Alfred P. Sloan Foundation

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Alfred P. Sloan Foundation

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Report for 1979

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President's Statement

President's Statement

During 1979, Nils Y. Wessell retired as President of the Alfred P. Sloan Foundation, having served as its chief executive for eleven years. On the occasion of his retirement, the Trustees adopted a resolution of which the following paragraphs were a part:

> Upon the retirement of Nils Y. Wessell as President and a Trustee of the Alfred P. Sloan Foundation, the Board of Trustees wishes to record its appreciation of his faithful service and distinguished leadership. For eleven years he guided the Foundation through a process of transition which preserved the best of its inherited traditions while also venturing forth in challenging new directions.
>
> Mr. Wessell thus leaves the Sloan Foundation stronger both institutionally and programmatically than he found it, capable of dealing with problems that are national in scope and, in some cases, making a difference. For that, for his steadfast guidance and counsel, and for the pleasure of their association with him over eleven eventful years, the Trustees express their enduring gratitude.

In his Statement in the Foundation's Report for 1978 Mr. Wessell reported that because of inflation and declines in the market value of securities the real value of the income and assets of most private foundations, including Sloan, had declined sharply during the period of his service. He added, "One seldom hears any longer the complaint that foundations have too much power. For most of the long-established ones, and certainly for this one, the question has become whether they are to retain any constructive influence at all in the new era of scarcity."

Mr. Wessell posed an important and thoughtful question, but it seems clear to me that it must be answered affirmatively; I would not have joined the

Foundation otherwise. Inflation and uncertain equity markets pose a serious threat to many private institutions, foundations among them. But whatever the merits of the Consumer Price Index in measuring real wages, it is not the only measure for judging the effectiveness of foundations. In my view, the programs over which Mr. Wessell presided were as relevant and as innovative at the end of his period of service as they were at the beginning.

The Sloan Foundation makes by far the largest part of its grants to colleges and universities, particularly to the major research universities. Among these are institutions whose own endowments are hundreds of millions of dollars. The Foundation receives many appeals from other kinds of organizations, including worthy charitable organizations that help the victims of disasters, rehabilitate the handicapped, and feed the hungry. These requests fall outside the program of the Foundation and must be refused.

The people whose requests are refused ask us at times questions that go like this: "You have turned down our plea for help, yet you give hundreds of thousands of dollars to Harvard and Stanford and the University of Chicago to add to the millions they already have. How can you live with yourselves?"

For those of us who join foundations late in our careers, as I did and as my predecessor did, such a question is disturbing. Nothing has prepared us for it. But as we become immersed in our new work, we come to feel that it can be answered.

Charity, as distinguished from broader forms of philanthropy, is essentially the attempt to alleviate human distress on a person-by-person basis. It is perhaps the oldest and noblest of philanthropic activities. We are all charitable in some degree, largely because we feel compassion for fellow humans in need and perhaps occasionally because we feel some guilt about our own good fortune.

But charity is not without its problems. To begin with, there appears to be no limit to human misery, and no charitable effort can deal with it all. All the charity the world can muster—even the charity institutionalized by government—cannot make a substantial difference in the sum total of misery in the world, although it can make all the difference to a particular beneficiary. The resources of private foundations, in this context, are minuscule.

What may be even worse, the help provided by charity must be provided all over again the next time the sun rises. Charity makes no enduring change in the state of affairs that calls forth the need for charity.

Those of us who control substantial amounts of money should be able to do better than that. We should try to use it in ways that will permanently improve the human condition, and that is what occupies what Aaron Wildavsky has called "the knowledgeable foundations"—the foundations rich enough to afford a full-time staff without making serious inroads on the funds available for direct philanthropic activities. Some of them use those funds to organize and sustain and provide leadership for social and civic organizations;

some use them to support creative activities in the arts and the humanities, which can improve the quality of life for all of us.

The Sloan Foundation puts its faith in the steady growth of scientific and technical knowledge, and of skills in managing the economy and the public and private institutions of our society. This is cold comfort for the mother of a sick child in an abandoned West Virginia coal mining community. But the support provided by nonprofit institutions for such researchers as Enders and Salk and Sabin means that there is one crippling illness that child will not suffer, and that is no small matter. We do act on faith, for we rarely support anything as clear-cut as the attack on polio. Most of the time we are simply helping to add steadily and almost imperceptibly to the slow growth of knowledge and to the training of people who will foster that growth.

It could be argued that this approach to philanthropy, however well-conceived, is callous; if all philanthropy were conducted by the knowledgeable foundations this charge would be hard to rebut. But that is not the case. The portion of philanthropy that is provided by the knowledgeable foundations is minute in relation to the whole. The amount that the knowledgeable foundations withhold from the poor of the world by spending on instruction and research is not only undetectable with respect to the total need; it is not even large relative to the other resources being applied to that need.

The Foundation receives appeals not only from institutions that help people in distress, but also from institutions that themselves face severe financial difficulties—the scholarly journal that will have to suspend publication unless it gets a subsidy; the college struggling to close a deficit. Helping the work of such institutions falls within the general scope of our activities. Compassion, however, is not a proper motive for selecting the institutions to help, for institutions are merely instruments and not ends in themselves. If the journal serves scholarship in some special way or the college meets educational needs that would not otherwise be met, they have a case to make. Otherwise they are no more deserving of help from the knowledgeable foundations than institutions whose revenues cover their current costs.

In making grants to institutions we believe that the proper guide is to try to support promise and excellence. For this reason we are sometimes called elitist, a characterization we gladly accept.

It is impossible for quality to be distributed uniformly across the more than 3,000 institutions of higher education in the United States, and if it were possible it would be undesirable. Good students and good teachers are naturally drawn together because the ablest students want and should have superior instruction, and the best teachers want and should have the most promising students. Research flourishes when able people interact frequently with one another and when they can stimulate their colleagues and correct their errors. Able researchers seldom want to be the big frog in a small pond; they seek and need other able people around them.

Moreover, good research and good teaching are not antithetical, but complementary. The most stimulating teacher is frequently the person who is doing research at the frontiers of his subject and can infect his students with the excitement of discovery.

Of course, this does not mean that foundation grants should go only to Harvard, Yale, and Princeton. Quality is far more diffused in the American system of higher education than is generally realized. There are institutions of all sorts in every part of the country that are excellent at doing what they do. Some are private and others public; some have 25 or 30 thousand students on one campus, others have fewer than a thousand. Some concentrate on graduate education, others are liberal arts colleges that give no earned graduate degrees. Some are specialized in such fields as engineering, art, or music; others cover virtually every aspect of postsecondary training and human knowledge. Some admit only women and some are predominantly black. Some are located in remote rural villages, some are in major metropolitan areas. Some attract students from across the country and around the world; others serve largely those who live within commuting distance.

Not only is quality diffused among institutions, but it is not uniformly distributed within institutions. No university is so good that it does not have one or more weak departments or schools. A strong university seeks to correct such weaknesses, but this is a slow, difficult and expensive task, and while weaknesses are being corrected in one area, they may be developing in another. Conversely, institutions of average quality may have jewels in their crowns—one or two programs of outstanding quality.

At most major universities there are, in addition to the usual academic departments and established professional schools, a variety of centers, institutes, and bureaus for the study of special areas and problems of all sorts; these organizations are more or less loosely attached to the core of the university. The quality of these peripheral organizations generally varies far more widely than that of the university's central departments and schools. Some such organizations follow innovative paths that will lead to the development of new fields of study. Others may be a little more than letterheads—hunting licenses with which ambitious academic entrepreneurs seek money wherever they may find it.

It is also relevant to note that there are important differences between reputation and merit. In the first place, public reputation often depends on exposure and skill in communication as much as it depends on scientific accomplishment. The scholar in any field who is best known to the general public is not necessarily the one considered best by his scientific peers. But even the reputation earned among one's peers lags behind actual accomplishment. The reputation of an individual, a department, or an institution depends on the cumulation of accomplishment over a long period. In some cases the

accomplishment still continues unabated; in others current output has diminished substantially, but the reputation survives. Moreover, some very good scientists and programs have not yet received the recognition to which they are entitled.

For all these reasons foundations cannot rely on the general reputations of institutions and programs as a guide to intelligent giving. They must scrutinize individual proposals, from whatever institutions they come. Reputation is relevant only as it suggests the promise of future work, for what is past no longer needs to be funded.

The preservation and enhancement of quality in American higher education in the 1980's will be especially important because of inevitable demographic changes. As we all know, the cohorts reaching age 18 in the 1980's will be substantially smaller than those that reached 18 in the 1970's. Moreover, the fraction of each cohort attending college has leveled off as the economic rate of return to higher education has decreased. Increases in enrollment from people older than traditional college students will offset only a part of the decline in the enrollment of 18 to 22 year olds. The result will be that American higher education must contract.

It is of utmost importance that this contraction take place in a way that preserves the strengths and minimizes the weaknesses of the higher education system. This will not happen if there are equal percentage cuts in enrollment and funding across the board. Each institution and each state must protect its unique assets and its strongest programs, while permitting weak or redundant programs to contract or disappear. Despite the general contraction, room must be found for new initiatives and for adding new blood to faculties. New ideas are the essence of research and the spice of teaching. Scholarship cannot flourish in faculties that cannot take in any young people with fresh insights.

The funding provided to higher education by private foundations is and will remain far too small to have a major influence on the pattern of contraction. The key decisions affecting this contraction will be made in Congress, in state governments, and by the administrations and boards of trustees of private institutions. The democratic political process, however, is often ill-suited to the preservation of quality. Legislators depend on votes for their continuation in office, and colleges and universities are made up of voters. All institutions and programs have constituencies, which are never aroused more powerfully than by the threat that the program or institution may cease to exist. In the face of such pressures, politicians will be tempted to fall back on equality of sacrifice and to preserve all existing programs at reduced levels of funding and effectiveness.

Because of these strong tendencies, it is more important than ever for private foundations to use their grants to promote innovation and recognize

merit in higher education. But the direct support of academic programs that foundations can provide will in itself be less important than the example they can set for decision-makers whose decisions involve far larger sums.

I do not believe that the knowledgeable foundations in general, or the Sloan Foundation in particular, need to be apologetic for what we have set out to do. How we can best go about doing it is another matter, and at times a perplexing one. No doubt there is room for improvements and we shall try to make them.

Albert Rees

General and Particular Programs

Under an operational concept adopted in 1969, the Alfred P. Sloan Foundation allocates resources through a General Program and one or more Particular Programs. The General Program reflects the Foundation's established interests in science and technology, economics and management, and related subjects; the Particular Programs are intended to focus on more sharply defined topics for limited periods of time. A typical Particular Program involves an expenditure of $10 million to $15 million over five to seven years.

During 1979 the fifth Particular Program, in Cognitive Science, completed its third year and the fourth one, in Minority Engineering Education, was phased out after six years of operation. Earlier Particular Programs were concerned with Minority Medicine and Management Education, Technology in Education, and Neuroscience. While the Foundation no longer designates funds specifically for these subject areas, it continues to make occasional grants in these fields through the General Program.

General Program

Science and Technology

1979 was a curious year for science and technology. On the one hand there was a dramatic and massively publicized series of technological accidents—the Skylab space station and a DC-10 airliner fell from the sky, the one harmlessly and the other tragically, and a nuclear reactor at Three Mile Island went out of control. Fears were expressed that public confidence in science and technology had been shaken.

On the other hand, government and industry support of science and technology appeared to be increasing, thus reversing a decade-long trend of dwindling resources for research and development. Such at least was the conclusion of the National Science Board, the governing body of the National Science Foundation, in its *Science Indicators: 1978*, published near the end of 1979.

Assessing the impact of science and technology on society and defining more precisely the federal commitment to research and development (as reflected in budgets) are two areas that require continuing attention. Another is making room on university and college faculties for young scientists who are finding fewer positions open to them.

Research and Education

• Twenty-five years ago the Foundation announced the first 22 grants to young scientists under the program now known as the Sloan Fellowships for Basic Research. Those young scholars, many of them prominent in the upper ranks of American science today, were the vanguard of a corps of talented Sloan Research Fellows whose number had mounted by 1979 to 1,563. Their collective contribution to science can never be calculated, but it is noteworthy that among them are six Nobel laureates (including two who received the prize in 1979), two recipients of the National Science Board's

Alan T. Waterman Award, and two winners of the Fields Medal, the highest honor in mathematics.

It thus appears that the Foundation's 25-year investment of some $31.2 million in the Sloan Fellowships was not misplaced, and that the program's projected expansion in 1981 into economics and applied mathematics may do for those disciplines what the program has done thus far for chemistry, physics, pure mathematics and, more recently, neuroscience.

While the Basic Research program has changed in some details over the quarter of a century, and will continue to change, its central emphasis remains the same: the identification and support of the most creative young scientists at very early stages of their careers. There is no reason to think that this type of assistance is any less important now than it was in 1955; it may be more so, as the average age of science faculties increases under contemporary constraints. It also happens to be a way in which a foundation of modest means can make a distinctive contribution to the progress of scientific research.

Sloan Research Fellows are chosen through a process of nomination rather than by application. Often the nominators are department chairmen or themselves former Fellows. A Foundation program committee now composed of two senior scientists from each of the four disciplines reviews nominations and makes the final selections. Committee members are asked, in reviewing nomination forms and supporting materials, to identify those nominees who show the most outstanding promise of making fundamental contributions to new knowledge.

The Sloan Fellowships are awarded to members of college and university faculties in the United States and Canada (except in neuroscience, where postdoctoral fellows may receive Sloan Fellowships). At present no candidates more than 32 years old at the time of nomination are considered, unless there are exceptional circumstances. (Further procedural details are set forth in a program brochure which is available on request.)

The program's early theme of "people, not projects" is still applicable. The Foundation does not expect or desire a research proposal from a prospective Fellow, and the particular subject of his research is not of primary interest to the program committee. The purpose of the Fellowship is to facilitate the Fellow's professional growth and development in whatever research area is of greatest interest to him. Should his interests change, he is free to move to a different area.

Currently the Fellowships are funded at $20,000 each over a two-year term. They may be applied to a wide variety of uses for which other, more restricted funds such as those from research project grants usually cannot be used. The intention is to confer the greatest possible flexibility on the Fellow's research effort at a time when other support often is difficult to obtain. Fellows have told the Foundation that this flexibility has made the Fellowships more

valuable than the number of dollars involved would indicate.

Although not originally intended as such, the Sloan Fellowships have come to be seen as a mark of distinction among young scientists and a definite stimulus to advancement in their careers. Such early recognition is valued highly by these young scholars who do not yet have extensive records of research activity.

At present the Fellowships are divided among four disciplines as follows: chemistry and physics, 30 per cent each, and mathematics and neuroscience, 20 per cent each. Foundation Trustees have approved the addition, beginning in 1981, of six fellowships a year in economics and four in applied mathematics. For that purpose $200,000 will be added to the present annual appropriation of $1,550,000 for the program.

An expansion of the program committee also has been authorized. The fields now included in the program have grown too broad and complex for two persons to cover adequately. It is also the view of advisers to the Foundation that younger scholars, closer in age to those being nominated, should be represented on the committee. Such persons, probably to include some recent Sloan Fellows, are being sought out for the four existing subcommittees, and a new subcommittee in economics is being organized. For the mathematics panel the new member will be an applied mathematician.

During 1979 the Foundation awarded Fellowships to 78 scientists at 42 universities and colleges in the United States and Canada. Program committee members reviewed some 400 nominations to arrive at the final selections. Members of the committee in 1979 were:

Mathematics
Dr. Jurgen Moser, New York University, Chairman
Dr. S. S. Chern, University of California, Berkeley

Chemistry
Dr. Ronald Breslow, Columbia University
Dr. John S. Waugh, Massachusetts Institute of Technology

Physics
Dr. William M. Fairbank, Stanford University
Dr. Malvin A. Ruderman, Columbia University

Neuroscience
Dr. Seymour S. Kety, Harvard Medical School
Dr. Eliot Stellar, University of Pennsylvania

Scientists who were awarded Sloan Research Fellowships in 1979 are listed below, by institution and field of science.

University of Arizona
Chemistry: Dennis L. Lichtenberger

University of British Columbia
Physics: A. John Berlinsky

California Institute of Technology
Chemistry: Robert R. Gagne

University of California, Berkeley
Chemistry: Paul A. Bartlett, Richard A. Mathies

University of California, Los Angeles
Chemistry: Michael E. Jung
Physics: Bruce H. Margon

University of California, San Francisco
Neuroscience: Allan I. Basbaum, Louis F. Reichardt, Michael P. Stryker

Carnegie-Mellon University
Physics: Ling-Fong Li

University of Chicago
Chemistry: Jeremy K. Burdett
Mathematics: Robert J. Zimmer
Physics: Sidney R. Nagel

University of Colorado
Chemistry: John W. Birks, G. Barney Ellison
Neuroscience: Anne C. Bekoff
Physics: Martin L. Smith

Columbia University
Mathematics: Avner Ash
Neuroscience: Daniel J. Goldberg
Physics: Stephen W. Herb

Cornell University
Chemistry: Paul L. Houston
Physics: Stuart L. Shapiro

Duke University
Neuroscience: Glenn C. Thompson
Physics: Richard G. Palmer

Harvard Medical School
Neuroscience: Robert W. Baughman, Stanley M. Goldin

Harvard University
Chemistry: Paul A. Wender
Neuroscience: Ronald L. Calabrese, David P. Crews
Physics: Jonathan E. Grindlay, David R. Nelson, Eli Yablonovitch

University of Illinois, Urbana
Chemistry: Clifford E. Dykstra

Iowa State University
Chemistry: George A. Kraus

Kansas State University
Physics: Chii-Dong Lin

University of Kentucky
Mathematics: Frederick R. Cohen, Lawrence C. Evans

University of Maryland
Mathematics: Sun-Yung A. Chang, Tai-Ping Liu, Lawrence C. Washington

Massachusetts Institute of Technology
Chemistry: F. Read McFeely

Michigan State University
Physics: Claus-Konrad Gelbke

University of Michigan
Physics: Robert P. Kirshner, Rudolf P. Thun

University of Minnesota
Mathematics: Troels Jorgensen

University of Missouri, Columbia
Physics: H. R. Chandrasekhar

New York University
Mathematics: Richard M. Schoen, Eugene B. Trubowitz

State University of New York, Albany
Physics: William A. Lanford

University of Notre Dame
Mathematics: Andrew J. Sommese

University of Pennsylvania
Chemistry: Kyriacos C. Nicolaou, J. Gary Pruett

Princeton University
Chemistry: Barry B. Snider
Mathematics: Eric D. Bedford, Sidney M. Webster
Neuroscience: Donald F. Ready

Purdue University
Chemistry: William L. Jorgensen
Mathematics: James O. Berger
Physics: Nicholas J. Giordano

University of Rochester
Chemistry: Douglas H. Turner
Physics: Arie Bodek

The Salk Institute
Neuroscience: Joseph H. Steinbach

University of Southern California
Chemistry: Charles H. Seiter

Stanford University
Chemistry: Steven G. Boxer
Physics: Robert Sinclair

Stanford University School of Medicine
Neuroscience: Susanna E. Blackshaw, Carla J. Shatz

Syracuse University
Physics: Edward D. Lipson

University of Texas, Austin
Mathematics: Cameron McAllan Gordon
Physics: Gregory A. Shields

University of Texas Health Science Center, Dallas
Neuroscience: John G. Parnavelas

University of Texas Medical Branch, Galveston
Neuroscience: Paul R. Adams

Vanderbilt University
Chemistry: Charles M. Lukehart

Wesleyan University
Chemistry: Stewart E. Novick

Yale University
Chemistry: Richard D. Adams
Mathematics: Gregg J. Zuckerman
Physics: Michael S. Lubell

• In the history of scientific ideas may be found many a clue to what is happening in the present. Prof. I. Bernard Cohen, of the Department of the History of Science at Harvard University, has devoted a long and productive career to this subject and is now engaged in what may be his most ambitious undertaking. His goal is to understand how the development of the social and behavioral sciences has been influenced by the exact or physical sciences (and mathematics) and by the natural or life sciences.

In numerous instances, Professor Cohen finds, the great thinkers in the social sciences and psychology have adopted ideas and concepts from physical and biological science. In this process, the application of ideas in circumstances which their originators never envisioned transforms them and is often the basis of new knowledge. Even incorrect transformations may have useful results. Professor Cohen hopes to expand and develop such preliminary insights into the nature of the creative process. While illuminating the development of the younger social and behavioral sciences, his study may cast a new light on the significance of the older sciences as well.

Professor Cohen's study will cover the period from Galileo and the scientific revolution up to recent times. He expects the work to take five years. The Foundation made a five-year grant of $90,000 to Harvard in support of this research.

• The Foundation's support of the Sloan-Kettering Institute for Cancer Research, which dates back to the Institute's founding in 1945, continued in 1979. The Institute, which is the research arm of Memorial Sloan-Kettering Cancer Center in New York City, is a major center of basic biological research related to the causes of cancer.

During the mid-1970s, as the federal government directed massive amounts of funds into the "war on cancer," the Sloan-Kettering Institute rapidly expanded its research programs, particularly in immunology and nutrition. Now, however, federal support has leveled off and funds from the National Cancer Institute have dropped significantly. Despite inflation the Institute managed to reduce its expenditures in 1979 but still was faced with a sizable deficit. The Foundation made a grant to the Institute of $600,000, the same amount it has provided annually since 1974.

• In the opinion of many mathematics educators, it is time for an updating of the undergraduate mathematics curriculum in general use in this country. A number of new developments affecting mathematics have occurred: computer science has become a major field, and the relationship between it and the mathematics curriculum needs to be defined; mathematics increasingly is being applied to subjects like biology, economics, and management, and student demand for such applied courses is growing. There is also a feeling that the mathematical preparation of public school teachers needs to be re-examined.

Such thoughts were crystallized at a 1978 conference on "Prospects in Mathematics Education in the 1980s," supported by a Sloan grant to the Mathematical Association of America. By 1979 the Association was ready to act on the findings and recommendations of that conference. It has organized a number of working parties of educators to develop course revisions and syllabi in computer science, calculus, modeling and operations research, statistics, and other topics and fields. The 18-month project is under the direction of the Association's Panel on a General Mathematical Sciences Program. It is supported by a Sloan grant of $37,500 to the Mathematical Association of America.

Science Assessment

• The growing public sense of threats to health from proliferating chemicals and nuclear materials has led to a flood of hearings, investigations, court cases, and regulatory actions by federal, state, and local agencies. The debates are often emotional and not always well-informed. In an effort to establish clearer communications about these controversial topics, Cold Spring Harbor Laboratory in 1978 instituted a series of conferences on biological risk assessment. The intent was to assemble interdisciplinary groups of experts concerned with the scientific, economic, and political aspects of risk assessment, and to produce as clear a picture as possible of the effects of questionable substances on humans exposed to them.

The first of these conferences, held at the Laboratory's Banbury conference center, dealt with the problem of determining the potential of various chemicals and radiation for causing harmful genetic changes. By the end of 1979, five conferences in all had been conducted. Their proceedings are published rapidly, within a few months.

In a further effort at speedy dissemination of the Banbury findings, Cold Spring Harbor wished to establish a series of informational workshops for Congressional staff members and for journalists. One Congressional workshop was held in 1979 and the response of the staff aides was extremely favorable. The Laboratory then proposed to hold four such workshops a year, two for Congressional aides and two for journalists. The Sloan Foundation made a

grant of $100,000 which will partially support these meetings for three years. (A Sloan grant of $100,000 in 1978 helped to establish the risk-assessment program.)

- The American Association for the Advancement of Science has received Sloan support in the past for various activities in science and public policy. One of those activities has proven to be an outstanding and unique service not only to the community of scientists, engineers, and administrators concerned with science and public policy, but also to members of the legislative and executive branches of the federal government who are involved in formulating the policies which affect scientific research and development. This is an annual series of analyses and colloquia concerned with research and development in the federal budget.

In the past, federal budgets for research and development have never been made explicit except in some relatively general breakdowns made by the Office of Management and Budget. The AAAS has helped to clarify the place of research and development in the budget through a series of annual analyses at three stages of the budget-making process. Each year a specific topic is treated at length, and colloquia are held to bring such information to the attention of the science and engineering community, congressional staff, and executive agency staff.

Preparation of these reports and the associated colloquia are still in the experimental stage, and the AAAS requested continued partial support for this project until permanent funding can be arranged. The Foundation made a two-year grant of $100,000 to the AAAS for this purpose.

Computers in Education

During 1979 the staff of the Foundation continued to explore some of the ramifications of the growing use of computers in higher education. These explorations arose in part from a concern for computer literacy, the notion that some familiarity with computers will be required in many of the occupations which today's students will be entering. But the computer also can be a powerful educational tool in many disciplines, a fact that is being demonstrated in a number of institutions.

While it now seems unlikely that academic computing will become a major program interest of the Foundation, several small grants were approved in 1979 to assist in exploring various aspects of this field. Recipients were:

Brandeis University **$13,000**
Rapidly rising student demand for computer science courses led Brandeis to re-examine its offerings and resources, and to survey resources available outside the University. Efforts are under way to expand computer usage in the social sciences, and to develop a computer science program with firm ties to the humanities. Computer science faculty members are working with members of other departments to introduce computer usage in individual courses.

Earlham College **$20,000**
Since 1976 Earlham has been developing an unusual interactive computer project with support from the Sloan Foundation and the National Science Foundation. An adaptation of DELPHI procedures, it enables students to use a computer as a conversational device to discuss with faculty members and with other students problems relating to a particular course or unit of study. Its advantages over classroom discussion are convenience, time for extended interrogation and response, individual attention, anonymity when desired, and more carefully framed questions and comments than usually occur in class. The system has been used mainly in the sciences; the 1979 grant is assisting in its expansion to the humanities and certain social sciences, and in further testing and evaluation of the system.

Harvey Mudd College **$19,000**
Four of the Claremont Colleges in California believe they can extend their cooperative activities into the field of computing, to develop a shared system for teaching and research which they have lacked and which would be superior to what any of them could do individually. The grant supports a planning and feasibility study as the first step toward building a computer system to ensure that at least 80 per cent of their future graduates will have a reasonable acquaintance with the computer. The colleges involved, besides Harvey Mudd, are Claremont Men's College, Pitzer College, and Scripps College.

New England Regional Computing Program **$18,500**
NERComP is studying ways of expanding computer usage among private liberal arts colleges, many of which lack funds to establish their own computer systems. With time-sharing networks like NERComP, and with small, lower-priced computers becoming available, the time may be ripe for many small institutions to become involved with computers. The study seeks to identify individual faculty members at selected colleges who may be ready to use computers in their teaching, given some assistance and encouragement.

Queens College of City University of New York **$18,000**
Prof. Joseph Raben of Queens College, founder and editor of the journal *Computers in the Humanities*, is leading an effort by directors of computerized information centers to overcome a communications problem in their field. The problem is that much valuable information acquired by scholars in the humanities and some of the social sciences is being entered into data banks in many different ways. This makes it unnecessarily difficult for scholars to use one another's data. A series of meetings is being held to define common procedures and standards for establishing data banks in particular disciplines. (Grant paid to Research Foundation of the City University of New York.)

State University of New York, Buffalo **$12,500**
Prof. Anthony Ralston, chairman of the computer science department at SUNY-Buffalo, is making a preliminary study of a question referred to earlier—the influence of computer science on the undergraduate mathematics curriculum. The main issue concerns the question of what mathematics should be studied by undergraduates in computer science, how that mathematics should be structured, and how the teaching of it should be integrated into the teaching of computer science. (Grant paid to Research Foundation of State University of New York.)

State University of New York, Stony Brook **$20,000**
The use of microcomputers in public schools seems likely to become widespread in a fairly short time. One concern of educators is that there may be a lack of software for the microcomputers and a lack of information about hardware on the part of those who do the purchasing for the public schools. A group headed by Ludwig Braun, professor of engineering at Stony Brook, is studying the feasibility of a national center to develop software and provide consumer information to the schools. (Grant paid to Research Foundation of State University of New York.)

Stevens Institute of Technology **$20,000**
Stevens believes that the rapidly spreading use of computers in industry for systems design and process control must be reflected in undergraduate engineering education. It is conducting a one-year study, in consultation with representatives of industry, government, and other schools, to assess the impact of these industrial changes on engineering education and to formulate an integrated academic program which will make use of computers throughout the undergraduate curriculum.

These other grants were approved in 1979 for research and education in science and technology:

Columbia University, New York, N.Y. **$6,500**
In support of a special series of visits by members of the Peking Institute of Theoretical Physics to research centers in the United States.

Drew University, Madison, N.J. **$20,000**
For partial support of a special spectroscopic research project in the Department of Chemistry.

Massachusetts Institute of Technology, Cambridge, Mass. **$10,000**
In support of a book project concerned with the history of science and technology, with particular reference to the role of M.I.T., to be undertaken by James R. Killian, Jr.

National Academy of Sciences, Washington, D.C. **$20,000**
In partial support of a study to prepare a guide for the safe handling of chemicals in laboratories.

University of Nevada, Reno, Nev. **$5,000**
To assist the Department of Physics in continuing a program in "physics appreciation" instituted by Prof. Sam Goudsmit.

New York Zoological Society, Bronx, N.Y. **$20,000**
In support of the undergraduate internship program of the Osborn Laboratories of Marine Sciences.

Palace of Arts and Science Foundation, San Francisco, Cal. **$15,000**
For partial support of a detailed study of the San Francisco Exploratorium by Prof. Hilde Hein of the College of the Holy Cross.

Research Foundation of the City University of New York **$7,100**
In support of a project directed by Prof. Warren Page of New York City Community College to develop and edit a two-year-college mathematics reader for the Mathematical Association of America.

Rutgers University, New Brunswick, N.J. **$10,000**
For partial support of development of the Benjamin Data Bank, a guide to medieval manuscripts on scientific and technological topics.

Society for Neuroscience, Bethesda, Md.
In partial support of a program to produce educational materials about neuroscience for use in schools and colleges. **$20,000**

In partial support, for two years, of the activities of the European Neuroscience Association. **$10,000**

Universities Research Association, Washington, D.C. **$6,000**
For partial support of a 1980 Symposium on the History of Particle Physics at the Fermi National Accelerator Laboratory.

Wentworth Institute of Technology, Boston, Mass. **$20,000**
For an exploration by a group of leading engineering technology schools of possible collaborative curriculum development in energy conservation and other fields.

Economics and Management

Some of the nation's most urgent problems in 1979 were among those addressed by the disciplines of economics and management. The Foundation continued to encourage research designed to illuminate the underlying causes of economic problems and programs of education intended to increase economic understanding and to enhance managerial skills.

Economic Research

• The nation is facing problems of slow productivity growth, wage inflation, and unemployment while it lacks sufficient empirical data on the nature of the changing labor market on which to base economic policies. In an effort to elucidate some of the major institutional and structural changes in the United States labor market, the National Bureau of Economic Research (NBER) is undertaking a new program of research in productivity, compensation, and employment. The research will seek to mesh newly available large computerized data files, which provide cross-sectional and longitudinal data on individuals, with more detailed institutional information based on interviews and surveys of the relevant decision makers. It will examine the ways in which productivity, wages, and employment and unemployment are influenced by labor-market institutions such as trade unions, governmental regulations, and corporate policy, as well as by major structural developments such as the increasing average age of the work force.

An essential feature of the program will be frequent interaction by the researchers with representatives of the business and labor communities. In keeping with NBER tradition, the studies will not make specific policy recommendations, but will focus instead on developing objective, quantitative information which can be used by others for specific policy decisions.

Research associates at NBER offices in Cambridge, New York, and Palo

Alto, and in various universities will conduct these studies under the general direction of Prof. Richard B. Freeman of Harvard University. The Foundation made a grant of $300,000, payable over three years, for support of this project.

• Government-sponsored enterprises are becoming more numerous in response to instances in which the normal workings of the free market do not efficiently provide services which are regarded as essential by significant segments of the population. At Northwestern University a group of scholars from the Graduate School of Management and the School of Law has begun a study of the growing use of government-sponsored enterprises (GSE's) as attempted solutions to market imperfections different from those which have led to direct economic regulation of private firms.

The Export-Import Bank is one of the GSE's being analyzed by the Northwestern group. The Bank provides credit to foreign importers of U.S. goods; it is viewed as a response to a market imperfection in which insufficient information about the credit-worthiness of foreign borrowers inhibits the operations of conventional lenders. The Bank's ability to take additional risks under such circumstances may be a sufficient rationale for the existence of such organizations.

Conrail has been selected as the case for study of a second type of market imperfection in which a failing or failed enterprise is perceived to provide essential benefits, or has sufficient support from interested parties to bring forth government intervention. In such cases, users of increasingly inefficient services become unwilling to pay their full costs and creation of a GSE spreads some of the costs to the general population through taxation.

The Northwestern group first will seek to determine whether the functions performed by a GSE are warranted and if so, whether a GSE is the most effective means of performing them. Secondly they will undertake to assess the quality of the government decision-making process that led to the creation of the enterprise, and of subsequent decision making by the GSE and the bodies to which it is accountable.

Prof. David Baron of Northwestern's Graduate School of Management and Prof. Jordan Hillman of the School of Law will be the principal investigators for this project, which is being supported by a two-year Sloan grant of $250,000.

• Wage differentials between public and private employees, and the effect of union or nonunion status on such differentials, are being analyzed by Prof. Linda Edwards of Queens College in New York City. Her study makes use of data on wages and fringe benefits of public and private workers in a single occupation—refuse collectors—from a National Science Foundation project on solid waste management in a cross section of 200 cities. The research is supported by a one-year Sloan grant of $19,344 to Research Foundation of the City University of New York.

Advanced Education

• In 1975 the Foundation and Princeton University inaugurated a program of graduate-level training for selected journalists, designed to increase their ability to analyze and interpret issues in economics for the public. By June of 1980 nearly forty persons from diverse news media—large and small daily newspapers, wire services, magazines, and broadcast media—will have benefited from intensive year-long studies in Princeton's Woodrow Wilson School of Public and International Affairs; presumably their audiences will benefit also.

The Woodrow Wilson School has designed a special program for the Alfred P. Sloan Foundation Fellows in Economics Journalism, which includes courses in macro- and microeconomics, quantitative analysis, and related public-policy subjects. Visiting experts from industry, government, academia, and journalism meet with the journalists in a special workshop. For the 1979-80 year Robert J. Donovan, a veteran Washington journalist and author of books on Presidents Eisenhower and Truman, has joined the program as a senior fellow of the University.

With the underwriting of the current class of fellows, the Foundation's original five-year commitment to the economics journalism program has been fulfilled. The Foundation and the University agree that the program has served its purpose of enlarging the number of journalists qualified to report on economic issues. Accordingly, a 1979 grant of $315,000 will terminate the program.

• The interaction of economics and the law has intensified at a time of growing state and federal regulatory activity and of legislative actions which increasingly intersect with economic policy. Since 1976 the Center for Law and Economics of the University of Miami has conducted a series of summer Legal Institutes for Economists which provide an intensive two-and-a-half-week exposure to the law for members of economics faculties in some of the stronger universities around the country. (These institutes were added to the Center's original program of institutes in economics for federal judges and law professors.)

By 1979 the Legal Institutes for Economists had established a sound reputation as a valuable instrument for cross-fertilization of the two disciplines but were not yet completely self-supporting. The Foundation agreed to make a final grant of $100,000 for the 1980 institute, bringing its total support of this activity to $417,000.

• An innovative approach to the professional education of managers is being pursued by Yale University's School of Organization and Management, which opened its doors in 1976. The School offers its students training in the usual techniques of business administration along with exposure to

management methods and problems of the governmental, nonprofit, and voluntary sectors. Its curriculum takes into account the increasingly indistinct lines between public and private sector activity, and the growing interdependence and interrelatedness of public and private sector institutions. Graduates having such a broad perspective of management may find a wider range of opportunities than holders of the traditional Master of Business Administration degree.

The program of the School of Organization and Management is still experimental and still developing, and some work remains to be done on its unusual curriculum. For this purpose the Foundation in 1979 made a grant of $97,000, supplementing a 1976 grant of $250,000.

Undergraduate Education

• Economics educators have a fairly clear idea of what constitutes a good introductory course in economics, thanks to past research on that subject. They know much less about the undergraduate major in economics, which is offered by about 1,000 colleges and universities in this country. A study sponsored by the Joint Council on Economic Education is seeking to describe the characteristics of these undergraduate major programs—what kinds of students take them, their career aspirations, the courses that make up the major, electives offered, the faculties who teach major programs, and the influence of graduate economics programs in institutions that have them. The study is being conducted by Professor John Siegfried of Vanderbilt University.

Information thus obtained from surveys of economics departments and individual students will be of considerable interest to the economics profession, the Joint Council believes. It should reveal the level of agreement in the profession about what should constitute a major in economics; it may offer guidance as to how some institutions can improve their programs; and it may throw light on the level of demand for economics courses. In a later phase it may be possible to track graduates of major programs into graduate schools or their first jobs.

The Foundation agreed to support the first phase of this study, the collection of data, through a grant of $44,000 to the Joint Council on Economic Education.

The Foundation made these other grants in 1979 for activities in economics and management:

American Assembly of Collegiate Schools of Business, St. Louis, Mo. **$20,000**
In partial support of three week-long workshops on "Business Environment/Public Policy and the Business School Curriculum."

Council on Foreign Relations, Inc., New York, N.Y. **$20,000**
For partial support of studies in international economic issues by fellows in the Council's International Affairs Fellowship Program.

National Association of Black Accountants, Inc., New York, N.Y. **$20,000**
For expansion of the Association's programs and services.

Public Communication Foundation for North Texas, Dallas, Texas **$20,000**
For partial support of a one-hour public television program on inflation.

Education for the Public Service

The management of government is fully as complex as the management of business, and perhaps more so. It is only in recent years, however, that programs of professional education designed to equip practitioners to deal with the full range of complexities encountered in public service have taken root in major universities.

The diversity of such programs was striking when the Sloan Foundation first became formally interested in this field in 1976. Programs were being conducted in schools of public policy, management, public administration, engineering, and law. A Foundation-sponsored seminar in 1976 helped to reveal elements of commonality in the various programs, and emphasized in particular the need for a scientific and technological component in such training.

There is still a healthy diversity among programs of education for the public service, and the Foundation has purposely supported a number of approaches in different kinds of institutions. Most such programs, however, share a concern for imparting a mastery of analytical and statistical mathematical techniques, a familiarity with economics, a comprehension of technological problems inherent in most policy issues, and an understanding of the political process. That the profession may be coming of age is indicated by the formation in 1979 of the Association for Public Policy Analysis and Management, which includes eighteen programs of education for the public service.

Students enrolling in the graduate professional programs are both recent college graduates and persons who have already spent some years in federal, state, or local government and who are seeking to upgrade their skills. At the undergraduate level a new kind of liberal education focused on interdisciplinary study of public policy issues is taking shape in some institutions. Graduates of such programs may progress to graduate studies in policy analysis or one of the more traditional professions, or move directly into positions in government, industry, or other organizations having public policy concerns.

Graduate-level Programs

• The University of Maryland's new School of Public Affairs will enjoy several advantages when it enrolls its first candidates for Master's and Ph.D. degrees. It will be able to build on the experience of well-established programs elsewhere in the nation, adopting major elements of their curricula in such areas as management skills, quantitative techniques, economic analysis, and program evaluation. In addition, Maryland is noted for its faculty strength in economics of the public sector, and a number of these distinguished economists will participate in the new School.

The other great asset of the School of Public Affairs is the University's location adjacent to the District of Columbia, nine miles from the U. S. Capitol. Thus it will be able to provide students with practical internships in the federal government to ease the transition from the world of study to public sector work. The School also will have an unparalleled opportunity to draw upon people actively involved in government and other Washington organizations for its teaching programs.

The University of Maryland program also plans to address the problem of how to provide mid-career training for the most effective federal employees without taking them away from their jobs for unacceptably long periods. At present outstanding federal employees cannot be spared from their jobs to spend a year at a mid-career program at a university away from Washington. The University of Maryland intends to develop programs which will permit such persons to gain advanced training while continuing in their federal duties.

The Foundation made a grant of $400,000 to the University of Maryland for partial support of the School of Public Affairs for three years. Planning for the new School was assisted by a 1978 Sloan grant of $20,000.

• Continuing developments in computers, telecommunications, toxic chemicals, energy, and numerous other fields make it imperative that future public managers be equipped to deal knowledgeably with technological issues and methodologies. In 1976 the graduate schools of public administration or public policy at New York University, the State University of New York at Stony Brook, and Syracuse University began a collaborative experiment in teaching their students from diverse backgrounds about technology. Their experience thus far suggests that there is an important place for a course on technology in the typical public administration curriculum. Students have found that such a course adds a valuable dimension to their professional education; faculty have found that the students can grasp technological concepts and can critically assess technical advice; and employers seem to welome this additional knowledge among applicants for public service positions.

The major deterrent to the three schools' efforts has been the scarcity of good curriculum materials placing technology in a public policy context. The schools also felt the need to develop a "critical mass" of faculty, researchers, and course materials which would generate sufficient interest on each campus to attract the best students to their programs. They proposed to create a more formal structure and a means of more intensive collaboration in developing case studies, course outlines, and supporting materials for their own use and for later dissemination to other institutions.

The Foundation made a two-year grant of $400,000 to Syracuse University for this expanded effort in technology and public policy. The grant provides support for a full-time professor at each of the three campuses, a coordinator at Syracuse, and other personnel and expenses. The three participating schools are the Maxwell School of Citizenship and Public Affairs at Syracuse, the Harriman School of Urban and Policy Sciences at the State University of New York at Stony Brook, and the Graduate School of Public Administration at New York University. A Sloan grant of $100,000 to Syracuse in 1976 helped initiate this project.

- Training of policy analysts who are able to work effectively in government and also outside government, in a variety of firms and agencies having public policy concerns, is the objective of a new two-year Master's degree program in Public Policy Studies at the University of Chicago. Recognizing that most policy analysts will move between the public and private sectors over the course of their careers, the Chicago program is developing courses in practical subjects like accounting and finance related to public-sector issues.

The Chicago program has a small core faculty, based in the Committee on Public Policy Studies, which is supplemented by faculty from many parts of the University, including the Law School, the Business School, the social science departments, and the Center for the Study of the Economy and the State. These faculty members will participate in seminars focused on current policy issues, which will be offered primarily for students in the second year of the program and will constitute as much as half of the course work for the Master's degree.

Chicago expects the Master's program to become self-supporting from tuition in a few years. While the program is becoming established, outside support is needed to enable faculty to spend time developing the new courses and seminars and other curriculum materials. The Foundation made a three-year grant of $250,000 for these activities.

- The Rand Graduate Institute offers advanced graduate training leading to a doctoral degree in public policy analysis, which it defines as the application of scientific methods to problems of public policy and choice. Founded in 1970 by the Rand Corporation, the Institute requires a Master's degree (or equivalent training or experience) for admission. From 1974 through the fall of 1979 it had awarded nine doctoral degrees, with three more about to

be awarded, and with fifteen students having completed qualifying examinations and working on their dissertations.

The three-year Rand curriculum includes three principal kinds of predoctoral work: (1) analytical core courses; (2) seminar workshops based on completed Rand studies, conducted by Rand project leaders or other senior participants, and (3) on-the-job training in ongoing Rand policy research projects. Dissertations are based on the applied work which students have done on their Rand research projects.

Many of the Rand students and a large part of the faculty have been trained in the natural and physical sciences, engineering, mathematics, and economics. The technological content of the program is strong, and the Institute wishes to make it still stronger through improvement of the core courses and workshops. For that purpose, and for partial support of student fellowships, visiting faculty, and occasional outside speakers, the Foundation made a three-year grant of $200,000 to the Rand Corporation.

- At Rice University education for public service takes place in the Jesse H. Jones Graduate School of Administration. The School believes in exposing students to problems and techniques applicable to both the private and the public sectors; it awards the degree of Master of Business and Public Management. Rice is now undertaking to strengthen the public management components of its program, with a view to creating a concentration in public management.

Specifically, Rice proposed to develop new courses in such areas as public financial management and regulatory agencies; to attract fifteen highly qualified students each year for the public management concentration, and to establish a summer internship program in government agencies for those students. It also proposed to begin planning for a Public Executive Development Program, for the continuing education of public officials.

The Foundation approved a two-year grant of $150,000 to Rice for those purposes. A 1978 grant of $20,000 assisted planning for the expanded public management program.

- The use of and demand for case-study materials in education for the public service is growing, and scholars in scores of institutions are producing such materials. Such cases, involving the application of analytical skills to concrete situations, have earned a secure place in business education; since 1957 their development and dissemination have been encouraged by the Intercollegiate Case Clearing House (ICCH), established by the Harvard Graduate School of Business Administration. In 1978 ICCH established the ICCH Council on Public Policy and Management to work toward the same objectives in public service education.

One of the Council's first actions was to publish and distribute a bibliography of existing public-policy case materials. Demand for this was so great that the Council has now embarked on an effort to build on the existing

momentum and to place the development of high-quality cases on a broad, permanent footing. Through an editorial board of leading educators in the field and a network of some 50 editors around the nation, it works to identify, publicize, and distribute selected high-quality cases in public policy and management. It also seeks, through public conferences and other means, to broaden awareness of the potential of case materials in public service education, and to increase academic recognition of the intellectual contributions made by scholars who develop cases.

In partial support of the ICCH Council on Public Policy and Management over three years, the Foundation made a grant of $150,000 to Harvard University.

- In 1977 Harvard University initiated its Interdisciplinary Programs in Health (IPH), designed to grapple with problems of health whose solution calls for knowledge beyond the specialized expertise of science and medicine. IPH is based in the Harvard School of Public Health and calls upon scholars from many parts of the University and from elsewhere as it studies problems like toxic chemicals in the environment.

In 1978 IPH appointed ten postdoctoral fellows, all but one from backgrounds in the natural sciences. An interdisciplinary symposium was launched, and a number of visiting scientists, professors of political science and business administration, and representatives of federal agencies shared their insights. The IPH director, Dr. Donald Hornig, is eager to broaden the number of disciplines represented by the fellows, and proposed to add several fellows trained in policy studies. He has designed a program in policy studies which would bring the fellows, both science-oriented and policy-oriented, into increased contact with faculty from the John F. Kennedy School of Government, the Harvard Business School, and the Law School. Joint research projects and seminars with the other schools are planned.

The Foundation made a two-year grant of $75,000 to Harvard University in partial support of the IPH policy studies fellows for two years.

Undergraduate Programs

Since 1976 the Foundation has made commitments totaling $2.6 million for support of undergraduate policy studies programs in eleven colleges and universities. The eleventh such grant and one for a somewhat related project were awarded in 1979.

- Stanford University has designed an interdisciplinary undergraduate program in public policy studies which it will offer in the 1980-81 academic year. Its objective is the education of future leaders who will be "more than technocrats," well-versed in economics, politics, quantitative and analytical methods, the workings of large organizations, and ethical and humanistic considerations in public policy issues. A set of core courses covering those

subjects and their relationship to public policy will be required. Prerequisites for the core will be courses in political science, statistics, and economics. After the core courses, students will engage in concentrated study of a particular area such as health care, arms control, or energy. They will also serve in summer internships.

The Stanford program's director, Prof. Nathan Rosenberg, states that its goal is "to force the student to a deeper realization of the nature of public policy problems, especially the inherent difficulties of dealing with multiple objectives and the inevitably conflicting interests of the separate groups which constitute the larger polity."

For support of course development and certain administrative costs of the Stanford program, the Foundation made a three-year grant of $367,000. Planning was supported by a 1977 grant of $32,500.

- Washington internships for undergraduates from a wide variety of institutions are provided by the Washington Center for Learning Alternatives (WCLA), a private, nonprofit educational organization established in 1975. WCLA's program includes housing and initial orientation for interns; individual supervision, evaluation, and counseling; a lecture and debate series, and cultural and social activities. Evening academic courses are taught in a wide range of subjects related to the interns' subject areas.

WCLA's initial recruiting efforts were centered in college departments of political and social science, and it has had increasing success in attracting such students for a semester's work in a Washington agency, usually in the federal government. Students majoring in the natural sciences have been fewer, for a number of reasons, and WCLA has begun a special effort to appeal to them. Placement opportunities have been developed in agencies concerned with health, space science, agriculture, communications, food and drugs, and other scientific matters. WCLA is training internship supervisors and developing an academic program specifically for science students, to begin in the spring of 1980.

While it is not assumed that many of WCLA's science interns will switch to careers in public service, the Washington experience may increase their awareness of career options and of the processes of policy formulation and implementation. The Foundation made a one-year grant of $70,000 to WCLA for start-up expenses of the science intern program. (Previous support of $35,000 in 1977 was granted for strengthening WCLA's general academic program.)

Public Policy Research

Research by faculty and sometimes students is a common feature of programs in education for the public service receiving Sloan support. On occasion the Foundation also supports policy research for its own sake. Some of this may in time become part of the curricula of the various schools.

• Resources for the Future (RFF), established in 1952 to explore the economics of natural resource management, later expanded its interests to a broad range of environmental issues and, still later, has placed increasing emphasis on analysis of policy alternatives under active public debate. It has been financed largely by the Ford Foundation, but in 1979 it succeeded in broadening its support sufficiently to establish a $22 million capital reserve fund, made up of contributions by Ford and other foundations and corporations. Income from the capital fund will insure the continuation of the core of RFF's research activities, although it will continue to seek grants for specific projects. Two such projects received Sloan support in 1979.

One RFF project will deal with alternatives to direct regulation in the management of environmental quality. It will evaluate the possibility of substituting economic incentives for traditional command and control regulatory methods in achieving environmental-quality goals. It will assess the effectiveness of using subtle pressures, working through prices and markets, to obtain desired actions in the environmental sphere. This project will be led by Clifford Russell and will run for three years.

The second project is an empirical study of the rulemaking procedures of the Environmental Protection Agency. The objective will be to understand the rulemaking process used to prepare highly technical regulations for a large number of dissimilar industries so that a basis for suggesting reforms in that process can be formulated. The approach will be to focus on one particular set of regulations, pertaining to the control of industrial effluent discharges into waterways, which are representative of a large number of technology-based standards promulgated by EPA and other federal agencies. Henry M. Peskin and Wesley Magat will direct this project, which is expected to take two years.

For these two research projects the Foundation made a three-year grant of $573,000 to Resources for the Future.

• How did government get so big? Until the beginning of the 19th Century, says Prof. Aaron Wildavsky, governments were, like many modern cities, virtually paupers. Several things happened in the 19th Century to change that, and those developments laid the basis for today's super-governments, with their enormous taxing and spending powers which are the object of so much current public disaffection.

Professor Wildavsky, of the Department of Political Science of the University of California, Berkeley, and Carolyn Webber have been studying the development of taxation and governmental budgeting down through history, beginning with ancient Mesopotamia in the fourth millennium B.C. Their research has brought them to the threshold of the 19th Century, where they discern four crucial developments: industrialization raised real incomes and the tax base; legislative government legitimized taxing and spending;

bureaucratic reform, especially development of budgetary practices and norms, increased government efficiency; and economic theory provided a rationale for new taxes.

A re-examination of the debates and controversies that surrounded these 19th Century reforms should aid in understanding the origins of current practices, and may be of help in charting the next round of reforms. After they complete their review of the 19th- and early 20th-Century background of today's revenue-raising practices, Wildavsky and Webber will turn to the growth of big-government finance in our own time. Their work is being assisted by a two-year grant of $165,000 to the University of California, Berkeley.

These other grants in 1979 were concerned with matters of public policy and public service education:

Albany Law School (Union University), Albany, N.Y. **$19,500**
For a program to enrich and improve the preparation of students for careers in public service in state and local government.

Fairleigh Dickinson University, Hackensack, N.J. **$20,000**
For partial support of a symposium of the School of Dentistry on regulatory issues in food content and labeling.

University of Rochester, Rochester, N.Y. **$10,000**
In support of a conference on the all-volunteer armed forces.

Book Program

The Foundation's Book Program, first discussed in the Report for 1976 (Page 29), gave birth in 1979 to two volumes by distinguished scientists. *Disturbing the Universe*, by Freeman Dyson, was enthusiastically acclaimed by nearly all of its reviewers, and *Advice to a Young Scientist*, by Sir Peter Medawar, also was warmly received.

Books in this series are intended "to convey to the educated lay reader a sense of the meaning of science and other forms of rational endeavor in the human and cultural contexts of which they are a part," in the words of a prospectus from the publisher, Harper & Row. The Sloan Foundation supports an advisory committee of eminent scholars which seeks out potential authors; once the authors have agreed to produce works for the series, they receive financial support necessary to bring their manuscripts to completion.

By the close of 1979 twelve scholars, in addition to Messrs. Dyson and Medawar, had agreed to write books for the Sloan series. Their names, fields, and affiliations are:

Jerome Bruner, psychology, Harvard University
E. Margaret Burbidge, astronomy, University of California, San Diego
Hendrik Casimir, physics, N.V. Philips, Eindhoven, Netherlands
Francis H. C. Crick, biology, The Salk Institute
John Pierce, engineering, California Institute of Technology
Isidor I. Rabi, physics, Columbia University
Gian-Carlo Rota, mathematics, Massachusetts Institute of Technology
Paul Samuelson, economics, Massachusetts Institute of Technology
Lewis Thomas, medicine, Memorial Sloan-Kettering Cancer Center
Sherwood Washburn, anthropology, University of California, Berkeley
Victor F. Weisskopf, physics, Massachusetts Institute of Technology
Robert R. Wilson, physics, Columbia University

Dr. Dyson is a mathematical physicist and theoretical astronomer at the Institute for Advanced Study, Princeton, N.J.; Dr. Medawar is a Nobel laureate in biology and director of the Clinical Research Centre in Harrow, England.

Additional authors are being commissioned, and it now seems likely that this program will continue until 1985 or longer. The first two books were completed rapidly and were published only a few months apart; it may be 1981 before another one appears in print. Thereafter probably two or three books a year will be issued until the planned total of 15 is reached.

The advisory committee, whose contacts with articulate scientists and other scholars throughout the world are indispensable to the series, is chaired by Dr. Robert L. Sinsheimer, chancellor of the University of California at Santa Cruz and a biologist. Its other members are Dr. Howard Hiatt, dean of the Harvard School of Public Health; Dr. Mark Kac, professor of mathematics at Rockefeller University; Dr. Robert Merton, professor of sociology at Columbia University; Dr. George Miller, professor of experimental psychology at Rockefeller University; Dr. Philip Morrison, professor of physics at Massachusetts Institute of Technology; Winthrop Knowlton, president of Harper & Row; Simon Michael Bessie, senior vice president of Harper & Row; and Stephen White and Arthur L. Singer, Jr., vice presidents of the Sloan Foundation.

Other General Program Grants

The Foundation makes some grants in pursuit of secondary interests which do not fall within its major program categories. Most of these are intended to advance educational activities of one sort or another; some are exploratory, designed to test the waters before a new program is launched; and a few are classified as "civic" grants, for the benefit of the greater New York area where the Foundation is situated.

History of Technology

• Since 1939 the fissionable atom has become a powerful and unsettling force in national and world affairs. McGeorge Bundy, whose career as an educator, public servant, and foundation executive has spanned roughly the full period of the atom's ascendancy, plans to spend the next five years on a multi-volume study to be entitled *The Nuclear Decades*. His base of research will be at New York University, where he is now a professor of history.

A fundamental aim of the Bundy study is the integration of scientific, military, and political data and differing conceptions of the use of nuclear technology, how it may be limited or controlled, and how nuclear policies have evolved in the last four decades. More specifically the aim is to discern ways in which nuclear technology has altered, enlarged, or circumscribed the foreign policy options of the nuclear powers. It is intended that the volumes produced by this study will reach a wide general audience.

Mr. Bundy is perhaps uniquely qualified to undertake such a task. During the 1950s he was a professor of government and dean at Harvard University. Beginning in 1961 he was for five years special assistant to the President for national security affairs. As president of the Ford Foundation thereafter he was responsible for a large program in arms control and international security, and for studies of nuclear energy policies, among other things. At present he is a member of the General Advisory Committee to the Arms Control and Disarmament Agency.

