, Biophysics
Eldridge, Graeme W., Sterling, Physics
Faber, Joan R., Waltham, Genetics
Fahey, Joseph R., Boston, Economics
Farkas, Edward J., Cambridge, Engineering
Federer, Charles A., III, Belmont, Agriculture
Feldman, Paul A., Chelsea, Physics
Fetz, Eberhard E., Boston, Biophysics
Fishbane, Paul M., Swampscott, Physics
Fitzgerald, Thomas J., Boston, Physics
Fogarty, John C., Belmont, Mathematics
Fuglister, Frederick J., Woods Hole, Mathematics
Gates, David F., Needham Heights, Economics
Gell, Jonathan M., Cambridge, Anthropology
Gerstmann, Joseph, Malden, Engineering
Gintis, Herbert M., Cambridge, Mathematics
Godchaux, Walter, III, Cambridge, Biology
Gross, David J., Newtonville, Physics
Guertin, Ralph F., Indian Orchard, Physics
Guinon, Walter J., III, Marblehead, Engineering
Halpern, Martin B., Cambridge, Physics
Higgins, Richard J., Reading, Engineering
Hollins, Clinton G., North Andover, Engineering
Horn, Henry S., Cambridge, Biology
Johnson, Kenneth D., Pittsfield, Mathematics
Kleiman, Steven L., Marblehead, Mathematics
Krefetz, Elliott I., Chelsea, Physics
Kresge, David T., Framingham, Economics
Larner, Kenneth L., Brookline, Earth Sciences
Leary, John J., South Deerfield, Mathematics
Litvack, James M., Newton, Economics
Lundberg, Charles A., Jr., Mattapan, Chemistry
Lynch, Thomas J., Quincy, Chemistry
Martins, Joseph F., Cambridge, Chemistry
Masters, Stanley H., Winchester, Economics
McCall, George J., Cambridge, Psychology
McCawley, James D., Cambridge, Linguistics
Michelson, William M., Cambridge, Sociology
Moore, Peter B., Brookline, Biophysics
Moulton, Margaret C., Scituate, Chemistry
Mutchler, Gordon S., Cambridge, Physics
Myrvaagnes, Barbara B., Winchester, Physics
Newton, Victor J., Boston, Physics
Paoli, Thomas L., New Bedford, Physics
Paradis, Stephen G., Cambridge, Engineering
Parsons, Sidney B., Amherst, Astronomy
Paul, Robert A., Concord, Anthropology
Pizer, Stephen M., Winthrop, Mathematics
Powers, Robert T., Boston, Physics
Prince, Julian F., Newton, Mathematics
Ralls, Kenneth M., Cambridge, Engineering
Rent, Nancy H., Randolph, Engineering
Richardson, Jonathan L., Harwich Port, Zoology
Roberts, Michael, Longmeadow, Engineering
Robinson, Robert W., Natick, Mathematics
Root, Stephen C., Winchester, Engineering
Rothkopf, Michael H., Newton, Social Sciences
Rowell, Glen A., Groveland, Engineering
Savin, Samuel M., Newton Highlands, Earth Sciences
Schuster, Richard H., Cambridge, Psychology
Sekerka, Robert F., Cambridge, Physics
Shnidman, Susan R., Allston, Psychology
Sigel, James L., Newton, Physics
Singer, Harvey A., Waltham, Engineering
Socolow, Robert H., Cambridge, Physics
Southard, John B., Cambridge, Earth Sciences
Stanley, Richard J., Pittsfield, Linguistics
Sullivan, Paul F., Natick, Physics
Sullivan, Roger J., North Chelmsford, Physics
Sutherland, William R., Lexington, Engineering
Thomas, Lee C., Brookline, Engineering
Trask, Newell J., Jr., Belmont, Earth Sciences
Weiner, Robert A., Cambridge, Physics
Weiner, Stephen D., West Newton, Physics
Weinstein, Herbert G., Swampscott, Engineering
Weisberger, William I., Brookline, Physics
Weisskopf, Thomas E., Cambridge, Economics
Wickelgren, Barbara G., Cambridge, Physiology
Wilkinson, Charles K., Jr., Danvers, Mathematics
Winkler, Herbert H., South Easton, Physiology
Wood, Benjamin H., Jr., West Springfield, Engineering
Yegian, Charles D., Amherst, Biophysics

Cooperative Graduate

Auslander, David M., Somerville, Engineering
Berger, Stephen D., Cambridge, Sociology
Chutoransky, Peter, Jr., Hudson, Engineering
Cooper, William W., IV, Leominster, Engineering
Cosman, Eric R., Arlington, Physics
Crabtree, Douglas E., Needham, Mathematics
Decourcy, Daniel J., Jr., Boston, Engineering
Ebbett, Ballard E., Quincy, Earth Sciences
Fox, Herbert L., Brookline, Physics
Gamache, Adrien E., Lynn, Agriculture
Glaser, Jerome I., Athol, Engineering
Goodman, Lawrence A., Swampscott, Engineering
Hatfield, Colby R., Jr., Leominster, Anthropology
Henry, Bruce R., Pittsfield, Mathematics
Kelleher, James J., Boston, Mathematics
Lieberman, Burton B., Brookline, Mathematics
Molinar, Judith A., Barre, Mathematics
Picard, Richard H., Boston, Physics

POWERS, EDWARD J., Pittsfield, Chemistry
RABOLD, GARY P., Boston, Chemistry
ROTHWELL, PAUL L., Wareham, Physics
SHAPIRO, GERALD N., Everett, Engineering
SHAW, BRENDA B., Cambridge, Zoology
SMITH, HENRY I., Jr., Littleton, Physics
STICKLER, DAVID B., Swansea, Engineering
THOMAE, IRVING H., Brookline, Physiology
VANDEWOESTINE, ROBERT V., Andover, Engineering
WARNER, FRANK W., III, Watertown, Mathematics
WILLIAMS, RICHARD S., Jr., Needham Heights, Earth Sciences

Graduate Teaching Assistant

ADEY, WALTER H., Medford, Botany
BOYD, SYLVIA L., Boston, Physics
CORLISS, SYLVIA, Gloucester, General Biology
COTE, WILLIAM E., Agawam, Earth Sciences
DEYRUP, CYNTHIA L., Cambridge, Chemistry
DOE, FRANK J., Chestnut Hill, Genetics
EBBETT, BALLARD E., Quincy, Earth Sciences
EVNIN, ANTHONY B., Cambridge, Chemistry
FARRELL, MARCUS J., Worcester, Physiology
GLOWACKI, ELLEN R., Winchester, Biochemistry
GREECHIE, RICHARD J., Dorchester, Mathematics
GROSS, KENNETH I., Everett, Mathematics
HOLMES, RICHARD B., Malden, Mathematics
INGRAHAM, MARTHA J., Worcester, Earth Sciences
LINARES, OLGA F., Cambridge, Anthropology
MACDONALD, ALEXANDER, Jr., East Bridgewater, Chemistry
PARSONS, TIMOTHY F., Cambridge, Chemistry
PAULSEN, DUANE E., Belmont, Chemistry
RALLS, KATHERINE S., Cambridge, Physiology
REID, HAY B., Jr., Osterville, Botany
SCANLON, PATRICIA M., Holyoke, Chemistry
SEGAL, ROBERT, Boston, Mathematics
SHAW, FREDERICK C., Cambridge, Earth Sciences
STEVENS, CHANDLER H., Jr., Bedford, Economics
SUTHERS, RODERICK A., Cambridge, Physiology
WINNER, JOHN M., Wakefield, General Biology

Postdoctoral

BURNETT, JOSEPH W., Dedham, Medical Sciences
COLLERY, ARNOLD, Amherst, Economics
FESSENDEN, JUNE M., Whitinsville, Medical Sciences
FISH, RICHARD W., Weston, Chemistry
GERSTEIN, IRA S., Cambridge, Physics
GIBB, THOMAS R. P., Winchester, Chemistry
KEITT, ALAN S., Boston, Medicine
KRONAUER, RICHARD E., Harvard, Engineering
LEVINE, JEROME P., Arlington, Mathematics
LOCKSHIN, RICHARD A., Northampton, Zoology
LUKAS, GEORGE, Boston, Chemistry
MATHEWS, MICHELINE M., Cambridge, Microbiology
SHAKIN, CARL M., Cambridge, Physics
STOLZENBERG, GABRIEL, Cambridge, Mathematics
VAUGHAN, MAURICE H., Jr., Cambridge, Biophysics
WARNER, JONATHAN R., Boston, Biophysics

Senior Postdoctoral

KLEIN, HAROLD P., Waltham, Genetics
LEVINE, ROBERT P., Cambridge, Biochemistry
PALAIS, RICHARD S., Waltham, Mathematics
SOLOW, ROBERT M., Cambridge, Economics

Science Faculty

DAVISON, WELLEN G., Boston, Engineering
GARRETT, WILLIAM R., Jr., North Andover, Engineering
GUINDON, REVEREND WILLIAM, Chestnut Hill, Physics
HEXTER, WILLIAM M., Amherst, Genetics
KERTZNER, STANLEY, Amherst, Mathematics
LONG, ROBERT, II, Worcester, Physics
MARINO, PASQUALE A., Boston, Engineering
McCARTHY, JOHN R., Worcester, Mathematics
PERRY, BRILLE R., Newton, Chemistry
SHELLEY, JOSEPH F., Kingspoint, Engineering
SILVA, ARMAND J., Worcester, Engineering
WHITNEY, LESTER F., Amherst, Engineering

Summer Fellowships for Secondary School Teachers

FAIRBANKS, GEORGE A., III, Rehoboth, Physics
HUTCHINSON, WILLIAM A., Amherst, Botany
KELLETT, JEREMIAH J., Weston, Mathematics
LEEDS, CLARENCE W., III, Sheffield, Mathematics
McDERMOTT, JOSEPH P., North Borough, Mathematics
POLLARD, MELVIN, Roxbury, Earth Sciences

MICHIGAN

Graduate

ALLARD, MARVEL J., East Lansing, Psychology
ANDERSEN, CARL M., Richmond, Physics
ANDERSON, PETER G., Midland, Mathematics
ARLINGHAUS, FRANCIS J., Detroit, Chemistry
BECK, WILLIAM F., Lansing, Engineering
BIALLAS, MICHAEL J., Pontiac, Chemistry
BROOKS, ELAINE R., Fremont, Physiology
BROT, FREDERICK E., Kalamazoo, Chemistry
BROWN, VERNE R., Birmingham, Engineering
BUTLER, PAUL W., Mount Clemens, Engineering
COBURN, LEWIS A., Ann Arbor, Mathematics
COELING, KENNETH J., Grand Rapids, Engineering
COHEN, JOEL M., Detroit, Psychology
COMPANS, RICHARD W., St. Joseph, Biochemistry
FALICK, ARNOLD M., Detroit, Chemistry
FANSELOW, JOHN L., Kalamazoo, Physics
FANSON, PHILIP L., Mason, Engineering
FELDMAN, LOUIS A., Saginaw, Mathematics
FLEURY, PAUL A., Detroit, Physics
FREEMAN, RICHARD D., Jr., Midland, Mathematics
GILMAN, FREDERICK J., Ann Arbor, Physics
GORDON, GERALD L., Detroit, Mathematics
GUSSIN, GARY N., Detroit, Biophysics
GUYER, MELVIN J., Detroit, Psychology
HARWOOD, CLIFFORD, Kalamazoo, Physics
HEMESATH, NORBERT B., East Lansing, Engineering
HEYT, JOHN W., Grand Rapids, Engineering
HINTON, FREDERICK L., Yale, Physics
HOGH, GOTTFRIED, Detroit, Zoology
HUBBARD, JOHN P., Pleasant Ridge, Zoology
HUBBELL, STEPHEN P., Ann Arbor, Biology
JENSEN, JOSEPH T., Muskegon, Genetics

Jokipii, Jack R., Ironwood, Physics
Kelly, Robert C., St. Joseph, Chemistry.
Knutson, Roger M., East Lansing, Botany
Koch, Stephen D., North Muskegon, Botany
Kratz, Lawrence J., Detroit, Mathematics
LePage, James J., East Lansing, Physics
Locker, John S., Detroit, Mathematics
Maki, Daniel P., Negaunee, Mathematics
Mason, Larry G., Wyandotte, Zoology
McBride, Joseph F., St. Louis, Engineering
McIlrath, Thomas J., East Lansing, Physics
McVaugh, Michael R., Ann Arbor, History and Philosophy of Science
Moberly, Walter R., Ann Arbor, Biology
Nowlin, Julia M., Flint, Mathematics
Olson, Robert D., Iron Mountain, Physiology
Opaskar, Carl G., Ypsilanti, Biophysics
Osterink, Larry M., Grand Rapids, Engineering
Palmer, Patrick E., Lansing, Physics
Parizek, Robert J., Bay City, Engineering
Petrie, Ted E., Lansing, Mathematics
Price, John A., Ann Arbor, Anthropology
Quaife, Arthur W., Dearborn, Mathematics
Rosenthal, Peter M., Ypsilanti, Mathematics
Ruesink, Albert W., Adrian, Botany
Ruhl, Robert C., Saginaw, Engineering
Salter, Kathleen C., Detroit, Mathematics
Siegfried, Edward G., Mount Clemens, Mathematics
Slakey, Sr. Paul M., Adrain, Biochemistry
Slobin, Dan I., Detroit, Psychology
Spitzer, Robert H., Jr., Detroit, Engineering
Teller, Andrew S., Ann Arbor, Engineering
Vedejs, Edwin, Grand Rapids, Chemistry
Walters, David R., Battle Creek, Physiology
Zacks, James L., Iron Mountain, Psychology

Cooperative Graduate

Andrews, Ronald A., Pontiac, Physics
Aubel, Joseph L., Lansing, Physics
Baerwaldt, James W., Ann Arbor, Psychology
Barber, Frederick W., Birmingham, Mathematics
Barnett, William K., Detroit, Sociology
Bartholomew, Robert C., Grand Rapids, Mathematics
Beirne, Patrick D., Detroit, Chemistry
Bremer, Bradley A., East Lansing, Psychology
Caple, Ronald, Ann Arbor, Chemistry
Cohen, Marshall M., Ann Arbor, Mathematics
Dickinson, J. Thomas, Kalamazoo, Physics
Dilling, Roger L., East Lansing, Physics
Donahue, Julian P., Harbor Beach, Zoology
Eagly, Alice J. H., Ann Arbor, Psychology
Eller, Anthony I., Detroit, Physics
Erickson, Karen C., Ypsilanti, Mathematics
Floyd, Richard L., Pontiac, Psychology
Foote, Frieda L., Benton Harbor, Sociology
Forbes, William C., Pontiac, Botany
Forsyth, John J., East Lansing, Engineering
Goranson, Mona M., Crystal Falls, Earth Sciences
Griffith, Dean L., Kalamazoo, Chemistry
Hall, Richard S., Eaton Rapids, Mathematics
Havlicek, Stephen C., Holland, Chemistry
Hunter, Kenneth M., Muskegon, Mathematics
Kamerschen, David R., East Lansing, Economics
Katz, Darryl, Detroit, Psychology
Keana, John F. W., Benton Harbor, Chemistry
King, John M., Ann Arbor, Chemistry
Kurczynski, Thaddeus W., Hamtramck, Anthropology
Lemert, James B., East Lansing, Social Sciences
Luehrs, Dean C., Lansing, Chemistry
Mason, James A., North Muskegon, Social Sciences
Metzler, Richard C., Detroit, Mathematics
Mitchell, Terry M., Detroit, Engineering
Patterson, Blake R., Royal Oak, Social Sciences
Posler, Jeanette, Detroit, Chemistry
Randall, Charles M., East Lansing, Physics
Rettig, Thomas A., Flint, Chemistry
Schilling, Carol A., Ann Arbor, Anthropology
Sigsbee, Raymond A., Allen Park, Engineering
Smallwood, Dennis E., Southfield, Mathematics
Smart, James B., Detroit, Chemistry
Tornberg, Neal E., Detroit, Physics
Webster, Mary M., Grand Rapids, Psychology
Westover, Charles J., Plymouth, Biophysics
Whiting, Gordon C., East Lansing, Social Sciences
Wright, Roger L., Royal Oak, Mathematics

Graduate Teaching Assistant

Balks, Edite V., Battle Creek, Physiology
Berndt, Bruce C., Stevensville, Mathematics
Bester, Julian J., Detroit, Physics
Bickel, Thomas F., Detroit, Mathematics
Brot, Frederick E., Kalamazoo, Chemistry
Burkey, Bruce C., East Lansing, Physics
Clifford, Loren R., Detroit, Physics
Cohen, Joel M., Detroit, Psychology
Cubitt, Earl D., Sandusky, Engineering
Falk, James E., Ann Arbor, Mathematics
Gilgen, Albert R., East Lansing, Psychology
Haire, Richard G., East Lansing, Chemistry
Hawkins, Roger E., Grass Lake, Psychology
Homeister, Owen E., Mason, Earth Sciences
Istock, Conrad A., Pinckney, General Biology
Jackson, Dennis C., East Lansing, Botany
Janowitz, Melvin F., Detroit, Mathematics
Levine, Joseph R., East Lansing, Psychology
McKay, James B., Detroit, Chemistry
McPhail, Shelvey C., Jr., East Lansing, Sociology
Michaels, Jeraldine A., Detroit, Microbiology
Mitchell, John A., East Detroit, Physics
Niedringhaus, Thomas E., East Lansing, Earth Sciences
Perfitt, Thomas E., East Lansing, Engineering
Perry, Clifford R., Detroit, Mathematics
Petrille, Dennis G., Grosse Pointe Park, Engineering
Ramsey, James H., Detroit, Mathematics
Robinson, Mary J., Fenton, Microbiology
Schmiegel, Klaus K., Dearborn, Chemistry
Schreiner, Erik A., Detroit, Mathematics
Sigsbee, Raymond A., Allen Park, Engineering
Sneden, Lawrence E., Lansing, Sociology
Solomon, Donald W., Detroit, Mathematics

Taylor, Gerald D., Ann Arbor, Mathematics
Trubey, Jeanne D., Grosse Pointe Farms, Microbiology
Vanderlind, Merwyn R., Grand Rapids, Physics
Ybarrondo, Lawrence J., Detroit, Engineering

Postdoctoral

Baker, David B., Saline, Botany
Carroll, Robert L., Mason, Earth Sciences
Harrison, Halstead, Ann Arbor, Chemistry
Paul, Coleman, Detroit, Psychology
Sahlins, Marshall D., Ann Arbor, Anthropology
Sarason, Donald E., Detroit, Mathematics
Sedlin, Elias D., Detroit, Physiology
Ting, Chao C., Ann Arbor, Physics

Senior Postdoctoral

Case, Kenneth M., Ann Arbor, Physics
Hecht, Karl T., Ann Arbor, Physics
Kirschner, Stanley, Detroit, Chemistry

Science Faculty

Bund, Robert W., Flint, Engineering
Clark, Philip J., East Lansing, Mathematics
Cowan, Archibald B., Ann Arbor, Zoology
Cowan, D. Ross, Ann Arbor, Mathematics
Duke, Richard D., East Lansing, Other Social Sciences
Dungy, Wilbur L., Jackson, Physiology
Janke, Robert A., Houghton, Botany
Kinsinger Jack B., East Lansing, Chemistry
Kruglak, Haym, Kalamazoo, Physics
Meike, Gerald E., Detroit, Mathematics
Scherba, Michael B., Detroit, Engineering
Sechler, Robert E., Kalamazoo, Mathematics
Stevens, Harry K., Kalamazoo, Zoology
Turner, Walter W., Flint, Mathematics

Summer Fellowships for Secondary School Teachers

Bidwell, James K., Bay City, Mathematics
Brod, Herbert M., Oak Park, Mathematics
Brumels, Gordon K., Kalamazoo, Mathematics
Freeman, Eulis D., Southfield, Mathematics
Herlein, George L., Romeo, Mathematics
Lambert, Sr. J. Therese, Lansing, Mathematics
Miles, Irene P., Kalamazoo, Mathematics
Newmyer, Joseph, Jr., Muskegon, Mathematics
Pyne, James H., Flint, Physics
Taylor, Gerald R., Farmington, Biology
Turlo, John B., Farmington, Botany
Van Conant, Darrel L., Warren, Mathematics
Wilkinson, Ruth M., Mattawan, Mathematics

MINNESOTA

Graduate

Anderson, Robert J., Minneapolis, Chemistry
Anderson, Roger J., Minneapolis, Chemistry
Bangerter, Benedict W., St. Paul, Chemistry
Berg, Kenneth R., Minneapolis, Mathematics
Blehert, Sandra L., Minneapolis, Psychology
Canner, Martha K., Minneapolis, Microbiology
Carlson, Keith J., White Bear Lake, Earth Science
Darley, Janet B., Minneapolis, Sociology
Darley, John M., Minneapolis, Psychology
Deraad, Lester L., Jr., St. Paul Park, Physics
Deutsche, Craig W., Minneapolis, Chemistry
Ecklund, Stanley D., Minneapolis, Physics
Enemark, John H., Tyler, Chemistry
Forstrom, Lee A., Lanesboro, History and Philosophy of Science
Gallistel, Charles R., Wayzata, Psychology
Hajicek, James D., Minneapolis, Physics
Hedman, Stephen C., Duluth, Genetics
Hegstrom, Roger A., Waconia, Chemistry
Hilden, Shirley A., Montevideo, Physiology
Hoffman, John R., Zumbrota, Engineering
Hume, Gary W., Minneapolis, Anthropology
James, David E., St. Paul, Earth Science
Jensen, Timothy B., Minneapolis, Engineering
Johnson, Lane R., Pipestone, Earth Science
Johnson, Leland G., Hadley, Physiology
Kampen, Garry R., Lesueur, Mathematics
Kuhfeld, Albert W., Morris, Physics
Kunz, Louis W., Mapleton, Physics
Loken, James G., Minneapolis, Physics
Loken, Maxine E., Ada, Anthropology
Luke, Jon C., Minneapolis, Mathematics
McKenzie, Douglas H., Minneapolis, Anthropology
Newman, Riley D., St. Paul, Physics
Nickum, John G., Stewartville, Zoology
Niessen, Charles W., St. Paul, Engineering
Norman, Carl E., Cokato, Earth Science
Ojakangas, Richard W., Warba, Earth Science
Rasmussen, Robert A., Mankato, Biology
Rovainen, Carl M., Excelsior, Physiology
Rush, Kent R., Minneapolis, Chemistry
Schleinitz, Henry M., Duluth, Engineering
Sell, Darrell D., Buffalo Lake, Physics
Somero, George N., Ely, Biology
Starr, James B., Minneapolis, Engineering
Stryk, Robert A., St. Paul, Physics
Tuleen, Neal A., St. Paul, Genetics
Weisbrod, Rita J., Minneapolis, Sociology

Cooperative Graduate

Berg, John C., Hopkins, Engineering
Brodsky, Stanley J., St. Paul, Physics
Bullock, Charles E., Lengby, Engineering
Burkel, William E., North Mankato, Zoology
Condiff, Duane W., St. Paul, Engineering
Denn, Morton M., St. Paul, Engineering
Fillmore, Jay P., Minneapolis, Mathematics
Fleming, David P., Minneapolis, Engineering
Forstrom, Richard J., Minneapolis, Engineering
Garon, Allan M., Duluth, Engineering
Green, Richard F., Duluth, Mathematics
Grove, Larry C., Minneapolis, Mathematics
Huneke, John C., St. Paul, Physics
Inglis, John D., Minneapolis, Mathematics
Janssen, Raymond A., Lamberton, Engineering
Jewsbury, Wilbur G., Mankato, Chemistry
Johnson, Roy A., Solway, Chemistry
Johnson, Wayne D., Becker, Engineering

JORDAN, MARY A., St. Paul, General Biology
KLINE, KENNETH A., Minneapolis, Engineering
KUELBS, JAMES D., St. Paul, Mathematics
LAEDY, LAWRENCE J., Minneapolis, Mathematics
LEZNIAK, THOMAS W., Minneapolis, Physics
LOOK, DAVLD C., Anoka, Physics
LUND, DAVID H., Roseau, Psychology
MUTSCH, EDWARD L., Minneapolis, Chemistry
NELSON, CARROLL A., Rothsay, Mathematics
NORD, RICHARD P., Rothsay, General Biology
O'BRIEN, THOMAS W., Rochester, Physiology
PALMER, DIANE J., Minneapolis, General Biology
PIERSKALLA, WILLIAM P., Bemidji, Mathematics
POTSWALD, HERBERT E., Duluth, Zoology
PTASHNE, MARK S., Minneapolis, Zoology
ROSENFIELD, JOAN S., Minneapolis, Chemistry
SANDLER, STANLEY I., Minneapolis, Engineering
SCHMEAL, WALTER R., Minneapolis, Engineering
SELLSTEDT, JOHN H., Minneapolis, Chemistry
SMITH, FRANKLIN C., Jr., St. Paul, Physics
TORRANCE, KENNETH E., Minneapolis, Engineering
VOSS, GORDON O., Minneapolis, Engineering
WASSINK, DARWIN, Edgerton, Economics
WHITE, DOUGLAS R., Minneapolis, Anthropology
WOLF, CALVIN J., New Ulm, Engineering
WOLLNER, THOMAS E., Rochester, Chemistry
WOODWORTH, GEORGE G., Minneapolis, Mathematics
ZIPOY, ROGER T., Minneapolis, Mathematics

Graduate Teaching Assistant

ANDERSON, GARY L., Bemidji, Mathematics
BERGMAN, CLARK, St. Paul, Physics
BLACK, ALBERT W., Minneapolis, Engineering
BOYD, RICHARD N., Minneapolis, Physics
BREDESON, JON G., Hawley, Engineering
COFFMAN, ROBERT E., Minneapolis, Chemistry
DEASON, JAMES R., Minneapolis, Chemistry
DUMONCEAUX, ROBERT H., Oak Park, Mathematics
FORBES, RICHARD B., Minneapolis, General Biology
FOSS, FREDERICK W., Jr., Winona, Chemistry
GREWE, ALFRED H., Jr., Saint Cloud, Zoology
GRONNER, JOAN E., Underwood, Sociology
GUNDERSON, PAUL E., Moorhead, Engineering
HAGER, RICHARD A., Minneapolis, Mathematics
HART, RICHARD B., St. Paul, Chemistry
HERICKHOFF, ROBERT J., Belgrade, Phyiscs
HILDEN, SHIRLEY A., Montevideo, Physiology
HINDERMAN, JERRY D., Minneapolis, Engineering
HYDUKE, SONJA L., St. Peter, Physiology
JOHNSON, ROY A., Solway, Chemistry
KUELBS, JAMES D., St. Paul, Mathematics
LARSON, WILLARD D., Austin, Chemistry
MUTSCH, EDWARD L., Minneapolis, Chemistry
NYQUIST, LAURENCE E., Tracy, Phyiscs
ORWOLL, ROBERT A., Minneapolis, Chemistry
OSBORN, JOHN E., Minneapolis, Mathematics
PRATT, SUSAN A., Minneapolis, General Biology
PULKRABEK, WILLARD W., St. Paul, Engineering
RECK, MARY K., Minneapolis, Chemistry
ROSENFIELD, JOAN S., Minneapolis, Chemistry
SCHWARTZ, GAYLORD P., Minneapolis, Mathematics
SELLSTEDT, JOHN H., Minneapolis, Chemistry
TERRELL, KATHLEEN L., Nopeming, Zoology
THEISSEN, ROBERT J., St. Paul, Chemistry
VALENTAS, KENNETH J., Minneapolis, Engineering
WEIBLEN, PAUL W., Minneapolis, Earth Sciences
WOODBURY, GEORGE W., Jr., Minneapolis, Chemistry
ZEMAN, RONALD J., St. Paul, Engineering

Postdoctoral

AHERN, PATRICK R., St. Paul, Mathematics
CONWAY, THOMAS W., St. Paul, Biochemistry
GIBBS, JAMES L., Jr., Minneapolis, Psychology
GUTTMAN, BURTON S., Minneapolis, Biology
HELLING, ROBERT B., Madelia, Genetics
HULLAR, THEODORE L., Minneapolis, Biochemistry
MILLER, FRANK C., Northfield, Anthropology
ROSE, RICHARD J., Fairmont, Psychology
VISTÉ, ARLEN E., Northfield, Chemistry
WARDEN, ROBERT B., St. Cloud, Engineering

Senior Postdoctoral

BRITTON, JOHN D., Minneapolis, Chemistry

Science Faculty

ANDERSON, GARY C., St. Paul, Mathematics
FLUEGEL, WALTER, Duluth, Microbiology
HANSON, HOWARD G., Duluth, Physics
OBERPRILLER, JOHN O., Minot, Zoology
ORR, HOWARD D., Northfield, Biology
REITZ, ROBERT A., Northfield, Physics
STENBERG, WARREN B., Minneapolis, Mathematics

Summer Fellowships for Secondary School Teachers

BECKLUND, LESTER A., Minneapolis, Mathematics
BURTON, RONALD F., Minneapolis, Biology
HOWELL, FRANCIS L., Marshall, Physics
JOHNSON, DOUGLAS H., Minneapolis, Zoology
LEARY, ROGER D., Richfield, Mathematics
NELSON, ROBERT D., Shakopee, Mathematics
NORDLAND, FLOYD H., Minneapolis, Biology

MISSISSIPPI

Graduate

BALGORD, WILLIAM D., Jackson, Earth Sciences
DRANE, DOUGLAS O., Jackson, Engineering
MILLER, WILLIAM H., Jackson, Chemistry
PATTERSON, JOHN D., Ellisville, Engineering
PRIESTLEY, WILLIAM M., Rosedale, Mathematics
ROBERTS, JERRY P., Hattiesburg, Physics

Cooperative Graduate

BURNETT, JOSEPH C., Jr., Meridian, Engineering

CARRAWAY, KERMIT L., Utica, Chemistry
McALPIN, JAMES J., Jackson, Chemistry
PENTON, JAMES R., Columbia, Chemistry
TREVATHAN, VERNON L., Jr., Meridian, Engineering

