Alfred P. Sloan Foundation

ANNUAL REPORTS

1995 ANNUAL REPORT

ALFRED P. SLOAN FOUNDATION

Alfred P. Sloan, Jr.
1875-1966

LIFE OF ALFRED P. SLOAN, JR.

Alfred Pritchard Sloan, Jr., was born in New Haven, Connecticut, May 23, 1875, the first of five children of Alfred Pritchard Sloan, Sr., and Katherine Mead Sloan. His father, a machinist by training, was then a partner in a small company importing coffee and tea. In 1885 the family moved to Brooklyn, where it was particularly active in the Methodist Church. (Young Alfred's maternal grandfather was a Methodist minister.) Alfred, Jr., excelled as a student both in the public schools and at Brooklyn Polytechnic Institute where he completed the college-preparatory course. After some delay in being admitted to the Massachusetts Institute of Technology (which considered him too young when he first applied), he matriculated in 1892 and took a degree in electrical engineering in three years as the youngest member of his graduating class.

Mr. Sloan began his working career as a draftsman in a small machine shop, the Hyatt Roller Bearing Company of Newark, New Jersey. At his urging, Hyatt was soon producing new antifriction bearings for automobiles. In 1898 he married Irene Jackson of Roxbury, Massachusetts. The next year, at age 24, he became the president of Hyatt, where he supervised all aspects of the company's business. Hyatt bearings became a standard in the automobile industry, and the company grew rapidly under his leadership. In 1916 the Hyatt Roller Bearing Company, together with a number of other manufacturers of automobile accessories, merged with the United Motors Corporation, of which Mr. Sloan became President. Two years later that company became part of the General Motors Corporation (itself established in 1908 as the General Motors Company), and Mr. Sloan was named Vice President in Charge of Accessories and a member of the Executive Committee.

He was elected President of General Motors in 1923, succeeding Pierre S. du Pont, who said of him on that occasion: "The greater part of the successful development of the Corporation's operations and the building of a strong manufacturing and sales organization is due to Mr. Sloan. His election to the presidency is a natural and well-merited recognition of his untiring and able efforts and successful achievement." Mr. Sloan had developed by then his system of disciplined, professional management that provided for decentralized operations with coordinated centralized policy control. Applying it to General Motors, he set the Corporation on its course of industrial leadership. The next 23 years, with Mr. Sloan as Chief Executive Officer, were years of enormous expansion for the Corporation and of a steady increase in its share of the automobile market.

In 1937 Mr. Sloan was elected Chairman of the Board of General Motors. He continued as Chief Executive Officer until 1946. When he resigned from the chairmanship in 1956, the General Motors Board said of him: "The Board of Directors has acceded to Mr. Sloan's wish to retire as Chairman. He has served the Corporation long and magnificently. His analysis and grasp of the problems of corporate management, his great vision and rare good judgement, laid the solid foundation which has made possible the growth and progress of General Motors over the years." Mr. Sloan was then named Honorary Chairman of the Board, a title he retained until his death on February 17, 1966. For many years he had devoted the largest share of his time and energy to philanthropic activities, both as a private donor to many causes and organizations and through the Alfred P. Sloan Foundation, which he established in 1934.

Mr. Sloan, as a realist as well as a humanist and philanthropist, looked upon the Foundation as an extension of his own life and work. Although he recognized the inevitability of change that might dictate a different course, he expected that the Foundation would "continue as an operating facility indefinitely into the future...to represent my accomplishments in this life." His accomplishments during his lifetime were of the highest order, and in themselves provide the most dramatic and lasting tribute to his extraordinary talent. Through the Foundation, his accomplishments have been extended and expanded.

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GENERAL INFORMATION

"The greatest real thrill that life offers is to create, to construct, to develop something useful. Too often we fail to recognize and pay tribute to the creative spirit. It is that spirit that creates our jobs. There has to be this pioneer, the individual who has the courage, the ambition to overcome the obstacles that always develop when one tries to do something worthwhile, especially when it is new and different."

—Alfred P. Sloan, Jr., 1941

PROGRAMS AND INTERESTS

The main interests and programs of the Foundation are concentrated primarily in four areas and can be outlined as follows:

Science and Technology

- Fellowships
- Direct Support of Research
- History of Science and Technology

Standard of Living and Economic Performance

- Industries
- Nonprofit Sectors
- The Family and the Workplace

Education and Careers in Science and Technology

- General Education and Training
- Minorities and Women
- Public Understanding of Science and Technology

Selected National Issues

This general information section provides a brief description, including current directions and plans, of the Foundation's evolving program in each of these areas.

SCIENCE AND TECHNOLOGY

Science and technology continue as major interests of the Foundation. Fellowships account for expenditures of $5 million annually. Grants for the direct support of research in selected fields and for work in the history of science and technology are also important components of the Foundation's program. Special-purpose conferences and workshops in mathematics, science, and technology are also supported as part of the program, mainly by means of officer grants.

FELLOWSHIPS

Sloan Research Fellowships

One hundred Sloan Research Fellowships are awarded each year in the following fields: chemistry, computer science, economics, mathematics, neuroscience, and physics. These are highly competitive grants given to young faculty members with outstanding research potential on the recommendation of senior scientists.

Dissertation Fellowships

Fifty awards in two fields, economics and mathematics, are made each year to allow especially promising graduate students to concentrate on completing their doctoral research and dissertations. Nominations are solicited from leading graduate departments in these fields.

Information on both these fellowship programs may be obtained by inquiry to the Foundation.

DIRECT SUPPORT OF RESEARCH

The Foundation seeks to identify areas of research that are scientifically significant but are either neglected by major governmental funding agencies or do not fit well within their program orientations. Among such areas being supported are theoretical neurobiology, molecular evolution, computational molecular biology, and astrophysics (Sloan Sky Survey). The Foundation is open to suggestions for other topics in science and also in technology that meet the specified criteria.

Theoretical Neurobiology

A research program in theoretical neurobiology was launched in 1994 with grants totaling almost $7 million to support five new research centers at Brandeis University, California Institute of Technology, New York University, Salk Institute, and University of California, San Francisco. The program gives young scientists with previous training in mathematics, physics, computer science, and other theoretical areas an opportunity to learn laboratory procedures and work with senior neurobiologists. The aim is to encourage significant research by a generation of theoreticians with intimate knowledge of important neurobiology problems. The first annual workshop to bring together this new community of researchers and trainees was held in 1995.

Molecular Evolution

The Sloan program in molecular evolution, started in 1986, has evolved into a two-part initiative operated jointly with the National Science Foundation. The first postdoctoral research fellowships in the joint NSF/Sloan program were made in 1994. Initial awards for young investigators as they start their independent research careers, the second part of the new joint program, were announced early in 1995.

Computational Molecular Biology

Postdoctoral awards in computational molecular biology, jointly supported with the Department of Energy, are designed to attract much-needed computational and analytic expertise to the challenging data analysis problems emerging in molecular biology. The first ten such awards for study and research in a molecular biology laboratory will be made in 1996.

Sloan Digital Sky Survey

Foundation grants totaling $10 million since 1992 have supported the Sloan Digital Sky Survey. This astronomical survey will produce three-dimensional position and spectrographic information on a million galaxies and one hundred thousand quasars. Completion of the specially designed telescope system is planned for mid-1996 and a period of testing will be followed by systematic observations expected to begin in 1997.

Limits to Knowledge

A series of Foundation-supported workshops on limits to knowledge is being held and this topic will be the subject of a 1996 book by astrophysicist Piet Hut and cognitive scientist Roger Shepard. Additional research proposals are of interest, including, for example, study of the limitations imposed on what can be known in such fields as the geosciences due to sensitivity of systems to initial conditions and associated chaotic behavior. The Foundation also seeks to expand work on limits to knowledge to fields outside of the mathematical and physical sciences.

HISTORY OF SCIENCE AND TECHNOLOGY

Archival Projects

The Foundation has supported a number of major archival projects devoted to collecting and publishing papers, letters, and notes of several eminent scientists: Charles Darwin, Thomas A. Edison, Albert Einstein, and Kurt Gödel. Recent funding will allow the Edison Papers Project to begin converting its books and microfilm to an electronic version in order to allow for quick and widespread distribution via the Internet. A review of the Foundation program for archival projects is planned in 1996.

STANDARD OF LIVING AND ECONOMIC PERFORMANCE

This program aims to improve understanding of the basic forces influencing economic progress and the U. S. standard of living in an increasingly competitive world economy. Originally emphasizing manufacturing, the program now includes studies of service industries, as well as research on globalization, start-up companies, and the role of the corporation. In the nonprofit sector, research is supported on higher education as an industry and on assessment of government performance. Another part of this program is devoted to human resource and work reorganization issues, including studies of the changing nature of work and its effects on both workers and their families.

INDUSTRIES

Industry Centers

The primary objective of this program has been to create academic groups with direct knowledge of industry. About 150 faculty members and an even larger number of graduate students are participants in research at Sloan industry centers; fifteen Ph.D.s were completed in the past year. Centers are actively involved with companies, have made reports to the Congressional Task Force on Manufacturing, the Federal Trade Commission, and the Department of Commerce, are publishing numerous research studies on their industries, and generally are producing data, observations, and theoretical results useful to American companies and the federal government. As this proceeds, the knowledge generated is influencing academic courses and curricula.

Foundation grants made over the last six years are now supporting eleven industry centers: in 1990, the **International Motor Vehicle Program** (Massachusetts Institute of Technology) and the **Center for the Apparel and Textile Industry** (Harvard University); in 1991, the **Sloan Steel Industry Center** (Carnegie Mellon University and University of Pittsburgh), the **Center for Competitive Semiconductor Manufacturing** (University of California, Berkeley), the **Computer Industry Project** (Stanford University), and the **Program on the Pharmaceutical Industry** (Massachusetts Institute of Technology); in 1992, the **Financial Institutions Center** (Wharton School, University of Pennsylvania); in 1993, the **Center for the Powder Metallurgy Industry** (Worcester Polytechnic Institute); in 1994, the **Retail Food Industry Center** (University of Minnesota); and in 1995, the **Program on the Trucking Service Industry** (University of Michigan), and the **Center for the Study of the Managed Health Care Industry** (Harvard University).

The Foundation will consider proposals for the formation of centers for the study of addi-

tional industries, for example, other small industries. The fifth annual meeting of all the centers will take place in 1996 and a joint book project on the sources of productivity and growth in each industry is being considered. Outreach to the industries and the academic community will continue to be emphasized by support of special meetings with companies, articles in industry trade journals, and academic conferences and workshops for each industry. Several of the centers are writing books on the overall state of their industries; the Steel Industry Center's book, *Transformation of the American Steel Industry: Lessons for Global Competitors* (Oxford University Press) will be published in 1996.

Human Resources/Jobs/Income

The **Sloan Human Resources Network** at MIT continues to serve as a coordinating center for researchers working on human resource and work organization issues, including those arising within the Sloan industry centers. It unites a diverse group of about 45 faculty members and more than 30 graduate students. A special meeting of the Network was held in January 1996 on wage effects (wage stagnation, income distribution) and another meeting of the Ph.D. students involved with research on human resource issues is also planned.

At the University of Wisconsin arrangements have been made with a number of companies to begin field work on manufacturing in the Middle West, with a special focus on jobs lost, regained, and newly created. In 1995, grants were made to MIT and Jobs for the Future to study wages, training, skills, and work reorganization in the context of outsourcing and downsizing.

The Foundation is interested in further research on the effect of new work organization and human resource practices on productivity, as well as studies of wage effects such as inequities and changes in required skill and training.

Globalization

The design, development, manufacturing, and distribution of many products and services are increasingly allocated internationally regardless of the home base of the company. The Foundation has begun a program to study this widening geographical distribution of production. Starting with an industry focus, the aim is to understand the main factors in location decisions and the effects these decisions have on the quantity and quality of jobs and pay. Grants have been made to the University of California, San Diego to study such

globalization issues for the computer disk industry, to the University of California, Davis for the television and personal computer industries, and to Carnegie Mellon University for the automobile industry. In 1996, further research on this theme will be supported, including studies of selected global services such as the software services industry.

Start-Up Companies

Grants in 1995 supported the enhancement of practitioner involvement in teaching entrepreneurial and venture capital business behavior in the business school of the University of California at Berkeley, and also the research of Kenneth Arrow on economic analysis of start-up companies. It is planned to enlarge this program in 1996.

Role of the Corporation

Several Sloan grants are now stimulating examination of the corporation as a fundamental institution of American society for generating and distributing jobs and income. *The American Corporation Today* (Oxford University Press, 1996), edited by MIT's Carl Kaysen, examines the corporation and its changing nature and role in our society. Grants in 1995 supported a variety of activities (networking, workshops, and writing), centered at the University of Maryland, designed to develop a national network of interested scholars examining the nature and purposes of the corporation. The Foundation is interested in strengthening and enlarging the network of researchers concerned with the role of the corporation.

Science and Technology Policy

The Foundation would like to understand the process by which new technology flows from academic research in the United States to the American economic enterprise. It appears this flow works well in some areas of science and technology, for some universities, and for some businesses and industries, but not for all. The Foundation may consider a program of case studies that will create a better understanding of this important question.

Economics and Other Studies

The National Bureau of Economic Research continues its Foundation-supported research program, focused on productivity, labor relations, and innovation in manufacturing, that emphasizes field observations and interviews at firms. The Brookings Institution micro-

economics series, *Micro BPEA*, featured Sloan industry studies in its 1995 issue and is planning a 1996 issue that will also contain Sloan industry publications. In 1995, five Ph.D.s were completed by students working at MIT's **Industrial Performance Center**, more than 200 companies were visited, and research results were obtained on human resource issues (in the telephone and metalworking sectors), on job, skill, and income changes in banking, and on the impact of computers on performance. The past year saw the first graduates of Stanford University's Ph.D. program to prepare professors of manufacturing take university faculty positions. Renewed Foundation support together with private financing will allow for at least 25 new professors of manufacturing, all with industrial experience and high-quality doctoral training.

Determining the contributions to productivity growth from changes in labor, technology, natural resources, and capital is a classic economic problem. The Foundation expects in 1996 to explore whether this problem can be illuminated by combining the Sloan industry approach with classical econometric methods. A grant has been made to the Woods Hole Oceanographic Institute to study the marine industries in this light.

NONPROFIT SECTORS

Universities

William Massy and Charles Goldman, under a grant to Stanford University, constructed a model of the Ph.D. production system of research universities and estimated that production of Ph.D.s in scientific fields is more than 20% in excess of demand from academic, corporate, and other potential employers of such highly skilled researchers. Moreover, the number of Ph.D. students is mainly driven not by labor force demand but by the volume of government research funding flowing to research universities. In its effort to expand the focus of research more generally on higher education as an industry, the Foundation has made some 1995 grants to study the collective role in the economy of higher education, to create a university simulator, and for an issue of *Daedalus* on challenges facing the American professoriate. Studies emphasizing community colleges and comprehensive universities, as well as the research university, are of interest.

Assessment of Government Performance

This Foundation program supports projects to produce results-oriented assessments of the performance of governmental agencies and programs and to involve citizens in these assessments as a means of effecting improved performance. With 1995 grants, the Fund for the City of New York is developing methodologies to provide reliable assessment of the effectiveness of New York City government agencies, the Kennedy School at Harvard University is working on measures for performance assessment of police departments that are moving to community policing, and the Urban Institute is creating and will institutionalize a local government performance program in 38 localities. The Foundation plans to expand this program by concentrating on assessing the delivery of core services that matter most to citizens, such as fire, police, and sanitation. The focus on involving citizens and stakeholder groups in the assessment process and in the use of the results will be continued.

FAMILY AND WORKPLACE

Part-Time Careers

The American family is changing. Dual career households, single parents, older workers caring for aged parents are now commonplace. Against this background, recent Foundation grants have been made to examine part-time careers for managers, engineers, lawyers, accountants, computer programmers, and technical writers. This program will be extended to new career areas. Additional study of the consequences of working part-time, for the family and at the workplace, will also be supported.

Work and Families

The American workplace is also in flux. Job security has become a thing of the past in many corporations. A Sloan Network on Work Restructuring and Work-Family Issues has been put in place. Its primary aim is to provide a forum for leading scholars to develop collaborative research that will clarify both the business and family effects of various work structures. Support is planned for additional research on the structure of work and its effects on families.

Understanding Working Families

The Foundation plans to establish a number of centers for research on working families. The intent is to study how middle-class American families are coping in this period of changing social and economic patterns and to examine the kinds of lives being led by families and children in our changing communities.

EDUCATION AND CAREERS IN SCIENCE AND TECHNOLOGY

Programs designed to educate and interest people in scientific and engineering fields have long been of interest to the Foundation. Under the heading of general education and training, one key area is **career choice**. Having chosen, there is the problem of **retention**. As the student population changes, opportunities for **learning outside the classroom** are increasingly important. There is the effect of **immigration** of scientists and engineers and the continuing problem of the underrepresentation of **minorities and women** in these professions. Related to and influencing all this is the **general public's understanding of science and technology**.

GENERAL EDUCATION AND TRAINING

Career Choice

The Foundation's aim is to understand how American students develop interests in and then proceed toward careers in science and engineering. Supported by a major 1992 grant, work is progressing on a six-year University of Chicago longitudinal study for which large amounts of data are being collected in ten junior and senior high school systems across the country. As a guide to possible further grant-making, a pilot study is underway on the development of work notions leading to career choices by college students.