The focus of Mr. Bundy's study will of course be much broader than science and technology; but it is certainly those disciplines which brought the nuclear era into being with all of its political, military, and economic consequences. A five-year Sloan grant of $300,000 to New York University is supporting about half the cost of this project.

Research Libraries

• The escalating costs of operating major research libraries have been a concern of Sloan and other foundations for most of the 1970s. In 1974 the Sloan Foundation participated in financing the Research Libraries Group, an experiment by four libraries in the Northeast in sharing resources through a computerized bibliographic service. By 1978 a plan for a national bibliographic network, based at the Library of Congress, had been developed, and the Sloan Foundation joined with other foundations and the National Endowment for the Humanities in support of that project. Its first stage is a five-year, $6.1 million undertaking which is being managed by the Council on Library Resources.

The national bibliographic network, ultimately providing computerized access to cataloging data and other bibliographic services at the Library of Congress, will not be confined to research libraries. But it is recognized that the needs of research libraries are special—their operations are more complex and extensive than those of other libraries, and a special network, which would be an integral part of the larger national network, is required to serve them. The Research Libraries Group proposed to create such a network through further development of the most promising of the existing computerized bibliographic systems, the BALLOTS system at Stanford University.

To develop and operate the new network the Research Libraries Group established the Research Libraries Information Network (RLIN). With a potential market of about 200 libraries, RLIN hopes to be self-supporting in three to four years. It estimates that it will need $4.2 million to reach that point of self-sufficiency. Those funds are being raised through a combination of grants and loans from a number of interested foundations. For its part the Sloan Foundation made a two-year grant of $500,000 to the Research Libraries Group, which at present includes three of the original members—Columbia University, Yale University, and the New York Public Library—and nine other universities that joined in 1979.

Sloan Commission on Government and Higher Education

During 1979 the Sloan Commission on Government and Higher Education, established in 1977, held five meetings, the last in New York City in September. Early in 1980, a draft of its report was circulated to the Commission members and, after incorporating their final comments, it was delivered to the Ballinger Publishing Company in Cambridge. The report will appear in mid-1980. A summary version should be available several months earlier.

Expository Writing

- Declining writing skills among students remained among the Foundation's concerns in 1979. Although the Foundation decided that the writing problem did not lend itself to a formal program, one proposal of unusual interest resulted in a grant to the University of Montana. In Montana's experimental writing program the conventional freshman composition course, which is proving less and less effective in teaching students to write, will be preceded by courses in computer programming and symbolic logic. The hypothesis is that the computer's rigorous demand for clarity of expression (in the BASIC language), together with greater student awareness of the logical structure of a natural language (English), will result in better writing when the student sits down to construct an English composition.

Sixty students a year, representing a cross section of mainly the freshman class, will be selected for the experimental writing program; their progress will be compared with that of control groups taking the standard freshman English course. Faculty from the departments of computer science, philosophy, and English are revising the three elements of the experimental program to constitute a one-year course of study, to begin in the fall of 1980. The program is being assisted by a three-year Sloan grant of $85,000 to the University of Montana Foundation.

- Rose-Hulman Institute of Technology views the inability of a scientist or engineer to communicate his analyses and ideas as a serious professional handicap. It is mounting an Institute-wide effort to overcome such handicaps, principally by integrating the teaching of communication skills into its technical courses. For the first pilot and planning year of this multi-year effort the Foundation made a grant of $17,000 to Rose-Hulman, which is in Terre Haute, Ind.

Television

While most persons would agree that television has come to exert a significant influence on contemporary life, there is little agreement on just what that influence is or how strong it is. The Sloan Foundation does not have a formal program interest in television as such, but it recognizes that the impact of television on society is a question which will not go away. Accordingly, after due preparation, it convened a week-long seminar in June of 1979 at Chatham, Mass., on that nearly inscrutable topic, "The Impact of Television on Society."

The intention was to obtain as wide a range of views as possible, and in that sense the seminar succeeded. Psychologists, sociologists, anthropologists, and political scientists were mixed together with economists, journalists, authors, and practitioners of the arts and sciences of television itself. As might be expected, no consensus emerged, but at least a beginning was made toward defining the important questions. There is evidence that some of the influential scholars and practitioners who participated, nearly thirty in all, have begun to think about television in new ways, which may be reflected in their future work. One tangible product of the seminar is a book-length report by Stephen White, Vice President of the Sloan Foundation, which has been widely circulated and may be commercially published.

- The Foundation also has been interested in exploring the potential of television as an instructional device in schools and colleges. An approach which has been demonstrated once, but not repeated, is the production of television programs, accompanied by printed study materials, based on national and international events of extraordinary interest and importance. This was done in an instructional program that followed quickly on the death of Martin Luther King, Jr., in 1968.

WGBH, a public television station in Boston, has been sponsoring a series of discussions involving persons from journalism, television, education, and other fields looking toward the creation of a permanent structure for the production of such instructional programs. The discussions are in an exploratory stage; obviously many questions must be answered before any firm planning can begin. A Sloan grant of $40,000 to WGBH Educational Foundation is supporting this activity.

Four smaller grants involving various aspects of television were made in 1979:

Associated Western Universities, Inc. **$13,700**
For partial support over three years of efforts to expand the circulation of, and fields covered by, a bibliography of videotaped courses, limited to higher education, called THE Catalog.

University of California, San Diego **$20,000**
For exploration of a possible series of public television programs relating news events to academic subjects taught in junior and senior high schools.

Laybourne Lemle & Kahn, Inc., New York, N.Y. **$20,000**
For planning phase of a project called MEDIA PROBES, whose purpose is to explore the social influence of communications technologies.

New York Council for the Humanities, New York, N.Y. **$20,000**
For partial support of production of a series of four television documentary films on New York during the 1930s.

Other grants for educational and civic activities:

Aspen Institute for Humanistic Studies, Aspen, Col. **$18,860**
In partial support of a week-long policy-oriented workshop on vocational education.

Association of Independent Colleges and Universities in Massachusetts, Boston, Mass. **$1,000**
For printing and mailing to the Massachusetts higher education community copies of a study on higher education in Massachusetts.

The British Open University Foundation, Inc., New York, N.Y. **$15,000**
For partial support of the Open University's American office for one year.

Coalition of National Voluntary Organizations, Washington, D.C. **$20,000**
To assist CONVO and the National Council on Philanthropy in planning a new organization to strengthen the independent sector in American life.

Community Service Society, New York, N.Y. **$20,000**
For partial support of a project to train Community Service Society staff in systems theory and its application to organizational change.

Council on Foundations, Inc., Washington, D.C. **$20,000**
For 1979 membership support.

Duke University, Durham, N.C. **$20,000**
For support of a newsletter and other dissemination activities related to the computer-aided instructional program called Teaching Information Processing System (TIPS).

Education Writers Association, Woodstown, N.J. **$13,000**
For support over three years of the preparation, testing, and distribution of a manual and guide for education reporting in news media.

Hudson Institute, Croton-on-Hudson, N.Y. **$12,000**
In support of studies on various aspects of the mid- and long-term future.

The Lenox School, New York, N.Y. **$18,000**
For a special development project in the teaching of expository writing.

NAACP Legal Defense and Educational Fund, Inc., New York, N.Y. **$15,000**
For partial support of the Legal Defense Fund's program to commemorate the 25th anniversary of *Brown v. Board of Education*, the Supreme Court decision ending officially imposed segregation in the United States.

National Association of Educational Broadcasters, Washington, D.C. **$20,000**
For partial support of regional meetings to discuss the 1979 report of the Carnegie Commission on the Future of Public Broadcasting and proposed revisions of the Federal Communications Act.

Princeton University, Princeton, N.J. **$20,000**
For partial support of an expanded research-and-publication project of Prof. Fritz Machlup entitled *Knowledge: Its Creation, Distribution, and Economic Significance*.

United Student Aid Funds, New York, N.Y. **$20,000**
For partial support of a two-year project to modernize the computer system of the grantee.

Particular Programs

Minority Engineering Education

Early in the decade it became evident that if minority persons were to contribute their share to the solution of society's technological problems, special efforts would be required to increase the flow of blacks and other minorities into and through schools of engineering. The six traditionally black engineering colleges could not by themselves correct the low minority representation in the engineering profession; and the large "white" universities generally were not well equipped to deal with the special needs and problems of engineering students from markedly different cultural and educational backgrounds.

The Sloan Foundation encouraged some early initiatives to overcome the deficit of minority engineers, and in 1973 it launched its Particular Program in Minority Engineering Education, with a planned life of five to seven years and a planned expenditure of $12 million to $15 million. One of the first activities supported by this program was a study by a broadly representative task force which produced the influential report *Minorities in Engineering: A Blueprint for Action*, published in 1974. The report specified most of the necessary actions which have subsequently been taken to raise minority engineering enrollments, and provided detailed statistical projections of future enrollments and educational costs. A later Foundation-sponsored conference in June of 1975 focused on possible courses of action at the pre-college, secondary-school level to prepare minority youths for engineering study. It was at that level that about two thirds of the Particular Program's funds ultimately were invested.

Final grants for the Particular Program in Minority Engineering Education were awarded in 1979, bringing to $13.1 million the Foundation's total commitments for this purpose. The largest share, 43 per cent, went for the pre-college programs of the regional minority engineering consortia discussed

below. Another 22 per cent supported a specially created project at the State University of New York at Stony Brook to develop supplementary pre-engineering curricular materials for secondary schools. Lesser amounts went for programs of identification, recruitment, and summer enrichment activities for promising minority high-school students; for administrative support of a new national financial aid program, The National Fund for Minority Engineering students; and for support of graduate engineering education for minorities, principally through the National Consortium for Graduate Degrees for Minorities in Engineering.

Thus as the Sloan Foundation steps down from its major role in the national minority engineering effort, it is rather striking to observe the scope and variety of activities and institutions now in place because of the efforts of foundations, corporations, universities, public-school systems, and others. Those efforts are reflected in increased minority freshman enrollments, more than doubled since 1973, and in a lesser increase in those receiving undergraduate engineering degrees. The four underrepresented minorities singled out by the *Blueprint* task force—blacks, Chicanos, mainland Puerto Ricans, and native American Indians—still are underrepresented in engineering schools, partly because of the great increases in over-all engineering enrollments in the later 1970s; but progress has been made.

While the Foundation plans no further major grants for minority engineering education, and is looking toward support of other activities on behalf of minorities, Sloan funds will continue to flow into the effort for some time. Under some of the grants approved in 1979, and through some earlier ones, payments will continue to be made as late as 1982. This arrangement is intended to allow time for industry, other foundations, and perhaps government to assume larger roles in this vital national effort.

Regional Consortia

One of the most effective instruments for spreading awareness and developing skills needed by minority secondary-school students who might become engineers is the regional consortium. Such groupings of engineering colleges, school districts, local and regional industries, and community organizations now exist in six parts of the country. There are regional differences in how they operate, but in general they aim at mobilizing the resources of their participants for increasing the numbers and achievement levels of minority students as early as the seventh grade in the demanding courses needed as preparation for engineering study—science, mathematics, and English and communication skills. The focus is on the classroom where skills are actually taught, but a variety of other activities usually occurs, including field trips, visiting speakers, teacher training, club projects, programs for parents, summer sessions for students, and programs of recognition for high achievement.

Directors of the six consortia estimate that their programs reach as many as 35,000 students in 103 school districts in 18 states. (An undetermined number of non-minority students are in some of the same classes, so the benefits are not limited to minorities.) Support for two of the consortia, described below, was initiated or renewed in 1979. The four others, which received final grants before 1979, are Philadelphia Regional Introduction for Minorities to Engineering (PRIME); Mathematics, Engineering, Science Achievement (MESA, in California); Southeastern Consortium for Minorities in Engineering (SECME); and Texas Alliance for Minorities in Engineering (TAME).

- A minority engineering consortium for the Boston-Cambridge area, organized in 1978, was able to take advantage of the experiences of the older consortia in other regions, especially PRIME in the Philadelphia area. It is called the Massachusetts Pre-engineering Program for Minority Students. MassPep became operational in the fall of 1979 with five participating secondary schools in Boston and Cambridge. Within three years it expects 700 to 1,000 minority students to be participating directly in the program with many others being indirectly affected.

MassPep began with a fully developed plan including most of the successful features of the other regional programs, and with significant support and commitment from leading corporations which operate in the area. It involves the five major schools of engineering in the area (Massachusetts Institute of Technology, Boston University, University of Massachusetts at Amherst, Northeastern University, and Tufts University), the Wentworth Institute of Technology, the school systems of the two cities, governmental agencies, and key community organizations. The special pre-engineering instructional materials being developed by the National Coordinating Center for Curriculum Development (see below) will be used in the MassPep program.

Costs of the MassPep project are estimated at $465,000 for its first three years. The Foundation was asked to provide $200,000 and responded with a three-year grant of that amount to the Eastern Massachusetts Urban League, Inc. (Partial planning support of $15,000 was provided for MassPep through the same recipient in 1978.)

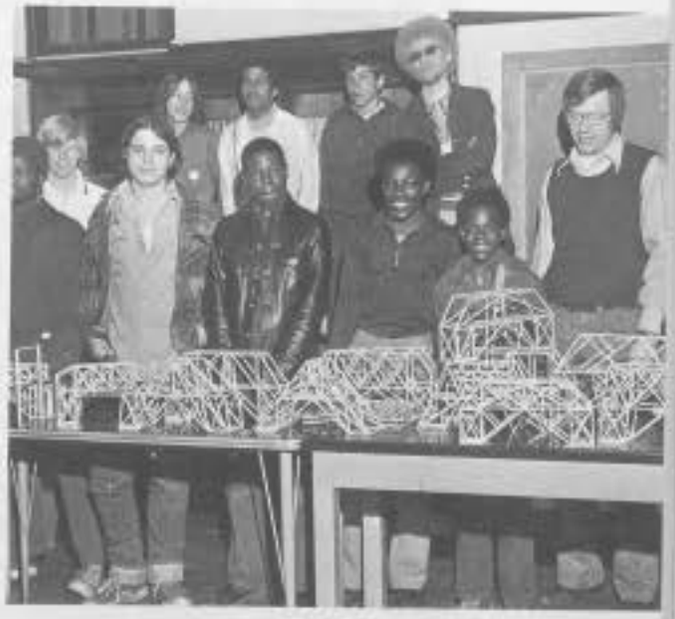
- In 1975 the Committee on Institutional Cooperation, an academic consortium based in Evanston, Ill., established with the Foundation's encouragement the Midwest Program for Minorities in Engineering. Including some institutions not members of CIC, the program is known as CIC + MPME and embraces 17 engineering schools: those on 13 campuses of the Big Ten universities plus the Illinois Institute of Technology, the University of Detroit, the University of Notre Dame, and Wayne State University. The member institutions, individually and in various combinations, conduct ten pre-college programs designed to increase the number of well-qualified minority matriculants at schools of engineering.

achusetts Pre-Engineering Program for Minority Students

Mathematics, Engineering, Science Achievement (Californi

Special activities designed to reinforce the interest of secondary-school students in engineering careers are a feature of the programs of regional minority engineering consortia around the nation. Engineers from industry visit students; students visit industrial facilities; and projects like building intricate wooden structures instill understanding of engineering principles.

Texas Alliance for Minorities in Engineering



Philadelphia Regional Introduction for Minorities to Engineerir

The two largest CIC programs are in Chicago and Detroit. In Detroit five engineering schools are working with 12 secondary schools with more to be added; in the Chicago area four schools of engineering and 23 secondary schools are participating. The Chicago program produced 145 minority engineering freshmen in 1977 and 226 in 1978. The other eight programs are on a somewhat smaller scale. Many of the individual programs are finding significant corporate support and most of the others are actively seeking it, so the continuation of a substantial part of the Midwest effort seems likely after Sloan support expires in 1981.

The Foundation made a final two-year grant of $600,000 for CIC + MPME to Northwestern University, bringing its total support of this consortium to $2.5 million.

• A program to enhance the mathematics and science proficiency of minority students in New York City's public schools is being expanded with assistance from Sloan. The Comprehensive Math and Science Program was initiated in 1975; four years later it involved six schools of engineering working with nine high schools. The engineering schools are those of the City College of New York, Columbia University, Cooper Union, Manhattan College, the Polytechnic Institute of New York, and Pratt Institute. Some 400 eleventh- and twelfth-graders were participating during the 1978-79 school year.

The current expansion involves the addition of three high schools and an increase of about 50 per cent in the number of participating students at that level, and the initiation of a program for grades seven through ten at appropriate schools. The latter program was projected to enroll about 700 students in the current academic year and twice that number next year. It was established in recognition of the fact that preparation for engineering studies must begin quite early in a student's pre-college schooling.

A third element of the New York effort is the introduction of a Unified Math and Science Program at Brooklyn Technical High School, which enrolls some 2,700 high-ability minority students. Many of those students drop out as freshmen; the new program is an effort to correct that situation through a modified curriculum which stresses the interdependence of science and mathematics and the relationship of both to the world of technology. The Brooklyn Tech program is being assisted by the National Coordinating Center for Curriculum Development.

The New York consortium, which is based at Columbia University, estimated the cost of all these activities through the 1980-81 academic year at $808,000. A substantial part of that amount is being provided by the New York City Board of Education and by corporations which have been contributing to the Comprehensive Math and Science Program. The Sloan Foundation agreed to provide $150,000 over a two-year period through a grant to Columbia University.

As one of its final contributions to the minority engineering education effort, the Foundation sponsored a two-day conference on the pre-college aspect of that effort in October of 1979 at Mount Kisco, N.Y. Intended to review progress and chart possible future directions, the meeting afforded an opportunity for an exchange of views and experiences among the directors of the six regional consortia, schoolteachers, engineering educators, and corporate representatives. A report on the conference was published as the Fall 1979 issue of the Foundation's newsletter, Work In Progress.

Curriculum Development

• Since engineering, unlike medicine and law, is an undergraduate professional program, the role of secondary schools in preparing students to enter it is crucial. The regional consortia work to strengthen schools through teacher training programs and by encouraging the introduction of advanced mathematics and science courses where they are lacking. Further academic support is provided by special pre-engineering curriculum materials produced by the National Coordinating Center for Curriculum Development (NCCCD).

Established in 1976 at the State University of New York at Stony Brook and supported since then by the Sloan Foundation, NCCCD works with engineering educators and secondary-school teachers to develop short, supplementary instructional modules in mathematics, science, and communications. The modules, in printed and audiotape form, are designed to present practical problems related to students' own experiences and to illustrate actual uses for the desired academic skills. They range in length from one class session to two weeks. The modules are tested in schools participating in the regional consortia and revised on the basis of feedback from teachers. NCCCD also develops guidance materials, teacher resource guides, activities for mathematics, science, and engineering clubs, and microcomputer programs in the relevant skills.

By the end of 1979, NCCCD had distributed more than 500,000 copies of 18 different modules, mostly for grades nine and ten, and was working on units for grades seven and eight, in response to teacher demand for more materials for the earlier grades. The completion, revision, and distribution of all the projected materials will occupy the Center staff until about the middle of 1981, by which time its total output will amount to about 90 weeks or 2½ years of academic high school course work. The Foundation made a final two-year grant of $570,000, payable to the Research Foundation of State University of New York, for completion of this phase of the project.

Graduate Education

• The lack of minority role models on engineering faculties has been a serious deterrent in the effort to encourage minority students to pursue engi-

neering study. Good jobs are available to any minority engineer holding a baccalaureate degree, and for most there is little incentive to undertake the additional studies required for an academic career. At Stanford University, the largest producer of graduate engineering degrees in the country, an effort is being made to solve this problem.

The proposed solution is straightforward: four or five teaching assistants, reporting to the associate dean for minority student affairs of the School of Engineering, are to work at recruiting minority engineering students, both at Stanford and elsewhere, for Master's and Ph.D. studies. The assistants provide initial orientation, tutoring, and counseling as needed by the students and try to make the most promising of them aware of the advantages of a Ph.D. degree. They will help Ph.D. candidates prepare for their oral examinations and place them in research assistantships where they can complete their Ph.D. programs. For support of these activities, the Foundation made a three-year grant of $150,000 to Stanford.

- A program in Engineering Teaching for Minority Students at the University of Michigan, initially supported by the Foundation in 1976, received a final grant of $15,000 in 1979.

- The American Indian Science and Engineering Society, based in Phoenix, Arizona, received a grant of $20,000 for expansion of its efforts to increase the number of native Americans in scientific and technical fields.

Cognitive Science

The Particular Program in Cognitive Science, which was inaugurated in 1977, entered its second phase in 1979. The first phase was concerned with initiating communication and dialogue among the numerous scientific disciplines which can contribute to an understanding of human mental processes. The second involves the establishment of formal training programs in the emerging discipline of cognitive science.

The field remains a somewhat loosely defined amalgam of subdisciplines at this early stage of its development. Its primary contributions come from the fields of computer science, psychology, linguistics, neuroscience, philosophy, and anthropology. Support of exploratory activities—workshops, brief interchanges of scientists among institutions, and interdisciplinary conferences—continued in 1979. An outgrowth of such activities has been the establishment of a solid base of multidisciplinary research in cognitive science at a number of universities. By 1979 several of these were ready to launch programs of advanced training, mainly at the postdoctoral level, for younger scientists who are willing and able to master more than one of the many disciplines involved in cognitive science.

Training Programs

- At the University of California, San Diego, the broad range of cognitive science interests is focused by the Center for Human Information Processing. Its members' interests include formal analyses of linguistic systems, neural mechanisms of cognitive functioning, and anthropological investigations of human belief systems. Previous Sloan support enabled the UCSD group to invite visiting scholars chosen for their expertise in relevant disciplines and to conduct conferences bringing together a variety of viewpoints on cognitive science.

UCSD is now instituting a postdoctoral training program drawing upon insights gained from computational methods, theoretical psychology, neuroscience, and related experimental techniques. The program also involves a few carefully selected graduate students. A Sloan grant of $500,000 over four years is assisting this second phase of the cognitive science program at UCSD.

- Massachusetts Institute of Technology during the first phase of Sloan support made significant strides toward establishing an integrated program of research and training in cognitive science. The Institute has rich resources in linguistics, philosophy, artificial intelligence, speech research, cognitive psychology, and neuroscience. Its administration has supported the creation of a Center for Cognitive Science which will draw upon all of those resources and provide some new ones. M.I.T. workshops on aspects of cognitive science have led to a number of new collaborative research projects, and new courses and seminars have been created.

A Sloan grant of $500,000 will support the first four years of a new pre- and postdoctoral training program in cognitive science at M.I.T.

- At Carnegie-Mellon University a group headed by Prof. Herbert Simon and Prof. Allan Newell has been working in areas related to cognitive science for many years. The Foundation in 1975 made a grant of $200,000 to Carnegie-Mellon for research on the educational implications of information-processing psychology, a field which has become one of the cornerstones of cognitive science.

Carnegie-Mellon is now instituting a postdoctoral research and training program which it anticipates will broaden and strengthen its pioneering efforts in cognitive science. New avenues of research have been identified, and renewed Sloan support will make possible their exploration along with the development of new cognitive scientists. A three-year grant of $420,000 is supporting this activity.

- The University of Pennsylvania during its first phase of Sloan support identified three principal disciplines—computer science, linguistics, and psychology—in which its faculty's strengths would provide a solid base for an integrated program in cognitive science. The research at Penn focuses on three strategic areas: inferential processes in language learning, the structure and function of discourse, and cognitive development. Each of these areas of research requires collaboration among several disciplines, and together they provide a productive environment for the training of future cognitive scientists.

Penn's second-phase program will involve ultimately five postdoctoral fellows and the continuation of small workshops which have proven to be helpful in consolidating and exchanging research results. It is being assisted by a three-year Sloan grant of $400,000. A supplemental grant of $15,000 was made later in the year to permit the adaptation of new computer facilities for use by cognitive scientists.

- Development of cognitive science at the University of Texas, Austin, has been based on strong departments of linguistics, psychology, and computer science. Recently those faculties have been further strengthened and the University has established a Center for Cognitive Science. Workshops and symposia conducted with earlier Sloan support have led to a number of new collaborative research projects. On that basis the University proposed to initiate a training program for cognitive scientists at the pre- and postdoctoral level, and the Foundation responded with a three-year grant of $416,000.

- At Yale University the emphasis is on the interaction of artificial intelligence with cognitive psychology. Yale's computer scientists, in collaboration with psychologists, have developed a number of computer programs which possess a considerable capacity to mimic such human behaviors as understanding newspaper articles, skimming and summarizing news stories, and understanding the plans and goals of characters in short stories. Work with these programs is expected to yield new insights into many human cognitive processes.

Yale is now instituting a training program which will build on this interdisciplinary foundation. It will involve ultimately six predoctoral and six postdoctoral fellows, most of them previously trained in psychology. Additions to faculty in cognitive science also are planned. The Foundation made a grant of $450,000 over three years for this effort at Yale.

Exploratory Activities

- The need to establish closer links among scholars in the various disciplines contributing to cognitive science has been recognized for some time at the University of California, Berkeley, and in 1979 an interdepartmental coordinating committee was appointed to expedite the necessary interactions. Disciplinary isolation will be attacked in several ways: a seminar series involving both Berkeley faculty and visiting scientists is planned; the visitors, chosen for their ability to provide "missing links" between fields, will be in residence for extended periods. In addition, the program will provide time for faculty to develop new seminars on specialized interdisciplinary topics and to interact more extensively with each other and with the visiting scientists. A two-year Sloan grant of $242,000 is supporting these activities. A 1979 summer conference for planning the Berkeley cognitive science program was supported by a separate grant of $19,000.

- A stimulating dialogue between cognitive psychologists and scientists studying event-related brain potentials began with the aid of a 1978 Sloan grant to the University of Illinois. Event-related potentials (ERP's), recorded from the scalp of a person performing cognitive tasks involving memory, recognition of faces, and the like, appear to be potentially useful tools for psychologists studying cognitive function. The organizers of the first workshop on this topic proposed to conduct additional annual sessions to explore in detail

some of the issues identified as critical to the utilization of ERP's in cognitive science. For support of two such meetings the Foundation made a grant of $62,000 to the University of Illinois at Urbana-Champaign.

• One of the aims of philosophy is explaining how intelligent behavior occurs; in the branch of computer science known as artificial intelligence, there is a quite similar concern with analyzing intelligent behavior, partially as a means toward constructing intelligent artifacts. It would seem, therefore, that philosophers have much to learn from artificial-intelligence theorists, and vice versa; and it is recognized that both fields have an important bearing on cognitive science.

A group of leading philosophers and artificial-intelligence practitioners is working together in a year-long study to identify and sort out the problems concerned with intelligent behavior in physical and biological systems which their fields share. This collaboration is taking place in Palo Alto, Cal., at the Center for Advanced Study in the Behavioral Sciences, which received a Sloan grant of $140,000 for its partial support.

• A multidisciplinary workshop on biological information processing, conducted at Cold Spring Harbor Laboratory in the summer of 1978, turned up some intriguing leads which the participants wished to pursue further. The Foundation in 1979 made a grant of $31,000 to Cold Spring Harbor for two additional workshops to explore in greater depth some of the issues that arose in 1978. The 1979 session was concerned with computer models of specific neural networks; a related subject in cognitive science will be chosen for the 1980 workshop.

Communications

• Cognitive science, like any young and vigorous field, is characterized by controversy and debate. An important forum for that debate is *The Behavioral and Brain Sciences*, published by Cambridge University Press. This journal deals specifically with current controversial issues in cognitive science; routine research reports are not accepted.

An unusual feature of *The Behavioral and Brain Sciences* is the publication, along with each article, of about thirty commentaries from scientists in a broad array of disciplines and the author's response to the commentaries. This peer commentary process lends the journal much of its value, and it also involves unusual expenses. To assist in meeting them for two years, the Foundation made a grant of $115,000 to Cambridge University Press.

Work continued during 1979 on perfecting a document describing the state of the art in cognitive science. This has proven to be not an easy task, given the fluid condition of the field, but a preliminary version of the state-of-the-art paper, prepared by a committee of distinguished scientists from the

several disciplines involved in cognitive science, has stimulated wide discussion and strong reactions. These are being taken into account as the Foundation proceeds in developing a comprehensive survey of the field. Internal appropriations totaling $68,000 were made for this work in 1979.

Two smaller grants were made in this field in 1979:

Brown University, Providence, R.I. **$15,000**
For supplemental support of cognitive science computer facilities.

Indiana University, Bloomington, Ind. **$15,000**
For partial support of a conference on genetic and experiential factors in perceptual development.

Policies and Procedures

The Alfred P. Sloan Foundation was established in 1934 by Alfred P. Sloan, Jr. and was incorporated in the state of Delaware. Mr. Sloan, who was for many years the chief executive officer of General Motors Corporation, was active in the affairs of the Foundation until his death in 1966.

The Foundation's basic interests are in science and technology, in economics and management, and in education and problems of society related to those interests. It operates through a General Program and through one or more Particular Programs, which are designed to concentrate specified resources on a closely defined problem area for a limited period of time.

The Foundation's program interests do *not* extend to religion, the humanities, the creative and performing arts, and medical research except for that conducted at the Sloan-Kettering Institute for Cancer Research. Requests involving activities outside the United States generally are discouraged, and the Foundation does not entertain requests for endowment funds, general support, or buildings, or for equipment which is not directly related to a Foundation-supported project. No grants are made directly to individuals.

Application may be made at any time for support of activities falling within the above guidelines. There are no deadlines and no special application forms except in the Sloan Fellowships for Basic Research. Letters of application usually are addressed to the President of the Foundation, and should state: (1) the specific nature of the problem to be attacked; (2) how the applicant plans to attempt to solve the problem; (3) the name(s) and qualifications of the person(s) to be responsible for the project; and (4) the expected cost and duration of the project. Often a preliminary letter of inquiry will be useful in helping the Foundation staff to determine whether submission of a full proposal would be appropriate. Like any foundation, the Alfred P. Sloan Foundation is obliged to decline many more proposals than it supports. Even where a proposal appears to be of merit and is clearly within program, it must compete with many other proposals for a share of the limited funds available to the Foundation.

A grant application should be accompanied by documents indicating the applicant's tax-exempt status and its classification as either a private foundation or a publicly supported organization.

The Foundation is governed by a Board of Trustees assisted by a professional staff. Final disposition of all proposals is the responsibility of members of the Board.

Financial Review

Financial Review

The financial statements and schedules of the Foundation, which have been audited by Deloitte Haskins & Sells, independent certified public accountants, appear on pages 59 to 75. They include the balance sheets, the statements of income and fund balance, the statements of changes in financial position, the schedules of administration and investment expenses, the schedule of marketable securities, and the schedule of grants and appropriations.

Investment and other income for 1979 was $18,173,000, an increase of $1,814,702 from $16,358,298 in 1978. This increase was for the most part due to the higher interest rates which prevailed during 1979.

After the deduction of investment expenses and provision for Federal excise tax from investment and other income, net investment income was $17,398,259 in 1979 as compared with $15,692,483 for the prior year. For 1979, investment expenses totaled $356,741, of which $301,059 represented investment counsel fees. Provision for Federal excise tax amounted to $418,000. The total of these deductions in 1979 was $774,741 versus $665,815 in 1978.

The total of grants and appropriations authorized and administration expenses during 1979 was $15,266,602. This sum was $2,131,657 under 1979 net investment income. Of this total, grants and appropriations amounted to $13,941,693 while administration expenses were $1,324,909. Over the Foundation's forty-five year history, the cumulative excess of grants and expenses over income has amounted to $52,127,214.

Grant and appropriation payments in 1979 were $13,140,877, compared with $13,436,958 the prior year. Together with 1979 administration expenses, investment expenses and Federal excise taxes paid, the total of cash expenditures in 1979 was $15,140,319, while in 1978 the amount was $15,723,143.

The market value of the Foundation's total assets was $252,057,634 at December 31, 1979, including marketable securities valued at $251,954,855, as compared with total assets of $244,599,756 at December 31, 1978. A summary of the Foundation's marketable securities at ledger amount and quoted market value at December 31, 1979 appears on page 64.

A listing of grants made during 1979 will be found on pages 72 to 75. Grants and appropriations authorized and payments during the year ended December 31, 1979 are summarized in the following table:

Grants and appropriations authorized but not due at January 1, 1979	$13,915,327
Authorized during 1979	13,941,693
	27,857,020
Payments during 1979	13,140,877
Grants and appropriations authorized but not due at December 31, 1979	$14,716,143

Income from investments credited to the General Motors Dealers Appreciation Fund during 1979, after provision for Federal excise tax, amounted to $267,665. During the year, a grant of $600,000 to the Sloan-Kettering Institute for Cancer Research was authorized, applied and paid against this Fund, as set forth on page 16.

The net worth of the Foundation at December 31, 1979, based on quoted market values, was divided as follows:

	Total Assets At Market Value	Grants and Appropriations Authorized But Not Due For Payment	Accrued Federal Excise Tax	Fund Balances At Market Value
General Fund	$248,464,021	$14,716,143	$413,656	$233,334,222
General Motors Dealers Appreciation Fund	3,593,613	—	6,306	3,587,307
Total	$252,057,634	$14,716,143	$419,962	$236,921,529

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AUDITORS' OPINION

Alfred P. Sloan Foundation:

We have examined the balance sheets of Alfred P. Sloan Foundation as of December 31, 1979 and 1978 and the related statements of income and fund balance and of changes in financial position for the years then ended. Our examinations were made in accordance with generally accepted auditing standards and, accordingly, included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, such financial statements present fairly the financial position of the Foundation at December 31, 1979 and 1978 and the results of its operations and the changes in its financial position for the years then ended, in conformity with generally accepted accounting principles applied on a consistent basis.

Our examinations also comprehended the supplemental schedules of administration and investment expenses for the years ended December 31, 1979 and 1978 and the supplemental schedules of marketable securities at December 31, 1979 and grants and appropriations for the year then ended. In our opinion, such supplemental schedules, when considered in relation to the basic financial statements, present fairly in all material respects the information shown therein.

Deloitte Haskins + Sells

February 8, 1980

Balance Sheets

December 31, 1979 and 1978

	1979	1978
Assets		
Marketable Securities:		
Fixed income securities:		
U.S. Government and agency obligations	$ 46,273,657	$ 48,303,039
Corporate and other	33,492,362	22,595,390
Total fixed income securities	79,766,019	70,898,429
Common stocks:		
General Motors Corporation	41,677,643	41,677,643
Other common stocks	108,511,966	108,429,372
Total common stocks	150,189,609	150,107,015
Total marketable securities (quoted market: 1979—$251,954,855; 1978—$243,949,426)	229,955,628	221,005,444
Cash	102,779	650,330
TOTAL	$230,058,407	$221,655,774
Obligations and Fund Balance		
Grants and Appropriations Authorized But Not Due for Payment	$ 14,716,143	$ 13,915,327
Accrued Federal Excise Tax	419,962	319,754
Fund Balance	214,922,302	207,420,693
TOTAL	$230,058,407	$221,655,774

See accompanying Notes to Financial Statements.

Statements of Income and Fund Balance

For the years ended December 31, 1979 and 1978

	1979	1978
INCOME:		
Investment income:		
Dividends	$ 11,608,372	$ 11,985,382
Interest	6,488,629	4,295,063
Other	75,999	77,853
	18,173,000	16,358,298
Less:		
Investment expenses	356,741	348,354
Provision for Federal excise tax	418,000	317,461
	774,741	665,815
Net investment income	17,398,259	15,692,483
Grants and expenses:		
Grants and appropriations authorized	13,941,693	13,314,469
Administration expenses	1,324,909	1,293,867
Total	15,266,602	14,608,336
Grants and expenses under income for the year	2,131,657	1,084,147
Cumulative excess of grants and expenses over income from inception to:		
Beginning of year	(54,258,871)	(55,343,018)
End of year	(52,127,214)	(54,258,871)
PRINCIPAL:		
Balance at beginning of year	261,679,564	258,644,968
Net gain on disposals of securities	5,369,952	3,034,596
Balance at end of year	267,049,516	261,679,564
FUND BALANCE AT END OF YEAR	$214,922,302	$207,420,693

See accompanying Notes to Financial Statements.

Statements of Changes in Financial Position

For the years ended December 31, 1979 and 1978

	1979	1978
SOURCE OF FUNDS:		
Investment and other income	$18,173,000	$16,358,298
Net gain on disposals of securities	5,369,952	3,034,596
	23,542,952	19,392,894
APPLICATION OF FUNDS:		
Grant and appropriation payments	13,140,877	13,436,958
Administration expenses	1,324,909	1,293,867
Investment expenses	356,741	348,354
Federal excise taxes paid	317,792	643,964
	15,140,319	15,723,143
INCREASE (DECREASE) IN FUNDS CONSISTING OF:		
Change in ledger value of investments	8,950,184	3,262,362
Change in cash balances	(547,551)	407,389
NET CHANGE	$ 8,402,633	$ 3,669,751

See accompanying Notes to Financial Statements.

Notes to Financial Statements

1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

The accompanying financial statements have been prepared substantially on the accrual basis of accounting and, accordingly, reflect all significant assets and liabilities. Investment income and investment and administration expenses are recorded on the cash basis, the effect of which on the accompanying financial statements is not materially different from the accrual basis.

Marketable securities purchased are carried at cost; those received by gift or bequest are carried at quoted market value at date of gift or bequest. Gain or loss on disposal of securities is determined generally on the basis of first-in, first-out cost, but in certain instances the identified certificate basis is used. Net gain or loss on disposals is applied to the principal fund.

Grant appropriations are accrued at the time authorized by the Trustees and the Federal excise tax is accrued in the year to which it relates.

2. RETIREMENT PLAN

The Foundation has a defined contribution retirement plan covering substantially all employees under arrangements with Teachers Insurance and Annuity Association of America and College Retirement Equities Fund which provides for purchase of annuities for employees. Retirement plan expense was $118,203 and $113,792 for 1979 and 1978, respectively.

3. LEASE

The Foundation's lease for its office space expires April 30, 1985. The lease contains an escalation clause which provides for rental increases resulting from increases in real estate taxes and certain other operating expenses. Under the lease, rent was $238,521 in 1979 and $235,853 in 1978 before sublease income.

Schedule of Administration and Investment Expenses

For the years ended December 31, 1979 and 1978

	1979	1978
ADMINISTRATION EXPENSES:		
Salaries and employee benefits:		
Salaries	$ 686,121	$ 664,377
Employees' retirement plan and other benefits	204,058	188,975
	890,179	853,352
Rent (net of sublease rentals of approximately $33,000 and $31,000, respectively)	206,661	205,109
Program expenses	114,800	96,732
Office expenses and services	98,100	128,445
Reports and publications	28,006	29,613
Auditing and legal	42,845	38,945
Total administration expenses	1,380,591	1,352,196
Less: Allocation of administration expenses applicable to investments	55,682	58,329
Balance of administration expenses applicable to grant making	$1,324,909	$1,293,867
INVESTMENT EXPENSES:		
Investment counsel fees	$ 301,059	$ 290,025
Allocation of administration expenses applicable to investments	55,682	58,329
Total investment expenses	$ 356,741	$ 348,354

Schedule of Marketable Securities

December 31, 1979

SUMMARY	Ledger Amount	Quoted Market Value Amount	Quoted Market Value Percent of Total Investment
Fixed income securities:			
U.S. Government and agency obligations	$ 46,273,657	$ 42,901,138	17.0%
Corporate and other	33,492,362	31,294,131	12.4
Total fixed income securities	79,766,019	74,195,269	29.4
Common stocks:			
General Motors Corporation	41,677,643	50,000,000	19.9
Other common stocks	108,511,966	127,759,586	50.7
Total common stocks	150,189,609	177,759,586	70.6
Total marketable securities	$229,955,628	$251,954,855	100.0%

FIXED INCOME SECURITIES	Principal Amount	Ledger Amount	Quoted Market Value
U.S. Government and Agency Obligations:			
Treasury Notes:			
7½%—January 31, 1980	$2,000,000	$ 1,971,250	$ 1,993,120
7⅝%—February 29, 1980	2,000,000	1,990,938	1,984,360
8%—May 31, 1980	1,400,000	1,397,812	1,375,052
8⅝%—September 30, 1980	1,000,000	998,828	973,430
7⅜%—May 15, 1981	2,100,000	2,088,188	1,995,000
7⅞%—March 31, 1982	2,500,000	2,485,938	2,353,125
8¼%—June 30, 1982	4,090,000	4,068,716	3,862,473
7%—November 15, 1983	1,700,000	1,668,437	1,517,250
7¼%—February 15, 1984	1,100,000	1,102,922	987,250
8%—February 15, 1985	500,000	501,094	453,750
7⅞%—May 15, 1986	3,252,000	3,498,797	2,875,971
8¼%—May 15, 1988	1,000,000	989,219	888,750

FIXED INCOME SECURITIES	Principal Amount	Ledger Amount	Quoted Market Value
Treasury Bonds:			
8⅝%—August 15, 1993	$1,000,000	$ 993,750	$ 873,120
8⅝%—November 15, 1993	1,000,000	1,000,469	873,750
10⅛%—November 15, 1994	4,000,000	4,012,642	3,962,480
8⅜%—August 15, 2000	1,000,000	988,125	847,500
9⅛%—May 15, 2009	4,000,000	3,734,128	3,667,480
Federal Home Loan Mortgage Corporation Mortgage Participation Certificates:			
10¾%—September 1, 2009	1,186,760	1,110,066	1,091,819
10¾%—October 1, 2009	1,791,145	1,675,392	1,647,853
Federal National Mortgage Association Debentures:			
7.05%—March 10, 1981	1,100,000	1,034,000	1,041,216
7.25%—June 10, 1981	300,000	297,656	281,718
6.65%—June 10, 1982	1,000,000	1,002,500	903,120
7.65%—March 11, 1985	2,000,000	1,991,250	1,747,500
8.60%—June 10, 1985	1,000,000	1,000,312	911,250
6.05%—February 1, 1988	1,000,000	996,250	746,250
Twelve Federal Land Banks Consolidated Bonds:			
7.30%—October 20, 1982	1,000,000	1,007,500	911,870
7.35%—January 20, 1997	2,795,000	2,667,478	2,134,681
Total U.S. Government and agency obligations		46,273,657	42,901,138
Corporate and Other:			
Short term:			
Undivided interest in demand notes:			
Atlantic Richfield Company	108,000	108,000	108,000
Federated Department Stores, Inc.	248,000	248,000	248,000
General Electric Company	607,000	607,000	607,000

Schedule of Marketable Securities

December 31, 1979 (Continued)

FIXED INCOME SECURITIES	Principal Amount	Ledger Amount	Quoted Market Value
Corporate and Other (Continued):			
Undivided interest in demand notes (continued):			
General Motors Acceptance Corporation	$ 153,000	$ 153,000	$ 153,000
Tenneco Corporation	8,000	8,000	8,000
Bankers' Acceptances:			
Citibank N.A.			
13½ %–February 7, 1980	500,000	489,312	492,950
Certificates of Deposit:			
Bank of America N.T. & S.A.			
14⅛ %–January 14, 1980	2,000,000	2,000,000	2,000,440
Continental Illinois National Bank & Trust Co.			
12⅝ %–January 4, 1980	1,800,000	1,800,000	1,799,838
13⅝ %–January 21, 1980	1,300,000	1,300,000	1,300,078
Manufacturers Hanover Trust Co.			
11¾ %–January 2, 1980	3,500,000	3,500,000	3,499,650
14¼ %–January 8, 1980	1,500,000	1,500,000	1,500,210
Commercial Paper:			
J.C. Penney Financial Corporation			
13.82%–January 14, 1980	2,100,000	2,100,000	2,100,000
Debentures:			
General Motors Acceptance Corporation			
5%–September 1, 1980	1,300,000	1,300,000	1,235,000
Total short term		15,113,312	15,052,166
Long term:			
Aluminum Company of Canada Limited, Sinking Fund Debentures			
9½ %–March 1, 1995	1,000,000	1,012,500	856,250

FIXED INCOME SECURITIES	Principal Amount	Ledger Amount	Quoted Market Value
Corporate and Other (Continued):			
American Telephone and Telegraph Company Debentures			
4⅜ %–April 1, 1985	$1,500,000	$ 1,518,210	$ 1,155,000
Continental Oil Company Sinking Fund Debentures			
8⅜ %–June 1, 2001	1,000,000	1,000,000	845,000
Dow Chemical Company Sinking Fund Debentures			
8⅜ %–May 1, 2000	1,337,000	1,382,240	1,096,340
E.I. duPont de Nemours & Company Notes			
8%–May 1, 1986	1,000,000	938,750	850,000
General Motors Acceptance Corporation Debentures			
5%–March 15, 1981	1,500,000	1,492,500	1,395,000
Georgia-Pacific Corporation Notes			
7¼ %–January 15, 1985	2,000,000	1,820,132	1,690,000
Household Finance Corporation Debentures			
8½ %–May 15, 1983	1,000,000	997,500	915,000
International Business Machines Corporation Notes			
9½ %–October 1, 1986	1,000,000	948,028	961,250
International Paper Company Sinking Fund Debentures			
8.85%–March 15, 1995	1,500,000	1,553,750	1,231,875
Manufacturers Hanover Trust Company Capital Debentures			
8½ %–June 1, 1985	1,000,000	973,440	861,250

Schedule of

December 31, 1979 (Continued)

FIXED INCOME SECURITIES	Principal Amount	Ledger Amount	Quoted Market Value
Corporate and Other (Continued):			
Ohio Bell Telephone Company Debentures 9%–November 1, 2018	$2,000,000	$ 1,846,000	$ 1,680,000
Pacific Northwest Bell Telephone Company Debentures 10⅛%–October 1, 2019	2,000,000	1,896,000	1,825,000
Security Pacific Corporation Notes 8.80%–December 15, 1985	1,000,000	1,000,000	880,000
Total long term		18,379,050	16,241,965
Total corporate and other		33,492,362	31,294,131
Total fixed income securities		$79,766,019	$74,195,269

COMMON STOCKS	Number Of Shares	Ledger Amount	Quoted Market Value
American Home Products Corporation	65,000	$ 1,936,825	$ 1,771,250
American Telephone and Telegraph Company	45,000	2,516,817	2,345,625
Anheuser-Busch Companies	60,000	1,325,000	1,350,000
Avon Products, Inc.	60,000	3,159,150	2,362,500
Baltimore Gas and Electric Company	50,000	1,389,650	1,106,250
BankAmerica Corporation	60,200	1,338,086	1,663,025
Bell Telephone Company of Canada	88,200	1,370,323	1,532,475
Bristol-Myers Company	40,000	1,276,820	1,480,000
Caterpillar Tractor Company	15,000	491,744	810,000

Marketable Securities

COMMON STOCKS	Number Of Shares	Ledger Amount	Quoted Market Value
Central Telephone & Utilities Corporation	50,000	$ 1,279,085	$ 1,268,750
Citicorp	46,000	1,524,025	1,092,500
Cities Service Company	20,000	1,151,714	1,670,000
Coca-Cola Company	40,000	1,624,677	1,380,000
Colgate-Palmolive Company	100,000	1,469,989	1,437,500
CPC International Inc.	19,000	904,060	1,147,125
Deere & Company	20,000	756,376	782,500
Delta Air Lines, Inc.	30,000	1,216,225	1,173,750
Dow Chemical Company	60,200	1,630,311	1,933,925
Eastman Kodak Company	50,000	2,110,789	2,406,250
Exxon Corporation	70,000	1,926,828	3,858,750
Federal National Mortgage Association	80,000	1,309,891	1,290,000
Federated Department Stores, Inc.	70,000	2,203,100	1,933,750
First Bank System, Inc.	30,000	1,258,350	1,185,000
First Chicago Corporation	57,456	630,518	890,568
First National Boston Corporation	30,000	865,200	862,500
Florida Power & Light Company	50,000	1,253,792	1,250,000
Foxboro Company	20,000	733,133	752,500
Gannett Company, Inc.	20,000	789,300	957,500
General Electric Company	50,000	2,287,451	2,531,250
General Motors Corporation	1,000,000	41,677,643	50,000,000
General Reinsurance Corporation	18,000	1,893,850	1,746,000
General Telephone & Electronics Corporation	60,000	1,648,272	1,695,000
Georgia-Pacific Corporation	70,000	1,948,500	1,846,250
Gulf United Corporation	20,000	301,800	425,000
Halliburton Company	45,000	1,881,724	3,825,000
INA Corporation	2,100	98,523	103,688
International Business Machines Corporation	192,000	5,321,227	12,360,000
International Minerals & Chemical Corporation	24,000	932,760	1,389,000
Fred S. James & Company, Inc.	25,000	534,679	631,250
Johnson & Johnson	20,000	1,829,399	1,585,000

Schedule of

December 31, 1979 (Continued)

COMMON STOCKS	Number Of Shares	Ledger Amount	Quoted Market Value
K mart Corporation	50,000	$ 1,175,075	$ 1,187,500
Kerr-McGee Corporation	23,200	1,453,248	1,571,800
Kraft, Inc.	40,000	1,882,500	1,910,000
Eli Lilly & Company	20,000	1,122,900	1,195,000
Lincoln National Corporation	20,000	863,200	875,000
Manufactures Hanover Corporation	25,000	798,787	778,125
McDonalds Corporation	25,000	1,048,072	1,084,375
Middle South Utilities, Inc.	90,000	1,207,800	1,136,250
Minnesota Mining and Manufacturing Company	25,000	1,139,088	1,256,250
Mobil Corporation	30,000	562,702	1,650,000
Monsanto Company	25,000	1,726,075	1,490,625
J. P. Morgan & Co., Inc.	70,000	1,310,880	3,237,500
Motorola, Inc.	40,000	1,604,575	2,045,000
Nabisco, Inc.	50,000	1,159,662	1,093,750
Natomas Corporation	60,000	1,770,450	1,815,000
Northwest Airlines, Inc.	50,000	1,317,500	1,381,250
Pacific Gas & Electric Company	50,000	1,103,500	1,150,000
J. C. Penney Company	69,400	4,007,249	1,813,075
Perkin-Elmer Corporation	60,000	1,283,549	2,520,000
Pioneer Hi-Bred International, Inc.	30,000	709,375	802,500
Procter & Gamble Company	25,000	532,772	1,856,250
RCA Corporation	120,000	3,157,700	2,655,000
Ralston Purina Company	115,000	1,610,202	1,265,000
Schlumberger Limited	48,900	692,993	4,584,375
Seagram Company Limited	30,000	898,900	1,218,750
Sears, Roebuck & Company	102,610	1,600,162	1,846,980
Southeast Banking Corporation	75,760	1,553,844	1,089,050
Square D Company	60,000	1,382,219	1,395,000
Squibb Corporation	51,000	2,305,438	1,925,250
Sterling Drug, Inc.	70,000	1,241,413	1,400,000
Tenneco, Inc.	60,600	1,911,467	2,348,250
Times Mirror Company	15,000	423,007	547,500

Marketable Securities

COMMON STOCKS	Number Of Shares	Ledger Amount	Quoted Market Value
Travelers Corporation	30,000	$ 1,153,400	$ 1,143,750
Union Camp Corporation	30,000	1,344,963	1,260,000
Upjohn Company	35,000	1,603,887	1,653,750
Whirlpool Corporation	60,000	1,104,762	1,125,000
Xerox Corporation	10,000	628,687	621,250
Total common stocks		150,189,609	177,759,586
Total fixed income securities		79,766,019	74,195,269
Total marketable securities		$229,955,628	$251,954,855

Schedule of Grants and Appropriations

	Authorized But Not Due Dec. 31, 1978	1979 Authorized	1979 Payments	Authorized But Not Due Dec. 31, 1979
Albany Law School—Union University		$ 19,500	$ 19,500	
American Assembly of Collegiate Schools of Business		20,000	20,000	
American Association for the Advancement of Science		100,000	50,000	$ 50,000
American Council on Education	$ 105,000		50,000	55,000
American Economic Association	60,000		60,000	
American Indian Science and Engineering Society		20,000	20,000	
Arizona, University of		20,000	10,000	10,000
Aspen Institute for Humanistic Studies		18,860	18,860	
Associated Western Universities, Inc.		13,700	13,700	
Association for the Integration of Management, Inc.	20,000		20,000	
Association of Independent Colleges and Universities in Massachusetts		1,000	1,000	
Babson College	79,000		39,500	39,500
Barnard College	9,900		9,900	
Boston University	36,800		36,800	
Brandeis University	19,800	13,000	32,800	
British Columbia, University of	9,900	20,000	19,900	10,000
British Open University Foundation, Inc.		15,000	15,000	
Brookings Institution	100,000		100,000	
Brown University	109,900	15,000	99,900	25,000
California, University of	1,301,600	1,132,427	1,247,027	1,187,000
California Institute of Technology	89,500	20,000	99,500	10,000
Cambridge, University of		115,000	50,000	65,000
Carnegie Institution of Washington	200,000		200,000	
Carnegie-Mellon University	75,000	440,000	85,000	430,000
Case Western Reserve University	50,000		50,000	
Center for Advanced Study in the Behavioral Sciences		140,000	40,000	100,000
Chicago, University of	350,800	310,000	329,800	331,000
Clemson University	9,900		9,900	
Coalition of National Voluntary Organizations		20,000	20,000	
Cold Spring Harbor Laboratory	50,000	131,000	81,000	100,000
Colorado, University of		80,000	40,000	40,000
Colorado State University	9,900	14,296	24,196	
Columbia University	139,800	216,500	201,300	155,000
Community Service Society		20,000	20,000	
Cornell University	169,800	40,000	139,800	70,000
Council on Foreign Relations, Inc.		20,000	20,000	
Council on Foundations, Inc.		20,000	20,000	
Council on Library Resources	480,000		120,000	360,000
Council on Science and Technology for Development	20,000		20,000	

	Authorized But Not Due Dec. 31, 1978	1979 Authorized	1979 Payments	Authorized But Not Due Dec. 31, 1979
CUNY Urban Academy for Management, Inc.	$ 200,000		$ 100,000	$ 100,000
Dartmouth College	50,000		50,000	
Denver, University of	137,000		106,000	31,000
Drew University		$ 20,000	20,000	
Duke University	119,900	50,100	100,000	70,000
Earlham College		20,000	20,000	
Eastern Massachusetts Urban League, Inc.	15,000	200,000	40,000	175,000
Education Writers Association		13,000	13,000	
Fairleigh Dickinson University		20,000	20,000	
Florida, University of	9,900		9,900	
Foundation Center, The	80,000		40,000	40,000
George Washington University	30,000		30,000	
Georgia Tech Foundation, Inc.	500,000		300,000	200,000
Georgia Tech Research Institute	50,000		50,000	
Guelph, University of	9,900		9,900	
Harvard University	99,700	475,000	270,200	304,500
Harvey Mudd College		19,000	19,000	
Hudson Institute		12,000	12,000	
Illinois, University of	29,700	82,000	70,700	41,000
Indiana University	19,800	15,000	34,800	
Institute for Advanced Study		13,880	13,880	
Iowa State University		20,000	10,000	10,000
Johns Hopkins University	9,900		9,900	
Joint Council on Economic Education		44,000		44,000
Kansas State University		20,000	10,000	10,000
Kentucky Research Foundation, University of	9,900	40,000	29,900	20,000
Lawrence University	160,000		75,000	85,000
Laybourne Lemle & Kahn, Inc.		20,000	20,000	
Lenox School		18,000	18,000	
Marquette University	10,000		10,000	
Maryland, University of		470,200	40,200	430,000
Massachusetts, University of	132,700		132,700	
Massachusetts Institute of Technology	625,000	546,404	411,404	760,000
Mathematical Association of America, Inc.		37,500	37,500	
McMaster University	9,900		9,900	
Meharry Medical College	300,000		60,000	240,000
Miami, University of	90,000	100,000	90,000	100,000
Michigan, University of	9,900	55,000	44,900	20,000
Michigan State University		20,000	10,000	10,000
Minnesota, University of		20,000	10,000	10,000
Missouri, University of		20,000	10,000	10,000
Montana, University of		85,000		85,000
NAACP Legal Defense and Educational Fund, Inc.		15,000	15,000	

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(Continued)

	Authorized But Not Due Dec. 31, 1978	1979 Authorized	1979 Payments	Authorized But Not Due Dec. 31, 1979
National Academy of Sciences		$ 20,000	$ 20,000	
National Association for the Exchange of Industrial Resources	$ 5,000		5,000	
National Association of Black Accountants, Inc.		20,000	20,000	
National Association of Educational Broadcasters		20,000	20,000	
National Bureau of Economic Research, Inc.	35,000	300,000	135,000	$ 200,000
National Fund for Minority Engineering Students	600,000		250,000	350,000
NERCOMP, Inc.		18,500	18,500	
Nevada, University of		5,000	5,000	
New York Council for the Humanities		20,000	20,000	
New York Public Library	125,000		100,000	25,000
New York University	70,000	354,572	164,572	260,000
New York Zoological Society		20,000	20,000	
North Carolina, University of	110,000	13,924	68,924	55,000
Northwestern University	9,900	850,000	272,400	587,500
Notre Dame, University of		20,000	10,000	10,000
Oberlin College	180,000		100,000	80,000
Ontario Institute for Studies in Education	100,000		100,000	
Palace of Arts and Science Foundation		15,000	15,000	
Pennsylvania, University of	29,700	455,000	139,700	345,000
Pennsylvania State University	29,700		29,700	
Philadelphia Regional Introduction for Minorities to Engineering (PRIME)	175,000		100,000	75,000
Pittsburgh, University of	9,900	10,569	20,469	
Princeton University	179,700	415,000	444,700	150,000
Princeton University Press	100,000		100,000	
Public Communication Foundation for North Texas		20,000	20,000	
Purdue University		60,000	30,000	30,000
Rand Corporation	90,000		90,000	
Rand Graduate Institute		200,000		200,000
Research Foundation of the City University of New York		44,444	44,444	
Research Foundation of the State University of New York	300,000	627,082	497,082	430,000
Research Libraries Group		500,000	250,000	250,000
Resources for the Future, Inc.	100,000	573,500	205,000	468,500
Rice University	9,900	150,000	79,900	80,000
Rochester, University of	100,000	50,000	80,000	70,000
Rockefeller University	9,900		9,900	
Rose-Hulman Institute of Technology		17,000	17,000	
Rutgers University		10,000	10,000	
Salk Institute for Biological Studies		20,000	10,000	10,000

Grants and Appropriations

	Authorized But Not Due Dec. 31, 1978	1979 Authorized	1979 Payments	Authorized But Not Due Dec. 31, 1979
SIAM Institute for Mathematics and Society	$ 56,000		$ 28,000	$ 28,000
Sloan-Kettering Institute for Cancer Research		$ 600,000	600,000	
Society for Neuroscience		30,000	30,000	
Southern California, University of	29,900	20,000	39,900	10,000
Stanford University	446,600	597,000	644,600	399,000
Stevens Institute of Technology		20,000	20,000	
Swarthmore College	100,000			100,000
Syracuse University	9,900	430,590	230,490	210,000
Texas Alliance for Minorities in Engineering, Inc.	6,500		6,500	
Texas, University of	288,900	496,000	353,900	431,000
Toronto, University of	9,900		9,900	
Tulane University	159,900		159,900	
United Student Aid Funds		20,000	20,000	
Universities Research Association, Inc.		6,000	6,000	
Vanderbilt University		20,000	10,000	10,000
Washington Center for Learning Alternatives		70,000	70,000	
Washington University	119,800		69,800	50,000
Washington, University of	9,900		9,900	
Wayne State University	29,700	(9,900)	19,800	
Wellesley College	165,000		80,000	85,000
Wentworth Institute of Technology		20,000	20,000	
Wesleyan University		20,000	10,000	10,000
WGBH Educational Foundation		40,000	40,000	
Williams College	50,000		50,000	
Wisconsin, University of	89,800		89,800	
Yale University	223,800	607,000	403,800	427,000
Sloan Commission on Government and Higher Education	569,604	500,000	756,282	313,322
Sloan Fellowships for Basic Research to be granted in ensuing year	1,550,000			1,550,000
Officer Grant appropriation for grants in ensuing year	850,000			850,000
Book Program	490,417	200,000	43,880	646,537
Other appropriations for grants and related expenses	86,206	94,689	93,611	87,284
	13,915,327	14,077,337	13,276,521	14,716,143
Reduction for Grant Transfers		135,644	135,644	
TOTAL GRANTS AND APPROPRIATIONS	$13,915,327	$13,941,693	$13,140,877	$14,716,143

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Alfred P. Sloan Foundation

Founded in 1934 by Alfred P. Sloan, Jr. (1875-1966)

Report for 1980

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President's Statement

President's Statement

As an economist, I naturally take particular interest in the Foundation's program in my own discipline. In the early years of the Foundation, as stated in its first report at the close of 1938, virtually all its grants were for economics research and economics education. As other programs grew in the fields of management education, science, and engineering, economics became less important. By the 1950's, economics was no longer the Foundation's predominant activity and in the five years ending in 1973, less than three percent of the Foundation's grants were made directly in the field of economics.