Graduate Teaching Assistant

BELL, JIMMY T., Oxford, Chemistry
CARRAWAY, KERMIT L., Utica, Chemistry
CONNER, JACK M., Jackson, Chemistry
GUSLER, LEE T., State College, Engineering
HILL, SUSAN C., Philadelphia, Botany
MAPLES, DAGO, Perkinston, Engineering
TANNER, ARTHUR C., New Albany, Mathematics

Postdoctoral

SIMMS, JAMES C., Jackson, Mathematics

Science Faculty

MILLIGAN, BARTON, Oxford, Chemistry

Summer Fellowships for Secondary School Teachers

GOUDELOCK, BIRMA M., Bruce, Mathematics
OSBORN, WILLIAM H., IUKA, Chemistry
WINSTEAD, ROBERT L. Gulfport, Mathematics

MISSOURI

Graduate

ADAMS, DAVID B., Neosho, Psychology
ANDERSON, DAVID K., Joplin, Chemistry
BARWISE, KENNETH J., Independence, Mathematics
BROWN, JOHN W., Jenkins, Engineering
CASEY, CHARLES P., St. Louis, Chemistry
CHIRPICH, THOMAS P., Kansas City, Biochemistry
CLEMENTS, JOHN L., Gallatin, Engineering
DRDA, WAYNE J., St. Louis, Engineering
ECKERT, CHARLES A., St. Louis, Engineering
ELSON, ELLIOT L., Ladue, Biochemistry
FORNEY, G. DAVID, Jr., St. Louis, Engineering
HERKSTROETER, WILLIAM G., St. Louis, Chemistry
HILLIX, M. KAREN, St. Joseph, Psychology
HOFFMAN, EDWARD J., St. Louis, Chemistry
HOUK, RICHARD D., Springfield, Botany
HUSTON, ROBERT E., Windsor, Engineering
JONES, ROBERT H., Webster Groves, Economics
KREWINGHAUS, ARTHUR B., St. Louis, Engineering
KURTZ, THOMAS G., La Plata, Mathematics
LAU, RICHARD L., Kansas City, Mathematics
LICHT, PAUL, St. Louis, Physiology
LINCK, PATRICIA A., Kirkwood, Psychology
MUNCH, JOHN H., Webster Groves, Chemistry
MURPHY, RALPH A., St. Louis, Engineering
O'BROCK, ARTHUR E., Richmond Heights, Mathematics
PINCKERT, RICHARD E., St. Louis, Engineering
ROEDER, JOHN L., Webster Groves, Physics
SANDER, LEONARD M., University City, Physics
SCHWARTZ, STEPHEN E., University City, Chemistry
SELVIDGE, CHARLES W., Eureka, Engineering
SMITH, DOUGLAS, St. Joseph, Earth Sciences
WEINBACH, JO L., St. Louis, Zoology
ZWART, PHILIP B., Florissant, Mathematics

Cooperative Graduate

BOUMAN, THOMAS D., Clayton, Chemistry
BOWERS, JOHN E., Jr., St. Louis, Chemistry
BRINKMAN, WILLIAM F., Jr., Columbia, Physics
COCHRAN, RUSSELL V., Jr., St. James, Physics
COOK, ROBERT A., University City, Mathematics
EARLY, CHARLES T., Baring, Physics
GREENE, HARVEY W., Moberly, Mathematics
GUERNSEY, ROBERT W., Jr., St. Louis, Physics
HANSS, ROBERT E., St. Louis, Earth Sciences
HUSTON, ROBERT E., Rolla, Engineering
JAMES, PHILIP B., Kansas City, Physics
KEITH, HAROLD D., Spickard, Engineering
LAPOSA, JOSEPH D., University City, Chemistry
MANKA, CHARLES K., Kearney, Physics
MAXWELL, DWIGHT T., Kansas City, Earth Sciences
McCHESNEY, JAMES D., Hatfield, Chemistry
MENKE, MICHAEL M., Webster Groves, Physics
MITCHELL, WILLIAM C., St. Louis, Physics
PORTER, JACK R., San Francisco, Mathematics
PORTER, LARRY D., Mercer, Engineering
RICE, ROBERT R., Rolla, Physics
ROGERS, PHYLLIS N., Fulton, Economics
SLUSHER, RICHART E., Higginsville, Physics
SNOW, JOEL A., St. Louis, Physics
STANLEY, JON G., Columbia, Physiology
TOMBAUGH, JOSEPHINE W., Columbia, Psychology
WOLCOTT, SR. DAMIEN, Normandy, Chemistry

Graduate Teaching Assistant

BANKS, LAWRENCE E., Jr., Springfield, Physics
BOWERS, JOHN E., St. Louis, Chemistry
BUCHERT, KENNETH P., Columbia, Engineering
BUNCH, DAVID W., Rolla, Engineering
CANIS, WAYNE F., Columbia, Earth Sciences
CANTERBERY, E. RAY, St. Louis, Economics
CARR, JERRY J., Rolla, Engineering
CHOLEWINSKI, FRANK M., University City, Mathematics
DAVIS, JEFFREY R., St. Louis, Mathematics
ENGLAND, JAMES W., Columbia, Mathematics
FERGUSON, RICHARD B., St. Louis, Physics
GAVER, RICHARD W., Columbia, Chemistry
GLOVER, ALAN D., Canton, Chemistry
GREENE, HARVEY W., Moberly, Mathematics
GRODSKY, IRVIN T., Overland, Physics
HATTEMER, JIMMIE R., St. Louis, Mathematics
HECKENBACH, ALAN J., Columbia, Mathematics
HEIDEN, EDWARD J., St. Louis, Economics
HUNT, RICHARD A., St. Louis, Mathematics
HURWITZ, CAMILLA T., St. Louis, Chemistry
JOHNSON, RICHARD T., Rolla, Engineering
JORDAN, ROBERT W., Clayton, Chemistry
KOVEL, STEVEN M., Rolla, Physics
LEVENTHAL, JACOB J., University City, Physics
MAXWELL, DWIGHT T., Kansas City, Earth Sciences
MITCHELL, WILLIAM C., St. Louis, Physics
MOLL, WILLIAM F., Jr., University City, Earth Sciences
MURRILL, SR. JOHN B., St. Louis, Chemistry

NEAL, WILLIAM J., Columbia, Earth Sciences
PALMER, HAROLD G., Nevada, Physics
RICE, ROBERT R., Rolla, Physics
SAIN, MICHAEL K., St. Louis, Engineering
SCHMIEDERER, JOHN M., St. Louis, General Biology
SNOW, JOEL A., St. Louis, Physics
VOSS, JUSTIN L., Columbia, Economics
WESTHOFF, DAVID D., St. Louis, Physiology

Postdoctoral

HAZEL, JOSEPH E., Caruthersville, Earth Sciences

Senior Postdoctoral

TOLMACH, LEONARD J., St. Louis, Biophysics
BURTON, ROBERT M., St. Louis, Biochemistry

Science Faculty

AMSTUTZ, G. CHRISTIAN, Rolla, Earth Sciences
BERRIER, HARRY H., Columbia, Pathology
BEST, JOHN L., Rolla, Engineering
CHILDRESS, DUDLEY S., Columbia, Engineering
DOLL, JOHN P., Columbia, Mathematics
HENNING, DALE R., Columbia, Anthropology
OTTO, DAVID A., Columbia, Earth Sciences
TUTT, EVELYN M., Jefferson City, Biology

Summer Fellowships for Secondary School Teachers

BARRETT, HELEN M., St. Louis, Mathematics
BEALMEAR, SR. M. MARGARET, Kansas City, Biology
DEALL, LOUIS, Clayton, Physics
GOWINS, GENE E., Rolla, Physics
GROS, JEFFREY A., Glencoe, Biology
MARLEY, JAMES R., Mexico, Mathematics
SCOTT, BOB R., Flat River, Mathematics
SKLOSS, ELMER R., Kirkwood, Mathematics

MONTANA

Graduate

HINTZMAN, DOUGLAS L., Polson, Psychology
IHLER, GARRET M., Great Falls, Biochemistry
JONAS, ROBERT J., Bozeman, Zoology
MANIS, MERLE E., Missoula, Mathematics
SIEVERS, SALLY R., Butte, Mathematics

Cooperative Graduate

CHASE, RONALD B., Missoula, Earth Sciences
DIETZ, F. MICHAEL, Great Falls, Mathematics
KRUEGER, DAVID A., Sidney, Physics
SILVER, JACK H., Missoula, Mathematics
STEVENS, DAVID R., Bozeman, Zoology

Graduate Teaching Assistant

CHASE, RONALD B., Missoula, Earth Sciences
MEAD, RODNEY A., Missoula, Zoology

Science Faculty

HEINRICH, ALBERT C., Missoula, Anthropology

Summer Fellowships for Secondary School Teachers

BEYHAN, SR. PETER, Billings, Biology
KINGSBURY, ANNA R., Great Falls, Microbiology
MCKEEVER, EUGENE R., Fort Benton, Biology

NEBRASKA

Graduate

ANDERSON, MARGARET E., Blair, Zoology
CARROLL, HUGH S., Lincoln, Mathematics
CASSEL, DAVID G., Ainsworth, Physics
DORNHOFF, LARRY L., Heartwell, Mathematics
FRAHM, RICHARD R., Lyman, Genetics
GAIDIS, JAMES M., North Platte, Chemistry
HIGGS, WILLIAM J., Rushville, Psychology
LACINA, WILLIAM B., Omaha, Physics
LINTZ, LARRY M., Big Springs, Psychology
LUKENBACH, ELVIN R., Scottsbluff, Chemistry
NOREM, PHILIP C., Omaha, Physics
PEARSON, JERRY D., Ponca, Engineering
RAKOWSKI, JAMES J., Omaha, Economics
SPEIER, RICHARD H., Omaha, Biophysics
WILLIAMS, LARRY G., Hickman, Genetics
WILLIAMS, ROGER, G., Johnstown, Chemistry
WRIGHT, BRADFORD L., Lincoln, Physics

Cooperative Graduate

CHURCH, JAMES D., Lincoln, Mathematics
JANOVY, DAVID L., Lincoln, Sociology
MAXWELL, DOUGLAS P., Lincoln, Botany
THOMAN, EVELYN B., Lincoln, Psychology
WHEAT, MARY L., Hastings, Mathematics

Graduate Teaching Assistant

DUYSEN, MURRAY E., Lincoln, Botany
HUGHES, EUGENE M., Chadron, Mathematics
MCARTHUR, DONALD E., Atlanta, Physics
PRATHER, THOMAS L., Kearney, Earth Sciences

Postdoctoral

ANDERSON, JOHN C., Lincoln, Medical Science
PARK, JOHN T., Lincoln, Physics

Science Faculty

SMITH, MARLE D., Kearney, Physics
SWANSON, JACK L., Omaha, Chemistry
WAGENER, REVEREND CLARENCE M., Chadron, Physics

Summer Fellowships for Secondary School Teachers

RILEY, MARION R., Scottsbluff, Biology
VANOVER, BENJAMIN, Holdrege, Zoology
WALLACE, WAYNE W., Burwell, Mathematics

NEVADA

Graduate

TING, IRWIN P., Reno, Botany

Cooperative Graduate

COONEY, GARY D., Reno, Botany

Graduate Teaching Assistant

HERBER, LAWRENCE J., Reno, Earth Sciences

Science Faculty

CARLSON, JAMES J., Reno, Engineering

NEW HAMPSHIRE

Graduate

HUBBARD, LINCOLN B., Exeter, Physics
O'MALLEY, ROBERT E., Somersworth, Mathematics
SWIFT, CHARLES M., Jr., Exeter, Earth Sciences

TAHK, FREDERICK C., Concord, Chemistry
TOBIN, ALLAN J., Manchester, Biophysics
WATERMAN, ASA, Woodsville, Engineering

Cooperative Graduate

COONEY, WILLIAM A., Claremont, Chemistry
GUYETTE, ANNA M., Durham, Psychology
LAMBERT, HELEN H., Dover, Physiology

Graduate Teaching Assistant

CHERTOK, BENSON T., Laconia, Physics
RIEL, STANLEY J., Manchester, Earth Sciences
ROUSSEAU, DENIS L., Franklin, Chemistry

Science Faculty

DENNISON, DAVID S., Hanover, Biophysics
KOLEGA, JOHN J., Durham, Engineering
MOSBERG, WILLIAM, Durham, Engineering

NEW JERSEY

Graduate

ACKERMANN, MARTIN N., Williamstown, Chemistry
ADLER, STEPHEN L., Princeton, Physics
ANTONSON, CARL R., Martinsville, Engineering
ASHIN, KENNETH A., Little Silver, Mathematics
BINKLEY, ROGER W., Westfield, Chemistry
BLANCHARD, KENNETH R., Perth Amboy, Chemistry
BROWN, FREDERICK G., West Orange, Zoology
CARROLL, GEORGE C., Plainfield, Botany
CASSIDY, Patrick J., Atlantic Highlands, Chemistry
CHAGNON, SPENCER O., Trenton, Engineering
CHAIKEN, JAN M., Rahway, Mathematics
CLARK, ALBERT H., Jr., Audubon, Physics
COHEN, JEFFREY M., Elizabeth, Physics
COMIZZOLI, ROBERT B., Union City, Physics
COOK, ROBERT M., Princeton, Sociology
CORNEIL, PAUL H., Short Hills, Chemistry
CRAIG, JAMES R., Haddon Heights, Earth Sciences
DAVEY, ROBERT F., Madison, Engineering
FEINSTEIN, DAVID L., West Englewood, Engineering
FEIT, IRA N., Princeton, Zoology
FICHTER, BARRY S., Clifton, Engineering
FOLKMAN, JON H., Princeton, Mathematics
FORT, RAYMOND C., Jr., Princeton, Chemistry
FRIEDMAN, KENNETH A., Highland Park, Physics
FRIEDRICH, LOUIS E., Penns Grove, Chemistry
GRANOFF, BARRY, Jersey City, Mathematics
GREENBERG, WILLIAM, Lakewood, Physics
HALPERN, GERALD M., Bayonne, Physics
HAND, BRYCE M., Millville, Earth Sciences
HARTUNG, ROLF, Fairlawn, Zoology
HARVEY, ROBIN J., Rutherford, Physics
HEMMENDINGER, DAVID, Belvidere, Mathematics
HILL, WILLIAM G., Jr., Pleasantville, Engineering
HOOKE, ROGER L., Montclair, Earth Sciences
JACKSON, ANDREW D., Jr., East Orange, Chemistry
KAHN, HILDAGARDE S., Bayonne, Biology
KEENAN, WILLIAM A. E., Wayne, Engineering
KERLEY, GERALD I., Hillsdale, Chemistry
KEVLES, DANIEL J., Princeton, History and Philosophy of Science
KLESKEN, DANIEL L., Trenton, Engineering
KOWAL, ROBERT R., Rochelle Park, Botany
KREUZER, LLOYD B., Princeton, Physics
LAMOLA, ANGELO A., Newark, Chemistry
LANGE, ARTHUR F., Summit, Engineering
LIEBERMAN, DAVID I., South Orange, Mathematics
LITTLE, LEWIS E., Wayne, Physics
LOWENSTEIN, JOHN H., South Orange, Physics
MANSFIELD, RICHARD B., Wayne, Mathematics
MARTIN, GEOFFREY, Ridgewood, Chemistry
MCAVOY, THOMAS J., Princeton, Engineering
MCGRATH, MICHAEL G., Wayne, Chemistry
MCKAY, DOUGLAS W., Tenafly, Engineering
MCMAHON, EDWARD P., Arlington, Engineering
MOORE, PAUL B., Ramsey, Earth Sciences
MOSKOWITZ, WARREN E., Newark, Economics
PINSKY, MARK A., Haddonfield, Mathematics
PRITCHARD, DAVID E., Scotch Plains, Physics
QUILLEN, DANIEL G., East Orange, Mathematics
RHODES, CHARLES K., Chatham, Engineering
ROBERTS, GEORGE W., East Orange, Engineering
RODGERS, PATRICIA E., Moorestown, Microbiology
RUTLEDGE, ROBERT A., Park Ridge, Mathematics
SCHULMAN, LAWRENCE S., Newark, Physics
SELLIN, HELEN G., Englewood, Biochemistry
SONDOW, JONATHAN D., Princeton, Mathematics
STRUZYNSKI, RAYMOND E., Jersey City, Physics
SULLIVAN, JEREMIAH D., Princeton, Physics
THEUER, RICHARD C., Cliffside, Biochemistry
THIESSEN, HENRY A., Dumont, Physics
THRAILKILL, JOHN V., Princeton, Earth Science
VALENTINE, DONALD H., Jr., Montclair, Chemistry
VARIAN, LEE C., Plainfield, Engineering
VEZZETTI, DAVID J., Hoboken, Physics
WAGNER, RICHARD C., Bloomfield, Mathematics
WAGONER, ROBERT V., Jr., West Englewood, Astronomy
WALLACE, ROGER N., Montclair, Engineering
WARD, RICHARD S., Sussex, Engineering
WELLS, JOHN C., Plainfield, Physics
ZANONI, CARL A., Trenton, Physics
ZWICK, MARTIN, Brooklyn, Biophysics

Cooperative Graduate

AKERLOF, GEORGE A., Princeton, Economics
AKLONIS, JOHN J., Elizabeth, Chemistry
ANDERSON, GRANT S., Union, Physics
BARR, ANTHONY J., Summit, Physics
BAUM, MODRIS O., Bloomfield, Physics
BUFFINGTON, JOHN D., Jersey City, General Biology
CALLAN, CURTIS G., Jr., Little Silver, Physics
CALLANAN, JANE E., Sr., Convent Station, Chemistry
CARLSSON, ROBERT J., Norwood, Economics
CHRISTMAN, JUDITH K., Englewood, Biochemistry
COHEN, JACK K., East Orange, Mathematics
COZZARELLI, NICHOLAS R., Jersey City, Biochemistry
EGETH, HOWARD E., Irvington, Psychology
EGIZI, CAROL A., Vineland, Engineering

EMPTAGE, MICHAEL R., North Bergen, Chemistry
FINKELSTEIN, JEROME L., Long Branch, Physics
FLANIGAN, FRANCIS J., Jersey City, Mathematics
FOWLER, BRUCE R., Pine Brook, Engineering
FREEMAN, RICHARD B., Oradell, Economics
FRIEDMAN, MARCELLE, Newark, Mathematics
GIFFEN, CHARLES H., Princeton, Mathematics
GOOD, NORMA K., New Brunswick, General Biology
GRIFFITH, MARTIN G., Margate, Chemistry
HABERT, WILLIAM C., Jersey City, Engineering
HENN, HOWARD C., North Plainfield, Engineering
HILL, DAVID W., Livingston, Engineering
HUBERMAN, JOEL A., Maplewood, Biochemistry
HURLEY, FRANCIS X., Lyndhurst, Engineering
JESSOP, WARREN H., Midland Park, Engineering
JORIS, LOUIS, North Bergen, Chemistry
KELDSEN, GLENN L., Mount Holly, Chemistry
KJELLGREN, JOHN, Wayne, Chemistry
KRAUTER, ALLAN I., Newark, Engineering
LIPPINCOTT, EZRA P., Jr., Medford Lakes, Physics
MCCONVILLE, GEORGE T., Jr., Princeton, Physics
MCCUE, HOWARD K., Jr., Trenton, Physics
MCKENZIE, ALEXANDER A., Hackensack, Mathematics
MCLEO, THOMAS J., Teaneck, Mathematics
MENGES, LILLIAN M., North Brunswick, Psychology
MIKE, VALERIE, Fords, Mathematics
OSLER, THOMAS J., Camden, Mathematics
PETITH, HOWARD C., Livingston, Economics
PLEVAN, ROBERT E., Ramsey, Engineering
POLLER, MERLE F., Highland Park, Psychology
RABINOWITZ, PAUL H., Hillside, Mathematics
REINERS, WILLIAM A., New Brunswick, Botany
RELLES, HOWARD M., New Brunswick, Chemistry
RICHTERS, JOHN S., Mountain Lakes, Engineering
ROCHE, SR. THERESE A., Convent Station, History and Philosophy of Science
RUMBILL, GEORGE J., South Orange, Engineering
SHAPIRO, JOEL A., East Brunswick, Physics
SMOLOWITZ, LAWRENCE H., Morristown, Mathematics
SOLODAR, ARTHUR J., West Orange, Chemistry
STANDAERT, WILLIAM F., Somerset, General Biology
TARLACH, THOMAS W., Scotch Plains, Engineering
VARGA, GIDEON M., Ho-Ho-Kus, Chemistry
WESSELY, ROBERT M., New Brunswick, Physics
WILEY, DAVID S., Franklin Park, Physics
WINTERHALTER, DAVID R., Morris Plains, Engineering
WOODS, ROBERT O., Trenton, Engineering

Graduate Teaching Assistant

ANDERSON, JAMES E., Princeton, Chemistry
CERKANOWICZ, ANTHONY E., Bayonne, Engineering
CRIST, DELANSON R., Saddle River, Chemistry
DAHL, NORMAN E., Princeton, Engineering
DENEER, GEORGE C., Jr., Livingston, Chemistry
DRUIN, MELVIN L., East Paterson, Engineering
FISHER, ARMEN G., New Brunswick, Mathematics
FREEDMAN, PHILIP E., Asbury Park, Psychology
GAUTREAU, RONALD T., Jersey City, Physics
GRIFFITH, MARTIN G., Margate, Chemistry
HAZINSKI, JOHN J., Clifton, Mathematics
HITE, JOE R., Princeton, Engineering
KNOWLTON, ROBERT E., Short Hills, Zoology
KURY, BERNHARD G., Union, Engineering
LIEB, MURRAY I., Newark, Engineering
LUNA, ROBERT E., Princeton, Engineering
MANN, RICHARD H., Princeton, Chemistry
MUIR, JAMES F., Princeton, Engineering
OSMAN, JACK W., New Brunswick, Economics
RUBENSTEIN, KENNETH E., Passaic, Chemistry
SCHULMAN, CAROL A., Westfield, Psychology
SEYBOLD, PAUL G., Collingswood, Biophysics
SHERMAN, JOHN D., Westfield, Engineering
VORONKA, ROMAN W., Irvington, Mathematics
WEISSBERG, RICHARD S., Princeton, Chemistry
WESSELY, ROBERT M., New Brunswick, Physics
WILSON, DONALD B., Princeton, Engineering
YAFFA, HAROLD, Camden, Botany

Postdoctoral

HUTCHINSON, JOHN W., Bridgeton, Engineering
KANTOR, PAUL B., Princeton, Physics
MARTIRE, DANIEL E., Fort Lee, Chemistry
MCNEAL, ROBERT J., Fort Lee, Chemistry
NUSBAUM, MOREYE, Englewood, Medical Sciences
WRIGHT, RICHARD T., Haddonfield,, Biology

Senior Postdoctoral

BONINI, WILLIAM E., Princeton, Earth Sciences
DAILEY, BENJAMIN P., Leonia, Chemistry
WHEELER, JOHN A., Princeton, Physics

Science Faculty

BUSH, LOUISE F., Madison, Zoology
EICHHORN, ROGER, Princeton, Engineering
MONAHAN, EDWARD J., Newark, Engineering

Summer Fellowships for Secondary School Teachers

CELLINI, DOROTHY B., Trenton, Chemistry
CURRAN, SR. M. ROSALIE, Madison, Biology
DALTON, MARGARET M., Parsippany, Mathematics
DAVIDOWSKI, ANTHONY F., Mountain Lakes, Mathematics
HEMMERLY, HOWARD T., Chatham, Mathematics
MACHAMER, BARBARA B., Bernardsville, Chemistry
MOYER, WAYNE A., East Brunswick, Biochemistry
OXMAN, CHARLES, South River, Biology
SCHOEN, SR. M. MYRONA, Plainfield, Mathematics
STEADY, JOSEPH C., Summit, Physics

NEW MEXICO

Graduate

CHANG, GEORGE W., Las Cruces, Biochemistry
COLLIER, GEORGE A., Alcalde, Anthropology
COLLIER, JANE F., Alcalde, Anthropology
HANSEN, ROBERT J., Albuquerque, Engineering
LATHROP, RICHARD G., Elida, Psychology
PERKINS, WALTER G., Albuquerque, Chemistry
SCHOOLEY, DAVID A., Montezuma, Chemistry
SHLAER, WILLIAM J., Los Alamos, Physics
SUTHERLAND, TERRY B., Bayard, Physics
THOMPSON, RICHARD S., Hobbs, Physics

Cooperative Graduate

BALL, RALPH W., Las Cruces, Mathematics
CASE, GLENN R., Albuquerque, Engineering
CHRISTENSON, CHARLES O., Las Cruces, Mathematics
DAYBELL, DOROTHY A., University Park, Mathematics
PELTZER, DOUGLAS L., Las Cruces, Physics
WHITLEY, ROBERT J., Las Cruces, Mathematics

Graduate Teaching Assistant

CALTON, WILLIAM G., Portales, Mathematics
ERDAL, BRUCE R., Albuquerque, Chemistry
GUSTAFSON, WILLIAM G., Albuquerque, Earth Sciences
KEPPLE, PAUL C., University Park, Physics
LEISHER, WILLIAM B., Santa Fe, Engineering
MILFORD, HOMER E., Santa Cruz, General Biology
MITCHELL, ROGER W., Las Cruces, Mathematics
RORERTSON, JACKIE M., Tucumcari, Mathematics

Postdoctoral

KIRKLAND, DOUGLAS W., Albuquerque, Earth Sciences
SMALL, AUDREY M., Las Vegas, Chemistry

Senior Postdoctoral

WALKER, ELBERT A., University Park, Mathematics

Science Faculty

CALVERT, FLOYD O., Albuquerque, Engineering
DYRESON, DELMAR A., Las Vegas, Mathematics
YUSUN, CLARE C. C., Albuquerque, Genetics

Summer Fellowships for Secondary School Teachers

EVANS, CARLTON L., Las Cruces, Mathematics
HURST, KENNETH B., Jr., Hobbs, Biology

NEW YORK

Graduate

ALPER, JOSEPH S., Brooklyn, Chemistry
ANDERSEN, HANS C., Brooklyn, Chemistry
ANTHONY, CORRINE V., Floral Park, Physiology
ANTMAN, STUART S., Rockville Center, Engineering
ASH, WILLIAM W., Binghamton, Physics
ASHE, ARTHUR J., III, West Nyack, Chemistry
AUSTER, RICHARD D., Brooklyn, Economics
BAKEMAN, PAUL E., Jr., Pittsford, Engineering
BALLONOFF, MARILYN S., Ithaca, Physiology
BARASH, NAOMI E., Brooklyn, Physics
BAUM, WILLIAM M., New York, Psychology
BECK, BRENDA E. F., New York, Anthropology
BEER, DAVID S., Bronx, Mathematics
BERGER, ROBERT, Freeport, Engineering
BERGMAN, GEORGE M., Brooklyn, Mathematics
BERNSTEIN, URI, Kew Gardens, Physics
BERTSCH, GEORGE F., West Hempstead, Physics
BICKART, PAUL H., Poughkeepsie, Chemistry
BIERON, JOSEPH F., Buffalo, Chemistry
BLUMENTHAL, ROBERT G., Brooklyn, Mathematics
BOYER, TIMOTHY H., Brooklyn, Physics
BOYLAN, STANLEY L., New York, Mathematics
BRAU, CHARLES A., Garden City, Engineering
BRAUN, MARTIN, Brooklyn, Mathematics
BRAUNSTEIN, STEPHEN S., Flushing, Engineering
BREGSTONE, EDWARD, Cambridge, Engineering
BRODY, BORUCH A., Brooklyn, History and Philosophy of Science
BROWN, THEODORE M., Elmhurst, History and Philosophy of Science
BURNS, RICHARD H., Rye, Engineering
CAHILL, KEVIN E., New York, Physics
CARTWRIGHT, RICHARD V., Honeoye Falls, Chemistry
CEASAR, GERALD P., New York, Chemistry
CHI, CARL C., New York, Psychology
CHIPMAN, DAVID M., Brooklyn, Chemistry
CHUCKROW, VICKI L., Brooklyn, Mathematics
CHUTJIAN, ARA, New York, Chemistry
CLAPHAM, WENTWORTH B., Jr., Chappaqua, Earth Sciences
COGGSHALL, WILLIAM L., Ithaca, Engineering
COHEN, ALLEN J., Brooklyn, Physics
COHEN, NATALIE S., Floral Park, Pathology
COLE, RANDALL K., Jr., Ithaca, Physics
COLE, STEPHEN, Sunnyside, Sociology
COON, DARRYL D., Bolton Landing, Physics
COOPERMAN, BARRY S., Flushing, Chemistry
CORNWELL, ROBERT G., Rochester, Physics
CURCI, JUDITH A., Elmhurst, Mathematics
DEGLOPPER, DONALD R., Kenmore, Anthropology
DELSON, MARTIN G., Laurelton, Physics
DEMBO, EDGAR A., Yonkers, Engineering
DEUTSCH, DAVID N., Brooklyn, Engineering
DIAMOND, HAROLD G., Wurtsboro, Mathematics
DONALDSON, JOAN A., Bronx, Mathematics
DONNELLY, JOSEPH P., Brooklyn, Engineering
DOOLEY, PETER C., ITHACA, Economics
DOSHAN, HAROLD D., Brooklyn, Chemistry
DRISCOLL, MICHAEL J., Buchanan, Engineering
DRUMIN, WILLIAM A., New York, Physics
DUSHMAN, MIRIAM B., New York, Microbiology
ECKHART, WALTER, Yonkers, Biophysics
EIMERS, LEROY E., Ripley, Physiology
EISENBERG, ROBERT S., New Rochelle, Biophysics
FALTZ, LEONARD M., Bronx, Mathematics
FARLEY, THOMAS S., New York, Physiology
FEIN, BURTON I., Brooklyn, Mathematics
FELDER, RICHARD M., Long Island City, Engineering
FELDMAN, LINDA S., Forest Hills Psychology