Having good **information about careers** is an important basis for making good career decisions. The Foundation program involves grants to professional societies to prepare high-quality career materials, aimed at college students, showing what it is actually like to be a scientist or engineer. Adapting these materials to create career information packages suitable for pre-college students and effective distribution of these materials are important next steps. Each professional society will not only prepare Internet web pages, videotapes, CD-ROMs, and career brochures, but also provide an interactive bulletin board on the Internet to permit dialogue on career issues between students and selected society members. Physics and mathematics societies have already completed this work under their grants. Career materials by the American Society of Mechanical Engineers, the American Geological Society, and the Minerals, Metals and Materials Society will be operational early in 1996. A recent grant to the National Academy of Sciences will create an Internet Career Planning Center designed to provide easy access via the World Wide Web to the career information being produced. The Foundation plans to make grants to other professional societies as part of this program. Arrangements for producing the packages for pre-college students and for publishing and distributing materials are also being planned.

Retention

A series of recent Foundation grants supported the work of Elaine Seymour and Nancy Hewitt of the University of Colorado on why capable college students switch out of science and engineering. Their results have been widely distributed and are now part of a basic understanding of retention. Other grants underway support studies of the departure from Ph.D. programs without the degree, of the decisions by undergraduate women to enroll and persist in a computer science major, and of reasons for the low enrollment of African-American and Hispanic students in mathematics, science, and engineering.

Learning Outside the Classroom

The Foundation seeks to help make available education outside the classroom, for those motivated to seek it, in science, mathematics, engineering, and other disciplines required in the world of work. The advance of electronic technologies makes this possible today via **asynchronous access to remote learning resources**, such as on-line course and library materials, fellow students and collaborators, and faculty. Asynchronous means that access to any remote resource is under the student's control and is, so to speak, available "on demand."

Grants in the past three years to establish asynchronous learning networks (ALNs) focus on one of three categories of learners: those living on or near campus; those within commuting distance; and those very far from campus. Twenty-eight projects have been funded since 1993 with a view toward exploring how learning is best done in an asynchronous environment. Some have modest goals, such as the development of a single course in the new mode. Others are attempting to deliver full degrees or certifications to remote learners, or to explore new outcomes that might be enabled by ALNs for traditional on-campus learners. These projects have contributed much information on matters as diverse as course development, faculty motivation, student satisfaction, program marketing, and learning outcomes.

It is now planned to emphasize projects with a national degree or certification focus. A 1995 grant to Drexel University to establish the Sloan Center for Asynchronous Education and Training is an example. Drexel will offer an ALN master's degree in information systems, initially in the Philadelphia area and then nationally. The possibility of an all-electronic national university will also be explored. The Foundation plans to improve information flow in the growing ALN community by the creation of an electronic newsletter and Internet bulletin board.

Immigration of Scientists and Engineers

Foundation-supported research on the impact on the U. S. economy and workforce of the immigration of scientists and engineers resulted in an important book by David North (*Soothing the Establishment: The Impact of Foreign-Born Scientists and Engineers on America*, University Press of America, 1995). A recent grant to Princeton University will support development of an overall statistical portrait of the population of scientists and engineers in the U. S., both native and foreign-born, and assessment of how this population has changed over the past several decades. The summary report of an earlier project, authored by Leon F. Bouvier and John L. Martin (*Foreign-Born Scientists, Engineers and Mathematicians*, Center for Immigration Studies, Washington, D.C.) was released in October 1995. The Foundation will continue to consider grants for objective assessments of the impacts of migration on U.S. labor markets in science, engineering, and computing.

MINORITIES AND WOMEN

The Foundation continues to support efforts to ameliorate the underrepresentation of minorities and women in mathematics, science, and engineering.

Minorities

The main focus is on increasing the number of **minority Ph.D.s** in mathematics, science, and engineering. Grants support individual faculty members, research groups, and entire departments, all with demonstrated records of success in producing minority Ph.D.s, in efforts to increase the number they produce. Such grants have gone in 1995 to Georgia Institute of Technology, Massachusetts Institute of Technology, Meharry Medical College, Auburn University, Purdue University, University of Pittsburgh, University of Texas at El Paso, and Hampton University. These grants are expected to result in an increase of almost 200 minority Ph.D.s. This program will continue in 1996 with support for projects designed to obtain an increase of another 100 minority Ph.D.s.

Another part of this program aims to increase the number of minority students in **specialized mathematics and science high schools** and to help them succeed once enrolled. Major grants have gone to schools in Virginia, Mississippi, Illinois, and California. The Foundation is exploring the possibility of making additional grants in this program to specialized high schools across the country.

The results of a Foundation-sponsored conference to review the status of knowledge about minorities in mathematics, science, and engineering will appear in an Oxford University Press volume now being prepared. A six-program television series, *Breakthrough: People of Color in American Science*, is scheduled to be aired in 1996. This Foundation-funded series features minority scientists and engineers working in mathematics, physics, chemistry, biology, computer communications, materials science, and environmental toxicology.

Women

For several years, the Foundation has funded a number of **model programs** that focus on improving the campus climate for women students in mathematics, natural sciences, and engineering. These programs have included special recruitment efforts, mentoring arrangements, research experience for undergraduates, curriculum development, encouragement of faculty and graduate teaching assistants to be sensitive to gender issues in their teaching, and the creation of communities of women students in these technical fields. Funded programs at Purdue University, Cornell University, University of Washington, University of Maryland, Dartmouth College, University of Michigan, and Douglass College of Rutgers University serve as models. A Foundation-sponsored program with the Women in Engineering Program Advocates Network has helped disseminate the work of these grantee institutions and others to campuses across the country. Under consideration for 1996 is a program with similar goals but now focused on women faculty in mathematics, science, and engineering.

Discovering Women, the Foundation-funded award-winning six-part television series profiling women scientists, was broadcast nationally on PBS in 1995, reaching almost nine million viewers. The results of a project to understand the current status of knowledge about women in mathematics, science, and engineering will be summarized in a book to be published in 1996 by Jossey-Bass, Inc.

PUBLIC UNDERSTANDING OF SCIENCE AND TECHNOLOGY

The goal of this program is to enhance understanding of the world around us through a keener appreciation of the increasingly scientific and technological environment in which we live.

With Foundation funding, the PBS historical documentary series *The American Experience* continues its production of **technology-related programs**. Planned for the 1996-1997 television season are programs on the creation and deployment of the U-2 airplane, the early years of the telephone, the building of the New York City subway, and the television pioneer Philo T. Farnsworth. In 1995, a grant was approved for the preparation of a series of prime time public television programs on the ways some knowledge of mathematics helps in understanding and appreciating the world. Broadcast is planned for 1997.

The Foundation has continued to fund the **reporting of technology** as part of various programs on National Public Radio.

The Sloan **Technology Book Series** saw its first books published in 1995: *Dark Sun: The Making of the Hydrogen Bomb*, by Richard Rhodes; *Dream Reaper: The Story of an Old-fashioned Inventor in the High-Tech, High-Stakes World of Modern Agriculture*, by Craig Canine; and *Turbulent Skies: Commercial Aviation in the Twentieth Century*, by T. A. Heppenheimer. Additional volumes on such topics as radar, television, and medical imaging are scheduled for 1996 publication. Selected science and technology books, not part of the Series, are also supported by the Foundation. Under consideration is a new book series on other significant issues of public concern where the level of debate is hampered by lack of knowledge of the underlying science or technology.

In order to make more informed use of various communication media, the Foundation is investigating means to evaluate the relative effectiveness of commercial television, radio, film, books, CD-ROMs, interactive media and the Internet. Also being explored is how to reach a wider audience about the importance of science and technology through such mass media as commercial television and films.

The Foundation attempts to contribute to other major issues of our time in a way appropriate to its expertise and size. A special approach to the study and understanding of broadly recognized problems is a requirement for Foundation support.

Findings of the RAND Corporation study of the effect of the legal status of **drugs** will appear in an article in the *Journal of Policy Analysis and Management* and in a book planned for publication in 1997 by Cambridge University Press. Foundation-funded research on **nuclear energy** and the public perception of nuclear power will also be the subject of a forthcoming book. Further funding of special projects exploring the nuclear energy option is being considered.

Work on a grant to the American Academy of Arts and Sciences supporting the development of improved indicators of the **position of children in the U. S.** was completed in 1995.

Two 1995 Foundation-supported projects concern **illegal gun markets** in American cities and their connection to juvenile violence. One investigates methods of dealing with youth violence through interventions focused on the illegal supply of guns to youth. The other is studying illegal gun markets and juvenile violence in Pittsburgh and Rochester.

CIVIC PROJECTS

In addition to its four main areas of funding, the Foundation will continue its tradition of making civic grants for projects aimed at enhancing the economy of New York City.

The new Center for Finance and Technology, supported with a 1994 grant to New York Polytechnic University, is now operating with a full schedule of courses, a growing faculty, and larger than expected student enrollment. A 1995 civic grant to the New York Academy of Sciences is supporting work on the origins and consequences of financial innovation and how New York City can compete more effectively in financial services. During 1995, Mitchell Moss's study of the manufacturing sector in New York was completed. A supplementary officer grant funds dissemination of his important result that the manufacturing sector in New York is still large and healthy, although based primarily on small companies with niche markets.

The Sloan Public Service Awards program continues to recognize outstanding performance by civil servants.

HOW TO APPLY FOR A GRANT

Applications can be made at any time for support of activities related to the range of interests indicated above. Grants of $30,000 or less are made throughout the year by officers of the Foundation. Officer grants enable the Foundation to respond quickly to proposals for many activities, such as workshops, symposia, and conferences, that fall within its program areas and interests, but require only moderate funding (at most $30,000). Officer grants can also be helpful for the preliminary planning and exploratory stages of major projects.

Grants over $30,000 are made by the Trustees who meet four times a year for that purpose. Letters of application are normally sent to the president or an officer of the Foundation and include, in addition to details about the applicant and the proposed project, information on the cost and duration of the work. Officer grants may not include any overhead charge; for trustee grants, at most fifteen percent of direct project costs can be budgeted for overhead. In the case of new applicants, the proof of tax-exempt status of the organization that would administer the grant should be included unless it is a recognized institution of higher education.

The Foundation's activities do not generally extend to religion, the creative or performing arts, elementary or secondary education, medical research or health care, the humanities or to activities outside the United States. Grants are not made for endowments or for buildings or equipment.

The Foundation has no deadlines or standard forms. Often a brief letter of inquiry, rather than a fully developed proposal, is an advisable first step for an applicant, conserving his or her time and allowing for a preliminary response regarding the possibility of support.

1995 GRANTS AND ACTIVITIES

SCIENCE AND TECHNOLOGY

Science and technology continue as major interests of the Foundation. Research and Doctoral Dissertation Fellowships accounted for expenditures of over $4.3 million in 1995. Trustee and officer grants for the direct support of research are part of this program. For major support of research the Foundation seeks to identify fields which, although scientifically significant, are not able to generate sufficient research resources and where Sloan funding can therefore have a substantial positive impact. Among such fields, special programs are being supported in theoretical neurobiology, molecular evolution, and computational molecular biology.

The program in theoretical neurobiology is in its early stages, having been initiated in 1994 with grants totaling almost $7 million to support five new research centers.

The Foundation's long-term support of research in molecular studies of evolution has now evolved into a jointly funded and operated research program with the National Science Foundation. Details of the seventeen NSF/Sloan postdoctoral fellowships in molecular evolution and of the first five young investigator awards in molecular evolution, all made in 1995, are given below.

A new program of postdoctoral awards in computational molecular biology, jointly supported with the Department of Energy, was announced in 1995. It aims to attract much-needed computational and analytical expertise to the challenging data analysis problems emerging in molecular biology.

A $2 million trustee grant in 1995 completed support totaling $10 million for the Sloan Digital Sky Survey, a major astrophysics project involving the design and construction of a new telescope to be used for optical imaging and spectrographic measurements of most of the extra-galactic northern sky.

The program also includes grants for the study of limits to knowledge and for projects in mathematics, science, technology, and science and technology policy.

The history of science and technology is another topic of interest to the Foundation, as illustrated by major grants in 1995 for archival projects devoted to the work of Thomas A. Edison and Kurt Gödel.

As in past years, a number of officer grants supported special studies and projects, scientific symposia, workshops, and conferences.

Sloan Research Fellowships **$3,000,000**

Initiated 40 years ago, the Sloan Research Fellowship Program aims to stimulate fundamental research by young scholars of outstanding promise at a time in their careers when their creative abilities are especially high and when federal or other support may be difficult to secure. Fellowships have gone to over 3,000 scientists and have accounted for expenditures of about $69 million. Sloan Research Fellows continue to receive numerous prizes and awards in recognition of their major research accomplishments. Nineteen Fellows have received Nobel prizes and twelve have been awarded the prestigious Fields Medal in mathematics.

Fellowship awards in 1995 were made in six fields: chemistry, computer science, economics, mathematics, neuroscience, and physics. Each fellowship is administered by the fellow's institution and is designed to allow the greatest possible freedom and flexibility in its use. A brochure entitled "Sloan Research Fellowships," available from the Foundation, describes the program in detail.

Candidates for Sloan Research Fellowships are nominated by department heads or other senior scientists familiar with their work. Within each discipline, a committee composed of three distinguished scientists reviews all nomination documents and recommends the final selections. Committee members are asked to identify those nominees who show the most outstanding promise of making fundamental contributions to new knowledge. During 1995, the Foundation awarded Research Fellowships of $30,000 each, over a two-year term, to 100 scholars at 51 institutions. Nominations were reviewed by the following committees:

Chemistry: Dr. Jacqueline K. Barton, California Institute of Technology; Dr. Richard Bersohn, Columbia University; Dr. Samuel Danishefsky, Columbia University.

Computer Science: Dr. John L. Hennessy, Stanford University; Dr. John E. Hopcroft, Cornell University; Dr. Richard M. Karp, University of Washington.

Economics: Dr. Gary Chamberlain, Harvard University; Dr. Kenneth Rogoff, Princeton University; Dr. Jose Scheinkman, University of Chicago.

Mathematics: Dr. Spencer J. Bloch, University of Chicago; Dr. William P. Thurston, Mathematical Sciences Research Institute; Dr. Karen Uhlenbeck, University of Texas at Austin.

Neuroscience: Dr. Lily Jan, University of California, San Francisco; Dr. Darcy B. Kelley, Columbia University; Dr. Robert H. Wurtz, National Institutes of Health.

Physics: Dr. Robert C. Dynes, University of California, San Diego; Dr. Saul Teukolsky, Cornell University; Dr. Frank Wilczek, Institute for Advanced Study.

FELLOWSHIP RECIPIENTS

Arizona, University of
Neuroscience: Mani Ramaswami

Boston University
Chemistry: John E. Straub
Mathematics: Tasso J. Kaper
Neuroscience: Frank H. Guenther
Isabelle Marie Mintz

Brown University
Physics: Alexander Zaslavsky

California Institute of Technology
Computer Science: Jehoshua Bruck

California, University of, Berkeley
Chemistry: Martin Head-Gordon
Economics: Matthew Rabin
Physics: Lars Bildsten

California, University of, Davis
Neuroscience: Mitchell L. Sutter

California, University of, Irvine
Chemistry: Craig C. Martens
Reginald M. Penner
Mathematics: Richard Wentworth
Neuroscience: Georg F. Striedter

California, University of, Los Angeles
Chemistry: Craig A. Merlic

California, University of, San Diego
Physics: Elizabeth Ellen Jenkins
Edward T. Yu

California, University of, San Francisco
Neuroscience: David S. Bredt
Kenneth D. Miller

California, University of, Santa Barbara
Computer Science: Martin C. Rinard

California, University of, Santa Cruz
Physics: Onuttom Narayan

Chicago, University of
Economics: Anil K. Kashyap
Lars A. Stole
Mathematics: Burt Totaro

Columbia University
Chemistry: Ann E. McDermott
Computer Science: Steven Mark Nowick
Physics: Yang Pang

Cornell University
Computer Science: Thorsten von Eicken

Duke University
Chemistry: Eric J. Toone
Mathematics: Andrea L. Bertozzi
Fangyang Zheng

Florida, University of
Chemistry: Robert T. Kennedy

Georgetown University
Chemistry: Janice M. Hicks

Georgia Institute of Technology
Computer Science: Jessica Kate Hodgins

Harvard University
Economics: Guido W. Imbens
Mathematics: Lucia Caporaso
Edward Frenkel

Illinois, University of, Urbana-Champaign
Chemistry: Jonathan V. Sweedler
Mathematics: Sergei Ivanov
Physics: Mats A. Selen
Alexander V. Sokol

Indiana University
Chemistry: Theodore S. Widlanski
Mathematics: Yuxi Zheng

Johns Hopkins University
Neuroscience: David D. Ginty
Alex L. Kolodkin
Physics: Adam Frederick Falk

Kentucky, University of
Physics: Alfred K. Shapere

Louisville, University of
Neuroscience: Zijiang J. He

Massachusetts Institute of Technology
Chemistry: James R. Williamson
Computer Science: Michael X. Goemans
Economics: Jonathan Gruber
Mathematics: Andras Szenes
Neuroscience: Matthew A. Wilson
Physics: Tomas A. Arias
Takashi Imai

Massachusetts, University of
Chemistry: Scott William Barton

McGill University
Neuroscience: Avijit Chaudhuri

Michigan State University
Physics: Simon J. L. Billinge

Michigan, University of
Chemistry: Gary D. Glick
Mathematics: Alexander I. Barvinok
Ruth J. Lawrence

Minnesota, University of
Mathematics: John S. Lowengrub

Montreal, University of
Neuroscience: Richard Robitaille

New York University
Chemistry: John Zeng Hui Zhang

North Carolina, University of
Chemistry: Cynthia K. Schauer
Computer Science: Dinesh Manocha

Northwestern University
Chemistry: Frank E. McDonald
Chad A. Mirkin
Mathematics: Daniel I. Tataru

Ohio State University
Mathematics: Ilya Zakharevich
Physics: Klaus Honscheid

Pennsylvania State University
Chemistry: Paul S. Weiss
Mathematics: Victor Nistor
Physics: Curt J. Cutler
Jorge Pullin

Pennsylvania, University of
Chemistry: Michael J. Therien
Economics: Andrew Atkeson
Janice C. Eberly
Mathematics: Bruce Kleiner
Physics: Alan T. Johnson, Jr.