A revival of the Foundation's interest and activity in economics began in 1973, initiated by two officers, Arthur L. Singer, Jr., and Stephen White, and soon strongly supported by two new economist trustees, William G . Bowen and George P. Shultz. Unhappily, both of these valued trustees, whose services to the Foundation were superlative, were forced by the press of other obligations not to stand for reelection in 1980.

In the period before 1973, the Foundation supported research in economics largely at the Brookings Institution and the National Bureau of Economic Research, and this support has continued since. To this it added a five-year program of economics education for journalists at Princeton University, which terminated on schedule in 1980, having successfully increased the sophistication in economics of about forty young reporters. The Foundation has also supported graduate workshops in applied microeconomics at a number of major universities. The first round of grants supported work at 10 universities over a period of five years generally beginning in 1975. A second round began in 1980 with grants to eight universities, of which four were new to the program. More second-round grants, in all probability, will be made in 1981. In each round, the Foundation has had the benefit of advice from a committee of outside economists chaired by Professor

Robert M. Solow of the Massachusetts Institute of Technology. In addition to its university grants, the Foundation has increased the number of independent research institutions to which it makes grants in economics. Recent developments in these areas are described elsewhere in this report.

The Foundation now provides substantially more money for the support of research and graduate training in economics in the United States than any other private foundation. Its expenditures, however, are smaller than those of the National Science Foundation, and several other private foundations do more than Sloan to support the education of the general public in economics and to support economics research and training overseas.

As one of its small grants in economics in 1980, the Foundation paid for a special issue of *The Public Interest*, devoted to discussion of "The Crisis in Economic Theory," in which a dozen economists appraised the present state of their discipline from divergent points of view. The results were most curious and disturbing. A casual reader might well conclude that economics is made up of sects somewhat less peaceable than schools of psychiatric practice or Middle Eastern States. He would wonder why any serious and sober foundation would support research or training in a discipline that is in such utter disarray.

This casual reader would nevertheless be under a misimpression. We may note first that the warring sects are of very unequal size. Some of the 12 contributors to "The Crisis in Economic Theory" are in the mainstream of American or British academic economics, while others represent views that have few adherents in English-speaking countries.

A more important point was made in the article contributed by Allan H. Meltzer. He argues that much of the disagreement is not about economic theory, but about economic policy. Policy cannot be determined solely by the progress of science. It must always involve as well social values not subject to scientific refutation. If physicists who agree on how to construct an atom bomb disagree strongly on whether one should have been dropped on an inhabited place, it is immediately obvious to all that the disagreement does not concern theoretical physics. Policy differences in economics are not this sharply divorced from theory. Keynesians and monetarists differ on policy in large part because their theories differ, though divergent social objectives may also play a role.

Policy differences are much narrower, however, in the field of applied microeconomics, which is precisely the part of economics that the Sloan Foundation has been supporting. It is our view that further progress can be made in this field from a firm base.

The area of professional agreement is based on the theory of the determination of prices and quantities in the markets for particular goods and services, popularly called the laws of supply and demand. If the price of gasoline doubles, economists will all predict that consumers will use less gasoline, and that the reduction in use will be greater in the long run than in the short run. Non-economists often argue that people must have gasoline to get to work, and that

therefore a change in price will not change the quantity demanded. In time such hypotheses are refuted by the evidence.

To be sure, economic theory does not predict whether the decrease in quantity demanded will be 10 percent or 30 percent, and such differences can be very important. Estimating parameters of this sort is the business of the newer specialty of econometrics, which is making rapid progress.

Sometimes consensus in microeconomic theory leads to consensus about economic policy. For example, economists of widely divergent views on other matters favored the deregulation of the airlines, and correctly predicted that it would lead to lower fares and increased frequency of service. However, this consensus involves more than agreement about theory. It involves a shared judgment that the interests of the traveling public should be given more weight than those of the employees and stockholders of airlines that had monopoly rights to certain routes under regulation. This is a social, not a scientific judgment.

The field of economics that *is* in disarray is macroeconomics, the field that deals with the general level of employment and prices. For two decades after World War II, this part of the discipline was dominated in the English-speaking world by the followers of John Maynard Keynes. Now monetarists, the new rational expectations school, and advocates of the gold standard all challenge the Keynesian view vigorously, while Keynesians themselves are divided into several factions.

The source of the malaise is the rapid inflation of recent years, and much of the contention arises over methods of combating inflation. Should anti-inflationary policy rely solely on control of the money supply and rigorous fiscal discipline or should it also use such tools as wage and price controls or guidelines? Should international financial markets determine exchange rates among currencies, or should the world return to a regime of fixed exchange rates?

Underlying such policy disputes is a disagreement about the root causes of inflation. Is it at heart a monetary phenomenon, does it result from unwise fiscal policy, or does it arise from the excessive power of oil cartels, trade unions, farm blocs, and large corporations? I have oversimplified some quite subtle questions in the interests of brevity and in order to make the point that these questions are in principle matters of fact and theory, not social values, and should be amenable to scientific investigation.

The confused state of macroeconomics, even in 1973, was one of the factors that led the Foundation to emphasize applied microeconomics in its own program. Yet the issues posed by macroeconomics are crucial to all market economies. At some time in the future, the Foundation may want to support research in this area on a substantial scale. When it does, I believe that it must keep one principle foremost. The officers and trustees of a major private foundation should not attempt to determine *a priori* which of the warring sects is the true faith, and to help it furnish its arsenal. It should support scholars of proven ability or demonstrated promise, especially those with innovative proposals, regardless of their

view on policy, or their adherence to a particular school. It should risk support of scholars whose work challenges accepted wisdom. The truth sometimes lurks in unsuspected places, and it is not given to us, especially in fields surrounded by controversy, to know in advance where these may be.

Albert Rees

Policies and Procedures

Policies and Procedures

The Alfred P. Sloan Foundation was established in 1934 by Alfred P. Sloan, Jr., and incorporated in the state of Delaware. Mr. Sloan, who for many years was the chief executive officer of General Motors Corporation, was active in the affairs of the Foundation until his death in 1966. Information about the Foundation's assets and disbursements appears in the last section of this report.

The Foundation's main interests are in science, technology, economics, management, and education for the public service; and in instructional programs, and problems of society, related to those interests. The Foundation's activities do not extend to primary or secondary education, or to the humanities, religion, the creative or performing arts, or to medical research. Grants are not made for endowments or for buildings or equipment, and are very rarely made for general support or for activities outside the United States.

Application can be made at any time for support of activities falling within the above guidelines. Grants of $20,000 or less are made throughout the year by the officers of the Foundation; grants over that amount are made by the trustees, who meet five times a year for that purpose. Letters of application are normally sent to the president of the Foundation and include information about the applicant, the work the applicant proposes to do, the cost and duration of the work, and in the case of new applicants the tax status of the organization that would administer the grant unless it is a recognized institution of higher education. The Foundation has no deadlines or standard application forms. Often a brief letter of inquiry, rather than a fully developed proposal, is an advisable first step for an applicant, conserving his time and allowing the Foundation to give the applicant a preliminary response as to the possibility of support.

The Foundation's funds are spent in two ways: on programs and activities that are developed by the Foundation's staff and for which grants are made,

usually on a competitive basis, in support of individuals and institutions; and in response to proposals that come unsolicited to the Foundation and that are also judged competitively, often with the help of outside reviewers. In both categories, the Foundation unfortunately is obliged to turn down many more proposals, sometimes proposals of great merit, than its resources will allow it to support.

General and Particular Programs

In 1969 the Foundation adopted a new mode of operation that distinguished between the "general program," under which the established interests of the Foundation were pursued, and a set of "particular programs," which focused on more sharply defined topics for limited periods of time. Four particular programs were developed and carried to completion between 1969 and 1979: one to increase the number of minority students in medicine and management; one to support experimental work in educational technology; one to help establish the new discipline of neuroscience; and one to increase the number of minority students in engineering. Total expenditures in each of these programs came to between $9 million and $14 million over a period of five-to-seven years.

Inflation has reduced the value of the Foundation's grant dollar by more than half since the concept of particular programs was adopted; and the original plan, which called for two or three particular programs to operate concurrently, has had to be modified. It now appears likely that the Foundation can sustain at most two, and possibly only one, such program at a time. The fifth particular program, in cognitive science, is now in operation and is discussed later in this report.

Grants and Activities in 1980

Two New Programs

Late in 1980 the trustees of the Foundation approved in principle two new programs that will formally begin in 1981. One is concerned with the process by which the United States selects its Presidents; the other is concerned with giving senior scientists an opportunity to take part in the discussion of national issues in science and other fields and to exercise an influence on public policy.

The Presidential Selection Process

The officers and staff of the Foundation began early in 1980 to share with a large proportion of the nation's informed citizenry a growing apprehension about the workings of the system by which the President of the United States was selected. It was clear that this apprehension was in no sense a matter of partisan bias: it was felt by members of all political parties and by individuals holding all varieties of political opinion. The system was seen by most of those who considered it thoughtfully to be interminably long, excessively costly, disruptive of governmental processes, and above all unlikely in the end to offer the voter a choice among the best candidates who might be available.

This problem was well beyond the ordinary range of the Foundation's activities, but the officers and staff believed it of such importance, and so appropriate for action by a private foundation, that a thorough examination of what the Sloan Foundation might do was undertaken. In due course this examination led to approval by the trustees of the Foundation of a long-term study, to begin in 1981, of the system by which American Presidents are chosen. From the beginning, there was no thought in the Foundation of a study that would attempt to deal with the short-term problem of the next presidential election; it was assumed that other persons and groups would soon be at work to frame reform recommendations for 1984, and that assumption appears to have been borne out by recent developments.

The Sloan study will be done by Alexander Heard, chancellor of Vanderbilt University, and will extend over several years at a probable cost in excess of $2 million. Mr. Heard will devote a portion of his time to the study until his retirement as chancellor in approximately two years. After that the study will become his principal activity at Vanderbilt.

Before becoming chancellor at Vanderbilt in 1963, Mr. Heard had a distinguished career as a political scientist at the University of North Carolina. He was a long-time student of politics in the southern United States and his book, *The Costs of Democracy,* published in 1960, is the principal scholarly work on the financing of American political parties and campaigns. He was chairman of a Commission on Presidential Campaign Costs appointed by President Kennedy and he was advisor to Presidents Johnson and Nixon on a variety of governmental and educational matters. Since 1972 Mr. Heard has been chairman of the board of trustees of the Ford Foundation.

In accepting the Sloan Foundation's invitation to direct this study, Mr. Heard said in a public statement about the project in December 1980:

> I have said in my discussions with officers of the Sloan Foundation, and they have fully concurred, that it would be a mistake to view this study as an abstract intellectual exploration. Rather, its purpose will be to contribute in tangible ways to an improved political system. The adequacy of the present presidential selection process is one element, and a central element, in the broader need to accommodate an 18th century Constitution to 21st century circumstances and requirements. The study will necessarily be concerned with the vital interests of individual citizens and organized groups and will not be confined to the perceptions and judgments of scholars alone.
>
> There is no intention to offer immediate solutions to the problems presented by the presidential selection process as it has come to exist in recent years. No doubt others will organize studies directed toward making changes before the election of 1984. They can be extremely useful in both illuminating issues and influencing change. Our own purposes look beyond the next election. The questions we hope to grapple with are too complex and fundamental to be resolved in a limited period of time. I, myself, am persuaded that the best service we can provide is to define and illuminate issues, and by so doing help to set the stage for a national debate that is likely to last out the century. It may be that immediate recommendations that might ameliorate the present system will emerge, but such recommendations will not be our central concern, nor will we set out to design some kind of model electoral system.

The study is designed to call for counsel from members of government, leaders of political parties, representatives of the media, foreign observers of American affairs, representatives of commerce and industry, representatives of population groups and geographic regions, and defenders of special interests whose concern with the selection process is intense. In his preliminary plans for the study, Mr. Heard contemplates the formation of committees of correspond-

ence, much like those that were of great importance during colonial times, to join with him in the conduct of the work.

The nature of the present process of selecting the President has generated dissatisfaction during the course of the last several elections, and that dissatisfaction has become even more widespread in recent years. The process is charged with eliminating able candidates at early stages, discouraging serious debate over issues, and disrupting the conduct of government. There is concern over the role of the media, the decline of cohesive political parties, the number, costs, and timing of primaries, and the constitutional provisions governing presidential primaries. The study will deal with these and related matters in a fashion that will examine their interrelationships and their significance for American government in its broadest aspects.

The study will be conducted at Vanderbilt, where staff support will be made available to Mr. Heard. The duration of the study has not been determined but in all likelihood it will continue until 1985. A more detailed statement about this project is available from the Foundation on request.

Science Fellowship Program

The second new program approved by the Foundation's trustees in 1980, and for which grants are contemplated in 1981, is related to one of the major fields in which the Foundation has been active for a large part of its existence — the support of science. That support has taken many forms, among which has been included a certain amount of support for scientific research and for higher education in science. But with the passage of years, the range of opportunities for useful Foundation activity in the field of science has altered considerably. Costs associated with research in the natural sciences have mounted sharply and in most areas of science now lie beyond the resources of any private foundation. Costs associated with graduate education in the natural sciences are also reaching formidable levels. The primary responsibility for maintaining the nation's scientific capability has passed to the federal government, which applies funds to the problem that private organizations cannot hope to match.

It is more or less the case that a private foundation today can do for science what the federal government has not yet found its way to do or what government, for special reasons, should not do. That state of affairs is by no means to be deplored. A total reliance on government would render the support, however lavish, imperfect in many ways; there is a sense in which foundation support, however paltry its share of the scientific dollar, is more essential than ever to the health of science. One way in which foundation support might be useful is in making it possible for outstanding scientists to take an active part in the process of policy formation at the national level. The government has a continuing need for scientific counsel of this kind in areas such as environmental protection where there is a strong scientific component, but also in areas such as public utility and

transit rates in which the need for technological advice is not nearly as obvious and might be overlooked.

What is needed, the Sloan Foundation believes, is a program that will allow some manageable number of scientists an extended period in Washington, a period during which they might build their own competence in policy formation and take an active role in public discussion and as counselors to government. Accordingly, the trustees of the Foundation have approved the establishment of a science fellowship program that is expected to begin on a modest scale in 1981, providing support for perhaps three senior scientists to spend a year in Washington attached to a non-governmental institution. If the program develops as expected, it will grow in succeeding years to support more fellows, possibly at more than one institution.

Memorial Sloan-Kettering Cancer Center

A grant in 1980 of $3,587,307 to Memorial Sloan-Kettering Cancer Center marked the end of an era for the Sloan Foundation and, it might be said, the end of an unusual chapter in American philanthropy. For the last 35 years, the Foundation has maintained a special relationship with the institution now known as Memorial Sloan-Kettering Cancer Center. The Center has two operational entities: Memorial Hospital for Cancer and Allied Diseases, and the Sloan-Kettering Institute for Cancer Research; the whole, widely known simply as "Sloan-Kettering," is managed through a third corporation — Memorial Sloan-Kettering Cancer Center. Although the Foundation has not been active in medical or cancer research since 1964, its regular support of Sloan-Kettering has been an exception to that policy.

The special relationship between the Foundation and Sloan-Kettering began in 1945 with a series of discussions that representatives of Memorial Hospital of New York had with Alfred P. Sloan, Jr. At issue was the question of how a center dedicated to research on cancer might be financed as a division of Memorial Hospital. The assets of the Foundation at that time were about $7 million. When the trustees voted a grant in 1945 of $2 million to Memorial Hospital for the construction of an institute for cancer research that would bear the name of both Mr. Sloan and his long-time associate and close friend, Charles F. Kettering, the Foundation sold U.S. Treasury bonds and General Motors stock to raise the funds with which to make the grant. Each year thereafter, the Foundation made a grant toward the operating expenses of Sloan-Kettering, starting at $200,000 and rising by 1975 to $600,000. Many additional grants, often in substantial amounts, were made to Sloan-Kettering over the years for buildings and equipment and other purposes. The Foundation has a settled policy against the financing of capital projects, but Sloan-Kettering was again an exception.

Many but by no means all of the grants to Sloan-Kettering came from a special fund within the Foundation called the General Motors Dealers Apprecia-

For the last 35 years, a special relationship has existed between the Sloan Foundation and the institution now known as Memorial Sloan-Kettering Cancer Center. Grants over that period of time to Sloan-Kettering, plus personal gifts from Alfred P. Sloan, Jr., total $67 million. Sloan-Kettering is now supported by many organizations and individuals and is the largest private institution in the world for the treatment of cancer and for cancer-centered research and training. (Above) Tissue specimens are subdivided and prepared for tissue cultures in a completely enclosed safety cabinet; and (below) a research nurse prepares tests for surgery patients in an anesthesia laboratory — surgery is being performed in the background.

tion Fund for Cancer and Medical Research. This fund was established in 1949 with gifts to the Sloan Foundation from General Motors dealers who wished to express their appreciation to Mr. Sloan for the work he had done over a period of years to strengthen the relationship between General Motors and its dealer organizations. The funds thus received, $1,525,000, were added to the other assets of the Foundation for investment purposes, but a separate account was kept in the name of the General Motors Dealers Appreciation Fund.

By 1965 the value of this fund had increased to $13.5 million, but the fund's balance in succeeding years was greatly reduced by the regular grants made from it to the Sloan-Kettering Institute. The grant of $3,587,307 announced by the Foundation in 1980 represented a transfer of the remaining assets of the General Motors Dealers Appreciation Fund to Sloan-Kettering, thus ending the special relationship between the two institutions that began in 1945. During that 35-year period, the Foundation's total gifts to Sloan-Kettering came to $34 million. Personal gifts from Alfred P. Sloan, Jr., during his lifetime and at his death, came to an additional $33 million, bringing the total benefactions attributable to Mr. Sloan to $67 million.

Today Sloan-Kettering is the largest private institution in the world for the treatment of cancer and for cancer-centered research and training. A few statistics for 1979 suggest the extent of work and activity that go on at Sloan-Kettering:

- —The staff totaled 5,249 persons, including 297 attending physicians, 210 physicians in training, 724 registered nurses, 230 research scientists, and 764 technicians.
- —Memorial Hospital, with 565 beds, treated 15,338 patients; and its 35 specialty outpatient clinics accommodated 134,394 visits.
- —The Sloan-Kettering Institute had 102 laboratories covering 237,300 net usable square feet of space; its scientific staff published 850 papers in professional journals in 1979.
- —The operating budget was $165,295,749, of which about $40 million was spent on research and training.

The history of growth at Sloan-Kettering is as good an illustration as might be found of the function private foundations can sometimes fill in providing venture capital for the first stages of an attack on a major problem of society—to be followed by government with its far greater funds that are indispensable to the ultimate solution of the problem. Private funds alone could not hope to meet the present budget of Sloan-Kettering or to finance the present pace of research and treatment. Private support remains essential to the Sloan-Kettering Institute—foundation grants and gifts from thousands of individuals now meet one-quarter of the Institute's budget, the other three-quarters coming from federal agencies. The budget for Memorial Hosptial is met primarily by third-party medical payments and patient fees. (Total federal support for cancer research, through the National Cancer Institute and the National Institutes of Health, is now over $2 billion a year.)

If there is no longer public discussion of the intractability of cancer, much of the credit goes to Sloan-Kettering. Few informed persons now doubt the eventual success of the struggle to control this ancient affliction of mankind. The Sloan Foundation looks back on its relationship with Sloan-Kettering with both pride and humility; both are interwoven in the part the Foundation and Mr. Sloan played in launching and helping grow beyond the Foundation's own ken one of the world's pre-eminent cancer centers.

Cognitive Science

The program in cognitive science, the Foundation's only current "particular program," is approximately halfway through its life cycle. It began in 1977 with grants to help researchers from loosely related academic fields work together on problems of understanding human mental processes. The first phase of the program in cognitive science was devoted mostly to bringing together scholars from the fields of psychology, linguistics, neuroscience, philosophy, anthropology, and computer science to begin the process of interdisciplinary discussion and research. Phase two of the program, emphasizing postdoctoral training in the emerging field of cognitive science, began in 1979 and continued in 1980. Support also continued in 1980 for planning and exploratory projects.

The Foundation is assisted in all aspects of the cognitive science program by an outside advisory committee whose members are:

Robert Q. Marston, President, University of Florida; chairman of the committee

William Kessen, Department of Psychology, Yale University

Seymour Kety, Professor of Psychiatry, Harvard Medical School

William A. Nierenberg, Director, Scripps Institution of Oceanography

Jerome Posner, Memorial Sloan-Kettering Cancer Center

Sherwood Washburn, Department of Anthropology, University of California, Berkeley

Trustee Grants in 1980

Training Projects

University of Chicago Chicago, Illinois 60637	**$450,000** (over three years)
University of Michigan Ann Arbor, Michigan 48104	**$430,000** (over three years)

After a lengthy planning period, these two institutions were ready in 1980 to begin a collaborative, but separately financed, program of postdoctoral training in cognitive science. The program will draw on the complementary strengths of each institution and will focus on interdisciplinary training in computer science, linguistics, philosophy, psychology, and anthropology. Both short-term study groups and workshops of longer duration will explore topics of mutual interest to researchers at the two schools. A series of shared cognitive science colloquia will also be conducted on each campus, and other collaborative activities will be undertaken.

Faculty members at both institutions are now doing computer studies of problem solving and control of action; linguistically oriented studies of pragmatics and logic; and psychological investigations of reasoning and decision making. The variety of research interests in this joint university program has an attractive balance, covering input processes to the brain (perception, attention), higher processes (reasoning, inference), and output processes (skilled movement, speech). Work on these topics weds two distinct approaches to cognitive science: one, the normative approach, deals at a theoretical level with the problem of what methods might be used for representing and processing information; the other, the empirical approach, is concerned with the methods human beings actually use for coding and processing information.

The Chicago-Michigan collaboration has a distinctive character within the field of cognitive science, and the Foundation hopes that other university collaborations may follow this one. Present restrictions on the growth of academic institutions make it highly improbable that any single school will be able to build a program in cognitive science that will cover all aspects of the field. In the future it will be essential for institutions to develop cooperative arrangements similar to those of Chicago and Michigan if students are to have access to a full range of training opportunities. (Project directors: David McNeill, Department of Behavioral Sciences, Chicago; and Gary M. Olson, Center for Cognitive Science, Michigan.)

Stanford University **$532,000**
Stanford, California 94305 (over three years)

The recipient of a grant in 1978 in the first phase of the cognitive science program, Stanford has developed an interdepartmental research project that it regards as the foundation for an Institute of Cognitive Science that will be established in the future. The project covers four areas, each of which involves faculty members from several disciplines: formal and empirical studies of semantics; models of language processing; knowledge, inferences, and understanding; and mental representation. Stanford will use these four research projects to provide the basis for a postdoctoral training program. (Project director: Julius M. Moravcsik, Department of Philosophy.)

Brown University **$500,000**
Providence, Rhode Island 02912 (over three years)

A grant from the Foundation to Brown in 1978 permitted the institution's many cognitive scientists to explore, through a series of workshops and seminars, the great diversity of opinion among them concerning the nature and the future of cognitive science. With the help of the first grant, Brown also formulated a plan for postdoctoral training that exploits four areas of particular interest to the faculty: various aspects of language and language structure; neural nets; theoretical studies in cognition; and empirical studies in cognition. At Brown, as at other institutions supported by the Foundation, the intent is to take postdoctoral students who have been trained in one aspect of cognitive science such as computer science and give them a working knowledge of the concepts and techniques of another such as cognitive psychology. Inevitably in such exchanges, the professor learns a great deal along with the student. (Project directors: Leon N. Cooper, Center for Neural Science; and Richard B. Millward, Center for Cognitive Science.)

University of Massachusetts, Amherst **$490,000**
Amherst, Massachusetts 01002 (over three years)

A grant from the Foundation to this institution in 1978 supported a program of workshops and visiting scientists. This program catalyzed an extensive development of cognitive science and laid the groundwork for a new postdoctoral training program that is supported by the present grant. The program has an especially distinctive element in its use of mathematical and computational models for the study of various aspects of cognition such as language processing, vision, and brain function. (Project directors: Michael A. Arbib, Department of Computer and Information Science; and Barbara Partee, Department of Linguistics.)

Cornell University **$455,000**
Ithaca, New York 14853 (over three years)

For the past several years, neuroscientists and cognitive psychologists have been working closely together at Cornell Medical College and Rockefeller University to forge a new program of research on the neural processes involved in human knowledge systems. For the most part their investigations take advantage of the "experiments of nature" provided by persons suffering various forms of brain damage such as stroke. The neurological studies of such disorders in the past have not been closely coupled, as is now the case at these two institutions, with cognitively oriented investigations of how the affected processes might operate in normal subjects. With the help of the present grant, the Cornell research group will establish a postdoctoral training program to enrich its research work in neural processes. (Project director: Michael Gazzaniga, Division of Cognitive Neuroscience, Cornell Medical School, 525 East 68th Street, New York, New York 10021.)

University of California, Irvine **$410,000**
Irvine, California 92717 (over three years)

A coherent program of research in cognitive science has developed at the Irvine campus largely as a result of a grant from the Foundation in 1978. That grant financed a series of workshops and visiting scientists that brought together scholars concerned with formal learnability theory—for which Irvine is now the foremost center—and with the sensory, perceptual, and biological foundations of higher cognitive functions. Four academic departments will take part in the postdoctoral training program supported by the present grant. (Project director: Kenneth Wexler, Department of Psychology.)

Other Trustee Grants in Cognitive Science

Initiatives in Cognitive Science **$250,000**
(over two years)

Since 1977 when the Foundation's program in cognitive science started, a growing number of institutions in the United States and Canada have begun to demonstrate an interest in the field. In 1980 the Foundation invited some of these institutions to submit proposals describing how they would use a small grant to help start research and training programs and otherwise begin to advance the state of knowledge in cognitive science. Nine awards (eight for $30,000 and one for $10,000) were made that, taken together, will finance a wide range of activities:

workshops, visiting scientists, symposia, and curriculum development. The recipients were:

University of Colorado
Project director: Walter Kintsch,
Department of Psychology

University of Connecticut
Project director: Janet D. Fodor,
Department of Linguistics

McGill University, Montreal
Project director: M. Gopnik,
University Teaching and Learning

University of Minnesota
Project director: Gerald M. Siegal,
Center for Research in Human Learning

University of North Carolina, Greensboro
Project director: Cheryl A. Logan,
Department of Psychology

Ohio State University
Project director: Arnold M. Zwicky,
Department of Linguistics

University of Oregon
Project director: Michael I. Posner,
Department of Psychology

University of Rochester
Project director: Patrick J. Hayes,
Departments of Philosophy, Computer Science, and Psychology

University of Western Ontario
Project director: Zenon Pylyshyn,
Department of Psychology

Harvard University **$70,000**
Cambridge, Massachusetts 02138 (over three years)

The intellectual roots of cognitive science reach far back in history and are tangled to an extraordinary degree. Because contemporary cognitive science draws its concepts and techniques from at least half a dozen older fields, this young science is beset by controversies compounded from those of all its forebears. Although the field is now one of exceptional excitement and ferment, no one has yet traced the process of intellectual evolution that led to the current critical stage of its development. Howard Gardner of the Graduate School of Education at Harvard will try to fill this gap by preparing a book that examines the historical and philosophical roots of cognitive science and traces its emergence as a scientific discipline.

Officer Grants in Cognitive Science

Brown University **$19,000**
Providence, Rhode Island 02912 (over one year)
In support of a planning study for the establishment of a network of institutions active in cognitive science. (Project director: Richard B. Millward, Center for Cognitive Science.)

University of California, San Diego **$20,000**
La Jolla, California 92093 (over two years)
For an investigation of the use of event-related brain potentials in the study of semantic processing. (Project director: Steven A. Hillyard, Department of Neurosciences.)

Cognitive Science Society **$20,000**
135 Cedar Street, Lexington, Massachusetts 02173 (over two years)
For the third annual meeting of the Society, to be held in Berkeley in the summer of 1981. (Project directors: Eleanor Rosch and Robert Wilensky, University of California, Berkeley.)

Columbia University **$20,000**
New York, New York 10027 (over one year)
In support of research on a cell biological approach to selected problems in cognition, to be done at the College of Physicians and Surgeons. (Project director: Eric R. Kandel, Department of Neurology.)

Cornell University **$20,000**
Ithaca, New York 14853 (over two years)
For a series of seminars at Cornell University Medical College on the evolution of human cognition. (Project director: Michael Gazzaniga, Division of Cognitive Neuroscience, Cornell Medical School, 525 East 68 Street, New York, New York 10021.)

Research Foundation of the State University of New York **$20,000**
Albany, New York 12201 (over two years)
In support of cellular studies of associative learning in a vertebrate model system at the State University of New York at Stony Brook. (Project director: David H. Cohen, Department of Neurobiology & Behavior.)

Science and Technology

The Sloan Foundation is the only large private philanthropy with major interests in science and engineering but, as was indicated earlier in the discussion of the Foundation's new science fellowship program, continued support of these fields is problematical. Currently science and engineering offer a strong contrast to each other. The natural sciences appear to be losing their intellectual appeal as undergraduate majors, not to mention their decline in primary and secondary schools; and graduate students are facing a contracting academic and industrial market. Engineering by comparison is awash in prosperity. Its enrollments are at record high levels and the demand from industry for its graduates is intense; doctoral candidates are in short supply because of industrial salaries and the engineering faculty is overloaded with students as well as consulting opportunities.

Such cycles come and go, but whatever the condition of these fields at a particular time, they are fields in which a private foundation finds it increasingly difficult to operate. The cost of supporting anything of importance in research, or of supporting new instructional programs that will be of service beyond a single institution, is rapidly reaching the point that will leave the main financing of such activities to the federal government.

In 1980 the Foundation continued, as it intends to do in the future, with its program of support for the research of young scientists. It also provided support for a variety of other activities in science and technology, but whether it will be able to allocate as much money to science and technology in the future as it has in the past is a question now under discussion at the Foundation.

(Left) Hyung L. Noh, a graduate student in electrical engineering at Rensselaer Polytechnic Institute, tests a computer-controlled robot under construction for use in an experimental curriculum supported by Sloan. Robotics is a field in which industry is well ahead of engineering schools, but educators at leading institutions are making special efforts to give their students some training in this rapidly developing field.

(Right) The problem of keeping practicing engineers up to date in their specialties is the main concern of a consortium of 22 engineering schools known as AMCEE, financed in part by Sloan. AMCEE schools produce television courses that are sent live by microwave or delivered by videotape to industrial sites where special viewing rooms are available to keep on-the-job engineers abreast of new developments or to offer them graduate-level courses. Here Professor Frederic Mowle of Purdue University tapes a lecture for his course on managing software for small computers.

(Bottom) A Sloan grant is helping support research in computer graphics at the Design Research Center of Carnegie-Mellon University. Here a student at the center, Gregg Glass, uses the Evans and Sutherland Picture System 2, a powerful computer graphics system that presents dynamically moving pictures of two- and three-dimensional objects. The high level of man-machine interaction afforded by this system gives the user fast and efficient control over the design process in engineering, architecture, and other fields.

Trustee Grants in Science

Sloan Fellowships for Basic Research

$1,560,000 over two years

For 26 years the Foundation has given a special kind of support to the most promising young scholars it could find in physics, chemistry, pure mathematics, and since 1972 in neuroscience. The research fellows program now has an alumni of 1,641 persons, many of them of great distinction in their fields. The Nobel Prize for physics was awarded in 1980 to two former Sloan fellows, bringing to eight the number of laureates who have held Sloan fellowships.

The fellowships awarded under this program are for $20,000 over a two-year period. The funds are used by the fellows to meet a wide variety of expenses such as technical assistance, professional travel, summer support, computer time, and equipment. The Foundation's intention is to confer the greatest possible flexibility on the fellow's research work at a time when such flexibility is the most valuable and when other financial support may be the hardest to find.

Although the fellowship program has changed in minor ways over the years, its central purpose remains constant: the identification and support of creative young scientists. The fellows, whose average age is 31, are chosen through a process of nomination rather than by application. Often the nominators are department chairmen who are themselves former fellows. Applications for 1980 were reviewed by a program committee consisting of two senior scientists from each of the four disciplines involved. The committee reviewed 396 applications, from which 78 awards were made. Beginning in 1981, the program will be expanded to include six fellowships a year in economics and four in applied mathematics. (A separate leaflet titled, "Sloan Research Fellowships," describes this program in greater detail and is available on request from the Foundation.)

Members of the program committee in 1980 were:

Mathematics

Jurgen Moser, Professor of Mathematics, New York University; chairman of the committee

S. S. Chern, Professor of Mathematics, University of California, Berkeley

Chemistry

Ronald Breslow, Professor of Chemistry, Columbia University

John S. Waugh, Professor of Chemistry, Massachusetts Institute of Technology

Physics

William M. Fairbank, Professor of Physics, Stanford University

Malvin Z. Ruderman, Professor of Physics, Columbia University

Neuroscience

Seymour S. Kety, Professor of Psychiatry, Harvard Medical School

Eliot Stellar, Professor of Physiological Psychology in Anatomy, University of Pennsylvania

The following scientists, listed by institution and field, received awards in 1980:

University of Arizona
Physics: Adrian Patrascioiu

Boston College
Chemistry: Kenneth M. Nicholas

Brandeis University
Neuroscience: Eve E. Marder

Brown University
Physics: Antal Jevicki

California Institute of Technology
Physics: Roger D. Blandford

University of California, Berkeley
Physics: Edgar Knobloch

University of California, Irvine
Neuroscience: John F. Marshall

University of California, Los Angeles
Chemistry: John A. Gladysz
Physics: Claude W. Bernard

University of California, San Diego
Mathematics: Michael H. Freedman
Neuroscience: Lawrence F. Kromer
Physics: Thomas H. Jordan

University of California, San Diego, School of Medicine
Neuroscience: Mark H. Ellisman

University of California, Santa Barbara
Chemistry: R. Daniel Little

University of Chicago
Chemistry: Graham R. Fleming
Mathematics: Robert A. Fefferman
Physics: Kyle M. Cudworth

University of Chicago, Pritzker School of Medicine
Neuroscience: Samir F. Atweh

Cornell University
Chemistry: Barry K. Carpenter
Mathematics: Oliver A. McBryan
Physics: Eric D. Siggia

Dartmouth College
Chemistry: Russell P. Hughes

Emory University
Chemistry: Dennis C. Liotta

Harvard University
Mathematics: Stephen S. T. Yau
Neuroscience: James R. Stellar
Physics: Peter M. McIntyre, III

Harvard Medical School
Neuroscience: Steven J. Burden, Jennings N. Naranjo

University of Houston
Chemistry: James A. McCammon

University of Illinois at Chicago Circle
Mathematics: Howard A. Masur

University of Illinois, Urbana
Physics: Telemachos Ch. Mouschovias, Larry L. Smarr

Indiana University
Chemistry: Peter Ortoleva

Johns Hopkins University
Chemistry: David R. Yarkony

University of Kansas
Physics: Shih-I Chu

University of Kentucky
Mathematics: Avinash Sathaye

University of Maryland
Mathematics: Paul C. Yang
Physics: David S. Eichler

Massachusetts Institute of Technology
Chemistry: William H. Rastetter
Physics: Claude R. Canizares, Michael M. Salour

Michigan State University
Chemistry: C. K. Chang

University of Michigan
Neuroscience: Richard J. Katz

University of North Carolina
Physics: Yee Jack Ng

Northeastern University
Neuroscience: Joseph L. Ayers, Jr.

Northwestern University
Chemistry: George C. Schatz

Oregon State University
Chemistry: Glenn T. Evans

Pennsylvania State University
Chemistry: Barbara J. Garrison
Mathematics: Stephen G. Simpson

University of Pennsylvania
Chemistry: Stanley J. Opella
Larry G. Sneddon
Mathematics: Jozef Dodziuk, Jonathan M. Rosenberg
Physics: Steven G. Louie

University of Pennsylvania School of Medicine
Neuroscience: Howard C. Hughes

Princeton University
Mathematics: Benedict H. Gross, Chuu-Lian Terng
Neuroscience: Darcy B. Kelley
Physics: Edwin L. Turner

Rice University
Chemistry: Shaul Mukamel

University of Rochester
Chemistry: George L. McLendon

University of Southern California
Chemistry: Maria C. Pellegrini
Physics: William E. Cooke, Steven E. Trullinger

Stanford University
Mathematics: Daniel J. Rudolph
Neuroscience: Corey S. Goodman

Stanford University School of Medicine
Neuroscience: Gary G. Matthews

University of Texas
Chemistry: Marye Anne Fox

University of Utah
Mathematics: Henryk Hecht

Vanderbilt University
Physics: John P. Wikswo, Jr.

Washington State University
Chemistry: Kerry W. Hipps
Physics: Philip L. Marston

Washington University School of Medicine
Neuroscience: Joshua R. Sanes

University of Washington
Chemistry: Stanley Raucher
Mathematics: Haynes R. Miller

Yale University
Mathematics: David J. Saltman
Physics: Hsiung Chia Tze

Yale University School of Medicine
Neuroscience: Neil J. MacLusky

Other Trustee Grants in Science

California Institute of Technology **$350,000**
Pasadena, California 91125 (over three years)

Between 1952 and 1957, the 48-inch telescope at Mount Palomar was used to assemble a series of 900 photographs of objects in the northern sky. This sky survey has proven to be an astronomical tool of great usefulness. Since the first survey, several technical developments in photography have occurred that would make possible significant improvements in the photographs. Astronomers at the California Institute of Technology will take advantage of these developments to conduct a new sky survey that will be of great value in itself but that will also be used in conjunction with the infrared satellite to be launched in 1982, the space telescope to be launched in 1983, and with many other astronomical projects. (Project director: Wallace L. W. Sargent, Professor and Executive Officer for Astronomy.)

University of California, Santa Cruz **$130,000**
Santa Cruz, California 95064 (over one year)

In 1977 the Foundation made a grant of $245,000 to this institution to support the Oakes College Science Program, a program designed to help students

from minority groups move into academic science. Special courses and laboratory projects have been developed in the last few years along with a number of other supporting activities. Oakes College now has a student body of 600, of which 42 percent are from minority groups. The science program has developed well, and the present grant is for its continued support. (Project director: David E. Dorfan, Professor of Physics.)

Rockefeller University **$46,000**
New York, New York 10021 (over two years)

Professor Abram Pais of this institution is a theoretical physicist of distinction who is at work on a scientific biography of Albert Einstein. It is a scholarly undertaking of great promise, and the work that has been done to date is impressive. This grant will provide partial support for the completion of Professor Pais's book.

Trustee Grants in Technology

Three related grants were made in 1980 in support of research and instruction in computer graphics, an advanced technology of fundamental importance in a number of academic fields, particularly engineering. The three were:

Carnegie-Mellon University **$482,000**
Pittsburgh, Pennsylvania 15213 (over four years)

Computer-aided design — the use of interactive "three dimensional" computer graphics as an aid in the design process in engineering, architecture, and other fields — is a rapidly developing, highly applied technology in which industry is well ahead of universities. A great deal of work must be done to bring educational institutions abreast of the state of the art, not to mention the cost of equipping them adequately to teach this technology.

Carnegie-Mellon University has special strengths in the disciplines related to research in computer-aided design. Its Design Research Center is an interdisciplinary laboratory in which faculty members from computer science, mathematics, operations research, architecture, and all of the departments of the Carnegie Institute of Technology (the university's engineering school) work together. Their hope is to build intelligence into computer graphics programming in such a way that the user can rely not only on his own ideas and intuition but can expect the program to take the initiative and suggest solutions and strategies. This grant will provide part of the support needed by the Design Research Center to pursue its program of research. (Project director: Steven J. Fenves, Department of Civil Engineering.)

Rensselaer Polytechnic Institute **$450,000**
Troy, New York 12181 (over four years)

The declining rate of American productivity in recent years, including the decline in manufacturing industries, has attracted a good deal of attention, but not much action, in schools of engineering. RPI plans to do more than talk about the problem. Through its new Center for Manufacturing Productivity, it will give its students experience in solving real manufacturing problems using such advanced technologies as computer-aided design, robotics, and artificial intelligence. RPI has laid an excellent foundation upon which to build such a program, having developed in recent years one of the most extensive computer graphics laboratories in higher education. This grant will help the school develop a range of classroom and laboratory materials in the application of advanced technologies to the manufacturing process. (Project director: Paul M. DeRusso, School of Engineering.)

Cornell University **$300,000**
Ithaca, New York 14853 (over three years)

The College of Engineering at Cornell is in the process of establishing a $1.2 million Computer-Aided Design Research Facility, whose main function will be to infuse work in computer graphics into the engineering curriculum. This facility, relying on some of the programming already developed at Cornell, will adapt and refine software routines for use in courses in industrial engineering, structural engineering, environmental engineering, and computer graphics itself. These software programs, when developed, will be at the leading edge of the computer graphics field; Cornell hopes they will prove of value to other engineering schools as well as its own. The Foundation's grant will go mainly for the released time of faculty members to work in the design facility. (Project director: Donald Greenberg, Professor of Architecture.)

Other Trustee Grants in Technology

Association for Media-Based Continuing Education for Engineers **$256,000**
Georgia Institute of Technology (over four years)
Atlanta, Georgia 30332

The profession of engineering has always had a special need for continuing or mid-career education, but the need is more pressing now than in the past because of the speed with which technologies change and new technologies develop. The median age of practicing engineers in the United States is 42; thus

the "average" engineer finished his formal training 20 years ago at a time when much of the technology with which he now works, or should be able to work, did not exist. One way in which engineering schools can deal with this problem is to teach advanced courses to practicing engineers via television and videotape at the job site; and that is what 22 universities that banded together a few years ago with Sloan Foundation support now do. The present grant will finance new course production at a number of the member schools of AMCEE and meet the costs of experimental work with new communications technologies. (Project director: J. David Waugh, dean of engineering at the University of South Carolina, Columbia, South Carolina 29208, and president of AMCEE.)

University of California, Berkeley **$145,000**
Berkeley, California 94720 (over three years)

The Foundation's program to increase the number of minority students in engineering was brought to an end in 1979 after seven years of operation and expenditures of about $14 million; but follow-up funds on a much reduced scale are provided on occasion to agencies that were established under the sponsorship of the Sloan program. The present grant will finance a project through which a number of regional agencies concerned with the problem of minorities in engineering will collaborate in long-range planning, fund raising, and other activities. (Project director: Robert Finell, Lawrence Hall of Science.)

University of North Carolina, Chapel Hill **$125,000**
Chapel Hill, North Carolina 27514 (over four years)

Microcomputers offer rich instructional opportunities to colleges and universities. They provide cheap processing power, excellent graphics, and immediate response. They are, however, severely limited in the software they can offer students, and they are, of course, isolated, free-standing machines. An important problem therefore confronts the established, regional computer networks that were built in the 1960's and are based on big machines linked by phone lines to terminals at member schools: how to give hundreds or thousands of microcomputer users access to programming and to related services they badly need. This grant will allow the North Carolina Educational Computing Service to develop software for linking microcomputers to larger machines and to experiment with a variety of other services for microcomputer users. (Project director: Louis T. Parker, Jr., Director, North Carolina Educational Computing Service, Box 1203, Research Triangle Park, North Carolina 27709.)

Boston's Museum of Science **$70,000**
Science Park, Boston, Massachusetts 02114 (over two years)

The Society for Neuroscience was founded in 1970 and has been concerned from the beginning with the problems of conveying to the general public something of the importance and excitement of brain research. One opportunity presented itself in 1980 with the opening of a new building at Boston's Museum of Science, the Thomsen Theatre of Electrical Science, which plans to devote 1,600 square feet of space to an exhibit on the brain, with bioelectricity as its unifying theme. The Foundation rarely supports museums, but the case for helping finance this exhibit was exceptionally strong. (Project director: David M. Pynchon, director of the museum.)

Officer Grants in Science and Technology

American Council of Learned Societies **$20,000**
800 Third Avenue, New York, New York 10022 (over one year)
For the preparation and publication of the 17th volume of the ACLS Dictionary of Scientific Biography. (Project director: R. M. Lumiansky, president of ACLS.)

University of California, San Diego **$20,000**
La Jolla, California 92093 (over two years)
For research at the Scripps Institution of Oceanography on amino acid dating of fossil materials. (Project director: Jeffrey L. Bada, Marine Chemistry Department.)

Capital Children's Museum **$14,500**
800 Third Street, N.E., Washington, D.C. 20002 (over two years)
Partial support for the development of a series of interactive computer exhibits and the training of student programmers. (Project director: Alan Kay, Xerox PARC, Palo Alto, California 94304.)

Harvard University **$5,000**
Cambridge, Massachusetts 02138 (over two years)
For the research and lecture activities in science and public affairs of George B. Kistiakowsky, Professor Emeritus, Department of Chemistry.

University of Maryland **$13,400**
College Park, Maryland 20742 (over two years)
Partial support for a study of the relations between science and culture in the 19th century. (Project director: Stephen G. Brush, Professor of History.)

Massachusetts Institute of Technology **$20,000**
Cambridge, Massachusetts 02139 (over two years)
For a project to explore the possibilities of developing university-based programming for use on cable television systems in the Boston Area. (Project director: Edwin F. Taylor, Director, Educational Video Resources.)

University of Pennsylvania **$10,000**
Philadelphia, Pennsylvania 19104 (over one year)
Partial support for a symposium on changing concepts of the nervous system. (Project director: Frank A. Pepe, Department of Anatomy, School of Medicine.)

Princeton University **$20,000**
Princeton, New Jersey 08540 (over two years)
For an experimental project in the instructional uses of automated, computer-based dictionaries. (Project director: George A. Miller, Department of Psychology.)

Princeton University **$15,000**
Princeton, New Jersey 08540 (over two years)
For the development of teaching materials, and for related activities, in the institution's program, Humanistic Studies in Modern Engineering. (Project directors: David P. Billington, Professor of Civil Engineering; and Robert Mark, Professor of Civil Engineering and Architecture.)

Research Foundation of the City University of New York **$20,000**
1515 Broadway, New York, New York 10036 (over two years)
For a study of the feasibility of using computer storage and other high-density technologies to take the place of printed journals for scholarly work. (Project director: Joseph Raben, Professor of English, Queens College, Flushing, New York 11367.)

San Diego State University **$20,000**
San Diego, California 92182 (over one year)
For the first phase of an experiment to furnish news directors and other television and radio personnel with background information on topics of current interest and importance. (Project director: Sig Mickelson, College of Professional Studies.)

Stanford University **$19,800**
Stanford, California 94305 (over one year)
For the development of three courses in technology to be offered by the School of Engineering to non-engineering students. (Project director: James L. Adams, Associate Dean, School of Engineering.)

Stevens Institute of Technology **$15,000**
Hoboken, New Jersey 07030 (over one year)
For a workshop on the teaching of technology to non-engineering students. (Project director: Edward A. Friedman, Dean of the College.)

Stony Brook Foundation **$20,000**
P.O. Box 666, Stony Brook, New York 11790 (over one year)
For a conference in 1981 to be conducted by members of the engineering faculty from the State University of New York, Stony Brook, on the teaching of technology to non-engineering students. (Project director: John G. Truxal, Department of Technology and Society.)

University of Texas, Austin **$20,000**
Austin, Texas 78712 (over one year)
For a study to analyze and define the intellectual tools and techniques of engineering, including the philosophical and historical aspects of the profession. (Project director: B. V. Koen, Department of Mechanical Engineering.)

THOR, Inc. **$3,000**
2030 M Street, N.W., Washington, D.C. 20036 (over one year)
Partial support for the preparation of a paper, commissioned by the National Research Council, on the federal role in improving the public's understanding of science. (Project director: Philip C. Ritterbush.)

Science Book Program

Although no grants were made in the Foundation's program to encourage the publication of books intended to further the public understanding of science, there was considerable work in progress during 1980. Portions of manuscripts were received from Jerome Bruner, psychologist, Harvard University; Lewis Thomas, medical scientist, Memorial Sloan-Kettering Cancer Center; Hendrik Casimir, physicist, Philips of Eindhoven; John Pierce, electrical engineer, California Institute of Technology; Victor F. Weisskopf, physicist, Massachusetts Institute of Technology; and W. H. Pickering, engineer, Jet Propulsion Laboratory.

Others who have undertaken to write for the series include Sherwood Washburn, anthropologist, University of California, Berkeley; Paul Samuelson, economist, Massachusetts Institute of Technology; Gian-Carlo Rota, mathematician, Massachusetts Institute of Technology; I. I. Rabi, physicist, Columbia University; Francis H. C. Crick, physicist, Salk Institute; Robert R. Wilson, physicist, Columbia University; Frederick Mosteller, statistician, Harvard University; and A. L. Cochrane, epidemiologist, Medical Research Council, South Wales. Discussions with other authors are continuing to go forward.

The first two books in the series, produced with unanticipated dispatch, were *Exploring the Universe* by Freeman Dyson, physicist, the Institute for Advanced Study, and *Advice to a Young Scientist* by Sir Peter Medawar, biologist, Clinical Research Centre, Harrow, Middlesex, England. Both books received great critical praise, and both have sold well, Mr. Dyson's extremely so both in this country and abroad. Both books have been translated into Japanese, Portugese, Spanish and Italian, and Mr. Dyson's into German as well.

Subsequent authors have written more slowly, as would have been expected; in some instances the agreement to write for the series was expressly a commitment for work that would be a year or more deferred. It is expected that two or three manuscripts will be completed by the close of 1981, and that there will be a steady flow of about two books a year thereafter. The publishing house of Harper & Row is working closely on the program with the Foundation, and is expected to publish most or all of the books.

The Foundation has been assisted in this program by a diligent advisory committee, composed of the following:

Robert L. Sinsheimer, Chancellor, University of California, Santa Cruz; chairman of the committee

Howard Hiatt, Dean, Harvard School of Public Health

Mark Kac, Professor of Mathematics, Rockefeller University

Daniel Kevles, Professor of History, California Institute of Technology

Robert Merton, University Professor Emeritus and Special Service Professor, Columbia University

George A. Miller, Professor of Psychology, Princeton University

Winthrop Knowlton, Chairman of the Board, Harper & Row

S. Michael Bessie, Senior Vice-President, Harper & Row

Economics and Management

In its public reports and other documents, the Foundation often lumps economics and management together in a single phrase, but they are not treated as a single field by the Foundation; they are, of course, very separate and distinct fields that, like science and technology, have ties between them that are many and strong. Over the last five years or more, the Foundation has been relatively inactive in management education, as will be clear from what follows in this section of the report.

Schools of management are in enviable financial health and not in need of a great deal of outside support from private foundations. Their enrollments are high and their faculties have ample consulting work and support for research. Their instructional programs may be in need of certain improvements, particularly in communication skills and in study materials that deal with the relations between government and private business. The Foundation has been of modest assistance with these problems, but most institutions can undertake the needed improvements out of internal funds. Management schools do suffer from a major problem similar to that of engineering schools and computer science departments — a shortage of American doctoral candidates — but this problem exceeds the resources of a private foundation.

Economics is in a somewhat different position. The standard introductory course in economics, many students would say, continues as in the past to bore and confuse students in large numbers, but as an academic field economics is popular on most campuses, just as management is. Support for research, however, is less generous and comes from fewer sources. Thus the Foundation for a number of years has turned its attention more to economics than management, and mainly to the support of research.