FENICHEL, ROBERT R., New York, Mathematics
FENSTER, STEVEN R., Belle Harbor, Economics
FINKEL, PAUL A., Bronx, Mathematics
FORYS, LEONARD J., Depew, Engineering
FREED, KARL F., Brooklyn Engineering
FRIEDMAN, DAVID, Brooklyn, Mathematics
GEIS, FLORENCE L., New York, Psychology
GEWIRTZ, STEPHEN J., Brooklyn, Mathematics
GILMORE, ROBERT, Long Island City, Physics
GILSON, BRUCE R., New York, Chemistry
GLAUBERMAN, GEORGE, Richmond Hill, Mathematics
GOLDFARB, DONALD, Bellerose, Engineering
GOLDHABER, ALFRED S., Bayport, Physics
GOLDIN, KENNETH D., Staten Island, Economics
GOLDMAN, MARTIN E., Brooklyn, Mathematics
GOLDSCHMIDT, HUBERT L., New York, Mathematics
GOLDSTEIN, PAUL B., New York, Mathematics
GOODMAN, JOHN M., Ithaca, Physics
GOODMAN, RICHARD H., Brooklyn, Mathematics
GOREN, ROBERT J., Brooklyn, Mathematics
GORMAN, DONALD S., White Plains, Biochemistry
GOULD, STEPHEN J., Flushing, Earth Sciences
GRACE, ROBERT E., Kenmore, Engineering
GREENFIELD, STEPHEN J., New York, Mathematics
GROSSFELD, ROBERT M., New York, Biochemistry
HABOUSH, WILLIAM J., Forest Hills, Mathematics
HALL, ANDREW D., Bedford Hills, Engineering
HALPERIN, BERTRAND I., Brooklyn, Physics
HAUPT, EDWARD J., Brooklyn, Psychology
HECHT, JANET S., Brooklyn, Biology
HELLER, NELSON B., Bronx, Engineering
HELLERSTEIN, DAVID, New York, Physics
HENRICH, CHRISTOPHER J., Buffalo, Physics
HERMAN, MARK N., Brooklyn, Engineering
HERSHFIELD, DAVID C., New York, Economics
HICKS, NANCY E., Staten Island, Physics
HIRKO, RICHARD G., Johnson City, Physics
HIRSCH, ELI, Brooklyn, History and Philosophy of Science
HOLZSAGER, RICHARD A., New York, Mathematics
ITZKOWITZ, MARTIN S., Brooklyn, Chemistry
JAFFE, ARTHUR M., Pelham, Physics
JAYSON, JOEL S., Garden City, Engineering
JESAITIS, RAYMOND G., Flushing, Chemistry
JOFFE, RUTH C., Brooklyn, Zoology
KADISH, ABRAHAM, Brooklyn, Mathematics
KAHN, FREDERIC J., Brooklyn, Physics
KAMMER, ANNE E., Auburn, Physiology
KATCHER, ALAN M., Brooklyn, Engineering
KAUFMAN, ROBERT P., New Haven, Mathematics
KAZDEN, RICHARD J., Queens Village, Engineering
KELLY, EDWARD F., Katonah, Psychology
KENNEDY, HUGH P., New York, Physics
KERN, LEILA R., New York, Psychology
KIMBALL, JOHN P., Montrose, History and Philosophy of Science
KINDLMANN, PETER J., Woodside, Physics
KLEIN, BENJAMIN G., Bellport, Mathematics
KLEVORICK, ALVIN K., Rego Park, Economics
KNAFF, DAVID B., New York, Biochemistry
KNEUER, JOSEPH G., Syracuse, Engineering
KOHLER, WERNER E., Yonkers, Engineering
KOHN, ELLIOTT S., New York, Engineering
KOPELL, NANCY J., New York, Mathematics
KOPELOFF, BARBARA B., Bronx, Psychology
KOTTAK, CONRAD P., Yonkers, Anthropology
KRA, IRWIN, Brooklyn, Mathematics
KUTTER, ELIZABETH M., Rochester, Biophysics
KUZMACK, ARNOLD M., Woodside, Mathematics
LAMANTIA, CHARLES R., New York, Engineering
LAMPE, MARTIN, Brooklyn, Physics
LANDMAN, MAURICE A., Jamaica, Mathematics
LANFORD, CAROLINE A., Fredonia, Chemistry
LANFORD, OSCAR E., III, Fredonia, Physics
LAROWE, EUGENE, Massapequa, Mathematics
LAVENBERG, STEPHEN S., Bellerose, Engineering
LEBOWITZ, ELLIOT, New York, Chemistry
LEDERMAN, JEROME M., New York, Engineering
LEICHTLING, BEN H., New York, Biochemistry
LESK, ARTHUR M., Brooklyn, Chemistry
LEVINE, DANIEL A., Bronx, Mathematics
LEVINE, JUDAH, Bronx, Physics
LEVINE, RHEA J. C., Brooklyn, Biochemistry
LEVITCH, ROY N., Buffalo, Engineering
LEVITT, NORMAN J., New York, Mathematics
LIEBERMAN, JUDITH S., New York, Chemistry
LISS, PHILLIP H., Corona, Psychology
LOCKERETZ, WILLIAM P., New York, Physics
LONGOBARDI, ALICE E., Brooklyn, Biochemistry
MALERBA, JOSEPH F., New York, Chemistry
MALTZ, HENRY, Brooklyn, Chemistry
MALTZ, MARTIN S., Brooklyn, Engineering
MAMANGAKIS, STANLEY E., Bronx, Mathematics
MANDULA, JEFFREY E., Bronx, Physics
MANSON, STEVEN T., Brooklyn, Physics
MARCUS, HARRIS L., Ellenville, Engineering
MARGOLIN, BARRY H., New York, Mathematics
MARIANS, CAROL S., Bronx, Mathematics
MAROVSKIS, JOHN, New York, Chemistry
MARTINELLI, MICHAEL A., Brooklyn, Physics
MCCARTHY, DONALD J., Brooklyn, Mathematics
MCGOWAN, JON G., Silver Creek, Engineering
MCNAMEE, PETER C., Bronx, Physics
MEININGHAUS, ARLYN R., Lancaster, Chemistry
MENAHAN, LAWRENCE A., Brooklyn, Biology
MENDLOW, JULIE L., New York, Mathematics
MESKIN, STEPHEN A., Jamaica, Mathematics
MESTER, ROGER L., Port Jervis, Engineering
MEYERS, JOHN H., Long Island City, Physics
MILLER, EDWARD J., Rochester, Biochemistry
MILLER, JOHN C., Lockport, Mathematics
MILLER, PENELOPE A., Lockport, Mathematics
MILLER, ROBERT E., Fresh Meadows, Physics
MINKOFF, ELI C., New York, Zoology
MINTZ, MICHAEL J., New York, Chemistry
MITCHELL, HENRY R., New York, Mathematics
MITCHELL, SIDNEY S., Flushing, Mathematics
MODEL, FRANK S., Jackson Heights, Chemistry
MULLINS, NICHOLAS C., Ithaca, Sociology
MURPHY, THOMAS J., Brooklyn, Physics
MURRAY, THOMAS E., Syracuse, Physics
MUTTER, VALERIE A., Bellaire, Physiology
NEIDELL, NORMAN S., New York, Earth Sciences
NEMETHY, PETER, New York, Physics

NEUBINGER, ALLEN J., Belle Harbor, Psychology
O'CONNELL, WILLIAM J., Brooklyn, Physics
O'CONNOR, EDWARD W., Bronx, Engineering
ORMAN, JUDITH A., Flushing, Mathematics
ORSZAG, STEVEN A., Forest Hills, Astronomy
ORZECH, MORRIS, Brooklyn, Mathematics
OSTERHOUT, CAROL, Clinton, Psychology
PARKER, KIM H., North Chili, Engineering
PARKER, WILLIAM L., Clinton, Chemistry
PARSEGIAN, VOZKEN A., Troy, Biophysics
PATSAKOS, GEORGE, Brooklyn, Physics
PAULSON, RICHARD W., Queens Village, Oceanography
PENN, STEPHEN, Flushing, Physics
PERRIN, ROBERT P., New York, Physics
PICKER, HARVEY S., Kew Gardens, Physics
PIECH, KENNETH R., Eggertsville, Physics
POCHODA, PHILIP M., New York, Sociology
PODOFF, DAVID, Brooklyn, Economics
POMERANCE, ERROL, Bronx, Mathematics
PORTER, JUDITH D. R., Ithaca, Sociology
POTTER, THOMAS F., Nyack, Mathematics
PRICE, BARBARA J., New York, Anthropology
PRILL, DAVID D., Buffalo, Mathematics
RACHLIN, HOWARD C., New York, Psychology
RADKOWSKI, ALFRED F., New York, Physics
RAFAL, MARSHALL, Whitestone, Engineering
RAMRAS, MARK B., Brooklyn, Mathematics
RAPP, WILLIAM V., New York, Economics
RASALA, RICHARD A., Brooklyn, Mathematics
RASCOFF, JOEL H., Rockaway, Mathematics
REDISH, EDWARD F., Lynbrook, Physics
REHWALDT, CHARLES A., Syracuse, Genetics
REICH, DANIEL, Brooklyn, Mathematics
REINER, ALBEY, Brooklyn, Mathematics
REISKIND, JONATHAN, Staten Island, Zoology
RICH, MARC A., Ozone Park, Engineering
RICHER, IRA, New York, Engineering
RIES, LILLIAN L., Beechhurst, Engineering
ROBBA, ARNOLD A., Mineola, Engineering
ROSE, RICHARD M., Port Washington, Psychology
ROSENBLATT, MATTHEW A., New York, Mathematics
ROSNER, JONATHAN L., Tuckahoe, Physics
ROSSER, EDWENNA M., Ithaca, Psychology
RUBEN, MURRAY A., Flushing, Engineering
RUBIN, DAVID, Brooklyn, Engineering
RUETHER, JOHN A., Canaan, Engineering
SAENGER, ROBERT M., Scarsdale, Physics
SAMPSON, SAMUEL F., Ithaca, Sociology
SAMUELS, MICHAEL R., Brooklyn, Engineering
SANDLER, IVAN S., Brooklyn, Engineering
SATTINGER, STANLEY S., Jeffersonville, Engineering
SCHECHTMAN, BARRY H., New York, Engineering
SCHEPS, MORTON R., New York, Physics
SCHIFF, LAWRENCE F., Forest Hills, Psychology
SCHNEIDER, ROBERT B., Huntington Station, Mathematics
SCHWARTZ, RICHARD E., Ithaca, Mathematics
SCHWARZ, JOHN H., Glen Head, Physics
SCHWEITZER, PAUL J., Elmont, Physics
SHAPIRO, BERT L., Roslyn Heights, Physiology
SHAPIRO, JUDITH C., New York, Economics
SHORE, HERBERT B., Brooklyn, Physics
SHORE, ROY E., Sherman, Psychology
SIDNEY, STUART J., White Plains, Mathematics
SMITH, STEPHEN S., Brooklyn, Biology
SOKOL, BARNETT J., Brooklyn, Mathematics
SOLAND, RICHARD M., New York, Mathematics
SOVEN, PAUL, Brooklyn, Physics
SPIELMAN, ALBERT I., Brooklyn, Physics
STEEN, LYNN A., Staten Island, Mathematics
STEINFELD, JEFFREY I., Flushing, Chemistry
STENARD, CHARLES E., Watertown, Mathematics
STEVENS, GUY V., Pearl River, Economics
STRICHARTZ, ROBERT S., New York, Mathematics
SUSSKIND, LEONARD, Ithaca, Physics
SVETLICHNY, GEORGE, Holbrook, Physics
SWEEDLER, MOSS E., Brooklyn, Mathematics
TANNENWALD, RONALD M., New York, Mathematics
TAUB, THELMA F., Brooklyn, Psychology
TAVEL, MORTON A., Brooklyn, Physics
TEITELBAUM, CLAIRE A., Bronx, Psychology
TERMAN, STANLEY A., New York, Biophysics
TITTERTON, PAUL J., Farmingdale, Physics
TOBENFELD, EMILE S., Brooklyn, Physics
TRIFARI, ARTHUR V., New Rochelle, Physics
ULLMAN, JEFFREY D., Floral Park, Engineering
VOGEL, STEVEN, Beacon, Zoology
WAGREICH, PHILIP D., Long Island City, Mathematics
WALSH, EDWARD K., Scotia, Engineering
WEBER, CHARLES F., Mineola, Mathematics
WEBER, WILLIAM P., New York, Chemistry
WEINBERG, ERIC S., New York, Biochemistry
WEINBERGER, GEORGE M., Brooklyn, Physics
WEINBLATT, HERBERT, New York, Engineering
WEINSTOCK, BARNET M., Brooklyn, Mathematics
WEISS, BENJAMIN, Bronx, Mathematics
WEISS, NORMAN J., Hempstead, Mathematics
WEISSGLASS, JULIAN, Staten Island, Mathematics
WEISSTEIN, NAOMI, New York, Psychology
WEITZMAN, MARTIN L., Wantagh, Mathematics
WELLMAN, BARRY S., Bronx, Sociology
WELLMAN, THOMAS R., New Hartford, Earth Sciences
WELTER, ELIZABETH A., Baldwin, Biology
WHITE, WARREN H., East Norwich, Mathematics
WICHURA, MICHAEL J., Hastings/Hudson, Mathematics
WILLIAMS, LYLE K., II, Katonah, Engineering
WILLIG, PAUL M., Brooklyn, Mathematics
WILSON, EDWARD N., Ithaca, Mathematics
WINKELMANN, FREDERICK C., East Meadow, Physics
WOLFE, RALPH G., Brooklyn, Engineering
WOLFOWITZ, LAURA M., Ithaca, Genetics
WRATTEN, CRAIG C., Snyder, Biochemistry
YAES, ROBERT J., Long Island City, Physics
ZUCKERMAN, HARRIET A., New York, Sociology

Cooperative Graduate

ABILOCK, ROBERT, Brooklyn, Physics
ALEXANDER, STUART D., Syracuse, Chemistry
ALPERT, RONALD L., Rochester, Engineering
AMATO, JAMES J., Richmond Hill, Physics
BAILYN, PAUL M., New York, Mathematics
BALCH, MICHAEL S., Brooklyn, Mathematics
BANK, JERRY M., New York, Mathematics
BANK, STEVEN B., Middle Village, Mathematics
BENNETT, WALTER S., Jr., Syracuse, Engineering
BENTSEN, IRVING O., Amenia, Mathematics
BLOCH, NORMAN J., Rochester, Mathematics
BREINAN, EDWARD M., Yonkers, Engineering
BRIENZA, MICHAEL J., Mt. Vernon, Physics
BROOKS, DAVID W., Brooklyn, Chemistry

BUTCHER, HOWARD J., Brooklyn, Chemistry
CALLAHAN, JAMES J., Poughkeepsie, Mathematics
CARPENTER, CLARK R., Syracuse, Chemistry
CHASE, LLOYD L., Ithaca, Physics
COHEN, RONALD B., Brooklyn, Chemistry
CONDIT, WILLIAM C., Syracuse, Physics
CONNOLLY, FRANCIS X., Rochester, Mathematics
COOK, DAVID M., Troy, Physics
CROWLEY, WILLIAM P., Schenectady, Earth Sciences
DEAN, DAVID E., Marion, Engineering
DELAHANTY, FRANCES M., New Rochelle, Psychology
DESSAU, RALPH, Far Rockaway, Chemistry
DEVINE, MICHAEL F., Bronx, Oceanography
DEWSBURY, DONALD A., Wantagh, Psychology
DIETZ, RUSSELL N., Seaford, Engineering
DITORO, DOMINIC M., Massapequa, Engineering
EACHUS, ALAN C., Syracuse, Chemistry
EASTON, PAUL D., New York, Physics
EICHENBAUM, BERNARD R., New York, Physics
ENGEL, ROGER K., Flushing, Engineering
ERICKSON, NILS E., White Plains, Chemistry
FEDELE, JAMES B., Endicott, Engineering
FEDER, PAUL I., Brooklyn, Mathematics
FEIDELMAN, PETER J., New York, Physics
FEINBLUM, DAVID A., Troy, Physics
FEINERMAN, ROBERT P., New York, Mathematics
FELS, STEPHEN B., New York, Physics
FOX, BERNARD M., New York, Engineering
FREEMAN, LESLIE G., Jr., New City, Anthropology
FREIFELD, CHARLES J., Flushing, Mathematics
FULMER, RICHARD H., Manlius, Physics
FUTUYMA, DOUGLAS J., Bronx, Zoology
GALANIDES, OTTO, Elmhurst, Psychology
GATELY, ADRIAN C., Lynbrook, Engineering
GATES, WALTER C., Jr., Ossining, Engineering
GELMAN, HARRY, Bronx, Physics
GEOGHAN, ROBERT E., Brooklyn, Mathematics
GERSTEN, JOEL I., Bronx, Physics
GIAMEI, ANTHONY F., Painted Post, Engineering
GIBIAN, MORTON J., Mt. Vernon, Chemistry
GLADSTONE, ROBERT J., East Meadow, Engineering
GLASS, EMILY K., Baldwin, Mathematics
GLICKFELD, BARNETT W., New York, Mathematics
GOELL, JAMES E., Scarsdale, Engineering
GOLDMAN, EDWARD B., Cedarhurst, Engineering
GOLDMAN, MARTIN V., Flushing, Physics
GOLOWICH, EUGENE, Ithaca, Physics
GORDON, ARNOLD J., Manhattan, Chemistry
GORDON, MYRA, Mt. Vernon, Chemistry
GORMAN, GEORGE C., Scarsdale, Zoology
GREENBERG, PHILIP J., Bronx, Physics
GREENHOUSE, JEFFREY A., Hempstead, Chemistry
GROSS, WALTER E., Brooklyn, Physics
HAFERMALZ, FREDERICK W., Ithaca, Engineering
HANDELSMAN, RICHARD A., Brooklyn, Mathematics
HANSER, FREDERICK A., Whitestone, Physics
HART, FRANCIS X., Hornell, Physics
HELLER, JERROLD A., Forest Hills, Engineering
HENDERSON, DALE B., Garden City, Physics
HERENDEEN, ROBERT A., Freeport, Physics
HILL, CLYDE D., Brooklyn, Mathematics
HOFFMAN, ALAN L., Flushing, Engineering
HOLLAND, MONTE W., Dekalb Junction, Physics
HOLMAN, ERIC W., New York, Psychology
HONIG, BARRY H., Brooklyn, Chemistry
HUSCH, LAWRENCE S., Sayville, Mathematics
HUSSEY, WILLIAM W., Suffern, Chemistry
HYMAN, DAVID S., Rego Park, Physics
INGLING, CARL R., Jr., Rochester, Psychology
INGLING, JANE H., Rochester, Psychology
ISAACSON, RICHARD A., New York, Physics
IVES, DAVID C., Binghamton, Engineering
JACKIW, ROMAN W., Ithaca, Physics
JACOBSON, DAVID N., Brooklyn, Mathematics
JANOWITZ, GERALD S., Brooklyn, Engineering
JENKINS, JOHN O., White Plains, Physics
JETZT, JOHN J., Bronx, Engineering
JUDD, GARY, Yonkers, Engineering
JULIAN, GLENN M., Apalachin, Physics
KAPLAN, STEVEN M., Westbury, Physics
KARPICK, JAMES T., Buffalo, Physics
KATAI, ANDREW A., Syracuse, Chemistry
KAUFMAN, HOWARD, Troy, Engineering
KELLEHER, MATTHEW D., Wantagh, Engineering
KELLER, KENNETH H., Brooklyn, Engineering
KERSHENBAUM, LESTER S., Far Rockaway, Engineering
KNIGHT, CHESTER G., Kenmore, Geography
KRAKAUER, LAWRENCE J., Great Neck, Engineering
KRAMER, MARTIN A., Ellenville, Physics
KURTZ, STUART J., Forest Hills, Engineering
LAPADULA, CHARLES A., New York, Engineering
LAVITA, JAMES A., Brooklyn, Mathematics
LAZAR, GERALD, New York, Psychology
LEFKOWITZ, JOEL M., Bronx, Psychology
LEONARD, JOHN L., Garden City, Mathematics
LEVINE, BARRY F., Forest Hills, Physics
LEVITAN, MICHAEL L., Brooklyn, Mathematics
LEWIS, HARRY R., New York, Psychology
LIEBERMAN, HENRY S., Brooklyn, Mathematics
LIPNER, LEONARD D., Flushing, Mathematics
LITOFSKY, BARRY, Brooklyn, Engineering
LOOS, MICHAEL P., Syracuse, Engineering
LOVETT, RONALD A., Rochester, Chemistry
LOWENTHAL, FRANKLIN, New York, Mathematics
LOWIN, AARON, New York, Psychology
MACEK, JOSEPH H., Troy, Physics
MACISCO, JOHN J., Bronx, Sociology
MACKNIGHT, WILLIAM J., Brightwaters, Chemistry
MAIO, TERRY, Brooklyn, Engineering
MALINCONICO, SALVATORE, Brooklyn, Physics
MAMMANO, NICHOLAS J., Brooklyn, Chemistry
MANHEIMER, WALLACE M., Flushing, Physics
MARCUS, SHERMAN W., Long Island City, Physics
MARGOLIS, HARVEY R., Forest Hills, Mathematics
MARK, RICHARD E., Patterson, Agriculture
MEER, MELVYN L., Brooklyn, Economics
MOSS, ROBERT A., Flushing, Chemistry
MUKAMAL, HAROLD, Woodmere, Chemistry
MULLINS, ROBERT E., New York, Mathematics
MULVEY, DENNIS M., Buffalo, Chemistry
NACHAMKIN, JACK, Troy, Physics
NAGLER, STEWART G., West Islip, Mathematics
NOVELLO, JOSEPH, Middle Village, Mathematics

OLIVO, RICHARD F., Brooklyn, Physiology
OREN, MATTHEW E., Flushing, Engineering
ORLECK, MICHAEL A., Plainview, Mathematics
OSHER, STANLEY J., Brooklyn, Mathematics
PARKER, ANN R., Astoria, Sociology
PARNAS, DAVID L., Bronx, Engineering
PASACHOFF, JAY M., New York, Astronomy
PATAI, OFRA J., Forest Hills, Genetics
PERKOWITZ, SIDNEY, Brooklyn, Physics
PIFER, JOE H., Williamsville, Physics
PITZELE, BARNETT S., New York, Chemistry
POLLOCK, NORMAN S., Flushing, Mathematics
RAGOZIN, DAVID L., New York, Mathematics
RAYMONDA, JOHN W., Utica, Chemistry
REASENBERG, ROBERT, Brooklyn, Physics
REISMAN, STANLEY S., Brooklyn, Engineering
RICHTER, STEPHEN L., New York, Engineering
RIEFFEL, MARC A., New York, Mathematics
RODEN, MARTIN S., Jackson Heights, Engineering
RODRIGUEZ, Herman R., Brooklyn, Chemistry
ROMANELLI, MICHAEL G., Brooklyn, Chemistry
ROSEMAN, JOSEPH J., Brooklyn, Mathematics
ROSENBLATT, ELAINE, Bronx, Sociology
ROSENKRANTZ, DANIEL J., New York, Engineering
ROSENSTEIN, JOSEPH G., Rochester, Mathematics
ROTHENBERG, RONALD I., New York, Engineering
RUBENS, JEFFREY P., Brooklyn, Mathematics
RUDKO, ROBERT I., New York, Engineering
SAAL, HARRY J., Brooklyn, Physics
SACHS, DAVID S., Brooklyn, Physics
SALTZMAN, HAROLD, Bronx, Chemistry
SALZMAN, GABRIEL S., Brooklyn, Physics
SAXE, BERNHARD D., Flushing, Chemistry
SCHENCK, JOHN F., Troy, Physics
SCHNEIDER, RONALD A., Ithaca, Chemistry
SCHULMAN, JEROME M., New Rochelle, Chemistry
SCHWARTZBERG, HENRY G., Hartsdale, Engineering
SEAGRAVE, CHARLES E., Bronxville, Economics
SEIF, JOSEPH B., Brooklyn, Mathematics
SERVEDIO, FRANK J., New York, Mathematics
SHANNON, RICHARD T., New York, Mathematics
SHAY, JOSEPH L., Albany, Engineering
SILLIMAN, SHERWOOD D., Hempstead, Mathematics
SIMON, JEROME D., Brooklyn, Engineering
SINGER, WILLIAM M., Great Neck, Physics
SLIVKA, JOHN J., Lackawanna, Mathematics
SMITH, RICHARD C., Keeseville, Physics
SMITH, ROBERT D., Brooklyn, Engineering
SONSHINE, RICHARD M., Yonkers, Engineering
SPERRY, PETER R., Tupper Lake, Engineering
STEIN, SAMUEL H., Brooklyn, Chemistry
STEMPLE, JOEL G., Brooklyn, Mathematics
STERN, FREDERICK, New York, Mathematics
STRIEGEL, MARIE K., Buffalo, Anthropology
THORSEN, RICHARD S., Queens Village, Engineering
THUM, DENISE I., New York, Psychology
TOBIAS, MICHAEL A., Brooklyn, Chemistry
TROMBETTA, MICHAEL L., New York Engineering
VAART, ALBERT, New York, Engineering
VITALE, WILLIAM R., Brooklyn, Chemistry
VOLK, BENJAMIN, New York, Mathematics
VOLLMERS, KARL W., Brooklyn, Physics
WAGNER, MARTIN G., Jackson Heights, Engineering
WALDRON, INGRID L., West Nyack, Zoology
WALKER, LEIGH E., Hancock, Chemistry
WALLER, MICHAEL H., Buffalo, Engineering
WEAVER, JOHN S., Rochester, Earth Sciences
WEINGOLD, HARRIS D., Bronx, Engineering
WEINSTEIN, MARVIN, Brooklyn, Physics
WEIS, JUDITH S., Woodside, General Biology
WHIMBEY, ARTHUR E., Jackson Heights, Psychology
WIDOM, ALLAN, Little Neck, Physics
WILLARD, STEPHEN W., Rochester, Mathematics
WILLIAMS, RAYMOND F. X., Brooklyn, Chemistry
WINOKUR, STEPHEN, New York, Economics
WOROSZ, JOANNE C., Niagara Falls, Chemistry
WRIGHT, THOMAS W., Ithaca, Engineering
ZECKHAUSER, RICHARD J., Great Neck, Economics
ZEH, DALE W., Syracuse, Engineering

Graduate Teaching Assistant

ARAKELIAN, LOUISE V., Douglaston, Mathematics
ARRINGTON, WENDELL S., Troy, Physics
BAKER, PHILIP C., Lockport, Botany
BENNION, LOWELL C., Syracuse, Geography
BIERMAN, GERALD J., Brooklyn, Engineering
BIERON, JOSEPH F., Buffalo, Chemistry
BOSCO, CAROLE A., Staten Island, Mathematics
BOSS, BRUCE D., Brooklyn, Chemistry
BRUALDI, RICHARD A., Syracuse, Mathematics
BRUST, DAVID P., Rochester, Chemistry
BUTTNER, PETER J. R., Rochester, Earth Sciences
CAMERON, BARRY W., Bellmore, Earth Sciences
CARPENTER, CLARK R., Syracuse, Chemistry
CEASAR, GERALD P., New York, Chemistry
DAURIA, JOHN M., New York, Chemistry
DIAMOND, HAROLD G., Wurtsboro, Mathematics
DOLBIER, WILLIAM R., Jr., Ithaca, Chemistry
DYKEMAN, LINDA M., Verbank, Mathematics
EHRLICH, BENJAMIN S., Yonkers, Chemistry
FEINBLUM, DAVID A., Troy, Physics
FILNER, PHILIP, Middle Village, Biochemistry
FRANCIS, ROBERT J., Honeoye Falls, Geography
FRANCO, VICTOR, New York, Physics
GERHARD, F. BRUCE, Jr., Troy, Earth Sciences
GERMANO, GENO J., Olean, Microbiology
GILBARG, PAUL G., Brooklyn, Mathematics
GOLDSTEIN, JULIUS L., Rochester, Engineering
GORDON, ARNOLD J., Manhattan, Chemistry
GRANOFF, BARRY, Brooklyn, Chemistry
GREEN, ROGER H., Brooktondale, General Biology
GREEN, THEODORE, III, Williamsville, Engineering
GRUBER, GARY R., New York, Physics
HANDEL, DAVID, Flushing, Mathematics
HARTMANN, LILLIAN E., Yonkers, Physics
HASELBAUER, PHILIP J., Buffalo, Physics
HAWKINS, ROBERT G., New York, Economics
HOLTZMAN, JULIAN C., Ithaca, Engineering
HUDSON, LAWRENCE R., Syracuse, Economics
HUMM, MARGARET M., Baldwinsville, Mathematics