Polytechnic University
Computer Science: Boris Aronov

Princeton University
Mathematics: Jeffery D. McNeal
Physics: Mordechai Segev
Michael A. Strauss

Rochester, University of
Neuroscience: Charles J. Duffy
Physics: Turan Erdogan

Rutgers University, Camden
Chemistry: Georgia A. Arbuckle

South Carolina, University of
Chemistry: Robert S. Coleman

Stanford University
Computer Science: Rajeev Motwani

State University of New York, Stony Brook
Mathematics: Yair Minsky

Syracuse University
Physics: A. Alan Middleton

Toronto, University of
Chemistry: Lewis E. Kay

Utah, University of
Mathematics: Yongbin Ruan
Neuroscience: Erik M. Jorgensen

Washington State University
Physics: Henry C. Kapteyn

Washington, University of
Computer Science: David Salesin
Neuroscience: Sandra M. Bajjalieh

Wisconsin, University of
Economics: Thaleia Zariphopoulou
Physics: Andrey V. Chubukov

1995 DOCTORAL DISSERTATION FELLOWSHIPS

Doctoral Dissertation Fellowships **$1,325,000**

The Sloan Dissertation Program, established in 1984, is designed to assist doctoral candidates in two fields of traditional interest to the Foundation: economics and mathematics. These awards allow Fellows to concentrate on completing their doctoral research and writing the dissertation.

Fellowships have been received by 590 graduate students and have accounted for expenditures of over $11 million. In 1995, awards covering full tuition plus a stipend of $15,000 were made to 25 doctoral candidates in each field. Nominations were solicited from the heads of leading graduate departments of economics and mathematics. They were reviewed and final selections made by the following committees:

Economics: Dr. Avinash K. Dixit, Princeton University; Dr. Sherwin Rosen, University of Chicago; Dr. John B. Taylor, Stanford University.

Mathematics: Dr. Richard W. Beals, Yale University; Dr. Nicholas M. Katz, Princeton University; Dr. John Morgan, Columbia University.

FELLOWSHIP RECIPIENTS

Brown University
Mathematics: Niranjan Ramachandran

California Institute of Technology
Mathematics: Alexander Kiselev
Stanislav Smirnov

California, University of, Berkeley
Economics: Jeffrey Christopher Ely
Edward D. O'Donoghue
Mathematics: Bumsig Kim

California, University of, Los Angeles
Mathematics: Semion Shteingold

California, University of, San Diego
Economics: Maria Teresa Candido
Jeffrey Robert Russell
Mathematics: Andrei E. Vityaev

Carnegie Mellon University
Economics: Patrik Sandas

Chicago, University of
Economics: Stefan Johannes Krieger
Jesus J. Santos
Bruce A. Weinberg
Mathematics: E. Jerome Beneviste
Norman Levin

Cornell University
Economics: Joydeep Bhattacharya

Duke University
Economics: Ted Gayer
Mathematics: Kevin Patrick Knudson

Harvard University
Economics: Jeffrey Liebman
Steven Tadelis
Mathematics: Brendan Hassett
Alexander Polishchuk

Maryland, University of
Mathematics: Vitali Kapovitch

Massachusetts Institute of Technology
Economics: Jeffrey D. Kubik
Robert J. Shimer
Mathematics: Charles W. Rezk
Christopher T. Woodward

Michigan, University of
Economics: Christopher Foote
Mathematics: Lev A. Borisov
Arvind N. Nair

Minnesota, University of
Economics: Andres Erosa-Etchebehere

New York University
Mathematics: Nicholas Nowak

Northwestern University
Economics: Carolyn M. Moehling
Nicola G. Persico

Princeton University
Economics: Sydney C. Ludvigson
Paul Oyer
Mathematics: Terence Tao

Purdue University
Mathematics: Luca Capogna

Rice University
Mathematics: Chang You Wang

Rochester, University of
Economics: George R. G. Clarke

Rutgers University
Mathematics: Galin Georgiev

Stanford University
Economics: Catherine Clark de Fontenay
Kevin Charles Murdock
Mathematics: Miguel Abreu

State University of New York, Stony Brook
Mathematics: Robert W. Donley

Yale University
Economics: Ivailo Izvorski
Guido Kuersteiner
Mathematics: Mikhail Khovanov
Dmitry Y. Kleinbock

THEORETICAL NEUROBIOLOGY

As described in last year's report, a program in theoretical neurobiology was launched in 1994 with grants totaling almost $7 million to support five new research centers at Brandeis University, California Institute of Technology, New York University, Salk Institute, and University of California, San Francisco. At each of these Centers, young scientists with degrees in physics, mathematics, and other theoretical fields have now been brought into training and research programs involving laboratory procedures. These young theoreticians are expected to join faculty members, some newly appointed as part of Center programs, in research projects at the various Center laboratories. A 1994 grant also supported a set of summer workshops designed to draw together the senior faculty from the Sloan Centers for Theoretical Neurobiology and the newly recruited junior theoretical members. The first such workshop was held in August 1995 at the Santa Fe Institute and afforded participants an opportunity to exchange start-up experiences, review research plans, and explore a variety of theoretical approaches to neurobiological problems.

NEUROSCIENCE, OFFICER GRANT

Santa Fe Institute **$29,995**
Santa Fe, NM 87501

Support for a meeting on neural disorders and neural oscillations. Project Director: Professor Nancy Kopell, Department of Mathematics, Boston University.

MOLECULAR EVOLUTION

Foundation support for research in molecular evolution dates from 1986. New insights into the process of evolution have since been developed and evolutionary perspectives have entered into the mainstream of molecular biology. This research support now includes an expanded program of postdoctoral research fellowships, jointly funded and operated by the National Science Foundation and the Sloan Foundation, and a jointly managed program of support for young investigators in molecular studies of evolution.

NSF/Sloan Postdoctoral Research Fellowships in Molecular Evolution

This competitive program is intended for young scientists who can benefit from the freedom to define and pursue their own research programs while developing relevant interdisciplinary knowledge and skills in a host laboratory or field station. The amount of the Fellowship award is $80,000 for a two-year period, which includes a stipend of $28,000 per year, an allowance of $8,000 per year to defray costs associated with the research and training plan, and an institutional allowance of $4,000 per year.

In this second year of the fellowship program, after a careful process of review of fellowship applications, the following 17 awards were made. Citations are given in the form: name and affiliation of the Fellow; sponsoring scientist and host institution; research topic.

Sharon M. Birks, Cornell University; Scott V. Edwards, University of Washington; *Evolution of megapode incubation strategies and their effect on mating systems: a molecular phylogenetic approach.*

Diane M. Bridge, American Museum of Natural History; Robert E. Steele, University of California, Irvine; *Role of "even-skipped" in Hydra and its evolution in metazoan development.*

Jay D. Evans, University of Utah; Kenneth G. Ross, University of Georgia; *Phylogenetic analysis of hybridization and its effect on social evolution of two polygynous ants.*

Cheryl Y. Hayashi, American Museum of Natural History; Randolph V. Lewis, University of Wyoming; *Molecular evolution of spider silk genes.*

Laura A. Katz, Cornell University; Laura Landweber, Princeton University; *Evolution of DNA deletion and gene scrambling in ciliates.*

Jessica C. Kissinger, Indiana University; Thomas F. McCutchan, National Institutes of Health; *Molecular approaches to the evolution and spread of Plasmodium and Haemosporidia.*

James A. Langeland, University of Oregon; Charles B. Kimmel, University of Oregon; *Origin and evolution of cranial neural crest: gene comparisons in chordate and vertebrate lineages.*

John M. Logsdon, Jr., Indiana University; W. Ford Doolittle, Dalhousie University; *A molecular study of the origin of meiosis.*

Jeffrey K. Lum, University of Hawaii; Lynn B. Jorde, University of Utah; *Evolution and maintenance of nuclear and mitochondrial genetic diversity in small populations.*

Varuni L. Mallampalli, University of Maryland; Rob DeSalle, American Museum of Natural History; *Development and evolution of head structures and their genes in Diptera.*

Rodney Mauricio, Duke University; Martin Kreitman, University of Chicago; *A molecular genetic study of natural variation for resistance in Arabidopsis thaliana.*

Michael A. McCartney, University of California; Harilaos A. Lessios, Smithsonian Tropical Research Institute; *Molecular evolution of reproductive isolation among sea urchins separated by the Isthmus of Panama.*

Ofer Mokady, Yale University; Leo W. Buss, Yale University; *Expression of "engrailed" and "even-skipped" genes in a nonsegmented, radially symmetric organism.*

Sonja Scheffer, State University of New York at Stony Brook; Brian Wiegmann, North Carolina State University; *Molecular systematics and evolution of host-use in Diptera.*

Rush S. Wells, Stanford University School of Medicine; Peter Parham, Stanford University School of Medicine; *Evolution and population genetics of divergent HLA class I alleles.*

Shawn E. White, University of Georgia; John Doebley, University of Minnesota; *Molecular basis of morphological evolution.*

Eugene Y. Xu, University of Chicago; Thomas Kaufman, Indiana University; *Functional and structural divergence of spermatogenic genes in speciation.*

Young Investigators Awards in Molecular Studies of Evolution

The intent of these awards is to provide early funds in support of the research careers of newly independent researchers in molecular evolution. Applicants must hold a position on the regular faculty (or its equivalent) of a U.S. or Canadian nonprofit public or private institution of higher education and research. They must be within the first few years of their research careers and genuinely independent of scientific mentors such as postdoctoral supervisors. Up to five awards per year will be made, each with a total budget of $100,000 over a period of three years. A careful review by an advisory committee of the 46 applications received in the first round of this competition resulted in the following five 1995 awards. Citations are given in the form: name, department, and institution of the awardee; title of proposed research plan.

Junhyong Kim, Department of Biology, Yale University; *Molecular evolution of developmental pathways governing segmentation in Drosophilidae.*

Kerry L. Shaw, Department of Organismic and Evolutionary Biology, Harvard University; *Molecular genetic architectures of speciation.*

Mark S. Springer, Department of Biology, University of California, Riverside; *Molecular evolutionary studies in Mammalian and Echinoderm systems.*

Jeffrey L. Thorne, Program in Statistical Genetics, Department of Statistics, North Carolina State University at Raleigh; *Variation of preferred residues among sequence sites.*

Gregory A. Wray, Department of Ecology and Evolution, State University of New York at Stony Brook; *Molecular determinants of body plan evolution in Echinoderms.*

MOLECULAR EVOLUTION, OFFICER GRANTS

Gordon Research Conferences **$12,500**
Kingston, RI 02881

Support for the first Gordon Conference on molecular evolution. Project Director: William R. Atchley, Professor of Genetics and Statistics, North Carolina State University at Raleigh.

Oxford University **$12,700**
Oxford, England OX1 2JD

For travel costs of U.S. scientists to attend the July 1995 Ancient DNA meeting. Project Director: Dr. Bryan Sykes, Vice-Chancellor.

Rutgers University **$25,000**
New Brunswick, NJ 08903

For initiating a workshop series among relevant scientific societies regarding the basic and applied science potentials of modern evolutionary biology. Project Director: Dr. Thomas R. Meagher, Director, Graduate Program in Ecology and Evolution.

COMPUTATIONAL MOLECULAR BIOLOGY

Exceptional scientific potential exists in the application of powerful modern computational techniques to the complex problems increasingly facing molecular biology. However, there are now too few scientists possessing the cross-disciplinary skills in both molecular biology and computation needed to further such advances. During 1995, the Alfred P. Sloan Foundation and the U.S. Department of Energy announced a joint postdoctoral fellowship program designed to give computationally sophisticated young scientists an intensive experience in a molecular biology laboratory. This program is focused on those aspects of computational molecular biology related to data and information resulting from the study of human and other genomes. Computational molecular biology is taken broadly to include the application of mathematics (continuous and discrete), statistics, probability, and computer science. The goal is to foster interactions between the mathematical and biological sciences for genome studies and to provide rigorous training for scientists in this new interdisciplinary area.

Up to ten annual fellowships will be granted, each with a total budget of $100,000 over two years, to support research work in an appropriate molecular biology department or laboratory in the U.S. or Canada. This new jointly sponsored postdoctoral research awards program was announced in July 1995. Since the first awards in the program were made in 1996, full details will appear in next year's annual report.

ASTROPHYSICS, TRUSTEE GRANT

Astrophysical Research Consortium **$2,000,000**
Seattle, WA 98195

In the three preceding years, the Foundation made grants totaling $8 million to this consortium for the development of what is now known as the Sloan Digital Sky Survey. The project involves building a specially designed telescope system and developing complex new software to survey much of the northern sky. One million galaxies and 100,000 quasars are expected to be photometrically and spectroscopically identified. Even if no unexpected discoveries occur, the survey will produce a huge amount of astrophysical data and is likely to result in a significant increase in our understanding of the development and structure of the universe.

The project involves support, scientific and financial, from many contributors. Completion of the telescope system is now planned for mid-1996 and a period of testing will be followed by systematic observations expected to begin in 1997. The current grant will assure that the transition from assembly of equipment through the commissioning period and into the initial observations is not delayed by funding problems. Project Director: Dr. Donald G. York, Director, Apache Point Observatory.

LIMITS TO KNOWLEDGE, TRUSTEE GRANTS

Institute for Advanced Study **$30,000**
Princeton, NJ 08540

A 1994 Foundation-supported workshop on the subject of limits to knowledge (inherent limitations, if any, to what we can ever know) has resulted in a collaboration between astrophysicist Piet Hut and Stanford University cognitive psychologist Roger Shepard. Their discussions, joined by several other scientists, have led to a working conclusion that limitations to scientific knowledge are temporary blockages awaiting new modes of thought, new methods and understanding of hidden assumptions. The current grant will allow these discussions to continue, will broaden the circle of scientists involved, and will enable Hut and Shepard to complete their book on this subject. Project Director: Piet Hut, Professor of Astronomy.

Santa Fe Institute **$108,618**
Santa Fe, NM 87501

The workshop mentioned above allowed about 25 participants, from such fields as mathematics, physics, astronomy, economics, biology, psychology, and computer science, to discuss the following questions: how do we recognize the current boundaries of what is known?; can we determine what more is knowable?; and are there things we will never know, that are inherently unknowable? The present grant supports continued discussion of these issues in two workshops, one in physics and the other in economics. These workshops are intended to bring the questions of how much we know and how much we can know to more people and thus to stimulate further analysis and research on the topic of limits to knowledge. Project Director: Professor Joseph F. Traub, Computer Science Department, Columbia University.

LIMITS TO KNOWLEDGE, OFFICER GRANT

International Institute for Applied Systems Analysis **$30,000**
Laxenburg, Austria

To support research and writing on limits to knowledge. Project Director: Cesare Marchetti, Professor.

MATHEMATICS AND COMPUTER SCIENCE, TRUSTEE GRANT

University of Southern California **$231,717**
Los Angeles, CA 90089

Leonard Adleman is a mathematical computer scientist who some years ago took time to learn how to do experimental molecular biology. His research report in *Science* (November 11, 1994) described how he obtained the solution of a small-sized graph theory problem using DNA as computing elements. Since that time there has been a great deal of discussion and controversy about this biological approach to computation carried out in test tubes. To extend the method to combinatorial problems large enough to be useful or to compete with electronic computation was quickly seen to require enormous amounts of DNA, reagents, and money. However, a new class of problems, so-called satisfaction problems in Boolean algebra, appears to be amenable to DNA methods. Other applications have also been suggested. This grant, by funding technical assistance and the cost of fabricating DNA strands, will allow trying out some of these new ideas in the laboratory. Project Director: Leonard M. Adleman, Professor of Computer Science.

MATHEMATICS AND COMPUTER SCIENCE, OFFICER GRANT

National Academy of Sciences — **$30,000**
Washington, DC 20418

Partial support for a conference on Actions for the Mathematical Sciences: Adapting to the Changed Environment. Project Director: Dr. John Tucker, Director, Board on Mathematical Sciences.