Trustee Grants in Economics

Microeconomics Workshops

$2,040,000 over three years

In 1980 the Foundation moved into the second phase of a program of research in microeconomics that began five years ago. In 1975-76, after a lengthy period of planning, the Foundation made a series of 10 grants to leading departments of economics that had entered a competition for such awards. The first round of grants was made for three years and was followed by renewal grants of two years, most of which have now expired. In each case the grant supported a workshop that dealt with a family of microeconomic problems and provided support for Ph.D. candidates and for related costs. The workshops produced a rich stream of dissertations and papers and, in the Foundation's judgment, met the twofold objective of the program very satisfactorily: to begin the process of building a systematic and coherent body of knowledge about a number of important microeconomic problems; and to train a large number of young scholars in the sub-discipline of microeconomics.

In 1980 the Foundation carried this program into a second five-year period and solicited proposals from economics departments with faculty strength in applied microeconomics research. Of the 35 departments invited to the second competition, 28 submitted proposals that the Foundation evaluated with the help of an outside advisory committee. Eight grants, each for $255,000, were made for workshops on the topics indicated (in each case the project director is a member of the department of economics):

Massachusetts Institute of Technology — social management of private markets. (Project director: Ann F. Friedlaender.)

University of Minnesota — transaction cost economics focusing largely on congestion, hierarchical contracts, and organization capital. (Project director: Herbert Mohring.)

Northwestern University — dynamics of strategic behavior by firms and regulators in selected economic markets. (Project directors: Ronald R. Braeutigam and F. M. Scherer.)

University of Pennsylvania — transaction cost economics including the modern corporation, intermediate modes of organization, and contract analysis. (Project director: Oliver Williamson.)

Princeton University — effects of regulation and taxation on the private economy. (Project director: Edwin Mills.)

Stanford University — role of transaction and information costs in the organization and operation of factor economics. (Project director: Thomas E. Macurdy.)

University of Washington — natural resource economics. (Project director: Gardner Brown.)

Yale University — financial markets and intertemporal resource allocation. (Project directors: William Brainard, William Nordhaus, and James Tobin.)

One renewal grant was also made in 1980 from the first round of microeconomics grants: *New York University, $140,000* over two years for a workshop on theoretical analysis of the determination of the structure of particular markets. (Project director: William J. Baumol.)

The advisory committee of economists that assists the Foundation in its microeconomics program is made up of the following persons:

Robert M. Solow, Massachusetts Institute of Technology, chairman of the committee

Edwin S. Mills, Princeton University

John B. Shoven, Stanford University

Michael Spence, Harvard University

Oliver Williamson, University of Pennsylvania

Other Trustee Grants in Economics

Brookings Institution **$375,000**
1775 Massachusetts Avenue, N.W. (over three years)
Washington, D.C. 20036

Beginning in 1966, just as economists were forming a consensus about the perversity of federal regulation of industry as it had traditionally been done, Congress established a number of new agencies designed to regulate health, safety, and environmental hazards. These agencies were created as a hurried response to what were seen to be pressing social problems, and in the process regulatory mechanisms were designed with little regard for their economic effects. A new and ambitious research program at Brookings will attempt to bring economic analysis to social regulation, an area in which economists have not been influential in the past, and to suggest reforms. (Project directors: Robert Crandall and Lester Lave.)

Committee for Economic Development **$250,000**
1700 K Street, N.W. (over two years)
Washington, D.C. 20006

Over the last 20 years, productivity growth in the United States has badly deteriorated, as is well known. The average annual rate of improvement for the entire private sector has been less than one percent since 1973. The decline has been well documented statistically for sectors of the economy and for major industries; but there is substantial disagreement about the major causes and their relative importance.

The Committee for Economic Development conducted a highly successful experiment in 1978-79 in public education concerning a complex issue. It reposed in one person the job of writing a monograph, called *Thinking Through the*

Energy Problem, for a lay audience, but created a task force of other persons with various kinds of expertise about the problem to meet regularly with the author and help shape his ideas. Thomas Schelling of the John F. Kennedy School of Government at Harvard University, was the author. With the help of his task force, he produced perhaps the most lucid non-technical paper on the energy problem that has yet been done. CED now plans to do a similar job with the problem of productivity and the Foundation has agreed to meet the costs. William J. Baumol, professor of economics at New York University, will be the author, and William F. May, retiring chairman of American Can Company and now dean of the Graduate School of Business at NYU, will be chairman of the task force.

London School of Economics and Political Science **$200,000**
University of London (over five years)
Houghton Street
London, WC2A, 2AE, England

On rare occasions the Foundation makes an exception to its policy against the support of international activities or of projects outside the United States. LSE is a special kind of institution with an international student body and a strong research tradition in economics, political science, and other social sciences. It is now in serious financial straits, even more so than other British universities. Because of the international character of the student body, it receives less support from local educational authorities than other institutions of higher education in Britain. LSE has therefore established a fund to help finance 1,000 overseas students during the decade of the 1980's.

The Foundation's grant will support six "studentships" a year for five years for overseas postgraduate students, primarily North Americans and primarily in economics. In each instance, the studentship will bear the name of a distinguished North American scholar who has been closely associated with LSE as a student or faculty member. The six are: William J. Baumol, Harry G. Johnson, Abba P. Lerner, Sir W. Arthur Lewis, Daniel Patrick Moynihan, and Edward Shils. (Project director: Ralf Dahrendorf, director of LSE.)

Harvard University **$145,000**
Cambridge, Massachusetts 02138 (over two years)

Francis M. Bator, professor of political economy at Harvard's John F. Kennedy School of Government, has proved himself to be a skilled interpreter of complex economic issues for a lay audience. His book, *The Question of Government Spending*, published in 1961 and addressed to a general readership, has

become a standard work noted for its clarity without condescension or superficiality. This grant will help Professor Bator try to do a book of similar quality on the problem of inflation. Such a book will indeed require an analyst and synthesist of extraordinary talent, and the Foundation has every reason to believe that Professor Bator is equal to the formidable task he has laid out for himself.

Brooklyn College **$96,000**
Brooklyn, New York 11210 (over three years)

This institution, a branch of the City University of New York, has had a strong undergraduate program in the physical sciences for many years. It regularly sends many of its science graduates to leading graduate and professional schools, but has become concerned in recent years with the contracting market for science Ph.D.'s. The college believes that other career opportunities, particularly in industry, should be developed for some of its undergraduate students in science. It has established a University-Industry Liaison Program through which a number of selected science students will be given a set of three courses in management together with a summer internship in either science-based industries such as computers, chemicals, and electronics, or non-science-based industries such as banking and publishing. The college expects that many of the students taking the program will pursue careers in industry and management after college, an hypothesis that remains to be tested with the help of this grant. (Project director: Brian B. Schwartz, Dean, School of Science.)

American Economic Association **$75,000**
1313–21st Avenue South (over one year)
Nashville, Tennessee 37217

Since 1974 the American Economic Association has conducted an intensive summer instructional program for students from minority groups just finishing their junior year of college. Students showing promise in their work in economics and related subjects are encouraged through these summer programs to continue into graduate education in economics. The program was located for several years at Northwestern University, the institutional home of its director, Marcus Alexis, before he became a Commissioner of the Interstate Commerce Commission. The program moved to Yale University in 1980 where it remains under the sponsorship of AEA. This grant met most of the costs of the program in 1980. (Project director: Donald Brown, Yale Department of Economics.)

Officer Grants in Economics and Management

American Assembly of Collegiate Schools of Business **$20,000**
1755 Massachusetts Avenue, N.W. (over one year)
Washington, D.C. 20036
For a series of conferences on ways to improve the work offered by schools of business and management on government-industry relations. (Project director: William K. Laidlaw, Jr., Executive Vice President.)

David R. Godine, Publisher, Inc. **$20,000**
306 Dartmouth Street (over one year)
Boston, Massachusetts 02116
For publication of a biography of the American industrialist, Owen D. Young, by Josephine Young Case and Everett Needham Case.

Emory University **$20,000**
Atlanta, Georgia 30322 (over one year)
For a conference on the history and intellectual origins of the movement to incorporate the study of economics into the law curriculum and law into the economics curriculum. (Project director: Henry G. Manne, Law and Economics Center.)

Michigan State University **$19,500**
East Lansing, Michigan 48824 (over one year)
For a conference on the issues involved in the discharge of non-union employees from their jobs. (Project director: Jack Stieber, School of Labor and Industrial Relations.)

National Affairs, Inc. **$20,000**
10 East 53 Street (over one year)
New York, New York 10022
For publication of a special issue of the journal, *The Public Interest*, on the subject of the present crisis in economic theory. (Project director: Irving Kristol.)

Netherlands Institute for Advanced Studies **$20,000**
Meyboomlaan 1, 2242 PR Wassenaar (over one year)
The Netherlands
Support for the work of Edgar L. Feige, professor of economics at the University of Wisconsin, on the unobserved economy.

New York University **$4,000**
New York, New York 10012 (over one year)
For the printing and distribution of the report, "University-Industry Cooperation," prepared by the university's Center for Science and Technology Policy. (Project director: Herbert I. Fusfeld, director of the center.)

Pacific Academy for Advanced Studies **$20,000**
1100 Glendon Avenue (over one year)
Los Angeles, California 90024
For an evaluation to be done by Finis Welch, professor of economics at the University of California, Los Angeles, of the summer programs for minority students that are sponsored by the American Economic Association.

Research Foundation of the City University of New York — **$20,000** (over one year)
1515 Broadway
New York, New York 10036

Development of a plan for promotion in executive management positions of the City University of New York. (Project directors: Robert E. Kibbee, Chancellor, City University of New York; and Jacqueline G. Wexler, Academic Consulting Associates, 400 Park Avenue, New York 10022.)

Urban Institute — **$20,000** (over one year)
2100 M Street, N.W.
Washington, D.C. 20037

For a planning project that will survey past studies in productivity and produce a list of studies recommended for the future. (Project director: Charles R. Hulten.)

Woodrow Wilson International Center for Scholars — **$20,000** (over one year)
Smithsonian Institution Building
Washington, D.C. 20560

Fellowship support for Marc Nerlove, professor of economics at Northwestern University, for work on problems of intergenerational justice.

Education and Research in Public Policy

The Foundation began in 1976 to give major support to new instructional programs that answered to a variety of names — public policy programs, policy analysis programs, policy sciences programs, public management programs. The name these new programs sought to avoid, "public administration," was associated with an old field that many educators regarded as tired and intellectually flaccid. Whatever the validity of that assessment, the new programs developed outside the traditional schools of public administration and put a strong emphasis on economics, statistics, computer skills, quantitative methods, on technology in a few cases, and in general on intellectual rigor and selective admissions. An inclusive name for Sloan's activities in this field is needed, and "education and research in public policy" seems appropriate.

The Foundation's support of this field took on a new direction in 1980. In past years the Foundation's funds were spent mainly to help start new master's degree programs at a number of universities and new undergraduate concentrations at a number of liberal arts colleges. Many of these programs are now firmly in place and capable of self-support, and others are developing satisfactorily. Having financed this considerable variety of models, the Foundation is not likely to help start many more in the future. Instead the Foundation began in 1980, and to some extent before that, to turn its attention to two new sets of needs in the field of public policy education.

First, the need for research. Like any academic discipline that hopes for acceptance and respectability, public policy needs to develop a strong research base upon which instruction can stand, particularly at the graduate level. The field has now begun to build such a base of research, but it is only a start and a somewhat shaky one. As a highly interdisciplinary field, public policy will require

time before tools and techniques for research are developed that are, and are seen to be, productive; and before a usable body of knowledge can be established. The Foundation is helping that process along as opportunities present themselves and as major research problems, such as those discussed below concerning environmental hazards and risk assessment, attract the attention of talented researchers.

Second, there is a need to increase the number of students from minority groups in the new types of public policy programs. A significant portion of the Foundation's grant funds has been devoted for many years to educational programs for minority students. Two of the Foundation's "particular programs" that are now completed represent large-scale investments in efforts to increase the number of minority students in medicine, management, and engineering. Currently the Foundation provides some support for similar activities in science and economics, but the principal effort of the Foundation in minority education in the next few years will be in public policy education. The Foundation began in a limited way to do something about this problem in 1980 and expects to do more in 1981 and beyond.

Important to both these new directions — research and minorities — is the Association for Public Policy Analysis and Management (APPAM), an organization made up of the leading institutions and individuals in public policy education. APPAM was of great assistance to the Foundation in 1980 in planning and carrying out activities in this field, and the Foundation hopes will continue to be in the future.

Trustee Grants in Education and Research in Public Policy

Harvard University **$750,000**
Cambridge, Massachusetts 02138 (over three years)

For the last eight years, since Howard H. Hiatt assumed the deanship of the Harvard School of Public Health, the school has striven to develop a research program in policy sciences as they relate to the health field. To provide an institution-wide focus for its varied work in policy analysis, the school, with the help of this grant, will establish a Program in Environmental Health Policy. The program will draw on the resources of the school and of the university to pursue a long-range research plan whose purpose is to provide government authorities as well as the private sector with more reliable analyses than are now available of the costs and benefits of particular policies in environmental health.

The principal concern of those who have responsibility for the program is the dilemma that now faces society in its efforts to reduce environmental hazards: legislation and regulation that are too often carried out in absolute and uncompromising terms and on the basis of very inadequate technical information; that seem to assume the feasibility of a zero-risk environment; and that generate substantial

The American Economic Association has sponsored each year since 1974 an intensive summer instructional program for minority students who show promise in economics. Here the economist, Marcus Alexis, formerly of Northwestern University and now a Commissioner of the Interstate Commerce Commission, lectures at last summer's institute, conducted at Yale University, and supported by Sloan.

Oakes College at the University of California, Santa Cruz, has a special program, supported in part by Sloan, to help minority students move into academic science. This student, Floyd Gray, recently completed his degree in geology and is working for the U.S. Geological Survey in Northern California.

With support from Sloan, the Association for Public Policy Analysis and Management is sponsoring summer workshops in economics, applied mathematics, and other subjects for students from minority groups. Some of the students from these workshops will enter graduate-level degree programs in policy analysis at leading universities. Here Professor Susan Hadden (second from right, second row) poses with her students at the summer 1980 workshop at the University of Texas, Austin.

costs along with confusion and hostility. But government's failure to act to reduce major environmental risks is equally indefensible. To find an acceptable means of dealing with this dilemma is the purpose of the Program in Environmental Health Policy, and it will require the collaborative efforts of researchers from many disciplines: biology, chemistry, physiology, toxicology, environmental engineering, epidemiology, economics, statistics and the political and behavioral sciences. To name the disciplines involved is to suggest the complexity of the undertaking. Whether this program can serve in the future as any kind of model for other policy-related fields, whether it can make headway against the problems it intends to address, and whether it can contribute to education for the public service, are all open questions; but hopes at Harvard are high, as they are at the Foundation. (Project directors: Milton C. Weinstein, Department of Biostatistics; and Marc J. Roberts, Department of Health Policy and Management.)

SIAM Institute for Mathematics and Society **$275,000**
97 Parish Road South (over five years)
New Canaan, Connecticut 06840

The Society for Industrial and Applied Mathematics, of which the Institute for Mathematics and Society (SIMS) is a part, is devoted to increasing the application of mathematical and statistical techniques to social problems, particularly problems in the assessment of environmental risks. SIMS pursues this goal in part through the sponsorship of "transplants"; that is, by making it possible for mathematicians to move from pure mathematics into applied risk-assessment fields where mathematical analysis is still undeveloped.

For some years, the Foundation has supported transplants and other SIMS projects. The present grant provides partial support for two activities: a joint project between the Department of Statistics of Stanford University and the Bay Area Air Quality Management District in the application of statistical techniques to several kinds of epidemiological studies of air pollution and health disorders; and a similar type of project on water pollution to be done by SIMS and the University of Washington's Biomathematics Group. (Project Directors: C. B. Bell, University of Washington; Paul Switzer, Stanford University; and Donald Thomsen, president of SIMS.)

Hudson Institute **$150,000**
Quaker Ridge Road (over two years)
Croton-on-Hudson, New York 10520

Every year the nation and its public authorities are confronted with complex questions of how to assess the risks of new or newly discovered environmental

hazards. Several years ago a study done by the Hudson Institute estimated that there were 1.2 million early deaths per year in the United States, many of which were caused by "insidious contaminants" in food or drugs or the workplace or the general environment. Frequently the degree of risk in such contaminants is uncertain, as is the method of removing them from the environment or protecting against them. With this grant, the Hudson Institute will continue its analysis of particular contaminants and will also enlarge its study to include consideration of how informed public debate can go forward and consensus be reached on policy issues of basic importance. (Project director: Max Singer, Hudson Institute, 1500 Wilson Boulevard, Arlington, Virginia 22209.)

Trustee Grants for Undergraduate Programs

Carleton College **$236,000**
Northfield, Minnesota 55057 (over three years)

Over the last four years, the Foundation has financed a variety of new undergraduate programs in public policy. Such undergraduate programs are not pre-professional and are not meant to prepare students for a career in government; they are part of the liberal education of students who enroll in them. Typically these programs focus on the social sciences, less often on science and technology. Carleton with its strong tradition in science and technology, will develop with the help of this grant a concentration in science, technology, and public policy, in which courses will be offered in such subjects as energy policy, health policy, environmental policy, and science and government, and in which students will produce a paper on some aspect of technology policy. (Project director: Norman Vig, Professor of Political Science.)

University of North Carolina, Chapel Hill **$30,000**
Chapel Hill, North Carolina 27514 (over one year)

A grant of $166,000 in 1978 financed the start of the university's Public Policy Analysis Program. The present grant will allow the program to complete its curriculum development plan and secure regular status and support in the university. (Project director: Duncan MacRae, Jr., Department of Political Science.)

Oberlin College **$175,000**
Oberlin, Ohio 44074 (over one year)

This institution also received support in 1978 for the start of its Public Service Studies Program. The program to date has developed in exemplary

fashion with a core of strong courses adapted from economics, political science, mathematics, and philosophy, all with a public policy focus. The present and final grant will allow the college to continue its course development and complete other activities needed to put the program on a permanent footing in the institution. (Project director: Paul A. Dawson, Department of Government.)

Tulane University **$230,000**
New Orleans, Louisiana 70118 (over two years)

This is also a renewal and final grant, following a grant of $350,000 in 1977 that financed the first three years of operation of the university's Center for Public Policy Studies. A policy studies major has been developed for undergraduate students along with a number of elective courses for students majoring in other fields. The program attempts to balance several competing approaches to policy analysis; it includes work in statistics, decision analysis, and quantitative methods, but attempts to place these analytical skills in a political and humanistic context. The present grant will support the further development of the Center for Public Policy Studies, including an internship program. (Project director: Brainard Guy Peters, director of the center.)

Minority Students and Education for the Public Service **$280,000**
(over one year)

To provide promising students from minority groups with academic remediation and career counseling, eight-week summer institutes were supported by the Foundation in 1980 at four institutions. Each program took about 25 students, most of whom had just finished their third undergraduate year. Special courses were given in economics, quantitative methods, and other subjects. The institutes were designed to help students prepare for a more rigorous set of courses in their senior year than they might otherwise have taken, and also to help the most successful of them gain admission after their baccalaureate degree to one of the high-quality graduate schools of public service. The four institutions, each of which received a grant of $70,000 for the 1980 institute, were:

Carnegie-Mellon University, Pittsburgh, Pennsylvania 15213—the School of Urban and Public Affairs (Project director: N. J. Johnson.)

University of Minnesota, Minneapolis, Minnesota 55455—the Hubert Humphrey Institute of Public Affairs (Project director: John E. Brandl.)

State University of New York, Stony Brook, New York 11794 — W. Averell Harriman College of Urban and Policy Sciences (Project director: Thomas Sexton.)

University of Texas, Austin, Austin, Texas 78712 — the Lyndon B. Johnson School of Public Affairs (Project director: Susan Hadden.)

Officer Grants in Public Policy

American Academy of Arts and Sciences **$15,000**
165 Allendale Street (over one year)
Jamaica Plain Station
Boston, Massachusetts 02130
For a comparative study of public policy in Britain and the United States regarding ethnic minorities. (Project director: Nathan Glazer.)

American Association of University Professors **$20,000**
One Dupont Circle (over one year)
Washington, D.C. 20036
For a study of institutional review boards and the impact of federal regulations on biomedical and social science research involving human subjects. (Project director: Judith Thomson.)

American Enterprise Institute for Public Policy Research **$20,000**
1150 Seventh Street, N.W. (over one year)
Washington, D.C. 20036
For completion of a study of immigration and public policy in the United States. (Project director: Elizabeth Midgley.)

Columbia University **$20,000**
New York, New York 10027 (over two years)
Partial support for a study of the influence of OSHA and its regulatory procedures on injury rates in American industry. (Project director: Ann Bartel, Graduate School of Business.)

New York Academy of Medicine **$9,000**
2 East 103rd Street (over one year)
New York, New York 10029
For publication of the proceedings of a symposium on health aspects of automotive emissions. (Project director: Dr. Maurice E. Shils.)

Other Grants and Activities

The following grants are related to the main interests of the Foundation but for one reason or another stand apart from a specific program. They are reviewed in order of declining amounts.

United Negro College Fund — **$630,000**
500 East 62nd Street — (over three years)
New York, New York 10021

Late in 1979 the Foundation developed a program in cooperation with UNCF whereby grants were made on a competitive basis to a number of black colleges. Invitations were sent to the member institutions of UNCF for proposals to improve the work of these schools in fields of primary interest to Sloan: science, mathematics, economics, management, engineering and pre-engineering. Proposals were received from 39 schools and nine awards of $70,000 each were made. The general director of the project is Christopher F. Edley (executive director of UNCF); the institutions receiving awards and the academic fields to be strengthened by the grants are:

Benedict College — curriculum development in economics.
Columbia, South Carolina 29204

Bennett College — new courses in science.
Greensboro, North Carolina 27420

Bishop College — an interdisciplinary program in molecular biology.
Dallas, Texas 75241

Dillard University — teaching materials in business administration and economics.
New Orleans, Louisiana 70122

Morehouse College — curriculum development in business administration.
Atlanta, Georgia 30314

Stillman College — a mathematics-science honors program.
Tuscaloosa, Alabama 35401

Tougaloo College — a combined program in economics and business.
Tougaloo, Mississippi 39174

Wilberforce University — business administration and a program in
Wilberforce, Ohio 45384 — public policy.

Xavier University — a pre-engineering program.
New Orleans, Louisiana 70125

As indicated earlier in this report, the money the Foundation can allocate over the next few years to increasing the number of students from minority groups in higher education will be concentrated in the field of public policy. The Foundation was in a transition year in 1980 in its support of minorities, phasing out its program in engineering and phasing in its program in public policy, thus leaving room for the large UNCF project.

Russell Sage Foundation — **$250,000**
633 Third Avenue — (over three years)
New York, New York 10017

The first decennial census was conducted 190 years ago, and the nation's need for complex statistical data about itself has grown steadily ever since. Statistics on population are the official figures used every ten years to compute the number of congressional representatives for each state and to align congressional districts to assure equal representation; and they are used, of course, for a great many other purposes. Special efforts have been made on several occasions in the past to design a coordinated series of studies based on census data covering a broad range of economic and social issues. The Russell Sage Foundation in collaboration with the Social Science Research Council has begun an ambitious program of such studies to be based on the census of 1980. A dozen or more studies will be produced that will deal with changes in population, age distribution, housing, residential patterns, migration patterns, occupational distribution, and many other matters. This grant is the Foundation's contribution to a budget that will reach about $3 million for the series. (Project directors: Peter E. de Janosi and Bernard Gifford.)

Yale University — **$200,000**
New Haven, Connecticut 06520 — (over two years)

The Foundation made a grant of $300,000 in 1977 in partial support of a group at Yale, led by John G. Simon, that was embarking on a long-term study of the non-profit or "voluntary" sector of American society—its size, rationale, methods of operation, effectiveness, and other characteristics. The program has

now made a promising start. Models of non-profit institutions have been constructed on a variety of hypotheses. Studies are under way of the public's attitude toward the voluntary sector, the legal environment in which the voluntary sector operates, the role that altruistic behavior plays in American society, state regulation of non-profit institutions, the expansion of the non-profit sector into industrial enterprises, and other issues. The present grant is for continued support of this group. (Project director: John G. Simon, director of the Program on Non-Profit Organizations.)

Ontario Institute for Advanced Studies in Education — **$150,000** (over four years)
252 Bloor Street West
Toronto, Ontario
Canada M5S IV6

Several years ago, the staff of the Foundation looked at some length into the problem of the teaching of writing in American schools and colleges. This inquiry was prompted partly by a large number of proposals arriving at the Foundation and concerned with the writing problem, and partly by the public and private statements of educators about the poor writing skills of many students. At the end of this exploration, the Foundation was persuaded that the problem had not been overestimated, that it was serious and pervasive, but also that it was not a problem that lent itself to effective action by the Foundation.

The decision was therefore made to exclude this problem from activities of primary concern to the Foundation, but there have been a few, a very few, exceptions to that policy when educators of extraordinary ability have sought support for projects of extraordinary promise. Professor Carl Bereiter of the Ontario Institute for Advanced Studies in Education is one such person. He leads a team of researchers trying to develop a sequential, cognitive-based curriculum in the teaching of writing in grades K-12. The Foundation made a grant of $200,000 in 1978 to help support his group's investigations, and the present grant represents renewal and final support for that work. (Project director: Carl Bereiter, Professor of Applied Psychology.)

Volunteer Urban Consulting Group, Inc. — **$120,000** (over three years)
24 West 40th Street
New York, New York 10018

In most years the Foundation makes one trustee grant and one or more officer grants in support of non-profit service agencies in New York City. A trustee grant in 1980 went to this outstanding organization that provides free professional

assistance to minority businesses and to non-profit agencies in the fields of health, social service, housing, education, community development, and the arts. VUCG's services to those organizations cover many aspects of accounting, financial planning, insurance, real estate, and internal operations. VUCG uses volunteers from a talent bank of over 1,000 individuals with expertise in management and other fields. (Project director: Brooke W. Mahoney, director of VUCG.)

Officer Grants

Association of American Universities — **$15,000** (over one year)
One Dupont Circle
Washington, D.C. 20036
Partial support for the second phase of a program concerned with the problems of research universities. (Project director: Thomas A. Bartlett, president of AAU.)

Atlanta University Center, Inc. — **$20,000** (over one year)
360 Westview Drive, S.W.
Atlanta, Georgia 30310
For a training program in research administration for minority institutions, to be offered jointly by the Georgia Institute of Technology and the Atlanta University Center. (Project director: Charles W. Merideth, chancellor of AUC.)

Brown University — **$13,000** (over one year)
Providence, Rhode Island 02912
Partial support for the first year of the university's program to train members of its administrative staff in management skills. (Project director: Richard J. Ramsden, Vice President.)

Coalition of National Voluntary Organizations — **$20,000** (over one year)
1828 L Street, N.W.
Washington, D.C. 20035
To help in the establishment of a new organization, called Independent Sector, to be formed from a merger of the Coalition of National Voluntary Organizations and the National Council on Philanthropy. (Project director: Brian O'Connell.)

Cornell University — **$6,000** (over two years)
Ithaca, New York 14853
To support the first phase of a program offering special help in mathematics to students of all ability levels. (Project director: Stephen Lichtenbaum, Department of Mathematics.)

Council on Foundations, Inc. — **$20,000** (over one year)
1828 L Street, N.W.
Washington, D.C. 20036
Members of the Council on Foundations, the principal organizational voice of private foundations in the United States, are assessed dues in proportion to their assets. This grant met the Sloan Foundation's dues for 1980.

Massachusetts Institute of Technology — **$15,000**
Cambridge, Massachusetts 02139 — (over one year)

For completion of a comparative study of violence in television programming in the United States and other countries. (Project director: Ithiel de Sola Pool, Department of Political Science.)

National Academy of Public Administration — **$20,000**
1225 Connecticut Avenue, N.W. — (over one year)
Washington, D.C. 20036

Partial support for a study of the role of the presidency in the management of the federal government. (Project directors: Don K. Price and Rocco C. Siciliano.)

National Academy of Sciences — **$20,000**
2101 Constitution Avenue — (over one year)
Washington, D.C. 20418

For the preparation of a background paper on the problems of data-sharing among scientists. (Project director: Clifford Hildreth.)

National Information Bureau, Inc. — **$10,000**
419 Park Avenue South — (over five years)
New York, New York 10016

For support of a project to encourage public accountability among American charities and other non-profit organizations. (Project director: M. C. Van de Workeen.)

New York University — **$20,000**
New York, New York 10012 — (over one year)

For a project on the anthropological analysis of television in the United States. (Project director: Karen Wollaeger, New York Institute for the Humanities.)

Virginia Polytechnic Institute and State University — **$20,000**
Blacksburg, Virginia 24060 — (over one year)

Support for a conference on the role of trade unions as institutions and their influence on public questions of efficiency, justice, and productivity. (Project director: Joe E. Reid, Jr., Center for Study of Public Choice.)

The Sloan Commission on Government and Higher Education

The Foundation's annual report for 1977 announced the formation of the Sloan Commission on Government and Higher Education. The commission was to be an independent, autonomous body that would examine the increasingly tangled and testy relationships between government (federal and state) and institutions of higher education. The Foundation's annual reports for 1978 and 1979 reviewed in some detail the progress the commission was making with this extremely intricate problem, and there is no need for recapitulation here. The commission finished its work in 1980 and its report, titled *A Program for Renewed Partnership,* is available from Ballinger Publishing Company, 17 Dunster St., Cambridge, Massachusetts 02138. The background papers that were done for the commission are also available at various prices from the ERIC Documentation Reproduction Service, P.O. Box 190, Arlington, Virginia 22210.

Financial Review

Financial Review

The financial statements and schedules of the Foundation, which have been audited by Deloitte Haskins & Sells, independent certified public accountants, appear on pages 61 to 76. They include the balance sheets, the statements of income and fund balance, the statements of changes in financial position, the schedules of administration and investment expenses, the schedule of marketable securities, and the schedule of grants and appropriations.

Investment and other income for 1980 was $18,788,562, an increase of $615,562 from $18,173,000 in 1979. To a major degree, this increase resulted from the high interest rates which prevailed during most of 1980.

After the deduction of investment expenses and provision for federal excise tax from investment and other income, net investment income was $17,903,151 in 1980 as compared with $17,398,259 for the prior year. Investment expenses during 1980 totaled $423,411, of which $319,350 represented investment counsel fees. Provision for federal excise tax amounted to $462,000. The total of these deductions from income in 1980 was $885,411 versus $774,741 in 1979.

The total of grants and appropriations authorized and administration expenses during 1980 was $20,236,373. This sum was $2,333,222 over 1980 net investment income. Of this total, grants and appropriations amounted to $18,859,618 while administration expenses were $1,376,755. Over the Foundation's 46-year history, the cumulative excess of grants and expenses over income has amounted to $54,460,436.

Grant and appropriation payments in 1980 were $16,733,622, compared with $13,140,877 the prior year. Together with 1980 administration expenses, investment expenses and federal excise taxes paid, the total of cash expenditures in 1980 was $18,951,294, while in 1979 the amount was $15,140,319.

The market value of the Foundation's total assets was $265,649,085 at December 31, 1980, including marketable securities valued at $265,495,305, as

compared with total assets of $252,057,634 at December 31, 1979. A summary of the Foundation's marketable securities at ledger amount and quoted market value at December 31, 1980 appears on page 66.

A listing of grants made during 1980 will be found on pages 73 to 76. Grants and appropriations authorized and payments during the year ended December 31, 1980 are summarized in the following table:

Grants and appropriations authorized but not due at January 1, 1980	$14,716,143
Authorized during 1980	18,859,618
	33,575,761
Payments during 1980	16,733,622
Grants and appropriations authorized but not due at December 31, 1980	$16,842,139

As part of its total assets, the Foundation has maintained in a separate account the General Motors Dealers Appreciation Fund for Cancer and Medical Research. This fund was established in 1949 by gifts from General Motors dealers in appreciation of the contribution of Alfred P. Sloan, Jr., to the Corporation and its dealer organizations. At December 31, 1979, the fund's market value was $3,587,307. During 1980, the Foundation authorized and paid as described on page 74 an appropriation equal to this market value to Memorial Sloan-Kettering Cancer Center from the Dealers Appreciation Fund, thereby removing the account from its assets. During its existence, the General Motors Dealers Appreciation Fund reached a market value high of over $13 million and with the amount paid this year, payments from the fund have been in excess of $18 million.

Deloitte
Haskins + Sells

One World Trade Center
New York, New York 10048
(212) 669-5000
International Telex 66272

AUDITORS' OPINION

Alfred P. Sloan Foundation,
630 Fifth Avenue,
New York, New York 10111.

Dear Sirs:

We have examined the balance sheets of Alfred P. Sloan Foundation as of December 31, 1980 and 1979 and the related statements of income and fund balance and of changes in financial position for the years then ended. Our examinations were made in accordance with generally accepted auditing standards and, accordingly, included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, such financial statements present fairly the financial position of the Foundation at December 31, 1980 and 1979 and the results of its operations and the changes in its financial position for the years then ended, in conformity with generally accepted accounting principles applied on a consistent basis.

Our examinations also comprehended the supplemental schedules of administration and investment expenses for the years ended December 31, 1980 and 1979 and the supplemental schedules of marketable securities at December 31, 1980 and of grants and appropriations for the year then ended. In our opinion, such supplemental schedules, when considered in relation to the basic financial statements, present fairly in all material respects the information shown therein.

Yours truly,

Deloitte Haskins & Sells

February 2, 1981

Balance Sheets

December 31, 1980 and 1979

	1980	1979
Assets		
Marketable Securities:		
Fixed income securities:		
U.S. Government and agency obligations	$ 38,891,127	$ 46,273,657
Corporate and other	46,717,277	33,492,362
Total Fixed Income Securities	85,608,404	79,766,019
Common stocks:		
General Motors Corporation	41,677,643	41,677,643
Other common stocks	110,325,640	108,511,966
Total common stocks	152,003,283	150,189,609
Total marketable securities (quoted market: 1980—$265,495,305; 1979—$251,954,855)	237,611,687	229,955,628
Cash	153,780	102,779
TOTAL	$237,765,467	$230,058,407
Obligations and Fund Balance		
Grants and Appropriations Authorized But Not Due for Payment	$ 16,842,139	$ 14,716,143
Accrued Federal Excise Tax	464,456	419,962
Fund Balance	220,458,872	214,922,302
TOTAL	$237,765,467	$230,058,407

See accompanying Notes to Financial Statements.

Statements of Income and Fund Balance

For the years ended December 31, 1980 and 1979

	1980	1979
INCOME:		
Investment income:		
Dividends	$ 10,239,728	$ 11,608,372
Interest	8,478,487	6,488,629
Other	70,347	75,999
	18,788,562	18,173,000
Less:		
Investment expenses	423,411	356,741
Provision for Federal excise tax	462,000	418,000
	885,411	774,741
Net investment income	17,903,151	17,398,259
Grants and expenses:		
Grants and appropriations authorized	18,859,618	13,941,693
Administration expenses	1,376,755	1,324,909
Total	20,236,373	15,266,602
Grants and expenses (over) under income for the year	(2,333,222)	2,131,657
Cumulative excess of grants and expenses over income from inception to:		
Beginning of year	(52,127,214)	(54,258,871)
End of year	(54,460,436)	(52,127,214)
PRINCIPAL:		
Balance at beginning of year	267,049,516	261,679,564
Assets received as remainderman of trust (Note 4)	1,497,804	—
Net gain on disposals of securities	6,371,988	5,369,952
Balance at end of year	274,919,308	267,049,516
FUND BALANCE AT END OF YEAR	$220,458,872	$214,922,302

See accompanying Notes to Financial Statements.

Statements of Changes in Financial Position

For the years ended December 31, 1980 and 1979

	1980	1979
SOURCE OF FUNDS:		
Investment and other income	$18,788,562	$18,173,000
Assets received as remainderman of trust	1,497,804	—
Net gain on disposals of securities	6,371,988	5,369,952
	26,658,354	23,542,952
APPLICATION OF FUNDS:		
Grant and appropriation payments	16,733,622	13,140,877
Administration expenses	1,376,755	1,324,909
Investment expenses	423,411	356,741
Federal excise taxes paid	417,506	317,792
	18,951,294	15,140,319
INCREASE (DECREASE) IN FUNDS CONSISTING OF:		
Change in ledger value of investments	7,656,059	8,950,184
Change in cash balances	51,001	(547,551)
NET CHANGE	$ 7,707,060	$ 8,402,633

See accompanying Notes to Financial Statements.

Notes to Financial Statements

1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

The accompanying financial statements have been prepared substantially on the accrual basis of accounting and, accordingly, reflect all significant assets and liabilities. Investment income and investment and administration expenses are recorded on the cash basis, the effect of which on the accompanying financial statements is not materially different from the accrual basis.

Marketable securities purchased are carried at cost; those received by gift or bequest are carried at quoted market value at date of gift or bequest. Gain or loss on disposal of securities is determined generally on the basis of first-in, first-out cost, but in certain instances the identified certificate basis is used. Net gain or loss on disposals is applied to the principal fund.

Grant appropriations are accrued at the time authorized by the Trustees and Federal excise tax is accrued in the year to which it relates.

2. RETIREMENT PLAN

The Foundation has a defined contribution retirement plan covering substantially all employees under arrangements with Teachers Insurance and Annuity Association of America and College Retirement Equities Fund which provides for purchase of annuities for employees. Retirement plan expense was $122,796 and $118,203 for 1980 and 1979, respectively.

3. LEASE

The Foundation's lease for its office space expires April 30, 1985. The lease contains an escalation clause which provides for rental increases resulting from increases in real estate taxes and certain other operating expenses. Under the lease, rent was $243,527 in 1980 and $238,521 in 1979 before sublease income.

4. DISTRIBUTION OF TRUST

Assets, in the amount of $1,497,804, consisting of cash, municipal bonds and common stocks, were received by the Foundation as a remainderman of the trust created by Alfred P. Sloan, Jr. for the benefit of Clifford A. Sloan.

Schedule of Administration and Investment Expenses

For the years ended December 31, 1980 and 1979

	1980	1979
ADMINISTRATION EXPENSES:		
Salaries and employee benefits:		
Salaries	$ 757,229	$ 686,121
Employees' retirement plan and other benefits	214,419	204,058
Total	971,648	890,179
Rent (net of sublease rentals of approximately $35,000 and $33,000, respectively)	210,077	206,661
Program expenses	139,100	114,800
Office expenses and services	87,256	98,100
Reports and publications	33,971	28,006
Professional fees	38,764	42,845
Total administration expenses	1,480,816	1,380,591
Less: Administration expenses applicable to investments	104,061	55,682
Administration expenses applicable to grant making	$1,376,755	$1,324,909
INVESTMENT EXPENSES:		
Investment counsel fees	$ 319,350	$ 301,059
Administration expenses applicable to investments	104,061	55,682
Total investment expenses	$ 423,411	$ 356,741

Schedule of Marketable Securities

December 31, 1980

SUMMARY	Ledger Amount	Quoted Market Value	
		Amount	Percent
Fixed income securities:			
U.S. Government and agency obligations	$ 38,891,127	$ 34,814,785	13.1%
Corporate and other	46,717,277	45,085,607	17.0
Total fixed income securities	85,608,404	79,900,392	30.1
Common stocks:			
General Motors Corporation	41,677,643	45,000,000	16.9
Other common stocks	110,325,640	140,594,913	53.0
Total common stocks	152,003,283	185,594,913	69.9
Total marketable securities	$237,611,687	$265,495,305	100.0%

FIXED INCOME SECURITIES	Principal Amount	Ledger Amount	Quoted Market Value
U.S. Government and Agency Obligations:			
Treasury Notes:			
7⅛% — May 15, 1981	$2,100,000	$ 2,088,188	$ 2,044,875
7¼% — March 31, 1982	2,500,000	2,485,938	2,356,250
8¼% — June 30, 1982	4,090,000	4,068,716	3,831,798
7¼% — February 15, 1984	2,300,000	2,069,438	1,996,676
8% — February 15, 1985	500,000	501,094	430,310
7⅞% — May 15, 1986	3,252,000	3,498,797	2,691,030
8¼% — May 15, 1988	1,000,000	989,219	805,620
Treasury Bonds:			
7⅞% — February 15, 1993	1,000,000	716,946	723,750
8⅛% — August 15, 1993	1,000,000	993,750	763,750
8⅛% — November 15, 1993	1,000,000	1,000,469	761,870
9% — February 15, 1994	1,000,000	772,065	786,870
10⅛% — November 15, 1994	2,000,000	1,983,125	1,708,740
8¾% — August 15, 2000	1,000,000	988,125	726,250
9⅛% — May 15, 2009	2,000,000	1,844,375	1,562,500

FIXED INCOME SECURITIES	Principal Amount	Ledger Amount	Quoted Market Value
Federal Farm Credit Banks Consolidated System-wide Bonds:			
9.20% — June 3, 1985	$1,000,000	$ 853,464	$ 880,000
7¾% — September 5, 1989	1,000,000	755,139	750,000
Federal Home Loan Mortgage Corporation Mortgage Participation Certificates:			
10¾% — September 1, 2009	1,155,467	1,074,584	957,592
10¾% — October 1, 2009	1,740,409	1,618,580	1,442,363
Federal Intermediate Credit Banks Consolidated Bonds			
6.95% — January 5, 1987	1,500,000	1,159,046	1,141,875
Federal Land Banks Consolidated Bonds:			
7.30% — October 20, 1982	1,000,000	1,007,500	910,000
8.20% — January 22, 1990	500,000	390,150	385,000
Federal National Mortgage Association Debentures:			
7.05% — March 10, 1981	1,100,000	1,034,000	1,079,375
7¼% — June 10, 1981	300,000	297,656	290,250
6.65% — June 10, 1982	1,000,000	1,002,500	912,500
7.65% — March 11, 1985	2,000,000	1,991,250	1,662,500
8.60% — June 10, 1985	1,000,000	1,000,312	857,500
8.20% — March 10, 1986	1,000,000	817,550	827,500
6.05% — February 1, 1988	1,000,000	996,250	685,000
Government National Mortgage Association Modified Pass Through Certificate			
11% — January 15, 2010	978,857	892,901	843,041
Total U.S. Government and Agency Obligations		$38,891,127	$34,814,785

Schedule of

December 31, 1980 (Continued)

FIXED INCOME SECURITIES	Principal Amount	Ledger Amount	Quoted Market Value
Corporate and Other:			
Short term:			
Undivided interest in demand notes at prevailing interest rates:			
General Electric Company	$ 316,000	$ 316,000	$ 316,000
General Motors Acceptance Corporation	1,301,000	1,301,000	1,301,000
Tenneco Corporation	288,000	288,000	288,000
Certificates of Deposit:			
Bank of America N.T. & S.A. 21% — January 16, 1981	5,000,000	5,000,000	5,006,250
First National Bank of Chicago			
18¼% — January 5, 1981	3,000,000	3,000,000	2,999,670
21% — January 15, 1981	4,000,000	4,000,000	4,004,680
Mellon Bank N.A. 18¼% — January 7, 1981	3,200,000	3,200,000	3,200,320
Seattle First National Bank 21.05% — January 12, 1981	6,000,000	6,000,000	6,005,520
Commercial Paper:			
Union Oil Credit Corporation 20.47% — January 5, 1981	1,100,000	1,100,000	1,100,000
Repurchase Agreements:			
U.S. Treasury Notes and Bills 17⅜% — January 2, 1981	4,175,000	4,175,000	4,175,000
Other:			
Duke Power Company First and Refunding Mortgage Bonds 3¼% — April 1, 1981	1,000,000	905,770	973,320
General Motors Acceptance Corporation Debentures 5% — March 15, 1981	1,500,000	1,492,500	1,467,735
Total short term		$30,778,270	$30,837,495

Marketable Securities

FIXED INCOME SECURITIES	Principal Amount	Ledger Amount	Quoted Market Value
Long term:			
American Telephone and Telegraph Company Debentures 4⅜% — April 1, 1985	$1,500,000	$ 1,518,210	$ 1,152,690
John Deere Credit Company Sinking Fund Debentures 4⅞% — October 31, 1985	1,000,000	704,530	710,740
E.I. du Pont de Nemours & Company Notes 8% — May 1, 1986	1,000,000	938,750	831,960
General Foods Corporation Notes 7½% — March 1, 1984	500,000	463,580	433,900
Georgia-Pacific Corporation Notes 7¼% — January 15, 1985	2,000,000	1,793,750	1,669,220
Household Finance Corporation Debentures:			
8½% — May 15, 1983	1,000,000	997,500	902,780
4⅜% — July 1, 1987	500,000	332,268	316,190
International Business Machines Corporation Notes 9½% — October 1, 1986	1,000,000	947,500	903,990
International Paper Company, Sinking Fund Debentures 8.85% — March 15, 1995	1,500,000	1,553,750	1,148,310
Manufacturers Hanover Trust Company, Capital Debentures 8½% — June 1, 1985	1,000,000	973,440	843,460
Ohio Bell Telephone Company Debentures 9% — November 1, 2018	1,000,000	862,500	713,120

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December 31, 1980 (Continued)

FIXED INCOME SECURITIES	Principal Amount	Ledger Amount	Quoted Market Value
Oklahoma Gas & Electric Company, First Mortgage Bonds			
4½% — January 1, 1987	$ 800,000	$ 514,944	$ 535,360
Pacific Northwest Bell Telephone Company Debentures			
10⅛% — October 1, 2019	1,000,000	930,000	785,360
Province of Ontario, Canada, Debentures			
4¼% — February 1, 1984	1,000,000	851,300	797,920
Security Pacific Corporation Notes			
8.80% — December 15, 1985	1,000,000	1,000,000	837,230
Southern California Edison Company, First and Refunding Mortgage Bonds			
4¼% — November 1, 1987	1,300,000	790,875	812,292
Texas Company Debentures			
3⅝% — May 1, 1983	1,000,000	766,110	853,590
Total long term		15,939,007	14,248,112
Total corporate and other		46,717,277	45,085,607
Total fixed income securities		$85,608,404	$79,900,392

COMMON STOCKS	Number Of Shares	Ledger Amount	Quoted Market Value
American Home Products Corporation	66,000	$ 1,965,075	$ 1,856,250
American Telephone and Telegraph Company	85,000	4,476,717	4,069,375
Anheuser-Busch Companies	60,000	1,325,000	1,665,000
Associated Dry Goods Corporation	70,000	1,831,117	1,715,000
Avon Products, Inc.	60,000	3,159,150	2,047,500

Marketable Securities

COMMON STOCKS	Number Of Shares	Ledger Amount	Quoted Market Value
BankAmerica Corporation	80,200	$ 1,795,986	$ 2,426,050
Bristol-Myers Company	30,000	975,983	1,511,250
Celanese Corporation	20,000	889,993	1,100,000
Coca-Cola Company	70,000	2,609,027	2,336,250
Colgate-Palmolive Company	100,000	1,469,989	1,462,500
Continental Group, Inc.	40,000	1,071,698	1,305,000
Dart & Kraft, Inc.	50,000	2,303,600	2,175,000
Delta Air Lines, Inc.	30,000	1,216,225	1,770,000
Eastman Kodak Company	50,500	2,137,414	3,522,375
Exxon Corporation	71,800	2,044,278	5,788,875
Federated Department Stores, Inc.	60,000	1,784,500	1,710,000
First National Boston Corporation	30,000	865,200	1,068,750
Florida Power & Light Company	50,000	1,253,792	1,306,250
General Electric Company	60,700	2,821,526	3,717,875
General Motors Corporation	1,000,000	41,677,643	45,000,000
General Telephone & Electronics Corporation	150,000	4,056,122	4,087,500
Georgia-Pacific Corporation	70,000	1,948,500	1,750,000
Gulf Oil Corporation	70,000	2,890,055	3,045,000
Halliburton Company	50,000	1,272,420	4,175,000
Honeywell, Inc.	20,000	1,511,468	2,235,000
INA Corporation	46,000	1,426,301	1,863,000
International Business Machines Corporation	192,000	5,321,227	13,032,000
Johnson & Johnson	20,000	1,829,399	1,995,000
K mart Corporation	80,000	1,754,525	1,430,000
Kerr-McGee Corporation	30,000	1,921,938	2,370,000
Eli Lilly & Company	40,000	2,121,200	2,550,000
Lincoln National Corporation	40,000	1,588,702	1,600,000
Manufacturers Hanover Corporation	40,000	1,269,337	1,310,000
Marathon Oil Company	40,000	2,933,764	2,830,000
McDermott, Inc.	37,200	1,523,153	1,525,200
McDonalds Corporation	25,000	1,048,072	1,218,750
Middle South Utilities, Inc.	120,000	1,535,850	1,380,000

Schedule of Marketable Securities

December 31, 1980 (Continued)

COMMON STOCKS	Number Of Shares	Ledger Amount	Quoted Market Value
Minnesota Mining and Manufacturing Company	25,000	$ 1,139,088	$ 1,475,000
J.P. Morgan & Co., Inc.	70,000	1,310,880	3,613,750
Motorola, Inc.	40,000	1,604,575	2,920,000
NCNB Corporation	100,000	1,225,812	1,350,000
Nabisco, Inc.	70,000	1,561,230	1,863,750
Natomas Company	80,000	1,180,300	2,940,000
Northwest Airlines, Inc.	70,000	1,799,400	1,662,500
Owens-Corning Fiberglas Corporation	50,00	1,301,721	1,337,500
Pacific Gas & Electric Company	100,000	2,175,832	2,050,000
Penney, (J.C.) Company	89,400	4,506,749	2,100,900
RCA Corporation	140,000	3,621,440	4,112,500
Schlumberger Limited	43,350	449,334	5,071,950
Sears, Roebuck & Company	102,610	1,600,162	1,564,803
Southeast Banking Corporation	75,760	1,553,844	1,496,260
Square D Company	100,000	2,195,019	2,900,000
Sterling Drug, Inc.	70,000	1,241,412	1,592,500
Texaco, Inc.	50,000	1,673,050	2,400,000
Travelers Corporation	80,000	3,162,950	3,110,000
Upjohn Company	35,000	1,603,887	2,362,500
Whirlpool Corporation	100,000	1,747,362	1,925,000
Xerox Corporation	30,000	1,723,290	1,796,250
Total common stocks		152,003,283	185,594,913
Total fixed income securities		85,608,404	79,900,392
Total marketable securities		$237,611,687	$265,495,305

Schedule of Grants and Appropriations

	Authorized But Not Due Dec. 31, 1979	1980 Authorized	1980 Payments	Authorized But Not Due Dec. 31, 1980
American Academy of Arts and Sciences		$ 15,000	$ 15,000	
American Assembly of Collegiate Schools of Business		20,000	20,000	
American Association for the Advancement of Science	$ 50,000		50,000	
American Association of University Professors		20,000	20,000	
American Council on Education	55,000			$ 55,000
American Council of Learned Societies		20,000	20,000	
American Economic Association		75,000	75,000	
American Enterprise Institute for Public Policy Research		20,000	20,000	
Arizona, University of	10,000	20,000	20,000	10,000
Association for Media-Based Continuing Education for Engineers		256,000		256,000
Association of American Universities		15,000	15,000	
Atlanta University Center, Inc.		20,000	20,000	
Babson College	39,500		39,500	
Baylor College of Medicine		10,000	10,000	
Benedict College		70,000	70,000	
Bennett College		70,000	70,000	
Bishop College		70,000	70,000	
Boston College		20,000	10,000	10,000
Brandeis University		20,000	10,000	10,000
British Columbia, University of	10,000		10,000	
Brookings Institution		375,000	125,000	250,000
Brooklyn College		96,000	32,000	64,000
Brown University	25,000	552,000	167,000	410,000
California, University of	1,187,000	940,687	1,030,687	1,097,000
California Institute of Technology	10,000	370,000	170,000	210,000
Cambridge, University of	65,000		65,000	
Capital Children's Museum		14,500	14,500	
Carleton College		236,000	10,000	226,000
Carnegie-Mellon University	430,000	552,000	399,000	583,000
Center for Advanced Study in the Behavioral Sciences	100,000		100,000	
Chicago, University of	331,000	530,000	346,000	515,000
Coalition of National Voluntary Organizations		20,000	20,000	
Cognitive Science Society, Inc.		20,000	20,000	
Cold Spring Harbor Laboratory	100,000		50,000	50,000
Colorado, University of	40,000	30,000	70,000	
Columbia University	155,000	43,147	148,147	50,000
Committee for Economic Development		250,000		250,000
Connecticut, University of		30,000	30,000	

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(Continued)

	Authorized But Not Due Dec. 31, 1979	1980 Authorized	1980 Payments	Authorized But Not Due Dec. 31, 1980
Cornell University	$ 70,000	$ 821,000	$ 266,000	$ 625,000
Council on Foundations, Inc.		20,000	20,000	
Council on Library Resources	360,000		120,000	240,000
CUNY Urban Academy for Management, Inc.	100,000		100,000	
Dartmouth College		40,000	20,000	20,000
Denver, University of	31,000		31,000	
Dillard University		70,000	70,000	
Duke University	70,000	6,688	76,688	
Eastern Massachusetts Urban League, Inc.	175,000		75,000	100,000
Emory University		40,000	30,000	10,000
Foundation Center	40,000		40,000	
Georgia Tech Foundation, Inc.	200,000		200,000	
Godine, David R., Publisher, Inc		20,000	20,000	
Harvard University	304,500	1,010,000	367,500	947,000
Houston, University of		20,000	10,000	10,000
Hudson Institute		150,000	75,000	75,000
Illinois, University of	41,000	80,000	81,000	40,000
Indiana University Foundation		40,000	20,000	20,000
Iowa State University of Science and Technology	10,000		10,000	
Johns Hopkins University		20,000	10,000	10,000
Joint Council on Economic Education	44,000		44,000	
Kansas, University of		20,000	10,000	10,000
Kansas State University	10,000		10,000	
Kentucky, University of, Research Foundation	20,000	20,000	30,000	10,000
Lawrence University	85,000		85,000	
London School of Economics and Political Science		200,000	100,000	100,000
Maryland, University of	430,000	47,334	182,334	295,000
Massachusetts, University of		490,000	100,000	390,000
Massachusetts Institute of Technology	760,000	350,000	460,000	650,000
McGill University		30,000	30,000	
McLean Hospital Corporation		22,908	12,908	10,000
Meharry Medical College	240,000		60,000	180,000
Memorial Sloan-Kettering Cancer Center		3,587,307	3,587,307	
Miami, University of	100,000		100,000	
Michigan, University of	20,000	450,000	100,000	370,000
Michigan State University	10,000	39,500	39,500	10,000
Minnesota, University of	10,000	373,554	213,554	170,000
Missouri, University of	10,000		10,000	
Montana, University of, Foundation	85,000		60,000	25,000
Morehouse College		70,000	70,000	
Museum of Science, Boston, Massachusetts		70,000		70,000
National Academy of Public Administration		20,000	20,000	

Grants and Appropriations

	Authorized But Not Due Dec. 31, 1979	1980 Authorized	1980 Payments	Authorized But Not Due Dec. 31, 1980
National Academy of Sciences		$ 20,000	$ 20,000	
National Affairs, Inc.		20,000	20,000	
National Bureau of Economic Research, Inc.	$ 200,000		100,000	$ 100,000
National Fund for Minority Engineering Students	350,000		200,000	150,000
National Information Bureau, Inc.		10,000	10,000	
Netherlands Institute for Advanced Studies		20,000	20,000	
New York Academy of Medicine		9,000	9,000	
New York Public Library	25,000		25,000	
New York University	260,000	184,000	184,000	260,000
North Carolina, University of	55,000	185,000	155,000	85,000
Northeastern University		20,000	10,000	10,000
Northwestern University	587,500	275,000	520,000	342,500
Notre Dame, University of	10,000		10,000	
Oberlin College	80,000	175,000	167,500	87,500
Ohio State University Research Foundation		30,000	30,000	
Ontario Institute for Studies in Education		150,000		150,000
Oregon, University of		30,000	30,000	
Oregon State University		20,000	10,000	10,000
Pacific Academy for Advanced Studies		20,000	20,000	
Pennsylvania, University of	345,000	345,000	305,000	385,000
Pennsylvania State University		40,000	20,000	20,000
Philadelphia Regional Introduction for Minorities to Engineering (PRIME)	75,000		75,000	
Princeton University	150,000	370,000	300,000	220,000
Purdue University	30,000		30,000	
Rand Corporation	200,000		62,000	138,000
Rensselaer Polytechnic Institute		450,000	150,000	300,000
Research Foundation of the City University of New York		40,000	40,000	
Research Foundation of the State University of New York	430,000	110,000	360,000	180,000
Research Libraries Group	250,000		250,000	
Resources for the Future, Inc.	468,500		230,000	238,500
Rice University	80,000	20,000	90,000	10,000
Rochester, University of	70,000	50,000	110,000	10,000
Rockefeller University		46,000	46,000	
Russell Sage Foundation		250,000		250,000
Salk Institute for Biological Studies	10,000		10,000	
San Diego State University Foundation		20,000	20,000	
SIAM Institute for Mathematics and Society	28,000	275,000	103,000	200,000
Southern California, University of	10,000	60,000	40,000	30,000
Stanford University	399,000	846,800	521,800	724,000
Stevens Institute of Technology		15,000	15,000	
Stillman College		70,000	70,000	

Schedule of Grants and Appropriations

(Continued)

	Authorized But Not Due Dec. 31, 1979	1980 Authorized	1980 Payments	Authorized But Not Due Dec. 31, 1980
Stony Brook Foundation		$ 20,000	$ 20,000	
Swarthmore College	$ 100,000		50,000	$ 50,000
Syracuse University	210,000		210,000	
Texas, University of	431,000	110,000	330,000	211,000
Texas A&M University		20,000	10,000	10,000
THOR, Inc.		3,000	3,000	
Tougaloo College		70,000	70,000	
Tulane University		230,000		230,000
Urban Institute		20,000	20,000	
Utah, University of		20,000	10,000	10,000
Vanderbilt University	10,000	20,000	20,000	10,000
Virginia Polytechnic Institute and State University		20,000	20,000	
Volunteer Urban Consulting Group, Inc.		120,000	40,000	80,000
Washington University	50,000	20,000	60,000	10,000
Washington, University of		312,176	122,176	190,000
Washington State University		40,000	20,000	20,000
Wayne State University		5,674	5,674	
Wellesley College	85,000		85,000	
Wesleyan University	10,000		10,000	
Western Ontario, University of		30,000	30,000	
Wilberforce University		70,000	70,000	
Woodrow Wilson International Center for Scholars		20,000	20,000	
Xavier University		70,000	70,000	
Yale University	427,000	515,000	492,000	450,000
Sloan Commission on Government and Higher Education	313,322	(152,930)	160,392	
Sloan Fellowships for Basic Research to be granted in ensuing year	1,550,000	210,000		1,760,000
Officer grant appropriation for grants in ensuing year	850,000			850,000
Book Program	646,537		102,452	544,085
Other appropriations for grants and related expenses	87,284	39,352	43,082	83,554
	14,716,143	18,936,697	16,810,701	16,842,139
Reduction for grant transfers		77,079	77,079	
Total grants and appropriations	$14,716,143	$18,859,618	$16,733,622	$16,842,139

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Alfred P. Sloan Foundation

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President's Statement

President's Statement

During 1981, the officers and staff of the Foundation were engaged in exploring a possible new program to be called The New Liberal Arts, a program that was approved by the Trustees early in 1982. The basic premises on which the program is based are that all college graduates should have some competence in quantitative and analytical reasoning and some understanding of technology, and that the present curriculum of many, perhaps most, good colleges does not fully meet these goals. The Foundation seeks to assist some liberal arts colleges to work toward these goals by making grants for the development of instructional materials, the planning of new components of the curriculum, and the retraining of faculty in such areas as applied mathematics and the history of technology.