ISAACSON, RICHARD A., New York, Physics
JACOBS, SUSAN I., New York, Physics
JORDAN, WILLIAM M., Brooklyn, Earth Sciences
KAHN, PETER J., Forest Hills, Mathematics
KAMMER, ANN E., Auburn, Physiology
KARLINER, JERRY, New York, Chemistry
KARP, STEWART, Freeport, Chemistry
KAYDOS, WILFRED J., Olean, Engineering
KURNIT, NORMAN A., New York, Physics
LANGE, RAYMOND J., Alden, Chemistry
LEPSCH, JAMES M., Cheektowaga, Engineering
LEVINE, LESLIE S., New York, Physics
LEVINE, RAYMOND, New York, Chemistry
LLOYD, VERNON J., Potsdam, Engineering
LONG, THOMAS V., II, Ithaca, Chemistry
MACLEAY, RONALD E., Buffalo, Chemistry
MALINCONICO, SALVATORE, Brooklyn, Physics
MALOFSKY, BERNARD M., Valley Stream, Chemistry
MCALPIN, JOHN H., New York, Mathematics
MCKENNEY, JOHN L., Canton, Engineering
MELILLO, JOSEPH T., New York, Chemistry
MILLS, ALLEN P., Rochester, Physics
MITCHELL, HENRY R., New York, Mathematics
MOREAU, ATHENA, Bronx, Psychology
MORGAN, ROBERT P., Troy, Engineering
MULDOON, JAMES F., New York, Engineering
NEWBERGER, STUART M., Brooklyn, Mathematics
NILSEN, TOR H., Long Island City, Earth Sciences
OSMAN, ELI, Brooklyn, Psychology
RABITZ, RONALD, Brooklyn, Physics
RANDO, ROBERT R., Ardsley, Chemistry
RHOADES, RICHARD W., Port Washington, Botany
RICCA, VINCENT T., Islip, Engineering
RIEFFEL, MARC A., New York, Mathematics
ROMANELLI, MICHAEL G., Brooklyn, Chemistry
ROSS, WILLIAM N., Brooklyn, Physics
SAMPSON, PATSY H., Ithaca, Psychology
SAPAN, JERROLD S., Brooklyn, Psychology
SCHER, HARVEY, Syracuse, Physics
SCHOENBERG, THEODORE, Long Island City, Engineering
SHAPIRO, HARVEY L., Forest Hills, Mathematics
SHAPIRO, STEPHEN L., Jamaica, Physics
SIMSON, JOSEPH M., New York, Chemistry
SPIEGEL, EUGENE, Brooklyn, Mathematics
STEIGMAN, GARY, New York, Physics
STILLER, KENNETH, Kew Gardens, Chemistry
SULLIVAN, HENRY W., Jamaica, Engineering
TANNER, RUTH E., Hamburg, Chemistry
THALER, RICHARD H., New York, Engineering
TOBIAS, MICHAEL A., Brooklyn, Chemistry
TULCHIN, NATALIE G., New York, General Biology
VILMS, JAAK, New York, Mathematics
VUNK, HAROLD C., Fultonville, Biochemistry
WALSH, ANNA M., New York, Physics
WASSEL, EDWARD R., Potsdam, Engineering
WEGMANN, FREDERICK J., Queens Village, Engineering
WEISS, JOSEPH F., Queens Village, Chemistry
WILLIAMS, RAYMOND F. X., Brooklyn, Chemistry
WILSON, GEORGE S., Scarsdale, Chemistry
WILSON, RONALD H., Schenectady, Physics
WIRTH, MICHAEL, Long Island City, Botany
WRIGHT, KAREN V., Manhasset, Botany
YEDINAK, PETER D., Big Flats, Physics

Postdoctoral

ALBRECHT, BOHUMIL, New York, Engineering
ANDERSON, ALFRED T., Jr., Garden City, Earth Sciences
ANSELME, JEANPIERRE L., Long Island City, Chemistry
BARDASIS, ANGELO, New York, Physics
BAUM, PAUL F., New York, Mathematics
BIENSTOCK, ARTHUR I., New York, Physics
BOEZI, JOHN A., Binghamton, Microbiology
BUTOW, RONALD A., Ithaca, Biochemistry
COOPER, STEPHEN, New York, Microbiology
CREASY, LEROY L., Oswego, Physiology
CURTIS, BRIAN A., Shoreham, Physiology
DWORIN, LOWELL, Brooklyn, Physics
FEINBERG, MELVYN J., New York, Chemistry
GOLDREICH, PETER M., Ithaca, Physics
GOLDSTEIN, BERNARD R., Brooklyn, History and Philosophy of Science
HARRIS, CHARLES S., Great Neck, Psychology
HENRY, RICHARD W., Ballston Lake, Biophysics
IRWIN, ERNEST J., Jr., Ithaca, Physics
JORDAN, THOMAS F., Rochester, Physics
LEVINE, ELLIOT M., Bayside, Biochemistry
LUBKIN, SAUL, Brooklyn, Mathematics
MALAMY, MICHAEL H., Bronx, Microbiology
MASSIMO, JOSEPH T., Port Washington, Physics
MORAN, PAUL R., Ithaca, Physics
NOSSAL, RALPH J., Brooklyn, Physics
PADWA, ALBERT, New York, Chemistry
PIRKLE, WILLIAM H., Rochester, Chemistry
RADINSKY, LEONARD B., New York, Earth Sciences
ROSEN, RONALD H., New York, Mathematics
RUBIN, STANLEY G., Brooklyn, Mathematics
RUSSELL, GEORGE K., Scarsdale, Biochemistry
SHELDEN, RONALD A., New York, Chemistry
STEINBERG, ROY H., New York, Physiology
WEIS, PEDDRICK, Woodside, Medical Sciences
ZIPSER, DAVID, New York, Biochemistry

Senior Postdoctoral

BERGMAN, EMMETT N., Ithaca, Physiology
DEMEREC, MILISLAV, Brookhaven, Genetics
FLAVELL, JOHN H., Rochester, Psychology
HOCHSTEIN, PAUL E., New York, Biochemistry
KIERSCH, GEORGE A., Ithaca, Earth Sciences
MCGILL, WILLIAM J., New York, Psychology
MICHALOS, JAMES, New York, Engineering
MOHN, JAMES F., Albany, Medical Sciences
ROSETT, RICHARD N., Rochester, Economics
SONDHEIMER, ERNEST, Syracuse, Chemistry
SPRUCH, LARRY, New York, Physics
TANENBAUM, STUART W., New York, Microbiology
WARBURTON, ERNEST K., Brookhaven, Physics
ZUMINO, BRUNO, New York, Physics

Science Faculty

BELSKY, MELVIN M., Brooklyn, Biology
BERNKOPF, MICHAEL, New York, Mathematics
BROWN, GEORGE A., Rochester, Engineering
BROWN, WILLIAM A., New York, Engineering
BUSCHI, JOSEPH M., New York, Mathematics
CANAVAN, REV. FREDERICK, New York, Physics
COWDERY, ROGER K., Potsdam, Engineering
CURRERI, JOHN R., Brooklyn, Mathematics
EVERETT, CARLETON S., Binghampton, Engineering
FIEL, ROBERT J., Buffalo, Chemistry

FURRY, RONALD B., Ithaca, Engineering
HARDIN, CLYDE L., Syracuse, History and Philosophy of Science
KAPLAN, EUGENE H., Hempstead, Biology
KENYON, RICHARD A., Potsdam, Engineering
LEE, CHARLES N., Syracuse, Engineering
LISTER, WILLIAM G., Stony Brook, Mathematics
LOEBL, ERNEST M., Brooklyn, Chemistry
LUFBURROW, ROBERT A., Canton, Physics
MARIEN, DANIEL, Flushing, Genetics
MARKIS, LOUISE L., New York, Mathematics
MARTIN, ALBERT R., Potsdam, Engineering
MINTZ, ESTHER U., New York, Physics
NILSON, ARTHUR H., Ithaca, Engineering
PALMER, GILBERT A., Genesco, Mathematics
ROBINSON, EDWARD J., New York, Physics
SMITH, SIGMUND A., Brockport, Mathematics
STRODT, RUTH C., New York, Mathematics
THERRIEN, JOHN T., Albany, Mathematics
WING, MERLE W., Cortland, Biology

Summer Fellowships for Secondary School Teachers

ABRAHAMS, ALLAN, White Plains, Chemistry
BALLOU, WALTER E., Ovid, General Science
CAMERIERI, BRO. CHRISTOPHER, Brooklyn, Chemistry
CONNELLY, SR. M. EDWARD, Rochester, Biology
FARINA, JOSEPH P., Hicksville, Biochemistry
FARRELL, MARGARET A., Albany, Mathematics
GELLIS, PHILIP, New York, Chemistry
GRELL, EINAR F., Huntington, Biology
JAFFE, BENJAMIN, New York, Mathematics
KELLOGG, MARY, New York, Mathematics
KRIEG, DAVID C., Allegany, Biology
KRISH, JEANNE M., Washingtonville, Mathematics
LOMBARDO, ANTHONY V., Baldwin, Zoology
MASTERSON, SR. HANNAH M., Woodhaven, Mathematics
MCINTYRE, PATRICK J., Mineola, Chemistry
MECKLER, LESTER, Farmingdale, Mathematics
REISNER, IRA A., Brooklyn, Chemistry
RICHARDS, IRVING, Far Rockaway, Mathematics
ROARKE, SR. MADELEVA, Kenmore, Biology
SCHMEER, SR. M. ROSARII, New York, Biology
SKLENARIK, ROBERT F., Unadilla, Biology
SMITH, ALDEN E., Lockport, Biology
SPITZ, BENJAMIN, New York, Mathematics
STARK, ELIAS, Long Beach, Mathematics
STEIN, RICHARD, New Rochelle, Physics
WAINE, SIDNEY I., Westbury, Biology
WEISS, EMANUEL, New York, Physics
YONIS, LEONARD, New York, Mathematics

NORTH CAROLINA

Graduate

BARNHILL, MAURICE V., III, Wilmington, Physics
BURNHAM, DEBORAH, Durham, Biochemistry
CAVINESS, BOBBY F., Asheboro, Mathematics
COLE, JAMES L., Raleigh, Psychology
COLEMAN, JAMES R., Durham, Zoology
COUCHELL, GUS P., Charlotte, Physics
CUNNINGHAM, ROBERT E., Jr., Greensboro, Chemistry
EVERETT, GROVER W., Jr., Greenville, Chemistry
FAMBROUGH, DOUGLAS M., Jr., Chapel Hill, Biochemistry
GIBBS, HYATT M., Wilkesboro, Physics
HARRIS, CONSTANCE M., Durham, Biochemistry
HERR, DAVID G., Chapel Hill, Mathematics
KENDALL, ROBERT L., Durham, Zoology
KESLER, STEPHEN E., Kings Mountain, Earth Sciences
LATOUR, PIERRE R., Kinston, Engineering
MICHAEL, WILLIAM B., Bostic, Physics
MOCK, MICHAEL S., Winston Salem, Physics
OWEN, GORDON N., Jr., Raleigh, Engineering
RASH, FRED H., Lexington, Chemistry
REID, RALPH C., Jr., Pineville, Mathematics
ROBERTS, BRYAN W., Hillsboro, Chemistry
SOOS, ZOLTAN G., Montreat, Chemistry

Cooperative Graduate

BANKS, HARVEY T., Raleigh, Mathematics
BLACK, STANLEY W., III, Charlotte, Economics
COCKE, WILLIAM J., Asheville, Physics
CROOM, FREDERICK H., Maxton, Mathematics
GARRISON, WILLARD L., Pfafftown, Mathematics
HART, ROBERT, Burnsville, Physics
HILLER, LOUIS K., Jr., Chapel Hill, Chemistry
LAMPHIER, VINCENT, Winston-Salem, Mathematics
McDOWELL, LELAND K., Tarboro, Mathematics
MCRARY, JOHN W., III. Raleigh, Physics
PANCOAST, DAVID L., High Point, Psychology
REYNOLDS, JOHN T., Durham, Physics
SAWERS, JAMES R., Jr., Durham, Physics
SCHWARTZ, MAURICE E., Laurinburg, Chemistry
SHARPE, TOMMY G., Statesville, Engineering
SWAIN, DAVID W., Raleigh, Physics

Graduate Teaching Assistant

AIUTO, RUSSELL, Chapel Hill, Botany
COFFEY, JANICE D., Lenoir, Botany
DRAPALIK, DONALD J., Chapel Hill, Botany
FULTON, JOHN D., Raleigh, Mathematics
GARCIA, BERTRAM H., Jr., Raleigh, Engineering
GARDINER, JOHN A., Greensboro, Chemistry
GODBOLD, THOMAS M., Raleigh, Engineering
KIRK, PAUL W., Jr., Durham, Botany
LANG, BRUCE Z., Chapel Hill, Zoology
POWE, HARRY L., Raleigh, Physiology
SMITH, RONALD E., Rocky Mount, Engineering
TAFT, KINGSLEY A., Jr., Cary, Agriculture
VANCATLEDGE, FREDERIC A., Charlotte, Chemistry
WORSHAM, WALTER C., Chapel Hill, Chemistry
YOUNT, JOHN D., Chapel Hill, Chemistry

Postdoctoral

GREENLEE, LORANCE L., Durham, Biophysics
HENDRIX, JAMES W., Greenville, Botany
ROBERTS, BRYAN W., Hillsboro, Chemistry

Senior Postdoctoral

THIBAUT, JOHN W., Chapel Hill, Psychology

Science Faculty

BOWERS, WAYNE A., Chapel Hill, Physics
BRANTLY, EUGENE P., Durham, Engineering
BUZZARD, GALE H., II, Durham, Engineering
EPPERSON, EDWARD R., Elon College, Chemistry
HARRAWOOD, PAUL, Durham, Engineering

LAW, JAMES R., Charlotte, Psychology
ROBERTS, FRANKLIN L., Durham, Genetics
TURNER, THOMAS J., Winston-Salem, Physics

Summer Fellowships for Secondary School Teachers

MCKINNON, JEANNE E., Charlotte, Mathematics
RUFTY, RUTH W., Newton, Mathematics
YONGUE, WILLIAM H., Jr., Charlotte, Zoology

NORTH DAKOTA

Graduate

ANDERSON, STUART D., Fargo, Physics
HAMANN, WAYNE C., Dickinson, Engineering
HARSTAD, KENNETH G., Hillsboro, Engineering
NYHUS, ORVILLE K., Palermo, Engineering
SUBY, STEPHEN F., Fargo, Engineering

Cooperative Graduate

ANDERSON, BRUCE A., Bismarck, Mathematics
BAILEY, VERNA M., Sutton, Chemistry
BIRD, HOWARD A., Flaxton, Mathematics
HOUSE, EDWIN W., Grand Forks, Physiology
LOKKEN, RONALD A., Valley City, Physics
LOOS, JAMES S., Grafton, Physics
ROSENTHAL, HASKELL P., Fargo, Mathematics
SCHEFFER, JOHN R., Minot, Chemistry
THARP, LESLIE H., Rhame, Mathematics
THOMPSON, DAVID A., Devils Lake, Engineering
TRODAHL, HARRY J., Leonard, Physics
ZIEMAN, DALE M., Bottineau, Chemistry

Graduate Teaching Assistant

BRAUN, ODELL E., Fargo, Engineering
DAVIS, DAVID G., Dickinson, Botany
PAPPAS, BETTY C., Voltaire, Chemistry
PATTERSON, FLOYD M., Donnybrook, Engineering
RANDALL, HAROLD E., Grand Forks, Psychology
ROSENTHAL, HASKELL P., Fargo, Mathematics
SCHEFFER, JOHN R., Minot, Chemistry
SIEFKEN, MARK W., Fargo, Chemistry
SOLTIS, FRANK G., Fargo, Engineering

Science Faculty

CASSEL, J. FRANK, Fargo, Zoology
DOWELL, HAROLD L., Jr., Grand Forks, Engineering
NELSON, GILBERT W., Fargo, Mathematics

Summer Fellowships for Secondary School Teachers

LEIDHOLM, RONALD J., New Salem, Mathematics
NELSON, HOWARD E., Mandan, Biology

OHIO

Graduate

ADMAN, RAYMOND L., Dayton, Biochemistry
ALEXANDER, HERBERT J., South Euclid, Mathematics
ALONSO, JOSE R., Painesville, Physics
ANDERSON, DONALD E., Maumee, Biochemistry
ARNDT, DONNA J., Wellington, Biochemistry
BEAN, ANITA M., Yellow Springs, Genetics
BECKER, NANCY A., Carroll, Physiology
BENEDICT, JAMES B., Jr., Cincinnati, Earth Sciences
BIXLER, MARK F., Yellow Springs, Chemistry
BODMAN, SAMUEL W., Akron, Engineering
BOYCE, DAVID E., Newark, Other Social Sciences
CARLSON, KRISTIN R., Toledo, Psychology
CLEMENS, CHARLES H., Dayton, Mathematics
CRAGGS, ROBERT F., Dayton, Mathematics
DAVIS, LINDA A., Columbus, Microbiology
DAVIS, MARY A., Cincinnati, Mathematics
DAVIS, TERRY L., Worthington, Engineering
DECHANT, SR. MARY J., Cleveland, Chemistry
ELLIS, DAVID R., Rocky River, Engineering
ERICKSON, BRUCE W., Columbus, Chemistry
FARISON, JAMES B., McClure, Engineering
FRIAR, JAMES L., Galion, Physics
GEIGER, DONALD R., Worthington, Botany
GEROCH, ROBERT P., Akron, Physics
GINAVEN, ROBERT O., Akron, Physics
GLESER, MALCOLM A., Cincinnati, Medical Sciences
GORDON, ROY G., Akron, Chemistry
HAMILTON, RICHARD S., Cincinnati, Mathematics
HARTMAN, RICHARD B., Athens, Chemistry
HEINZ, RICHARD M., Toledo, Physics
HENNINGS, JOHN A., Swanton, Chemistry
HERNER, JAMES P., Berea, Engineering
HICKMAN, JAMES C., Portsmouth, Biology
HOWE, MARIAN, Wilberforce, Mathematics
IDEN, GEORGE R., Bloomingburg, Economics
KARCH, RICHARD R., Hudson, Mathematics
KLAUMINZER, GARY K., Rocky River, Physics
KLOSS, KENNETH E., Loudonville, Mathematics
KLUMP, KIRBY N., Dayton, Chemistry
KRIZEK, DONALD T., Garfield Heights, Botany
LAZDINS, DAGNIJA, Delaware, Chemistry
LEIBACHER, JOHN W., Shaker Heights, Astronomy
LOELIGER, DAVID A., Wooster, Chemistry
MATESICH, SR. MARY A., Columbus, Chemistry
MCBRIDE, JAMES M., Lima, Chemistry
MCMAHON, DANIEL S., Cleveland, Botany
MEHLHORN, ROLF J., Cleveland, Physics
MEYER, DAVID H., New Carlisle, History and Philosophy of Science
MILLER, DAVID L., Cincinnati, Chemistry
MITCHELL, GEORGE T., Sidney, Mathematics
MOREY, PHILIP R., Cleveland, Botany
NIECE, RONALD L., Lakeview, Genetics
NIEMAN, GEORGE C., Tipp City, Chemistry
NOBLE, JANE L., Shaker Heights, Biochemistry
NORTH, JAMES C., Canal Winchester, Physics
OBERLANDER, HERBERT, Cleveland, Physiology
PATCH, RICHARD W., Westerville, Engineering
PIERRET, ROBERT F., Euclid, Physics
POTZICK, JAMES E., Cincinnati, Physics
REINSCHMIDT, KENNETH F., Cincinnati, Engineering
RILEY, MERLE E., Waterford, Chemistry
RIX, JOHN R., Ridgeville, Physics
RUBLE, JANE M., Piqua, Genetics
RUSS, JAMES S., Canton, Physics
SCHAEFER, DALE W., Mentor, Chemistry
SCHIVELL, JOHN F., Twinsburg, Physics
SCHWALBE, CARL H., Chillicothe, Chemistry
SCOTT, LAURA J., Middletown, Chemistry
SEALER, DAVID A., Ashland, Engineering
SERNKA, THOMAS J., Cleveland, Physiology

SMITH, JOYCE E., Findlay, Botany
SNEIDER, THOMAS W., Fremont, Physiology
SPITZNAGEL, EDWARD L., Jr., Cincinnati, Mathematics
SWIGERT, ROGER D., Louisville, Chemistry
TAPPE, JOHN, Cincinnati, Earth Sciences
WAYLAND, BRADFORD B., Lakewood, Chemistry
WILSON, JOHN E., Celina, Biochemistry
YANOSKO, KENNETH P., Cleveland, Mathematics
ZARE, RICHARD N., University Heights, Chemistry

Cooperative Graduate

ANDERSON, LOWELL R., Columbus, Chemistry
AUE, DONALD H., Columbus, Chemistry
BARKER, WILLIAM W., Sheffield Lake, Botany
BLOOD, FRANK A., Jr., Portsmouth, Physics
BLOUNT, JOHN F., Gahanna, Chemistry
BOGAN, LARRY D., Bucyrus, Physics
BOUGHTON, ROBERT I., Hilliard, Engineering
BRANNAN, JOHN R., Columbus, Physics
CASSADY, JOHN M., Cleveland, Chemistry
COLBURN, HARRY S., Portsmouth, Engineering
COOKE, GEORGE D., Kent, Zoology
DALRYMPLE, DAVID L., Fredericktown, Chemistry
DAVIDSON, NEIL A., Cleveland Heights, Mathematics
DAY, RUFUS S., III, Shaker Heights, Biophysics
DETCHON, JOEL C., Sebring, Chemistry
ELLISON, JAMES T., Cleveland, Mathematics
EPSTEIN, ANITA G., Columbus, Earth Sciences
FEHLAU, PAUL E., Cleveland Heights, Physics
FISHER, E. MARCIA, North Jackson, Chemistry
FISHER, FARLEY, Painesville, Chemistry
FOX, CHARLES F., Springfield, Biochemistry
FRANKS, EDWIN C., Columbus, Zoology
FROMME, JOSEPH A., Columbus, Mathematics
GARY, STEPHEN P., Campbell, Physics
GAY, DAVID A., Cambridge, Mathematics
GERHEIM, CHARLES C., Canfield, Engineering
GREGG, HAROLD R., Lakewood, Engineering
GRILLIOT, THOMAS J., Dayton, Mathematics
HAMILTON, JOHN T., Columbus, Physics
HODGSON, THOMAS R., Rocky River, Engineering
HUTH, BERNARD G., North Canton, Engineering
JANSSEN, JOHN G., Chardon, Engineering
JOYCE, WILLIAM B., Columbus, Physics
KERN, ROBERT A., Highland Heights, Engineering
KOCH, GARY G., Mt. Vernon, Mathematics
KRUGER, TERRY L., Columbus, Chemistry
LANG, RUDOLPH M., Jr., Cincinnati, Engineering
LANGE, RICHARD M., Cleveland, Chemistry
LEWIS, RAYMOND A., Xenia, Physics
LISTERMAN, THOMAS W., Cincinnati, Physics
LOVE, JOHN C., Columbus, Physics
MACH, GEORGE W., Ottawa, Chemistry
MARGOLIS, GALE V., Cincinnati, Psychology
MILLER, VERNON R., Jr., Tiffin, Chemistry
OAKBERG, THEODORE C., Cincinnati, Physics
PEREIRA, CARLOS M., Cleveland, Physics
POLITZER, PETER A., Cleveland, Chemistry
PRUTOW, RICHARD J., Cleveland Heights, Engineering
RAQUET, CHARLES A., Cleveland, Physics
RAVE, TERENCE W., Dayton, Chemistry
REED, ALLAN H., Youngstown, Chemistry
SAFKO, JOHN L., Columbus, Physics
SAMPSON, THOMAS E., Garrettsville, Engineering
SCHAEFFER, DAVID G., Wyoming, Physics
SCHIMKE, JOEL T., Massillon, Engineering
SCHROEDER, PAUL R., Cincinnati, Physics
SCHROEER, DIETRICH, Enon, Physics
SHEPARD, KENNETH W., Worthington, Physics
SIGMAN, DONALD R., Columbus, Physics
STEIN, CAROL B., Worthington, General Biology
STEINER, EUNICE M., Dalton, Chemistry
STEINLAGE, RALPH C., St. Henry, Mathematics
STRAUSS, AARON S., Cleveland, Mathematics
SWAIN, RICHARD R., Toledo, Biochemistry
THOMAS, TIMOTHY F., Berea, Chemistry
TSCHANZ, JOHN F., Lima, Physics
WALDORF, DAVID L., Columbus, Physics
WEAVER, PATRICIA L., Akron, Mathematics
WEIDNER, TERRY M., Columbus, Botany
WENNER, BRUCE R., Canton, Mathematics
WILLIAMS, FRANCIS D., Columbus, Mathematics
WISH, MYRON, Euclid, Psychology

Graduate Teaching Assistant

BARKLEY, JOHN R., Athens, Physics
BENSON, ANTHONY L., Akron, Earth Sciences
BILES, MARILYN E., Warren, Mathematics
CASKEY, JERRY A., Nevada, Engineering
CLOW, SANDRA S., Cincinnati, General Biology
COOKE, GEORGE D., Kent, General Biology
DALRYMPLE, DAVID L., Fredericktown, Chemistry
DAVIES, WILLIAM D., Cincinnati, Zoology
EVANS, SANDRA J., Tallmadge, Zoology
FEIL, SUSAN E., Cuyahoga Falls, Chemistry
GARD, THEODORE M., Lisbon, Earth Sciences
GARY, STEPHEN P., Campbell, Physics
GAY, DAVID A., Cambridge, Mathematics
GETTYS, WILLIAM E., Athens, Physics
GINAVEN, JOHN H., Akron, Physics
GOLDMAN, MARGARET B., Cincinnati, Chemistry
HAARTZ, JANET C., Cincinnati, Chemistry
HANSON, HAROLD N., Cincinnati, Chemistry
HARMON, SHIRLEY A., Marietta, Microbiology
HERR, RICHARD B., East Cleveland, Astronomy
HILLER, JOHN J., Jr., East Cleveland, Chemistry
KRAMER, KENNETH F., Cleveland, Earth Sciences
KROPP, WILLIAM R., Jr., East Cleveland, Physics
LESH, GEORGIA E., Cleveland, Zoology
MEARS, DAVID E., Harrison, Engineering
MOORHEAD, ELIZABETH G., Findlay, Chemistry
MOORHEAD, REBECCA A., Findlay, Chemistry
O'DELL, RUTH D., Cleveland Heights, Mathematics
OETGEN, RONALD R., Cleveland Heights, Chemistry
OLIVE, JOHN H., Kent, General Biology
SCHUPP, PAUL E., East Cleveland, Mathematics
SKAVARIL, RUSSELL V., Columbus, Genetics
STUCKEY, RONALD L., Bloomville, Botany
TAPPE, JOHN, Cincinnati, Earth Sciences
VESCELIUS, LEE E., Kent, Chemistry
WALKER, FRANCES A., Adena, Chemistry

WALKER, JUDITH A., Cuyahoga Falls, Chemistry
WALTZ, MARION D., Paris, Engineering
WILLIAMS, WILLIAM J., Rio Grande, Engineering
WILSON, JERRY D., Conesville, Physics

Postdoctoral

GERHOLD, GEORGE A., Doylestown, Chemistry
GLASER, FREDERIC M., Columbus, Physics
HEMPFLING, WALTER P., Cincinnati, Microbiology
LUTHER, LARS C., Marietta, Chemistry
SLAYMAN, CLIFFORD L., Jr., Canton, Physiology

Senior Postdoctoral

DESSY, RAYMOND E., Cincinnati, Chemistry
FOLDY, LESLIE L., Cleveland, Physics
GOLDTHWAIT, DAVID A., Cleveland, Genetics
LARNER, JOSEPH, Cleveland, Medical Science
SAPIRSTEIN, LEO A., Cincinnati, Physiology
WHITE, WILLIAM N., Columbus, Biochemistry

Science Faculty

BORCHERS, PERRY E., Columbus, Engineering
CANNON, C. VERNON, Yellow Springs, Biophysics
CHIANG, ALPHA C., Granville, Mathematics
DANIEL, PAUL M., Oxford, Biology
HARKNESS, KENNETH A., Columbus, Biophysics
KIEFFER, WILLIAM F., Wooster, Chemistry
MCGOVERN, FRANCIS G., Dayton, Economics
MULHOLLAND, JOHN D., Cincinnati, Astronomy
POORMAN, ALAN G., Ashland, Mathematics
ROLWING, RAYMOND H., Cincinnati, Mathematics
WONG, EDWARD T., Oberlin, Mathematics
ZACCARO, LUKE N., Hiram, Mathematics

Summer Fellowships for Secondary School Teachers

BADAR, LAWRENCE J., Rocky River, Physics
BAECHLER, CHARLES A., Toledo, Microbiology
BALL, GEORGE A., Hopedale, Biology
DEMARCO, FRANK E., Uniontown, Biology
KAUFLIN, SR. AGNES S., Columbus, Mathematics
LAFER, PHILIP J., Port Clinton, Mathematics
LAMBERT, CHARLES L., Cincinnati, Mathematics
LARKIN, SR. PETER M., Columbus, Mathematics
MCMAHON, SR. M. JAMES, Columbus, Mathematics
NIKLAS, SR. M. JOHANNA, Cincinnati, Mathematics
OEHLENSCHLAGER, WM. R., Jr., Wadsworth, Biology
PERKINS, KENNETH E., Vandalia, Biology
POINER, RICHARD T., Kent, Biology
ROBINSON, EDSEL D., Thompson, Zoology
ROSE, DANIEL A., Perrysburg, Zoology
ROSE, RICHARD, Euclid, Mathematics

OKLAHOMA

Graduate

BUTLER, LARRY G., Ochelata, Biochemistry
EARLOUGHER, ROBERT C., Jr., Tulsa, Engineering
FAUDREE, RALPH J., Atoka, Mathematics
FINLAYSON, BRUCE A., Tulsa, Engineering
FORD, HOLLAND C., Granite, Astronomy
GILBERT, M. CHARLES, Lawton, Earth Sciences
HAWKINS, HEBERT R., Tulsa, Chemistry
KIRMSE, DALE W., Alva, Engineering
LANE, NEAL F., Norman, Physics
MCGINLEY, JOHN R., Jr. Tulsa, Earth Sciences
MILLER, JUANITA A., Norman, Anthropology
MORAN, WILLIAM P., Tulsa, Physics
MURRAY, FREDERICK N., Tulsa, Earth Sciences
RANDLES, PHILIP W., Hardesty, Engineering
REINHARDT, WILLIAM N., Bartlesville, Mathematics
THACH, ROBERT E., Oklahoma City, Biochemistry
WOOD, DAVID E., Seminole, Chemistry