SCIENCE AND TECHNOLOGY POLICY, TRUSTEE GRANT

American Association for the Advancement of Science — **$150,000**
Washington, DC 20005

This grant supports the work of Philip M. Smith and Michael McGeary, in preparation of a book examining the recent history and current state of national science and technology policy. During 1981-94, Smith was executive officer and McGeary was senior staff officer and study director of the National Academy of Sciences. They will describe and analyze recent policy decisions that have led to changes in the level of support for basic and applied research and in the administration of the research enterprise. Other issues, such as government's role in the support of private technology and the increasing importance of international cooperation in scientific programs, will also be examined. Extensive interviews are planned with key participants in policy decisions. The aim is to produce a book summarizing the recent evolution of science and technology policies and programs in the United States and discussing current and future issues and trends. Project Director: Albert H. Teich, Director for Science and Policy Programs.

SCIENCE AND TECHNOLOGY POLICY, OFFICER GRANT

Harvard University — **$30,000**
Cambridge, MA 02138

Support for a faculty and student seminar and the production of a manuscript on the role of science policy in the nation's economic and other objectives. Project Director: Lewis M. Branscomb, Director, Science, Technology and Public Policy Program.

OTHER SCIENCE AND TECHNOLOGY, OFFICER GRANTS

Georgia Tech Foundation, Inc. — **$15,000**
Atlanta, GA 30332

Funds to help U.S. university researchers attend a conference on the future of semiconductor technology. Project Director: James Meindl, Pettit Professor of Microelectronics, Georgia Institute of Technology.

Keystone Center — **$25,000**
Keystone, CO 80435

Support for the summer 1995 Scientist-to-Scientist Colloquium. Project Director: Robert W. Craig, President.

TRUSTEE GRANTS

Association for Symbolic Logic **$131,780**
New Haven, CT 06520

This grant supports the work of a team of mathematical logicians in preparation of the fourth (and final) volume of the collected works of Kurt Gödel, generally considered the most outstanding logician of the twentieth century. Gödel's *Nachlass*, his unpublished manuscripts, lecture notes, and notebooks will all be preserved on microfilm. Project Director: Solomon Feferman, Professor of Mathematics, Stanford University.

Massachusetts Institute of Technology **$70,060**
Cambridge, MA 02139

A 1992 officer grant supported the collection and preservation of an archive of interviews, manuscripts, and other items of historical interest concerning the then-ongoing transformation of science in the recently collapsed Soviet Union. The current grant will support the writing of a book based on this unique archive. Project Director: Loren R. Graham, Professor of History of Science.

Rutgers University **$412,650**
New Brunswick, NJ 08903

Since 1981, the Foundation has made three grants to support the Papers of Thomas A. Edison project, resulting in the completion of three of six parts of a microfilm edition and three of the projected fifteen volumes of the book edition. This new grant will support preparation of the fourth and fifth volumes covering the years 1878-1881, a period when Edison developed and marketed the tin-foil phonograph, refined the transmitter portion of the telephone, and did fundamental research on the incandescent light. Work will be done to allow for the transformation of project documents and books to more widely accessible electronic versions. The grant also includes support for the completion of a new biography of Edison by Paul Israel, Professor of History at Rutgers, and a long-time member of the team of editors of the Edison project. Project Director: Dr. Robert Rosenberg, Director and Editor, Thomas A. Edison Papers.

OFFICER GRANT

American Philosophical Society **$30,000**
Philadelphia, PA 19106

Support for publication of a biography of Henry Cavendish. Project Director: Herman H. Goldstine, Executive Director.

STANDARD OF LIVING AND ECONOMIC PERFORMANCE

The goal of this program is to contribute to the understanding of the basic forces that will maintain and improve a high American standard of living in an increasingly competitive global economy. The program spans a broad range of areas which affect the ability of U.S. industry to compete in world markets: the vitality of manufacturing and service sector industries; the process of globalization of industry; productivity and innovation; start-up companies; the nature and role of the corporation; nonprofit sectors; training for jobs; human resources; and workplace and family issues.

In 1990, the Foundation launched a major effort within this program by establishing interdisciplinary centers at leading research universities to study selected U.S. industries. The objective is to support the growth of an academic community involving scholars, mainly in engineering, management, and economics, who will develop close contacts with industry and provide realistic research and education on the American industrial sector.

In 1995, new centers were established for study of the managed health care industry at Harvard University and for the trucking industry at the University of Michigan. Renewal grants were approved for continued operation of the center studying the financial services industry at the Wharton School of the University of Pennsylvania and of the Industrial Performance Center at Massachusetts Institute of Technology. Activities continued at the other established centers: steel (Carnegie Mellon and Pittsburgh); motor vehicles (MIT); semiconductors (UC Berkeley); apparel and textile (Harvard); pharmaceuticals (MIT); computers (Stanford); powder metallurgy (Worcester Polytech); and the food retail and service industry (Minnesota).

Other major 1995 grants, all reported in this section, supported projects on manufacturing and technology, globalization, economics research, the role of the corporation, training and education, university as a system, assessment of government performance, human resource management, and workplace and family issues.

TRUSTEE GRANTS

Harvard University **$1,232,515**
Cambridge, MA 02138

This grant supports the creation of a center for the study of the managed health care industry. Faculty and graduate students from the Graduate School of Public Health, Medical School, Kennedy School of Government, the Business School, and several departments of the College of Arts and Sciences will participate. Visits to a varied group of health plan companies and to hospital and physician health care providers will be used to explore such issues as the contractual relationship between payers and providers, the effect of these business arrangements on the amount and quality of care, and the outcomes of various medical and preventive procedures in this business context. Major field studies will follow the initial period of interacting with actual companies and participants of the industry. Project Director: Joseph P. Newhouse, MacArthur Professor of Health Policy and Management.

Massachusetts Institute of Technology **$2,689,563**
Cambridge, MA 02139

A Foundation grant in 1991 supported the formation of the Industrial Performance Center at MIT. The Center's major objectives were to create an academic environment in which issues of industrial performance could be brought forward to faculty and students, to work on research topics arising from those issues, and to develop relationships with industrial companies and government agencies in order to encourage the flow of information between the Center and this off-campus audience. In its first four years, faculty of the Center produced six Ph.D.s, had twice that number of enrolled doctoral students and an even larger number at the Masters level, completed two books and over 30 research papers and reports, introduced new courses, testified for congressional committees, and visited, made observations, and received data from 150 companies, government bureaus, and other organizations. The Sloan Human Resources Network, a meeting ground for scholars to join in research on new human resource and work organization issues, was made part of the Center.

This grant renews support of the Center's work. Research will be conducted on such topics as the influence of new workplace organization and technology on the training and education of personnel, the dependence of manufacturing performance on the process supply chain, and differences and similarities in international production. The Center will continue developing its role as a central focus on industrial activities at MIT, keeping industrial issues close to the science and engineering functions of the Institute. Project Director: Professor Richard K. Lester, Director, MIT Industrial Performance Center.

University of Michigan **$2,206,500**
Ann Arbor, MI 48109

A center for study of the trucking service industry will be created with this grant. The industry, employing 1.6 million people and carrying 78% of the dollar value of the nation's freight, is an essential link in the goods economy. Its efficiency and quality of service directly affects the supply of materials into and out of our factories.

Michigan business and engineering faculty and their students will conduct an initial comparative study of two fundamental questions: how trucking firms manage on-time, high quality deliveries that accommodate shippers and satisfy receivers, and how firms hire and retain the kind of drivers now required by both regulation and by the need to fulfill service goals. Turnover rates are very high in many firms and human resource problems are therefore of great importance. Contacts will be made and interviews conducted not only with trucking firms, but also with shippers and receivers of goods, the Teamsters Union, and government agencies. A set of case studies will be prepared. Graduate seminars, workshops, and other academic activities are planned. This pilot research is expected to lead to several major comparative studies of U.S. companies within and across industry segments. The aim is to develop an understanding of the role in the industry of technology, logistics, business organization, human resource management, and other factors. The comparative contribution of trucking services to the economies of their countries will eventually be studied, as will the interaction of trucking with other modes of transport of goods. Project Director: Chelsea C. White, III, Professor of Industrial and Operations Engineering.

University of Pennsylvania **$2,510,000**
Philadelphia, PA 19104

This grant renews support of a center for the study of the financial services industry initiated at the Wharton School with Foundation funding in 1992. The aim was to work directly with banks, insurance companies, and investment firms on the most significant issues for the industry and to make observations, collect data, and develop information of value to the industry. An early set of visits to twenty leading national companies produced the somewhat unexpected result that the major issue was not the productivity of back office transaction processing, but rather the effectiveness of the retail "front end" of the firm, the innovative ways that products and kinds of customers could be increased. Another issue that surfaced was the need to understand better the combined set of risks and tradeoffs that institutions in all the subsections of the financial industry continually face. Over the past three years, 20 faculty members and 24 graduate students have worked on these and other studies. Eight students have received Ph.D.s, conferences and workshops have been held, new courses have been developed, and over 40 articles have been written, mostly for academic journals but also for trade magazines.

Ongoing study of productivity drivers in retail banking will be continued with additional fieldwork and surveys and extended to banking in other countries. A similar large study for the insurance industry is also planned, as is an assessment of productivity of non-banking institutions that also compete for savings, investments, and loans. On the issue of risk, the focus will be on quantification of the state of practice of risk management within each sector of the industry and on improvements in firm-level risk management practices. Also planned is an extension of the work on mutual funds. Project Director: Anthony M. Santomero, Mellon Professor of Finance, Wharton School.

Northeast-Midwest Institute **$28,919**
Washington, DC 20003

To support a presentation by Sloan industry studies leaders for the Congressional Task Force on Manufacturing. Project Director: Dick Munson, Executive Director.

Training Research Corporation **$26,000**
Sherman Oaks, CA 91403

Support for the preparation of a book on the diffusion of lean production into a supplier network. Project Director: Professor Wellford W. Wilms, Graduate School of Education and Information Studies.

University of California, Irvine **$30,000**
Irvine, CA 92717

Support for the preparation of a book on the development of the computer industry in Southeast Asia. Project Director: Kenneth L. Kraemer, Professor of Management and Computer Science.

University of Minnesota **$289,973**
Minneapolis, MN 55455

Flat panel displays are a new technology that make notebook computers possible. They represent yet another of the technologies in which American companies produced early discoveries and patents, but which ended up in Japanese manufactured products. Development of a U.S. manufacturing capability has recently been encouraged by the Departments of Defense and Commerce. This grant supports the study of developments in Japan, Korea, the United States, and Europe that have led to the present situation. Researchers will examine the internal corporate and external environmental changes that would be necessary for a significant re-entry into the industry by U.S. firms. Information will be sought from government agencies and detailed interviews with company managers and technical leaders will be undertaken to assess the relevant technical and business issues. Project Director: Professor Stefanie Ann Lenway, Carlson School of Management.

University of Wisconsin **$491,765**
Madison, WI 53706

This grant supports an examination of the recovery of manufacturing industries in the Midwest from the "rusting" evident in the early eighties. Changes in the quantity and nature of jobs, in skills and training requirements, in compensation, and in the organization of companies and their work processes will be considered. The study will seek to understand what accounts for the lack of uniformity in the recovery, both in states and industries of the region. A small number of industries important in Midwest manufacturing will be selected and detailed interviews conducted with about a dozen small and large firms per industry. A large number of randomly selected regional firms will also be approached. The aim is to gain insight via this regional study into important aspects of employment in the country's changing industrial economy. Project Director: Craig Olson, Wolfe Professor of Business Research.

MANUFACTURING, OFFICER GRANTS

Harvard University **$24,066**
Cambridge, MA 02138

Support for research on the distribution of profits from invention. Project Director: F. M. Scherer, Professor of Business and Government.

Yale University **$30,000**
New Haven, CT 06520

For study of quality practices and results in the U.S. and Japan. Project Director: Arthur J. Swersey, Professor of Operations Research.

TRAINING AND EDUCATION, TRUSTEE GRANTS

Editorial Projects in Education **$90,000**
Washington, DC 20008

This grant supports the research and writing for a book that will describe the successes and difficulties of new school-to-work transition programs. Efforts to prepare young people for work in manufacturing are now supported by the federal government, but questions remain about how to make them actually work. Lynn Olson plans to write detailed accounts of several state and city apprenticeship and tech-prep efforts. She will interview the entire constituency — students, parents, teachers, company managers and workers, civic leaders, union representatives. The aim is to write an evenhanded account of what works and what is hard to achieve so that the public, especially those concerned with schools and school policy, can be informed. Project Director: Lynn Olson, Senior Editor.

Stanford University **$2,000,000**
Stanford, CA 94305

This grant renews support for a program initiated in 1991 designed to produce professors of manufacturing. The first class of five students began in September 1992 and a fourth class is now enrolled. All students have had industrial experience and are candidates for doctoral degrees in a department of either the Graduate School of Business or the School of Engineering. Special courses, seminars, and field experiences have been created in order not only to ready students for academic careers, but also to have them understand how to deal with companies. Links to manufacturing companies have been forged as part of the research support for theses projects. The program has increased the emphasis on manufacturing in engineering and business courses at Stanford and course materials will be propagated to other graduate schools. Initial graduates of the program have found attractive university faculty positions. Stanford has been successful in obtaining matching funds from private sources, individuals and companies. This renewal grant will complete the funding for the first five classes, producing 25 new professors of manufacturing. Project Director: Professor Charles Holloway, Graduate School of Business.

TRUSTEE GRANTS

Carnegie Mellon University **$393,399**
Pittsburgh, PA 15213

This grant funds a study of how the globalization of the automobile industry is affecting the quantity and quality of jobs and pay in that industry. Included will be the movement to locations outside the U.S. of assembly, parts supply, and other functions by U. S. manufacturers, as well as the transfer of production facilities to the U.S. by foreign producers. A set of case studies will be developed in an attempt to understand why new locations for various functions and products were chosen, and what the effects of those decisions have been on productivity and on employment conditions at new and old locations. General Motors, Volkswagon, and Toyota will be among the companies studied. Close cooperation between this research and the work of the International Motor Vehicle Program at MIT will be maintained. Project Director: Dr. Richard Florida, Director, Center for Economic Development.

University of California, Davis **$123,338**
Davis, CA 95616

Within the broad context of globalization of industries, there is a secondary tendency to regionalize at the continental level, particularly for manufacturing. This grant supports a comparative study of the changes in personal computer and color television manufacturing on the North American continent. Using bibliographic research and on-site plant visits, data-gathering, and personal interviews, the study will document the international division of labor between Asia and North America in these industries, how it is changing, and how these changes are reflecting themselves in locational changes within North American countries, primarily the U.S. and Mexico. Project Director: Professor Martin Kenney, Institute of Governmental Affairs.

University of California, San Diego **$1,150,510**
La Jolla, CA 92093

The focus of the research supported with this grant is the phenomenon of globalization in the computer data storage products industry. This industry, although begun in America and still dominated by U.S. firms, has seen significant globalization within the last five years. All the major U.S. companies now do the bulk of their manufacturing offshore. In many similar industries, loss of manufacturing has eventually led to the loss of other parts of the industry, with only marketing, distribution, and support remaining in the U.S. The study will measure the actual extent of globalization in the industry, model manufacturing costs and other factors in order to understand their importance in siting decisions, and seek to understand the movement offshore and the likelihood of eventual loss of the entire industry in the U.S. Contacts within the industry resulting from the work over several years of the School of Engineering's Center for Magnetic Recording Research will facilitate interviews and information gathering. The possibility of generalizing what has been learned to other high-tech "commodity" industries will be considered. Project Director: Dr. Peter Gourevitch, Dean, Graduate School of International Relations and Pacific Studies.

OFFICER GRANTS

Carnegie Mellon University **$23,111**
Pittsburgh, PA 15213

To support revisions and preparation of a proposal for the joint CMU-MIT study of globalization and automotive industry employment. Project Director; Dr. Richard Florida, Director, Center for Economic Development.

Institute for International Economics **$30,000**
Washington, DC 20036

Partial support for a study and report on standards, conformity-assessment, and trade in the Asia-Pacific Economic Cooperation region. Project Director: John Sullivan Wilson, Visiting Fellow.

University of California, Berkeley **$30,000**
Berkeley, CA 94720

Support for a workshop on globalization. Project Director: Professor Michael Borrus, Co-Director, Berkeley Roundtable on the International Economy.

University of California, San Diego **$25,226**
La Jolla, CA 92093

For a preliminary investigation into globalization of the data storage industry. Project Director: Dr. Roger Bohn, Graduate School of International Relations and Pacific Studies.

University of Michigan **$29,832**
Ann Arbor, MI 48109

Support for research on globalization of production and services. Project Director: Frank P. Stafford, Professor of Economics.

TRUSTEE GRANTS

Health Effects Institute **$175,900**
Cambridge, MA 02139

The HEI was formed in 1980 to do research required by both the government and the automobile industry on poorly understood, unregulated constituents of automotive emissions. HEI studies have influenced many decisions, for example, on carbon monoxide regulations. All world manufacturers of car and truck engines used in the U.S. and the government share in funding HEI work. Its operating budget is restricted to meeting its chartered functions and cannot be used to address other scientific issues of importance to industry, for example, asbestos (building materials industry) and electromagnetic fields (electric power industry). This grant enables HEI to evaluate whether its way of working can apply effectively in other industrial sectors where environmental and health effects are important. Project Director: Daniel S. Greenbaum, President.