The basic premises of the program are set out in some detail in the Occasional Paper, *The New Liberal Arts*, which consists of an essay by Stephen White, Director of Special Projects at the Foundation; solicited comments from 10 educators; and concluding remarks by Mr. White. The paper was edited by Vice President James D. Koerner. Because this paper has been widely distributed and is still available on request from the Foundation, I shall not attempt to summarize it here.

The development of this program illustrates well the way in which the Sloan Foundation typically works. When I came to the Foundation, I had never been employed by any foundation except as an occasional consultant. I imagined that the Foundation operated largely by receiving a stream of unsolicited proposals, from which it selected for funding those of the greatest merit. This concept of a foundation as primarily a passive, neutral referee, although it is a widespread one, turned out to be incorrect. To be sure, the Foundation does receive many unsolicited proposals, some of which do get funded, but foundation officers seldom find the best proposals simply by opening their mail.

At the opposite extreme, an idea may be generated by a discussion with a visitor to the Foundation or at a conference that a Foundation staff member attends, or by something that appears in a current publication. This idea creates an awareness of the case for a grant for which there is no proposal. In such instances the Foundation becomes an initiator, seeking out potential grantees. The search may reveal that the idea is not in fact as promising as it first seemed, or it may result in a grant that the grantee would not have proposed without encouragement.

Most of our grants fall in a large middle ground. They are part of coherent programs that are devised by a long process of interaction between the Foundation and the scholarly community. The program, The New Liberal Arts, is the outcome of just such a process.

The ultimate origins of any idea are hard to trace. For each of us at the Foundation, the impetus for the new program may have been somewhat different. It has some relationship to earlier Foundation efforts to improve the teaching of writing and to promote computer literacy, efforts that never became full-scale programs. It draws in some ways on our earlier program in public policy studies at liberal arts colleges.

To the extent that I can identify the immediate origins of the program, I would say that among them were three small grants made in 1980. These were grants to Princeton University for the development of teaching materials for the program Humanistic Studies in Modern Engineering, to Stanford University for the development of three courses in technology to be offered by the School of Engineering to nonengineering students, and to Stevens Institute of Technology for a workshop on the teaching of technology to nonengineering students. The problems addressed by these grants clearly extended far beyond the three grantee institutions. The Foundation therefore funded a conference organized by John Truxal of the State University of New York at Stony Brook in January 1981 at which 16 people interested in the problem of technological literacy discussed various ways to address it. Independently, the Foundation received a proposal from Professor Gail Young, then at Case-Western Reserve University, for work on improving the teaching of applied mathematics. From this grew a small conference on applied mathematics held in June and funded by a grant to Case-Western Reserve. It quickly became clear that the areas of technological literacy and quantitative reasoning were closely related.

From these beginnings, the effort grew in a number of directions. One was the Occasional Paper, *The New Liberal Arts,* whose content was widely reported in the press. This in turn produced a series of letters and visits to the Foundation by college faculty and administrators who expressed their views on the issues raised. A second direction of growth of the project is represented by a number of more substantial grants in technological literacy made in 1981 and described on pages 25-29 of this report. A third was the convening of three additional small conferences during the second half of 1981. These involved representatives from

a wide variety of institutions from small colleges to major universities and ranging across disciplines from mathematics and engineering to history and classics. Finally, there were discussions of the proposed program with the Trustees of the Foundation.

The process just sketched is in part an interaction between the Foundation and the academic community, and in part a discussion within the academic community which the Foundation facilitates. Nothing in the process offers any guarantee that a new program will succeed. It does, however, assure that there is a widespread agreement on the need for the program and an interest in trying to make it work.

In the course of our deliberations about the new program, one of the most important things we have learned is that some humanists see the Foundation's initiative as threatening to some of their cherished values. This view has been encouraged by headlines in the press that stated that the Foundation urges "drastic change" in the undergraduate curriculum. Such language does not accurately reflect our purpose. The undergraduate curriculum has always changed to incorporate new knowledge and new modes of thought while preserving the best of the old. We seek to assist this gradual process of change within the limits of our modest capabilities.

The humanists' qualms about quantitative analysis seem to involve the notion that estimating magnitudes and reducing things to numbers denies the importance of such concepts as truth, beauty, and virtue. The scientists reply that these concepts are simply in a different domain. No one can make decisions without reference to a set of values, whether explicit or implicit. No amount of quantitative or analytical reasoning can tell us what these values should be. But analytical reasoning can help us estimate the probable consequences of different decisions, so that we can apply our values with a better understanding of the possible alternative outcomes. It is this process that should be part of the mental armory of the educated person.

As quantitative methods and sophisticated technologies are increasingly applied to such disciplines as history, linguistics, and archeology, the present resistance to analytical modes of thought will diminish. The question will become not whether the methods should be used, but how can they be used well. It will eventually be agreed it is no more threatening to humanistic values to argue that a history major should know how to use statistics than it is threatening to scientific values to argue that a science major should be able to write clear prose.

Albert Rees

Policies and Procedures

Policies and Procedures

The Alfred P. Sloan Foundation was established in 1934 by Alfred P. Sloan, Jr., and incorporated in the state of Delaware. Mr. Sloan, who for many years was the chief executive officer of General Motors Corporation, was active in the affairs of the Foundation until his death in 1966. Information about the Foundation's assets and disbursements appears in the last section of this report.

The Foundation's main interests are in science, technology, economics, management, and education for the public service; and in instructional programs, and problems of society, related to those interests. The Foundation's activities do not extend to primary or secondary education, or to religion, the creative or performing arts, medical research, or (except in very limited ways described later in this report) the humanities. Grants are not made for endowments or for buildings or equipment, and are very rarely made for general support or for activities outside the United States.

Application can be made at any time for support of activities falling within the above guidelines. Grants of $20,000 or less are made throughout the year by the officers of the Foundation; grants over that amount are made by the Trustees, who meet five times a year for that purpose. Letters of application are normally sent to the President of the Foundation and include, in addition to information about the work the applicant proposes to do, information about the applicant himself, the cost and duration of the work, and in the case of new applicants the tax status of the organization that would administer the grant unless it is a recognized institution of higher education. The Foundation has no deadlines or standard application forms. Often a brief letter of inquiry, rather than a fully developed proposal, is an advisable first step for an applicant, conserving his time and allowing the Foundation to give the applicant a preliminary response as to the possibility of support.

The Foundation's funds are spent in two ways: on programs and activities that are developed by the Foundation's staff and for which grants are made, usually on a competitive basis, in support of individuals and institutions; and in response to proposals that come unsolicited to the Foundation and that are also judged competitively, often with the help of outside reviewers. In both categories, the Foundation unfortunately is obliged to turn down many more proposals, sometimes proposals of great merit, than its resources will allow it to support.

General and Particular Programs

In 1969 the Foundation adopted a new mode of operation that distinguished between the "general program," under which the established interests of the Foundation were pursued, and a set of "particular programs," which focused on more sharply defined topics for limited periods of time. Four particular programs were developed and carried to completion between 1969 and 1979: one to increase the number of minority students in medicine and management; one to support experimental work in educational technology; one to help establish the new discipline of neuroscience; and one to increase the number of minority students in engineering. Total expenditures in each of these programs came to between $9 million and $14 million over a period of five-to-seven years.

Inflation has reduced the value of the Foundation's grant dollar by more than half since the concept of particular programs was adopted; and the original plan, which called for three particular programs to operate concurrently, has had to be modified. It now appears likely that the Foundation can sustain at most two such programs at a time. The fifth particular program, in cognitive science, is now in operation and is discussed later in this report. The sixth particular program, called The New Liberal Arts, will begin in 1982, following a development period in 1981.

Grants and Activities in 1981

Cognitive Science

Cognitive science, one of the newest and most challenging fields of scholarly research, is a highly interdisciplinary science that seeks to improve man's understanding of his own mental makeup. It encompasses the disciplines of psychology, neuroscience, linguistics, computer science, philosophy, and anthropology. Research in cognitive science is concerned with the extremely complex and little understood processes by which human beings reason, remember, acquire language, solve problems, make decisions, and take actions based on information the brain receives from the sensory organs.

The Sloan Foundation's program in cognitive science was the only "particular program" (see page 10) in operation in 1981. This program began in 1977 with grants to help researchers from what were then loosely related academic fields begin to work together and to develop some understanding of the concepts and methods of one another's research. From these discussions emerged many new lines of investigation. Two years later, the program entered its second phase with major grants to institutions, most of which had also been supported in phase one, to establish interdisciplinary postdoctoral training programs. The third and final phase of our program in cognitive science, overlapping with phase two, began in 1981 and is expected to extend to the 1985-86 academic year. Phase three will concentrate on institutional development. Support will be given for the establishment at each participating institution of an identifiable, self-sustaining center, institute, department, or other administrative entity where a continuing program of research and training will be conducted in cognitive science.

To ensure the orderly development of phase three, the Trustees of the Foundation took the unusual step in 1981 of identifying institutions to which grants are expected to be made throughout phase three and of committing the Foundation to these grants in the future as proposals are perfected and individually

Cognitive science, a new and highly interdisciplinary field concerned with the understanding of human mental processes, continued to be a major field of interest for the Sloan Foundation in 1981. Researchers in psychology, neuroscience, linguistics, computer science, philosophy, and anthropology find some of the most challenging problems of science in this new field.

(Right) One of the research topics at a Sloan-supported workshop in cognitive science at the University of Minnesota's Center for Research in Human Learning is focused on human perception. Here a researcher wears prismatic goggles that tilt the world 45 degrees counterclockwise; perceptual adaptation occurs in about a week.

(Below) Professor Michael I. Posner of the Department of Psychology at the University of Oregon works with apparatus in a hospital-based program supported by Sloan and concerned with medical applications of cognitive science.

approved. The institutions selected, together with the total grant monies expected to go to them, were:

Massachusetts Institute of Technology	$2.5 million
University of California, Berkeley	$2.5 million
Carnegie-Mellon University	$1.0 million
Stanford University	$1.0 million
University of Pennsylvania	$1.0 million
Cognitive Neuroscience Institute	$0.5 million
University of California, Irvine	$0.5 million
University of Rochester	$0.5 million
University of Texas, Austin	$0.5 million

These grants and commitments to future grants were the product of a vigorous competition among 22 leading universities and research institutions that chose to submit proposals for institutional development in cognitive science. All the proposals were extensively reviewed by panels of recognized scholars. By the time the last grants are made in phase three, the Foundation will have invested $20 million in cognitive science, making this program the largest of the five "particular programs" the Foundation has conducted to date. Future annual reports will review grants made in the third and final phase of the program as they are separately approved by the Trustees.

In addition to the special panels that reviewed phase three proposals, an outside advisory committee consisting of the following persons assists the Foundation in all aspects of the cognitive science program:

Robert Q. Marston, President, University of Florida; chairman of the committee

Theodore H. Bullock, Department of Neurosciences, University of California, San Diego

Jerome A. Feldman, Department of Computer Science, University of Rochester

William Kessen, Department of Psychology, Yale University

William A. Nierenberg, Director, Scripps Institution of Oceanography

Sherwood Washburn, Department of Anthropology, University of California, Berkeley

Trustee Grants in Cognitive Science

Massachusetts Institute of Technology **$1,500,000**
Cambridge, Massachusetts 02139 (over three years)

For nearly 25 years, MIT has been the site of isolated but conceptually related studies in human cognition. With the help of Sloan grants in phases one and two of our program in cognitive science, work began to be coordinated at MIT in the late 1970s in linguistics, philosophy, psychology, brain science, speech and vision, artificial intelligence, and computer science. This work led to the formation in 1979 of MIT's Center for Cognitive Science, now fully operational with a broad-based program of interdisciplinary research. The fundamental approach of the MIT group to cognitive science is based on the "modularity thesis." It holds that different cognitive processes such as our understanding of language or recognition of familiar faces is carried out by separate "mental organs." This view contrasts with the proposition advanced by other research groups that the mind is a sort of general purpose computer that is programmed differently to perform different functions. Like many other issues in this new field of research, this one can only be resolved by more research. MIT will use the present grant, the first grant the Foundation has made in phase three, for the further development of its Center for Cognitive Science and for research and training activities focused on language, vision, and conceptual reasoning. (Project director: Samuel Jay Keyser, Department of Linguistics and Philosophy.)

University of California, Berkeley **$500,000**
Berkeley, California 94720 (over three years)

An unusually large number of faculty members from many departments are at work on the Berkeley campus in cognitive science. Previous grants from the Foundation have been used to encourage as many of these scattered researchers as possible to work together. Most of the interaction that now takes place among the cognitive scientists at Berkeley occurs in three broad areas of research. The broadest concern is with the way individuals deal with their knowledge of everyday experience. Much of the research at Berkeley is designed to uncover different methods of representing and organizing this knowledge. The second area of interest at Berkeley deals with language processing and the analysis of texts, including such matters as computer analysis of inference procedures and a study of the kinds of procedures needed to understand written passages. The third area is concerned with perception, exemplified by a study of the interplay among physiology, perception, and conceptual categories of colors across different cultures. A base has now been laid at Berkeley for a broadly conceived postdoctoral training program in cognitive science, which is the purpose to which the present grant will be put. (Project director: Robert Wilensky, Department of Electrical Engineering.)

University of Rochester
Rochester, New York 14627 **$500,000**
(over four years)

The program in cognitive science at Rochester involves a dozen investigators from eight departments whose collaborative efforts fall into three categories: inference and language, early visual processing, and the development of abstract concepts. The first focuses on the individual's internal representation of knowledge, a central concern of cognitive science. The second takes advantage of Rochester's special strengths in the development of parallel processing computers and in the anatomy and physiology of the visual nervous system. The third is concerned with understanding the processes involved in the development and application of the fundamental concepts of such fields as biology and physics. Rochester, the first institution to establish a chair in cognitive science, will use this grant for new faculty positions and for postdoctoral training activities. (Project director: Patrick J. Hayes, Departments of Philosophy, Computer Science, and Psychology.)

University of Illinois, Urbana-Champaign
Champaign, Illinois 61820 **$110,000**
(over two years)

While the abstract level of cognitive science is the realm of philosophers who try to define the range of possible cognitive mechanisms, neuroscientists at the concrete end of the spectrum try to understand how the brain's maze of nerve cells actually performs complex processes. One approach of the latter group involves the use of minute electrical signals generated by the brain and known as event-related potentials (ERP's). These signals, recorded from the scalps of subjects as they perform such cognitive activities as reading or listening to speech, have been demonstrated to be useful tools for probing the underlying brain mechanisms. In 1979 the Foundation made a grant of $65,000 to the University of Illinois, Urbana-Champaign, to support two conferences that explored the application of ERP tools to certain aspects of research in cognitive science. The present grant will support two more conferences, somewhat larger than the first two, on the same subject. (Project director: Emanuel Donchin, Department of Psychology.)

Center for Advanced Study in the Behavioral Sciences
202 Junipero Serra Boulevard
Stanford, California 94305 **$100,000**
(over two years)

Over the years the Center for Advanced Study in the Behavioral Sciences has proved to be a fertile source of interdisciplinary studies. It provides an ideal setting in which scholars holding widely differing views can, over an extended period of time, explore common approaches to their research interests. The result

can often be new contributions to the body of knowledge in a particular field. The Center is therefore a promising site at which to encourage the kind of scholarly interaction that is critical to the advancement of cognitive science. The Foundation made a grant of $140,000 in 1979 to the Center for support of a study project on the contributions of artificial intelligence and philosophy to cognitive science. Based on the results of that grant, the Foundation made the present grant as partial support for a study project that will bring together a group of linguists, psycholinguists, philosophers of language, and mathematical logicians to address the subject of how the human mind extracts meaning from language. (Project director: Gardner Lindzey, Director of the Center.)

New School for Social Research
65 Fifth Avenue
New York, New York 10003 **$100,000**
(over three years)

In 1980 the Foundation made a grant of $20,000 to Cornell University for a series of seminars on the evolution of human cognition. The present grant builds on the one in 1980 and will allow Leon Festinger of the Department of Psychology at the New School for Social Research to lay plans for a study of how certain kinds of archeological evidence, such as tools and skeletons, might reveal previously undiscovered evolutionary advances in human cognitive abilities. Festinger's project is intended to develop testable hypotheses from data in the fossil record. It involves a series of seminars, conferences, experimental programs, and the preparation of a book.

* * * * *

The Trustees of the Foundation also approved in 1981 an internal appropriation of $30,000 to meet the costs of a two-day conference attended by the heads of all the projects in cognitive science being supported by the Foundation; the conference was also attended by representatives of federal agencies that support research in cognitive science.

Officer Grants in Cognitive Science

Cognitive Neuroscience Institute
515 East 71st Street
New York, New York 10021 **$20,000**
(over one year)

For a conference on how the scholarly field of psychology, given the impact on it of such interdisciplinary research as that in cognitive science, might be redesigned. (Project director: William Kessen, Department of Psychology, Yale University.)

Massachusetts Institute of Technology **$20,000**
Cambridge, Massachusetts 02139 (over one year)

For a series of three conferences on the contributions made by David Marr to the study of visual information processing. (Project director: Whitman Richards, Department of Psychology.)

Salk Institute for Biological Studies **$20,000**
San Diego, California 92112 (over one year)

For exploratory research on the effects of early cognitive experience on the functional organization of the brain. (Project director: Helen Neville.)

Society for Neuroscience **$2,500**
9650 Rockville Pike (over one year)
Bethesda, Maryland 20014

For a special presentation on cognitive science to be made at the annual meeting of the Society. (Project director: Larry R. Squire, Department of Psychiatry, University of California, San Diego.)

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In addition to the above officer grants, an internal appropriation of $10,000, made as an officer grant, was approved in 1981 for partial support of a conference to explore possible contributions of research in cognitive science and neuroscience to education. Other contributors to the conference, and participants in it, were the National Science Foundation and the National Institute of Education.

Science and Technology

The Science Research Fellowships Program, together with our program in cognitive science, was our principal vehicle in 1981, as it has been in recent years, for the Foundation's support of research in science. We also provided modest support for research in the history of science and technology. Beyond these limited areas, there is not much within the Foundation's financial range that can usefully be done in research or instruction in science and engineering. By any kind of market test, engineering education was in robust health in 1981, although still faced with large-scale problems such as the shortage of doctoral candidates and state-of-the-art equipment in advanced technologies. Science was less robust. Enrollments were still down in 1981, the job market shaky, and government support for research uncertain.

To say that such problems, given their scale, are now the concern of government, industry, and the institutions themselves, is a comfortless response to applicants, but it is a necessary position for a private foundation whose resources no longer match its traditional interests in science and engineering. At a time of government retrenchment, private foundations can rescue only a few of the federally supported projects whose financing is being reduced or withdrawn. The federal contraction in 1981 produced an unusually large number of proposals in science and engineering (and other fields) to the Sloan Foundation. To our regret, we were able to support very few. Sloan's interest in these fields is alive and well but it is an interest that survives on a leaner diet than in the past.

Trustee Grants in Science

Sloan Research Fellowships

$1,780,000 over two years

For over a quarter of a century, the Foundation has been supporting the research of the most promising young scientists it could find. The program, called Sloan Research Fellowships, is the longest running by far in the history of the Foundation. In previous years, it was limited to scholars in the fields of physics, chemistry, pure mathematics, and neuroscience; in 1981 we added six fellowships in economics and four in applied mathematics. The entry of economics into the program may throw doubt on our habit of calling it a "science" program, but we may continue to take that small liberty. The expansion of the Sloan Research Fellowships Program this year bespeaks the confidence we have in the program and the reputation it enjoys in the academic field. Over the years, the Foundation has expended about $34 million on the program and has assisted 1,730 researchers, many of them now distinguished in their fields; the Nobel Prize for chemistry was given in 1981 to Roald Hoffmann, Cornell University, bringing to nine the number of laureates who as young scientists held Sloan fellowships.

The program was established by the Foundation in 1955 as a means of stimulating fundamental research by young scholars at a time in their careers when government and other support is difficult for them to obtain. The grants, administered by each fellow's institution, are designed to permit the greatest possible freedom and flexibility for the fellows. They need not pursue a specified research project and are free to shift the direction of their research at any time. The fellowship funds may be used for technical assistance, professional travel, summer support, computer time, research assistants, equipment and supplies, and other purposes approved by the fellow's institution. (A leaflet titled "Sloan Research Fellowships" describes this program in greater detail and is available on request from the Foundation.)

Candidates for fellowships are nominated by senior scholars familiar with their work. For the 1981 competition, 400 nominations were received from which 89 awards were made, each for $20,000. Nominations were reviewed by a committee of senior scientists and economists made up of the following persons:

Mathematics
- Dr. Jurgen Moser, New York University, chairman of the committee
- Dr. S.S. Chern, University of California, Berkeley
- Dr. David Mumford, Harvard University

Chemistry
- Dr. Ronald Breslow, Columbia University
- Dr. Richard H. Holm, Harvard University
- Dr. John S. Waugh, Massachusetts Institute of Technology

Economics
- Dr. Richard Quandt, Princeton University
- Dr. Michael Rothschild, University of Wisconsin
- Dr. James Tobin, Yale University

Neuroscience
- Dr. Eric R. Kandel, Columbia University
- Dr. Seymour S. Kety, Harvard Medical School
- Dr. Eliot Stellar, University of Pennsylvania

Physics
- Dr. William M. Fairbank, Stanford University
- Dr. Malvin A. Ruderman, Columbia University
- Dr. Kenneth G. Wilson, Cornell University

The following persons, listed by institution and field, received the 1981 awards:

University of Arizona
Physics: Charles J. Lada

Brandeis University
Mathematics: Mark Adler
Kiyoshi Igusa

University of British Columbia
Mathematics: R. Mark Goresky

California Institute of Technology
Neuroscience: Elliot M. Meyerowitz
Physics: Peter J. Young*

University of California, Berkeley
Chemistry: Lawrence R. Pratt
Physics: Raymond F. Jeanloz

University of California, Davis
Physics: Joseph E. Kiskis, Jr.

University of California, Los Angeles
Mathematics: Richard Durrett
John R. Steel

University of California, San Francisco
Neuroscience: Stephen G. Lisberger

University of California, San Francisco Medical School
Neuroscience: Geoffrey H. Gold

University of Chicago
Economics: Sanford J. Grossman
Jonathan E. Ingersoll, Jr.
Mathematics: Peter W. Jones
Neuroscience: Richard J. Miller

University of Colorado
Chemistry: Mary C. Rakowski-DuBois

Columbia University
Neuroscience: Eric Proshansky

Cornell University
Economics: Tapan Mitra
Mathematics: Michael J. Todd
Physics: Murdock G. D. Gilchriese
Wilson Ho

Dartmouth College
Chemistry: Karen W. Jennette

Harvard University
Chemistry: Veronica Vaida

Harvard University Medical School
Neuroscience: Jane Dodd
Ralph A. Nixon

Illinois Institute of Technology
Chemistry: Tomas Hudlicky

University of Illinois
Chemistry: Peter G. Wolynes

Indiana University
Chemistry: R. Mark Wightman
Mathematics: Robert T. Glassey

Iowa State University
Chemistry: Cheuk-yiu Ng

Johns Hopkins Medical School
Neuroscience: Paul N. Hoffman

University of Maryland
Mathematics: Henry C. King
Stephen S. Kudla
Scott A. Wolpert
Physics: Ho Jung Paik

Massachusetts Institute of Technology
Chemistry: Rick L. Danheiser
Economics: Henry S. Farber
Mathematics: Victor G. Kac
Physics: A. Nihat Berker
Alan H. Guth

University of Massachusetts
Neuroscience: Paul Herron

Michigan State University
Chemistry: Bruce A. Averill

University of Michigan
Physics: David W. Gidley
Robert S. Savit

University of Minnesota
Mathematics: Carlos E. Kenig
Physics: E. Dan Dahlberg

New York University
Physics: Patrick J. Huggins

Northwestern University
Chemistry: Richard B. Silverman

University of Notre Dame
Chemistry: Marvin J. Miller
Mathematics: William G. Dwyer
Nancy K. Stanton

Ohio State University
Chemistry: Richard L. McCreery
C. William McCurdy

University of Oregon
Neuroscience: Monte Westerfield

Pennsylvania State University
Mathematics: Wen-Ch'ing Winnie Li

University of Pennsylvania
Neuroscience: Mary Anne Della-Fera
Physics: Laird R. Cormell

University of Pennsylvania Medical School
Neuroscience: Thomas L. Davis

University of Pittsburgh
Physics: Anthony Duncan

Polytechnic Institute of New York
Physics: Stephen Arnold

Princeton University
Mathematics: Michael Aizenman
Physics: E. Tomboulis

Purdue University
Physics: Gary S. Grest

*Died September 1981.

University of Rochester
Chemistry: James M. Farrar
Mathematics: Jon T. Pitts
Physics: Thomas M. Cormier

Rockefeller University
Neuroscience: Lee L. Rubin

Rutgers University
Mathematics: Vladimir Scheffer

State University of New York, Albany
Neuroscience: John T. Schmidt

State University of New York, Stony Brook
Chemistry: Glenn D. Prestwich
Neuroscience: Sheryl A. Scott

State University of New York, Upstate Medical Center
Neuroscience: John A. Robson

Syracuse University
Physics: Abhay Ashtekar

Texas A&M University
Mathematics: Stephen C. Milne
Physics: Jeevak M. Parpia

University of Utah
Chemistry: Gary E. Keck

Vanderbilt University
Chemistry: Timothy L. Macdonald

Wayne State University
Chemistry: H. Bernhard Schlegel

Wesleyan University
Physics: Robert P. Behringer

University of Wisconsin
Chemistry: F. Fleming Crim, Jr.
Arthur B. Ellis
Economics: Gary Chamberlain
Charles A. Wilson

Yale University
Chemistry: Robert H. Crabtree
John A. Gerlt
Physics: Edward A. Hinds

Yale University Medical School
Neuroscience: Michael L. Cooper

Other Trustee Grants in Science

Brookings Institution **$330,000**
1775 Massachusetts Avenue, N.W. (over two years)
Washington, D.C. 20036

The Foundation's report for 1980 carried the announcement of a new program planned for 1981, the purpose of which was to make it possible for a small number of senior scientists and engineers to spend a year in Washington attached to a non-governmental organization where they might take an active role in the process of policy formation at the national level. This program has now begun at the Brookings Institution, where it is called the Science Policy Fellowship Program. The first three fellows, selected from among many nominations by a special advisory committee of scientists and engineers, were appointed in 1981 and took up their fellowships at various times during the year. They were: Marilyn Bach, Associate Professor, Departments of Laboratory Medicine/Pathology of the Medical School and the Health Services Research Center, School of Public Health, University of Minnesota, and Special Assistant to the Director for Program Development, National Institutes of Health (on leave from her university under the Intergovernmental Personnel Act); Melvin Gottlieb, formerly Director of the Plasma Physics Laboratory at Princeton University; and Gilbert Omenn, Professor of Medicine and Genetics at the University of Washington and former Deputy Director of the Office of Science and Technology Policy, and former Associate Director for the Office of Management and Budget. This grant covers the cost of the program for its first year. (Project director: Bruce K. MacLaury, President of Brookings.)

Scientists' Institute for Public Information **$200,000**
355 Lexington Avenue (over two years)
New York, New York 10017

Two years ago the Scientists' Institute for Public Information established the Media Resource Service, whose purpose is to give journalists and other writers rapid access to expert opinion on scientific and technological subjects. The Media Resource Service is a referral organization that responds to requests. It expresses no opinion and strives to maintain a neutral position on the issues, often controversial, with which it is asked to deal. It gives journalists who make inquiries a balanced roster of experts with whom they are free to consult. The Media Resource Service has compiled and cross-referenced in the form of a computerized data base the names, qualifications, and interests of over 5,000 scientists and technologists who have agreed to respond to questions when called upon by journalists. This grant will meet part of the costs of the Media Resource Service for a two-year period. (Project director: Alan McGowan.)

Princeton University Press — **$120,000**
Princeton, New Jersey 08540 — (over one year)

The Foundation made a grant of $150,000 in 1978 to Princeton University Press in partial support of a project of preeminent importance — the organizing, editing, and publishing of the papers of Albert Einstein. The editor of the papers, Professor John Stachel, Department of Physics, Boston University, has made good progress to date in the face of a number of difficult start-up problems. He has completed and placed several duplicate archives, one of which will be used for editorial purposes, the others being available to qualified scholars. He has also prepared a computer index and guide to the 43,000 documents involved. As his next task, Stachel expects to lay plans for the first three volumes of the projected Einstein Edition, covering the period up to Einstein's move to Berlin in 1914. The present grant will help maintain the momentum of the project while the long-term support needed for the entire project is secured. (Project director: Herbert S. Bailey, Jr., Director of the Press.)

Harvard University — **$114,000**
Cambridge, Massachusetts 02138 — (over three years)

I. Bernard Cohen, a distinguished elder statesman of the history of science, has been working for some time on a study, beginning with Galileo, of the manner in which the empirical foundations of the sciences have affected the development of the social and behavioral sciences; and by extension of how the social and behavioral sciences affect the formation of such derivative movements as "Social Darwinism." To help with this work, the Foundation made a grant to Harvard of $90,000 in June 1979. Cohen expected to raise the remaining funds he needed from government agencies but was unable to do so. The present grant is supplementary support for the completion of his study.

Hampton Institute — **$100,000**
Hampton, Virginia 23668 — (over three years)

A leading black college of 3,200 students, Hampton has embarked on a $1.5 million campaign to finance a center for marine and coastal environmental studies. It expects to offer a degree in marine science, as well as conduct research and provide a variety of services to national and local industries. Hampton reached the half-way mark in its campaign in 1981, and our grant was a contribution to the marine fund. (Project director: Craig L. Ruddell, Director, Marine Science Center.)

Haverford College — **$100,000**
Haverford, Pennsylvania 19041 — (over three years)

Among the least accessible academic fields for minority students in high school and college are the physical sciences. Haverford, with a strong program in science, is one of the few liberal arts colleges that has made a serious effort to do something about the problem. It was one of the colleges that received Sloan support from 1966 through 1975 as part of our college science program. The present grant will help meet the costs of a special program of the college to recruit and prepare minority students to major in science. (Project director: Bruce R. Partridge, Department of Astronomy.)

National Academy of Sciences — **$75,000**
2101 Constitution Avenue — (over two years)
Washington, D.C. 20418

The rating of graduate degree programs of American universities has been done for many years on the basis of reputation and peer opinion. Such publications as the Cartter Report and the Roose-Anderson Reports, containing these rankings, are widely used but also widely criticized as lacking reliable indicators of quality. After a lengthy planning period financed by Sloan and other foundations, the National Academy of Sciences launched a program in 1980 to produce a less subjective system of ratings for Ph.D. programs. NAS is now in the process of reviewing and rating 2,648 doctoral programs in 31 fields. The Academy recognizes that no single criterion will yield definitive results and indeed that all of the criteria it has developed, taken together, will not produce flawless ratings; but it is persuaded that the project will result in a more reliable system than anything that has gone before. This grant will help meet the costs of the main project. (Project director: William C. Kelly, Executive Director, Commission on Human Resources.)

Trustee Grants in Technology

Technological Literacy
$810,000

The Foundation has been concerned for some time with the low level of technological understanding on the part of college students not majoring in a scientific or engineering field. It is obvious, on the one hand, that an education presuming to prepare students for life in a high-technology culture should convey

to those students some understanding of the intellectual tools and the industrial process by which technologies are developed; not so obvious, on the other hand, is the best way to go about the task. How to avoid superficiality and at the same time give the general liberal arts undergraduate a non-mathematical but substantive experience of technology is a pedagogical problem of some complexity.

To explore this problem, the Foundation convened a conference in January 1981, attended mainly by engineering educators who were teaching courses for non-engineering undergraduate students at their home universities. Following that conference, the Foundation made a number of grants in "technological literacy" over the rest of 1981. With these grants, we were responding in part to requests from institutions that had recently been through the process of redefining course requirements for the bachelor's degree and that had included some study of technology in their new requirements; and in part we were attempting to encourage leading institutions that had not considered the matter previously to include the study of technology in their undergraduate curriculum.

At the same time that grants in technological literacy were in process during 1981, the Foundation was also concerned with the related but broader problem of quantitative literacy; that is, with the question of how the quantitative skills of undergraduates not majoring in quantitative fields might be improved. Out of our concern with that question has come a new program at Sloan, The New Liberal Arts, that is described in the "President's Statement" on pages 3-5 of this report and that will formally begin in 1982. As his comments imply, we do not anticipate further grants in technological literacy as such in 1982, but we do expect to support work in liberal arts colleges in which the teaching of technology in some form to non-science students will be a constituent part of projects whose principal concern is with the larger matter of quantitative reasoning.

Washington University **$250,000**
St. Louis, Missouri 63130 (over three years)

The Department of Technology and Human Affairs at Washington University, part of the university's engineering school, offers courses to students from all departments and divisions of the institution. It also offers a bachelor's, master's, and doctor's degree in one or another aspect of technology and public policy, and is one of the few public policy programs with its base in engineering. With this grant, the Department of Technology and Human Affairs will jointly develop with the Department of History a concentration of courses in history and technology to be offered by the College of Arts and Sciences. These courses will be designed to teach basic engineering concepts, computing, and applied mathematics to non-engineering undergraduates, many of them majoring in history. By giving the project a home in both engineering and history, the university hopes to attract the interest and support of faculties and students in the humanities. Other activities will also be carried out under this grant, including the restructuring of

The Foundation made several grants in 1981 to support the development of teaching materials in technology for non-engineering undergraduate students. (Right) The co-directors of a Sloan project in "technological literacy" at Washington University, Professor Robert P. Morgan (standing), head of the Department of Technology and Human Affairs, and Professor Robert C. Williams of the Department of History, work at an Apple microcomputer.

Since 1973, the Foundation has supported a research and development program at Dartmouth College in educational technology. One of the instructional systems developed under that program, by Professor Christian Jernstedt of the Department of Psychology, is shown below. It is a combined computer-television system, easily portable, moderate in cost, that accommodates student responses, and measures response latencies, from 100 students simultaneously (each of whom has a response box of five keys); it is entirely software controlled, provides a two-way flow of information, and operates in real time.

an existing minor in technology and human affairs so as to incorporate new courses concerned less with policy and more with engineering method. (Project directors: Robert P. Morgan, Chairman of the Department of Technology and Human Affairs; and Robert C. Williams, Department of History.)

Syracuse University **$200,000**
Syracuse, New York 13210 (over three years)

Over the last five years, the faculty of arts and sciences at Syracuse has extensively restructured the lower-division curriculum, and a new "Liberal Arts Core" has been made obligatory for all undergraduates. It includes substantial work in quantitative subjects in which students must complete a cluster of four courses that either focus on an important theme in the natural sciences and mathematics or that offer a general introduction to an area of study. This grant will provide partial support for the development of additional clusters in the natural sciences that will include a major component of engineering and technology. These courses and teaching materials, and the social and economic issues raised by new technologies, will treat the study of engineering as a natural part of the sciences from which technology derives. New clusters that incorporate the study of technology in this manner will be developed in biology, physics, chemistry, and geology. (Project director: Gershon Vincow, Dean of the College of Arts and Sciences.)

Yale University **$200,000**
New Haven, Connecticut 06520 (over three years)

The work to be undertaken by Yale with the help of this grant is particularly suited to an institution with a strong humanistic tradition that now wishes to advance the study of technology and quantitative reasoning. Three-quarters of Yale's undergraduates major in the humanities and social sciences, and tend to seek out courses that require a minimum of mathematics. Less than 20 percent of them graduate with a reasonable knowledge of computing. Yale recognizes that this deficiency is serious and that the university cannot continue to turn out future leaders of industry and government who are ignorant of technology and ill-equipped in quantitative skills. Much of the work to be done under this grant will represent a joint endeavor, like that at Washington University (reviewed above), between the engineering and the history faculty: a historical element will be added to a series of short courses called "Perspectives in Technology" that has been offered for some years at Yale; new team-taught courses such as one to be called "A World Gone Mathematical" will be developed; a historian of technology will be added to the faculty; and an extended faculty seminar will be

organized to consider the place of technology and quantitative skills in the liberal arts curriculum. (Project directors: Frank Turner, Professor of History; and Robert G. Wheeler, Professor of Applied Physics.)

Research Foundation of the
State University of New York **$90,000**
P.O. Box 9 (over two years)
Albany, New York 12201

Under the leadership of John G. Truxal, the Department of Technology and Society at the State University of New York, Stony Brook, was one of the first to develop a set of courses in engineering for non-engineering undergraduate students. Two of these courses having the widest appeal to students, Cybernetics and Problem Solving, will be further developed under this grant, and the possibilities for additional courses in technological literacy will be explored. The cybernetics course treats such topics as dynamic signals, Fourier decomposition, spectra, sound signals and hearing, video signals and vision, modulation, and information theory. The problem-solving course is focused on the set of analytical tools with which an engineer typically formulates a problem and seeks its solution. (Project director: John G. Truxal, Distinguished Teaching Professor, State University of New York, Stony Brook 11794.)

Lincoln University **$70,000**
Lincoln University, Pennsylvania 19352 (over three years)

This institution has been a leader among black colleges for many years, and its President, Herman Branson, a physicist, has a strong interest in the teaching of technology to non-engineering students. This grant will allow an interdisciplinary group of faculty members at Lincoln to experiment with ways of incorporating the study of engineering into many of the basic courses offered by the institution. (Project director: Herman Branson.)

Other Trustee Grants in Technology

Dartmouth College **$200,000**
Hanover, New Hampshire 03755 (over four years)

The Foundation has been supporting development work in educational technology at Dartmouth since 1973. A high-capacity cable television system has been installed on the campus and a number of projects in the instructional uses

of this video system have been completed; the combined uses of video and computer technologies for instruction have been explored; and other, complementary activities have gone forward. The Foundation's hope is that Dartmouth will ultimately become a national center where a long-term program of research and development can be conducted in the application of new communications technologies to education. The present grant will finance several new activities, two in particular: a "premastering" facility in videodisc technology, and in videodisc/computer technology, will be developed for campus use and possibly regional use at a later time; and an experiment will be conducted to test the uses of the videodisc as a low-cost, high-density "printing" medium for scholarly material — as a means of substituting inexpensive electronic storage and retrieval for expensive printed journals and other conventional means of scholarly communication. (Project director: William M. Smith, Director of the Office of Instructional Services and Educational Research.)

Rutgers University Foundation **$200,000**
191 College Avenue (over five years)
New Brunswick, New Jersey 08903

At his death in 1931, Thomas Alva Edison left more than two million pages of correspondence, laboratory notebooks, and other documents in which are represented his prodigious contributions to technological research and engineering practice. Over a wide range of technical areas, they reveal the development of ideas from their embryonic stages to patent application, pilot plant, manufacture, and marketing; some of those ideas came to fruition in great industries and fundamental changes in society. The documents Edison left have never been systematically examined. Although in principle they are available to scholars, the unorganized mass of material makes access difficult or impossible. A major project to organize, edit, and publish these papers has been established, jointly sponsored by the Smithsonian Institution, the National Park Service, the New Jersey Historical Commission, and Rutgers University. The project is expected to continue over a period of 20 years at an estimated cost of $6 million. This grant is a contribution to the early stages of this historically important enterprise. (Project director: Reese V. Jenkins, 1 Richardson Street, New Brunswick, New Jersey 08903.)

Research Libraries Group, Inc. **$100,000**
Jordan Quadrangle (over one year)
Stanford, California 94305

High on the list of problems confronting the nation's academic libraries is the proliferation of learned journals, the cost of which has been rising for many

years faster than the general rate of inflation. New technology, the computer in particular, may help libraries deal with this and other problems. The Research Libraries Group (RLG) was brought into being in 1975 as a consortium of four libraries to develop computer-based services in common; to develop a system for the sharing of scholarly journals so that all four institutions would not need to collect the same journals and store them on each campus in perpetuity; and to develop other services. The Sloan Foundation made a grant of $350,000 in 1975 to help establish RLG. We made a second grant in 1979 of $500,000, by which time the consortium had grown to 13 research libraries, to help establish a subsidiary organization called the Research Libraries Information Network (RLIN). Of first importance for RLIN was the development of a centralized system of automating the repetitive, labor-intensive functions by which its member libraries ordered books and serials and handled them after they were received. By 1981 RLIN had grown to 23 members but still fell short of self-support through the fees its members paid for computer transactions. To help meet its deficit and see it through a period of reorganization, with self-support as the principal goal in 1982, the Foundation made the present, supplementary grant in 1981. (Project director: Edward E. Shaw, President of RLG.)

Five Colleges, Inc. **$78,000**
P.O. Box 740 (over three years)
Amherst, Massachusetts 01004

As automation increases among academic libraries, institutions in close proximity to one another will find it advisable to develop computer systems that will create, in effect, a single library. The consortium of institutions in central Massachusetts known as Five Colleges, Inc. — Amherst, Hampshire, Mount Holyoke, Smith, and the University of Massachusetts — plans to install a computer system that will link the five libraries and provide comprehensive, automated services for most of the routine functions of ordering, recording, locating, lending, and otherwise handling books and materials. Such a project, involving five institutions, the purchase of many computer terminals and much associated equipment, extensive training of the staff, and other activities, is expensive; this grant will meet only some of the administrative and development costs. (Project director: Gai Carpenter, Librarian of Hampshire College.)

Officer Grants in Science and Technology

American Institute of Physics **$20,000**
335 East 45th Street (over three years)
New York, New York 10017

Partial support for the preparation of a history of solid state physics. (Project director: Spencer R. Weart, Director of AIP.)

University of California, Los Angeles **$20,000**
Los Angeles, California 90024 (over one year)

Partial support for the West Coast Consortium of Universities in the Neurosciences, an association that promotes the sharing of resources for research. (Project director: Walker A. Bush, Brain Research Institute, UCLA.)

Cornell University **$20,000**
Ithaca, New York 14853 (over two years)

For a study, from industry's point of view, of the financing by industry of university-based research. (Project director: Walter R. Lynn, Director of the Program on Science, Technology and Society.)

Educational Foundation for Nuclear Science **$12,000**
1020 - 58th Street (over one year)
Chicago, Illinois 60637

For a six-month leave for Ruth Adams, editor of *The Bulletin of the Atomic Scientists*, to develop editorial plans for the magazine in the 1980's.

Harvey Mudd College **$20,000**
Claremont, California 91711 (over one year)

For a review of the college's engineering curriculum and a redesign of that curriculum based on new industrial demands and expectations. (Project director: Samuel B. Tanenbaum, Dean of the Faculty.)

University of Michigan **$9,000**
Ann Arbor, Michigan 48109 (over two years)

Partial support for the development of computer software to standardize scholarly bibliographies. (Project director: Victor Rosenberg, School of Library Resources.)

National Academy of Sciences **$20,000**
2101 Constitution Avenue (over one year)
Washington, D.C. 20418

Partial support for a study of long-term needs in engineering education and manpower. (Project director: H. Guyford Stever, Chairman, Assembly of Engineering.)

Palace of Arts and Science Foundation **$5,000**
3601 Lyon Street (over one year)
San Francisco, California 94123

Renewal and final support for a study of the science and technology museum known as the Exploratorium, by Hilde Hein, Professor of Philosophy, College of the Holy Cross, Worcester, Massachusetts 01610.

Pennsylvania State University **$20,000**
University Park, Pennsylvania 16802 (over one year)

For a project to evaluate trends in American science and to make recommendations for the future. (Project directors: Rustum Roy, Director, Materials Research Laboratory, Pennsylvania State University; and Deborah Shapley, 2236 Q Street, N.W., Washington, D. C. 20008.)

Planetary Society **$10,000**
110 South Euclid Avenue (over one year)
Pasadena, California 91103

For the expenses of American scientists to attend a conference on communications with extraterrestrial intelligence, sponsored by the Soviet Academy of Sciences and held in Tallin, Estonia. (Project director: Louis Friedman.)

Southern Methodist University **$17,000**
Dallas, Texas 75275 (over one year)

For a planning project, based on the report of SMU's Commission on Undergraduate Studies, on the teaching of technology to non-engineering students. (Project director: Edward R. Biehl, Department of Chemistry.)

University of Texas, Austin **$20,000**
Austin, Texas 78712 (over two years)

Renewal and final support for a study by Professor B. V. Koen, Department of Mechanical Engineering, of the professional practice of engineering.

Science Book Program

The Foundation's Science Book Program, first discussed in our annual report for 1976, made good progress in 1981. The purpose of the program is to enrich the public's understanding of science as a human and intellectual enterprise. During 1981, complete manuscripts were received from Dr. Lewis Thomas, Chancellor of the Memorial Sloan-Kettering Cancer Center, and Dr. Hendrick Casimir, former President of the European Physical Society and Managing Director of Phillips of Eindhoven. Both are now in the hands of the publisher. If present schedules hold, the Thomas book will be published in late summer of 1982, and the Casimir book a few months thereafter.

A third manuscript, by Dr. Jerome Bruner, now of the psychology department at the New School for Social Research, is being edited. Publication is expected in 1983.

During the year, agreements were signed with Dr. Dorothy Hodgkin, chemical crystallographer and Nobel Laureate, of Oxford University; Dr. S.E. Luria, biologist and Nobel Laureate, of the Massachusetts Institute of Technology; and Dr. Maclyn McCarty, epidemiologist, of Rockefeller University.

Portions of manuscripts or extended outlines have been received from Dr. McCarty; Dr. A.L. Cochrane, epidemiologist, of the Medical Research Center, South Wales; and John L. Rigden of the American Journal of Physics, who is working in collaboration with Dr. I.I. Rabi.

Others who have undertaken to write for the series include Paul Samuelson, Victor Weisskopf, and Gian-Carlo Rota, all of M.I.T.; Francis H.C. Crick of the Salk Institute; Robert W. Wilson of Columbia University; and Frederick Mosteller of Harvard University.

The first two books in the series, *Exploring the Universe*, by Freeman Dyson, and *Advice to a Young Scientist*, by Sir Peter Medawar, have received great

critical praise and continue to sell well in hard cover and paperback. Both have been translated into Japanese, Spanish, Italian and Portuguese, and Dr. Dyson's into German as well. The Foundation has been assisted by a diligent advisory committee:

Robert L. Sinsheimer, Chancellor, University of California, Santa Cruz, chairman of the committee

Howard Hiatt, Dean, Harvard School of Public Health

Mark Kac, Professor of Mathematics, University of Southern California

Daniel Kevles, Professor of History, California Institute of Technology

Robert Merton, University Professor Emeritus and Special Service Professor, Columbia University

George A. Miller, Professor of Psychology, Princeton University

S. Michael Bessie, Senior Vice President, Harper & Row

Edward L. Burlingame, Vice President and Publisher, Harper & Row

Economics and Management

The Foundation continues to speak of "economics and management" in its public reports and other documents as though they were a single field, but it is a phrase of convenience not meant to suggest that we regard as one these quite separate fields of traditional interest at Sloan. In 1981 we maintained our support of research in economics. In management our support was concentrated in "public" management, and our activity in this field is reviewed separately on pages 43-51. Our inactivity in the larger field of management education, or what some people might call our neglect of the field, reflects a simple fact of foundation life: resources are limited, priorities must be set, judgments must be made; and some academic fields in which Sloan is interested are in better health, and less in need of outside support, than others. The management field at the present time is one of the most prosperous.

Economics too is enjoying better health, as judged by enrollments, than many academic fields, but support for research is less generous and comes from fewer sources than is true of management. The reduction in federal support of economics that began in 1981 put under special pressure the private foundations with an interest in this field, particularly Sloan. We were able to respond to this pressure in a few cases of central importance to the economics field, but were obliged to turn down the vast majority of proposals that had failed to find renewal support at government agencies or had failed to find support there in the first instance. Many were projects of high merit and our inability to support more of the best of them was a source of distress at Sloan this year.

Trustee Grants in Economics and Management

Microeconomics Workshops

$1,160,000

Our program in applied microeconomics research continued in 1981, but the grants made this year were made in anticipation of a reduction of our activity in this field. Because new competitions in microeconomics research are not contemplated in the future, a brief backward look at this program may now be in order. Late in 1973 the Foundation's staff undertook a series of discussions with academic and business economists that continued in one form or another over a great many months. The subject was nothing less sweeping than the state of the economics profession, and the purpose was to define the needs of that profession that might be addressed with the modest amounts of money the Sloan Foundation could bring to bear on them. Out of these extended discussions emerged several

broad areas of agreement among the economists we consulted as to what the Foundation might do and what it might avoid doing.

The Foundation was advised to avoid the support of research in macroeconomics, which was already adequately supported. We were advised to put little or no money into formal education in economics, which was not without its weaknesses but did not need large grants for improvement. And we were advised to shun ventures designed to improve the public's understanding of economics through television or other means of mass communication.

The Foundation's advisors found themselves in agreement that the field most in need of support was applied microeconomics — the application of theory to particular markets, firms, and industries. They further agreed that the best way to stimulate the field would be through workshops for doctoral candidates at major research departments of economics. Following this lengthy planning period, the Foundation made a series of 10 grants in 1974-76 to leading departments of economics that had entered a competition for such awards. The first round of grants was made for three years and was followed by renewal grants of two years, most of which have now expired. In each case the grant supported a workshop that dealt with a family of microeconomics problems and provided support for Ph.D. candidates and for related costs. The workshops produced a rich stream of dissertations and papers and, in our judgment, met the objectives of the Foundation's program quite satisfactorily — namely, to help to build a systematic, coherent body of knowledge about a number of important microeconomics problems; and to train a large number of young scholars in the subdiscipline of microeconomics.

In 1980 the Foundation carried this program into a second five-year period. Proposals were invited on a competitive basis and evaluated with the help of an outside advisory committee. Eight grants, each for $255,000 were made. In 1981 four additional grants were made, each for $255,000 over three years (with two-year renewal proposals to be considered in 1983-84) for workshops on the topics indicated below; project directors are members of their institution's economics department:

University of California, Los Angeles
Los Angeles, California 90024

Workshop on the economics of transaction-contracting costs and the implications for industrial organization. (Project director: Axel Leijonhufvud.)

Carnegie-Mellon University
Pittsburgh, Pennsylvania 19213

Workshop in industrial organization, transaction costs and related conceptual developments linking theory and actual markets. (Project director: Robert M. Townsend.)

University of Chicago
Chicago, Illinois 60637

Workshop to cover research in further developing the methods of applied welfare economics, in strengthening its conceptual foundations, and in extending its range of application. (Project director: Arnold C. Harberger.)

University of Maryland
College Park, Maryland 20742

Workshop on the interrelationship between the structure of private and public sectors in the urban economy. (Project director: Christopher K. Clague.)

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One renewal grant was also made in 1981 from the first round of microeconomics workshop grants: *Harvard University*, $140,000 over two years, for a continuing workshop on understanding financial markets through the behavior of financial institutions, individual investors, and non-financial corporations. (Project director: Benjamin M. Friedman.)

The advisory committee of economists, now discharged, that assisted the Foundation in its microeconomics program was made up of the following persons:

Robert M. Solow, Massachusetts Institute of Technology, chairman of the committee
Edwin S. Mills, Princeton University
John B. Shoven, Stanford University
Michael Spence, Harvard University
Oliver Williamson, University of Pennsylvania

Other Trustee Grants in Economics and Management

University of Michigan
Ann Arbor, Michigan 48106

$130,000
(over one year)
$450,000
(over two years)

The Institute for Social Research at the University of Michigan has collected longitudinal data each year since 1968 on a sample of 5,000 American families. The project, called the Panel Study on Income Dynamics (PSID), gathers infor-

mation on such economic variables as income, employment, and job search, and on such demographic and social variables as family composition and methods of child care. Longitudinal data of this kind permit research that is not possible with cross-sectional data such as the Census or the Current Population Survey. Were the yearly collection of data by PSID to be interrupted, the continuity of the series would be destroyed and its value as a unique resource for the social sciences, especially economics, would be seriously damaged. To maintain PSID is expensive, total costs being somewhat in excess of $1 million a year. The Foundation made two grants in support of PSID in 1981. PSID believes these grants, together with expected support from the National Science Foundation and other donors, will finance the project at least to the end of 1983. The first Sloan grant, $130,000, went to support the analysis of data from the 1980 wave; the second, $450,000, will be used to help meet PSID costs in 1982 and 1983. (Project director: James N. Morgan, Institute for Social Research.)

Massachusetts Institute of Technology **$450,000**
Cambridge, Massachusetts 02139 (over three years)

Union membership in the private sector of the economy is falling and the industries most heavily unionized appear to be on the decline. Foreign competition in industries such as steel, textiles, and automobiles has led management to adopt new bargaining strategies and to press unions for wage concessions, givebacks, and productivity increases. At the same time, federal deregulation has stimulated the entry of new, non-union firms into a number of industries. The Industrial Relations Section of the Alfred P. Sloan School of Management at MIT, with the help of this grant, will study the process of change, and accommodation to change, on the part of both labor and management. The study will analyze such management strategies as the avoidance of unions, hard bargaining to obtain concessions, and the encouragement of employee participation in improving the quality of working life; and it will study the response of labor to such strategies. To assist MIT in the planning phase of this project, the Foundation made an officer grant, also in 1981, cited later in this section of the report. (Project director: Thomas A. Kochan, Professor of Industrial Relations.)