Cooperative Graduate

BACON, CHARLES M., Bartlesville, Engineering
BALLEW, DAVID W., Norman, Mathematics
BLADE, RICHARD A., Bartlesville, Physics
BRANT, GEORGE, Stroud, Genetics
BURRIS, STANLEY N., Claremore, Mathematics
CAVES, THOMAS C., Pryor, Chemistry
DOTSON, RONALD D., Lawton, Engineering
GILLILAND, HAROLD E., Oklahoma City, Engineering
GLYNN, WILLIAM A., Nowata, Mathematics
MCCREARY, JAMES G., Norman, Engineering
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
QUINN, JAMES A., Jr., Guymon, Botany
RUTLEDGE, JAMES L., Woodward, Physics
SHELDON, GEORGE A., Jr., Hugo, Engineering
SMITH, WILLIAM W., Walters, Mathematics
STEFFENSEN, ROGER J., Chelsea, Engineering
STURM, GENE P., Jr., Bartlesville, Chemistry
TATUM, J. PATRICK, Tulsa, Chemistry
VAUGHAN, ROBERT W., Kiowa, Engineering

Graduate Teaching Assistant

ARMSTRONG, GENE L., Stillwater, Engineering
BAILEY, HORACE H., Norman, Physiology
COCHRAN, ALLAN C., Norman, Mathematics
DOWTY, EARL L., Pryor, Engineering
GLYNN, WILLIAM A., Nowata, Mathematics
LOGAN, JOHN M., Norman, Earth Sciences
POTTMYER, JAMES J., Oklahoma City, Engineering
ROBINSON, ROBERT L., Jr., Muskogee, Engineering
THOMASON, LOUIS C., Stillwater, Engineering

Postdoctoral

SMITH, FRANK W., Norman, Mathematics
CLARK, ALFRED, Jr., Bartlesville, Mathematics

Science Faculty

GRIMES, BILLY R., Stillwater, Mathematics
MANKE, PHILLIP G., Stillwater, Engineering
MCCOY, JEROME D., Tulsa, Physics
MONKS, HERBERT V., Tahlequah, Mathematics
THURSTON, GEORGE B., Stillwater, Physics

Summer Fellowships for Secondary School Teachers

ADAMS, CHARLES A., Muskogee, Biophysics
BRANDT, LOIS C., Norman, Biology

FARMER, RUTH F., Okmulgee, Microbiology
KLENTOS, GUS, Tulsa, Mathematics
PLUMLEE, ERIC S., Claremore, Mathematics
ROWE, RICHARD H., Cromwell, Mathematics
SKELTON, JACK B., Tulsa, Mathematics
WHISENHUNT, BETTY R., Tahlequah, Zoology
WOODRUFF, GEORGE W., Stillwater, Biology

OREGON

Graduate

ASHLEY, ROGER P., Portland, Earth Sciences
AUERBACH, CARL F., Portland, Psychology
BLAU, HARVEY I., Molalla, Mathematics
BOGART, ELIZABETH A., Corvallis, Zoology
CASSELMAN, WILLIAM A., Portland, Mathematics
GERDING, ROBERT K., Portland, Biochemistry
GOOSMAN, DAVID R., Portland, Physics
LADD, LARRY A., Portland, Physics
MACINTYRE, ROSS J., Yachats, Genetics
MOURSUND, ANNE L., Eugene, Chemistry
PEARSON, GARY A., Portland, Physics
RETTIG, ROBERT L., Ontario, Engineering
RINARD, GILBERT A., Newberg, Physiology
SALLEE, GEORGE T., Nyssa, Mathematics
SATHER, CLIFFORD A., Portland, Anthropology
THOMASON, STEVEN K., Albany, Mathematics
WELCH, RONALD A., Salem, Mathematics
WRIGHT, LINDA A., Ashland, Chemistry

Cooperative Graduate

BAKER, GEORGE F., Salem, Zoology
BASS, WALTER E., Portland, Engineering
GLOVER, DIANA R., Eugene, Biochemistry
GRAVES, DONALD L., Corvallis, Engineering
HADDOCK, GERALD H., Grants Pass, Earth Sciences
HARPER, LAWRENCE H., Eugene, Mathematics
MYERS, MICHAEL K., Portland, Engineering
NIBLER, JOSEPH W., Salem, Chemistry
PAWLOWSKI, NORMAN E., Jacksonville, Chemistry
RYAN, ROBERT R., Corvallis, Chemistry
SEXTON, HAROLD C., Medford, Chemistry
THORNBER, KARVEL K., Portland, Engineering
WINN, DAVID A., Eugene, Physics

Graduate Teaching Assistant

ESPEY, RODNEY E., Portland, Mathematics
HELSER, GARRY A., Portland, Mathematics
KERLEY, DAVID E., Corvallis, Physiology
LYFORD, JOHN H., Jr., Corvallis, Botany
RITSCHARD, RONALD L., Corvallis, Zoology
SHERIDAN, RICHARD P., Eugene, Botany
STEIN, DONALD G., Eugene, Psychology
WHITE, RONALD J., Corvallis, Physiology

Postdoctoral

CROTHERS, DONALD M., Salem, Biophysics
IRGENS-MOLLER, HELGE, Corvallis, Genetics
LUTHER, NORMAN Y., Salem, Mathematics
RUSSELL, DALE A., Enterprise, Earth Sciences
THIELE, EVERETT A., Eugene, Chemistry

Senior Postdoctoral

DECIUS, JOHN C., Corvallis, Chemistry
STAFFORD, HELEN A., Portland, Biochemistry

Science Faculty

KARLE, JAMES H., Portland, Physics
LEADLEY, JOHN D., Portland, Mathematics
LONG, VERNON L., Portland, Physics
MCCLURE, ELDON R., Corvallis, Engineering
TABBUTT, FREDERICK D., Portland, Chemistry
WALTON, JESSE S., Corvallis, Engineering
YOUTZ, BYRON L., Portland, Biophysics
ZAWORSKI, ROBERT J., Corvallis, Engineering

Summer Fellowships for Secondary School Teachers

BACHMAN, ALFRED M., Portland, Mathematics
MADDOX, TERRANCE, Springfield, Earth Sciences
MCKENZIE, DONALD S., Stayton, Zoology
NEAL, VICTOR T., Portland, Earth Sciences
PERRY, GEORGE H., Gresham, Mathematics

PENNSYLVANIA

Graduate

AFRICA, BRUCE B., Warren, Biochemistry
ANDERS, LESLIE R., Lansdale, Chemistry
ANTHONY, THOMAS R., Pittsburgh, Physics
BAILEY, DAVID N., Irwin, Chemistry
BAJURA, RICHARD A., Duquesne, Engineering
BALCH, ALAN L., Royersford, Chemistry
BALSLEY, MERLE, Glen Mills, Genetics
BARTEN, CAROLYN O., State College, Biophysics
BENNETT, ALAN J., Philadelphia, Physics
BEUSCH, JOHN U., Erie, Engineering
BICKING, LEWIS A., Phoenixville, Biophysics
BOARDMAN, CHARLES J., Pittsburgh, Engineering
BRANDT, RICHARD A., Kingston, Physics
BREZIN, JONATHAN P., Pittsburgh, Mathematics
BROOKS, MORRIS W., Reading, Mathematics
BURNHAM, DAVID C., Pittsburgh, Physics
CAPECCHI, MARIO R., Southampton, Biophysics
CHERNOFF, PAUL R., Philadelphia, Mathematics
COMANOR, WILLIAM, S., Philadelphia, Economics
COOKE, GEORGE E., Rosemont, Mathematics
CROSS, RICHARD J., Jr., Pittsburgh, Chemistry
DEMKO, GEORGE J., Newtown Square, Geography
DESANTO, JOHN A., Kingston, Physics
DRISCOLL, GARY L., Forksville, Chemistry
EDWARDS, DALLAS C., Meadville, Zoology
EISENBERG, MURRAY, Philadelphia, Mathematics
EPLER, JAMES L., York, Genetics
FEELEY, ROBERT P., Scranton, Mathematics
FELDMAN, JERRY F., Philadelphia, Zoology
FINARELLI, HUGO J., Jr., Upper Darby, Mathematics
FINK, JAMES P., Broomall, Mathematics
FLEISCHMAN, WILLIAM M., Bethlehem, Mathematics
GABRIELE, THOMAS L., York, Engineering
GARLAND, STEPHEN J., Pittsburgh, Mathematics
GASTON, CHARLES A., Lancaster, Engineering
GILBERT, KEITH D., Boyertown, Engineering
GIMPEL, JAMES F., Philadelphia, Engineering
GRAHAM, LAWRENCE D., Bradford, Engineering
GRANDY, RICHARD E., Gibsonia, History and Philosophy of Science
GRAY, DONALD M., Milton, Biophysics

HAMILTON, GEORGE T., Pittsburgh, Engineering
HEINTZELMAN, WILLIAM J., Neffs, Physics
HELWIG, JAMES A., Glenside, Earth Sciences
HESS, DAVID F., Doylestown, Earth Sciences
HICKEY, LEO J., Philadelphia, Earth Sciences
HOFFMAN, DONALD B., Allentown, Biophysics
HOFFMAN, RICHARD B., Bethlehem, Physics
HOLLAND, RICHARD W., Upper Darby, Engineering
HOLMBERG, GARY L., Warren, Engineering
HOROWITZ, DANIEL H., State College, Earth Sciences
HUEBNER, JOHN S., Wynnewood, Earth Sciences
HUMPHREYS, JAMES E., Erie, Mathematics
JEFFERYS, WILLIAM H., III, Radnor, Astronomy
JEROME, JOSEPH W., Philadelphia, Mathematics
KALME, CHARLES I., Philadelphia, Mathematics
KATZ, VICTOR J., Philadelphia, Mathematics
KELLY, FRANCES J., Shamokin, Biology
KLEIN, FRANCIS M., Wilkes-Barre, Chemistry
KRAMER, ANTHONY J., Philadelphia, Engineering
LANGRETH, SUSAN G., Pittsburgh, Zoology
LAVINE, RICHARD B., Huntingdon Valley, Mathematics
LAWRENCE, PAUL J., Hazleton, Biochemistry
LIBERMAN, DAVID, Philadelphia, Mathematics
LIPPARD, STEPHEN J., Pittsburgh, Chemistry
LIVE, THEODORE R., Philadelphia, Biochemistry
LOLORDO, VINCENT M., Philadelphia, Psychology
MARKLEY, F. LANDIS, Cheltenham, Physics
MARTIN, RICHARD K., Elizabethtown, History and Philosophy of Science
MAZESS, RICHARD B., Philadelphia, Anthropology
MCGRADY, SR. M. MERCY, Pittsburgh, Chemistry
MCLEISTER, ELIZABETH O., Pittsburgh, Chemistry
MIESEL, JOHN L., Erie, Chemistry
MOHR, SCOTT C., Warren, Biochemistry
MOORE, LAWRENCE C., Jr., Newtown Square, Mathematics
MUNLEY, FRANCIS E., Archbald, Physics
MURPHY, JOHN H., Pittsburgh, Engineering
NIEDRA, JANIS M., Beaver Falls, Engineering
NOBLE, ROBERT W., Jr., Ardmore, Biophysics
NUNEMAKER, RODNEY D., Centerport, Physics
O'DONNELL, VINCENT F., Philadelphia, Physics
ORNSTON, LEO N., Horsham, Biochemistry
PACKEL, EDWARD W., Merion Station, Mathematics
PARSONS, TORRENCE D., Lock Haven, Mathematics
PASSELL, NICHOLAS, Pittsburgh, Mathematics
PIERCE, RUSSELL D., Homer City, Physics
RAUB, WILLIAM F., Nanticoke, Physiology
RESCORLA, ROBERT A., Philadelphia, Psychology
RUSSAKOFF, GERALD S., Philadelphia, Physics
SANKOWSKY, DANIEL A., Merion, Mathematics
SCHICK, MICHAEL, Philadelphia, Physics
SHABAKER, ROBERT H., Media, Engineering
SHAFFER, OLIVIA C., Swarthmore, Psychology
SHARPLESS, KARL B., Haverford, Chemistry
SHORTESS, DAVID K., Bloomsburg, Genetics
SHUMANN, ANN P., Easton, Psychology
SILVERSTEIN, MARTIN L., Philadelphia, Mathematics
SPEER, VIRGINIA E., Pittsburgh, Mathematics
STANLEY, HARRY E., Jr., West Chester, Biophysics
STOWELL, JOHN C., Erie, Chemistry
SWAIN, PHILIP H., Philadelphia, Engineering
SWITKES, LOUISE S., Pittsburgh, Biochemistry
TAPPERT, FREDERICK D., Philadelphia, Physics
THOMAS, JAMES A., Chester, History and Philosophy of Science
TROST, BARRY M., Philadelphia, Chemistry
UHRIG, JEROME L., Irwin, Engineering
WELCH, DAVID O., Swarthmore, Engineering
WILLIAMSON, SAMUEL J., Sayre, Physics
WILLS, ESTHER V., Secane, Biochemistry
WILSON, G. EDWIN, Jr., Philadelphia Chemistry
WOLF, RICHARD A., Pittsburgh, Physics
YAROSH, EDWARD C., Baden, Biophysics
YODER, CLAUDE H., West Reading, Chemistry
ZAMBLE, EDWARD, Philadelphia, Psychology
ZIEGLER, JOANNA R., Lewisburg, Botany

Cooperative Graduate

BAECKER, RONALD M., Pittsburgh, Engineering
BEALS, RICHARD W., Erie, Mathematics
BENZINGER, WILLIAM D., Pittsburgh, Chemistry
BOSSARD, DAVID C., Perkasie, Physics
BRANDT, RICHARD C., Swarthmore, Physics
BRISBIN, I. LEHR, Jr., Drexel Hill, Zoology
BUCHEK, PHILIP M., McKees Rocks, Engineering
CAMPBELL, FRANCIS J., Philadelphia, Physics
CAMPBELL, MARY K., Havertown, Chemistry
CARLSON, GUSTAV A., Oakmont, Engineering
COHEN, GERSON H., Philadelphia, Chemistry
COOK, RAYMOND G., McKeesport, Engineering
CUTNELL, JOHN D., Whitaker, Chemistry
DANIHER, FRANCIS A., Pittsburgh, Chemistry
DARWIN, PATRICIA L., Jenkintown, Psychology
DORWART, WILLIAM V., Jr., Lancaster, General Biology
DOUTY, CHARLES F., Pittsburgh, Chemistry
ENGEL, ROBERT R., Pittsburgh, Chemistry
FONASH, STEPHEN J., Haverford, Engineering
FORNEY, LEROY S., Harrisburg, Chemistry
FOUNTAINE, JAMES E., Drexel Hill, Chemistry
GREYTAK, THOMAS J., Nanticoke, Physics
GUINAN, JOHN J., Jr., Lafayette Hill, Engineering
HANSON, KENNETH L., State College, Engineering
HARTRANFT, RONALD J., Bethlehem, Engineering
HAUDE, RICHARD H., Pittsburgh, Psychology
HAYS, JO N., State College, History and Philosophy of Science
HOFFMAN, PETER D., Altoona, Engineering
HOFFMEISTER, JOHN L., Philadelphia, Engineering
HORN, ROGER A., Easton, Mathematics
HUMMEL, FLOYD A., State College, Physics
JEFFERS, PETER M., Myerstown, Chemistry
KENIG, MARVIN J., Philadelphia, Engineering
KENSCHAFT, ROLAND P., Philadelphia, Physics
KOMITSKY, FRANK, Jr., Butler, Chemistry
KRISCH, ALAN D., Philadelphia, Physics
LANGERHOLC, JOHN, Johnstown, Physics
LIPOWITZ, JONATHAN, Pittsburgh, Chemistry

MAGAN, JOHN R., Bethlehem, Physics
MANOVE, MICHAEL E., Havertown, Mathematics
MATTHYS, DONALD R., Philadelphia, Physics
MAYER, RAYMOND A., Jr., Philadelphia, Mathematics
McDOWELL, GEORGE O., Butler, Engineering
McKAY, DAVID S., Paoli, Earth Sciences
McKEEVER, LELAND D., Pittsburgh, Chemistry
MILLER, FORREST R., Jr., York, Mathematics
MILLER, NORMAN C., Jeannette, Economics
MITCHELL, EDWARD J., Aldan, Economics
MORRISON, FRANK A., Jr., Greensburg, Engineering
NADOLSKY, RICHARD J., Lilly, Chemistry
NAGLE, JOHN F., Girard, Physics
NEAL, TIMOTHY R., Curwensville, Physics
PAULSON, ALBERT S., Plymouth, Mathematics
PLATENIUS, PETER H., Ardmore, Psychology
POWER, JOSEPH, Pittsburgh, Microbiology
RANK, DAVID M., State College, Physics
RATCLIFF, KEITH F., Pittsburgh, Physics
REYNER, EMERSON M., II, Harrisburg, Engineering
RORRES, CHRIS, Havertown, Mathematics
ROSENZWEIG, MICHAEL, Philadelphia, General Biology
ROSS, JAMES A., Drexel Hill, Physics
SCHACHER, MURRAY M., Philadelphia, Mathematics
SCHALLER, EDWARD J., Philadelphia, Engineering
SHORT, HERBERT M., Bridgeville, Mathematics
SLAGLE, OTIS D., University Park, Earth Sciences
SMITH, JOHN E., Jr., Clairton, Physics
SWIFT, ARTHUR R., Folcroft, Physics
TAMARELLI, ALAN W., Pittsburgh, Engineering
TORRENCE, ROBERT J., Pittsburgh, Physics
TRAVIS, CAROL A., North East, Physics
TRESSLER, RICHARD E., Bellefonte, Earth Sciences
URBACH, FREDERICK L., Beaver Falls, Chemistry
WASHBURN, ALAN R., Pittsburgh, Engineering
WEBBER, STEPHEN E., Scranton, Chemistry
WEHRY, EARL L., Jr., Reading, Chemistry
WEVER, GRACEMARIE H., Barto, Zoology
WHIRLOW, DONALD K., Pittsburgh, Engineering
WINTER, HARRY C., State College, Biochemistry
WYSE, GORDON A., Wallingford, Physiology
YERGEY, ALFRED L., III, Willow Grove, Chemistry

Graduate Teaching Assistant

ALLEN, GEORGE R., Doylestown, Physics
BEIDLEMAN, JAMES C., State College, Mathematics
BENSINGER, WILLIAM D., Pittsburgh, Chemistry
BOVE, FRANK C., Yeadon, Medical Sciences
BRIMHALL, JAMES E., Pittsburgh, Physics
BRODSKY, ALAN R., Philadelphia, Mathematics
BROOKS, WILLIAM H., Camp Hill, Botany
DERSARKISSIAN, MICHAEL, State College, Physics
DIEBST, KAY E., Pittsburgh, Physiology
DIGREGORIC, GUERINO J., Drexel Hill, Medical Sciences
DOUTY, CHARLES F., Pittsburgh, Chemistry
DUBOFF, RICHARD B., Philadelphia, Economics
ERB, KENNETH L., Souderton City, Botany
FOURNIER, ALINE F., Pittsburgh, Chemistry
GADE, EDWARD H. H., III, Pittsburgh, Mathematics
GOOD, RICHARD S., Bryn Mawr, Earth Sciences
HEATWOLE, NANCY L., Pittsburgh, Chemistry
HEDDING, DALE P., Pittsburgh, Engineering
HITT, JOE S., Pittsburgh, Engineering
HOHENLEITNER, FRANK J., Philadelphia, Physiology
HOTSON, JOHN H., Bethayres, Economics
HUBER, CARL I., North East, Engineering
MARES, ERIKA A., State College, Mathematics
McGEARY, DAVID F. R., State College, Earth Sciences
McLEAN, PETER C., Villanova, Chemistry
MOORE, LAWRENCE C., Jr., Newtown Square, Mathematics
MORGAN, CHARLES D., Bethlehem, Engineering
MORRIS, CLIFTON, Fredericktown, Botany
MUNRO, DONALD W., University Park, Physiology.
MUSHRUSH, GEORGE W., Homer City, Chemistry
OSGOOD, RICHARD G., Jr., West Chester, Earth Sciences
POMMERSHEIM, JAMES M., Pittsburgh, Engineering
POWERS, DAVID L., Glenside, Mathematics
PRESTON, IVAN L., Pittsburgh, Social Sciences
RIFFE, WILLIAM J., Pittsburgh, Engineering
ROSE, MARY E., Pittsburgh, General Biology
SALTER, JAMES W., Pittsburgh, Mathematics
SCHLEICHER, DAVID L., State College, Earth Sciences
SOBOTA, ANTHONY E., Pittsburgh, Botany
STANSFIELD, CHARLES, Jr., Pittsburgh, Geography
STUSNICK, ERIC, Edwardsville, Physics
SUMNER, PATRICIA C., Dimock, Botany
SZUSZCZEWICZ, ANTHONY J., Philadelphia, Medical Sciences
TROST, BARRY M., Philadelphia, Chemistry
WAAG, ROBERT C., Drexel Hill, Engineering
WELLS, JACQUELINE G., Monroeville, Mathematics
WILDE, PAT, Pittsburgh, Earth Sciences

Postdoctoral

BLOOM, BARRY R., Philadelphia, Biochemistry
CIMA, JOSEPH A., State College, Mathematics
FETTER, ALEXANDER L., Philadelphia, Physics
HRUSKA, SAMUEL J., Pittsburgh, Engineering
KRANTZ, DAVID H., Philadelphia, Psychology
LANG, L. GEORGE, Pittsburgh, Physics
NICHOLS, FRED A., Bridgeville, Engineering
OFFENHARTZ, PETER O., Philadelphia, Chemistry
RUSSELL, KENNETH C., Pittsburgh, Engineering
SMITH, PAUL L., Jr., Pittsburgh, Meteorology
STEERS, EDWARD, Jr., Philadelphia, Genetics
TRAHANOVSKY, WALTER S., Conemaugh, Chemistry

Senior Postdoctoral

HEPLER, LOREN G., Pittsburgh, Chemistry
PROKASY, WILLIAM F., University Park, Psychology
STEELE, WILLIAM A., University Park, Chemistry

Science Faculty

BETHEM, AUGUST J., San Luis Obispo, Mathematics
BOTDORF, RUTH G., University Park, Chemistry
CARSON, BERNARD H., University Park, Engineering
CRAWFORD, JAMES P., Easton, Mathematics
DINES, EDWARD A., Pittsburgh, Oceanography
DUNATHAN, HARMON C., Haverford, Chemistry
HEALD, MARK A., Swarthmore, Physics
HERBICH, JOHN B., Bethlehem, Engineering
JONES, ROBERT R., Easton, Engineering
KACZMARCZIK, PAUL, Philadelphia, Physics
KIMLIN, MARY J., Easton, Chemistry
LAUBER, GEORGE, Jr., Villanova, Sociology
LEONARD, ROY J., Bethlehem, Engineering
MATHERS, LEWIS J., Villanova, Engineering
ROINE, JARL, San Luis Obispo, Geography
ROLL, FREDERIC, Philadelphia, Engineering
SCHILLER, JOHN J., Jr., Philadelphia, Mathematics
SHEWMON, PAUL G., Pittsburgh, Engineering
THOMAS, DONALD H., Philadelphia, Engineering
WEST, HARRY H., University Park, Engineering

Summer Fellowships for Secondary School Teachers

BLYLER, GEORGE E., Emmaus, Mathematics
BROBST, DONALD L., Williamsport, Earth Sciences
CLEMSON, DAVIS F., Jr., State College, Mathematics
DAY, GORDON M., New Hope, Biology
DEMITRAS, BRO. GREGORY, Philadelphia, Chemistry
DIVELY, GALEN P., Claysburg, General Sciences
HEBERLIG, RAYMOND D., Lebanon, Botany
HELMS, DORIS E., Hellertown, Mathematics
KELLER, PAUL J., II, Lewisburg, Biology
MANLEY, THOMAS R., Selinsgrove, Zoology
MURRAY, CECIL P., Rimersbury, Mathematics
SCHILLINGER, SR. JOANNA, Pittsburgh, Biology
SCHWALBE, PAUL W., Lima, Biology
SMITH, ALVA N., Lock Haven, Microbiology
VAUX, JAMES E., Pittsburgh, Chemistry
WILLIAMS, EUGENE M., Warren, Biology
YODER, HAROLD D., Altoona, Microbiology
ZAMPETTI, GEORGE P., Philadelphia, Mathematics

PUERTO RICO

Graduate

STOLBERG, HAROLD J., Rio Piedras, Mathematics

Science Faculty

RODRIQUEZ, SR. HAYDEE, Santa Maria, Ponce, Mathematics

Summer Fellowships for Secondary School Teachers

SUAREZ DE OJEDA, OLGA L., Hato Rey, Mathematics

RHODE ISLAND

Graduate

FRANK, MARION E., Providence, Psychology
KENNY, JOHN J., Cranston, Engineering
LUND, JUDITH N., Providence, Botany
MILLWARD, CECLIA M., Providence, Linguistics
PIKE, ARTHUR C., Warwick, Meteorology
SHIMP, CHARLES P., Providence, Psychology
SUPLINSKAS, RAYMOND J., Providence, Chemistry

Cooperative Graduate

ARNOLD, LESLIE K., Providence, Mathematics
BROSHAR, WAYNE C., Providence, Physics
FLETCHER, RAYMOND C., Hope, Earth Sciences
KAUFMAN, MICHELE, Tiverton, Astronomy
WINICOUR, JEFFREY H., Providence, Physics

Graduate Teaching Assistant

BOUFFARD, ROLAND A., Pawtucket, Chemistry
COTTER, JOHN T., Cranston, Engineering
DILBONE, GILBERT R., Providence, Microbiology
MARSOCCI, SAMUEL F., West Warwick, Chemistry
SCHWARTZ, BRIAN B., Providence, Physics
TUCKER, DONALD P., Barrington, Economics

Postdoctoral

BROWDER, ANDREW, Providence, Mathematics

Senior Postdoctoral

CLARKE, JOSEPH H., Providence, Engineering

Science Faculty

GOULD, WALTER P., Kingston, Zoology
LAVELLE, FRANCIS H., Kingston, Engineering

Summer Fellowships for Secondary School Teachers

EHRLICH, ROSALIND H., Providence, Chemistry

SOUTH CAROLINA

Graduate

ANSELMO, ROBERT A., Florence, Physics
ARRINGTON, CHARLES A., Jr., Clemson, Chemistry
HEALD, LAWRENCE A., Hartsville, Engineering
INGRAM, LIONEL R., Charleston, Economics
KEELER, EMMETT B., Charleston, Mathematics
LIVERMAN, ROBERT B., Lexington, Economics
LUNNEY, DAVID C., Columbia, Chemistry
ROGERSON, NANCY C., Columbia, Physics
TEMPLE, ROBERT D., Mount Pleasant, Chemistry
WYMAN, BOSTWICK F., Columbia, Mathematics

Cooperative Graduate

AGEE, FORREST, J., Jr., Mount Pleasant, Physics
BRELAND, JOHN G., Jr., Holly Hill, Chemistry
CANTRELL, THOMAS S., Columbia, Chemistry
CRAVER, LARRY W., Columbia, Engineering
DAVIS, DONALD R., Greenville, Physics
LUCAS, SPURGEON L., Jr., Columbia, Engineering
MADDOX, BILLY H., Columbia, Mathematics
PACE, MARSHALL O., Columbia, Engineering
REID, WILLIAM J., Jr., Abbeville, Physics
SHAND, JULIAN B., Jr., Columbia, Physics

Graduate Teaching Assistant

BRITTAIN, JOAN, Clemson, Mathematics
COLEMAN, ROBERT A., Anderson, Engineering
CRAVER, LARRY W., Columbia, Engineering
FOLEY, JOHN M., Anderson, Psychology
LEACH, WILLIAM M., Abbeville, Engineering
MOORE, LAWRENCE E., Conway, Chemistry
STEWART, WILLIAM H., Jr., Nichols, Physics
THOMAS, JOHN P., Columbia, Mathematics

Science Faculty

GAMBRELL, SAMUEL C., Jr., Clemson, Engineering
JOHNSON, JAMES K., Jr., Clemson, Engineering

Summer Fellowships for Secondary School Teachers

DODGE, HOWARD P., Spartanburg, Mathematics
JACOBS, JACQUELINE E., Columbia, Botany

SOUTH DAKOTA

Graduate

CAULKINS, DAVID D., Rapid City, Anthropology
CLARK, HERBERT H., Deadwood, Psychology
EERNISSE, ERROL P., Rapid City, Engineering
FROEMKE, JON C., Sioux Falls, Mathematics
RUMELHART, DAVID E., Wessington Springs, Psychology
WAGNER, RAYMOND L., Bristol, Engineering

Cooperative Graduate

KIDMAN, RUSSELL B., Wessington Springs, Physics

Graduate Teaching Assistant

CLAFLIN, TOM O., Vermillion, Zoology

Postdoctoral

RAPP, GEORGE R., Rapid City, Earth Sciences

Science Faculty

ADAIR, JOHN G., Mitchell, Psychology
GRAETZER, HANS G., Brookings, Physiology
KOEPSELL, PAUL L., Brookings, Engineering
MOLLER, GOTTFRIED I., Vermillion, Physics
THOMPSON, JOHN D., Sioux Falls, Biophysics

TENNESSEE

Graduate

BENNETT, RALPH B., Knoxville, Mathematics
BOYLES, WILEY R., Maryville, Psychology
BUTLER, WILLIAM R., Lexington, Physics
ENGELBERG, DON P., Memphis, Physics
FORTUNE, HERMAN T., Selmer, Physics
HALL, DONALD E., Cleveland, Physics
HIRSCH, ALBERT E., Knoxville, Engineering
JOHNSON, PORTER W., Tyner, Physics
KYLE, CHARLES F., Memphis, Physics
MANKIN, WILLIAM G., Memphis, Physics
PARKER, WESLEY A., Knoxville, Engineering
RITTENBERG, ALAN, Nashville, Physics
RITTER, ENLOE T., Memphis, Physics
SCHAEFGEN, HAROLD W., Memphis, Engineering
THOMPSON, JAMES R., Memphis, Mathematics
WALPOLE, JAMES N., Brownsville, Engineering

Cooperative Graduate

BACKSTROM, NEIL C., Nashville, Physics
BLACKBURN, JOSEPH D., Kingsport, Engineering
COX, RICHARD L., Lenoir City, Engineering
GAUSTER, WILHELM B., Oak Ridge, Physics
HETZLER, MORRIS C., Jr., Nashville, Physics
LEWIS, JAMES L., III, Nashville, Engineering
MARTIN, WILLIAM J., Somerville, Engineering
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., Knoxville, Chemistry
TRENTHAM, JIMMY N., Nashville, Zoology
WALLER, JOHN W., Johnson City, Engineering
WILLIAMS, RICHARD K., Nashville, Mathematics