National Bureau of Economic Research **$111,817**
Cambridge, MA 02138

This grant supports the preparation of the first scholarly survey of the sources and consequences of financial innovation in the United States. Included will be commercial, investment, and central banking, the money market, securities markets, mortgage and consumer credit, and insurance. Project Director: Richard Sylla, Professor of Economics, New York University, and Research Associate, NBER.

New York University **$404,850**
New York, NY 10011

Recently developed theoretical work in the field of international trade deals with the ability of countries to create and hold industries whose products show increasing returns to scale. The new theory seeks to explain realistic examples of trade and industry that do not follow the classical theory of comparative advantage. Its major theoretical contribution is the ability to deal with the large number of equilibrium points that result when the industries have products with increasing returns. The theory predicts that govern-

ment help may be needed in getting over the threshold barrier of starting an industry or in retaining a desired national industry. This grant supports empirical testing of the theory using new data on the movement and retention of industries in various countries. A set of case studies will be developed on industry creation, retention, and loss. A dynamic version of the theory will be studied that models the movement of industries and shows the effects of learning by doing and how advantages deteriorate over time. Project Director: Professor William J. Baumol, C. V. Starr Center for Applied Economics.

Stanford University **$210,193**
Stanford, CA 94305

This grant supports a study of the economic value of information in start-up companies. The theoretical work will be informed by case studies of new companies in Silicon Valley in order to understand the information required by investors, entrepreneurs, and managers in the process of creation and growth. The research will try to clarify the ways in which firms retain information, through people and other means, and thus create value. The kind of information leading to a commitment to a new product, the way entrepreneurs acquire the needed information before deciding to develop or abandon a product, how information is transmitted to potential backers, are examples of topics to be included in the study. Project Director: Kenneth J. Arrow, Professor of Economics Emeritus.

Woods Hole Oceanographic Institution **$314,727**
Woods Hole, MA 02543

During the past few decades, traditional U.S. marine industries, such as ship-building, shipping, and fishing, have declined in value or employment while new activities, particularly recreation and the extraction of offshore oil and gas, have grown. The research supported with this grant deals with sources of productivity change in the marine sector and explores how these have affected its evolution and may influence its future. One part of the study will emphasize interaction with persons having first-hand knowledge of regulatory impacts and other factors affecting marine industries. Another will employ econometric techniques with data from the key marine industries to estimate an aggregate production function for the sector. Project Director: Dr. Di Jin, Assistant Scientist.

ECONOMIC ASPECTS AND RESEARCH, OFFICER GRANTS

Brookings Institution **$30,000**
Washington, DC 20036

For research and writing on the relations between individual behavior, economic preferences, and public economic policy. Project Director: Dr. Henry J. Aaron, Director of Economic Studies.

University of Minnesota **$30,000**
Minneapolis, MN 55455

To prepare a book on technology and development. Project Director: Professor Vernon W. Ruttan, Department of Agricultural and Applied Economics.

Washington State University **$26,072**
Pullman, WA 99164

To explore ways to improve connections between the university and local food processors. Project Director: Dr. Desmond O'Rourke, Director, International Marketing Program for Agricultural Commodities and Trade (IMPACT) Center.

TRUSTEE GRANTS

Stanford University **$245,802**
Stanford, CA 94305

University of California, Berkeley **$204,070**
Berkeley, CA 94720

As part of the Foundation's program in the role of the corporation as a central institution of American society, it is useful to have a sound empirical understanding of the life cycles and patterns of birth and death of enterprises. (Founding new corporations and some mergers, for example, lead to births; bankruptcy, other mergers, disbanding, and suspension by regulators lead to deaths.) The field of "corporate demography" studies the lifetimes of enterprise populations within an industry. This grant supports research in this field. How social conditions at an organization's birth affect its chance of survival and how various events in a corporation's lifetime relate to its age, size, and the composition of the population of which it is a part are among the questions to be studied. Detailed case studies to be developed will examine populations of firms in the financial services sector in the U.S. and the worldwide automobile industry. Project Directors: Michael T. Hannan, Jr., Professor of Organizational Behavior and Human Resources, Stanford University; Glenn R. Carroll, Professor of Management, UC Berkeley.

University of Maryland **$201,250**
College Park, MD 20742

This grant supports the formation of a network which will help define and enlarge the growing community of researchers examining the fundamental nature and purposes of the corporation. Three workshops, visits and regular electronic communication will encourage discussion of various views of the corporation and other related issues. Publication of a collection of papers on current research on the role of the corporation is planned. Project Director: Lee E. Preston, Professor of Business and Public Policy.

OFFICER GRANTS

Brookings Institution **$30,000**
Washington, DC 20036

Support for a conference on corporate governance and human capital. Project Director: Margaret Blair, Senior Fellow.

St. John's College **$30,000**
Annapolis, MD 21404

For research and writing on the evolution of the role of the corporation in American culture. Project Director: Dr. David L. Townsend, Tenured Tutor.

UNIVERSITY AS A SYSTEM, TRUSTEE GRANTS

Georgia Tech Foundation, Inc. **$51,325**
Atlanta, GA 30332

Numerous leaders in higher education have expressed concerns in recent years about how individual universities and the sector as a whole can best adapt to changing times. The basic purposes of the institutions as well as their cost-effectiveness and productivity have been questioned. This grant supports a workshop to explore major problems facing universities, review prior attempts to analyze these issues, and identify fields where research results about the nature of the university and higher education as an industry would be useful to university leaders and others. Particular attention will be given to looking at individual problems in the larger context of the university as a system. Project Director: Dr. Michael E. Thomas, Executive Vice President.

RAND Corporation **$620,276**
Santa Monica, CA 90407

This grant supports a study of higher education as an industry by a number of RAND specialists in higher education and the economics of service industries. The internal dynamics of higher education, its context (demographic, fiscal, regulatory), and outputs and outcomes of higher education for society will be characterized and analyzed. Visits to campuses, workshops, existing data sources at the national, state, and institutional level, and a new as yet unanalyzed survey of several hundred departments will be used as sources of information. Project Director: Dr. Roger Benjamin, Director, Institute on Education and Training.

UNIVERSITY AS A SYSTEM, OFFICER GRANTS

American Academy of Arts and Sciences **$30,000**
Cambridge, MA 02138

Support of a workshop and the publication of an issue of *Daedalus* on the American academic profession. Project Director: Stephen R. Graubard, Editor, *Daedalus*.

Stanford University **$20,000**
Stanford, CA 94305

To disseminate the results of Sloan-supported studies on the production of science and engineering doctorates. Project Director: William F. Massy, Director, Stanford Institute for Higher Education.

University of California, Berkeley **$30,000**
Berkeley, CA 94720

For research and writing comparing higher education in the U.S. and other advanced industrialized nations. Project Director: Professor Martin Trow, Graduate School of Public Policy.

University of California, Los Angeles **$30,000**
Los Angeles, CA 90024

To explore the feasibility of creating system models of the university. Project Director: Dr. C. Kumar N. Patel, Vice Chancellor, Research.

ASSESSMENT OF GOVERNMENT PERFORMANCE, TRUSTEE GRANTS

Fund for the City of New York **$2,000,000**
New York, NY 10013

A Center for the Assessment of Municipal Government Performance will be established with this grant. Measures to assess the performance of New York City agencies will be developed, tested, and implemented. The Fund has had successful experience with their Sanitation Scorecard, now used by evaluators hired by the Mayor's Office of Operations to rate the cleanliness of selected blocks in each of the city's sanitation districts. This system was developed with citizen input and is used by many city community boards in their regular discussions with the Sanitation Department. Based on opinions obtained

from citizen focus groups, community boards, and other interested organizations, additional government functions will be selected for assessment. The adequacy of public safety, cleanliness of public spaces, and the condition of streets and roadways are possible themes. Accepting the view that the key to useful assessment is identification of an audience outside the government who will pay attention to the assessment and employ it to effect improvement, newly developed assessment measures will be tested and refined and the results at every stage widely reported to city agencies, the Mayor's Office of Operations, the press, community boards and other interested nongovernment organizations and citizen groups. Project Director: Dr. Barbara Cohn, Vice President.

Harvard University **$198,660**
Cambridge, MA 02138

Among traditional performance measures for the evaluation of police departments are reported crime rates, overall arrests, and response times. As departments undertake the transition to community policing, additional measures are needed of the extent to which crime is deterred, the citizen's sense of security increased, and other services to the community provided. With this grant, a working group of the chiefs of police of major cities moving to community policing, representatives of local communities, individuals from public sector accounting firms active in auditing police operations for mayors and city councils, crime reporters, and academic experts in policing will be brought together for a series of meetings to develop practical and affordable performance measures deemed workable in the cities. Case studies will be prepared documenting the policy making and implementation process occurring in the cities. Throughout this process, representatives of local communities, the press, and nongovernment groups will be involved so they are able to use the new measures to improve performance of their police departments. Project Director: Mark H. Moore, Guggenheim Professor of Criminal Justice Policy and Management, Kennedy School of Government.

Urban Institute **$1,540,328**
Washington, DC 20037

At the request of city managers, the International City/County Management Association (ICMA) created in 1994 the Comparative Performance Measurement Consortium. The Consortium, with 38 jurisdictions participating, sought assistance from the Urban Institute for the provision of data analysis and interpretation, and for reporting of performance measures that could be readily used by chief executives and their staffs to effect improvement in the provision of services to citizens. The current grant will fund this work and also support the participation of the National Civic League, a private, nonprofit corporation with extensive experience in forging community-based coalitions to address local problems. The Consortium has committed to assuming the costs of this program over time. Their staff will be assisted and trained initially by the Urban Institute. Joined by ICMA and the National Civic League, all will work with local citizen groups in each locality to engage them in the effort and, where appropriate, to train them to use the performance assessment results to effect local change. Project Director: Gene Steuerle, Senior Fellow.

TRUSTEE GRANTS

Jobs for the Future **$476,565**
Boston, MA 02114

This grant funds a study of the effects of corporate restructuring on wages and skill development. As companies reorganize, employees may lose jobs or otherwise find themselves with entirely altered career opportunities. One part of this project, to be carried out by Jobs for the Future, will develop case studies of large corporations in two different industries (large appliances and insurance) and with the contractors and suppliers of services and goods who have taken up some of the organizational and production functions of these companies. The other part, by the Urban Institute, will use worker and employer wage records in state unemployment insurance systems in four states to examine individual employment dynamics as workers move out of firms and into others. Project Director: Dr. Harold Salzman, Director of Research.

Massachusetts Institute of Technology **$130,649**
Cambridge, MA 02139

The project supported by this grant will study wage effects in companies that have reorganized work and introduced new technology and human resource practices. Data collected earlier from 875 U.S. companies on their adoption of so-called high performance work and management practices, as well as on wage, job level, job tenure and other worker characteristics from a sample of employees at these companies, will form the basis for this study. The aim is to understand sources of wage effects and the impact of changes in organizations, such as restructuring, downsizing, and outsourcing, on careers and job security. Project Director: Paul Osterman, Professor of Human Resources and Management.

RAND Corporation **$333,296**
Santa Monica, CA 90407

In collaboration with the National Institute for Economics and Social Research of London, RAND will study the relationship between actual job performance and education, training, and skill of the workforce in two service sector industries, business hotel and banking, and in three countries, England, Germany, and the U.S. Ten to twelve establishments for each sector in each of the three countries, making a total of 60-70 companies, will be visited. Interviews will be conducted with managers, supervisors, and workers. Direct observations will be made of workers and their skills and how they are managed at each company. Data will be obtained for each hotel and bank on amount and quality of service provided, educational requirements for jobs, computer investment and use, and human resource management practices. Project Director; Dr. David L. Finegold, Institute on Education and Training.

OFFICER GRANTS

Cornell University **$26,462**
Ithaca, NY 14853

Support for writing a book on the decentralization of human resource management and industrial relations. Project Director: Harry C. Katz, Professor of Industrial and Labor Relations.

University of California, Berkeley **$29,206**
Berkeley, CA 94720

To support a workshop on workplace research in the service sector. Project Director: Jean Lave, Professor of Social and Cultural Studies, Graduate School of Education.

University of Minnesota **$18,000**
Minneapolis, MN 55455

For a survey of firms to analyze the determinants and consequences of work organization. Project Director: Professor Avner Ben-Ner, Industrial Relations Center.

TRUSTEE GRANTS

Boston University **$240,045**
Boston, MA 02215

Both the workplace and the family have undergone massive changes in the last several decades. Firms have restructured their business strategies, work organizations, and human resource practices. Families and households have experienced a radical transformation as women have entered the labor market in large numbers. This grant supports the formation of a research network that will bring together leading scholars of the restructuring of work and of work-family issues. The network will provide a forum for generating collaborative research to examine how changes in the workplace can be used to incorporate work-family needs of employees. Project Director: Dr. Bradley Googins, Director, Center on Work and Family.

Institute for Women's Policy Research **$264,000**
Washington, DC 20036

This grant supports a two-year project to produce new nationally representative data on the extent and nature of career enhancing part-time work for managers and professionals. Several different national data sets will be used to determine which types of work locations are most conducive to these career opportunities. The research will contribute to our knowledge of the types of professionals and managers who pursue part-time careers, taking into account their specific occupations, life stages, gender, and family characteristics. Project Director: Dr. Roberta Spalter-Roth, Director of Research.

National Public Radio **$145,402**
Washington, DC 20001

NPR will use this grant to improve its coverage of work and family issues. A workplace and family issues beat will be established, on a one-year pilot basis, with a full-time reporter and part-time editor and producer. Work-family reports and special series will appear on NPR's award winning news programs. Project Director: Larry Abramson, Senior Editor.

Women's Research and Education Institute **$229,876**
Washington, DC 20009

Since the mid-1980s, the structure of work has changed for many workers. Increasing numbers now work in nonstandard arrangements, as self-employed independent contractors, leased employees, part-time workers, and temporaries. In 1995, the Bureau of Labor Statistics (BLS) completed its first study of nonstandard forms of work, focusing primarily on the demographic, industrial, and occupational characteristics of nonstandard workers. Family issues were not emphasized. This grant supports additional analysis of the BLS data on professional and managerial nonstandard workers, to be carried out by the Women's Research and Education Institute in conjunction with the University of North Carolina and the Economic Policy Institute. Wages, career paths, motivation, and satisfaction of standard and nonstandard workers will be compared and the dependence of these variables on family type explored. Project Director: Barbara K. Krimgold, Acting Research Director.

OFFICER GRANTS

9to5, Working Women Education Fund **$25,000**
Milwaukee, WI 53208

Support for a public education campaign for *The Job/Family Challenge: a 9to5 Guide (Not for Women Only)*. Project Director: Ellen Bravo, Chair.

Bentley College **$11,830**
Waltham, MA 02154

For a conference on part-time work. Project Director: Patricia M. Flynn, Dean and Professor of Economics.

Columbia University **$29,800**
New York, NY 10027

For a pilot study of work-family strategies used by senior executive women in the financial services industry. Project Director: Dr. Katherine S. Newman, Professor of Anthropology.

Families and Work Institute **$29,743**
New York, NY 10001

Support for the formation of a network of companies to expand involvement in work-family initiatives. Project Director: Ms. Dana E. Friedman, Co-President.

Massachusetts Institute of Technology **$22,128**
Cambridge, MA 02139

For a study of the structural barriers to shorter work hours in professional firms via a case study of large legal firms. Project Director: Jim Rebitzer, Associate Professor, Sloan School of Management.

University of Pennsylvania **$25,901**
Philadelphia, PA 19104

For secondary analysis of the National Data Set to determine workplace structures that alleviate work-family conflicts. Project Director: Jerry A. Jacobs, Professor of Sociology.

Wellesley College **$28,683**
Wellesley, MA 02181

Support to conduct an analytic review of the work/family literature. Project Director: Dr. Rosalind C. Barnett, Senior Research Associate, Center for Research on Women.

EDUCATION AND CAREERS IN SCIENCE AND TECHNOLOGY

The Foundation has a wide-ranging set of programs in this area, including projects on the nature of work in science and engineering, the underrepresentation of women and minorities, and the use of technology for education outside of the classroom. Science and engineering professional societies have been enlisted in an effort to prepare high-quality materials about the nature of careers in these fields. Several grants in this Foundation-supported program were made in 1995. As part of the Foundation's efforts to ameliorate the underrepresentation of minorities in mathematics, science, and engineering, various projects designed to increase the number of minority Ph.D.s were supported with 1995 grants. Helping institutions with relatively successful model programs to improve the campus climate for women students in mathematics, natural sciences, and engineering has been the focus of many grants in prior years. One additional such Trustee grant was made in 1995. Another component of the Foundation's program is making education available outside the classroom. The effort is aimed at independent learning in science and technology by means of electronic technologies that make possible asynchronous access, i.e., access under the learner's control, to remote learning resources. Grants made in 1995 support the evolution of this program toward projects designed to deliver full degree or certification courses to remote learners, including those at both home and work sites.

A number of grants on human resources in science and engineering, including study of immigration and its effects, are described in this section.