Brookings Institution **$400,000**
1775 Massachusetts Avenue, N.W. (over five years)
Washington, D.C. 20036

The Brookings Panel on Economic Activity was formed in 1970 with a grant of $300,000 from the Sloan Foundation, and received a renewal grant in 1973 of $150,000, after which the Panel was supported by the National Science Foundation until July 1981. The purpose of the Panel is to focus research in macroeconomics on problems currently facing the American economy. The Panel strives

to fulfill this purpose by generating and publishing outstanding research on timely subjects; it does not pursue highly abstract or purely theoretical modeling of economic relationships that cannot be tested against data and experience. It stimulates research to explore fundamental characteristics of the economy and of how the economy responds to government policies, as well as more applied research aimed at clarifying and quantifying economic relationships. The Panel represents a broad range of professional views and is held in high regard by economists who span the economic spectrum from liberal to conservative, activist to non-interventionist, Keynesian to neoclassical. This grant will meet part of the costs of the Panel for five years. (Project director: Joseph A. Pechman, Director of Economic Studies.)

American Economic Association **$200,000**
1313 - 21st Avenue South (over two years)
Nashville, Tennessee 37212

Every year since 1974, the American Economic Association has sponsored a summer program for minority students in the study of economics. The program's principal aim is to increase the number of professional economists from minority groups. The eight-week institute recruits undergraduate minority students who have shown promise in economics and who might be interested in studying for the Ph.D. degree; it gives them a chance to test their abilities in graduate-level economics and at the same time reveals to them professional options they may not have considered before. The program began at the University of California, Berkeley, then moved in 1975 to Northwestern, and then to Yale in 1980, where it remains today under the sponsorship of AEA. This grant will finance the program for two years. (Project director: Donald J. Brown, Department of Economics at Yale.)

American Enterprise Institute for Public Policy Research **$140,000**
1150 Seventeenth Street, N.W. (over two years)
Washington, D.C. 20036

The Committee to Fight Inflation is a non-partisan, non-governmental group whose chairman is Arthur F. Burns, formerly Chairman of the Board of Governors of the Federal Reserve System and now U.S. Ambassador to West Germany. The American Enterprise Institute provides the committee with administrative and support services. The work of the committee includes an extensive study, for which the Sloan grant was made, of the inflationary bias that emerged in the American economy after World War II and that has led to rapid inflation since the late 1960s. Mr. Burns will supervise the study. (Project director: Arthur L. Broida.)

National Bureau of Economic Research **$101,000**
1050 Massachusetts Avenue (over two years)
Cambridge, Massachusetts 02138

For several years Professor Edgar Feige of the economics faculty of the University of Wisconsin has been studying what he calls the unobserved economy, otherwise known as the underground economy that operates outside the purview of the Internal Revenue Service. This sector of the economy, involving unreported or under-reported cash receipts, barter, and other subterranean activities, has been growing relative to the observed economy, Feige believes, and is distorting economic statistics and economic policy. Investigating the unobserved economy requires special methods of measurement, which Feige has developed, based largely on the ratios of currency to deposits adjusted for changes in the average life of currency. Feige is assisted in his study by an advisory committee of monetary economists. The Foundation made an officer grant of $20,000 in 1980 to finance a part of Feige's study and made the present grant to permit him to continue the study.

Florida Agricultural and Mechanical University **$100,000**
Tallahassee, Florida 32307 (over two years)

This is the third grant the Foundation has made since 1973 to Florida A&M, an outstanding black institution, in support of its program in accounting. Previous grants were used for faculty and curriculum development in this widely noted program. The 1981 grant will be used to increase the use of the computer in the accounting curriculum; new computer-based courses will be developed and more intensive use will be made of the computer in existing courses. (Project director: Sybil C. Mobley, Dean of the School of Business and Industry.)

Duke University **$51,500**
Durham, North Carolina 27706 (over one year)

Professor H. Gregg Lewis of the economics faculty at Duke is one of the leading labor economists in the United States, and has trained many of the well-known economists in this field. He is the author of *Unionism and Relative Wages in the United States*, published in 1963, a classic work but badly out of date. With this grant, Lewis will revise his book and bring it up to date.

Officer Grants in Economics and Management

Association of Environmental and Resource Economists **$7,000**
c/o Resources for the Future (over one year)
1755 Massachusetts Avenue, N.W.
Washington, D.C. 20036

To help provide matching support for the establishment of a new professional organization to be called the Association of Environmental and Resource Economists. (Project director: William H. Baumol, Department of Economics, New York University.)

University of Chicago **$5,463**
Chicago, Illinois 60637 (over two years)

For an analysis of the impact of the Bankruptcy Reform Act of 1978 and an evaluation of alternative bankruptcy laws. (Project director: Ronald A. Dye, Graduate School of Business.)

Columbia University **$20,000**
New York, New York 10027 (over two years)

For a series of exploratory seminars on the psychological dimensions of economic theory. (Project directors: Stanley Schachter, Robert Johnston Niven Professor of Social Psychology; and Don Hood, Professor of Psychology.)

London School of Economics and Political Science **$20,000**
Houghton Street (over two years)
London, WC2A 2AE, England

For an international conference on "Trends in Women's Work, Education and Family-Building." (Project director: Richard Layard, Center for Labor Economics.)

Massachusetts Institute of Technology **$20,000**
Cambridge, Massachusetts 02139 (over one year)

For a planning project to allow the Alfred P. Sloan School of Management to prepare a proposal on collective bargaining and industrial relations. (Project director: Robert B. McKersie, Industrial Relations Section.)

University of Missouri, St. Louis **$19,937**
8001 Natural Bridge Road (over one year)
St. Louis, Missouri 63121

Partial support for the completion of the study, "Who Pays for Government?" (Project director: Donald Phares, Center for Metropolitan Studies.)

National Bureau of Economic Research **$20,000**
1050 Massachusetts Avenue (over one year)
Cambridge, Massachusetts 02138

For a conference on "social experimentation" in housing, income maintenance, employment, and medical services. (Project director: Charles E. McLure.)

National Planning Association **$16,000**
1606 New Hampshire Avenue, N.W. (over one year)
Washington, D.C. 20009

For a study in productivity analysis that will test certain relationships between research and development and productivity. (Project director: Nestor E. Terleckyj, Vice President of NPA.)

New York University **$13,000**
New York, New York 10003 (over one year)

For preparing and publishing a report, "R & D Productivity," based on a seminar series at the university's Center for Science and Technology Policy. (Project director: Herbert Fusfeld, Director of the Center.)

University of North Carolina **$20,000**
Chapel Hill, North Carolina 27514 (over one year)

For a conference on the theory and practice of cost-benefit analysis. (Project director: V. Kerry Smith, Department of Economics.)

Princeton University **$20,000**
Princeton, New Jersey 08544 (over one year)

Partial support for a microeconomics research project called "Inventory Behavior and Macroeconomic Fluctuations." (Project director: Alan S. Blinder, Department of Economics.)

Tulane University **$7,000**
New Orleans, Louisiana 70118 (over one year)

Partial support for a conference on "Strategies for Managing Nuclear Proliferation: Economic and Political Issues." (Project director: Dagobert L. Brito, Murphy Institute of Political Economy.)

University of Warwick **$12,000**
Coventry CV47AL, England (over one year)

For a summer workshop on the macroeconomics of open economies. (Project director: Marcus H. Miller, Department of Economics.)

Education and Research in Public Policy

Last year the Foundation's program in education and research in public policy, focused on two new sets of needs in the field: research and minorities. These new directions in our program followed five years of grantmaking in which the Foundation provided major support for new instructional programs at the bachelor's, master's, and Ph.D. levels. Although we continued to make some support for instructional programs available in 1981, we believe an ample variety of models and experimental programs are now in place; and we therefore put our emphasis on developing a strong base of research in the public policy field, upon which instruction can stand, and on increasing the flow of minority students into high-quality courses of study in public policy.

The Foundation has had an organized program for minorities in one field or another of interest to Sloan since 1969, and we regard the Foundation's present activity in public policy as our main program in that tradition; but the Foundation in 1981 also supported on an *ad hoc* basis a number of other projects for minorities, and they are reviewed under the appropriate headings elsewhere in this report.

In 1981 the Foundation was once again assisted in its public policy program by the Association for Public Policy Analysis and Management (APPAM), an organization made up of leading institutions and individuals in the field of education for the public service.

Trustee Grants in Education and Research in Public Policy

Minority Students

$979,500

Summer Institutes

Six APPAM Institutes — **$480,000** (over one year)

Harvard University — **$122,000** (over one year)
Cambridge, Massachusetts 02138

In 1980 the Foundation supported four summer institutes, developed by APPAM, for minority students who had just completed their third year of undergraduate study. These students wished to prepare for rigorous courses in policy analysis in their senior year and perhaps for enrollment in a master's degree program in public policy after that. In 1981 the Foundation continued its support of these summer institutes at the same four universities and added two more. The 1981 institutes were again intensive eight-week programs in economics, applied mathematics, and communication skills; career counseling was also provided. The six universities, each of which received a grant of $80,000 for its summer institute, were:

University of California, Berkeley
Berkeley, California 94720
(Project director: Allan P. Sindler, Dean, Graduate School of Public Policy.)

Carnegie-Mellon University
Pittsburgh, Pennsylvania 15213
(Project director: Otto A. Davis, Dean, School of Urban and Public Affairs.)

University of Minnesota
Minneapolis, Minnesota 55455
(Project director: John Brandl, Hubert H. Humphrey Institute of Public Affairs.)

Research Foundation of the State University of New York
Albany, New York 12201
(Project location: The State University of New York at Stony Brook; Project director: Thomas Sexton, W. Averell Harriman College of Urban and Policy Studies.)

University of Texas, Austin
Austin, Texas 78712
(Project director: Susan Hadden, Lyndon B. Johnson School of Public Affairs.)

University of Washington
Seattle, Washington 98195
(Project director: Jared Hazelton, Dean, Graduate School of Public Affairs.)

In addition to the support of these six institutes, the Foundation made a grant of $122,000 to Harvard University to finance a second-year institute for a group of selected students. These were students who had been through one of the first institutes in 1980 and had been accepted during their senior year by one of the APPAM schools for enrollment in the fall of 1981 for graduate work in public policy. The second summer institute was conducted at the John F. Kennedy School of Government and emphasized further work in economics, applied mathematics, and communication skills. (Project director: H. James Brown.)

Fellowship Support for Minority Students

University of Washington — **$362,500** (over one year)
Seattle, Washington 98195

Another important step was taken in 1981 in the program developed by the Foundation and APPAM for increasing the number of minority students in APPAM schools of public policy; it provided fellowship support of minority students during their first year of graduate work. This grant, which will be administered on behalf of APPAM by the University of Washington, will provide fellowship support for 36 minority students who were accepted, in most cases for a master's degree program, by 14 APPAM schools for enrollment in the fall of 1981. Most of these students had been through the Harvard summer institute described above. After completion of their first year of graduate study, they will be expected to be in the mainstream of students at their institutions and to be responsible for financing the rest of their program on the same basis as other students. (Project director: Jared Hazelton, Dean, Graduate School of Public Affairs, and treasurer of APPAM.)

* * * * *

An internal appropriation of $15,000 was also approved by the Sloan Trustees in 1981 to meet the costs of a coordinating office at the Foundation concerned with the minorities program in public policy.

As a part of its continuing effort to increase the flow of minority students into high-quality public policy programs, the Foundation supported six summer workshops in 1981 that provided intensive study in applied mathematics, economics, and communication skills to a selected group of minority students. Here Robert Morgado, the principal assistant to the Governor of New York, talks with students at the workshop held at the State University of New York at Stony Brook.

Other Trustee Grants in Education and Research in Public Policy

Duke University **$300,000**
Durham, North Carolina 27706 (over three years)

The Institute of Policy Sciences and Public Affairs at Duke, under the leadership of Joel Fleishman, has been an outstanding school of public policy over the last 10 years. The Foundation has supported the Institute with several grants in the past, and the present grant is part of the Foundation's effort to encourage a few of the leading universities in the public policy field to develop a base of scholarly research under this field. With this grant, Duke will establish a research program in telecommunications policy. Telecommunications is a rapidly evolving field in which new technology along with government deregulation have introduced issues of fundamental public importance that are promising material for research. (Project director: Joel Fleishman, Director of the Institute.)

Harvard University **$300,000**
Cambridge, Massachusetts 02138 (over two years)

The John F. Kennedy School of Government at Harvard is one of the premier schools in the public policy field. With a curriculum based on applied economics, statistics, and other analytical skills, the Kennedy School has attracted students of high intellectual caliber to its public policy program, while at the same time drawing to its mid-career program outstanding administrators from every level of government. Great effort and substantial resources have gone into building the analytic curriculum over the last decade. The school recognizes that it must now make a similar effort on the managerial side of government, where "optimal" policies, buttressed as they may be by skillful analysis, have to be implemented through large bureaucracies on a day-to-day basis. With this grant, the school will approach its problem of curriculum development in public management through a research program that focuses on such topics as constitutional reform, strategic planning, performance and accountability, negotiation, and financial management. (Project director: Mark H. Moore, Guggenheim Professor of Criminal Justice Policy and Management.)

University of Michigan **$300,000**
Ann Arbor, Michigan 48109 (over three years)

The Institute of Public Policy Studies at the University of Michigan is served by political scientists, economists, other social scientists, and occasionally engineers and natural scientists, all with a common interest in preparing students for careers in public service. The faculty has spent much of the last decade developing and teaching a new curriculum that emphasizes quantitative and analytical skills, but has had little time and few resources for research in public policy. This grant will support a research program on such topics as evaluating large government programs, improving the management of the budget process in state and local government, developing personnel policies for government employees based on those that have worked well in the private sector, and adapting econometric modeling techniques to the needs of regulatory agencies. (Project director: Edward Gramlich, Director of the Institute.)

Urban Academy for Management, Inc. **$250,000**
One Times Square (over two years)
New York, New York 10036

With the help of Sloan grants over the last five years, the Urban Academy has now taken to an advanced state of development a program to improve the

analytical and managerial abilities of middle-level executives of the government of New York City. Called the Top 40 Program, it recruits and carefully screens about 100 candidates twice a year for entry to classes of 20 participants each. The course of study occupies one day a week over a nine-month period and is focused on the specific needs of New York City. Specialists and practitioners from higher education, industry, and government make up the faculty. The Top 40 Program is strongly supported by New York City and has attracted the interest of other large cities. This grant represents the Foundation's final support of the program; $50,000 of the funds will be used to assist other cities in establishing similar programs. (Project director: George W. McGurn, President of the Academy.)

Smith College **$240,000**
Northampton, Massachusetts 01063 (over three years)

Like other liberal arts colleges that have been assisted by the Foundation in developing a curriculum in public policy, Smith will use this grant to establish a "concentration," not a major, in the field. The Smith program, with prerequisites in economics, political science, and natural science, will consist of an introductory course in policy analysis, a set of intermediate courses, and a capstone senior-year project that will be presented to a panel of faculty members and visiting public officials. A summer internship before the senior year will also be encouraged. (Project director: Donald Robinson, Professor of Government, and Director of the American Studies Program.)

American Enterprise Institute for Public Policy Research **$200,000**
1150 Seventeenth Street, N.W. (over two years)
Washington, D.C. 20036

In 1976 the Foundation made a grant of $500,000 to support a series of studies at the American Enterprise Institute's new Center for the Study of Government Regulation. The present grant will provide partial support for a second series of research studies concerned with such topics as: Air Pollution Abatement Programs for Stationary Sources at EPA; Nuclear Safety Regulation by NRC; Food and Drug Safety Regulation by FDA; and Workplace Safety and Health Regulation by OSHA. The grant will also cover the costs of a conference on health, safety, and environmental regulation. (Project director: Marvin H. Kosters, Director of the Center.)

Lawrence University **$174,000**
Appleton, Wisconsin 54911 (over two years)

Among the grants made by the Foundation in recent years to help liberal arts colleges establish programs in public policy was a grant of $160,000 to Lawrence University in 1978. The college has now developed a set of courses, and related activities, in this field. The core of the program is work in economics and government that retains the rigor of the college's other non-vocational, liberal arts courses while concentrating on policy applications. The present grant is renewal and final support to the college for the further development of its public policy program. (Project director: Jeffrey Alan Miller, Director, Public Service Program.)

Urban Institute **$135,000**
2100 M Street, N.W. (over one year)
Washington, D.C. 20037

With this grant, a group of labor economists will undertake an evaluation of a major federal program, the Comprehensive Employment and Training Act (CETA). The study will use a rich new data source known as the Continuous Longitudinal Manpower Survey. The CETA program, funded currently at $8 billion a year, will be considered for renewal in 1982, and an evaluation of its past performance by a non-governmental organization may prove important and timely. (Project director: Isabel Sawhill, Program Director for Employment and Labor Policy.)

Williams College **$129,000**
Williamstown, Massachusetts 02167 (over two years)

Williams received a Sloan grant of $165,000 in 1977 to finance the development of its Political Economy Program, an interdisciplinary program in public policy that, like similar programs at Smith and Lawrence (reviewed above), is aimed at talented students who will probably combine careers in the professions with periods of public service. The present grant is for renewal and final support and will meet the costs of several new courses, seminars, and an internship program. (Project director: MacAlister Brown, Chairman, Program in Political Economy.)

Harvard University **$92,000**
Cambridge, Massachusetts 02138 (over one year)

For the last three years, James Q. Wilson of Harvard's Department of Government, and Richard J. Herrnstein of the Department of Psychology, have jointly taught a course on crime and the criminal justice system. One of their main interests has been the development of a comprehensive theory of crime—of why some people commit crimes and others do not, and of public policies that might reduce crime. Herrnstein is an experimental psychologist with an interest in how individuals with different psychological characteristics interact with social institutions such as the criminal justice system. Wilson has played a part in an effort by economists and political scientists to discover whether the crime rate in cities, states, and nations varies in a predictable way with the probability of detection and punishment and with conditions in the labor market. This grant will allow Wilson and Herrnstein to complete a book in which they will try to adumbrate a comprehensive theory of crime.

Resources for the Future, Inc. **$50,000**
1755 Massachusetts Avenue, N.W. (over one year)
Washington, D.C. 20036

The Foundation made a grant of $200,000 in 1978 to Resources for the Future to finance a study of whether and how research in public policy actually affects government agencies and the formation of policy. The original plan at RFF was to concentrate on eight analyses of the energy problem done in the few years following the first OPEC crisis in 1973; but as the work progressed, the desirability of extending it to the entire decade of the 70's and to include in all 14 studies became clear. This grant is supplementary support for the expanded study. (Project director: Martin Greenberger.)

Officer Grants in Education and Research in Public Policy

Harvard University **$20,000**
Cambridge, Massachusetts 02138 (over one year)

For a semester-long faculty seminar on public management, to be conducted at the John F. Kennedy School of Government. (Project directors: Mark H. Moore and Philip B. Heymann.)

Society for Risk Analysis **$20,000**
2101 Constitution Avenue (over one year)
Washington, D.C. 20418

For a conference on how individuals perceive risk in varying circumstances and how that perception affects their own actions and the policies of government agencies. (Project director: Robert G. Tardiff, Secretary of the Society.)

Urban Institute **$20,000**
2100 M Street, N.W. (over one year)
Washington, D.C. 20037

For a series of seminars, to be attended by government executives, to examine and help define the field of public management. (Project director: Lester M. Salamon.)

Urban Institute **$19,950**
2100 M Street, N.W. (over one year)
Washington, D.C. 20037

For a study of the extent to which members of minority groups are employed in the public sector. (Project director: Charles L. Betsey.)

Other Grants and Activities

The following grants are related to the main interests of the Foundation but for one reason or another stand apart from a specific program or from our support of projects in particular academic fields.

Trustee Grants in Mathematics and Quantitative Skills

In addition to the Sloan Research Fellowships Program (see pages 20-22), the Foundation has a continuing interest, although not a coherent program, in mathematics, mainly in applied mathematics. We also have an interest in improving the quantitative skills of liberal arts students, as is reviewed on pages 52-54 of this report. These are complementary but quite separate interests of the Foundation; they are treated together here for the sake of convenience. As our new program in quantitative skills in the undergraduate curriculum develops in 1982 and beyond, it will be reviewed in our annual reports as a separate item in its own right. The following grants in mathematics and quantitative skills were made in 1981:

Institute for Advanced Study **$150,000**
Princeton, New Jersey 08540 (over one year)

Since its inception, the Institute for Advanced Study has been a powerful force in the field of pure mathematics. Its permanent faculty includes eminent mathematicians and it regularly attracts visiting faculty members from the United States and other countries. This grant will meet part of the cost of an undertaking called the "Special Year Algebraic Geometry Project," which will bring together a group of distinguished mathematicians over an academic year to examine the state of knowledge in a special area of pure mathematics. (Project director: Harry Wolf, Director of the Institute.)

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The three grants described below, totaling $68,000, were approved as a package by the Sloan Trustees in 1981. They deal with matters that were touched on but not explored in depth at a conference on applied mathematics (also described below) that was supported by the Foundation in 1981.

Clarkson College **$23,000**
Potsdam, New York 13676 (over one year)

For a conference on the feasibility of training Ph.D. mathematicians in computer science to the level necessary for them to teach introductory courses in computing and teach mathematics courses in which computing plays a large role. (Project director: Edward Dubinsky, Department of Mathematics and Computer Science.)

Oberlin College **$19,000**
Oberlin, Ohio 44074 (over one year)

Support over half an academic year for Samuel Goldberg, Professor of Mathematics, to allow him to complete a textbook on decision analysis for use in introductory courses for non-mathematics majors.

Research Foundation of the State University of New York **$26,000**
P.O. Box 9 (over one year)
Albany, New York 12201

For a conference on redesigning the first two years of the mathematics curriculum, with an emphasis on the needs of students in computer science, engineering, and management. (Project director: Anthony Ralston, Department of Computer Science, State University of New York, Buffalo.)

Officer Grants in Mathematics and Quantitative Skills

Brown University **$12,500**
Providence, Rhode Island 02912 (over one year)

Partial support for a conference on the influence of the computer on mathematics, philosophy, and culture. (Project director: Philip J. Davis, Division of Applied Mathematics.)

Case Western Reserve University **$20,000**
Cleveland, Ohio 44106 (over one year)

For a conference, attended by pure and applied mathematicians and computer scientists, on the state of the mathematics course of study, with emphasis on the need for new undergraduate and graduate programs in applied mathematics. (Project director: Gail Young, Department of Mathematics, University of Wyoming, Laramie, Wyoming 82071; formerly of the Case Western Reserve faculty of mathematics.)

Earlham College **$20,000**
Richmond, Indiana 47374 (over one year)

For a conference, attended by representatives of liberal arts colleges, on the place of technology and quantitative skills in the undergraduate curriculum. (Project director: Jerome H. Woolpy, Department of Biology.)

Wellesley College **$19,000**
Wellesley, Massachusetts 02181 (over one year)

For a conference, attended by representatives of women's colleges that have formal associations with universities, on the place of technology and quantitative skills in the undergraduate curriculum. (Project director: Nannerl O. Keohane, President.)

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In addition to the above officer grants, which helped the Foundation develop its new program in quantitative skills, an internal appropriation of $30,000, made as an officer grant, was approved in 1981 to allow the Foundation to conduct a conference at the end of the year on "The New Liberal Arts."

Other Trustee Grants for Miscellaneous Purposes

Vanderbilt University **$260,000**
Nashville, Tennessee 47240 (over two years)

The Foundation's annual report for 1980 carried the announcement of a new program, "The Presidential Selection Process," that was described as a long-term study of the process by which Presidents of the United States are selected. The study formally began in 1981 under the direction of Alexander Heard, Chancellor of Vanderbilt University. To meet the costs of the project through 1982, the Trustees approved an appropriation of $290,000 in 1981. Of this amount, $30,000, together with an officer grant of $10,000, was used to meet expenses incurred by the Foundation in the planning phase of the project. At the end of the planning phase, the remainder of the appropriation, $260,000, was transferred as a grant to Vanderbilt University in 1981.

Community Service Society of New York **$150,000**
105 East 22nd Street (over three years)
New York, New York 10010

The Community Service Society (CSS) offers a wide range of social and community services to the five boroughs of New York City, with particular attention to areas of poverty such as the South Bronx, East Harlem, and Central Brooklyn. It provides direct services to people in need; technical assistance to community groups such as school boards and neighborhood organizations; and expert analysis of public policies and legislation intended to improve community life. This grant, a modest contribution to CSS's operating budget, was one of the Foundation's "civic" grants (which usually go to social service agencies in New York City) in 1981. (Project director: Bertram M. Beck, General Director of CSS.)

Yale University **$150,000**
New Haven, Connecticut (over three years)

Kingman Brewster, formerly President of Yale and more recently U.S. Ambassador to the Court of St. James's, has been concerned over much of his career with the survival and well-being of what he calls the "Voluntary Society": with the social traditions and economic and political institutions that maximize the individual's mobility in society and his freedom of choice. Brewster is concerned with fundamental questions such as the accountability of government and the decentralization of power in an age that tends to concentrate authority. Having reflected on such questions throughout a distinguished career as law school professor, university president, and public servant, Brewster plans to write a book on the preservation of the voluntary society. This grant will enable him to spend half-time over three years on the project, during which he will be associated with Yale's Institution for Social and Policy Studies.

Foundation Center **$120,000**
888 Seventh Avenue (over three years)
New York, New York 10106

For 25 years the Foundation Center has served as the principal source of public information about philanthropic foundations. Over that time, the Center has regularly improved and expanded its services to grant-seekers, public officials, and the foundation field itself. It offers computer searches and other kinds of library and reference services; it conducts seminars on private philanthropy for non-profit organizations; it offers its members free services concerning new information technologies; and it produces various publications of interest to grant-makers and grant-seekers. This grant will help meet the Center's operating expenses for the period 1981-84. (Project director: Thomas R. Buckman, President of the Center.)

Officer Grants for Miscellaneous Purposes

Budget and Credit Counseling Service, Inc. **$10,000**
105 East 22nd Street (over one year)
New York, New York 10010

A civic grant to help meet the operating budget of an organization devoted to assisting low-income families with advice about debt management and other financial matters. (Project director: Luther R. Gatling, President of BCCS.)

University of California, San Diego **$18,000**
La Jolla, California 92093 (over one year)

For the development of an interactive computer system to help elementary school students improve their writing skills. (Project director: James Levin, Center for Human Information Processing Laboratory.)

Capital Children's Museum — **$20,000**
800 Third Street, N.E. — (over one year)
Washington, D.C. 20002

Partial support for the development of interactive computer exhibits, in particular for the costs of adapting the computer language, LOGO, to the museum's microcomputers. (Project director: Ann W. Lewin, Executive Director of the Museum.)

Council on Foundations, Inc. — **$20,000**
1828 L Street, N.W. — (over one year)
Washington, D.C. 20036

This grant represents the annual dues of the Sloan Foundation for membership in the principal national association of private foundations. (Project director: Charles S. Rooks, Vice President.)

Education Writers Association — **$20,000**
P.O. Box 281 — (over two years)
Woodstown, New Jersey 08098

For a series of workshops for new education reporters on problems of covering the education field. (Project director: Charles H. Harrison, Executive Director of the Association.)

Lesley College — **$7,500**
Cambridge, Massachusetts 02138 — (over one year)

Partial support for a meeting, to be attended by teachers from public and private schools, on the teaching of expository writing. (Project director: Winifred Skolnikoff.)

National Affairs, Inc. — **$15,000**
10 East 53rd Street — (over one year)
New York, New York 10022

For a symposium in the journal, *The Public Interest*, on ethics and moral education. (Project director: Irving Kristol, Editor of *The Public Interest*.)

New York City School Volunteer Program, Inc. — **$20,000**
20 West 40th Street — (over one year)
New York, New York 10018

A civic grant for support of an organization that offers a number of volunteer services, including supplementary instruction for students, to the 600 public schools of New York City. (Project director: Mildred E. Jones, Director of NYCSVP.)

New York Community Trust — **$15,000**
415 Madison Avenue — (over one year)
New York, New York 10017

A civic grant in partial support of the program of New York Community Trust to reduce the energy costs of non-profit organizations based in New York City. (Project director: Dale R. Partoll.)

Ohio State University — **$7,200**
Columbus, Ohio 43210

To reimburse the institution for costs incurred in 1977-78 in conducting a self-study for the Sloan Commission on Government and Higher Education.

United Negro College Fund — **$20,000**
500 East 62nd Street — (over one year)
New York, New York 10021

Partial support for a study called "Career Patterns of Graduates of United Negro College Fund Colleges." (Project director: Daniel C. Thompson, Dillard University, New Orleans, Louisiana 70122.)

United Way of Tri-State — **$3,000**
99 Park Avenue — (over one year)
New York, New York 10016

A contribution made by the Foundation on behalf of its staff to the annual fund-raising campaign of United Way of Tri-State.

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An internal appropriation of $16,000, made as an officer grant, was approved in 1981 to meet the expenses of a demonstration project, conducted by the Foundation, in "archival television" — that is, in the use of television to record historically important events from the point of view of participants in those events.

Financial Review

Financial Review

The financial statements and schedules of the Foundation, which have been audited by Ernst & Whinney, independent certified public accountants, appear on pages 62-77. They include the balance sheets, the statements of income, expenses and changes in fund balance, the statements of changes in financial position, the schedules of administration and investment expenses, the schedule of marketable securities, and the schedule of grants and appropriations.

Investment and other income for 1981 was $20,609,237, an increase of $1,866,200 from $18,743,037 in 1980. This increase resulted largely from the continued high interest rates which prevailed during 1981.

After the deduction of investment expenses and provision for Federal excise tax from investment and other income, net investment income was $19,593,977 in 1981 as compared with $17,857,626 for the prior year. Investment expenses during 1981 totaled $501,260, of which $330,140 represented investment counsel fees. Provision for Federal excise tax amounted to $514,000. The total of these deductions from income in 1981 was $1,015,260 versus $885,411 in 1980.

The total of grants and appropriations authorized net of grant refunds and administration expenses during 1981 was $16,880,749. This sum was $2,713,228 under 1981 net investment income. Of this total, grants and appropriations authorized amounted to $15,542,134 while administration expenses were $1,381,238. Over the Foundation's forty-seven year history, the cumulative excess of grants and expenses over the Foundation's income has amounted to $51,747,208.

Grant and appropriation payments in 1981 were $14,852,001, compared with $16,733,622 the prior year. Together with 1981 administration expenses, investment expenses and Federal excise taxes paid, the total of cash expenditures net of grant refunds in 1981 was $17,151,651, while in 1980 the amount was $18,905,769.

The market value of the Foundation's total assets was $253,385,427 at December 31, 1981, including marketable securities valued at $251,774,719 as compared with total assets of $265,649,085 at December 31, 1980. A summary of the Foundation's marketable securities at cost and quoted market value at December 31, 1981 appears on pages 68-73. Changes in holdings and in market values have increased the fixed income securities holdings in 1981 from 30.1 percent to 36.6 percent. The holdings of common stocks have correspondingly decreased from 69.9 percent to 63.4 percent.

A listing of grants made during 1981 will be found on pages 74-77. Grants and appropriations authorized and payments during the year ended December 31, 1981 are summarized in the following table:

Grants and appropriations authorized but not due at January 1, 1981	$16,842,139
Authorized during 1981	15,542,134
	32,384,273
Payments during 1981	14,852,001
Grants and appropriations authorized but not due at December 31, 1981	$17,532,272

Report of Ernst & Whinney, Independent Auditors

Board of Trustees
Alfred P. Sloan Foundation
New York, New York

We have examined the balance sheet of the Alfred P. Sloan Foundation as of December 31, 1981 and the related statements of income, expenses and changes in fund balance and changes in financial position for the year then ended and the supplementary schedules of marketable securities at December 31, 1981, and of administration and investment expenses and grants and appropriations for the year then ended. Our examination was made in accordance with generally accepted auditing standards and, accordingly, included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances. The financial statements of the Alfred P. Sloan Foundation for the year ended December 31, 1980, were examined by other auditors whose report dated February 2, 1981, expressed an unqualified opinion on those statements.

In our opinion, the financial statements referred to above present fairly the financial position of the Alfred P. Sloan Foundation at December 31, 1981, and the results of its operations and changes in its fund balance and financial position for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year. Also, in our opinion, the supplementary schedules referred to above are fairly stated in all material respects in relation to the financial statements taken as a whole.

Ernst & Whinney

New York, New York
January 27, 1982

Balance Sheets

December 31, 1981 and 1980

	1981	1980
Assets		
Marketable Securities:		
Fixed income securities:		
U.S. Government and agency obligations	$ 40,826,507	$ 38,891,127
Corporate and other	55,449,968	46,717,277
	96,276,475	85,608,404
Common Stocks:		
General Motors Corporation	41,677,643	41,677,643
Other common stocks	108,547,574	110,325,640
	150,225,217	152,003,283
Total marketable securities (quoted market: 1981 - - $251,774,719; 1980 - - $265,495,305)	246,501,692	237,611,687
Due for securities sold, not delivered - - net	1,292,036	
Cash	318,672	153,780
TOTAL	$248,112,400	$237,765,467
Liabilities and Fund Balance		
Grants and Appropriations Authorized But Not Due for Payment	$ 17,532,272	$ 16,842,139
Accrued Federal Excise Tax	518,681	464,456
Fund Balance	230,061,447	220,458,872
TOTAL	$248,112,400	$237,765,467

See accompanying notes to financial statements.

Statements of Income, Expenses and Changes In Fund Balance

For the years ended December 31, 1981 and 1980

	1981	1980
Investment Income:		
Dividends	$ 10,452,292	$ 10,239,728
Interest	10,128,561	8,478,487
Other	28,384	24,822
	20,609,237	18,743,037
Less:		
Investment expenses	501,260	423,411
Provision for Federal excise tax	514,000	462,000
	1,015,260	885,411
Net investment income	19,593,977	17,857,626
Grants and administration expenses:		
Grants and appropriations authorized (net of grant refunds: 1981 - - $42,623; 1980 - - $45,525)	15,499,511	18,814,093
Administration expenses	1,381,238	1,376,755
Total	16,880,749	20,190,848
Grants and expenses under (over) income for the year	2,713,228	(2,333,222)
Net gain on disposals of securities	6,831,058	6,371,988
Assets received as remainderman of trust	58,289	1,497,804
NET CHANGE IN FUND BALANCE FOR YEAR	9,602,575	5,536,570
Fund balance January 1	220,458,872	214,922,302
FUND BALANCE AT END OF YEAR	$230,061,447	$220,458,872

See accompanying notes to financial statements.

Statements of Changes in Financial Position

For the years ended December 31, 1981 and 1980

	1981	1980
SOURCE OF FUNDS		
Investment income	$ 20,609,237	$ 18,743,037
Assets received as remainderman of trust	58,289	1,497,804
Net gain on disposals of securities	6,831,058	6,371,988
	27,498,584	26,612,829
APPLICATION OF FUNDS		
Grant and appropriation payments (net of grant refunds: 1981 - - $42,623; 1980 - - $45,525)	14,809,378	16,688,097
Administration expenses	1,381,238	1,376,755
Investment expenses	501,260	423,411
Federal excise taxes paid	459,775	417,506
	17,151,651	18,905,769
INCREASE IN FUNDS CONSISTING OF		
Cost of investments	8,890,005	7,656,059
Amount due for securities sold, not delivered - - net	1,292,036	
Cash balances	164,892	51,001
NET CHANGE	$ 10,346,933	$ 7,707,060

See accompanying notes to financial statements.

Notes to Financial Statements

1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

The accompanying financial statements have been prepared substantially on the accrual basis of accounting and, accordingly, reflect all significant assets and liabilities. Investment income and investment and administration expenses are recorded on the cash basis, the effect of which on the accompanying financial statements is not materially different from the accrual basis.

Marketable securities purchased are carried at cost; for those received by gift or bequest, cost is quoted market value at date of gift or bequest. Gain or loss on disposal of securities is determined generally on the basis of first-in, first-out cost, but in certain instances the identified lot basis is used. Net gain or loss on disposals is applied to the principal section of the fund balance.

Grant appropriations are accrued at the time authorized by the Trustees and Federal excise tax is accrued in the year to which it relates.

2. RETIREMENT PLAN

The Foundation has a defined contribution retirement plan covering substantially all employees under arrangements with Teachers Insurance and Annuity Association of America and College Retirement Equities Fund which provides for purchase of annuities for employees. Retirement plan expense was $115,745 and $122,796 for 1981 and 1980, respectively.

3. LEASE

The Foundation's lease for its office space expires April 30, 1985. The lease contains an escalation clause which provides for rental increases resulting from increases in real estate taxes and certain other operating expenses. Under the lease, rent was $255,195 in 1981 and $243,527 in 1980 before sublease income.

Notes to Financial Statements

(Continued)

4. FUND BALANCE

Fund balance, at year-end, is comprised of the following:

	1981	1980
Principal	$281,808,655	$274,919,308
Income - - cumulative excess of grants and expenses over income from inception of the Foundation	(51,747,208)	(54,460,436)
Fund balance	$230,061,447	$220,458,872

5. DISTRIBUTION OF TRUST

Assets, in the amount of $1,497,804, were received in 1980 by the Foundation as a remainderman of the trust created by Alfred P. Sloan, Jr. for the benefit of Clifford A. Sloan. In 1981, a final distribution of $58,289 was received by the Foundation from the trust.

Schedule of Administration and Investment Expenses

For the years ended December 31, 1981 and 1980

	1981	1980
ADMINISTRATION EXPENSES		
Salaries and employee benefits:		
Salaries	$ 718,760	$ 757,229
Employees' retirement plan and other benefits	222,969	214,419
Total	941,729	971,648
Rent (net of sublease rentals of approximately $39,000 and $35,000, respectively)	218,835	210,077
Program expenses	190,272	139,100
Office expenses and services	110,958	87,256
Reports and publications	52,665	33,971
Professional fees	37,899	38,764
Total administration expenses	1,552,358	1,480,816
Less administration expenses applicable to investments	171,120	104,061
Administration expenses applicable to grant making	$1,381,238	$1,376,755
INVESTMENT EXPENSES		
Investment counsel fees	$ 330,140	$ 319,350
Administration expenses applicable to investments	171,120	104,061
Total investment expenses	$ 501,260	$ 423,411

Schedule of Marketable Securities

December 31, 1981

SUMMARY	Cost	Quoted Market Value: Amount	Quoted Market Value: Percent of Total Investment
Fixed income securities:			
U.S. Government and agency obligations	$ 40,826,507	$ 38,223,573	15.2%
Corporate and others	55,449,968	54,004,935	21.4
Total fixed income securities	96,276,475	92,228,508	36.6
Common stocks:			
General Motors Corporation	41,677,643	38,500,000	15.3
Other common stocks	108,547,574	121,046,211	48.1
Total common stocks	150,225,217	159,546,211	63.4
Total marketable securities	$246,501,692	$251,774,719	100.0%

FIXED INCOME SECURITIES	Principal Amount	Cost	Quoted Market Value
U.S. Government and agency obligations:			
U. S. Treasury:			
7¼% Notes 3/31/82	$2,500,000	$ 2,485,937	$ 2,473,425
8¼% Notes 6/30/82	4,090,000	4,068,716	4,005,623
14⅝% Notes 6/30/83	1,000,000	995,000	1,010,000
7¼% Notes 2/15/84	2,300,000	2,069,438	2,034,051
8% Notes 2/15/85	500,000	501,094	428,750
14% Notes 6/30/85	1,000,000	954,844	999,370
13½% Notes 2/15/86	5,000,000	5,116,101	4,918,750
8¼% Notes 5/15/88	1,000,000	989,219	767,500
14% Notes 7/15/88	1,000,000	977,075	996,250
13% Notes 11/15/90	4,000,000	3,893,467	3,820,000
7⅛% Bonds 2/15/93	1,000,000	690,625	685,000
9% Bonds 2/15/94	1,000,000	741,250	713,120
10¼% Bonds 11/15/94	2,000,000	1,983,125	1,555,000
9¼% Bonds 5/15/2009	2,000,000	1,844,375	1,382,500
Federal Farm Credit Banks, Consolidated Systemwide:			
9.20% Bonds 6/3/85	1,000,000	849,375	860,000
7¼% Bonds 9/5/89	1,000,000	732,750	701,250
Federal Home Loan Mortgage Corporation, Mortgage Participation:			
10¼% Certificates 9/1/2009	$1,123,973	$ 1,045,294	$ 793,805
10¼% Certificates 10/1/2009	1,696,853	1,578,073	1,198,402
Federal Intermediate Credit Banks			
6.95% Bonds 1/5/87	1,500,000	1,120,339	1,128,750
Federal Land Banks:			
7.30% Bonds 10/20/82	1,000,000	1,007,500	955,620
8.20% Bonds 1/22/90	500,000	373,750	360,000
Federal National Mortgage Association:			
6.65% Debentures 6/10/82	1,000,000	1,002,500	972,500
14½% Debentures 3/11/85	2,000,000	2,062,000	1,977,500
8.20% Debentures 3/10/86	1,000,000	795,000	801,250
14.40% Debentures 2/10/88	2,000,000	2,071,400	1,945,000
Government National Mortgage Association			
11% Modified Pass Through Certificate 1/15/2010	962,807	878,260	740,157
Total U.S. Government and agency obligations		40,826,507	38,223,573
Corporate and other:			
Short term:			
Interest bearing foreign currency call accounts	9,437,235	9,437,235	9,437,235
Interest bearing demand notes:			
Atlantic Richfield Company	263,000	263,000	263,000
General Electric Company	2,011,000	2,011,000	2,011,000
General Motors Acceptance Corporation	1,265,000	1,265,000	1,265,000
NLT Corporation	1,000,000	1,000,000	1,000,000
Tenneco Corporation	648,000	648,000	648,000
Certificates of Deposit:			
Bank of America N.T. & S.A. 12¼% 2/2/82	2,000,000	2,000,000	2,000,260
Continental Illinois National Bank & Trust Company 16% 2/16/82	2,000,000	2,000,000	2,005,800

Schedule of Marketable Securities

December 31, 1981 (Continued)

FIXED INCOME SECURITIES	Principal Amount	Cost	Quoted Market Value
Corporate and other (continued):			
Short term (continued):			
Commercial Paper:			
American Express Credit Corporation 12.57% 1/13/82	$2,000,000	$ 2,000,000	$ 2,000,000
Sears Roebuck Acceptance Corporation 14.29% 1/6/82	4,000,000	4,000,000	4,000,000
Repurchase Agreements:			
U.S. Treasury Securities 11% 1/4/82	7,341,000	7,341,000	7,341,000
Total short term		31,965,235	31,971,295
Long term:			
American Telephone and Telegraph Company 13¼% Notes 3/25/91	2,000,000	1,981,892	1,912,840
Avco Corporation 5½% Convertible Subordinated Debentures 11/30/93	2,000,000	1,203,979	1,050,000
Chesapeake & Ohio Railway Company 8½% Conditional Sale Agreement 1/1/89	715,167	579,240	582,414
E.I. du Pont de Nemours & Company:			
8% Notes 5/1/86	1,000,000	938,750	793,410
14% Notes 12/1/91	2,000,000	1,950,056	1,909,240
General Foods Corporation 7½% Notes 3/1/84	500,000	463,580	437,265
General Motors Acceptance Corporation 14⅜% Notes 6/15/89	2,000,000	1,968,367	1,922,500
Georgia-Pacific Corporation 7¼% Notes 1/15/85	2,000,000	1,793,750	1,642,940
Household Finance Corporation:			
8½% Debentures 5/15/83	1,000,000	997,500	919,160
4⅛% Debentures 7/1/87	500,000	324,430	307,720
International Bank for Reconstruction and Development 14⅛% Notes 12/15/86	3,000,000	2,942,250	2,939,400

FIXED INCOME SECURITIES	Principal Amount	Cost	Quoted Market Value
Corporate and other (continued):			
Long term (continued):			
International Business Machines Corporation 9½% Notes 10/1/86	$1,000,000	$ 947,500	$ 864,880
John Deere Credit Company 4⅛% Sinking Fund Debentures 10/31/85	1,000,000	704,530	737,410
Manufacturers Hanover Trust Company 8½% Capital Debentures 6/1/85	1,000,000	973,440	841,520
Ohio Bell Telephone Company 9% Debentures 11/1/2018	1,000,000	862,500	613,490
Oklahoma Gas & Electric Company 4½% First Mortgage Bonds 1/1/87	800,000	514,944	524,416
Pacific Northwest Bell Telephone Company 10⅛% Debentures 10/1/2019	1,000,000	930,000	682,320
Province of Ontario, Canada 4¼% Debentures 2/1/84	1,000,000	851,300	845,570
Security Pacific Corporation 8.80% Notes 12/15/85	1,000,000	1,000,000	826,360
Southern California Edison Company 4¼% First and Refunding Mortgage Bonds 11/1/87	1,300,000	790,615	805,805
Texas Company 3⅜% Debentures 5/1/83	1,000,000	766,110	874,980
Total long term		23,484,733	22,033,640
Total corporate and other		55,449,968	54,004,935
Total fixed income securities		$96,276,475	$92,228,508

Schedule of Marketable Securities

December 31, 1981 (Continued)

COMMON STOCKS	Number of Shares	Cost	Quoted Market Value
United States:			
American Cyanamid Company	95,000	$ 2,842,957	$ 2,755,000
American Hoist & Derrick Company	19,000	362,140	306,375
American Home Products Corporation	66,000	1,965,075	2,409,000
American Telephone and Telegraph Company	81,000	4,212,990	4,758,750
AMF Inc.	80,000	1,850,331	2,220,000
Associated Dry Goods Corporation	67,000	1,752,640	1,641,500
Avon Products, Inc.	57,000	2,987,010	1,710,000
BankAmerica Corporation	76,200	1,701,557	1,619,250
Coca-Cola Company	67,000	2,489,124	2,328,250
Colgate-Palmolive Company	143,000	2,232,340	2,395,250
Continental Group, Inc.	57,000	1,680,959	1,866,750
Dart & Kraft, Inc.	48,000	2,215,320	2,436,000
Deltona Corporation	70,000	1,060,395	612,500
Eastman Kodak Company	38,500	1,824,092	2,738,313
Exxon Corporation	136,600	1,940,272	4,268,750
Federated Department Stores, Inc.	57,000	1,687,075	2,052,000
First National Boston Corporation	21,800	628,712	994,625
FMC Corporation	48,000	1,391,719	1,230,000
General Electric Company	57,700	2,683,525	3,310,538
General Motors Corporation	1,000,000	41,677,643	38,500,000
General Telephone & Electronics Corporation	143,000	3,862,524	4,576,000
Gulf Oil Corporation	86,000	3,545,347	3,042,250
Gulfstream Land and Development Corporation	70,000	1,310,218	1,032,500
Honeywell, Inc.	19,000	1,435,895	1,327,625
International Business Machines Corporation	182,000	5,168,112	10,351,250
K mart Corporation	76,000	1,660,519	1,197,000
Lilly (Eli) & Company	29,000	1,503,605	1,624,000
Lincoln National Corporation	48,000	1,952,565	1,950,000
LTV Corporation	114,000	2,410,976	1,866,750
Manufacturers Hanover Corporation	48,000	1,555,143	1,710,000
McDermott, Inc.	60,000	2,423,743	2,280,000
Middle South Utilities, Inc.	114,000	1,455,330	1,439,250
Morgan (J.P.) & Company Inc.	70,000	1,310,880	3,762,500
Nabisco Brands, Inc.	72,800	1,561,230	2,265,900
Natomas Corporation	53,000	781,949	1,272,000
NCNB Corporation	114,000	1,482,193	1,695,750
Northwest Airlines, Inc.	67,000	1,720,350	1,809,000
Owens-Corning Fiberglas Corporation	50,000	1,301,721	1,125,000
Pacific Gas & Electric Company	95,000	2,065,482	1,995,000
Penney (J.C.) Company	84,400	4,192,188	2,415,950
Phillips Petroleum Company	27,000	1,088,424	1,093,500
Punta Gorda Isles, Inc.	30,000	$ 403,755	$ 270,000
RCA Corporation	143,000	3,685,345	2,609,750
Schlumberger Limited	51,675	356,755	2,887,341
Sears, Roebuck & Company	97,610	1,558,709	1,573,961
Software A.G. International, Inc.	10,000	147,500	130,000
Southeast Banking Corporation	73,760	1,503,304	1,355,340
Square D Company	67,000	1,403,466	1,934,625
Sterling Drug Inc.	105,000	2,020,839	2,336,250
Syntex Corporation	57,000	3,332,156	3,512,625
Texaco Inc.	57,000	1,974,117	1,881,000
Travelers Corporation	66,000	2,624,697	2,895,750
UAL, Inc.	95,000	2,000,510	1,567,500
Upjohn Company	38,000	1,834,504	2,042,500
Whirlpool Corporation	95,000	1,655,299	2,410,625
Xerox Corporation	43,000	2,327,539	1,741,500
Foreign:			
Alps Electric Company Limited	15,000	95,730	94,247
Fujitsu Company Limited	30,000	98,934	99,027
Nippon Shinpan Company Limited	20,000	91,610	89,238
Sanyo Shokai Limited	13,000	28,182	24,681
Sumitomo Electric Industries Limited	40,000	107,996	106,175
Total common stocks		150,225,217	159,546,211
Total fixed income securities		96,276,475	92,228,508
Total marketable securities		$246,501,692	$251,774,719

Schedule of Grants and Appropriations

	Authorized But Not Due Dec. 31, 1980	1981 Authorized	1981 Payments	Authorized But Not Due Dec. 31, 1981
American Council on Education	$ 55,000		$ 55,000	
American Economic Association		$ 200,000	100,000	$ 100,000
American Enterprise Institute for Public Policy Research		340,000	190,000	150,000
American Institute of Physics		20,000	20,000	
Arizona, University of	10,000	20,000	20,000	10,000
Association of Environmental and Resource Economists		7,000	7,000	
Association for Media-Based Continuing Education for Engineers	256,000		80,000	176,000
Boston College	10,000		10,000	
Brandeis University	10,000	48,395	38,395	20,000
British Columbia, University of		20,000	10,000	10,000
Brookings Institution	250,000	730,000	655,000	325,000
Brooklyn College	64,000		32,000	32,000
Brown University	410,000	12,500	197,500	225,000
Budget and Credit Counseling Service, Inc.		10,000	10,000	
California, University of	1,097,000	1,013,000	1,134,000	976,000
California Institute of Technology	210,000	20,000	120,000	110,000
Capital Children's Museum		20,000	20,000	
Carleton College	226,000		113,000	113,000
Carnegie-Mellon University	583,000	335,000	419,000	499,000
Case Western Reserve University		20,000	20,000	
Center for Advanced Study in the Behavioral Sciences		100,000	50,000	50,000
Chicago, University of	515,000	340,463	420,463	435,000
Clarkson College		23,000	23,000	
Cognitive Neuroscience Institute		20,000	20,000	
Cold Spring Harbor Laboratory	50,000		30,000	20,000
Colorado, University of		20,000	10,000	10,000
Columbia University	50,000	40,000	30,000	60,000
Committee for Economic Development	250,000		125,000	125,000
Community Service Society of New York		150,000	50,000	100,000
Cornell University	625,000	100,000	355,000	370,000
Council on Foundations, Inc.		20,000	20,000	
Council on Library Resources	240,000		120,000	120,000
Dartmouth College	20,000	220,000	130,000	110,000
Duke University		351,500	151,500	200,000
Earlham College		20,000	20,000	
Eastern Massachusetts Urban League, Inc.	100,000		50,000	50,000
Education Writers Association		20,000	20,000	
Educational Foundation for Nuclear Science		12,000	12,000	
Emory University	10,000		10,000	

	Authorized But Not Due Dec. 31, 1980	1981 Authorized	1981 Payments	Authorized But Not Due Dec. 31, 1981
Five Colleges, Inc.		$ 78,000	$ 45,000	$ 33,000
Florida Agricultural and Mechanical University		100,000	50,000	50,000
Foundation Center		120,000	60,000	60,000
Hampton Institute		100,000	50,000	50,000
Harvard University	$ 947,000	848,000	756,000	1,039,000
Harvey Mudd College		20,000	20,000	
Haverford College		100,000	50,000	50,000
Houston, University of	10,000		10,000	
Hudson Institute	75,000		75,000	
Illinois, University of	40,000	130,000	105,000	65,000
Illinois Institute of Technology		20,000	10,000	10,000
Indiana University Foundation	20,000	40,000	40,000	20,000
Institute for Advanced Study		150,000	75,000	75,000
Iowa State University of Science and Technology		20,000	10,000	10,000
Johns Hopkins University	10,000	29,335	29,335	10,000
Kansas, University of	10,000		10,000	
Kentucky, University of, Research Foundation	10,000		10,000	
Lawrence University		174,000	87,000	87,000
Lesley College		7,500	7,500	
Lincoln University		70,000	70,000	
London School of Economics and Political Science	100,000	20,000	120,000	
Maryland, University of	295,000	354,013	241,513	407,500
Massachusetts, University of	390,000	20,000	185,000	225,000
Massachusetts Institute of Technology	650,000	2,091,207	456,207	2,285,000
McLean Hospital Corporation	10,000	(10,000)		
Meharry Medical College	180,000		60,000	120,000
Michigan, University of	370,000	929,000	359,000	940,000
Michigan State University	10,000	20,000	20,000	10,000
Minnesota, University of	170,000	120,000	185,000	105,000
Missouri, University of		19,937	19,937	
Montana, University of, Foundation	25,000		25,000	
Museum of Science, Boston, Massachusetts	70,000		70,000	
National Academy of Sciences		95,000	95,000	
National Affairs, Inc.		15,000	15,000	
National Bureau of Economic Research, Inc.	100,000	121,000	221,000	
National Fund for Minority Engineering Students	150,000		150,000	
National Planning Association		16,000	16,000	
New School for Social Research		100,000	16,000	84,000
New York City School Volunteer Program, Inc.		20,000	20,000	

Schedule of

(Continued)

	Authorized But Not Due Dec. 31, 1980	1981 Authorized	1981 Payments	Authorized But Not Due Dec. 31, 1981
New York Community Trust		$ 15,000	$ 15,000	
New York University	$ 260,000	33,000	163,000	$ 130,000
North Carolina, University of	85,000	20,000	80,000	25,000
Northeastern University	10,000		10,000	
Northwestern University	342,500	20,000	267,500	95,000
Notre Dame, University of		60,000	30,000	30,000
Oberlin College	87,500	19,000	106,500	
Ohio State University		47,200	27,200	20,000
Ontario Institute for Studies in Education	150,000		50,000	100,000
Oregon, University of		20,000	10,000	10,000
Oregon State University	10,000		10,000	
Palace of Arts and Science Foundation		5,000	5,000	
Pennsylvania, University of	385,000	60,000	305,000	140,000
Pennsylvania State University	20,000	40,000	50,000	10,000
Pittsburgh, University of		20,000	10,000	10,000
Planetary Society		10,000	10,000	
Polytechnic Institute of New York		20,000	10,000	10,000
Princeton University	220,000	60,000	175,000	105,000
Princeton University Press		120,000	75,000	45,000
Rand Corporation	138,000		68,000	70,000
Rensselaer Polytechnic Institute	300,000		150,000	150,000
Research Foundation of the City University of New York		14,531	14,531	
Research Foundation of the State University of New York	180,000	276,000	416,000	40,000
Research Libraries Group, Inc.		100,000	100,000	
Resources for the Future, Inc.	238,500	50,000	106,750	181,750
Rice University	10,000		10,000	
Rochester, University of	10,000	560,000	90,000	480,000
Rockefeller University		20,000	10,000	10,000
Russell Sage Foundation	250,000		100,000	150,000
Rutgers University Foundation		220,000	210,000	10,000
Salk Institute for Biological Studies		20,000	20,000	
Scientists' Institute for Public Information		200,000	100,000	100,000
SIAM Institute for Mathematics and Society	200,000		55,000	145,000
Smith College		240,000	30,000	210,000
Society for Neuroscience		2,500	2,500	
Society for Risk Analysis		20,000	20,000	
Southern California, University of	30,000		30,000	
Southern Methodist University		17,000	17,000	
Stanford University	724,000		457,000	267,000
Swarthmore College	50,000		50,000	
Syracuse University		220,000	75,000	145,000
Texas, University of	211,000	100,000	250,000	61,000

Grants and Appropriations

	Authorized But Not Due Dec. 31, 1980	1981 Authorized	1981 Payments	Authorized But Not Due Dec. 31, 1981
Texas A & M University	$ 10,000	$ 40,000	$ 30,000	$ 20,000
Tulane University	230,000	7,000	122,000	115,000
United Negro College Fund		20,000	20,000	
United Way of Tri-State		3,000	3,000	
Urban Academy for Management, Inc.		250,000	125,000	125,000
Urban Institute		174,950	174,950	
Utah, University of	10,000	20,000	20,000	10,000
Vanderbilt University	10,000	280,000	280,000	10,000
Vermont, University of, and State Agricultural College		10,617	10,617	
Volunteer Urban Consulting Group, Inc.	80,000		40,000	40,000
Warwick, University of, General Fund		12,000	12,000	
Washington, University of	190,000	442,500	547,500	85,000
Washington University	10,000	250,000	90,000	170,000
Washington State University	20,000		20,000	
Wayne State University		20,000	10,000	10,000
Wellesley College		19,000	19,000	
Wesleyan University		20,000	10,000	10,000
Williams College		129,000	64,500	64,500
Wisconsin, University of		80,000	40,000	40,000
Yale University	450,000	430,000	455,000	425,000
Sloan Fellowships for Basic Research to be granted in ensuing year	1,760,000	440,000		2,200,000
Officer grant appropriations for grants in ensuing year	850,000			850,000
Book Program	544,085		151,525	392,560
Other appropriations for grants and related expenses	83,554	135,878	135,470	83,962
	16,842,139	15,604,026	14,913,893	17,532,272
Reduction for grant transfers		61,892	61,892	
	$16,842,139	$15,542,134	$14,852,001	$17,532,272

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Alfred P. Sloan Foundation

Founded in 1934 by Alfred P. Sloan, Jr. (1875–1966)

Report for 1982

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President's Statement

Cuts in the Federal Budget for nondefense activities have had an impact on most private foundations in the past two years. The Sloan Foundation has been most affected by cuts in Federal expenditures for research in economics and related social sciences. The National Science Foundation budget for Social and Economic Science was cut from $31 million in Fiscal Year 1980 to $18 million in 1982. Even larger cuts were proposed by the Administration but restored by the Congress. Federal expenditures on research in the natural sciences and technology, in contrast, have not been reduced. The Administration proposed a 15 percent increase in the National Science Foundation budget for Science and Engineering Research from Fiscal 1981 to Fiscal 1982.