Graduate Teaching Assistant

BAILEY, DONALD F., Nashville, Mathematics
BIVENS, DONALD B., Cleveland, Engineering
CHRISTY, JOHN H., Jr., Nashville, Mathematics
COCHRAN, GEORGE T., Knoxville, Chemistry
KINSER, HUBERT B., Madisonville, Chemistry
LATHAM, ROGER A., Springfield, Chemistry
LIPTON, DOUGLAS S., Nashville, Sociology
MCCARTY, STUART W., Knoxville, Chemistry
NELSON, OSCAR T., Jr., Nashville, Mathematics
PEEK, NORMAN E., Concord, Chemistry
RAY, GENE W., Knoxville, Physics
ROBERTS, MARY D., Selmer, Zoology
ROVEE, DAVID T., Memphis, Zoology
SHUGART, LEE R., Maryville, Microbiology
VONDRAK, EDWARD A., Nashville, Physics
WILLIAMS, RICHARD K., Nashville, Mathematics
WOOD, JAMES L., Nashville, Chemistry
YATES, HARRIS O., Nashville, Botany
ZGANJAR, EDWARD F., Nashville, Physics

Postdoctoral

KOEN, FRANK M., Nashville, Psychology

Senior Postdoctoral

WELSHONS, WILLIAM J., Oak Ridge, Genetics

Science Faculty

BOLING, RONALD W., Knoxville, Engineering
BROWN, FLOYD L., Clarksville, Botany
GLASER, DONALD L., Memphis, Engineering
MOTT, JULIAN E., Knoxville, Engineering

TEXAS

Graduate

BEYNON, EUGENE T., Jr., Corpus Christi, Engineering
BLACKMON, MAURICE L., Beaumont, Physics
BLACKWELL, DAVID D., Dallas, Earth Sciences
BLANKENSHIP, JAMES E., Sherman, Physiology
BLUM, FRED A., Jr., Austin, Physics
BRONSTAD, GILBERT W., Arlington, Psychology

CARMICHAEL, J. W., Jr., Dimmitt, Chemistry
CARTER, LUCIAN C., III, Beaumont, Physics
COLLIER, ROBERT J., Fort Worth, Physiology
COOKE, JAMES H., Denton, Physics
COURY, GLENN E., Houston, Engineering
DOMASH, LAWRENCE H., Houston, Physics
DOYLE, JOSEPH C., Houston, Physics
FARIES, DILLARD W., Brownwood, Physics
FISK, GEORGE A., Houston, Chemistry
FUREY, WILLIAM N., Jr., Mount Pleasant, Physics
GIBSON, BENJAMIN F. V., Lufkin, Physics
GILMARTIN, MICHAEL C., Fort Worth, Mathematics
GREENHALL, CHARLES A., Dallas, Mathematics
GUILLORY, JOHN U., Jr., Houston, Physics
HANNIGAN, JAMES R., Bryan, Engineering
HARRIS, RICHARD J., Houston, Psychology
HICKMAN, KATIE H., Port Neches, Zoology
HITT, JOHN C., Houston, Psychology
HODGES, CARROLL A., Austin, Earth Sciences
JOCKUSCH, CARL G., Jr., San Antonio, Mathematics
JOHNSON, LARRY C., Fort Worth, Physics
JOHNSON, RAYMOND L., Alice, Mathematics
KNEZEK, BERNARD D., Seymour, Biology
KONEN, HARRY P., Houston, Mathematics
LAMBERT, JOSEPH B., San Antonio, Chemistry
LARMORE, LAWRENCE L., Jr., Houston, Mathematics
LESSER, HERBERT A., Fort Worth, Engineering
LEVY, CHARLES M., Houston, Psychology
LOCKERD, ROBERT M., Abilene, Engineering
LOGAN, JAMES B., Austin, Biochemistry
MANNING, ROBERT J., Dallas, Physics
MATZNER, RICHARD A., Hurst, Physics
MCCLAIN, WILLIAM M., Georgetown, Chemistry
MOORE, ALLEN M., Austin, Biology
MORROW, JAMES A., Dallas, Mathematics
NELSON, WILLIAM G., IV, Orange, Economics
PAGE, LINDA J., Fort Worth, Anthropology
PORTER, JOHN R., Austin, Physics
PRESCOTT, CHARLES Y., Houston, Physics
ROBINSON, LYNDON H. Jr., Orange, Engineering
SUDDERTH, WILLIAM D., Dallas, Mathematics
SULLIVAN, DENNIS P., Houston, Mathematics
VAUGHN, MARK H., San Benito, Physics
VENNIX, ALAN J., Houston, Engineering
VUILLEMIN, JOSEPH J., Chicago, Physics
WARREN, ROBERT H., Bellaire, Zoology
WELLS, RAYMOND O., Jr., Dallas, Mathematics
WEST, LYNN, P., Lamesa, Engineering
WOODWARD, JOE W., Beaumont, Engineering
WOOTEN, DAVID C., Bellaire, Engineering
WRIGHT, ALAN C., Houston, Chemistry

Cooperative Graduate

ABLES, PAULA R., Austin, Biochemistry
ANDERSON, CHARLES L., Dallas, Mathematics
ARTERBURN, DAVID R., Amarillo, Mathematics
BORM, ALFRED E., Pearland, Mathematics
BRAMMER, LINDA R., Denton, Chemistry
BURTON, JOHN D., Waco, Physics
CARACENA, FERNANDO, Jr., El Paso, Physics
COHEN, LEWIS H., Dallas, Earth Sciences.
DAVIS, ANN A., Austin, Mathematics
DAVIS, ROBERT C., Dallas, Mathematics
ELLIS, NEWTON C., Texas City, Psychology
EVERETT, JOHN R., Austin, Earth Sciences
FISHER, GARY D., Borger, Engineering
GARRARD, WILLIAM L., Jr., Austin, Engineering
GRAY, ALFRED, Dallas, Mathematics
GROVES, MORTON D. P., Matador, Engineering
GUY, JIMMIE D., College Station, Engineering
HARPER, RICHARD I., Pasadena, History and Philosophy of Science
HAYSE, FRANKLIN A., McAllen, Zoology
HERMES, ROBERT A., Hallettsville, Engineering
HILL, JOHN G., Hereford, Earth Sciences
HIRSH, CONRAD W., Houston, Mathematics
HUGHES, MICHAEL P., Houston, Chemistry
KIERGAN, STEPHEN E., Longview, Physics
MANNING, GERALD S., El Paso, Biochemistry
MCENTEE, WINNIE R., Dallas, Chemistry
MOORE, LESLIE R., Westbrook, Mathematics
MORGAN, JERRY D., Houston, Engineering
MURPHY, JOSEPH S., Austin, Chemistry
NAUGLE, DONALD G., Fort Worth, Physics
OTTMERS, DELBERT M., Jr., Austin, Engineering
POPE, LARRY D., Pasadena, Engineering
PORTER, VERNON R., Dallas, Earth Sciences
POTTER, PATRICIA S., Fort Worth, Microbiology
PRESCOTT, LANSING M., Houston, Physiology
ROBERTS, HOWARD N., Corpus Christi, Engineering
ROGERS, JACK W., Jr., Austin, Mathematics
SMITH, ROGER E., Arlington, Engineering
SPENCER, ALEXANDER B., San Antonio, Earth Sciences
STANFORD, JOHN L., La Porte, Physics
SULLIVAN, CHARLES R., El Paso, Physics
WHEELER, LEWIS T., Houston, Engineering
WISCAMB, MARGARET R., Euless, Mathematics

Graduate Teaching Assistant

BAKER, JAMES H., Fort Worth, Microbiology
BISHOP, BOBBY A., Cleburne, Earth Sciences
BOEHME, HOLLIS C., Bryan, Physics
BRIDGES, GILBERT S., Dallas, Economics
CASE, WILLIAM E., Lubbock, Physics
CASS, LOIS J., Dallas, Physics
CLEMONS, RUSSELL E., Austin, Earth Sciences
CRUTCHER, JAMES E., Kilgore, Engineering
DAUGHERTY, MARY A., Dallas, Anthropology
EDMONDSON, ANDREW J., Bryan, Engineering
GREEN, WALTER L., College Station, Engineering
HARRIS, ELIZABETH F., Hurst, Zoology
HARRISON, DOUGLAS P., Frost, Engineering
HAYNES, JACK R., Fort Worth, Psychology
HOBBS, JAMES W., Wichita Falls, Chemistry
HUDDLESTON, ROBERT E., Fort Worth, Mathematics
KING, ELBERT A., Jr., Austin, Earth Sciences
MCPHERSON, RONALD V., Comanche, Mathematics
MEYER, PAUL A., San Antonio, Economics
MILLING, MARCUS E., Galveston, Earth Sciences
MOORE, ALLEN M., Austin, General Biology
PALMER, RICHARD A., Austin, Chemistry
ROBINSON, JOHN K., Houston, Chemistry
RUSSELL, THOMAS W., Kingsville, Chemistry
SCHMALSTIEG, FRANK C., Sinton, Chemistry
SHARP, MARJORIE S., Fort Worth, Microbiology
SHORT, THOMAS E., Jr., Port Arthur, Engineering
STEELMAN, JAMES E., Plainview, Engineering
STOUT, CHARLES L., Waco, Zoology
TRAVIS, JOHN C., Waco, Physics
TYLER, JOHN R., Nacogdoches, Economics

WANTLAND, KENNETH F., Houston, Earth Sciences
WIFF, DONALD R., College Station, Physics
WILLIAMS, BERT B., Farwell, Engineering
WILLIS, JAMES F., Dallas, Economics
WILSON, WAYNE J., Dallas, Psychology
WISCAMB, MARGARET R., Euless, Mathematics
WUNTCH, THOMAS, Dallas, Genetics
YEAGER, PHYLLIS A., Nevada, Zoology

Postdoctoral

GOGGIN, JUDITH P., El Paso, Psychology
HEATHCOCK, CLAYTON H., San Antonio, Chemistry
HIGHTOWER, JOE W., Weslaco, Chemistry
KOENIG, THOMAS W., Dallas, Chemistry
YOUNG, DAVID LIVINGSTON, Dallas, Biochemistry

Senior Postdoctoral

CARMAN, MAX F., Jr., Houston, Earth Sciences
HOOD, DONALD W., College Station, Earth Sciences

Science Faculty

ASHBY, EBERT A., Canyon, Physiology
CARRY, LAROY R., Bonham, Mathematics
DAVIS, THOMAS F., Houston, Mathematics
DOUGLAS, SAMUEL H., College Station, Mathematics
FETZER, HOMER D., Belton, Physics
HUFFMAN, LOUIE C., Wichita Falls, Mathematics
JONES, JERREL B., College Station, Engineering
KIESLING, ERNST W., Lubbock, Engineering
MARTINEZ EUGENE P., Beaumont, Engineering
PIERCE, KENNETH R., College Station, General Sciences
SALANI, HAROLD J., Houston, Engineering
STARK, JEREMIAH M., Beaumont, Mathematics
WAGNER, NORMAN K., Austin, Meteorology

Summer Fellowships for Secondary School Teachers

ALEXANDER, CLYDE W., Houston, Mathematics
BARKETT, JEANETTE, Tyler, Mathematics
CHIGAR, REVEREND DONALD M., Houston, Microbiology
CONNORS, SR. TERRESA, J., San Antonio, Mathematics
COWGILL, TOMMY D., Dallas, Mathematics
CRUSE, KEITH L., San Antonio, Mathematics
HERNANDEZ, NORMA G., El Paso, Mathematics
LOPEZ, FRANK, Eagle Pass, Physics
MCGRAW, JOE B., Jr., White Oak, Mathematics
OWENS, KENNITH R., Dallas, Mathematics
RENFROE, FRANCIS F., Rochelle, Mathematics
SCHILHAUB, ELGIN, J., Austin, Mathematics
SEGO, JAMES T., Jr., Rochester, General Science
STOKES, SAM B., Corpus Christi, Zoology
THOMPSON, GERALD L., Petersburg, Botany
WATKINS, TERRY A., Cross Plains, Mathematics
WORSHAM, JAMES R., Avalon, Zoology

UTAH

Graduate

ANDERSON, NEAL W., Salt Lake City, Botany
BUNDERSON, CHARLES V., Ogden, Psychology
CHASE, KENNETH W., Provo, Engineering
DORNY, CARL N., Provo, Engineering
GALE, NORD L., Provo, Microbiology
GRANT, SHELDON K., New Harmony, Earth Sciences
HATLEY, ELBERT T., Salt Lake City, Engineering
JENSON, EVAN D., Brigham City, Chemistry
MCCONKIE, GEORGE W., St. George, Psychology
MURPHY, CAROL J., Logan, Anthropology
SWONSON, JOHN C., Jr., Salt Lake City, Engineering
WARNER, CHARLES Y., Provo, Engineering
WOODBURY, ELROD T., Monroe, Engineering
WOODWARD, JOHN L., Provo, Engineering

Cooperative Graduate

GUYMON, ERVIN P., Blanding, Chemistry
HALL, EDNA, J., Salt Lake City, Physics
JONES, MERRELL R., Cedar City, Physics
LARSON, MICHAEL O., Salt Lake City, Physics
MATHER, JANET L., Salt Lake City, Physics
MILLER, RICHARD R., Salt Lake City, Chemistry
MINER, ELLIS D., Provo, Physics
MORRIS, MARVIN L., Salt Lake City, Physics
PARKER, JACK L., Springville, Physics
ROBINS, MORRIS J., Scipio, Chemistry
SCHRIEVER, RICHARD L., Salt Lake City, Engineering
SENIOR, EDWIN W., Salt Lake City, Engineering
TUERPE, DIETER R., Salt Lake City, Physics
WORLTON, THOMAS G., Layton, Physics

Graduate Teaching Assistant

ANDERSON, LYNN R., Vernal, Psychology
BENTLEY, ANTHONY I., Jr., Provo, Sociology
CHAPPELL, GILFORD A., Salt Lake City, Chemistry
HOFF, SUSAN D., Salt Lake City, Chemistry
HUNSAKER, WORTHEN N., Logan, Mathematics
IRWIN, RONALD L., Salt Lake City, Mathematics
JENSEN, GARY L., Provo, Zoology
LARSON, MICHAEL O., Salt Lake City, Physics
LOVELAND, LOWELL D., Salt Lake City, Mathematics
MATHESON, AUDRIA, Provo, Microbiology
MILES, DANIEL W., Saint George, Chemistry
MILTON, ERNEST H., Jr., Salt Lake City, Mathematics
MORRIS, MARVIN L., Salt Lake City, Physics
PETERSON, GERALD E., Salt Lake City, Mathematics
WOOD, LAWRENCE C., Salt Lake City, Earth Sciences

Postdoctoral

GRAFF, DARRELL J., St. George, Zoology
KRAUTHAMER, SIGMOND, Salt Lake City, Economics
NIELSEN, HARRY S., Jr., Ferron, Botany

Science Faculty

HEYBORNE, ROBERT L., Logan, Engineering
HOLDREDGE, RUSSELL M., Logan, Engineering
SNOW, RICHARD L., Provo, Mathematics
STANLEY, MELISSA S., Salt Lake City, Biology
UNDERWOOD, ERNEST E., Logan, Mathematics

Summer Fellowships for Secondary School Teachers

FREEMAN, LEE W., Salt Lake City, Biology
KLEINHANZ, SR. M. IRENE, Salt Lake City, Biology

Vaughan, Sr. M. Thomasita, Salt Lake City, Biology

VERMONT

Graduate

Ballard, David J., Cambridge, Mathematics
Cole, Stephen A., Jamaica, History and Philosophy of Science
Drew, David C., Lyndonville, Physics
Eldredge, Dorothy M, Springfield, Botany
Wright, Robert K, Castleton, Mathematics

Cooperative Graduate

Buss, Dennis D, Rochester, Engineering
Divine, Theodore N., Dorset, Astronomy
Reilly, Lorraine F, Rutland, Microbiology

Graduate Teaching Assistant

Potter, Noel, Jr, Rutland, Earth Sciences

Postdoctoral

Scheans, Daniel J., Burlington, Anthropology

Science Faculty

Folinas, Sr. Mary D., Burlington, Physiology
Kreider, Donald L., Hanover, Mathematics

VIRGINIA

Graduate

Blandford, Robert R., Falls Church, Oceanography
Bracey, Gerald W., Williamsburg, Psychology
Brolin, Edson C., Alexandria, Engineering
Cocke, Charles L., Jr., Roanoke, Physics
Coe, Robert S., Arlington, Earth Sciences
Cook, Gerald, Galax, Engineering
Dunn, Floyd E., Falls Church, Physics
Fairley, William B., Afton, Economics
Foster, Ted M., Lynchburg, Engineering
Gaffney, George W., Norfolk, Physics
Garrick, Linda S., Hampton, Biochemistry
Hill, Charles W., Danville, Biochemistry
Kaiser, John E., Jr., Newport News, Engineering
Kauffman, Glenn M., Mount Crawford, Chemistry
Keener, Carl S., Harrisonburg, Botany
Landstreet, John D., Fairfax, Physics
Losee, David L., Arlington, Physics
Miller, Philip C., Falls Church, Biology
Newman, Robert C., Arlington, Physics
Shaker, Richard J., Arlington, Mathematics
Smith, Robert S., Arlington, Engineering
Stephens, Mo M., Arlington, Biochemistry
Ullom, Stephen V., Alexandria, Mathematics
Whitehead, Harriet, Chatham, Anthropology

Cooperative Graduate

Allen, Nancy L., Falls Church, Genetics
Allison, William D., Hampton, Engineering
Atkinson, Walter E., II, Charlottesville, Physics
Beckedorff, David L., Cambridge, Mathematics
Boyd, Richard N., Arlington, Social Sciences
Bryant, Herman G., Jr., Charlottesville, Chemistry
Crawford, Charles D., Charlottesville, Engineering
Creager, Joan G., Arlington, Zoology
Derby, James R., Blacksburg, Earth Sciences
Evans, James E., Arlington, Engineering
Flora, Robert M., Richmond, Biochemistry
Grossnickle, William F., Arlington, Psychology
Letcher, John S., Lexington, Engineering
Mohn, William S., Jr., Richmond, Engineering
Pearson, Roy L., Farmville, Economics
Pratt, Robert E., Charlottesville, Chemistry
Rhodes, Edgar A., Clifton Forge, Physics
Rowan, Lawrence C., Charlottesville, Earth Sciences
Salmon, Lydia S., Williamsburg, Chemistry
Salmon, William I., Williamsburg, Chemistry
Williams, Harry T., Jr., Newport News, Physics

Graduate Teaching Assistant

Beck, Jean L., Norfolk, Chemistry
Charlton, Mary V., Dillwyn, Botany
Hunt, Lois T., Hopewell, Zoology
Keener, Ronald L., Fort Belvoir, Chemistry
Kierstead, Roger C., Vienna, Chemistry
Moore, Donald P., Blacksburg, Earth Sciences
Olton, Robert M., Jr., Richmond, Psychology
Payne, Joseph G., Madison, Engineering
Rowan, Lawrence C., Charlottesville, Earth Sciences
Vaughan, Lawrence G., Arlington, Chemistry

Postdoctoral

Drum, Charles M., Richmond, Physics

Senior Postdoctoral

Schatz, Paul N., Charlottesville, Chemistry

Science Faculty

Dawley, Eleanor G., Hampton, Mathematics
Dedrick, Robert L., McLean, Engineering
Iachetta, Fulvio A., Charlottesville, Engineering
Kent, George W., Bridgewater, Psychology
Kernell, Robert L., Williamsburg, Physics

Summer Fellowships for Secondary School Teachers

Baker, Melvin C., New Market, Mathematics
Haack, Louise B., Arlington, Mathematics
Hauser, Sr. Ann Joseph, Alexandria, Mathematics
McCullough, James M., Arlington, Botany
Roberson, William C., Staunton, Mathematics

WASHINGTON

Graduate

Beatty, David D., Blaine, Physiology
Beaulieu, Thomas J., Richland, Physics
Bossert, John M., Seattle, Mathematics
Bracken, Thomas D., Seattle, Physics
Braden, Charles B., Pullman, Mathematics
Calder, William A., Jr., Pullman, Physiology

CARLETON, CANDACE W., Mercer Island, Anthropology
CURTIS, ROBERT O., Fall City, Agriculture
DENZEL, GEORGE E., Seattle, Mathematics
DOBER, FRED H., Seattle, Chemistry
EKSTROM, PHILIP A., Walla Walla, Physics
FERGUSON, DAVID R., Seattle, Mathematics
GRUBER, WILLIAM P., Seattle, Engineering
HARTILL, DONALD L., Chewelah, Physics
HOPCROFT, JOHN E., Seattle, Engineering
JACOBSON, ERIC S., Vancouver, Biochemistry
JOHNSON, WALTER C., Jr., Seattle, Chemistry
KLEIN, GERALD W., Seattle, Chemistry
LECKENBY, DONAVIN A., Olympia, Zoology
PETERSON, EARL A., Sumner, Physics
POOL, KARL H., Seattle, Chemistry
RUSTAD, DOUGLAS S., Poulsbo, Chemistry
SANDSTROM, DONALD R., Bellevue, Physics
SCHREIBER, BERT M., Seattle, Mathematics
SMITH, CHRISTOPHER C., Seattle, Biology
STEIN, DONNA K., Longview, Psychology
SWANSON, DONALD A., Centralia, Earth Sciences
TAYLOR, CARL E., Okanogan, Mathematics
WILSON, JAMES D., Seattle, Chemistry
WRIGHT, WAYNE M., Tacoma, Chemistry

Cooperative Graduate

AAGAARD, KNUT, Seattle, Oceanography
BLICK, KATHARINE I., Seattle, Psychology
BURTON, THEODORE A., Onalaska, Mathematics
CALLIS, PATRIK R., Seattle, Chemistry
DEMEYER, FRANK R., Seattle, Mathematics
EAKIN, RICHARD R., Pullman, Mathematics
EBLIN, JAMES B., Pullman, Botany
ELLIOTT, JAMES E., Sedro Woolley, Earth Sciences
FISET, EDMUND O., Seattle, Physics
FOSTER, HERBERT R., Jr., Seattle, Engineering
FRYXELL, RONALD C., Pullman, Mathematics
HILL, MATTHEW H., Olympia, Anthropology
KUENZI, WILBUR D., Seattle, Earth Sciences
LOVELAND, WALTER D., Seattle, Chemistry
MAIMON, ALBERT S., Seattle, Mathematics
MARTIN, MICHAEL S., Seattle, Mathematics
MARTIN, TIMOTHY W., Kent, Engineering
MILLER, ALEX. E., Seattle, Chemistry
MORTON, MARTIN L., Pullman, Physiology
PARISEAU, WILLIAM G., Ellensburg, Engineering
PEMBRL, Sr., M. JOHANNA, Edmonds, Zoology
PETCOFF, DARRELL G., Yakima, Chemistry
PETERSON, ROY J., Seattle, Physics
SPIGER, ROBERT J., Seattle, Physics
TOUGH, JAMES T., Seattle, Physics
WARREN, WILLIAM W., Jr., Seattle, Physics

Graduate Teaching Assistant

ALLENDOERFER, ROBERT D., Seattle, Chemistry
BAILEY, DONALD J., Pasco, Engineering
CALVIN, CLYDE L., Toledo, Botany
CHARRON, LORETTA A., Pullman, Microbiology
COOMBS, ROBERT H., Pullman, Sociology
DAUGHERTY, KENNETH E., Seattle, Chemistry
GUNN, DONALD W., Pullman, Earth Sciences
HEID, WILLIAM H., Seattle, Psychology
HODGES, JOHN D., Seattle, Agriculture
HORDEMANN, GARY J., Spokane, Engineering
JOHNSON, WALTER C., Jr., Seattle, Chemistry
MARICICH, TOM J., Anacortes, Chemistry
MEANY, JOHN E., Seattle, Chemistry
MILLER, ALEX E., Seattle, Chemistry
MURPHY, BARRY T., Seattle, Chemistry
PARISEAU, MARIAN A., Kelso, Chemistry
PEDERSON, DENNIS M., Tacoma, Biochemistry
RIETMAN, JAN D., Seattle, Earth Sciences
ROTHENBERG, STEPHEN, Seattle, Chemistry
SESSE, WILLIAM S., Pullman, Chemistry
STEVENS, KENNETH D., Seattle, Chemistry
THIEDE, ROGER L., Seattle, Geography
WOLLNER, THOMAS E., Pullman, Chemistry

Postdoctoral

ARMSTRONG, RICHARD L., Seattle, Earth Sciences
PARISEAU, MARIAN A., Kelso, Chemistry
RICHARDSON, ROGER W., Jr., Seattle, Mathematics
SEGAL, JACK, Seattle, Mathematics
WEISS, MAX L., Seattle, Mathematics

Senior Postdoctoral

HARTZ, BILLY J., Seattle, Engineering
SCHMIDT, FRED H., Seattle, Physics

Science Faculty

BENNETT, ROBERT B., Walla Walla, Physics
BRUN, ROBERT F., Pullman, Engineering
BUCKRIDGE, TERRY N., Everett, Botany
CHANG, CHU C., Seattle, Mathematics
GAGE, BYRON P., Seattle, Engineering
HALLEEN, ROBERT M., Pullman, Engineering
KERLEE, DONALD D., Seattle, Physics
SEAMANS, DAVID A., Pullman, Engineering
SELKER, ALAN H., Seattle, Engineering

Summer Fellowships for Secondary School Teachers

KNOLL, DAVID G., Snoqualmie, Biochemistry
LOMAX, BERNICE V., Seattle, Biology
NIEMIEC, DAVID F., Seattle, Mathematics
TUSCHER, MELVIN F., Seattle, Mathematics
YOST, NICHOLAS K., Tacoma, General Science

WEST VIRGINIA

Graduate

ARMSTRONG, DONALD J., Elm Grove, Botany
BILLHEIMER, JOHN W., Huntington, Engineering
BIRD, NANCY L., St. Albans, Zoology
DAVIES, CAROLYN M., Huntington, Psychology
DETCH, JOHN L., Jr., Lewisburg, Physics
FOURNEY, WILLIAM L., Blue Jay, Engineering
FRIEDLY, JOHN C., Jr., Moundsville, Engineering
HOLT, R. BYRNE, Charleston, Chemistry
JARRETT, EUGENE L., St. Albans, Engineering
MARCUM, HOWARD B., St. Albans, Psychology
MILLER, MICKEY D., Romney, Psychology
SWIGER, ELIZABETH D., Fairmont, Chemistry

Cooperative Graduate

CALDWELL, RICHARD A., Huntington, Chemistry
CAMPBELL, LAURENCE J., Huntington, Physics
GROVES, JOEL L., Canvas, Physics
HEADLEY, LARRY C., Morgantown, Physics
MATHEWS, ROBERT C., Charleston, Physics
WEIMER, ROBERT F., Wheeling, Engineering

Senior Postdoctoral

CABBELL, THOMAS R., Institute, Chemistry
CASTRO, WALTER E., Clemson, Engineering
PLYBON, BENJAMIN F., Huntington, Mathematics

Graduate Teaching Assistant

BURLITCH, JAMES M., Wheeling, Chemistry
CASTELLI, MARYROSE, Logan, Botany
NUNLEY, ROBERT G., Morgantown, Botany

WISCONSIN

Graduate

ADAMS, ARTHUR C., Madison, Chemistry
ANDERSON, JEROME E., Hammond, Chemistry
ANSORGE, JANET M., Gillett, Anthropology
BARCALOW, MARTHA A., Mequon, Chemistry
BECKER, GEORGE C., Jr., Stevens Point, Zoology
BECKER, WAYNE M., Merton, Biochemistry
BRUENING, GEORGE E., Madison, Biochemistry
BURTON, EARL G., Knapp, Biochemistry
CARHART, RICHARD A., Madison, Physics
DAUB, EDWARD E., Milwaukee, History and Philosophy of Science
DOEDENS, ROBERT J., New Glarus, Chemistry
DONHOWE, JOHN M., Madison, Physics
EBERT, PAUL M., Watertown, Engineering
ELA, STEPHEN W., Madison, Chemistry
ELIAS, JOHN E., New Berlin, Physics
EMLEN, STEPHEN T., Madison, Zoology
FROEHLICH, WALTER J., Milwaukee, Physics
GLASER, LESLIE C., Madison, Mathematics
HAMMES, RICHARD R., Madison, Earth Science
HAWKINS, THOMAS W., Jr., Madison, History and Philosophy of Science
HENDERSON, DAVID W., Madison, Mathematics
HEYWOOD, JOHN G., Hudson, Mathematics
HULBURT, DAVID A., Reedsburg, Engineering
HULS, THOMAS A., Stanley, Engineering
INGRAHAM, EDWARD C., Madison, Mathematics
JASPERSON, STEPHEN N., Wisconsin Rapids, Physics
KARON, JOHN M., Milwaukee, Mathematics
KAUFMAN, RONALD, Milwaukee, Psychology
KRESS, LAWRENCE F., Milwaukee, Physiology
LUTTRELL, ERIC M., Eau Claire, Earth Science
MEYER, RALPH R., Milwaukee, Zoology
MUELLER, DENNIS C., Milwaukee, Economics
MYSZEWSKI, MICHAEL E., Whitewater, Genetics
OSTRIKER, JEREMIAH P., Madison, Astronomy
PETROF, ROBERT C., Beloit, Engineering
POSSIN, GEORGE E., Burnett, Physics
PRICE, THOMAS M., Madison, Mathematics
ROBINSON, STEPHEN M., Madison, Mathematics
ROLKE, ROGER W., Sun Prairie, Engineering
RUTHERFORD, REGINALD, Madison, Physics
SMITH, DENNIS E., Madison, Mathematics
WILLARSON, JON B., Madison, History and Philosophy of Science
WOLLER, BARBARA A., Hamburg, Zoology
WOOD, HERBERT T., Madison, Chemistry
WORKMAN, WILLIAM B., Madison, Anthropology
WYNGAARD, JOHN C., Madison, Engineering