Enhancing public understanding of science and technology is another interest of the Foundation. A major 1995 grant supports the production of a series of television programs on the role of mathematics in everyday life. Assistance was given for the preparation of a number of books for the general reader on various topics in science and engineering. The first books in the Sloan Technology Book Series were published in 1995. The series focuses on some of the major technologies of the twentieth century and treats their emergence, development, and role in our society.

ENTRY AND RETENTION, TRUSTEE GRANT

University of Maryland **$10,000**
College Park, MD 20742

This supplements a 1993 grant for a study of the causes and consequences of departure of graduate students from doctoral programs without completing the degree. Project Director: Barbara Lovitts, Faculty Research Assistant, Department of Sociology.

OFFICER GRANTS

Indiana University **$28,500**
Bloomington, IN 47405

Support for a study to explore from a social-psychological perspective the factors that affect women's educational and career choices in science, mathematics, and engineering. Project Director: Sheldon Stryker, Distinguished Professor of Sociology.

Mathematical Association of America **$30,000**
Washington, DC 20036

To fund a national survey of minority graduate students in mathematics with the objective of improving retention. Project Director: Dr. William Hawkins, SUMMA Director.

CAREER INFORMATION, TRUSTEE GRANTS

The Foundation has made a series of grants to professional societies for the preparation of high quality career information and services that will give college students realistic perspectives on professional careers in science and engineering. The societies will prepare brochures, videotapes, World Wide Web pages, and CD-ROMs. Directories of summer internships and other cooperative educational opportunities will be created. Members of the societies, from a mix of work environments and with different levels of education and experience, will be selected and special arrangements made to allow students to seek answers about careers from these professionals, often via interactive bulletin boards on the Internet. The societies plan to keep these materials updated and sustain their career activities after Sloan support has ended. Trustee grants in 1995 were made to the following five professional societies.

American Chemical Society **$444,075**
Washington, DC 20036

Project Director: Ann Clair Anderson, Senior Staff Associate, Education Division.

American Geological Institute **$467,624**
Alexandria, VA 22302

Project Director: Dr. Frank Wantland, Director, Planning and Development.

American Society of Mechanical Engineers **$418,198**
New York, NY 10017

Project Director: Chor W. Tan, Managing Director, Education.

Institute of Electrical and Electronics Engineers **$464,440**
Piscataway, NJ 08855

Project Director: Dr. Peter K. Wiesner, Director, Continuing Education.

Minerals, Metals and Materials Society **$441,550**
Warrendale, PA 15086

Project Director: Dr. Paul G. Campbell, Jr., President.

National Academy of Sciences **$127,838**
Washington, DC 20418

This grant supports the development by the National Research Council (NRC) of a career planning center on the Internet and World Wide Web. The purpose is to provide current, accurate, and accessible information on job market conditions and graduate education for students in science and engineering. Easy-to-use hypertext linkages will be provided to career information available from science and engineering professional societies. The NRC would thus create a single Internet site for interested young students seeking information about graduate programs, careers, and employment opportunities in a very wide range of scientific and engineering fields. Project Director: Dr. Deborah D. Stine, Associate Director, Special Projects.

University of Colorado **$74,238**
Boulder, CO 80309

A pilot study is planned to test new methodology for exploring the decision-making process by which college students make career decisions. Starting with a group of people past their schooling, at work, or in the last year of graduate school, the researchers will seek to identify the critical time periods when key information was obtained or when career decisions were made. They will then obtain the same sort of information from a group, probably seniors, new graduate students, or newly employed graduates, who are currently just at the critical times recalled by the first group. A third group of students, presumably undergraduates, now at the critical decision times identified by the second group, will be interviewed. This backward cascading should allow key times and events to be identified so that information from the final group of students is able to be obtained when critical choices and decisions are actually being made rather than in recall. This test of the method will be carried out with 30 people in each group. Project Director: Dr. Elaine Seymour, Bureau of Sociological Research.

Advanced Network and Services, Inc. **$25,000**
Armonk, NY 10504

To work with societies preparing CD-ROM career materials in order to establish common standards. Project Director: Allan H. Weis, President and CEO.

American Association for the Advancement of Science **$30,000**
Washington, DC 20005

For the publication of career information on the World Wide Web. Project Director: Dr. John Benditt, Features Editor, *Science*.

Fund for the City of New York **$29,984**
New York, NY 10013

To produce a pilot video program to expose New York City pre-college students to technical careers. Project Director: Kenneth G. Vaughn.

Northwestern University **$30,000**
Evanston, IL 60208

To devise strategies and a recommended course of action for disseminating information on careers. Project Director: Marvin L. Manheim, Distinguished Professor, Kellogg Graduate School of Management.

Science and Technology Advisory Board **$30,000**
New York, NY 10022

Support for a pilot program to evaluate the delivery of career management services to young scientists via the Internet. Project Director: Stephen Rosen, Chairman.

University of Minnesota **$30,000**
Minneapolis, MN 55455

Partial support for a workshop on women in mathematical science connected to industry. Project Director: Dr. Avner Friedman, Director, Institute for Mathematics and Its Applications.

WOMEN, TRUSTEE GRANTS

Carnegie Mellon University **$160,265**
Pittsburgh, PA 15213

Among science and engineering fields, computer science is among those with the least representation of women. This grant funds a study to determine the factors influencing decisions of undergraduate women whether to enroll and then to persist in the computer science major and to establish the relative importance of these factors. Ethnographic research and focus group interviews will be conducted with both men and women students in the CMU department as well as those who have left the department. The results of the study are expected to be relevant and useful to computer science programs around the country. Project Director: Dr. Allan Fisher, Associate Dean for Undergraduate Education.

University of Michigan **$473,247**
Ann Arbor, MI 48104

This grant supports a major program designed to improve the university's recruitment and retention of women graduate students in engineering and the physical sciences. In the fall of 1994, women made up 11% of doctoral students in the university's College of Engineering, 21% in Physics and Applied Physics, and 33% in Chemistry. These numbers are well above national averages and give Michigan an excellent base from which to effect improvements. Actions will be taken that are known to work: special recruiting; programs to prevent new women students from feeling isolated and being overwhelmed

upon arrival; peer mentoring; a Society of Women Engineers chapter on campus; faculty workshops on climate for women, sexual harassment, and women's learning styles; codification of departmental procedures and regulations; and recognition of departments with exemplary performance. Other actions will be added as ongoing research and evaluation identify needs and opportunities. The university is fully responsible for the program's continuation beyond the four-year grant period. Michigan's Center for the Education for Women will ensure that information about successful features of the program is disseminated to other universities. Project Director: Dr. Cinda-Sue Davis, Director, Women in Science and Engineering Program.

WOMEN, OFFICER GRANTS

Goodman Research Group, Inc. **$30,000**
Cambridge, MA 02139

To plan an evaluation of women in science and women in engineering programs. Project Director: Irene F. Goodman, President.

Pennsylvania State University **$29,900**
University Park, PA 16802

For an assessment of the climate for women in science and engineering programs. Project Director: Dr. Mary Jane Irwin, Interim Director, Women in the Sciences and Engineering Institute.

Wake Forest University **$30,000**
Winston-Salem, NC 27109

To fund an assessment of the academic climate for women in mathematics and science at Wake Forest and to initiate a Women in Science mentoring program and a local chapter of the Association for Women in Science. Project Director: Cheryl Leggon, Associate Professor of Sociology.

The Foundation's program is focused on increasing the number of minority Ph.D.s in mathematics, science, and engineering. Individual faculty members, research groups, or entire departments are eligible for support if they have demonstrated success in producing minority doctorates and have effective plans to increase the number they produce. Funding is used for improved recruiting efforts, stipends, special summer transition courses, mentoring, collaborative research opportunities, student attendance at professional meetings, and other support programs that increase the likelihood that minority students, once enrolled, will persist and succeed. Seven grants of this sort were made in 1995, as follows. (In each case, the targeted faculty members, departments, or schools of the university where the grant funds will be used are specified.)

Auburn University **$150,000**
Auburn University, AL 36849

Materials Research and Education Center. Project Director: Dr. James Brown, Assistant to the President for Minority Advancement.

Georgia Tech Foundation, Inc. **$1,168,044**
Atlanta, GA 30332

College of Engineering: Schools of Chemical Engineering, Civil and Environmental Engineering, Industrial and Systems Engineering, Mechanical Engineering, Materials Science and Engineering, and Electrical and Computer Engineering; College of Sciences: Schools of Chemistry, Biochemistry, Physics, and the Atmospheric Sciences in the School of Earth and Atmospheric Sciences. Project Directors: Deans John A. White (Engineering) and Gary B. Schuster (Sciences), Georgia Institute of Technology.

Massachusetts Institute of Technology **$690,000**
Cambridge, MA 02139

Chemistry, Physics, Toxicology, and the Parsons Laboratory for Environmental Science in the Department of Civil and Environmental Engineering. Project Director: Dr. Isaac M. Colbert, Associate Dean of the Graduate School.

Meharry Medical College **$450,000**
Nashville, TN 37208

Microbiology, Biomedical Sciences, and Physiology. Project Director: Dr. James G. Townsel, Acting Dean, School of Graduate Studies and Research.

Purdue University **$540,000**
West Lafayette, IN 47907

Departments of Biology and Chemistry and the School of Electrical and Computer Engineering. Project Director: Dr. Luis M. Proenza, Vice President for Research and Dean of the Graduate School.

University of Pittsburgh **$90,000**
Pittsburgh, PA 15213

The laboratory of Professor Sandra Murray. Project Director: Professor Sandra Murray, Department of Cell Biology.

University of Texas at El Paso **$150,000**
El Paso, TX 79968

Dr. Lawrence Murr, Director, Materials Research Institute; Drs. Sergio Cabrera and Benjamin Flores, Electrical and Computer Engineering. Project Director: Sergio D. Cabrera, Associate Professor of Electrical and Computer Engineering.

Hampton University **$540,000**
Hampton, VA 23668

Hampton has several successful undergraduate and masters programs in the physical and biomedical sciences that are high volume feeders of minority students into Ph.D. programs. With this grant, similar programs will be created in non-biomedical biology and marine and environmental science, fields where African Americans are highly

underrepresented. Special support and programs, including training and experience in research, will be made available to selected students in these fields who indicate an interest in going on for the Ph.D. degree. Project Director: Dr. Johnnye M. Jones, Assistant Dean, School of Pure and Applied Sciences.

University of Maryland, Baltimore County **$350,000**
Baltimore, MD 21228

This grant funds an ethnographic study to seek the reasons for the underrepresentation of African Americans and Hispanics in mathematics, science, and engineering. The researchers will interview 120 minority students, half male, half female, with high aptitude for mathematics, science, and engineering, but who have chosen not to major in these fields. Both in-depth interviews and focus group discussions are planned, as are interviews with faculty and administrators at the three institutions from which the students will be selected. Project Director: Shirley Vining Brown, Senior Research Scientist.

MINORITIES, OFFICER GRANTS

American Association for the Advancement of Science **$30,000**
Washington, DC 20005

To fund a workshop on the effect of the changing policy climate on science, mathematics and engineering diversity. Project Director: Dr. Shirley M. Malcom, Head, Directorate for Education and Human Resources Programs.

American Society for Engineering Education **$29,518**
Washington, DC 20036

Funding for a summit meeting of leaders of the minority engineering effort. Project Director: Dr. Frank L. Huband, Executive Director.

Board of Education of the City of New York **$30,000**
Brooklyn, NY 11201

To put in place in Fall 1995 a program to help underrepresented minority students succeed at Bronx High School of Science. Project Director: Stanley Blumenstein, Principal, Bronx High School of Science.

Board of Education of the City of New York **$30,000**
Brooklyn, NY 11201

To provide funds for the Math-Science Institute, a program to help prepare minority students for the City's specialized science high schools, in its first year. Project Director: Jacqueline Charity, Deputy Director, Office of Access and Compliance.

Colorado State University **$29,872**
Fort Collins, CO 80523

Support for a study of attrition of American Indian students in higher education. Project Director: Mary E. McAfee, Instructor.

Massachusetts Institute of Technology **$28,500**
Cambridge, MA 02139

For a workshop of the Quality Education for Minorities, Mathematics, Science and Engineering Network. Project Director: Isaac M. Colbert, Dean, Graduate School.

Mathematical Association of America **$27,150**
Washington, DC 20036

To produce and disseminate an archival record of minorities with Ph.D.s in mathematics or mathematics education and a directory of minority mathematicians. Project Director: Dr. William Hawkins, SUMMA Director.

National Association of Mathematicians **$28,000**
Elizabeth City, NC 27909

Support for the production of a book on the lives of minority mathematicians. Project Director: Dr. Johnny L. Houston, Executive Secretary.

National Consortium for Graduate Degrees for Minorities **$30,000**
Notre Dame, IN 46556

For the development of instructional materials in support of GEM's graduate research orientation workshops. Project Director: Dr. Norman Fortenberry, Executive Director.

Oak Ridge Associated Universities **$29,200**
Oak Ridge, TN 37831

Support for planning a program to attract and retain Hispanic students in physics. Project Director: Dr. David J. Ernst, Director, Pan-American Association for Physics.

EDUCATION OUTSIDE THE CLASSROOM, TRUSTEE GRANTS

Brown University **$248,000**
Providence, RI 02912

Brown's Chemistry Department has been active in the use of computers, particularly commercial chemistry software, in undergraduate courses. Their successful exploration of changes in chemistry education for traditional on-campus students that might come about through computer-based networks has led to plans to expand their effort to a core sequence of five chemistry courses. This grant will enable Brown to create an asynchronous learning network for these five courses. At the completion of the project, students will be able at any time to access course materials and communicate via computer with fellow students and the instructor. A self-paced option will be offered for a limited number of students and means of testing these students will be developed. Project Director: Jim Doll, Metcalf Professor of Chemistry.

Drexel University **$1,305,000**
Philadelphia, PA 19104

A 1993 grant enabled Drexel to convert nine courses in the Information Systems curriculum to a non-classroom asynchronous learning network (ALN). The ALN allowed on-campus students to complete course work mainly through networked computers running Lotus Notes groupware. Part-time students and those on co-op assignments also were able to participate. Learning outcomes appeared to be equal or better than those for classroom courses and student satisfaction was higher. This grant will support a three-year program to offer a full M.S. degree in Information Systems via an ALN. All remaining degree courses will be converted, the requisite support and delivery system will be developed, and a process for evaluation and improvement will be established. Drexel also will prepare and offer five short training courses via an ALN. These will initially be offered for employees of CIGNA, a large Philadelphia insurance company. There is confidence at Drexel that this project will lead to the establishment of a national ALN degree and training program. Project Director: Richard H. Lytle, Dean, Information Science and Technology.

Northern Virginia Community College **$395,841**
Annandale, VA 22003

Four courses (Chemistry, Calculus, Engineering Graphics I and II) in the two-year associate degree in Engineering were developed for asynchronous delivery to home learners in a Foundation-sponsored project starting in 1993. Although difficulties arose, the results appear positive for the 100 enrolled students. The current grant will enable the college to complete an additional ten courses, enough for the entire degree. Faculty development activities and student support functions will be increased. Lotus Notes will be replaced by an easier-to-use groupware package (First Class) and student cohorts will be established for these off-campus classes. When completed, this project will result in the first

two-year engineering degree program to be available in an asynchronous networked fashion to off-campus students. Project Director: Dr. Randal A. Lemke, Professor and Director, Extended Learning Institute.

Pennsylvania State University **$545,000**
University Park, PA 16802

Penn State offers an M.S. degree in Acoustics at remote sites via satellite TV. This grant supports the creation of a new graduate acoustics certification to be offered nationally via an on-demand asynchronous learning network. A series of five CD-ROMs will be created for this program. Learners will also use books and other print materials and special software for engineering analysis. They will communicate with each other and the instructor via Internet services. Penn State expects to reach widely distributed learners through this ALN approach, as opposed to the two or three site limitation imposed by synchronous televised courses. Both small and large companies with employees interested in acoustics will participate. The final course in the sequence will be customized for different industry specialties and will require some residence on campus for laboratory work and examinations. Project Director: Alan D. Stuart, Associate Professor of Acoustics.

Regional Technology Strategies, Inc. **$262,855**
Chapel Hill, NC 27515

This grant will enable six community colleges, members of the Consortium for Manufacturing Competitiveness and mainly in the Southeast, to experiment with delivery of training courses to remotely located learners through asynchronous learning networks. Learners will work whenever (at the workplace or at home) and whenever convenient and be able to communicate with instructors and other students via computer. As examples, Chattanooga State Technical College will teach digital electronics to industrial maintenance personnel of area manufacturers and Trident Technical College in Charleston will offer one of the courses necessary for employees of manufacturing firms to pass the American Production and Inventory Control Society certification exam. Project Director: Dr. Stuart A. Rosenfeld, Principal.

Research Foundation of State University of New York **$995,769**
Albany, NY 12201

A 1994 grant supported a project to create access to a baccalaureate degree for home learners residing in a large section of the mid-Hudson region. The aim was to enable those who have completed two years at a community college to continue and complete the final two years toward a B.S. in business without having to leave their home communities. Six community colleges and two four-year colleges in the SUNY system have cooperated in this project. Students receive books and notes in the mail and participate in discussion, problem-solving, and other "class" activities on their own computers. The instructor for a particular class may be located at any of the eight campuses. Faculty development activities were launched, student support sites (for students without adequate computer equipment of their own) were established at the community colleges, and six courses were developed in ALN format. The current grant will enable SUNY to continue development of 20 new courses in ALN format and to begin classes in the fall of 1995. Project Director: Dr. Richard B. Dressner, Assistant to the Chancellor.