The architects of the Federal Budget cuts have expressed the hope that private donors would help to fill the gap the cuts have left. In one sense, the Foundation has filled part of this gap. In 1981 and 1982, it made grants to five grantees that were requested to replace funds previously furnished by the National Science Foundation or by the Department of Health and Human Services. The 1981 grants were to the Institute for Social Research of the University of Michigan to help continue the Panel Study on Income Dynamics, and to the Brookings Institution to continue the Brookings Panel on Economic Activity. The Panel Study on Income Dynamics is also receiving support from the Ford Foundation and the Rockefeller Foundation. The 1982 grants were to the Center for Advanced Study in the Behavioral Sciences for fellowships in the areas of the Foundation's interests, to the University of Rochester for continuation of the Carnegie-Rochester seminars in monetary economics, and to the Institute for Research on Poverty of the University of Wisconsin for studies of income distribution. The total amount of the grants to these five grantees was approximately $1.7 million, or slightly more than 5 percent of the total grants authorized by the Foundation during these two years.

There may be additional grants made in 1983 because of cuts in Federal research expenditures. Some proposals that result from these cuts have not yet been acted on.

The number of requests received as a result of the Federal Budget cuts has been far larger than the number funded. In selecting from among these the few that received grants, we have tried to select projects of high demonstrated value with able leadership, and those where termination or interruption would cause the greatest harm. We have avoided large new projects undertaken by organizations whose Federal funding had been reduced if a principal unstated

purpose of the project seemed to be simply to preserve the organization or its staff.

The case against the interruption of a program was most compelling for the Panel Study on Income Dynamics. This study has fifteen years of continuous data on the same 5,000 families, which are a unique source of data on changes in employment, income, consumption, and household composition through time. Interruption of data collection for a year or more would destroy the continuity of the series so that the whole panel would have to be started over from square one.

Although the Foundation has helped to rescue some projects which it judges to be well worth continuing, it has not increased its total grantmaking in economics and related social sciences as a result of the Federal Budget cuts. This obviously implies that for every dollar we spent to preserve a continuing activity, we spent a dollar less in helping some promising new activity get started. For the five grantees listed above, we helped to fill the gap, but in the aggregate we did not fill the gap at all. What we did seemed to us to be the proper response to a temporary period of adversity. In the long run, however, such a policy could have disastrous consequences. The small resources at the disposal of the Foundation must in general be used to help new projects and programs that have not yet proved their worth. As a source of support for well-established continuing activities, however valuable, the Foundation is simply too small to make a difference.

The grants to the Panel Study on Income Dynamics represent the first time that the Foundation has supported data collection on a large scale, and may well be the last. In the division of labor in the social sciences between data acquisition and analysis, it makes sense for the Federal government to be the sole sponsor of the former, and the private foundations to concentrate on the latter. Large-scale data collection is in general beyond the means of private donors, but tends to be value free and hence noncontroversial. Analysis of social and economic data, in contrast, involves value judgments that may at times subject Federal funding agencies to political risks. These risks are not present in anything like the same degree for private foundations.

Large-scale data collection organizations such as the Institute for Social Research at Michigan and the National Opinion Research Center at Chicago provide for the social sciences the same kind of common property resource furnished to ground-based astronomers by such major observatories as Mount Palomar or to high-energy physicists by large particle accelerators. Such facilities, or the observations they generate, are made available to qualified researchers at many institutions because the facilities are too costly for any one institution to support from its own resources and too valuable for one institution to monopolize. For this reason, the funding of large data bases should be a high priority of Federal support of social science.

Apart from saving the taxpayers some money, the greatest value of Federal Budget cuts for social science research is that they have united the social science community and made it think carefully about how to state its case. The social sciences appear to have been singled out by budget cutters because they are perceived both as radical and as imprecise. I know of no evidence that leading research scholars in the social sciences are more radical than their counterparts among natural scientists — surely both groups run the gamut of political views — but in the social sciences a researcher's views may be more likely to affect the conclusions of the research. Social scientists may also be more likely to take policy positions based on their research findings. In addition, the social sciences, except for psychology, are unlike the natural sciences because they can make little use of true experiments. Indeed, only meteorology among the natural sciences shares with economics both the inability to rely heavily on experimental methods and the obvious incorrectness of many of its forecasts.

Because the issues addressed by the social sciences are of vital importance to public policy, the United States cannot afford to abandon this area of research or to conduct it on a sharply reduced scale. But social scientists, who lose support when they appear contentious or use sloppy methods, will win allies if they increase their emphasis on the careful testing of theories against reliable data. Although the phenomena studied by economics or sociology will never display the regularity of those studied by chemistry and physics, the social sciences can nevertheless use scientific methods. There are major obstacles to the development of tested knowledge in these areas but they can be overcome. The Foundation will continue to assist in overcoming them by supporting work that meets high standards of rigor and objectivity.

During 1982, the Foundation lost three distinguished Trustees. John A. Perkins died on April 6, having been a Trustee for fourteen years. Richard C. Gerstenberg retired in June as Chairman of the Board of Trustees, and Laurance S. Rockefeller retired in June as a Trustee. Mr. Gerstenberg had served as a Trustee since 1974 and as Chairman since 1975. Mr. Rockefeller had served since 1950, longer than any other Trustee in the Foundation's history, including its founder. All three will be deeply missed.

I should like to express a special word of appreciation to Mr. Gerstenberg for the splendid way in which he carried out his duties as Chairman. He presided over our Board meetings with great restraint and skill. He was always available to the staff when we had problems, yet he understood thoroughly the differing roles of staff and Trustees in a large foundation. My only regret is that my association with him was so brief.

President

Policies and Procedures

The Alfred P. Sloan Foundation was established in 1934 by Alfred P. Sloan, Jr., and incorporated in the state of Delaware. Mr. Sloan, who for many years was the chief executive officer of General Motors Corporation, was active in the affairs of the Foundation until his death in 1966. Information about the Foundation's assets and disbursements appears in the last section of this report.

The Foundation's main interests are in science, technology, economics, management, and education for the public service; and in instructional programs, and problems of society, related to those interests. The Foundation's activities do not extend to primary or secondary education or to religion, the creative or performing arts, or medical research. Nor do they extend to the humanities except in the particular way described on pages 8-14. Grants are not made for endowments or for buildings or equipment, and are very rarely made for general support or for activities outside the United States.

Application can be made at any time for support of activities falling within the above guidelines. Grants of $20,000 or less are made throughout the year by the officers of the Foundation, and may be made up to $30,000 for projects with high travel costs; grants over that amount are made by the Trustees, who meet five times a year for that purpose. Letters of application are normally sent to the President of the Foundation and include, in addition to a discussion of the work the applicant proposes to do, information about the applicant himself, the cost and duration of the work, and in the case of new applicants the tax status of the organization that would administer the grant unless it is a recognized institution of higher education. The Foundation has no deadlines or application forms. Often a brief letter of inquiry, rather than a fully developed proposal, is an advisable first step for an applicant, conserving his time and allowing the Foundation to give the applicant a preliminary response as to the possibility of support.

The Foundation's funds are spent in two ways: on programs and activities developed by the Foundation's staff and for which grants are made, usually on a competitive basis, in support of individuals and institutions; and in response to proposals that come unsolicited to the Foundation and that are also judged competitively. In considering both types of proposals, the Foundation often seeks the advice of outside reviewers. The Foundation unfortunately is obliged to turn down many more proposals, sometimes proposals of great merit, than its resources will allow it to support.

General and Particular Programs

In 1969 the Foundation adopted a new mode of operation that distinguished between the "general program," under which the established interests of the Foundation were pursued, and a set of "particular programs," which focused on more sharply defined topics for limited periods of time. Four particular programs were developed and carried to completion between 1969 and 1979: one to increase the number of minority students in medicine and management; one to support experimental work in educational technology; one to help establish the new discipline of neuroscience; and one to increase the number of minority students in engineering. Total expenditures in each of these programs came to between nine and 14 million dollars over a period of five to seven years.

Inflation has reduced the value of the Foundation's grant dollar by more than half since the concept of particular programs was adopted; and the original plan, which called for three particular programs to operate concurrently, has had to be modified. It now appears likely that the Foundation can sustain only two such programs at a time. The fifth particular program, in cognitive science, has been in operation since 1977 and is discussed later in this report. The sixth particular program, called the New Liberal Arts Program, began in 1982 and is also discussed below.

Grants and Activities in 1982

The New Liberal Arts Program

In the Foundation's annual report for 1981, the President's Statement foreshadowed the start of a new "particular program" at the Foundation to be called the New Liberal Arts Program. That program began as planned in 1982 and is likely to operate, as have other particular programs, for six or seven years at a level of about $2.5 million a year.

A long planning period preceded the launching of the New Liberal Arts Program during which the staff of the Foundation explored questions of need, acceptability, feasibility, and strategy in many conferences and in many private discussions with faculty members and administrators. We needed to test as thoroughly as possible the main assumption of the program: that anything called a liberal education today should include a substantial exposure to quantitative reasoning; that it should include, in particular, experience in the application of mathematics to topics and problems as they might be encountered in many courses and many disciplines; and that it should also include some kind of study of technology and the technological process that plays so central a role in modern life.

Our explorations demonstrated clearly that the majority of educators accepted this assumption. Dissenting voices were also heard, sometimes speaking eloquently of the dangers of technologizing or vocationalizing the undergraduate curriculum; but the great majority of individuals with whom we discussed this potential program readily grasped the notion that applied mathematics and technology are, or ought to be, as essential to a liberal education in the last years of the twentieth century as history or literature or music or art.

We made the job of starting the New Liberal Arts Program a little more difficult than it might otherwise have been by our decision to restrict the program to the nation's leading independent liberal arts colleges, at least for the first two years. It is on these campuses that humanistic traditions are strongest, that pure mathematics is dominant, and that technology, in most places, is non-existent. But it is also on these campuses that teaching is emphasized and rewarded, and it is from these campuses that come the students who move in disproportionate numbers into our best graduate schools and who later in life are found in positions of leadership in both public and private life.

Our explorations also persuaded us that, receptive as the colleges might be to the aims of the New Liberal Arts Program, they would need a period of planning themselves if they were to take part in the program. They would want to assess the needs and attitudes of their own faculties and determine how they could best meet the challenge of the New Liberal Arts Program in their own way and in their own academic environment. Accordingly, in March 1982 the

Foundation wrote the presidents of the 30 leading liberal arts colleges of the country, as determined by their SAT scores, inviting them to accept a planning grant of $10,000 with which to prepare a proposal to Sloan for a major grant under the New Liberal Arts Program. Our letter made it clear that this was an invitation to a competition in which the Foundation anticipated being able to support about a third of the submissions. All 30 colleges accepted our invitation and conducted planning projects over the summer; and all submitted their proposals to the Foundation by the September deadline (30 planning grants of $10,000 each were made but 33 proposals were received, three colleges having been admitted to the competition for special reasons.)

These proposals were carefully reviewed by the staff of the Foundation with the help of an outside advisory committee consisting of the following persons:

Elting E. Morison, Professor Emeritus, Massachusetts Institute of Technology, chairman of the committee

Peter Caws, University Professor of Philosophy, George Washington University

John G. Kemeny, Professor of Mathematics, Dartmouth College

William Kessen, Eugene Higgins Professor of Psychology, Yale University

John G. Truxal, Distinguished Teaching Professor of Engineering and Applied Science, State University of New York, Stony Brook

The general quality of the proposals, as judged by the advisory committee and the Foundation's staff, was gratifyingly high. The colleges demonstrated a firm grasp of the purposes of the New Liberal Arts Program and had promising plans for advancing those purposes. Faculty development through summer workshops and other means was high on almost everybody's list, as was the development of new courses and the revision of many existing courses. Technology was a difficult problem, as we supposed it would be, for most of the colleges: finding ways to introduce into the curriculum, on campuses without an engineering faculty and no experience in the matter, the serious study of technology and the technological process was no easy task.

Nor was our own task at all easy of judging these proposals one against another. Distinctions were often hard to make and the distance between winners and losers was frequently short. In the end, the Foundation decided, given the overall high quality of the proposals, to make two groups of grants: Large grants

for the 10 best proposals, and smaller ones for the others. Grants of $250,000 each were therefore made in 1982 to the following colleges; all were for a three-year period except Carleton (two years) and Wellesley (five years):

Carleton College
Northfield, Minnesota 55057
(Project directors: Paul S. Jorgensen, Associate Dean of the College; and Peter W. Stanley, Dean.)

Davidson College
Davidson, North Carolina 28036
(Project director: J. Nicholas Burnett, Associate Dean of the Faculty; and Maxwell Chambers, Professor of Chemistry.)

Grinnell College
Grinnell, Iowa 50112
(Project director: Charles Jepsen, Department of Mathematics.)

Lafayette College
Easton, Pennsylvania 18042
(Project directors: Charles Best, Head, Department of Engineering Science; Ralph Slaght, Head, Department of Philosophy; and James Vitelli, Head, Department of English.)

Mount Holyoke College
South Hadley, Massachusetts 01075
(Project director: Paul Dobosh, Department of Chemistry.)

Oberlin College
Oberlin, Ohio 44074
(Project director: David Love, Associate Provost.)

Union College
Schenectady, New York 12308
(Project director: Alan D. Taylor, Department of Mathematics.)

Vassar College
Poughkeepsie, New York 12601
(Project director: Patricia Johnson, Professor of Biology.)

Wellesley College
Wellesley, Massachusetts 02181
(Project directors: Martin Brody, Department of Music; Maud H. Chaplin, Dean of the College; and Alan Shochat, Chairman, Department of Mathematics.)

Williams College
Williamstown, Massachusetts 01267
(Project director: Neil Grabois, Chairman, Department of Mathematics.)

Grants of $25,000 each were made to the rest of the colleges that had earlier received planning grants under the New Liberal Arts Program. These were "discretionary" grants to be used over one year at the discretion of the president of the college for activities to which he gave the highest priority in the institution's proposal. The following colleges received grants of $25,000 each in 1982:

Amherst College
Amherst, Massachusetts 01002 (President: Julian H. Gibbs.)

Bates College
Lewiston, Maine 04240 (President: Thomas H. Reynolds.)

Bowdoin College
Brunswick, Maine 04011 (President: A. Leroy Greason.)

Bryn Mawr College
Bryn Mawr, Pennsylvania 19010 (President: Mary P. McPherson.)

Bucknell University
Lewisburg, Pennsylvania 17837 (President: G. Dennis O'Brien.)

Claremont McKenna College
Claremont, California 91711 (President: Jack L. Stark.)

Colby College
Waterville, Maine 04901 (President: William R. Cotter.)

Colgate University
Hamilton, New York 13346 (President: George D. Langdon, Jr.)

Connecticut College
New London, Connecticut 06320 (President: Oakes Ames.)

Dartmouth College
Hanover, New Hampshire 03755 (President: David T. McLaughlin.)

Franklin and Marshall College
Lancaster, Pennsylvania 17604 (President: Keith Spalding.)

Hamilton College
Clinton, New York 13323 (President: J. Martin Carovano.)

Haverford College
Haverford, Pennsylvania 19041 (President: Robert B. Stevens.)

Middlebury College
Middlebury, Vermont 05753 (President: Olin C. Robison.)

Pomona College
Claremont, California 91711 (President: David Alexander.)

Reed College
Portland, Oregon 97202 (President: Paul E. Bragdon.)

Saint John's College
Annapolis, Maryland 21404 (President: Edwin J. Delattre.)

Smith College
Northampton, Massachusetts 01063 (President: Jill K. Conway.)

Swarthmore College
Swarthmore, Pennsylvania 19081 (President: David W. Fraser.)

Trinity College
Hartford, Connecticut 06106 (President: James F. English, Jr.)

Wesleyan University
Middletown, Connecticut 06457 (President: Colin G. Campbell.)

These discretionary grants will help the colleges exploit the valuable planning process through which they went and make at least a start on the "new liberal arts." The Foundation hopes to maintain a long-term relationship with all the colleges that took part in this first phase of the New Liberal Arts Program and expects to be of continuing assistance to them. We hope to mold all of them into a network for regular communication with one another, for the exchange of courses and teaching materials, possibly for the exchange of faculty members,

for the convening of meetings and conferences, and for many other purposes.

These were unusually large expenditures for the first year of a program at Sloan, reflecting in this instance the lengthy planning that preceded the formal start of the program. Yearly expenditures will be lower in the future, but we hope and believe that 1982 marked the beginning of a program that in time will exert a wide influence in higher education.

Two other grants were made by the Foundation's Trustees in 1982 in the New Liberal Arts Program:

Dartmouth College **$69,000**
Hanover, New Hampshire 03755 (over two years)

The introduction at Dartmouth 25 years ago of a course in finite mathematics taught by John Kemeny was a notable development. It was the first attempt to teach modern mathematical concepts at the elementary college level to non-science students. The mathematical content of such a course is as relevant today as it was 25 years ago, and particularly relevant to the New Liberal Arts Program; but it is, as Professor Kemeny puts it, "a crime to teach such a course today without the use of the computer. The subject matter is ideal for the introduction of computer programming and for use of the computer to enrich the course by allowing students to solve interesting (rather than 'text-book') problems." This grant will allow Professor Kemeny together with Thomas Kurtz and J. Laurie Snell to develop a series of units on computer programming and applications of computers for use with Professor Kemeny's textbook on finite mathematics and also for possible use with the many other textbooks that followed his and have similar mathematical content.

Massachusetts Institute of Technology **$47,000**
Cambridge, Massachusetts 02139 (over one year)

Because faculty development lies at the center of the New Liberal Arts Program, the Foundation hopes to stimulate cooperative arrangements between the colleges taking part in the program and universities with facilities and faculty expertise, especially in technology, that are lacking at the colleges. It is not clear how these arrangements can best be developed, but the Foundation believes that one important means of bringing the two groups into a fruitful collaboration might be summer workshops on university campuses for faculty members from the colleges. This grant is supporting a seminar organized by M.I.T. that will move from campus to campus in New England for the first six or seven months of 1983. The seminar will have a permanent core of faculty members from universities in the Boston area and from some of the colleges in the New Liberal Arts Program, and will have other, short-term participants as it moves from site

to site. Out of these extended discussions between university and college faculty members will come, we expect, a plan for long-term collaboration between the two groups to advance the "new liberal arts" on all the compuses involved. (Project directors: Margaret L. A. MacVicar, Department of Physics, M.I.T.; and Leon Trilling, Department of Aeronautics and Astronautics, M.I.T.)

These, then, were the activities that inaugurated Sloan's new particular program in 1982: $300,000 for planning grants to 30 colleges; $2,500,000 for major grants to 10 colleges; $525,000 for discretionary grants to 21 colleges; $69,000 to Dartmouth; and $47,000 to M.I.T.—a total of $3,441,000. In addition an internal appropriation of $15,000 was made in January of 1982, and one of $19,500 in May of 1982, for conferences conducted by the Foundation and focused on the New Liberal Arts Program.

The Cognitive Science Program

The Foundation's "particular program" in cognitive science, having been in operation for the last seven years, moved well into its third and final phase in 1982. Our purpose in this program is to support basic research in a new and highly interdisciplinary field that embraces psychology, neuroscience, linguistics, computer science, philosophy, and anthropology. Research in this intensely interesting field seeks to improve man's understanding of his own mental makeup. It is concerned with the complex, little understood processes by which human beings reason, remember, acquire language, solve problems, make decisions, and take actions on the basis of information the brain receives from the sensory organs.

The Cognitive Science Program began in 1977 with grants to researchers in disciplines that at the time were only loosely related, if at all. Sloan's support went to help such researchers begin to work together and to develop some understanding of the concepts and methods of one another's disciplines. From these activities many new lines of research emerged. The Cognitive Science Program entered its second phase in 1979 with major grants to institutions, most of which had also been supported in phase one, to establish interdisciplinary postdoctoral training programs. The third and final phase of our program began in 1981, overlapping with phase two, and is expected to extend through the 1987-88 academic year. Grants in phase three are concentrated on institutional development; that is, they help establish at each institution an identifiable, self-sustaining center, institute, or department where a continuing program of research and training in cognitive science will be carried on after Sloan support comes to an end.

To ensure the orderly development of phase three, the Foundation's Board of Trustees took the unusual step in 1981 of identifying those institutions to which grants were expected to be made throughout the final phase of the program, and of committing the Foundation to these grants, totaling $10 million, in the future as proposals are perfected and individually approved. The first grants in phase three, totaling $2.5 million, were made in 1981 and were reviewed in last year's annual report. By the time the final grants are made in the Cognitive Science Program, the Foundation will have invested $20 million in this new field, making the program the largest of Sloan's "particular programs" by a considerable margin.

An outside advisory committee of the following persons assists the Foundation in all aspects of the Cognitive Science Program:

Robert Q. Marston, President, University of Florida, chairman of the committee

Theodore H. Bullock, Department of Neurosciences, University of California, San Diego

Jerome A. Feldman, Department of Computer Science, University of Rochester

William Kessen, Department of Psychology, Yale University

William A. Nierenberg, Director, Scripps Institution of Oceanography

Sherwood Washburn, Department of Anthropology, University of California, Berkeley

Trustee Grants in Cognitive Science

Carnegie-Mellon University **$500,000**
Pittsburgh, Pennsylvania 15213 (over three years)

Under the leadership of Herbert Simon, Carnegie-Mellon University was one of the first to engage in a major program of research on problems now aggregated under the name of cognitive science. The University's program is broadly based, involving the departments of mathematics, computer science, psychology, architecture, English, social studies, and electrical engineering, as well as the Graduate School of Industrial Management. Although work in cognitive science is usually basic research, the Carnegie-Mellon group is particularly alert to potential applications. Its research program is concerned with five lines of investigation: study of complex processes such as problem-solving, speech recognition, language acquisition, and automatic design; computer simulation as a tool for developing and testing theories; artificial intelligence blended with cognitive psychology; human language and its interaction with memory; and applications of information processing in such fields as cognitive development in children and problem-solving in science. (Project director: Herbert A. Simon, University Professor.)

Cognitive Neuroscience Institute **$500,000**
515 East 71st Street (over three years)
New York, New York 10021

Cornell University Medical College started a program in cognitive science in 1977 with the help of a small grant from Sloan. Since that time the program,

with further Sloan grants in 1978 and 1980, has assumed a leadership position in research and teaching focused on brain mechanisms involved in cognitive processes. It is only at this Institute that cognitive scientists have the advantage of studying large patient populations with well-specified brain disorders. An understanding of the effects of these disorders on cognitive functions yields important insights into normal cognitive capacities. The Cornell program rapidly outgrew its institutional bounds; it has now become a consortium of universities in the New York City area and is known as the Cognitive Neuroscience Institute. Other institutions in the consortium are the City University of New York, Columbia University, the New School for Social Research, Princeton University, and Rockefeller University. (Project director: Michael S. Gazzaniga, President of the Cognitive Neuroscience Institute.)

University of Pennsylvania **$500,000**
Philadelphia, Pennsylvania 19104 (over two years)

Cognitive science at the University of Pennsylvania became formalized with the help of a small Sloan grant in 1977 and was firmly established with a second grant in 1980. The University has become known in the cognitive science field as a principal center for the study of language learning, language processing, semantic theory and conceptual development. Research at Penn is concerned particularly with such aspects of language learning as environmental effects, effects of mental states, language deficits and "creolization" (the formalization of pidgin language). Also emphasized are studies in perception and space and motion. Representation of space, for example, in human adults, in animals and in normal and blind children, is investigated, and researchers attempt to answer such questions as which aspects of spatial environment are preserved in memory. (Project directors: Lila Gleitman, Department of Psychology; and Aravind K. Joshi, Department of Computer and Information Science.)

University of Texas, Austin **$500,000**
Austin, Texas 78712 (over three years)

The recipient of Sloan grants in cognitive science in 1977 and 1979, the University of Texas has now established a Center for Cognitive Science and is known widely in the field for its work in linguistic and semantic theory. Its research is concentrated in two areas. One deals with reading as bodily function and is concerned in particular with the precise measurement of eye movement and the control of visual display contingent upon eye movement. The second area is concerned with the integration of formal semantics with linguistic theory; it is concerned, for example, with the fact that comprehension of a language involves not only word recognition but also the integration of words into a syntactic structure and

involves the semantic interpretation of that structure. (Project directors: Philip B. Gough and Stanley Peters, Co-directors of the Center for Cognitive Science.)

One officer grant in cognitive science was made in 1982:

University of Michigan **$15,000**
Ann Arbor, Michigan 48109 (over one year)
Support for the 1982 meeting of the Cognitive Science Society. (Project director: Gary M. Olson, Department of Psychology.)

Sloan Research Fellowships

$2,200,000 over two years

Our program known as Sloan Research Fellowships entered its 27th year in 1982, making it by far the oldest program in the Foundation's history, although those who receive the grants are among the youngest scholars the Foundation assists. It has grown in size and cost over the years and now includes several disciplines not covered at the beginning (one of which did not exist in 1955); but the purpose remains the same: to stimulate fundamental research by young scholars of outstanding promise at a time in their careers when they work especially well at the frontiers of their disciplines and when government or other support is as yet difficult to obtain.

An evaluation of this program a few years ago by the staff of the Foundation, together with the kind of continuous but informal evaluation of it that comes to the Foundation in the normal course of our work, gives us a good deal of confidence in the Sloan Research Fellowships as well as satisfaction with the reputation the program enjoys in the academic field.

Awards are now made in six disciplines: physics, chemistry, neuroscience, economics, and pure and applied mathematics. The value of the awards was raised in 1982 from $20,000 to $25,000 and will normally be expended by the fellow over a two-year period. The awards are administered by the fellow's institution and are designed to permit him the greatest possible freedom and flexibility. The fellow does not need to pursue a specified research project and is free to shift the direction of his research at any time. The award may be used for technical assistance, equipment, summer support, professional travel, computer time, research assistants, or other purposes approved by the fellow's institution.

The 1982 awards bring the number of young researchers assisted by the Foundation since the beginning of the program to 1,818 at a cost of $36 million. Nine former Sloan fellows have become Nobel laureates; two others have received the National Science Board's Alan T. Waterman Award; and two have received the Fields Medal, the highest award in mathematics. (A leaflet entitled "Sloan Research Fellowships" describes this program in greater detail and is available on request from the Foundation.)

Candidates for Sloan Research Fellowships are nominated by senior scholars familiar with their work. For the 1982 competition, 400 nominations were received from which 88 awards were made to researchers at 53 institutions in the United States and Canada. Their average age was 31.

The Foundation is assisted in this program by an outside committee of senior scientists and economists that reviews all nominations. The committee in 1982 consisted of:

Chemistry
Ronald Breslow, Columbia University, chairman of the committee
Richard H. Holm, Harvard University
John S. Waugh, Massachusetts Institute of Technology

Economics
Richard Quandt, Princeton University
Michael Rothschild, University of Wisconsin
James Tobin, Yale University

Mathematics
S. S. Chern, University of California, Berkeley
Peter D. Lax, New York University
David Mumford, Harvard University

Neuroscience
Eric R. Kandel, Columbia University
Seymour S. Kety, Harvard Medical School
Eliot Stellar, University of Pennsylvania

Physics
William M. Fairbank, Stanford University
Malvin A. Ruderman, Columbia University
Kenneth G. Wilson, Cornell University

The following persons, listed by institution and field, received the 1982 awards:

Brown University
Mathematics: Joseph Harris

Bryn Mawr College
Physics: Neal B. Abraham

California Institute of Technology
Chemistry: Kenneth C. Janda
Mathematics: Brent P. Smith
Physics: Bradford H. Hager

University of California, Berkeley
Chemistry: John H. Clark
Neuroscience: John P. Miller

University of California, Davis
Chemistry: David A. Case

University of California, Irvine
Chemistry: William J. Evans
Neuroscience: Christine M. Gall

University of California, Los Angeles
Chemistry: Steven Clarke

University of California, Riverside
Chemistry: David F. Bocian

Carnegie Institution of Washington
Neuroscience: Richard L. Rotundo

Carnegie-Mellon University
Chemistry: David A. Tirrell
Economics: Lars Peter Hansen

Case Western Reserve University
Mathematics: Michael J. Katz

University of Chicago
Economics: Frederic S. Mishkin
Mathematics: Niels O. Nygaard
Physics: Daniel Friedan
Stephen H. Shenker

Colorado State University
Chemistry: Branka M. Ladanyi

University of Colorado
Chemistry: David M. Walba
Physics: Keith Burnett

Columbia University
Mathematics: Duong H. Phong
Neuroscience: Stephen M. Schuetze
Physics: Gary A. Chanan

Columbia University, College of Physicians and Surgeons
Neuroscience: Steven A. Siegelbaum

Cornell University
Chemistry: Lawrence Que, Jr.
Physics: Steven V. W. Beckwith

Emory University, School of Medicine
Neuroscience: Barbara B. Gould

Harvard University
Chemistry: N. John Cooper
Economics: Alan J. Auerbach
Neuroscience: Dale Corbett
Physics: Savas Dimopoulos
John P. Preskill

Harvard University, Harvard Medical School
Neuroscience: Kathleen J. Sweadner

University of Houston
Chemistry: Thomas A. Albright

University of Illinois
Physics: James E. Wiss

Indiana University
Chemistry: James P. Reilly
Neuroscience: Michael R. Petersen

Johns Hopkins University
Chemistry: Craig A. Townsend

Johns Hopkins University, School of Medicine
Neuroscience: Peter J. Whitehouse

Kansas State University
Neuroscience: Paul T. Kelly

University of Kentucky
Mathematics: Craig J. Benham
Robert R. Jensen

University of Maryland
Mathematics: Rebecca A. Herb

Massachusetts Institute of Technology
Chemistry: Mary F. Roberts
William R. Roush
Physics: Scott D. Tremaine

Medical College of Pennsylvania
Neuroscience: Pat R. Levitt

University of Minnesota
Chemistry: Matthew V. Tirrell

Ohio State University
Chemistry: Matthew S. Platz
Physics: Ciriyam Jayaprakash

University of Oregon
Chemistry: Paul C. Engelking
Richard G. Finke

Pennsylvania State University
Mathematics: David M. Bressoud
Physics: Don N. Page

University of Pittsburgh
Mathematics: Nicholas Hanges
Physics: George A. J. Sparling

Princeton University
Economics: Robert M. Anderson
Neuroscience: Ralph J. Greenspan
Physics: Bruce T. Draine

Purdue University
Chemistry: Michael J. Weaver
Mathematics: Craig Huneke

Rice University
Mathematics: Robert L. Bryant

Rockefeller University
Neuroscience: Thomas C. Rainbow

Rutgers University
Chemistry: Ronald M. Levy
Mathematics: David E. Rohrlich

Salk Institute for Biological Studies
Neuroscience: Richard A. Andersen

Simon Fraser University, Canada
Physics: Michael L. W. Thewalt

University of Southern California
Physics: Nai-Phuan Ong

Stanford University
Mathematics: Ralph L. Cohen
Peter Li
Physics: Brian D. Serot
Karl Van Bibber

State University of New York, Stony Brook
Physics: Sudip Chakravarty
James M. Lattimer

University of Tennessee
Mathematics: John J. Walsh

University of Texas, Austin
Chemistry: Peter J. Rossky

University of Utah
Mathematics: Ron Donagi
Domingo Toledo

University of Virginia
Mathematics: David C. Brydges

University of Washington
Physics: Larry D. McLerran

University of Wisconsin, Madison
Economics: John F. Geweke
Mathematics: David S. Griffeath

Yale University
Economics: John Geanakoplos
Physics: Ramamurti Shankar

Yeshiva University, Albert Einstein College of Medicine
Neuroscience: Rosemary D. Ginzberg

Science, Technology, and Mathematics

The Sloan Research Fellowships and the Cognitive Science Program (reviewed above) again constituted the Foundation's principal support of science in 1982, as they have for several years past. Other grants in science are reviewed in this section. In engineering and technology, the Foundation's activities were sharply limited in 1982. Research in engineering is a high-cost enterprise best supported by government, industry, and the universities themselves; and engineering education continues to be in robust health except for certain deficiencies that are serious and that extend to all engineering schools but do not lend themselves to remediation by private foundations. Technology plays a central role, of course, in our New Liberal Arts Program. A significant portion of the Foundation's grants in this program support experiments in the teaching of technology to liberal arts students, although such work is outside the mainstream of engineering research and engineering education.

We maintained our interest in applied mathematics and in the history and philosophy of science and technology in 1982, but made very few grants; more are anticipated in 1983. These limited disbursements were again augmented by the New Liberal Arts Program, which flows into many other areas of Sloan's activities: developmental work in the teaching of applied mathematics and in the history of technology is supported widely in grants made under the New Liberal Arts Program.

Trustee Grants in Science, Technology, and Mathematics

Brookings Institution — **$330,000**
1775 Massachusetts Avenue — (over one year)
Washington, D.C. 20036

A program supported by Sloan at Brookings and known as the Science Policy Fellowships moved into its second year in 1982. This program makes it possible for a small number of senior scientists and engineers to spend a year in Washington attached to a non-governmental organization where they take an active part in the process of policy formation at the national level. Three fellows, selected by a special advisory committee of scientists and engineers, were in residence the first year, representing the fields of physics, medicine, and genetics.

For the 1982-83 academic year, three other fellows are in residence: Robert P. Morgan, Professor of Engineering and Chairman of the Department of Technology and Human Affairs, Washington University, who is working on problems of science and development in the third world; Sandra Panem, Assistant Professor, Department of Pathology, and the Committee on Virology, University of Chicago, who is working on public policy issues as they relate to genetic engineering; and Rustum Roy, Professor of Geochemistry and Director of the Materials Research Laboratory, Pennsylvania State University, who is working on problems of industrial innovation, research and development, and the American economy. (Project director: Bruce K. MacLaury, President.)

Council on Library Resources — **$400,000**
1785 Massachusetts Avenue, N.W. — (over three years)
Washington, D.C. 20036

The Sloan Foundation has been a member for the last seven years of an informal consortium of foundations whose main interest has been the application of technology to research libraries. To help these libraries contain their costs, which are rising at a faster rate than inflation, and to improve their services to scholars, the consortium has supported several large-scale automation projects in recent years designed to benefit most if not all the nation's research libraries. Central to the success of these projects, and to many others in library technology as well, is the Council on Library Resources, the principal independent organization in the library field. CLR completed its 25th year in 1982 and observed the occasion by producing a five-year development plan for itself in which technology as it can be applied to libraries is an important element. This grant will meet about half the costs of the technology part of CLR's plan over the five-year period. (Project director: Warren J. Haas, President.)

Massachusetts Institute of Technology — **$250,000**
Cambridge, Massachusetts 02139 — (over two years)

The Sloan Foundation has been concerned for many years with ways of improving the public's understanding of the major fields in which the Foundation is active. One way of achieving this objective, a long-range way, is to improve instructional programs in those fields in colleges and universities; and we do a good deal of that. On occasion we attempt something aimed more directly at that portion of the body politic that has a serious and sustained interest in these fields. Television is frequently commended to us as the ideal instrument for that purpose, but for various reasons we have not seen our way to support the proposals we have received over the years for television projects that try to educate the public in economics, science, technology, or other fields. Educational

programs for journalists seem to us a more promising possibility. The Foundation supported a program in economics journalism from 1975 to 1980 conducted at Princeton University's Woodrow Wilson School of Public and International Affairs. Each year eight practicing journalists specializing in financial reporting were given an intensive year of advanced work in economics and finance designed especially for them.

Looking back on that successful experience, the Foundation helped start a program in 1982 at the Massachusetts Institute of Technology called the Vannevar Bush Fellowships. It is a program for journalists with experience in writing for a lay audience about technology, engineering, and the underlying science. The need for improvement in this journalistic field hardly needs discussion. M.I.T. hopes to attract up to 12 talented journalists a year and intends to make the program a permanent part of the institution. A year of technology-centered work tailored to the needs of working journalists will be provided together with many ancillary activities. This grant will help the program during its organizational phase and its first year of operation. (Project director: Victor McElheny, Program in Science, Technology and Society.)

National Academy of Sciences — **$359,000**
2101 Constitution Avenue — (over two years)
Washington, D.C. 20418

The federal government's support of basic research in American universities continues to generate a good deal of friction and heat. Both parties have complaints that can in all probability be moderated if not satisfied with a clearer delineation of the issues than seems to have been possible in the past. This grant will allow the National Academy of Sciences to conduct a study of the relationship between government and universities in the conduct of basic research. The study is being done by a distinguished panel drawn from universities, industry, and government; the chairman is Burke Marshall of the Yale Law School. (Project director: Micah N. Naftalin, Executive Director of NAS's Committee on Science, Engineering, and Public Policy.)

Recording for the Blind — **$100,000**
215 East 58th Street — (over three years)
New York, New York 10022

Since 1951, Recording for the Blind has been taping educational books of many kinds for blind students and researchers, done by volunteers who are competent in the subject at hand. RFB's master tape library now comes to 55,000 titles, to which are added about 400 more a month. Books in science pose special difficulties, requiring the volunteer scientist to find ways of portraying graphs, tables, equations, and diagrams for blind readers. With this grant, Recording for

the Blind will build a core collection in science that will anticipate student requests rather than merely respond to them, as has been the procedure in the past. (Project director: Stuart Carothers, Executive Director.)

Officer Grants in Science, Technology, and Mathematics

Association for Women in Mathematics — **$20,000**
Wellesley College — (over two years)
Wellesley, Massachusetts 02181
For a Speaker's Bureau that sponsors women mathematicians to appear at schools and colleges to discuss research and careers in the mathematical sciences. (Project director: Bhama Srinivasan, President of AWM.)

Association of American Colleges — **$20,000**
1818 R Street, N.W. — (over one year)
Washington, D.C. 20009
Partial support for a conference on the place of science and technology in the undergraduate liberal arts curriculum. (Project director: William R. O'Connell, Vice President.)

California Institute of Technology — **$20,000**
Pasadena, California 91125 — (over two years)
Partial support for a team of researchers, using data from the Voyager I and II spacecrafts, to study the rings of Saturn. (Project director: David J. Diner, Jet Propulsion Laboratory.)

California Institute of Technology — **$19,350**
Pasadena, California 91125 — (over one year)
Partial support for the research of Professor Daniel Kevles on the history of eugenics and human genetics.

Cold Spring Harbor Laboratory — **$20,000**
P.O. Box 100 — (over one year)
Cold Spring Harbor, New York 11724
Partial support for a summer workshop on "Molecular Approaches to the Nervous System." (Project director: James D. Watson, Director.)

Columbia University — **$4,950**
New York, New York 10027 — (over one year)
Partial support for a conference on the developmental biology of the nervous system. (Project director: Eduardo Macagno, Department of Biological Sciences.)

Harvard University — **$18,000**
Cambridge, Massachusetts 02138 — (over one year)
Partial support of the 1982 "New Horizons in Science Briefings," a program of the Council for the Advancement of Science Writers, to be held at the Harvard School of Public Health. (Project director: Howard H. Hiatt, Dean, School of Public Health.)

Population Reference Bureau, Inc. — **$19,500**
1337 Connecticut Avenue, N.W. — (over one year)
Washington, D.C. 20036
For work that will incorporate immigration into formal mathematically based demographic models. (Project director: Leon F. Bouvier.)

Princeton University — **$20,000**
Princeton, New Jersey 08540 — (over one year)
Partial support to meet the first year's costs of a faculty appointment for Bohdan Paczynski, an astronomer recently permitted to leave Poland. (Project director: Jeremiah P. Ostriker, Department of Astrophysics.)

Rene Dubos Center for Human Environments, Inc. — **$20,000**
249th Street and Independence Avenue — (over one year)
Bronx, New York 10471
Partial support for assembling and cataloguing a collection of books, articles, and other documents of Rene Dubos. (Project director: Jean Dubos.)

Research Foundation of the State University of New York — **$10,000**
P.O. Box 9 — (over one year)
Albany, New York 12201
Partial support for the planning phase of a project to develop a high school for engineering in Washington, D.C. (Project director: John G. Truxal, College of Engineering and Applied Science, State University of New York, Stony Brook.)

Salk Institute — **$20,000**
San Diego, California 92112 — (over one year)
For a scientific exchange program between the Salk Institute and the University Laboratory of Physiology, Oxford University. (Project director: Maxwell Cowan, Vice President.)

Stanford University — **$10,000**
Stanford, California 94305 — (over one year)
Partial support for a conference called "Near Zero: New Frontiers of Physics," held in honor of William M. Fairbank. (Project director: A.L. Schawlow, Department of Physics.)

University of California, San Diego — **$20,000**
La Jolla, California 92093 — (over one year)
Partial support for a preliminary study of ocean policy in the United States and other countries. (Project director: Richard Morse, Scripps Institution of Oceanography.)

University of Delaware — **$20,000**
Newark, Delaware 19711 — (over one year)
Partial support for the establishment of a physics center at Lewes, Delaware. (Project director: Arthur Halprin, Department of Physics.)

University of Michigan **$14,000**
Ann Arbor, Michigan 48109 (over one year)
Partial support for the development of a new program in the history and philosophy of science and technology. (Project director: Nicholas H. Steneck, Collegiate Institute for Values and Science.)

Yale University **$20,000**
New Haven, Connecticut 06520 (over one year)
Partial support of a research project on the frontal lobe functions of the rhesus monkey. (Project director: Patricia Goldman-Rakic, Professor of Neuroscience.)

Economics and Management

The Foundation's interest in economics research continued in 1982, but our activity was comparatively limited. Sloan's program in applied microeconomics research, which has been reviewed in detail in past annual reports, was in the middle of its second five-year period in 1982. The twelve grants made in 1980 and 1981 were still in operation last year, and no additional grants in this program were made. Some proposals for renewal grants are due for consideration in 1983.

In the management field, our grants in 1982 were again concentrated in "public" management, as a part of our program in education for the public service, which is reviewed later in this report.

Trustee Grants in Economics and Management

Columbia University **$150,000**
New York, New York 10027 (over one year)

One of the principal areas of research at a Columbia University institute called Conservation of Human Resources is in the competition for jobs between native-born and immigrant workers. The methods used for exploring this question are statistical analysis and field studies, including interviews with employers; and concentration on particular industries that employ large numbers of immigrant workers, such as the restaurant industry. This grant will meet part of the costs that Conservation of Human Resources will incur in extending its study to the garment and the hotel and motel industries. (Project director: Eli Ginzberg, Director.)

National Bureau of Economic Research, Inc. **$450,000**
1050 Massachusetts Avenue (over three years)
Cambridge, Massachusetts 02138

Perhaps the most important challenge facing American industry is learning how to function effectively in the international economic environment that has developed over the last 15 years. The technological lead and the productivity of the American labor force that the country enjoyed for many years after World War II, and that made overseas expansion possible for American companies, has been steadily eroded. The advance of European and Asian economies has brought an end to the unique position occupied for so long by the United States in the world economy.

"Comparative advantage" is a term economists use to describe the specialization through which some countries produce certain goods and services at lower costs than others. Countries and industries also differ in speed and character of productivity growth and technological advance. These differences create pressures for new patterns of production and trade. If resources can be quickly shifted among industries, changes in production can be readily accomplished and comparative advantage pressed; but in reality firms have heavy investments in plant, equipment, and in individuals with skills that are specific to a product or industry. Rapid change is difficult. To improve our understanding of comparative advantage and its many ramifications, the National Bureau of Economic Research began a research project in 1982 that is expected to last four years at a cost of $2.4 million. Sloan's grant is a contribution to this large-scale study. (Project director: Eli Shapiro, President.)

Resources for the Future **$160,000**
1755 Massachusetts Avenue, N.W. (over three years)
Washington, D.C. 20036

Mineral production in the United States relies heavily on exploration. Many questions have been raised in recent years regarding the falling rate of success in exploration and changes in exploration targets. Resources for the Future and the Department of Mineral Economics at Pennsylvania State University, with the help of this grant, are jointly conducting a research project on the economics of mineral exploration. They are investigating changes in the level and distribution of the exploration effort, by geographic area and type of deposit, and changes in the productivity of exploration. The product of the study will be a book for both policy-makers and the public that will identify the important issues, summarize the findings of case studies, compare these findings with the conventional wisdom on exploration, and examine policy implications for this field. (Project director: Hans L. Landsberg.)

Russell Sage Foundation **$163,000**
112 East 64th Street (over two years)
New York, New York 10021

The Foundation made a grant of $250,000 in 1980 to the Russell Sage Foundation to help that organization start, in collaboration with the Social Science Research Council, the 1980 Census Monograph Series. The series produces studies based on census data covering a broad range of social and economic matters. Our grant was a modest contribution to a very large budget. Since that time, the budget has been reduced but the project expanded. Eighteen monographs are now

planned on such topics as housing, women, migration, aging, and neighborhoods. This supplementary grant will meet the cost of two monographs: "Work in the American Economy," by Professor Glen Cain of the University of Wisconsin, and "Living Standards and the Income Distribution," by Professor Frank Levy of the University of Maryland. (Project director: Marshall Robinson, President of the Russell Sage Foundation.)

University of Illinois, Urbana-Champaign **$75,000**
Champaign, Illinois 61820 (over two years)

Economists have done relatively little work on the economic effects of immigration, a surprising fact in light of the obvious importance of this subject for public policy. Professor Julian Simon will use this grant to produce two books on the subject, one a technical work for professional economists and a shorter one for a more general readership. (He has previously produced such a combination on population growth and resources.) The immigration books will deal with such topics as the effects of immigrants on the income of native-born workers through transfer payments to, and taxes paid by, the immigrants; effects of immigrants on productivity through increased demand, learning by doing, and the supply of new ideas; and the effects of immigrants on the utilization of human capital by native-born workers.

University of Rochester **$243,000**
Rochester, New York 14627 (over two years)

Since 1973 the University of Rochester and Carnegie-Mellon University have jointly sponsored two conferences a year to analyze monetary and macroeconomic policy issues. These meetings are attended by about 40 economists whose papers and discussions are published in serial form by North-Holland Publishing Company and distributed to individual subscribers to the *Journal of Monetary Economics*. The meetings have three purposes: to develop the implications of recent research policy; to encourage economists with different points of view to moderate their differences; and to analyze the analysis used by institutions that set public policies. The conferences help to narrow the gap between economics research and public policy and in the process heighten the awareness of academic and government economists of the influences under which each group works. This project has been supported in recent years by NSF and is one of the few cut off from that source of support that Sloan has been able to rescue. This grant will support the conference series through 1983. (Project directors: Karl Brunner, Department of Economics, University of Rochester; and Allan Meltzer, Department of Economics, Carnegie-Mellon University.)

University of Wisconsin **$187,000**
Madison, Wisconsin 53706 (over two years)

One of the puzzles of recent economic history is the fact that the number of people living in poverty has sharply declined as a result of transfer payments but that income distribution as a whole has not changed. This implies that the earnings of people at the bottom of the income distribution have fallen as transfer payments have risen. With this grant, the University of Wisconsin's Institute for Research on Poverty is pursuing a three-part program of research on income inequality: one part deals with the effect of education on income inequality; one deals with the effects of demographic change, particularly that of the baby boom generation that recently entered the labor force; and one deals with the effect of macroeconomic conditions such as inflation and unemployment. (Project director: Eugene Smolensky, Director, Institute for Research on Poverty.)

Officer Grants in Economics and Management

American Assembly **$20,000**
Columbia University (over one year)
New York, New York 10027
Partial support for a project entitled "The American Economy in Transition," the product of which will be a collection of papers to be made into a book. (Project director: G. William Miller.)

American Productivity Center **$20,000**
123 North Post Oak Lane (over one year)
Houston, Texas 77024
Partial support for the 1982 edition of the Multiple Input Productivity Index. (Project director: Carl G. Thor, Vice President.)

Boston University **$30,000**
Boston, Massachusetts 02215 (over one year)
Partial support for an Anglo-American Conference on the decline of the British Economy, with emphasis on the influence of labor market institutions on industrial change. (Project director: Bernard Elbaum, Department of Economics.)

Brookings Institution **$4,000**
1775 Massachusetts Avenue, N.W. (over one year)
Washington, D.C. 20036
Partial support for special aspects of a study entitled "Prices and Incomes Policies in the United States." (Project director: Joseph A. Pechman.)

Conference Board **$20,000**
845 Third Avenue (over one year)
New York, New York 10022
For a conference on the relation between budget deficits and the performance of the American economy. (Project director: Albert T. Sommers.)

Massachusetts Institute of Technology **$12,000**
Cambridge, Massachusetts 02139 (over one year)
Partial support for publication of a volume of selected essays by the late Arthur Okun, to be published by the M.I.T. Press. (Project director: Joseph A. Pechman, The Brookings Institution, 1775 Massachusetts Avenue, N.W., Washington, D.C. 20036.)

Michigan State University **$13,000**
East Lansing, Michigan 48824 (over one year)
For research on certain issues in the macroeconomics of labor-market adjustment. (Project director: Daniel S. Hamermesh, Department of Economics.)

National Opinion Research Center **$20,000**
6030 South Ellis (over one year)
Chicago, Illinois 60637
For a week-long summer workshop for researchers on longitudinal data analysis, emphasizing modern statistical theory and computer programs. (Project director: Robert T. Michael, Director of the Economics Research Center at NORC.)

New York University **$10,000**
70 Washington Square South (over one year)
New York, New York 10012
Partial support for a planning project concerned with the development of public and industry policy for the microelectronics industry. (Project director: Herbert I. Fusfeld, Director, Center for Science and Technology Policy.)

Research Foundation of the City University of New York **$17,750**
(over one year)
1515 Broadway
New York, New York 10036
Partial support for preliminary work on a six-volume edition of the papers of Albert Gallatin. (Project director: Barbara Oberg, Center for the Study of Business and Government, Baruch College.)

Tuskegee Institute **$20,000**
Tuskegee, Alabama 36088 (over one year)
To meet planning costs for a new school of management that will specialize in training personnel for industries that process and distribute agricultural products. (Project director: James Hefner, Provost.)

University of Maryland Foundation, Inc. **$20,000**
Adelphi, Maryland 20783 (over one year)
Partial support for a series of conferences on macroeconomic policy. (Project director: Albert Bowker, School of Public Affairs.)

University of Minnesota **$20,000**
Minneapolis, Minnesota 55455 (over one year)
For a study during its Chicago years, 1944-1954, of the Cowles Commission, which helped establish the basis of modern quantitative economics. (Project director: Clifford Hildreth, Department of Economics.)

Work in America Institute, Inc. **$19,350**
700 White Plains Road (over one year)
Scarsdale, New York 10583
For a conference entitled "The Management of Collectively Bargained Pension Funds." (Project director: Jerome M. Rosow, President.)

Education and Research in Public Policy

The Foundation has been active in the public policy field in a substantial way since 1976. In 1981 we began to turn our attention to two particular needs: building a base of scholarly research under this still emerging but well-established academic field; and increasing the number of minority students entering the field. In 1982 we continued both lines of activity. We also continued our support of instructional programs in public policy but mostly for renewal support of programs the Foundation helped establish in past years; we do not anticipate financing new instructional programs in this field in the near future.

We regard the minorities part of our program in public policy as another element in Sloan's support of minorities that goes back to 1969. Sloan has had an organized program for preparing minorities for professional careers since that time in several fields of interest to the Foundation, and our present activity in public policy is our principal program in that tradition. We also supported other minority projects on an *ad hoc* basis in 1982, and they are reviewed in appropriate places elsewhere in this report.

The Foundation was again assisted in 1982 in its public policy program by the Association for Public Policy Analysis and Management (APPAM), an organization made up of leading institutions and individuals in the field of education for the public service.

Trustee Grants for Minority Students in Public Policy
$1,364,000

Six APPAM Post-Junior Year Summer Institutes **$504,000**
(over one year)

Two APPAM Post-Senior Year Summer Institutes **$266,000**
(over one year)

In 1982 the Foundation provided its third year of support for the program developed by APPAM for increasing the number of minority students in high-quality graduate schools of public policy. APPAM's ultimate objective is, of course, to increase the number of minorities in important public policy careers, especially in state and local government. To facilitate the movement of promising students into graduate programs, APPAM provides them with extra academic

support and counseling while they are undergraduates. This support comes mainly through an intensive eight-week summer residential institute where instruction is concentrated in economics, applied mathematics, and communications skills. The student attends the institute between his junior and senior years, and may attend another, higher-level institute in the summer after his undergraduate degree and before enrolling in an APPAM graduate school. Again in 1982, the Foundation supported, as we did in 1981, six post-junior year institutes, each at $84,000, at the following APPAM schools:

Carnegie-Mellon University
Pittsburgh, Pennsylvania 15213
(Project director: Brian J.L. Berry,
Dean of the School of Urban and Public Affairs.)

Research Foundation of the State University of New York
P.O. Box 9
Albany, New York 12201
(Project location: The State University of New York, Stony Brook; project director: Thomas Sexton, W. Averell Harriman College for Urban and Policy Sciences.)

University of California, Berkeley
Berkeley, California 94720
(Project director: Allan P. Sindler,
Dean of the Graduate School of Public Policy.)

University of Minnesota
Minneapolis, Minnesota 55455
(Project director: John Brandl,
Hubert H. Humphrey Institute of Public Affairs.)

University of Texas, Austin
Austin, Texas 78712
(Project director: Susan Hadden,
Lyndon B. Johnson School of Public Affairs.)

University of Washington
Seattle, Washington 98195
(Project director: Jared Hazleton,
Dean of the Graduate School of Public Affairs.)