Cooperative Graduate

ASPNES, DAVID E., DeForest, Physics
BIELEFELD, MICHAEL J., Milwaukee, Chemistry
CADMAN, RICHARD V., Evansville, Engineering
CHRISTENSEN, JAMES H., Waupaca, Engineering
GUSTAFSON, GERALD J., Eau Claire, Physics
HINTZ, HAROLD L., Appleton, Chemistry
HOWLETT, GEORGE F., Jr., Green Bay, Botany
KANNENBERG, DANIEL G., Milwaukee, Physics
LAYLAND, JAMES W., La Crosse, Engineering
MANTIK, DAVID W., Gleason, Physics
MOLANDER, ROGER C. Marinette, Engineering
NYBAKKEN, BETTE H., Madison, General Biology
NYBAKKEN, JAMES W., Madison, General Biology
OKSENBERG, LOIS E. C., Madison, Psychology
SCRIBNER, JOHN D., Appelton, Biochemistry
SPIEGELBERG, HARRY L., Appleton, Chemistry
WAGNER, CURTIS A., Monroe, Physics
WENDLAND, DANIEL W., Madison, Engineering
WILLIAMS, MICHAEL C., Madison, Engineering
WILLSON, MARY F., Baraboo, General Biology

Graduate Teaching Assistant

ANDERSON, RAYMOND P., Madison, Chemistry
BROOKS, SUSAN C., Milwaukee, Physiology
ERICKSON, CLIFFORD W., Madison, Physics
FATZINGER, DALE R., Platteville, Geography
FERGUSON, ARTHUR C., Madison, Chemistry
FREY, FREDERICK A., Wauwatosa, Chemistry
GUSTAFSON, GERALD J., Eau Claire, Physics
HETZEL, ARLENE F., Milwaukee, Chemistry
HUPPLER, JOHN D., Neenah, Engineering
KIECKHEFER, BARBARA J., Milwaukee, General Biology
LONNGREN, KARL E., Milwaukee, Engineering
MINORE, DON, Minong, Botany
PETRAS, JOHN W., Barksdale, Sociology
REAM, CATHERINE H., Madison, General Biology
SETHER, LOWELL A., Iola, Zoology
STEPHENS, RALPH I., Madison, Engineering
STUEWER, ROGER H., Bonduel, Physics
UNDERBRINK, CHARLES D., Spring Green, Chemistry
UTTORMARK, PAUL D., Marion, Engineering
WIEGNER, EDWARD A., Madison, Economics
WIENS, JOHN A., Madison, General Biology
WITHBROE, GEORGE L., Green Bay, Astronomy
WOOD, HERBERT T., Madison, Chemistry
WOPSCHALL, ROBERT H., Madison, Chemistry
WRIGLEY, VICTOR K., Brookfield, Physics

Science Faculty

BENDER, PHILLIP R., Milwaukee, Mathematics
GRENNAN, LAURIE M., Milwaukee, Chemistry
LIVERMORE, DONALD F., Madison, Engineering
NEWCOMB, ELDON H., Madison, Biology
OVERBY, CHARLES M., Madison, General Science
PEJSA, ARTHUR J., Milwaukee, Mathematics
STORLIE, JOHN C., La Crosse, Chemistry
VEERKAMP, NORBERT B., Madison, Engineering

Postdoctoral

MACURDA, DONALD B., Jr., Madison, Earth Sciences
ROESLER, FREDERICK L., Wauwatosa, Physics

Senior Postdoctoral

CURTIS, CHARLES W., Madison, Mathematics
ROSEN, WALTER G., Milwaukee, Biochemistry

Summer Fellowships for Secondary School Teachers

CASE, ELON E., Antigo, Biology
FRANZ, CLARK E., Wauwatosa, Botany
HANSKNECHT, SR. LIBORIS, Milwaukee, Mathematics
MCKOWN, DWAINE S., Madison, Mathematics
NELSON, ROBERT A., Chippewa Falls, Mathematics
NESS, HAROLD M., Jr., Kohler, Mathematics
TREBATOSKI, SR. GABRIEL, Stevens Port, Biology

WYOMING

Graduate

DINNEEN, JOHN G., Laramie, Mathematics
GILBERT, JOHN C., Laramie, Chemistry
NORTHEN, PHILIP T., Laramie, Zoology
ROSSI, CHARLES E., Gillette, Physics

Cooperative Graduate

CONLEY, CURTIS D., Laramie, Earth Sciences
FERRIS, CLINTON S., Jr., Laramie, Earth Sciences

Graduate Teaching Assistant

CALL, MAYO W., Laramie, General Biology
DAVIS, JAMES RAYMOND, Laramie, Earth Sciences
JOZWIK, FRANCIS X., Casper, Botany
STRAIN, BOYD R., Newcastle, Botany
WELLS, VICTOR A., Laramie, Engineering
WOLF, KENNETH G., Gillette, Engineering
WORL, RONALD G., Pinedale, Earth Sciences

Science Faculty

BURMAN, ROBERT D., Laramie, Engineering
HOYT, PHILIP M., Laramie, Engineering
VARINEAU, VERNE J., Laramie, Mathematics

Institutions Chosen by Fellowship Awardees—Fiscal Year 1963

[Key to table: A, Graduate; B, Cooperative Graduate; C, Summer Fellowships for Graduate Teaching Assistants; D, Postdoctoral; E, Senior Postdoctoral; F, Science Faculty; G, Summer Fellowships for Secondary School Teachers; and H, Senior Foreign Scientists.]

State and institution	A	B	C	D	E	F	G	H	Total
ALABAMA:									
Auburn University	1	3	4			1			9
University of Alabama		1	4						5
Sub-total	1	4	8			1			14
ALASKA:									
University of Alaska			1						1
Sub-total			1						1
ARIZONA:									
Arizona State University		2	3			1	1		7
University of Arizona	5	6	6			2	3	1	23
Sub-total	5	8	9			3	4	1	30
ARKANSAS:									
University of Arkansas		3					2		5
Sub-total		3					2		5
CALIFORNIA:									
California Institute of Technology	96	20	18	8		4		1	147
California State College at Hayward							2		2
Center for Advanced Study in the Behavioral Sciences				1	1				2
Claremont Graduate School		4							4
Fresno State College							1		1
Loma Linda University		1							1
Long Beach State College							1		1
San Diego State College							2		2
San Jose State College							1		1
Stanford University	151	48	37	8	3	23	3	1	274
University of California:									
Berkeley	199	60	18	14	2	19	2	1	315
Davis	2	2	3			2		1	10
San Diego	6	9		1					16
Los Angeles	20	17	16	3	4	3	2	1	66
Riverside	2	6	3			1			12
San Francisco			1						1
Santa Barbara		3	2						5
University of Southern California	3	13	4			2	7	1	30
University of the Pacific		3	2			1	1		7
Sub-total	479	186	104	35	10	55	22	6	897

State and institution	A	B	C	D	E	F	G	H	Total
COLORADO:									
Colorado School of Mines	1		2						3
Colorado State College							1		1
Coloraso State University	3		3			1	1		11
University of Colorado	10	7	10	2		7	10	1	47
University of Denver	1	1				1	1		4
Sub-total	15	11	15	2		9	13	1	66
CONNECTICUT:									
Connecticut College						1			1
University of Connecticut		6	7			3		1	17
Wesleyan University							2		2
Yale University	66	13	13	3		4	1		100
Sub-total	66	19	20	3		8	3	1	120
DELAWARE:									
University of Delaware		6	3				1	1	11
Sub-total		6	3				1	1	11
DISTRICT OF COLUMBIA:									
The American University			1						1
The Catholic University of America	3	9	3			3	4		22
The George Washington University		4	3				1	1	9
Georgetown University	1	4							5
Smithsonian Institution				1					1
U.S. Department of Defense						1			1
U.S. Department of Health, Education, and Welfare						2			2
Sub-total	4	17	7	1		6	5	1	41
FLORIDA:									
Florida State University	8	8	7			1	2	1	27
University of Florida	2	9	9	1		1	2	1	25
University of Miami	1	7	3			1	2		14
Sub-total	11	24	19	1		3	6	2	66
GEORGIA:									
Atlanta University							1		1
Emory University	2	2	3			1			8
Georgia Institute of Technology		8	8	1		2			19
University of Georgia	1	5	3			2	1		12
Sub-total	3	15	14	1		5	2		40
HAWAII:									
University of Hawai		1	3			1			5
Sub-total		1	3			1			5
IDAHO:									
University of Idaho		1	3						4
Sub-total		1	3						4
ILLINOIS:									
Illinois Institute of Technology		6	5				1		12
Loyola University		1							1
Northern Illinois University							2		2
Northwestern University	21	10	11			7	4	1	54
Southern Illinois University	1	5	4				1		11
University of Chicago	72	19	6	3		4	3	1	108
University of Illinois	48	55	27	2		4	3	1	140
Western Illinois University							1		1
Sub-total	142	96	53	5		15	15	3	329
INDIANA:									
Indiana University	10	11	7	3	1	2	3	1	38
Purdue University	21	28	12			9	5	1	76
University of Notre Dame	7	6	5				7	1	26
Sub-total	38	45	24	3	1	11	15	3	140

State and institution	A	B	C	D	E	F	G	H	Total
IOWA:									
Iowa State University of Science and Technology	10	10	11			9	2		42
State College of Iowa							1		1
University of Iowa	2	9	10			5	1		27
Sub-total	12	19	21			14	4		70
KANSAS:									
Kansas State Teachers College	1								1
Kansas State University of Agriculture and Applied Science	4	7	4			2	1	1	19
University of Kansas	6	7	5		1	1	1		21
Sub-total	11	14	9		1	3	2	1	41
KENTUCKY:									
University of Kentucky		6	3				1	1	11
University of Louisville		2	2			1			5
Sub-total		8	5			1	1	1	16
LOUISIANA:									
Louisiana State University and Agricultural and Mechanical College	1	7	4				3	1	16
Tulane University of Louisiana	3	6	3			3			15
University of Southwestern Louisiana							2		2
Sub-total	4	13	7			3	5	1	33
MAINE:									
Roscoe B. Jackson Memorial Laboratory					1				1
University of Maine		1							1
Sub-total		1			1				2
MARYLAND:									
Johns Hopkins University	23	13	3	1				1	41
University of Maryland	4	10	8			1	5	1	29
Sub-total	27	23	11	1		1	5	2	70
MASSACHUSETTS:									
Boston College		1							1
Boston University	1	5	5			1		1	13
Brandeis University	10	6	3	1		1			21
Clark University		1	3						4
Harvard University	227	20	12	11	2	4	1		277
Marine Biological Laboratory						2	1		3
Massachusetts Institute of Technology	198	63	22	5	1	8	1	1	299
Northeastern University	1	3					1		5
Smith College			2						2
Tufts University		1							1
University of Massachusetts	3	3	3				1		10
Woods Hole Oceanographic Institution				2			1		3
Worcester Polytechnic Institute		1				1			2
Sub-total	440	104	50	19	3	17	6	2	641
MICHIGAN:									
Michigan State University of Agriculture and Applied Science	7	17	15			10	3	1	53
University of Detroit							1		1
University of Michigan	47	34	18	3		3	7	1	113
Wayne State University	1	6	13					1	21
Western Michigan University							6		6
Sub-total	55	57	46	3		13	17	3	194
MINNESOTA:									
St. Mary's College							2		2
University of Minnesota	20	45	38	2		5	6	1	117
Sub-total	20	45	38	2		5	8	1	119
MISSISSIPPI:									
Mississippi State University		2	4			1			7
University of Mississippi		3	2				5		10
Sub-total		5	6			1	5		17

State and institution	A	B	C	D	E	F	G	H	Total
MISSOURI:									
Central Missouri State College							3		3
Missouri School of Mines and Metallurgy	1						1		2
St. Louis University		2	3			1	4		10
University of Missouri		9	14			1	2		26
Washington University	3	11	23	1		3	2		43
Sub-total	4	22	40	1		5	12		84
MONTANA:									
Montana State College	1	1							2
Montana State University		4	4				1		9
Sub-total	1	5	4				1		11
NEBRASKA:									
Creighton University							2		2
University of Nebraska	1	4	3	1		2			11
Sub-total	1	4	3	1		2	2		13
NEVADA:									
University of Nevada		3	2						5
Sub-total		3	2						5
NEW HAMPSHIRE:									
Dartmouth College		7	5						12
University of New Hampshire		1					1		2
Sub-total		8	5				1		14
NEW JERSEY:									
The Institute for Advanced Study				7	3				10
Montclair State College							1		1
Newark College of Engineering		2	4						6
Princeton University	133	13	18	5	1			1	171
Rutgers, The State University	2	9	4					1	16
Stevens Institute of Technology	6	4	4						14
Sub-total	141	28	30	12	4		1	2	218
NEW MEXICO:									
New Mexico Highlands University		1		1			2		4
New Mexico State University		8	3			1	2		14
University of New Mexico	1	2	3	1					7
Sub-total	1	11	6	2		1	4		25
NEW YORK:									
Adelphi College		1				1	3		5
American Museum of Natural History				2					2
Brookhaven National Laboratory					1				1
City College of New York							1		1
City University of New York		1	3						4
Clarkson College of Technology		1	7						8
Columbia University	55	32	18	5		3		1	114
Cornell University	43	25	6	3		8	4		89
Fordham University		2	2			1	5		10
Long Island University							1		1
New School for Social Research		2							2
New York University	20	40	9	3		6	2		80
Polytechnic Institute of Brooklyn	2	10	2				2		16
Public Health Research Institute of the City of New York				2					2
Rensselaer Polytechnic Institute	3	11	6			1	1	1	23
Rockefeller Institute				1	1				2
St. Bonaventure University		1	1				2		4
St. Johns University	1	2					3		6
State University College at Albany							1		1
State University College of Forestry at Syracuse		5	1			1			7
State University of New York at Buffalo	1	3	3	1		1			9
Syracuse University	5	6	7			3			21
Teachers College of Columbia University							2		2
University of Rochester	4	13	3			2			22
Yeshiva University	1	6		1					8
Sub-total	135	161	68	18	2	27	27	2	440

State and institution	A	B	C	D	E	F	G	H	Total
NORTH CAROLINA:									
Appalachian State Teachers College							1		1
Duke University	9	6	2	2		1		1	21
State College of Agriculture and Engineering	3	8	5			4		1	21
University of North Carolina	7	6	9			1		1	24
Sub-total	19	20	16	2		6	1	3	67
NORTH DAKOTA:									
North Dakota State University	1	3	5						9
University of North Dakota		6	3				1		10
Sub-total	1	9	8				1		19
OHIO:									
Case Institute of Technology	1	6	3			2			12
Kent State University			3				2		5
Ohio State University	10	27	9			6	4	1	57
Ohio University		1	3						4
University of Akron		2	2						4
University of Cincinnati	2	6	9			4	1		22
University of Toledo							1		1
Western Reserve University	5	6	3				2		16
Xavier University							2		2
Sub-total	18	48	32			12	12	1	123
OKLAHOMA:									
Oklahoma State University of Agriculture and Applied Science	1	7	6			11	3	1	29
University of Oklahoma	4	7	9			1	8	1	30
Sub-total	5	14	15			12	11	2	59
OREGON:									
Oregon State University	3	8	4			3	3		21
University of Oregon	5	6	3			1	3		18
Sub-total	8	14	7			4	6		39
PENNSYLVANIA:									
Bryn Mawr College	1	4	2						7
Carnegie Institute of Technology	8	15	8			1	1		33
Hahnemann Medical College and Hospital			3						3
Lehigh University	6	6	2			2	1	1	18
The Pennsylvania State University	10	16	8			7	9	1	51
Philadelphia College of Pharmacy and Science			1						1
Temple University		2				1	1		4
University of Pennsylvania	18	12	2	3		1	3	1	40
University of Pittsburgh	1	16	13			3		1	34
Villanova University							2		2
Sub-total	44	71	39	3		15	17	4	193
RHODE ISLAND:									
Brown University	11	6	4		1	2	5	1	30
University of Rhode Island			3				1		4
Sub-total	11	6	7		1	2	6	1	34
SOUTH CAROLINA:									
Clemson College		1	3						4
University of South Carolina	1	4	3				1		9
Sub-total	1	5	6				1		13
SOUTH DAKOTA:									
South Dakota State College of Agriculture and Mechanic Arts		1							1
State University of South Dakota		1	2				5		8
Sub-total		2	2				5		9
TENNESSEE:									
George Peabody College for Teachers			1				1		2
University of Tennessee	4	7	7			2		1	21
Vanderbilt University		7	13			1		1	22
Sub-total	4	14	21			3	1	2	45

State and institution	A	B	C	D	E	F	G	H	Total
TEXAS:									
Baylor University	1	1	1	-----	-----	2	-----	-----	5
East Texas State College	-----	-----	-----	-----	-----	-----	1	-----	1
North Texas State University	-----	-----	-----	-----	-----	-----	1	-----	1
William Marsh Rice University	6	4	3	1	-----	-----	-----	1	15
Southern Methodist University	-----	-----	3	-----	-----	-----	-----	-----	3
Texas Agricultural and Mechanical University	-----	4	5	-----	-----	3	-----	-----	12
Texas Christian University	-----	3	8	-----	-----	-----	-----	-----	11
Texas Technological College	-----	1	1	-----	-----	-----	2	-----	4
Trinity University	-----	-----	-----	-----	-----	-----	1	-----	1
University of Houston	1	1	-----	-----	-----	-----	-----	-----	2
University of Texas	6	12	9	-----	-----	6	6	1	40
Sub-total	14	26	30	1	-----	11	11	2	95
UTAH:									
Brigham Young University	1	4	6	-----	-----	1	-----	-----	12
University of Utah	2	6	11	-----	-----	2	1	1	23
Utah State University of Agriculture and Applied Science	-----	4	-----	-----	-----	-----	-----	-----	4
Sub-total	3	14	17	-----	-----	3	1	1	39
VERMONT:									
University of Vermont and State Agricultural College	-----	-----	-----	1	-----	-----	-----	-----	1
Sub-total	-----	-----	-----	1	-----	-----	-----	-----	1
VIRGINIA:									
University of Virginia	2	8	1	-----	-----	-----	3	-----	14
Virginia Polytechnic Institute	-----	6	3	-----	-----	-----	-----	-----	9
Sub-total	2	14	4	-----	-----	-----	3	-----	23
WASHINGTON:									
Pacific Lutheran University	-----	-----	-----	-----	-----	-----	1	-----	1
Seattle University	-----	-----	-----	-----	-----	-----	1	-----	1
University of Washington	19	24	15	-----	-----	6	4	1	69
Washington State University	1	6	10	-----	-----	-----	1	1	19
Sub-total	20	30	25	-----	-----	6	7	2	90
WEST VIRGINIA:									
West Virginia University	1	2	2	-----	-----	2	1	-----	8
Sub-total	1	2	2	-----	-----	2	1	-----	8
WISCONSIN:									
The Institute of Paper Chemistry	-----	2	-----	-----	-----	-----	-----	-----	2
Marquette University	2	2	-----	-----	-----	-----	1	-----	5
University of Wisconsin	64	37	32	4	-----	8	10	1	156
Sub-total	66	41	32	4	-----	8	11	1	163
WYOMING:									
University of Wyoming	-----	3	9	-----	-----	-----	4	-----	16
Sub-total	-----	3	9	-----	-----	-----	4	-----	16
Total	1,833	1,300	906	121	23	294	288	53	4,818

Foreign Institutions Chosen by Fellowship Awardees—Fiscal Year 1963

[Key to table: A, Graduate;
D, Postdoctoral;
E, Senior Postdoctoral; and
F, Science Faculty.]

	A	D	E	F	Total
ARGENTINA:					
University of Buenos Aires		1			1
Sub-total		1			1
AUSTRALIA:					
Australian National University	1				1
Commonwealth Scientific and Industrial Research Organization		1	2		3
University of Melbourne		1			1
University of New England			1		1
University of Queensland		1			1
University of Sydney			1		1
Sub-total	1	3	4		8
AUSTRIA:					
University of Technology			1		1
Sub-total			1		1
BELGIUM:					
Center for Study of Nuclear Energy				1	1
Free University of Brussels		1	1		2
Sub-total		1	1	1	3
BRAZIL:					
University of Sao Paulo			1		1
Sub-total			1		1
CANADA:					
McGill University	6	4			10
University of Alberta	2				2
University of British Columbia	1			1	2
Sub-total	9	4		1	14
CHILE:					
University of Chile			1		1
Sub-total			1		1
DENMARK:					
Carlsberg Foundation			1		1
Copenhagen University		4	2		6
Nordic Institute for Theoretical Physics		1			1
The Royal Veterinary and Agricultural College		1			1
Technical University of Denmark		1	1		2
Sub-total		7	4		11
EAST AFRICA:					
Makerere College		1			1
Sub-total		1			1
FINLAND:					
University of Helsinki				1	1
Sub-total				1	1
FRANCE:					
National Center of Scientific Research (CNRS)		2	3		5
Higher Normal School		1			1
Museum of Ethnology and Anthropology		1			1
Pasteur Institute		1	2		3
Polytechnic School				1	1
Saclay Nuclear Research Center		3	1		4
University of Paris		5	5		10
Sub-total		13	11	1	25

Foreign Institutions Chosen by Fellowship Awardees—Fiscal Year 1963— Continued

	A	D	E	F	Total
GERMANY:					
Albert Ludwig University at Freiburg	1				1
Baden Institute of Technology	1				1
Eberhard Karls University		2		1	3
Forest Research Institute		1			1
Free University of Berlin	1				1
George August University of Gottingen		1			1
Johann Wolfgang Goethe University at Frankfurt	1				1
Ludwig Maximilian University at Munich		3			3
Max Planck Institutes		3	4	2	9
Rhenish Frederick William University of Bonn		1			1
Ruprecht Karl University		1			1
Technical Institute at Hanover		1			1
Technical Institute at Stuttgart				1	1
University of Cologne			1		1
Sub-total	4	14	5	4	27
INDIA:					
University of Poona				1	1
Sub-total				1	1
ISRAEL:					
The Hebrew University	1	1			2
Weizmann Institute of Science		3	1		4
Sub-total	1	4	1		6
ITALY:					
Higher Institute of Health			1		1
Polytechnic Institute of Turin			1		1
University of Padua		1			1
University of Rome		1	3	1	5
Sub-total		2	5	1	8
JAPAN:					
Kyoto University		1		1	2
University of Tokyo				1	1
Sub-total		1		2	3
LEBANON:					
American University of Beirut	1				1
Sub-total	1				1
MEXICO:					
Indigenous Art Institute			1		1
Mexico City College				1	1
Sub-total			1	1	2
THE NETHERLANDS:					
Netherlands School of Economics	1	1	2		4
State University of Groningen				1	1
State University of Leiden	1	1		1	3
Technological University of Delft		1			1
Sub-total	2	3	2	2	9
NEW ZEALAND:					
University of Auckland	1				1
University of Canterbury	1				1
Victoria University of Wellington			1		1
Sub-total	2		1		3
NORWAY:					
Technical University of Norway				1	1
University of Oslo		1			1
Sub-total		1		1	2

Foreign Institutions Chosen by Fellowship Awardees—Fiscal Year 1963—Continued

	A	D	E	F	Total
SWEDEN:					
Caroline Hospital		1			1
Royal Caroline Medico-Surgical Institute		2			2
Royal Institute of Technology				2	2
Royal University of Uppsala		4			4
University of Lund		1			1
University of Stockholm	1		2	1	4
Sub-total	1	8	2	3	14
SWITZERLAND:					
European Council for Nuclear Research		4	3		7
Swiss Federal Institute of Technology		2	1		3
University of Basel		1			1
University of Bern		2	1		3
University of Geneva			2		2
Sub-total		9	7		16
UNITED KINGDOM:					
Atomic Energy Research Establishment		4		1	5
British Museum of Natural History		1			1
Cambridge University	10	19	7	2	38
Cement and Concrete Association, Laboratories				1	1
Institute of Animal Physiology, Agricultural Research Council		1			1
Marine Biological Association of the United Kingdom		1			1
Medical Research Council		1			1
Oxford University	2	4	5	1	12
Queens University of Belfast		1			1
University College of Wales		1			1
University of Aberdeen			1		1
University of Birmingham	1	1			2
University of Bristol		3			3
University of Durham		1	1		2
University of East Anglia			1		1
University of Edinburgh		2			2
The University of Hull		1			1
University of Leeds	1				1
University of London	11	11	9	5	36
University of Nottingham			1		1
University of Southampton				1	1
Victoria University of Manchester	1			1	2
Sub-total	26	52	25	115	112
Total	47	124	72	31	274

Present or Most Recent Institutional Affiliation of Individuals Offered Science Faculty, Senior Postdoctoral, and Postdoctoral Fellowships for Fiscal Year 1963

	Science faculty	Senior post-doctoral	Post-doctoral
ALABAMA:			
Auburn University	2		
Howard College	1		
Livingston State College	1		
Tuskegee Institute	1		
University of Alabama	1		
ALASKA:			
University of Alaska	1		
ARKANSAS:			
University of Arkansas	4		1
ARIZONA:			
Arizona State University	2		
University of Arizona	1	1	
CALIFORNIA:			
Bakersfield College	2		
California Institute of Technology		2	5
California State Polytechnic College	1		
Chabot College	1		
Chico State College	1		
Contra Costa College	1		
El Camino College	1		
Foothill College	1		
Fullerton Junior College	1		
Harvey Mudd College	1		
La Verne College	1		
Los Angeles Pierce College	1		
Los Angeles Valley College	1		
Mills College	1		
Monterey Peninsula College	2		
Pasadena City College	1		
Sacramento State College	2		
San Bernardino Valley College	1		
San Fernando Valley State College	1		
San Jose State College	3		
Stanford University		4	8
Stockton College	1		
U.S. Naval Postgraduate School	1		
University of California, Berkeley		7	23
University of California, Davis		2	3
University of California, Los Angeles		1	7
University of California, Riverside		1	
University of California, San Diego			2
University of California, Santa Barbara	1		
University of Redlands	1		
University of Southern California	1		
Westmont College	1		
COLORADO:			
Colorado College	1		
Colorado State University	1		
University of Colorado	3		3
CONNECTICUT:			
Connecticut Agricultural Experiment Station		1	
University of Connecticut	2	1	
Wesleyan University	1		
Yale University			6
DELAWARE:			
University of Delaware	1		1
DISTRICT OF COLUMBIA:			
Department of Commerce		1	
George Washington University	1		
Howard University	3		
FLORIDA:			
Chipola Junior College	1		
Florida Presbyterian College	1		
Florida State University		1	1
University of Florida		1	
University of Miami	1		
GEORGIA:			
Berry College	1		
Clark College	1		
Columbus College	1		
Emory University			1
Georgia Institute of Technology	2		
University of Georgia	1		2
HAWAII:			
University of Hawaii	1		

Present or Most Recent Institutional Affiliation of Individuals Offered Science Faculty, Senior Postdoctoral, and Postdoctoral Fellowships for Fiscal Year 1963—Continued

	Science faculty	Senior post-doctoral	Post-doctoral
ILLINOIS:			
Augustana College	1		
Chicago City Junior College, Wright Branch	1		
Illinois Institute of Technology		3	1
Monmouth College	1		
Northern Illinois University	1		
Northwestern University		2	2
Roosevelt University	1		
Shimer College	1		
University of Chicago		3	8
University of Illinois	3	3	10
Western Illinois University	1		
INDIANA:			
Ball State Teachers College	2		
DePauw University	1		
Goshen College	1		
Indiana University		1	5
Purdue University	2	4	4
Rose Polytechnic Institute	1		
University of Notre Dame	2		1
IOWA:			
Central College	1		
Clarke College	1		
Grinnell College	1		
Iowa State University of Science and Technology	2		1
Marycrest College	1		
State College of Iowa	1		
University of Iowa			3
KANSAS:			
Bethel College	1		
Kansas State University of Agriculture and Applied Science	4		
University of Kansas	2	1	
University of Wichita	2		
KENTUCKY:			
Murray State College	1		
University of Kentucky	1		
University of Louisville	2		
Villa Madonna College	1		
LOUISIANA:			
Grambling College	1		
International Business Machines Corporation	1		
Louisiana State University	3		1
Newcomb College	1		
Northwestern State College of Louisiana	1		
Tulane University of Louisiana	1	1	1
MAINE:			
Gorham State Teachers College	1		
Nasson College	1		
MARYLAND:			
Johns Hopkins University		3	1
U.S. Naval Academy	2		
University of Maryland		2	3
MASSACHUSETTS:			
Amherst College	1		
Boston City Hospital			1
Boston College	1		
Brandeis University		2	1
College of the Holy Cross	1		
Harvard University		1	22
Massachusetts Institute of Technology		1	11
Merrimac College	1		
Northeastern University	1		
Tufts University			1
University of Massachusetts	2		
Western New England College	1		
Worcester Polytechnic Institute	2		
MICHIGAN:			
General Motors Institute	2		
Jackson Junior College	1		
Michigan College of Mining and Technology	1		
Michigan State University of Agriculture and Applied Science	3		
University of Detroit	1		
University of Michigan	2	2	9
Wayne State University	1	1	1
Western Michigan University	3		

Present or Most Recent Institutional Affiliation of Individuals Offered Science Faculty, Senior Postdoctoral, and Postdoctoral Fellowships for Fiscal Year 1963—Continued