University of Illinois at Urbana-Champaign **$2,116,000**
Champaign, IL 61820

With the help of a 1993 grant, the University's Department of Electrical and Computer Engineering established a computer network that allowed students taking Introduction to Circuit Analysis to get help with concepts and homework problems. The network now operates as a highly interactive learning community for the approximately 400 students in the course. Students submit solutions to homework problems on the network and receive instant feedback from a grading program running on the network server. Students can receive help from colleagues or tutors on the network at almost any day or time. Student learning has improved and faculty are pleased with the new flexibility in their schedules. This new grant will establish a Sloan Center for Asynchronous Learning Environments in order to explore the benefits of ALNs across a broader range of courses involving many more students. Center leaders will work with interested faculty colleagues on the use of ALNs in restructuring courses in all areas of the university, including social sciences and humanities as well as science and engineering. The effects on student retention rates, average time to earn a degree, faculty productivity, and economics

of education will be studied. An interdisciplinary group of social scientists will assess the effect of ALN courses on the quality of learning. The university will aim to restructure about 15 courses per year for the three-year duration of the grant. Project Director: Burks Oakley II, Professor, Department of Electrical and Computer Engineering.

Virginia Polytechnic Institute and State University **$200,000**
Blacksburg, VA 24061

During the summer of 1995, two faculty taught courses using a variety of communication tools over a high speed campus computer network. Students communicated via e-mail and bulletin board conferencing and formed electronic study groups. They met together as a class only once a week. Based on the success of these experiments, the newly-funded project will recast five biology courses (General Biology, Principles of Biology, Experimental Biology, Honors Biology, and Microbiology) so that much of the presentation and discussion can be carried out via asynchronous networks. Faculty would meet with small groups of students during the week, but large lectures would be almost entirely eliminated. The university seeks to determine if an additional 20 percent of students can be served in this way without increases in faculty and without sacrificing learning quality. Project Director: Dr. Lucinda Roy, Associate Dean, Arts & Sciences.

Westchester Community College Foundation **$166,486**
Valhalla, NY 10595

This grant will support the training of faculty in the asynchronous delivery of course material to remote students and the delivery of four courses (Anatomy, Computer Applications, Electrical Circuits, and Telecommunications) to students who live within commuting distance of the college. A 1994 Foundation grant allowed for the development of the necessary infrastructure and skills for the delivery of ALN-style courses. Students whose work schedules prevent regular commitment to on-campus classes would be able to enroll in the new courses and work from home or the workplace. NYNEX has a large number of employees taking three of the courses and they will permit selection of the ALN version as an option. Project Director: Dr. Amy J. Geffen, Assistant Dean, Community Services.

EDUCATION OUTSIDE THE CLASSROOM, OFFICER GRANTS

Cornell University **$29,139**
Ithaca, NY 14853

To prepare physics teaching materials for publication. Project Director: Kurt Gottfried, Professor of Physics.

Ferris State University **$29,240**
Big Rapids, MI 49307

To produce an ALN course in Geomatics for local government. Project Director: Khagendra Thapa, Professor of Surveying Engineering.

Georgia Tech Research Corporation **$30,000**
Atlanta, GA 30332

For the development of pilot programs for creation of a "virtual university" based on asynchronous learning network principles. Project Director: John P. Crecine, Professor, School of International Affairs.

Metropolitan State University Foundation **$30,000**
St. Paul, MN 55106

To prepare and offer remotely and asynchronously two courses for purchasing professionals. Project Director: Dr. Frederick Manzara, Chair, Marketing Department.

Michigan State University **$25,000**
East Lansing, MI 48824

For the addition of computer conferencing and the elimination of recitation sections in a 500-student physics class. Project Director: Edwin Kashy, Professor of Physics.

New Jersey Institute of Technology — $18,280
Newark, NJ 07102

To improve access for remote ALN students by adding modem capacity. Project Director: Starr Roxanne Hiltz, Professor of Computer and Information Sciences.

New York University — $20,425
New York, NY 10011

To organize and hold a one-day conference on asynchronous learning networks for Sloan grantees and selected guests. Project Director: Dr. Richard P. Vigilante, Director, Information Technologies Institute, School of Continuing Education.

Pace University — $25,000
New York, NY 10038

For the development of two ALN courses on using the Internet. Project Director: Dr. David Sachs, Assistant Dean, School of Computer Science and Information Systems.

Pennsylvania State University — $12,000
University Park, PA 16802

For planning for certification in acoustics via ALN. Project Director: Alan D. Stuart, Associate Professor of Acoustics.

Stanford University — $24,308
Stanford, CA 94305

Support for an experiment in remote teaching to increase entry of Native American students into high quality colleges. Project Director: Robert Allen Warrior, Assistant Professor of English.

University of North Carolina — $30,000
Chapel Hill, NC 27514

To develop requirements for tools and related interfaces in order that the World Wide Web can be more effectively used for education. Project Director: Dr. William H. Graves, Associate Provost for Information Technology.

University of Wisconsin-Stout — $29,681
Menomonie, WI 54751

To convert a course for delivery to small business and other off-campus learners. Project Director: Professor James T. Buergermeister, Chairman, Department of Hospitality and Tourism.

Villa Julie College — $28,000
Baltimore, MD 21208

Support to develop and deliver a course in Microsoft Visual Basic to local information science professionals. Project Director: Michael M. Rogich, Director, Center for Advanced Technology and Competitiveness.

Virginia Polytechnic Institute and State University — $30,000
Blacksburg, VA 24061

To establish an electronic help line for minority students. Project Director: Dr. Bevlee A. Watford, Director, Office of Minority Engineering.

TECHNOLOGY AND MANAGEMENT EDUCATION, TRUSTEE GRANT

University of California, Berkeley **$172,500**
Berkeley, CA 94720

Entrepreneurship and new-business creation are important activities in the U.S., accounting for new jobs and, in some cases, even new industries. This grant supports an effort to make the field of entrepreneurship more central to the business school. Adjunct faculty with deep knowledge and experience in entrepreneurship and high technology will be brought to the business school and linked with permanent faculty. They will connect faculty with the community of entrepreneurs and their service-providing network of law firms, venture capitalists, accountants, and management consultants. They will also help faculty and graduate students identify research issues of importance. Adjuncts will be teamed with regular faculty as co-instructors of some courses. The effort, focused primarily on high-tech entrepreneurship, will permit recruitment of adjuncts from the nearby Silicon Valley area and will strengthen the internship program for MBA students with young, high-tech firms. Project Director: John H. Freeman, Helzel Professor of Entrepreneurship and Innovation, Haas School of Business.

HUMAN RESOURCES IN SCIENCE AND ENGINEERING

TRUSTEE GRANT

Commission on Professionals in Science and Technology **$415,000**
Washington, DC 20005

With a 1993 grant, the Commission assembled data on the labor market experiences of recent graduates in science and engineering. Consistent data across fields turned out not to be available and the Commission report had to be pieced together from information that lacked consistency as to the time and nature of the data collected. The current grant will fund the development of a statistical system for continuous monitoring of the supply and demand situation of recent graduates in science and engineering. Disciplinary societies representing chemists, geologists, geophysicists, mathematicians, physicists, and psychologists have joined the effort and others are welcome. Data collection will build upon these societies' ongoing data efforts, but with agreed-upon standards to make possible cross-disciplinary comparison. A composite set of indicators will be created to allow early identification of labor market trends. Project Director: Dr. Catherine D. Gaddy, Executive Director.

OFFICER GRANT

American Association of Engineering Societies **$30,000**
Washington, DC 20036

For projects to improve data and analysis concerning the supply and demand for engineers in the U.S. Project Director: R. A. Ellis, Director, Research.

IMMIGRATION OF SCIENTISTS AND ENGINEERS, TRUSTEE GRANTS

Oak Ridge Associated Universities **$89,784**
Oak Ridge, TN 37831

Princeton University **$250,768**
Princeton, NJ 08544

The research project supported with these grants will utilize existing census and National Science Foundation data to create a statistical profile of the science and engineering workforce in the United States. An assessment will then be able to be made of the contribution of immigration to changes in this profile over the past 25 years. Project Directors: Dr. Michael Finn, Deputy Director, Labor and Policy Studies Program, Oak Ridge Institute for Science and Education; Dr. Thomas J. Espenshade, Princeton Office of Population Research.

PUBLIC UNDERSTANDING OF SCIENCE AND TECHNOLOGY

TRUSTEE GRANTS

Massachusetts Institute of Technology **$80,000**
Cambridge, MA 02139

This grant supports the writing by Paul Samuelson, the first American Nobel prize winner in economics, of his scientific autobiography, *Economics in My Time*. Project Director: Paul A. Samuelson, Professor Emeritus, Department of Economics.

Princeton University **$128,500**
Princeton, NJ 08544

Support is provided by this grant for the writing of a book on behavioral genetics. Tentatively titled *A Sense of Time: Clock Genes and the Future of Biology*, the book uses the particular example of the isolation and study of the genes regulating the time sense, for example, the sleep-wake cycle, as a means of explaining the emerging science of behavioral genetics and how the scientists that work in the field go about their research. Project Director: Jonathan Weiner, science writer.

Princeton University **$172,149**
Princeton, NJ 08544

For some years now, Professor Billington has taught courses for undergraduate engineers at Princeton in which he discusses the environment within which the engineer works, illustrating not only the technical challenges, but the historical, social, and cultural aspects of the profession. Materials from those courses will be the basis for a series of books to be prepared with the help of this grant. They will be published by Wiley as textbooks and also in trade book editions for a general audience. The first book will examine steam engines, the American industrial revolution, railroads, the telegraph, and the electric light. The second will survey the rise of the steel, electrical, oil, automobile, and aircraft industries. The third will cover bridges, water projects, and other large civil works projects such as the interstate highway system and the construction of regional airports. A fourth book, on information and infrastructure, is also planned. Project Director: David P. Billington, Professor of Civil Engineering and Operations Research.

QED Communications, Inc. **$1,000,000**
Pittsburgh, PA 15213

This grant provides partial support for the preparation of a series of prime time television shows on the ways in which mathematics can help in the understanding and appreciation of the world around us. Initial funding provided by the National Science Foundation allowed the development of preliminary outlines and program treatments. The series, titled *M — The Invisible Universe*, examines real life matters of interest (such as health risks and the structure of plants and animals) and demonstrates how mathematics can illuminate these subjects. Making up the series are programs on statistics and probability, patterns of nature, mathematics and building and manufacturing, visualization, mathematics and economics, mathematics and society, innumeracy and math anxiety, and mathematics and the family. Mathematician John Allen Paulos, author of several books on mathematics for the general public, will chair the series advisory committee. Project Director: Dr. Greg Andorfer, Vice President, National Projects.

PUBLIC UNDERSTANDING OF SCIENCE AND TECHNOLOGY, OFFICER GRANTS

Massachusetts Institute of Technology **$30,000**
Cambridge, MA 02139

Support for preparation of an on-line journal and a book on Internet economics. Project Director: Dr. Lee McKnight, Principal Research Associate.

National Association of Science Writers, Inc. **$15,000**
Greenlawn, NY 11740

Support for preparation of a book on science writing. Project Director: Deborah Blum, Board Member, and Science Writer, *The Sacramento Bee*.

Rockefeller University **$25,000**
New York, NY 10021

For preparation of a book of portraits of renowned scientists. Project Director: Professor Abraham Pais, Department of Physics.

Self-Reliance Foundation **$30,000**
Santa Fe, NM 87501

To prepare and disseminate, with the Hispanic Radio Network, a series of Spanish radio programs discussing the Sloan-supported *Breakthrough* television series on minorities in science and engineering. Project Director: Molly M. Multedo, Executive Director.

Self-Reliance Foundation **$30,000**
Santa Fe, NM 87501

To prepare and disseminate, with the Hispanic Radio Network, a series of Spanish radio programs discussing the Sloan-supported *Discovering Women* television series on women in science and engineering. Project Director: Jeff Kline, President.

University of Southern California **$29,900**
Los Angeles, CA 90089

To evaluate the extent to which the *Discovering Women* television series influences target gatekeepers. Project Director: Sheila T. Murphy, Professor of Communications.

Western Maryland College **$13,931**
Westminster, MD 21157

Partial support for preparation of a book on emerging diseases. Project Director: Ed Regis, College Scholar.

TECHNOLOGY BOOKS

The Alfred P. Sloan Foundation is sponsoring a series of books intended to broaden public understanding of important modern technologies. Books in the Sloan Technology Book Series will describe the development of specific technologies, including the circumstances of their emergence, their early development and use, their applications, and their actual and potential impacts on society.

The first three books in the series were published in 1995:

Craig Canine, *Dream Reaper: The Story of an Old-fashioned Inventor in the High-Tech, High-Stakes World of Modern Agriculture* (Knopf)

T. A. Heppenheimer, *Turbulent Skies: Commercial Aviation in the Twentieth Century* (Wiley)

Richard Rhodes, *Dark Sun: The Making of the Hydrogen Bomb* (Simon & Schuster)

Series books expected to be published in 1996 include the following:

Robert Buderi, *A Blip on the Screen: The History of Radar* (Simon and Schuster)

David A. Fisher and Marshall Jon Fisher, *Tube: The Invention of Television* (Counterpoint)

Bettyann Kevles, *Naked to the Bone: Medical Imaging in the 20th Century* (Rutgers University Press)

Robert Kanigel, *The One Best Way: Frederick Winslow Taylor and the Enigma of Efficiency* (Viking)

Books on some fifteen other technology-based topics are also being prepared and will be published as they are completed and reviewed by the advisory committee for the series. Also planned as part of the series is an anthology of writings tracing the history of ideas about technology, edited by Richard Rhodes. This book will provide a general social, cultural, and intellectual context for the individual stories, both technical and human, surrounding particular technologies.

Additional books, supported by the Sloan Foundation, are also part of the program to increase public understanding of technology. The first of the following titles was published in 1995; the others are expected to be published in 1996.

Henry Petroski, *Engineers of Dreams: Great Bridge Builders and the Spanning of America* (Knopf)

Martin Campbell-Kelly and William Aspray, *Computer: A History of the Information Machine* (Basic Books)

John Cairns, *Matters of Life and Death: The History of Molecular Biology in Cancer Research* (Princeton University Press)

The Foundation is interested in contributing to major issues of our time, but in a way appropriate to its expertise and limited size. Usually this requires a special approach in order that a meaningful new contribution can be made to widely recognized issues and problems. The Foundation will support work in areas where such an approach can be developed, with the goal of enhancing understanding of complex issues of national importance.

Projects approved in previous years include research on the effect of the legal status of drugs in modern industrial societies, a study of the deep oceans as waste depositories, a large survey to understand the public perception of nuclear power, analysis of the long-term cleanup of radioactive waste at nuclear reactor facilities, and the development of a set of quantitative social indicators of the position of children in the United States.

Two 1995 grants, described below, concern illegal gun markets in American cities and their connection to juvenile violence.

TRUSTEE GRANTS

American Council of Learned Societies **$262,000**
New York, NY 10017

This grant provides partial support for the preparation of a film and video on issues involved in assuring continuing access to information that has been created, distributed, and stored electronically. Additional support is provided by the National Endowment for the Humanities. It is a widely held impression, mistaken however, that information in electronic or digital form will be forever accessible. The lifetimes of magnetic and optical media are uncertain. Indeed, the means of even reading stored information may disappear if new technology is developed that is incompatible with old formats. The objective of this project is to generate awareness of the issues, to call attention to the problems, and to encourage the identification and implementation of solutions. Project Director: Dr. Stanley N. Katz, President.

Carnegie Mellon University **$753,518**
Pittsburgh, PA 15213

This grant supports a project focused on illegal gun markets and juvenile violence in the cities of Pittsburgh and Rochester, both experiencing recent sharp increases in gun violence and homicides involving youthful offenders and victims. The Carnegie Mellon researchers have been assisting the Pittsburgh Bureau of Police and the Rochester Police Department develop and implement automated information systems for their gun task forces. These three groups will be joined by the Pittsburgh Youth Study of the University of Pittsburgh and the Rochester Youth Development Study of the School of Criminal Justice at the State University of New York at Albany as project participants. Relying on police records, they will examine the changing nature of illegal gun markets in both cities and the effectiveness of various law enforcement and investigatory strategies for intervening in these markets. Through interviews, information on gun access and juvenile activities that may go undetected by police data will also be collected and analyzed. Questions on gun involvement will be added to ongoing longitudinal panel surveys in both cities which already include information on crime and delinquency as well as drug and alcohol abuse. In both cities, the cohort samples are at-risk youth from the general population of public school students. Project Director: Dr. Jacqueline Cohen, Principal Research Scientist, Heinz School of Public Policy and Management.