The post-senior institutes offered work in the same subjects as the post-junior year institutes: economics, applied mathematics, and communications skills, but at an advanced level. These institutes were conducted for selected students who had successfully completed one of the post-junior year institutes and had been accepted by an APPAM school for enrollment in a graduate program in the fall of 1982. The Foundation supported two post-senior year summer institutes in 1982, one for 45 students at Harvard at a cost of $196,000, and one at the Rand Corporation for 12 students at a cost of $70,000:

Harvard University
Cambridge, Massachusetts 02138
(Project director: Avis C. Vidal,
John F. Kennedy School of Government.)

Rand Corporation
1700 Main Street
Santa Monica, California 90406
(Project director: Charles Wolf, Jr.,
Dean of the Rand Graduate Institute.)

Graduate Fellowship Support for Minority Students

University of Texas, Austin — **$573,000**
Austin, Texas 78712 — (over one year)

For the second year, the Foundation provided fellowship support for a selected number of minority students entering graduate degree programs at APPAM schools. This year's grant, a sizeable increase over 1981, reflects APPAM's successful experience the first year. The fellowships provided under this program are for one year; students are then expected to finance their second year in the same manner as do other students. This grant, which is administered on behalf of APPAM by the University of Texas, will provide 52 first-year graduate fellowships at 14 APPAM schools. (Project director: Elspeth Rostow, Dean of the Lyndon B. Johnson School of Public Affairs.)

An internal appropriation of $21,000 was also approved by the Sloan Trustees in 1982 to meet the costs of a coordinating office at the Foundation concerned with the minorities program in public policy.

Other Trustee Grants in Public Policy

Boston University — **$100,000**
Boston, Massachusetts 02215 — (over two years)

The Foundation has provided $50,000 a year for the last three years for the development of case materials in public policy and public management. This work has been sponsored by the Public Policy and Management Program (PPMP), recently transferred from Harvard to Boston University. PPMP has pioneered in the promotion of the case method in education for the public service and now has well-developed procedures for producing cases and ensuring their quality. With this grant, PPMP will turn its attention more explicitly to the task of combining cases with other instructional materials so as to make an integrated curricular structure. (Project director: Colin S. Diver, Professor of Law.)

Harvard University — **$150,000**
Cambridge, Massachusetts 02138 — (over one year)

Over the last 10 years, the Harvard School of Public Health has become engaged in a number of new activities that reflect the changing needs and expectations arising out of modern medical science and modern technology. The School's capacities for conventional education in public health have been maintained, and to them have been added commensurate strengths in the social sciences and policy science. Both in education and in broadly based, interdisciplinary research and policy studies, the School has now assumed a preeminent position.

During most of 1981 and much of 1982, the senior staff of the School, together with much of the junior staff, engaged in a planning study of the American health care system in all its aspects. The system itself is enormous, consuming in medical care alone (not the whole of the system) 11 percent of the gross national product. The system is not well understood in general and the manner in which its many parts interact is not understood at all. The Harvard School of Public Health proposes nothing less than a comprehensive, highly interdisciplinary study of the entire system. It is expected to take between two and three years at a cost of $2 million. The Sloan grant is intended to get the project started and to keep together the research team that has been assembled while the School secures the remaining funds needed for the project. If the full budget is raised and the project successful, it will have far-reaching implications for public policy in a vital area of American life. (Project director: Howard H. Hiatt, Dean of the School of Public Health.)

Princeton University — **$300,000**
Princeton, New Jersey 08544 — (over three years)

Most of the grants the Foundation has made for undergraduate programs in public policy have supported the development of new "concentrations" of courses. This grant, which is intended to be the last of our undergraduate grants in this field, will support the expansion and modernization of the well-established and highly reputed program at the Woodrow Wilson School of Public and International Affairs. The heart of this program is the junior year policy workshop and the senior thesis, which in the past have been biased toward the social sciences. This grant will allow the school to develop policy workshops that deal with public policy problems in science and technology — areas of intense interest today to both students and faculty members. (Project director: Charles Berry, Associate Dean of the Woodrow Wilson School.)

Stanford University — **$260,000**
Stanford, California 94305 — (over three years)

The Foundation made a grant of $360,000 to Stanford in 1979 for the development of an undergraduate program in public policy studies. Five core courses were developed and offered in 1981-1982. Student evaluation of the courses has been extremely favorable and the university's own evaluation no less so. This renewal and final grant will support the continued development of the public policy program and is intended to put the program on a permanent financial footing. (Project director: Nathan Rosenberg, Department of Economics.)

Swarthmore College — **$135,000**
Swarthmore, Pennsylvania 19081 — (over three years)

This too is a renewal and final grant (our first grant was for $165,000 in 1977) in support of an undergraduate program in public policy studies. Swarthmore's approach to this field is not simply to teach policy analysis itself, but to consider policy studies as an element in a liberal education involving history, political science, and quantitative analytic techniques. New courses have been developed in such fields as health, defense, and social welfare, and coordinated with existing prerequisites in economics and political science; and an internship program has been established. This grant will support the further development of the undergraduate concentration and will help make it a permanent feature of the Swarthmore curriculum. (Project director: Richard Rubin, Director of the Program in Undergraduate Public Policy Studies.)

University of California, Berkeley **$300,000**
Berkeley, California 94720 (over three years)

This grant is the fourth in a series of grants the Foundation has made (the others having gone to Duke, Harvard, and the University of Michigan) to help develop the research capacities of leading graduate programs of public policy. Over the last 10 years, faculty members in these programs have had their hands full in developing a new, interdisciplinary curriculum. That curriculum is now stable and effective, and some of the faculty's time and energy must now be devoted to building a base of research upon which instructional programs can stand. Each school naturally exploits the strengths of its faculty. In Berkeley's case, the research emphasis will be on state agencies and their internal controls; on the ways in which state agencies adapt to a reduced rate of federal spending; on the implications of increasing judicial intervention in the operations of government; and on the procedures for transferring certain functions from the public to the private sector. (Project director: Allan P. Sindler, Dean of the Graduate School of Public Policy.)

University of Chicago **$250,000**
Chicago, Illinois 60637 (over two years)

In 1979 the Foundation provided start-up support with a grant of $250,000 for a new master's degree program in public policy at Chicago. That program is now well established and is distinguished from others by several features: it is based on the committee system that has been a successful organizing mechanism at the University for many years; it is focused on the analysis of public policy problems and does not concern itself exclusively with the preparation of students for public careers; and small seminars, led by senior faculty members, concentrate on current research in public policy. The present grant represents renewal and final support for this program. (Project director: Paul E. Peterson, Chairman of the Committee on Public Policy Studies.)

Officer Grants in Public Policy

Boston University **$25,000**
Boston, Massachusetts 02215 (over one year)
For the third annual editorial board conference of the Public Policy and Management Program and Case/Curriculum Development. (Project director: Colin S. Diver, School of Law.)

Cornell University **$20,000**
Ithaca, New York 14853 (over one year)
For a study of the feasibility of designing a training program for mid-career union leaders in the public sector, modeled on New York City's "Top Forty Program." (Project director: Lois S. Gray, Associate Dean of the New York State School of Industrial and Labor Relations Extension Division.)

Resources for the Future **$20,000**
1775 Massachusetts Avenue, N.W. (over one year)
Washington, D.C. 20036
Supplementary support for completion of a study of the effectiveness of public policy research in the field of energy. (Project director: Martin Greenberger.)

Other Grants and Activities

Reviewed below are grants and activities that in most cases are related to the main interests of the Foundation but for one reason or another stand apart from a specific program or from our support of work in particular academic fields.

Experiments in Video History

Our annual report for 1981 recorded an internal appropriation of $16,000 for what we were then calling "archival television." That activity, to which we have now given a new and, we think, more appropriate name, "video history," grew in 1982. We conducted a second experiment last year, financed by an internal appropriation of $30,000; and at year's end, had mapped plans for still another internally conducted project. Also in 1982, the Sloan Trustees approved a more ambitious experiment in video history than any of the other three, to be done outside the Foundation; it will be conducted at the Massachusetts Institute of Technology with a three-year grant of $150,000. (Project director: Ithiel de Sola Pool, Arthur and Ruth Sloan Professor of Political Science.) An assessment of the value of these projects will be made in 1983 and a further course charted.

Over most of its history, television technology, and what more recently is perhaps more aptly called video technology, has been directed almost entirely toward entertainment, even when it has had documentary intent. Some educational activity has taken place, but for the most part on budgets so low that the potentialities of the technology have necessarily been left unexplored.

The Foundation's initial venture in what could be called "serious" video was directed toward the creation of historical archives. The analogy with oral history comes at once to mind, but is misleading. Even beyond the immense advantages of video deriving from its sheer power to transmit information, it makes possible collective recollection and discussion of historical events as contrasted with the interviewer-interviewee mode of oral history, and generates as well all the stimulation that comes from discussion among peers.

The Foundation first tested the concept in more than six hours of taping at the Massachusetts Institute of Technology, with a dozen or so scientists, engineers and economists taking part, generally in groups of four or five. The subject was Project Charles, a study group organized in 1949-50 when it was learned that the Soviet Union had succeeded in detonating a "nuclear device" in August 1949. Project Charles led to the Lincoln Laboratory and the air defense technology that was brought into being during the 50's, and made recommendations for Civil Defense as well. Participants in this first attempt at "video history" included James R. Killian, Jerome Wiesner, Jerrold Zacharias, Paul

Samuelson, Carl Kaysen, Jay Forrester and others. Historian Elting Morison was moderator.

The result of that experiment, "quick and dirty" as first experiments generally are, was encouraging enough for the Foundation to undertake a second taping, this one dealing with the decision to accelerate the hydrogen bomb program announced by President Truman in January 1950 after considerable staff work in the Department of State, the Department of Defense and the Atomic Energy Commission. Again six hours of video-tape was created, this time at Princeton in June 1982, with most of those still active who had conducted the staff work. McGeorge Bundy was moderator.

The two experimental tapings were shared with historians and the generally positive reaction with which they were greeted was more than sufficient to encourage the Foundation to proceed. They were shared also with other college faculty, particularly at the Kennedy School of Government at Harvard, and the Foundation was advised that the material might be of great value in an educational setting where it would be used selectively by lecturers and seminar leaders explicitly as a resource and not as an "educational program," as video-tapes are generally used.

That response strongly affected planning for the third experiment, which will take place in Atlanta in late January of 1983. The archival purposes remain, but the moderator in this instance (Richard Neustadt) has devoted much time to anticipating educational uses which might be enhanced as the taping proceeds. The subject will be the Cuban Missile Crisis of 1962, and among those taking part will be Dean Rusk, Robert McNamara, George Ball, McGeorge Bundy, and four or five others. A more detailed report of this experiment will be forthcoming in our 1983 annual report.

Meanwhile, an even more ambitious undertaking, as was mentioned above, has begun at M.I.T. under the direction of Professor Ithiel de Sola Pool. Using the same technique of collective recollection and discussion, Professor Pool and his associates will lay down on video-tape a history of the development of the digital computer as it appears to those who presided over that development. Taping will be conducted over a period of many months at many sites, with many groups.

Something more should be said of the technique. The technology now permits taping to take place in the atmosphere of an ordinary living-room. Room-lighting is sufficient, lapel microphones are used, and there need be neither fuss nor feathers. (No one is made up; there is no "set design"; no stage director; no cueing or prompting.) The moderator, as the conversation proceeds, is facilitator rather than guide or goad. Four cameras are used, and experience has demonstrated that their presence is pretty much forgotten soon after the taping begins. All cameras run uninterruptedly, aside from the few moments when one or another of the four halts to reload.

Participants may require that passages be, quite literally, destroyed if they

wish them to be, or alternatively embargoed. As yet no such demand has been made. Aside from any such required deletions, the tapes themselves are retained in their entirety for the use of historians, and may be edited selectively for use in education.

Over-the-air use has not as yet been considered, and indeed the experiments already completed do not contain any large amount of material that would lend itself to conventional programming. But these are experiments, and nothing is ruled out. Needless to say, no broadcast use will ever be made without permission of participants.

Those of us at the Foundation who have played a part in this endeavor are greatly encouraged by what has been achieved. We believe that the Foundation has already done much to bring the employment of video technology to a kind of maturity that for far too long has seemed either distressingly remote and perhaps unattainable. The experiments which the Foundation hopes to conduct in 1983 will extend the range of subject matter and in all likelihood the range of utility of the product as well.

Additional grants for miscellaneous purposes are reviewed alphabetically below in two sections: grants made by the Board of Trustees of the Foundation and grants made by the officers of the Foundation.

Trustee Grants For Miscellaneous Purposes

Center for Advanced Study in the Behavioral Sciences — **$300,000**
202 Junipero Serra Boulevard — (over five years)
Stanford, California 94305

For the last quarter of a century, the Center for Advanced Study in the Behavioral Sciences has brought together scholars from the social sciences and related fields as fellows for a year of residence without teaching duties. This has proved to be a fruitful way of stimulating interdisciplinary research, as the record of publications by fellows richly demonstrates. With the help of this grant, the Center will include in the scholarly groups that are formed one or more individuals from the fields of economics, applied mathematics, statistics, and from cognitive science or neuroscience. Support for this program in the past has come from federal agencies. It has not been possible for the Foundation to assist the great majority of projects that have come to us and that were previously supported by the federal government, or that failed to gain support there in the first instance (see the President's Statement beginning on page 1); but we made a few exceptions in 1982, as we did in 1981, where we felt there was an exceptional case to be made. This grant is one such exception. (Project director: Gardner Lindzey, Director.)

Harvard University — **$100,000**
Cambridge, Massachusetts 02138 — (over one year)

$400,000
(over three years)

With these two grants, the Harvard Law School under its new dean, James Vorenberg, is conducting a comprehensive examination of the roles of lawyers in American life and of the institutions they operate. Law schools have traditionally concentrated on teaching and developing the doctrine of the law and the set of rules and understandings that regulate relationships among individuals and organizations and between these and the government. Law schools have also paid great attention to the proper roles of institutions (courts, legislatures, administrative agencies) and to the processes through which disputes are formally resolved. The role of lawyers in the United States, the needs that are met and unmet, the effect of "legalization" of relationships, and the failures of courts and related institutions have not been handled by law schools with either concentrated or sustained attention or a general integrating plan. As President Derek Bok puts it: "Legal regulations seem burdensome to the point that they conflict unduly with progress, productivity and initiative. The law is increasingly used as a tool to manipulate and bludgeon adversaries. Legal services are not available to all segments of the population, and the total cost of our system of enforcing rules and settling disputes appears more and more excessive."

It is to these complex and intertwining problems that the Harvard Law School will direct itself. Without denying the great contributions of law and lawyers to the country, Harvard intends to look hard at the criticisms, assess their validity, develop an understanding of the failures, and propose solutions. They regard this program as a full-scale appraisal of the legal profession and the legal education system.

The Foundation made two grants in 1982 in support of this project, one of $100,000 in February to get the program started, and one of $400,000 in October to see it through. (Project director: James Vorenberg, Dean, Harvard Law School.)

Harvard University **$100,000**
Cambridge, Massachusetts 02138 (over two years)

Scholarly attempts to integrate politics and economics in order to enrich our understanding of both have not been notably successful, important though the subject is. One of the most imaginative researchers in this subdiscipline is Douglas Hibbs, a political scientist teaching political economy and econometric/statistical modeling courses at Harvard. With this grant, he will undertake a two-year study of the interdependence of macroeconomic policy and unemployment and inflation; macroeconomic performance as it has been affected by unemployment and inflation; and electoral behavior. His purpose is to put these interdependencies, which involve public attitudes and reactions as well as electoral pressures, on the same rigorous footing as conventional economic analysis of macroeconomic issues.

Harvard University **$52,500**
Cambridge, Massachusetts 02138 (over two years)

This grant will provide half the support, the other half coming from the Russell Sage Foundation, to allow Thomas C. Schelling of the John F. Kennedy School of Government, to devote much of the next two years to a subject broader than his scholarly discipline but in which he has become deeply interested. In recent years he has given much study to the manner in which individuals exercise self-control and "self-management" and in particular the ways in which they, as he puts it, "protect themselves against appetite and impetuosity by attempting to constrain their future freedom of choice." Professor Schelling hopes to pursue conceptually and empirically the subject of self-management. He intends to concentrate on self-management with respect to smoking, including the effect of coercive constraints, private and governmental, which have the effect of supporting the task of self-management. He hopes also to link the concept of self-management to the more general concept of the "rational consumer, in order to look for a model of human decision-making that can allow for various aberrations from the idea of the consumer as a logic machine."

Meharry Medical College **$400,000**
Nashville, Tennessee 37208 (over three years)

This institution for many years has been the country's largest single educator of black physicians and dentists. Of the 355 black physicians on the faculty of U.S. medical schools, 46 percent are Meharry graduates; and of the black students enrolled in medical schools in the south, 43 percent attend Meharry. The great majority of Meharry students are trained for primary care practice; very few

enter medical research. Meharry has a much smaller research budget than other medical schools of similar size. This grant will help Meharry start a Medical Scholars Program to attract a larger share of the nation's best-qualified minority applicants and to increase the number of minority medical students interested in careers in academic medicine. The research area to be emphasized in this program is tropical medicine, particularly molecular parasitology, an area where further research is badly needed and one that has special appeal to minority students. (Project director: Richard G. Lester, President.)

Research Foundation of the City University of New York **$200,000**
1515 Broadway (over two years)
New York, New York 10036

Each year the Foundation makes a major "civic" grant and one or more smaller ones to institutions in New York City in recognition of the Foundation's obligations as a corporate citizen. This year's major grant went to LaGuardia Community College, a unit of the City University of New York that occupies a special place in the City's system of higher education. It is the only community college in the country to have a cooperative (work-study) program for all its students, who are nearly 80 percent black and 50 percent female. A two-year program of study at LaGuardia normally includes five quarters of full-time classroom work interspersed with three quarters of full-time internships at jobs of increasing responsibility in fields related to the student's major. The great majority of LaGuardia's graduates are hired by employers for whom they worked as students. New curriculum programs at the College usually require two years for research, planning, and development. This grant will enable the College to expand its relationships with business and industry and to develop new curricula in response to labor-market needs. (Project director: Joseph Shenker, President.)

Officer Grants for Miscellaneous Purposes

American Association of University Professors **$16,000**
One Dupont Circle (over one year)
Washington, D.C. 20036
For a conference to bring together representatives of the professional associations in higher education to address problems of financial retrenchment. (Project director: Irving J. Spitzberg, Jr., General Secretary.)

Association of American Colleges **$5,000**
1818 R Street, N.W. (over one year)
Washington, D.C. 20009
Partial support for the Association's fifth and final conference on the undergraduate curriculum. (Project director: William R. O'Connell, Jr., Vice President.)

Atlanta University **$20,000**
Atlanta, Georgia 30314 (over one year)
To allow a group of faculty members and administrators to spend part of the summer developing a five-year plan for the University. (Project director: Cleveland L. Dennard, President.)

Council on Foundations, Inc. **$20,000**
1828 L Street, N.W. (over one year)
Washington, D.C. 20036
This grant represents the annual dues of the Sloan Foundation for membership in the principal national association of private foundations. (Project director: Charles S. Rooks, Vice President.)

Earlham College **$20,000**
Richmond, Indiana 47374 (over one year)
Partial support for the further development of the DELPHI computer system and for associated activities. (Project director: Jerome H. Woolpy, Professor of Biology and Psychology.)

New School for Social Research **$20,000**
New York, New York 10011 (over one year)
Support for a presidential task force to evaluate the undergraduate curriculum of the New School and make recommendations for change. (Project director: Robert Heilbroner, Department of Economics.)

United Neighborhood Houses of New York, Inc. **$20,000**
101 East 15th Street (over one year)
New York, New York 10003
A civic grant in partial support of UNH's program to strengthen the financial base of settlement houses in New York City.

United Way of Tri-State **$3,000**
99 Park Avenue (over one year)
New York, New York 10015
A contribution made by the Foundation to the annual fund-raising campaign of United Way of Tri-State.

University of Houston **$19,600**
Houston, Texas 77004 (over one year)
Partial support for research on the political economy of telecommunications with emphasis on the effects of the now-settled American Telephone and Telegraph antitrust suit. (Project director: Alan Stone, Department of Political Science.)

Yale University **$20,000**
New Haven, Connecticut 06520 (over one year)
For a conference on Evolutionary Modeling and Metaphors in the Social Sciences, to be conducted by the Institution for Social and Policy Studies. (Project director: Richard R. Nelson, Director of ISPS.)

Sloan Book Program

The purpose of the Foundation's Book Program since its beginning in 1976 has been to enrich the public's understanding of science as a human and intellectual enterprise. The first two books in the Sloan series, *Disturbing the Universe*, by Freeman Dyson, and *Advice to a Young Scientist*, by Sir Peter Medawar, were received with gratifying acclaim by critics and the public and continue to sell well in hard cover and paperback.

Three additional books for the series were completed in 1982 and will be published in 1983: one by Jerome Bruner, psychologist, the New School for Social Research; one by Hendrick Casimir, physicist and later Managing Director of Phillips of Eindhoven; and one by Lewis Thomas, Chancellor of the Memorial Sloan-Kettering Cancer Center. A fourth book, by S. E. Huria, Nobel laureate and biologist, Massachusetts Institute of Technology, was brought close to completion during the year.

Other authors in the series whose manuscripts are in various stages of preparation are: Francis H. C. Crick, Nobel laureate and biologist, Salk Institute; Dorothy Hodgkin, Nobel laureate and chemical crystallographer, Oxford University; Maclyn McCarty, epidemiologist, Rockefeller University; Frederick Mosteller, statistician, Harvard University; John L. Rigden of the American Journal of Physics, who is working in collaboration with I. I. Rabi, Nobel laureate and physicist; and Gian-Carlo Rota, mathematician, and Victor Weisskopf, physicist—both of the Massachusetts Institute of Technology.

The Foundation is assisted in the Sloan Book Program by a committee of the following persons:

Robert L. Sinsheimer, Chancellor, University of California, Santa Cruz, chairman of the committee

Howard H. Hiatt, Dean, Harvard School of Public Health

Mark Kac, Professor of Mathematics, University of Southern California

Daniel Kevles, Professor of History, California Institute of Technology

Robert Merton, University Professor Emeritus and Special Service Professor, Columbia University

George A. Miller, Professor of Psychology, Princeton University

Edward L. Burlingame, Vice President and Publisher, Harper & Row

Presidential Selection Project

The Foundation's study of the system by which the country's Presidents are selected, first announced in our 1980 annual report, required no further financial support in 1982. This long-range study is being conducted by Alexander Heard, Chancellor Emeritus of Vanderbilt University, who is assisted from time to time by Kingman Brewster, former President of Yale University, and Joel Fleishman, Director of the Institute of Policy Sciences and Public Affairs at Duke University. The study progressed on schedule in 1982; one of its major activities was a week-long conference of political scientists, historians, and journalists at Montauk, Long Island, where the discussions focused on the role of the press, electronic and printed, in the selection process, on the primaries, on the problems of governance itself, and on many other issues at the center of this study.

Financial Review

Financial Review

The financial statements and schedules of the Foundation, which have been audited by Ernst & Whinney, independent certified public accountants, appear on pages 54 to 70. They include the balance sheets, the statements of income, expenses and changes in fund balance, the statements of changes in financial position, the schedule of administration and investment expenses, the schedule of investments and the schedule of grants and appropriations.

Investment and other income for 1982 was $20,521,861, a decrease of $87,376 from $20,609,237 in 1981. This slight decrease resulted largely from the general economic slowdown which prevailed during 1982 and declining interest rates.

After the deduction of investment expenses and provision for Federal excise tax from investment and other income, net investment income was $19,439,481 in 1982 as compared with $19,593,977 for the prior year. Investment expenses during 1982 totaled $645,380, of which $376,996 represented investment counsel fees. Provision for Federal excise tax amounted to $437,000. The total of these deductions from income in 1982 was $1,082,380 versus $1,015,260 in 1981.

The total of grants and appropriations authorized net of grant refunds and administration expenses during 1982 was $17,405,610. This sum was $2,033,871 under 1982 net investment income. Of this total, grants and appropriations authorized amounted to $16,066,952 while administration expenses were $1,374,016. Over the Foundation's forty-eight year history, the cumulative excess of grants and expenses over the Foundation's income has amounted to $49,713,337.

Grant and appropriation payments in 1982 were $16,720,475, compared with $14,852,001 the prior year. Together with 1982 administration expenses, investment expenses and Federal excise taxes paid, the total of cash expenditures net of grant refunds in 1982 was $19,220,347, while in 1981 the amount was $17,151,651.

The market value of the Foundation's total assets was $316,397,030 at December 31, 1982, including investments valued at $316,154,847, as compared with total assets of $253,385,427 at December 31, 1981. A summary of the Foundation's investments at cost and quoted market value at December 31, 1982 appears on pages 59 to 65. Changes in holdings and in market values have decreased the fixed income securities holdings in 1982 from 36.6 percent to 30.6 percent. The holdings of equity securities have correspondingly increased from 63.4 percent to 69.4 percent.

A listing of grants made during 1982 will be found on pages 66 to 70. Grants and appropriations authorized and payments during the year ended December 31, 1982 are summarized in the following table:

Grants and appropriations authorized but not due at January 1, 1982	$ 17,532,272
Authorized during 1982	16,066,952
	33,599,224
Payments during 1982	16,720,475
Grants and appropriations authorized but not due at December 31, 1982	$ 16,878,749

Report of Ernst & Whinney,
Independent Auditors

Board of Trustees
Alfred P. Sloan Foundation
New York, New York

We have examined the balance sheets of the Alfred P. Sloan Foundation as of December 31, 1982 and 1981 and the related statements of income, expenses and changes in fund balance and changes in financial position for the years then ended and the supplementary schedules of investments at December 31, 1982, and of administration and investment expenses and grants and appropriations for the years then ended. Our examinations were made in accordance with generally accepted auditing standards and, accordingly, included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the financial statements referred to above present fairly the financial position of the Alfred P. Sloan Foundation at December 31, 1982 and 1981, and the results of its operations and changes in its fund balance and financial position for the years then ended, in conformity with generally accepted accounting principles applied on a consistent basis. Also, in our opinion, the supplementary schedules referred to above are fairly stated in all material respects in relation to the financial statements taken as a whole.

Ernst & Whinney

New York, New York
January 26, 1983

Balance Sheets

December 31, 1982 and 1981

	1982	1981
Assets		
Investments:		
Fixed income securities:		
U.S. Government and agency obligations	$ 49,195,252	$ 40,826,507
Corporate and other	41,771,999	55,449,968
	90,967,251	96,276,475
Equity securities:		
General Motors Corporation	41,677,643	41,677,643
Other equities	119,221,818	108,547,574
	160,899,461	150,225,217
Total investments (quoted market: 1982 - - $316,154,847; 1981 - - $251,774,719)	251,866,712	246,501,692
Due for securities sold, not delivered - - net		1,292,036
Cash	242,183	318,672
Total	$252,108,895	$248,112,400
Liabilities and Fund Balance		
Grants and appropriations authorized but not due for payment	$ 16,878,749	$ 17,532,272
Accrued Federal excise tax and other liabilities	547,029	518,681
Fund balance	234,683,117	230,061,447
Total	$252,108,895	$248,112,400

See accompanying notes to financial statements.

Statements of Income, Expenses and Changes In Fund Balance

For the years ended December 31, 1982 and 1981

	1982	1981
Investment Income:		
Dividends	$ 10,180,395	$ 10,452,292
Interest	10,331,237	10,128,561
Other	10,229	28,384
	20,521,861	20,609,237
Less:		
Investment expenses	645,380	501,260
Provision for Federal excise tax	437,000	514,000
	1,082,380	1,015,260
Net investment income	19,439,481	19,593,977
Grants and administration expenses:		
Grants and appropriations authorized (net of grant refunds: 1982 - - $35,358; 1981 - - $42,623)	16,031,594	15,499,511
Administration expenses	1,374,016	1,381,238
Total	17,405,610	16,880,749
Grants and expenses under income for the year	2,033,871	2,713,228
Net gain on disposals of securities	2,255,324	6,831,058
Assets received as remainderman of various trusts	332,475	58,289
NET CHANGE IN FUND BALANCE FOR YEAR	4,621,670	9,602,575
Fund balance January 1	230,061,447	220,458,872
FUND BALANCE AT END OF YEAR	$234,683,117	$230,061,447

See accompanying notes to financial statements.

Statements of Changes in Financial Position

For the years ended December 31, 1982 and 1981

	1982	1981
SOURCE OF FUNDS		
Investment income	$20,521,861	$20,609,237
Net gain of disposals of securities	2,255,324	6,831,058
Other	439,657	58,289
	23,216,842	27,498,584
APPLICATION OF FUNDS		
Grant and appropriation payments (net of grant refunds: 1982 - - $35,358; 1981 - - $42,623)	16,685,117	14,809,378
Administration expenses	1,374,016	1,381,238
Investment expenses	645,380	501,260
Federal excise taxes paid	515,834	459,775
	19,220,347	17,151,651
(DECREASE) INCREASE IN FUNDS CONSISTING OF		
Cost of investments	5,365,020	8,890,005
Amount due for securities sold, not delivered - - net	(1,292,036)	1,292,036
Cash balances	(76,489)	164,892
NET INCREASE	$ 3,996,495	$10,346,933

See accompanying notes to financial statements.

Notes to Financial Statements

1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

The accompanying financial statements have been prepared substantially on the accrual basis of accounting and, accordingly, reflect all significant assets and liabilities. Investment income and investment and administration expenses are recorded on the cash basis, the effect of which on the accompanying financial statements is not materially different from the accrual basis.

Investments purchased are carried at cost; for those received by gift or bequest, cost is quoted market value at date of gift or bequest. Gain or loss on disposal of investments is determined generally on the basis of first-in, first-out cost, but in certain instances the identified lot basis is used. Net gain or loss on disposals is applied to the principal section of the fund balance.

Grant appropriations are accrued at the time authorized by the Trustees and Federal excise tax is accrued in the year to which it relates.

2. RETIREMENT PLAN

The Foundation has a defined contribution retirement plan covering substantially all employees under arrangements with Teachers Insurance and Annuity Association of America and College Retirement Equities Fund which provides for purchase of annuities for employees. Retirement plan expense was $116,650 and $115,745 for 1982 and 1981, respectively.

3. LEASE

The Foundation's lease for its office space expires April 30, 1985. The lease contains an escalation clause which provides for rental increases resulting from increases in real estate taxes and certain other operating expenses. Under the lease, rent was $281,973 in 1982 and $255,195 in 1981 before sublease income.

4. FUND BALANCE

Fund balance, at year end, is comprised of the following:

	1982	1981
Principal	$284,396,454	$281,808,655
Income - - cumulative excess of grants and expenses over income from inception of the Foundation	(49,713,337)	(51,747,208)
Fund balance	$234,683,117	$230,061,447

Schedule of Administration and Investment Expenses

For the years ended December 31, 1982 and 1981

	1982	1981
ADMINISTRATION EXPENSES		
Salaries and employee benefits:		
Salaries	$ 778,917	$ 718,760
Employees' retirement plan and other benefits	221,741	222,969
Total	1,000,658	941,729
Rent (net of sublease rentals of approximately $41,000 and $39,000, respectively)	243,561	218,835
Program expenses	208,782	190,272
Office expenses and services	128,983	110,958
Reports and publications	28,553	52,665
Professional fees	31,863	37,899
Total administration expenses	1,642,400	1,552,358
Less administration expenses applicable to investments	268,384	171,120
Administration expenses applicable to grant making	$1,374,016	$1,381,238
INVESTMENT EXPENSES		
Investment counsel fees	$ 376,996	$ 330,140
Administration expenses applicable to investments	268,384	171,120
Total investment expenses	$ 645,380	$ 501,260

Schedule of Investments

December 31, 1982

SUMMARY	Cost	Quoted Market Value: Amount	Quoted Market Value: Percent of Total Investment
Fixed income securities:			
U.S. Government and agency obligations	$ 49,195,252	$ 52,038,161	16.5%
Corporate and others	41,771,999	44,700,604	14.1
Total fixed income securities	90,967,251	96,738,765	30.6
Equity securities:			
General Motors Corporation	41,677,643	62,375,000	19.7
Other equities	119,221,818	157,041,082	49.7
Total equity securities	160,899,461	219,416,082	69.4
Total investments	$251,866,712	$316,154,847	100.0%

FIXED INCOME SECURITIES	Principal Amount	Cost	Quoted Market Value
U.S. Government and agency obligations:			
U.S. Treasury:			
Bills 3/17/83	$ 375,000	$ 358,555	$ 369,030
Bills 4/7/83	1,560,000	1,499,444	1,528,426
Bills 5/19/83	7,915,000	7,578,076	7,678,737
Bills 6/2/82	6,460,000	6,199,554	6,247,337
Bills 10/6/83	500,000	459,927	469,525
Bills 11/3/83	8,255,000	7,576,428	7,700,759
14⅛% Notes 6/30/83	1,000,000	995,000	1,028,750
15% Notes 1/31/84	2,500,000	2,496,905	2,648,425
15⅛% Notes 2/29/84	2,000,000	1,998,840	2,127,500
14⅛% Notes 2/15/85	2,000,000	1,976,250	2,186,240
14% Notes 6/30/85	1,000,000	954,844	1,091,870
13½% Notes 2/15/86	5,000,000	4,912,500	5,446,850
14% Notes 7/15/88	1,000,000	935,937	1,136,250
Federal Farm Credit Banks:			
9.20% Bonds 6/3/85	1,000,000	849,375	983,120
7¼% Bonds 9/5/89	1,000,000	732,750	880,000
Federal Home Loan Mortgage Corporation, Mortgage Participation:			
10¼% Certificates 9/1/2009	1,111,870	1,034,039	1,004,852
10¼% Certificates 10/1/2009	1,656,573	1,540,613	1,497,127

Schedule of Investments

December 31, 1982 (continued)

FIXED INCOME SECURITIES	Principal Amount	Cost	Quoted Market Value
U.S. Government and agency obligations (continued):			
Federal Intermediate Credit Banks 6.95% Bonds 1/5/87	$1,500,000	$ 1,120,339	$1,338,750
Federal Land Banks 8.20% Bonds 1/22/90	500,000	373,750	433,750
Federal National Mortgage Association:			
14¼% Debentures 3/11/85	2,000,000	1,981,250	2,163,740
8.20% Debentures 3/10/86	1,000,000	795,000	945,000
14.40% Debentures 2/10/88	2,000,000	1,965,000	2,245,000
Government National Mortgage Association 11% Modified Pass Through Certificate 1/15/2010	943,749	860,876	887,123
Total U.S. Government and agency obligations		49,195,252	52,038,161
Corporate and other:			
Short term:			
Interest bearing call account	3,560	3,560	3,560
Interest bearing demand notes:			
Atlantic Richfield Company	8,000	8,000	8,000
General Electric Company	559,000	559,000	559,000
General Motors Acceptance Corporation	1,964,000	1,964,000	1,964,000
Time deposit:			
Nippon Credit Bank, London 9.50% 1/7/83	46,284	46,284	46,284
Other:			
Household Finance Corporation 8½% Debentures 5/15/83	1,000,000	997,500	995,180
Total short term		3,578,344	3,576,024
Long term:			
Air Products and Chemicals, Inc. 14⅝% Notes 8/1/87	1,000,000	995,812	1,092,350
American Telephone and Telegraph Company 13¼% Notes 2/15/91	2,000,000	1,904,600	2,139,020

Schedule of Investments

December 31, 1982 (continued)

FIXED INCOME SECURITIES	Principal Amount	Cost	Quoted Market Value
Corporate and other (continued):			
Long term (continued):			
Chesapeake & Ohio Railway Company 8½% Conditional Sale Agreement 1/1/89	$ 641,472	$ 517,034	$ 588,551
C.I.T. Financial Corporation 13% Notes 10/15/85	3,000,000	3,002,167	3,030,960
E.I. du Pont de Nemours & Company:			
8% Notes 5/1/86	1,000,000	938,750	937,800
14% Notes 12/1/91	3,000,000	2,915,000	3,305,820
Exxon Finance N.V. 11% Notes 10/1/87	1,600,000	1,625,422	1,600,576
General Foods Corporation 7½% Notes 3/1/84	500,000	463,580	486,550
General Motors Acceptance Corporation			
12½% Notes 4/2/84	3,000,000	3,009,000	3,000,000
14⅜% Notes 6/15/89	2,000,000	1,956,180	2,169,880
Georgia-Pacific Corporation 7¾% Notes 1/15/85	2,000,000	1,793,750	1,879,980
International Bank for Reconstruction and Development 14⅜% Notes 12/15/86	3,000,000	2,932,500	3,286,440
International Business Machine Corporation 9½% Notes 10/1/86	1,000,000	947,500	977,130
Manufacturers Hanover Trust Company 8½% Capital Debentures 6/1/85	1,000,000	973,440	949,180
NCNB Corporation 14½% Notes 9/1/92	3,000,000	3,008,708	3,186,000
Province of Ontario, Canada 4¾% Debentures 2/1/84	1,000,000	851,300	950,230
SCOA Industries, Inc. 10% Convertible Subordinated Debentures 9/1/2007	1,000,000	1,238,278	1,320,000

Schedule of Investments

December 31, 1982 (continued)

FIXED INCOME SECURITIES	Principal	Cost	Quoted Market Value
Corporate and other (continued):			
Long term (continued):			
Security Pacific Corporation 8.80% Notes 12/15/85	$1,000,000	$ 1,000,000	$ 946,930
Service Merchandise, Inc. 11% Convertible Debentures 8/1/2002	500,000	501,681	795,000
Shoney's, Inc. 10% Convertible Subordinated Debentures 5/1/97	500,000	500,000	695,000
Standard Oil Company (Indiana) 14% Notes 6/1/91	3,000,000	2,989,080	3,329,310
Standard Oil Company (Ohio) 13⅛% Notes 9/15/92	3,000,000	2,982,365	3,186,870
Non U.S. Currency:			
Government of Netherlands: 10.25% Bonds 10/15/90	500,000 (florins)	182,497	219,493
10.25% Bonds 7/1/92	500,000 (florins)	185,542	219,684
State Electric Commission, Queensland (Australia) 17% Loan 10/1/92	400,000 (Aus.$)	391,380	432,023
United Kingdom Treasury 14.5% Loan 3/1/94	200,000 (pounds)	388,089	399,803
Total long term		38,193,655	41,124,580
Total corporate and other		41,771,999	44,700,604
Total fixed income securities		$90,967,251	$96,738,765

EQUITY SECURITIES	Number of Shares	Cost	Quoted Market Value
United States:			
American Hoist & Derrick Company	19,000	$ 362,140	$ 220,875
American Home Products Corporation	66,000	1,965,075	2,953,500
American Telephone and Telegraph Company	81,000	4,212,990	4,809,375
AMF Inc.	80,000	1,850,331	1,310,000
Associated Dry Goods Corporation	67,000	1,752,640	2,981,500
Atlantic Richfield Company	60,000	2,222,665	2,520,000
Avco Corporation	40,000	1,093,075	1,135,000
Avon Products, Inc.	57,000	2,987,010	1,524,750

Schedule of Investments

December 31, 1982 (continued)

EQUITY SECURITIES	Number of Shares	Cost	Quoted Market Value
United States: (continued):			
BankAmerica Corporation	96,200	$ 2,082,757	$ 1,936,025
Burlington Industries, Inc.	60,000	1,600,092	1,680,000
Chemical New York Corporation	55,000	1,651,521	2,227,500
Coca-Cola Company	60,000	2,203,807	3,120,000
Colgate-Palmolive Company	143,000	2,232,340	2,806,375
Continental Group, Inc.	57,000	1,680,959	1,938,000
Dart & Kraft, Inc.	48,000	2,215,320	3,288,000
Deltona Corporation	70,000	1,060,395	603,750
Dresser Industries, Inc.	58,000	1,405,978	1,145,500
Eastman Kodak Company	52,500	2,993,792	4,515,000
Electro-Biology, Inc.	20,000	675,000	665,000
Exxon Corporation	136,600	1,940,272	4,063,850
FMC Corporation	74,600	2,240,800	2,405,850
General Electric Company	57,700	2,683,526	5,474,288
General Motors Corporation	1,000,000	41,677,643	62,375,000
Genstar Corporation	91,600	1,323,823	1,499,950
GTE Corporation	143,000	3,862,524	5,934,500
Gulf Oil Corporation	86,000	3,545,346	2,558,500
Gulfstream Land and Development Corporation	70,000	1,310,218	1,680,000
International Business Machines Corporation	182,000	5,168,112	17,517,500
La Quinta Motor Inns, Inc.	15,000	233,700	270,000
Lincoln National Corporation	48,000	1,952,565	2,148,000
LTV Corporation	114,000	2,410,976	1,296,750
Manufacturers Hanover Corporation	48,000	1,555,143	1,998,000
McDermott, Inc.	8,120	238,631	166,460
McDermott International, Inc.	69,880	1,327,720	1,415,070
Middle South Utilities, Inc.	114,000	1,455,330	1,695,750
Mohasco Corporation	4,700	74,938	75,788
Morgan (J.P.) & Company Inc.	70,000	1,310,880	4,725,000
Nabisco Brands, Inc.	33,000	660,598	1,212,750
Natomas Company	106,000	1,816,747	1,722,500
NCNB Corporation	114,000	1,482,193	2,137,500
NL Industries, Inc.	58,000	1,499,975	1,065,750
Northwest Airlines, Inc.	67,000	1,720,350	3,149,000
Pacific Gas & Electric Company	95,000	2,065,482	2,671,875
Penney (J.C.) Company	84,400	4,192,188	4,082,850
Phillips Petroleum Company	81,000	2,576,934	2,642,625
Punta Gorda Isles, Inc.	30,000	403,755	300,000
Schlumberger, Ltd.	61,675	785,065	2,875,597
Sears, Roebuck & Company	97,610	1,558,709	2,940,501
Software A.G. Systems Group	10,000	147,500	105,000
Southern Pacific Company	50,000	1,778,260	1,812,500
Square D Company	67,000	1,403,466	2,294,750
Sterling Drug Inc.	105,000	2,020,839	2,362,500
Syntex Corporation	53,000	1,469,110	2,544,000

Schedule of Investments

December 31, 1982 (continued)

EQUITY SECURITIES	Number of Shares	Cost	Quoted Market Value
United States: (continued):			
Texaco Inc.	57,000	$ 1,974,117	$ 1,774,125
Textron, Inc.	62,400	1,659,589	1,482,000
Transamerica Corporation	112,600	2,429,406	2,632,025
Travelers Corporation	132,000	2,624,697	3,184,500
UAL, Inc.	95,000	2,000,510	3,158,750
Upjohn Company	38,000	1,834,504	1,762,250
White Consolidated Industries, Inc.	62,400	2,000,417	2,246,400
Xerox Corporation	43,000	2,327,539	1,607,125
Foreign:			
Australia:			
Australia and New Zealand Banking Group, Ltd.	25,000	85,413	88,192
Bougainville Copper, Ltd.	60,000	100,943	112,885
Carlton and United Breweries, Ltd.	50,000	100,426	97,994
Hardie (James) Industries, Ltd.	30,000	98,410	88,192
Mayne Nickless, Ltd., Ordinary A $.50	40,000	98,089	90,151
Santos, Ltd.	30,000	161,717	151,102
Foreign Republic of Germany:			
B.M.W. Bayerische Motorenwerke A.G.	1,700	137,463	162,704
Daimler-Benz A.G.	800	102,349	132,267
Deutsche Bank A.G. (warrants)	4,500	135,610	160,349
Hussel Holding, Ltd.	1,667	122,534	135,354
Linde A.G.	1,200	145,902	162,305
Mercedes-Automobil-Holding A.G.	1,150	143,288	167,782
Rheinisch-Westfaelisches Electric A.G., Preferred	2,000	146,254	161,548
Japan:			
Brother Industries, Ltd.	92,500	196,657	241,158
Canon Inc.	25,000	105,474	129,930
Casio Computer Company, Ltd.	30,000	101,458	139,302
Dai Nippon Printing Company, Ltd.	49,000	145,890	151,962
Fanuc, Ltd.	3,000	73,341	62,749
Fuji Photo Film Company, Ltd.	16,500	95,443	133,551
Fujisawa Pharmaceutical Company, Ltd.	23,000	106,801	124,434
Fujitsu, Ltd.	46,500	154,804	195,118
Hitachi, Ltd.	85,000	221,207	303,439
Hitachi Koki Company, Ltd.	55,000	150,384	166,118
Hitachi Maxell, Ltd.	20,000	315,800	350,172
Kokusai Electric Company, Ltd.	27,000	103,007	108,808
Matsushita Electric Industrial Company, Ltd.	30,000	157,331	182,754
NEC Corporation	42,000	149,504	173,194
Nintendo Company, Ltd.	15,000	168,413	198,729

Schedule of Investments

December 31, 1982 (continued)

EQUITY SECURITIES	Number of Shares	Cost	Quoted Market Value
Foreign (continued):			
Japan (continued):			
Nippon Columbia Company, Ltd.	33,000	$ 157,641	$ 140,580
Nitsuko, Ltd.	40,000	114,698	195,960
Nitto Electric Industrial Company, Ltd.	40,000	100,030	129,504
Nomura Securities Company, Ltd.	41,200	107,228	111,801
Olympus Optical Company, Ltd.	20,000	91,837	109,056
Omron Tateisi Electronics Company	25,000	102,249	124,605
Orient Finance Company, Ltd.	19,000	100,622	120,600
Pioneer Electronic Corporation	21,000	152,158	198,601
Sankyo Company, Ltd.	30,000	90,650	98,789
Sanyo Shokai, Ltd.	56,100	97,222	85,089
Sharp Corporation	30,000	105,412	149,526
Takeda Chemical Industries, Ltd.	38,000	152,741	145,206
Tanabe Seiyaku Company, Ltd.	30,000	100,160	121,410
Victor Company of Japan, Ltd.	13,000	137,459	133,465
Yamato Transport Company, Ltd.	35,000	134,775	134,935
Netherlands:			
Philips Gloeilampenfabrieken N.V.	11,000	103,711	114,754
Singapore:			
Development Bank of Singapore, Ltd.	30,000	119,100	112,010
United Overseas Bank, Ltd.	60,000	127,056	107,300
United Kingdom:			
Associated Dairies Group, Ltd.	53,333	108,430	129,359
Barratt Developments, Ltd.	21,000	146,617	158,918
Boots Company, Ltd.	25,000	102,631	101,871
Cadbury Schweppes, Ltd.	50,000	99,488	94,594
Distillers Company, Ltd.	40,000	154,687	160,406
Grand Metropolitan, Ltd.	57,142	210,930	308,617
London & Scottish Marine Oil Company, Ltd.	15,000	102,309	68,399
Marks & Spencer, Ltd.	30,000	92,354	107,207
Marley PLC	185,000	147,707	143,589
MFI Furniture Group, Ltd.	70,000	105,149	169,785
Northern Foods, Ltd.	40,000	103,151	120,304
Racal Electronics, Ltd.	10,000	99,426	96,534
RMC Group PLC	20,000	98,391	111,249
Rowntree Mackintosh PLC	30,000	104,516	98,960
Sears Holdings	170,000	213,257	280,387
TI Group PLC	50,000	99,773	113,190
Total equity securities		160,899,461	219,416,082
Total fixed income securities		90,967,251	96,738,765
Total investments		$251,866,712	$316,154,847

1982
Schedule of Grants and Appropriations

	Authorized But Not Due Dec. 31, 1981	1982 Authorized	1982 Payments	Authorized But Not Due Dec. 31, 1982
American Assembly		$ 20,000	$ 20,000	
American Association of University Professors		16,000	16,000	
American Economic Association	$ 100,000		100,000	
American Enterprise Institute for Public Policy Research	150,000		150,000	
American Productivity Center		20,000	20,000	
Amherst College		35,000	35,000	
Arizona, University of	10,000		10,000	
Association for Media-Based Continuing Education for Engineers	176,000		84,000	$ 92,000
Association for Women in Mathematics		20,000	20,000	
Association of American Colleges		25,000	25,000	
Atlanta University		20,000	20,000	
Bates College		35,000	35,000	
Boston University		155,000	105,000	50,000
Bowdoin College		35,000	35,000	
Brandeis University	20,000		20,000	
British Columbia, University of	10,000		10,000	
Brookings Institution	325,000	334,000	459,000	200,000
Brooklyn College	32,000		32,000	
Brown University	225,000	45,000	182,500	87,500
Bryn Mawr College		60,000	47,500	12,500
Bucknell University		35,000	35,000	
California, University of	976,000	579,000	897,500	657,500
California Institute of Technology	110,000	114,350	186,850	37,500
Carleton College	113,000	250,000	113,000	250,000
Carnegie Institution of Washington		25,000	12,500	12,500
Carnegie-Mellon University	499,000	634,000	585,000	548,000
Case Western Reserve University		25,000	12,500	12,500
Center for Advanced Study in the Behavioral Sciences	50,000	300,000	100,000	250,000
Chicago, University of	435,000	360,023	460,023	335,000
Claremont McKenna College		35,000	35,000	
Cognitive Neuroscience Institute		500,000	150,000	350,000
Colby College		35,000	35,000	
Cold Spring Harbor Laboratory	20,000	20,000	40,000	
Colgate University		35,000	35,000	
Colorado, University of	10,000	50,000	35,000	25,000
Colorado State University		25,000	12,500	12,500
Columbia University	60,000	254,950	214,950	100,000
Committee for Economic Development	125,000		125,000	

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Community Service Society of New York	$100,000		$ 50,000	$ 50,000
Conference Board		$ 20,000	20,000	
Connecticut College		35,000	35,000	
Cornell University	370,000	70,000	315,000	125,000
Council on Foundations, Inc.		20,000	20,000	
Council on Library Resources	120,000	400,000	200,000	320,000
Dartmouth College	110,000	104,000	164,000	50,000
Davidson College		260,000	10,000	250,000
Delaware, University of		20,000	20,000	
Duke University	200,000	17,126	117,126	100,000
Earlham College		20,000	20,000	
Emory University		25,000	12,500	12,500
Five Colleges, Inc.	33,000		17,000	16,000
Florida Agricultural and Mechanical University	50,000		50,000	
Foundation Center	60,000		60,000	
Franklin and Marshall College		35,000	35,000	
Grinnell College		260,000	10,000	250,000
Hamilton College		35,000	35,000	
Hampton Institute	50,000		50,000	
Harvard University	1,039,000	1,166,500	1,243,250	962,250
Haverford College	50,000	35,000	85,000	
Houston, University of		44,600	32,100	12,500
Illinois, University of	65,000	100,000	152,500	12,500
Illinois Institute of Technology	10,000		10,000	
Indiana University Foundation	20,000	50,000	45,000	25,000
Institute for Advanced Study	75,000		75,000	
Iowa State University of Science and Technology	10,000		10,000	
Johns Hopkins University	10,000	50,000	35,000	25,000
Kansas State University		25,000	12,500	12,500
Kentucky, University of		50,000	25,000	25,000
Lafayette College		260,000	10,000	250,000
Lawrence University	87,000		87,000	
Maryland, University of	407,500	(172,500)	137,500	97,500
Maryland, University of, Foundation, Inc.		217,500	20,000	197,500
Massachusetts, University of	225,000		185,000	40,000
Massachusetts Institute of Technology	2,285,000	534,000	1,134,500	1,684,500
MassPep, Inc.	50,000		50,000	
Medical College of Pennsylvania		25,000	12,500	12,500
Meharry Medical College	120,000	400,000	190,000	330,000
Michigan, University of	940,000	29,000	649,000	320,000
Michigan State University	10,000	14,647	24,647	

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	Authorized But Not Due Dec. 31, 1981	1982 Authorized	1982 Payments	Authorized But Not Due Dec. 31, 1982
Middlebury College		$ 35,000	$ 35,000	
Minnesota, University of	$ 105,000	129,000	221,500	$ 12,500
Mount Holyoke College		260,000	10,000	250,000
National Academy of Sciences		359,000	359,000	
National Bureau of Economic Research, Inc.		450,000	150,000	300,000
National Opinion Research Center		20,000	20,000	
New School for Social Research	84,000	20,000	53,000	51,000
New York University	130,000	10,000	80,000	60,000
North Carolina, University of	25,000		25,000	
Northeastern University		16,442	16,442	
Northwestern University	95,000		95,000	
Notre Dame, University of	30,000		30,000	
Oberlin College		260,000	10,000	250,000
Ohio State University	20,000	50,000	45,000	25,000
Ontario Institute for Studies in Education	100,000		50,000	50,000
Oregon, University of	10,000	50,000	35,000	25,000
Pennsylvania, University of	140,000	500,000	390,000	250,000
Pennsylvania State University	10,000	50,000	35,000	25,000
Pittsburgh, University of	10,000	50,000	35,000	25,000
Polytechnic Institute of New York	10,000		10,000	
Pomona College		35,000	35,000	
Population Reference Bureau, Inc.		19,500	19,500	
Princeton University	105,000	395,000	262,500	237,500
Princeton University Press	45,000		45,000	
Public Personnel Research, Inc.		125,000	125,000	
Purdue University		48,353	23,353	25,000
Rand Corporation	70,000	70,000	140,000	
Recording for the Blind, Inc.		100,000	100,000	
Reed College		35,000	35,000	
Rene Dubos Center for Human Environments, Inc.		20,000	20,000	
Rensselaer Polytechnic Institute	150,000		150,000	
Research Foundation of The City University of New York		217,750	117,750	100,000
Research Foundation of State University of New York	40,000	144,000	159,000	25,000
Resources for the Future, Inc.	181,750	180,000	281,750	80,000
Rice University		25,000	12,500	12,500
Rochester, University of	480,000	250,371	197,371	533,000
Rockefeller University	10,000	25,000	22,500	12,500
Russell Sage Foundation	150,000	163,000	158,000	155,000
Rutgers University Foundation	10,000	60,653	45,653	25,000

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Saint John's College		$ 35,000	$ 35,000	
Salk Institute for Biological Studies		45,000	32,500	$ 12,500
Scientists' Institute for Public Information	$ 100,000		100,000	
SIAM Institute for Mathematics and Society	145,000		90,000	55,000
Simon Fraser University		25,000	12,500	12,500
Smith College	210,000	35,000	105,000	140,000
Southern California, University of		25,000	12,500	12,500
Stanford University	267,000	370,000	427,000	210,000
Swarthmore College		170,000	85,000	85,000
Syracuse University	145,000		75,000	70,000
Tennessee, University of		25,000	12,500	12,500
Texas, University of	61,000	1,189,879	788,379	462,500
Texas A & M University	20,000	20,000	40,000	
Trinity College		35,000	35,000	
Tulane University	115,000		115,000	
Tuskegee Institute		20,000	20,000	
Union College		260,000	10,000	250,000
United Neighborhood Houses of New York, Inc.		20,000	20,000	
United Way of Tri-State		3,000	3,000	
Urban Academy for Management, Inc.	125,000	(125,000)		
Utah, University of	10,000	57,723	42,723	25,000
Vanderbilt University	10,000		10,000	
Vassar College		260,000	10,000	250,000
Virginia, University of		39,790	27,290	12,500
Virginia Polytechnic Institute and State University		5,654	5,654	
Volunteer Urban Consulting Group, Inc.	40,000		40,000	
Washington, University of	85,000	109,000	181,500	12,500
Washington University	170,000		85,000	85,000
Wayne State University	10,000		10,000	
Wellesley College		260,000	10,000	250,000
Wesleyan University	10,000	35,000	45,000	
Williams College	64,500	260,000	74,500	250,000
Wisconsin, University of	40,000	237,000	155,000	122,000
Work in America Institute, Inc.		19,350	19,350	
Yale University	425,000	105,045	355,045	175,000
Yeshiva University		25,000	12,500	12,500
Sloan Fellowships for Basic Research to be granted in ensuing year	2,200,000			2,200,000

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Book Program	392,560		$ 37,563	354,997
Other appropriations for grants and related expenses	83,962	82,952	101,912	65,002
	17,532,272	16,219,658	16,873,181	16,878,749
Reduction for grant transfers		152,706	152,706	
	$17,532,272	$16,066,952	$16,720,475	$16,878,749

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