	Science faculty	Senior post-doctoral	Post-doctoral
MINNESOTA:			
Carleton College	1	-----	-----
Hamline University	1	-----	-----
St. Olaf College	1	-----	-----
University of Minnesota, Duluth	2	-----	-----
University of Minnesota, Minneapolis	1	1	9
MISSISSIPPI:			
University of Mississippi	1	-----	-----
MISSOURI:			
Lincoln University	1	-----	-----
Missouri School of Mines and Metallurgy	2	-----	-----
Stevens College	1	-----	-----
University of Missouri	4	-----	-----
Washington University	-----	2	-----
MONTANA:			
Montana State University	1	-----	-----
NEBRASKA:			
Creighton University	1	-----	-----
Nebraska State Teachers College, Chadron	1	-----	-----
Nebraska State Teachers College, Kearney	1	-----	-----
University of Nebraska	-----	-----	2
NEVADA:			
University of Nevada	2	-----	-----
NEW HAMPSHIRE:			
Dartmouth College	2	-----	-----
University of New Hampshire	2	-----	-----
NEW JERSEY:			
Drew University	1	-----	-----
Newark College of Engineering	1	-----	-----
Princeton University	1	2	10
Stevens Institute of Technology	-----	-----	1
NEW MEXICO:			
College of St. Joseph in the Rio Grande	1	-----	-----
New Mexico Highlands University	1	-----	-----
New Mexico State University	-----	1	1
University of New Mexico	1	-----	1
NEW YORK:			
American Museum of Natural History	-----	-----	1
Brookhaven National Laboratory	-----	2	-----
Broome Technical Community College	1	-----	-----
City University of New York:			
Brooklyn College	1	-----	-----
City College	2	-----	-----
Hunter College	2	-----	-----
Queens College	1	-----	-----
Clarkson College of Technology	3	-----	-----
Columbia University	-----	4	9
Cornell University	2	2	7
Erie County Technical Institute	1	-----	-----
Fordham University	1	-----	-----
Hofstra College	1	-----	-----
Manhattan College	2	-----	-----
Mt. Sinai Hospital	-----	-----	1
New York Medical College	-----	-----	1
New York University	1	3	2
Polytechnic Institute of Brooklyn	3	-----	-----
Rensselaer Polytechnic Institute	-----	-----	1
Rochester Institute of Technology	1	-----	-----
Rockefeller Institute	-----	-----	5
St. Lawrence University	1	-----	-----
State University of New York:			
Agricultural and Technical Institute at Farmingdale	1	-----	-----
College at Albany	1	-----	-----
College at Brockport	1	-----	-----
College at Cortland	1	-----	-----
College at Geneseo	1	-----	-----
College of Forestry at Syracuse University	1	1	-----
Long Island Center, Stony Brook	1	-----	-----
University at Buffalo	-----	1	-----
Syracuse University	1	-----	-----
U.S. Merchant Marine Academy	1	-----	-----
University of Rochester	-----	2	4
NORTH CAROLINA:			
Duke University	2	-----	1
Elon College	1	-----	-----
Johnson C. Smith University	1	-----	-----
State College of Agriculture and Engineering	2	-----	1
University of North Carolina	1	1	1
Wake Forest College	1	-----	-----

Present or Most Recent Institutional Affiliation of Individuals Offered Science Faculty, Senior Postdoctoral, and Postdoctoral Fellowships for Fiscal Year 1963—Continued

	Science faculty	Senior post-doctoral	Post-doctoral
NORTH DAKOTA:			
North Dakota State University	2		
State Teachers College, Minot	1		
University of North Dakota	1		
OHIO:			
Antioch College	1		
Ashland College	1		
Case Institute of Technology		1	
College of Wooster	1		
Denison University	1		
Hiram College	1		
Miami University	1		
Oberlin College	1		
Ohio State University	2	2	2
University of Cincinnati	2	1	
University of Dayton	1		
Western Reserve University		2	
OKLAHOMA:			
Northeastern State College	1		
Oklahoma State University of Agriculture and Applied Science	2		
Southeastern State College	1		
University of Oklahoma			1
University of Tulsa	1		
OREGON:			
Lewis and Clark College	2		
Oregon State University	3	1	1
Reed College	3	1	
University of Oregon			1
PENNSYLVANIA:			
California State College	2		
Carnegie Institute of Technology	1	1	5
Drexel Institute of Technology	2		
Haverford College	1		
Lafayette College	2		
Lehigh University	2		
The Pennsylvania State University	3	2	2
St. Francis College	1		
Swarthmore College	1		
Temple University	1		
University of Pennsylvania	1		4
University of Pittsburgh	1		1
Villanova University	1		
RHODE ISLAND:			
Brown University		1	2
University of Rhode Island	2		
SOUTH CAROLINA:			
Clemson Agricultural College	3		
SOUTH DAKOTA:			
Augustana College	1		
Dakota Wesleyan University	1		
South Dakota State College of Agriculture and Mechanic Arts	2		
State University of South Dakota	1		
TENNESSEE:			
Austin-Peay State College	1		
Christian Brothers College	1		
Fisk University	1		
Oak Ridge National Laboratory		1	
University of Tennessee	2		
Vanderbilt University			1
TEXAS:			
Agricultural and Mechanical College of Texas	2	1	
Lamar State College of Technology	3		
Midwestern University	1		
Prairie View Agricultural and Mechanical College	1		
Rice University	1		
St. Mary's University of San Antonio	1		
Sam Houston State Teachers College	1		
Texas Technological College	1		
University of Houston		1	
University of Texas	1		2
West Texas State College	1		
UTAH:			
Brigham Young University	2		
Utah State University of Agriculture and Applied Science	3		
Westminster College	1		
VERMONT:			
Trinity College	1		
University of Vermont and State Agricultural College			1

Present or Most Recent Institutional Affiliation of Individuals Offered Science Faculty, Senior Postdoctoral, and Postdoctoral Fellowships for Fiscal Year 1963—Continued

	Science faculty	Senior post-doctoral	Post-doctoral
VIRGINIA:			
Bridgewater College	1		
College of William and Mary	1		
Hampton Institute	1		
University of Virginia	1	1	1
WASHINGTON:			
Everett Junior College	1		
Gonzaga University	1		
Seattle Pacific College	1		
Seattle University	3		
University of Washington		2	4
Washington State University	3		
Whitman College	1		
WEST VIRGINIA:			
Marshall University	1		
West Virginia State College	1		
WISCONSIN:			
AC Spark Plug Division, General Motors Corporation	1		
Marquette University	1	1	
Milwaukee-Downer College	1		
University of Wisconsin	4	1	3
Wisconsin State College, La Crosse	1		
WYOMING:			
University of Wyoming	3		
PUERTO RICO:			
Catholic University of Puerto Rico	1		
ENGLAND:			
Cambridge University			1
University of London			1
FRANCE:			
National Center of Scientific Research			1
University of Paris			1
SPAIN:			
University of Seville			1
SWEDEN:			
Royal Carolina Medico-surgical Institute			1
Total	325	95	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 two patents by the U.S. Patent Office covering inventions arising out of Foundation-supported activities.

1. Patent No. 3,085,120 entitled "Preparation of Allylic Metal Compounds" was issued on April 9, 1963, to Dietmar Seyferth and Michael A. Weiner on an invention made during the course of research supported by a grant to the Massachusetts Institute of Technology. It relates to a high-yield process for preparing allylic metal compounds in a high state of purity.

2. Patent No. 3,091,647 entitled "Process for the Preparation of Alkylene Glycols" was issued on May 28, 1963, to Gene E. Hamilton, Arthur B. Metzner and John E. Ehrreich on an invention made during the course of research supported by a grant to the University of Delaware. It relates specifically to the conversion of ethylene oxide to ethylene glycol.

APPENDIX G

National Science Foundation-Sponsored Scientific Conferences, Symposia, and Advanced Science Seminars Held During Fiscal Year 1963

SCIENTIFIC CONFERENCES AND SYMPOSIA IN THE BIOLOGICAL AND MEDICAL SCIENCES

Symposium on Heterosynthetic and Autosynthetic Molecules in Developmental Processes—Philadelphia, Pa.; Dec. 26–30, 1962; Chairman: Edgar Zwilling, Biology Department, Brandeis University; Cosponsors: American Society of Zoologists, American Association for the Advancement of Science.

Conference on Comparative Developmental Behavior—New York, N.Y.; Jan.–June, 1963 (Biweekly); Chairman: Frances H. Palmer, Social Science Research Council; Cosponsor: Social Science Research Council.

Conference on Body Composition—New York, N.Y.; Jan. 28–Feb. 2, 1963; Chairman: Joseph Brozek, Lehigh University; Cosponsors: New York Academy of Sciences and National Institutes of Health.

Symposium on Prospect for Experimental Control of Human Behavior—Delaware, Ohio; April 6, 1963; Chairman: Elwood B. Shirling, Department of Botany and Bacteriology, Ohio Wesleyan University.

Microcirculatory Conference—Bethesda, Md.; April 7–9, 1963; Chairman: Herbert J. Berman, Department of Biology, Boston University; Cosponsors: National Institutes of Health, Royal Microscopic Society.

International Conference on Some Biochemical and Immunological Aspects of Host-Parasite Relationships—New York, N.Y.; April 23–25; 1963; Chairman: Thomas G. Cheng, Department of Biology, Lafayette College; Cosponsor: New York Academy of Sciences.

Conference on Biological Coding by Macromolecules—Montreal, Canada; April 30–May 2, 1963; Chairman: Martyn Ycas, Department of Microbiology, State University of New York; Cosponsor: State University of New York.

International Conference on Histone Biology and Chemistry—San Diego, Calif.; April 29–May 2, 1963; Chairmen: James Bonner, California Institute of Technology and Paul O. P. Ts'o, Johns Hopkins University; Cosponsors: Office of Naval Research, California Institute of Technology, and H. Kirke Macomber.

Symposium on Growth—Cleveland, Ohio; May 5–9, 1963; Chairman: J. L. Stokes, American Society of Microbiology; Cosponsor: American Society of Microbiology.

Conference on the Basic Mechanisms in the Radiation Chemistry of Aqueous Media—Gatlinburg, Tenn.; May 8–10, 1963; Chairmen: Edwin J. Hart, Argonne National Laboratory and Ernest Pollard, Pennsylvania State University; Cosponsors: Atomic Energy Commission, National Academy of Sciences—National Research Council.

Conference on Cellular Control of DNA Biosynthesis—Aspen, Colo.; May 30–June 1, 1963; Chairman: Rollin Hotchkiss, Rockefeller Institute; Cosponsor: St. Louis University.

Conference on Synthesis and Structure of Macromolecules and First Meeting of the Commission on Molecular Biophysics of the International Organization for Pure and Applied Biophysics—Cold Spring Harbor, N.Y.; June 7–13, 1963; Chairman: H. Edwin Umbatger, Director, Cold Spring Harbor Laboratory; Cosponsors: National Institutes of Health, National Aeronautics and

Space Administration, Office of Naval Research, Atomic Energy Commission, Air Force Office of Scientific Research, Long Island Biological Association.

CONFERENCE ON LEARNED AND NONLEARNED BEHAVIOR IN IMMATURE ORGANISMS—Madison, Wis.; June 9–14, 1963; Chairman: Harold W. Stevenson, Institute of Child Development, University of Minnesota; Cosponsor: Social Science Research Council.

SEMICENTENNIAL MEETING OF THE AMERICAN SOCIETY OF OCHTHYOLOGISTS AND HERPETOLOGISTS—Vancouver, B.C.; June 17–22; Chairman: Carl L. Hubbs, Scripps Institution of Oceanography, University of California, La Jolla; Cosponsor: University of British Columbia.

GORDON RESEARCH CONFERENCE ON NUCLEIC ACIDS—New Hampton, N.H.; June 17–21, 1963; Chairman: Heinz Frankel-Conrat, Virus Laboratory, University of California, Berkeley; Cosponsor: Gordon Research Conferences, Inc.

GORDON RESEARCH CONFERENCE ON CELL STRUCTURE AND METABOLISM—Meriden, N.H.; June 17–21, 1963; Chairman: Alexander Leaf, Harvard Medical School, Cambridge, Mass.; Cosponsor: Gordon Research Conferences, Inc.

GORDON RESEARCH CONFERENCE ON PROTEINS—New Hampton, N.H.; June 24–28, 1963; Chairman: Harold Scheraga, Department of Chemistry, Cornell University; Cosponsor: Gordon Research Conferences, Inc.

SCIENTIFIC CONFERENCES AND SYMPOSIA IN THE MATHEMATICAL, PHYSICAL, AND ENGINEERING SCIENCES

INTERNATIONAL CONGRESS ON GLASS—Washington, D.C.; July 8–14, 1962; Chairmen: C. H. Hahner, National Bureau of Standards and J. H. Koenig, School of Ceramics, Rutgers University; Cosponsors: The International Commission on Glass and the American Ceramic Society.

CONFERENCE ON DYNAMICAL SYSTEMS—Copenhagen, Denmark; July 15–August 19, 1962; Chairman: Shlomo Sternberg, Harvard University; Cosponsor: Research Institute for Advanced Studies.

THIRD INTERNATIONAL SYMPOSIUM ON X-RAY MICROANALYSIS—Stanford, Calif.; August 22–24, 1962; Chairman: Howard H. Pattee, W. W. Hansen Laboratories of Physics, Stanford University; Cosponsor: Stanford University.

SYMPOSIUM ON ASTROMETERY—New Haven, Conn.; August 26–29, 1962; Chairman: Dirk Brouwer, Yale University Observatory; Cosponsor: American Astronomical Society.

NINTH INTERNATIONAL COMBUSTION SYMPOSIUM—Ithaca, N.Y.; August 27–September 1, 1962; Chairman: Bernard Lewis, President, The Combustion Institute, Pittsburgh, Pennsylvania; Cosponsors: U.S. Army Research Office, National Aeronautics and Space Administration, and The Combustion Institute.

CONFERENCE ON DUST EXPLOSIONS—University Park, Pa.; Sept. 4–5, 1962; Chairman: M. W. Thring, University of Sheffield, England; Cosponsor: Pennsylvania State University, College of Mineral Industries.

CONFERENCE ON FLUID DYNAMICS IN GEOPHYSICS—Boulder, Colo.; September 5–8, 1962; Chairman: Walter Orr Roberts, National Center for Atmospheric Research; Cosponsors: American Meteorological Society, American Physical Society, and the American Institute of Physics.

WORKING CONFERENCE IN PERU ON EQUATORIAL AERONOMY—Huaychulo, Peru; September 18–26, 1962; Chairman: Merle A. Tuve, Department of Terrestial Magnetism, Carnegie Institution of Washington; Cosponsors: Instiuto Geofisico del Peru; Carnegie Institution of Washington; Peruvian Government, Central Radio Propogation Laboratories, and Air Force Cambridge Research Laboratories.

WORLD CONFERENCE ON SHELL STRUCTURES—San Francisco, Calif.; October 1–4, 1962; Chairman: Egor Popov, Department of Civil Engineering, University of California, Berkeley; Cosponsors: National Academy of Science—National Research Council, International Association for Shell Structures, and the University of California.

Eastern Conference on Theoretical Physics—Charlottesville, Va.; October 26–27, 1962; Chairman: Morris E. Rose, Department of Physics, University of Virginia; Cosponsor: University of Virginia.

International Conference on Saline Deposits—Grand Junction, Colo. and Houston, Tex.; November 2–23, 1962; Chairman: Ralph E. Taylor, Humble Oil and Refining Company; Cosponsors: National Academy of Sciences—National Research Council, American Geological Institute, Atomic Energy Commission, and the Advanced Research Projects Agency.

Conference on Photon Interactions in the BeV-Energy Range—Cambridge, Mass.; January 25–30, 1963; Chairman: Bernard T. Feld, Laboratory for Nuclear Science, Massachusetts Institute of Technology; Cosponsors: Massachusetts Institute of Technology, Atomic Energy Commission, and Office of Naval Research.

Engineering for Major Scientific Programs—Atlanta, Ga.; February 5–6, 1963; Chairman: M. W. Long, Engineering Experiment Station, Georgia Institute of Technology; Cosponsor: Georgia Institute of Technology.

Conference on Balanced Research in Mineral Deposits—Dallas, Tex.; February 23–28, 1963; Chairman: L. C. Graton, Professor Emeritus of Harvard; Cosponsor: Southern Methodist University.

International Symposium on Unit Processes in Hydrometallurgy—Dallas, Tex.; February 24–28, 1963; Chairmen: Milton E. Wadsworth, University of Utah and Franklin T. Davis, Metallurgical Division, Colorado School of Mines; Cosponsor: Metallurgical Society of the American Institute of Mining, Metallurgical and Petroleum Engineers.

Conference on Complex Manifolds and Several Complex Variables—Notre Dame, Ind.; March 2–10, 1963; Chairman: Wilhelm Stoll, Department of Mathematics, University of Notre Dame; Cosponsor: University of Notre Dame.

Second International Congress on Metallic Corrosion—New York, N.Y.; March 11–15, 1963; Chairman: E. C. Greco, United Gas Corporation; Cosponsor: National Association of Corrosion Engineers.

Conference on Deformation Twinning—Gainesville, Fla.; March 21–22, 1963; Chairman: Robert E. Reed-Hill, University of Florida; Cosponsors: University of Florida and The Metallurgical Society of the American Institute of Mining, Metallurgical and Petroleum Engineers.

Symposium on Stress Waves in Anelastic Solids—Providence, R.I.; April 3–5, 1963; Chairman: H. Kolsky, Division of Applied Mathematics, Brown University; Cosponsor: The International Union of Theoretical and Applied Mathematics.

Oceanic Biogeochemistry Symposium—Bedford Institute of Oceanography, Halifax, Nova Scotia; April 5–6, 1963; Chairman: Fritz Koczy, Institute of Marine Science, University of Miami; Cosponsors: Scientific Committee on Oceanographic Research of the International Council of Scientific Unions, Committee on Oceanography, National Academy of Sciences—National Research Council.

Symposium on Electrochemical Effects on the Mechanical Properties of Metals—Pittsburgh, Pa.; April 14–18, 1963; Chairman: Robert K. Shannon, The Electrochemical Society, Inc.; Cosponsor: The Electrochemical Society, Inc.

International Conference on Nonlinear Magnetics—Washington, D.C.; April 17–19, 1963; Chairman: J. J. Suozzi, Bell Telephone Laboratories; Cosponsors: Institute of Radio Engineers and the American Institute of Electrical Engineers.

Symposium on Astronomical Instrumentation—Tucson, Ariz.; April 17–20, 1963; Chairman: A. B. Meinel, Department of Astronomy, University of Arizona.

Conference on Instrument Techniques in Nuclear Pulse Analysis—Monterey, Calif.; April 29–May 3, 1963; Chairman: F. S. Goulding, Lawrence Radiation Laboratory; Cosponsors: National Academy of Sciences—National Research Council and Atomic Energy Commission.

Conference on Computer Utilization in Geology and Geography—Washington, D.C., May 11, 1963; Chairmen: Edward B. Espenshade, Jr. and William T. Pecora; Cosponsors: Office of Naval Research; Division of Earth Sciences, National Academy of Sciences—National Research Council.

Midwest Conference on Theoretical Physics—Notre Dame, Ind.; May 31–June 1, 1963; Chairman: Charles J. Mullin, Department of Physics, University of Notre Dame; Cosponsor: University of Notre Dame.

Third Conference on Hurricanes and Tropical Meteorology—Mexico City, Mexico; June 6–12, 1963; Chairman: M. A. Alaka; Cosponsors: The Mexican Geophysical Union, the American Geophysical Union, and the American Meteorological Society.

State of Stress in the Earth's Crust—Santa Monica, Calif.; June 13–14, 1963; Chairman: W. R. Judd, RAND Corporation; Cosponsors: Committee on Rock Mechanics, Engineering Geology Division, Geological Society of America and the RAND Corporation.

Sixth Biennial Conference on Carbon—Pittsburgh, Pa.; June 17–21, 1963; Chairman: S. Ergun, Bureau of Mines; Cosponsors: U.S. Bureau of Mines, The American Carbon Committee and Office of Naval Research.

Conferences To Advance the Science of Hydrology—Monticello, Ill.; June 24–28, 1963; Chairman: William C. Achermann, Section of Hydrology, American Geophysical Union; Cosponsors: American Geophysical Union, National Academy of Sciences—National Research Council.

International Symposium on the Theory of Models—Berkeley, Calif.; June 25–July 11, 1963; Chairmen: Leon Henkin, Association for Symbolic Logic and Alfred Tarski, Department of Mathematics, University of California, Berkeley; Cosponsors: The Association for Symbolic Logic, The International Union of History and Philosophy of Science, and the National Academy of Sciences—National Research Council.

ADVANCED SCIENCE SEMINARS

Nonlinear Problems of Continuum Mechanics—University of Delaware, Newark, Del.; June 19–21, 1963; Director: W. F. Ames.

Field School in Ethnology and Linguistics—University of Oklahoma, Norman, Okla.; June 4–July 28, 1963; Director: William E. Bittle.

Recent Advances in Clay Mineralogy—Pennsylvania State University, University Park, Pa.; July 30–August 10, 1962; Director: G. W. Brindley.

Institute for Theoretical Physics—University of Colorado, Boulder, Colo.; June 16–August 24, 1963; Director: W. E. Brittin.

Seminar for Graduate Students in Topology—Brandeis University, Waltham, Mass.; June 24–August 19, 1963; Director: E. H. Brown.

Institute in Marine Science—Bermuda Biological Station; St. George's West, Bermuda; August 1–September 8, 1962; Director: K. E. Chave.

Marine Paleoecology—Lehigh University, Bethlehem, Pa.; May 6–9, 1963; Director: K. E. Chave.

Conference on Lunar Exploration—Virginia Polytechnic Institute, Blacksburg, Va.; August 13–17, 1962; Director: J. B. Eades, Jr.

Field School in Ethnography on Nez Perce Indian Reservation—Washington State University, Pullman, Wash.; June 17–August 11, 1963; Director: E. Elmendorf.

Theoretical Physics—Brandeis University, Waltham, Mass.; June 11–July 23, 1963; Director: K. W. Ford.

Seminar for Graduate Students in Mathematical Analysis—Northwestern University, Evanston, Ill.; June 17–August 9, 1963; Director: R. R. Goldberg.

Field Methods for Systematic Vertebrate Zoologists and Paleontologists—University of Kansas, Lawrence, Kans.; June 8–July 28, 1963; Director: E. R. Hall.

Advanced Courses in Anthropology for Science Museum Personnel—American Association of Museums, Washington, D.C.; June 15–July 27, 1963; Director: E. W. Haury.

Forest Genetics Workshop—Southern Forest Tree Improvement Committee, Savannah, Ga.; October 25–27, 1962; Director: J. W. Johnson.

Seminar for Graduate Students in Algebra—Pennsylvania State University, University Park, Pa.; June 24–August 19, 1963; Director: D. G. Johnson.

Institute in Observational Astronomy—Harvard College Observatory, Cambridge, Mass.; July 1–September 15, 1962; Director: William Liller.

Winter Institutes in Quantum Chemistry and Solid-State Physics—University of Florida, Gainesville, Fla.; December 10–January 19, 1963; Director: Per-Olov Lowdin.

Graduate Summer Courses in Nematology—Cornell University, Ithaca, N.Y.; July 1–August 3, 1962; Director: W. F. Mai.

Field Program in Anthropology—Brandeis University, Waltham, Mass.; June 15–September 15, 1963; Director: R. Manners.

Special Summer Session on Mathematical Methods in Biology—North Carolina State College, Raleigh, N.C.; June 10–July 19, 1963; Director: F. E. McVay.

Computer Programming for College Teachers—Agricultural and Mechanical College of Texas, College Station, Tex.; July 16–August 24, 1962; Director: B. C. Moore.

Symposium on Lubrication and Wear—University of Houston, Houston, Tex.; June 10–28, 1963; Director: D. Muster.

Symposium on Molecular Structure and Spectroscopy—Ohio State University Research Foundation, Columbus, Ohio; June 10–14, 1963; Director: H. Nielsen.

Seminar in Marine Science—University of Texas, Austin, Tex.; June 15–August 15, 1963; Director: Howard Odum.

Computers in Engineering Education—University of Houston, Houston, Tex.; June 10–August 2, 1963; Director: E. I. Organick.

Simulation of Cognitive Processes—Social Sciences Research Council, New York, N.Y.; June 17–July 26, 1963; Director: F. H. Palmer.

International Field Institute in Geology in Scandinavia—National Academy of Sciences—National Research Council, Washington, D.C.; June 27–August 26, 1963; Director: P. H. Reitan.

Two Summer Sessions in Advanced Mathematics—Canadian Mathematical Congress, Montreal, Canada; June 25–August 17, 1963; Director: L. F. S. Ritcey.

Summer Institute in Theoretical Physics—University of Wisconsin, Madison, Wis.; June 15–August 15, 1963; Director: R. G. Sachs.

ADVANCED INSTITUTE IN TROPICAL BIOLOGY—University of Southern California, Los Angeles, Calif.; July 1–August 15, 1962; Director: Jay Savage.

CONFERENCE ON MECHANICAL BEHAVIOR OF WOOD—University of California, Berkeley, Calif.; August 27–September 1, 1962; Director: A. Schniewind.

EDUCATION AND RFSEARCH IN TROPICAL FORESTRY—State University College of Forestry at Syracuse, Syracuse, N.Y.; June 10–July 21, 1963; Director: H. L. Shirley.

RECENT ADVANCES IN SYTOGENETICS AND DEVELOPMENTAL GENETICS—American Society of Zoologists, New York, N.Y.; August 27, 1962; Director: Curt Stern.

THEORETICAL STUDIES IN GEOPHYSICAL FLUID DYNAMICS—Woods Hole Oceanographic Institution, Woods Hole, Mass.; June 24–August 30, 1963; Director: G. Veronis.

FIELD INSTITUTE IN ANTHROPOLOGY—Harvard University, Cambridge, Mass.; June 10–September 10, 1963; Director: E. Z. Vogt.

THEORETICAL AND MATHEMATICAL BIOLOGY—Yale University, New Haven, Conn.; January 15–June 1, 1963; Director: Talbot Waterman.

APPENDIX H

Publications of the National Science Foundation

This listing includes publications issued by the National Science Foundation during fiscal year 1963. A complete listing of available Foundation publications may be obtained upon request from the Foundation.

The publications marked with a price may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402. Other publications are available from the Foundation.

ANNUAL REPORTS

1. Twelfth Annual Report, for fiscal year ending June 30, 1962: NSF 63-1, $1.50.
2. Fourth Annual Weather Modification Report, for fiscal year ending June 30, 1962: NSF 63-29, $.50.

MANPOWER AND EDUCATION REPORTS

1. Profiles of Manpower in Science and Technology: NSF 63-23.
2. Science Course Improvement Projects:
   I. Courses, Written Materials, Films, Studies: NSF 62-38.
   II. Science Teaching Equipment: NSF 63-15.
3. Secondary School Science and Mathematics Teachers (Characteristics and Service Loads): NSF 63-10, $.35.
4. American Science Manpower, 1960 (A report of the National Register of Scientific and Technical Personnel): NSF 62-43, $.65.
5. Scientific and Technical Personnel in the Federal Government, 1959-60: NSF 62-26, $.55.
6. Scientific Manpower from Abroad: NSF 62-24, $.25.
7. 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, $.25.
8. Scientific Manpower Bulletins:
   No. 19. Salaries and Characteristics of Scientists in the National Register of Scientific and Technical Personnel, 1962: NSF 62-47, $.15.
   No. 18. Metropolitan Area Distribution of Scientists in the National Register of Scientific and Technical Personnel, 1960: NSF 62-33, $.05.

RESEARCH AND DEVELOPMENT ECONOMIC REPORTS

1. Current Projects on Economic and Social Implications of Science and Technology, 1962: NSF 63-8, $.40.
2. Research and Development in Industry, 1960 (A Final Report): NSF 63-7, $.65.
3. Scientific Research and Development in Colleges and Universities—Expenditures and Manpower, 1958: NSF 62-44, $.70.
4. Federal Funds for Science XI: NSF 63-11, $1.00.
5. Reviews of Data on Research and Development (A series of leaflets devoted to specific aspects of research and development economics):
   No. 39. R&D Funds and R&D Scientists and Engineers in the Aircraft and Missiles Industry (1956-61): NSF 63-19, $.15.
   No. 38. Inquiries Into Industrial R&D and Innovation: NSF 63-12, $.05.
   No. 37. Science and Engineering Professional Manpower Resources in Colleges and Universities: NSF 63-4, $.15.
   No. 36. Research and Development in American Industry, 1961: NSF 62-32, $.15.

No. 35. Scientific Research and Other Programs of Private Foundations: NSF 62–28, $.10.

No. 34. Innovation in Individual Firms: NSF 62–16, $.10.

SCIENCE INFORMATION EXCHANGE REPORTS

1. Scientific Information Notes (bimonthly periodical reporting national and international developments in scientific and technical information dissemination): Single copy $.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. 16. Department of the Interior—Part II: NSF 62–35, $.15.
   No. 15. U.S. Air Force—Part II: NSF 62–17, $.20.
   No. 14. Federal Aviation Agency: NSF 62–19, $.10.
3. Current Research and Development in Scientific Documentation, No. 11: NSF 63–5, $4.00.*
4. Nonconventional Technical Information Systems in Current Use, No. 3: NSF 62–34.
5. A Guide to the Scientific and Technical Literature of Eastern Europe: NSF 62–49.

INTERNATIONAL SCIENCE REPORTS

1. No. 1. Organization of Scientific Activities in India: NSF 62–40.
2. No. 2. The Organization of Science in Germany: NSF 63–25, $.55.

DESCRIPTIVE PROGRAM BROCHURES

1. Grants for Scientific Research: NSF 63–27.
2. U.S.-Japan Cooperative Science Programs: NSF 63–21.
3. NSF Programs for Education in the Sciences: NSF 63–20.
4. United States Antarctic Research Program: NSF 63–14.
5. NSF Programs for the Dissemination of Scientific Information: NSF 63–2.
6. National Science Foundation (Program Activities): NSF 62–23.

SCIENCE ADMINISTRATION REPORTS

1. Research Trends: Nuclear Structure Physics, 1962–1967: NSF 62–45.
2. Federal Organization for Scientific Activities, 1962: NSF 62–37, $3.50.

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*Available from the Office of Technical Services, Department of Commerce.

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