George Washington University **$200,000**
Washington, DC 20037

Dr. Lynn's work has shown that physicians often misunderstand or ignore dying patients' preferences with the result that large numbers of people still die alone, in pain, at high cost, often tethered to life-support systems in intensive care units. This grant supports the preparation of a unique mass market book, titled *The Handbook for Mortals*, that will offer details of how people die of specific diseases, practical advice about symptoms, special vignettes, poetry, and graphics, all designed to inform concerned readers about the issues of dying and enable them to live better while dying. Project Director: Dr. Joanne Lynn, Director, Center to Improve Care of the Dying.

Harvard University **$605,469**
Cambridge, MA 02138

The possession of guns by juveniles is already illegal almost everywhere. What needs to be better understood are the illegal gun markets, their role as sources of guns for juveniles, and their connection to youth violence. Professor Moore, joined by Professor Philip Cook of Duke University's Institute of Policy Studies, will study these issues by means of statistical and ethnographic research conducted in six U.S. cities. Pilot studies with a somewhat different focus have already been carried out in Durham and Boston. Based on the data and information they gather, they will make recommendations about how the supply of guns to juveniles might best be interdicted. If, for example, evidence confirms the expectation that youth have particular tastes in hand guns, there will be a strong basis to use federal firearm records to search for legal gun dealers who directly or indirectly supply the illegal markets. The hope is that this two-year study will contribute important insights into the epidemic of youth violence and homicide and will suggest realistic actions that can stem the killing. Project Director: Mark H. Moore, Guggenheim Professor of Criminal Justice Policy and Management.

SELECTED NATIONAL ISSUES, OFFICER GRANTS

International Society of Technology Assessment in Health Care **$8,000**
Washington, DC 20007

Support for a special plenary session, "Cost Reducing Technological Innovations in Health Care," at the 1995 conference of the Society. Project Director: Dr. Norman Weissman, Chief Executive Officer.

University of California, Berkeley **$30,000**
Berkeley, CA 94720

For a cross-disciplinary inquiry into the future of nuclear power in the United States. Project Director: Gene I. Rochlin, Professor of Energy and Resources.

TRUSTEE GRANTS

Fund for the City of New York **$400,000**
New York, NY 10013

The Sloan Public Service Awards honor a carefully selected group of six of the City of New York's most dedicated and imaginative civil servants, at all levels. The awards result from an intensive nomination and evaluation process carried out by the Fund for the City of New York. They are presented at a formal reception attended by the Mayor. In addition, a reception is held earlier the same day in each of the six recipient's departments, usually presided over by that department's Commissioner and attended by large numbers of the awardee's coworkers. Public announcement of the awards receives a very substantial level of press coverage and public attention. This grant will increase the award stipend to $10,000 and continue support of the program for another five years. Project Director: Dr. Barbara Cohn, Vice President.

New York Academy of Sciences **$75,000**
New York, NY 10021

A major civic grant in 1994 provided support to Polytechnic University to establish a master's degree program to educate professionals in a combination of technology and finance. The Foundation has also supported the establishment of a center for study of the financial services industry at the Wharton School of the University of Pennsylvania. Leadership in financial services is of particular importance to New York City. This grant supports a conference planned to bring together practitioners and scholars in order to analyze the origins and roles of innovation in financial services. An important issue is the organization of research and development in this service industry. The current President (Nathan Liebowitz, Salomon Brothers) and Treasurer (Henry Lichstein, CITICORP) of the New York Academy of Sciences lead the planning committee for the conference. Project Director: Dr. Rodney W. Nichols, Chief Executive Officer.

CIVIC PROJECTS, OFFICER GRANT

New York University $30,000
New York, NY 10003

To disseminate the research findings generated by the project on the future of manufacturing in New York City. Project Director: Dr. Mitchell L. Moss, Director, Taub Urban Research Center.

ADDITIONAL GRANTS

TRUSTEE GRANTS

Council on Foundations $40,000
Washington, DC 20036

Independent Sector $7,500
Washington, DC 20036

New York Regional Association of Grantmakers $10,500
New York, NY 10018

The Council on Foundations (COF) is the foundation community's national organization, whose mission is to promote responsible and effective philanthropy. It provides publications and research reports, conducts workshops, seminars, and an annual conference, and maintains an active government relations staff.

Independent Sector (IS) is mainly concerned with government relations, not-for-profit research, and leadership and management in not-for-profit organizations.

The New York Regional Association of Grantmakers (NYRAG) is one of 24 regional associations of foundations affiliated with the COF. Concentrating on the greater New York area, it supplies programs and information focusing on local foundation activities. Project Directors: Dorothy S. Ridings, President, COF; Sara E. Meléndez, President, IS; Barbara Bryan, Executive Director, NYRAG.

1995 FINANCIAL REVIEW

FINANCIAL REVIEW

The financial statements and schedules of the Foundation for 1995 and 1994, which have been audited by KPMG Peat Marwick LLP appear on pages 104 to 111. They include balance sheets, statements of activity and cash flows, and schedules of management and investment expenses.

Investment income for 1995 was $36,927,709, an increase of $3,580,915 from $33,346,794 in 1994. After the deduction of investment expenses and provision for Federal excise tax, net investment income was $32,119,170 in 1995 as compared with $29,139,720 for the prior year. Investment expenses during 1995 totaled $3,708,539 of which $3,073,029 represented investment advisor fees. The provision for Federal excise tax amounted to $1,100,000. The total of these deductions from investment income in 1995 was $4,808,539 versus $4,207,074 in 1994.

Grants authorized (net of grant refunds) and management expenses during 1995 was $56,050,107, which was $23,930,937 greater than 1995 net investment income. Of this total, grants authorized (net of refunds) amounted to $52,575,014 while management expenses were $3,475,093. Since the Foundation's inception in 1934, the cumulative excess of grants and expenses over the Foundation's net investment income has amounted to $67,893,468.

Grant payments in 1995 were $40,590,535 compared with $37,631,096 for the prior year. Together with management expenses, investment expenses, federal excise taxes paid and other charges, the total of cash expenditures net of grant refunds in 1995 was $48,203,358 while in 1994 the amount was $45,663,157.

Grants authorized and payments made during the year ended December 31, 1995 are summarized in the following table:

Grants unpaid at December 31, 1994	$41,976,649
Authorized during 1995	52,805,078
	94,781,727
Payments during 1995	40,590,535
Grants unpaid at December 31, 1995	$54,191,192

The market value of the Foundation's total assets was $935,191,343 at December 31, 1995 including investments valued at $934,869,916 as compared with total assets of $790,306,900 at December 31, 1994.

AUDITORS' REPORT

Report of KPMG Peat Marwick LLP
Independent Auditors

The Board of Trustees
Alfred P. Sloan Foundation:

We have audited the accompanying balance sheets of the Alfred P. Sloan Foundation as of December 31, 1995 and 1994, and the related statements of activity and cash flows for the years then ended. These financial statements are the responsibility of the Foundation's management. Our responsibility is to express an opinion on these financial statements based on our audits.

We conducted our audits in accordance with generally accepted auditing standards. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of the Alfred P. Sloan Foundation as of December 31, 1995 and 1994, and the changes in its net assets and its cash flows for the years then ended in conformity with generally accepted accounting principles.

As discussed in note 1 to the financial statements, in 1995 the Foundation adopted the provisions of Statement of Financial Accounting Standards No. 124, "Accounting for Certain Investments Held by Not-for-Profit Organizations."

Our audits were made for the purpose of forming an opinion on the basic financial statements taken as a whole. The supplementary information included in the schedules of management and investment expenses for the years ended December 31, 1995 and 1994 is presented for purposes of additional analysis and is not a required part of the basic financial statements. Such information has been subjected to the auditing procedures applied in the audits of the basic financial statements and, in our opinion, is fairly stated in all material respects in relation to the basic financial statements taken as a whole.

KPMG Peat Marwick LLP

February 9, 1996

BALANCE SHEETS
DECEMBER 31, 1995 AND 1994

	1995	1994
Assets		
CASH	$ 91,568	$ 84,304
INVESTMENTS:		
Fixed income	212,400,645	194,656,641
Equity	636,196,494	519,917,458
Other	86,272,777	74,979,590
TOTAL INVESTMENTS	934,869,916	789,553,689
OTHER	229,859	668,907
Total	**$935,191,343**	**$790,306,900**
Liabilities and Net Assets		
GRANTS PAYABLE	$ 54,191,192	$ 41,976,649
DEFERRED FEDERAL EXCISE TAX	1,689,878	123,278
	55,881,070	42,099,927
NET ASSETS–UNRESTRICTED	879,310,273	748,206,973
Total	**$935,191,343**	**$790,306,900**

See accompanying notes to financial statements.

STATEMENTS OF ACTIVITY
YEARS ENDED DECEMBER 31, 1995 AND 1994

	1995	1994
INVESTMENT INCOME:		
Interest	$ 21,767,373	$ 20,884,842
Dividends	15,160,336	12,461,952
	36,927,709	33,346,794
LESS:		
Investment expenses	3,708,539	3,411,074
Provision for Federal excise tax	1,100,000	796,000
	4,808,539	4,207,074
Net investment income	32,119,170	29,139,720
EXPENSES:		
Grants authorized (net of refunds of $230,064 in 1995 and $223,004 in 1994)	52,575,014	49,158,177
Management expenses	3,475,093	3,355,027
	56,050,107	52,513,204
EXCESS OF EXPENSES OVER NET INVESTMENT INCOME	(23,930,937)	(23,373,484)
NET GAIN ON DISPOSAL OF INVESTMENTS	78,270,835	48,233,785
INCREASE (DECREASE) IN UNREALIZED APPRECIATION OF INVESTMENTS, NET OF DEFERRED FEDERAL EXCISE TAX	76,763,402	(94,103,941)
	155,034,237	(45,870,156)
INCREASE (DECREASE) IN NET ASSETS	131,103,300	(69,243,640)
NET ASSETS AT BEGINNING OF YEAR	748,206,973	817,450,613
NET ASSETS AT END OF YEAR	$879,310,273	$748,206,973

See accompanying notes to financial statements.

STATEMENTS OF CASH FLOWS
YEARS ENDED DECEMBER 31, 1995 AND 1994

	1995	1994
Cash flows from operating activities:		
INCREASE (DECREASE) IN NET ASSETS	$131,103,300	($69,243,640)
ADJUSTMENTS TO RECONCILE INCREASE (DECREASE) IN NET ASSETS TO NET CASH USED IN OPERATING ACTIVITIES:		
Net gain on disposal of investments	(78,270,835)	(48,233,785)
(Increase) decrease in unrealized appreciation of investments	(78,330,002)	96,024,430
Increase (decrease) in deferred federal excise tax	1,566,600	(1,920,489)
(Increase) decrease in other assets	439,048	(668,907)
Increase in grants payable	12,214,543	11,750,085
(Decrease) in other liabilities	—	(20,360)
Net cash used in operating activities	(11,277,346)	(12,312,666)
Cash flows from investing activities:		
Proceeds from sale of investments	1,029,959,261	907,151,693
Purchase of investments	1,018,674,651	894,669,237
Net cash from investing activities	11,284,610	12,482,456
NET INCREASE IN CASH	7,264	169,790
CASH AT BEGINNING OF YEAR	84,304	(85,486)
CASH AT END OF YEAR	$ 91,568	$ 84,304

See accompanying 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 management expenses, including post-retirement benefit expense, are recorded on the cash basis, the effect of which on the accompanying financial statements is not materially different from the accrual basis. Grants are accrued when authorized by the Trustees.

In 1995, the Foundation adopted the provisions of Statement of Financial Accounting Standards No. 124, "Accounting for Certain Investments Held by Not-for-Profit Organizations," and, accordingly, investments are recorded at market. Prior to the adoption of this standard, the Foundation accounted for investments at cost. The Foundation has increased net assets at December 31, 1993 by $100,144,587 to reflect this change and to reflect the associated deferred taxes on the net appreciation in market value of investments. In addition, the 1994 balance sheet and statement of activity have been restated to reflect these changes.

Gains or losses on disposal of investments are determined on the first-in, first-out basis. Market value for traded securities is based on quoted market prices. Real estate and other investments of limited marketability are reported at estimated fair values based upon appraisals by the managers of the various interests.

2. INVESTMENTS

Investments at December 31, 1995 are summarized as follows:

	Cost	Market	% of Total
FIXED INCOME:			
Short term	$ 30,092,274	$ 30,261,057	3.2
Long term	172,458,210	182,139,588	19.5
	202,550,484	212,400,645	22.7
EQUITIES	565,129,817	636,196,494	68.1
OTHER	82,695,689	86,272,777	9.2
	$850,375,990	$934,869,916	100.0

At December 31, 1994 the market value of the investments exceeded cost by $6,163,924.

3. FINANCIAL INSTRUMENTS WITH OFF-BALANCE SHEET CREDIT OR MARKET RISK

The Foundation's investment strategy incorporates certain financial instruments which involve, to varying degrees, elements of market risk and credit risk in excess of the amounts recorded in the financial statements. These instruments include financial futures, forward foreign currency contracts, loaned securities and securities sold, not yet purchased.

The Foundation is subject to market risk associated with the changes in the value of the futures contracts. The Foundation held long and short S&P 500 and U.S. Treasury futures contracts at December 31, 1995 and 1994 valued at approximately $146.2 million and $232.2 million, respectively. These amounts, however, may differ from the Foundation's future cash requirements as the Foundation may close out futures positions prior to settlement and thus be subject only to the change in value of the futures contracts since the contracts are valued daily using the mark-to-market method. The net appreciation in the market value is recognized as received. The margin requirements on deposit with a third party for futures contracts were approximately $6.7 million at December 31, 1995 and $9.4 million at December 31, 1994.

The Foundation purchases forward foreign currency contracts as a hedge against fluctuations in currency prices. Forward foreign currency buy and sell contracts held as of December 31, 1995 were valued at approximately $52.6 million and $52.9 million, respectively, and, as of December 31, 1994, at approximately $51.2 million and $50.5 million, respectively. Such contracts involve, to varying degrees, risk of loss arising from the possible inability of counterparties to meet the terms of the contract.

Through a securities lending program managed by its investment advisor, the Foundation loans certain stocks and bonds included in its investment portfolio. The Foundation's investment advisor has indemnified the program. The Foundation's gross securities loaned to certain borrowers at December 31, 1995 and 1994 amounted to $20 million and $77 million, respectively.

Securities sold, not yet purchased ($66.4 million and $46.8 million at December 31, 1995 and December 31, 1994, respectively) are recorded net in the Foundation's investment accounts. These securities have market risk to the extent that the Foundation, in satisfying its obligations, may have to purchase securities at a higher value than recorded. Required collateral is held by a third party.

Management does not anticipate that losses, if any, resulting from its market or credit risks would materially affect the financial position of the Foundation.

NOTES TO FINANCIAL STATEMENTS

4. FEDERAL EXCISE TAX

The Foundation is liable for federal excise taxes of 2 percent of its net investment income, which includes realized capital gains, for the year. However, this tax is reduced to 1 percent if certain conditions are met. The Foundation met the requirements for the reduced tax for the years ended December 31, 1995 and 1994. Therefore, current taxes are estimated at 1 percent of the net investment income for 1995 and 1994.

Deferred taxes represent 2 percent of unrealized appreciation of investments at December 31, 1995 and 1994, as qualification for the 1 percent tax is not determinable until the fiscal year in which gains are realized.

5. 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 the purchase of annuities for employees. Retirement plan expense was $268,446 and $239,384 in 1995 and 1994, respectively.

In addition, the Foundation provides certain health care and life insurance benefits to its retirees. The cost of providing nonpension benefits to retirees was $81,313 and $63,212 in 1995 and 1994, respectively, on a pay-as-you-go basis.

6. LEASE

The Foundation's lease for its office space expires December 31, 1998. The lease contains an escalation clause which provides for rental increases resulting from increases in real estate taxes and certain other operating expenses. Rent expense amounted to $405,778 and $403,704 in 1995 and 1994, respectively. At December 31, 1995, base rent commitments aggregate approximately $1,212,900 and are payable at approximately $404,300 annually.

SCHEDULES OF MANAGEMENT AND INVESTMENT EXPENSES YEARS ENDED DECEMBER 31, 1995 AND 1994

	1995	1994
Management Expenses		
Salaries and employee benefits:		
Salaries	$1,989,132	$1,921,271
Employees' retirement plan and other benefits	710,858	588,564
Total	2,699,990	2,509,835
Rent	405,778	403,704
Program expenses	493,500	508,133
Office expenses	408,910	444,764
Reports and publications	51,711	51,723
Professional fees	50,714	46,460
Total management expenses	4,110,603	3,964,619
Less management expenses allocated to investments	635,510	609,592
Management expenses	$3,475,093	$3,355,027
Investment Expenses		
Investment management fees	$3,073,029	$2,801,482
Management expenses allocated to investments	635,510	609,592
Investment expenses	$3,708,539	$3,411,074

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INDEX OF GRANTS

1996 ANNUAL REPORT

ALFRED P. SLOAN FOUNDATION

Alfred P. Sloan, Jr.
1875-1966

LIFE OF ALFRED P. SLOAN, JR.

Alfred Pritchard Sloan, Jr., was born in New Haven, Connecticut, May 23, 1875, the first of five children of Alfred Pritchard Sloan, Sr., and Katherine Mead Sloan. His father, a machinist by training, was then a partner in a small company importing coffee and tea. In 1885 the family moved to Brooklyn, where it was particularly active in the Methodist Church. (Young Alfred's maternal grandfather was a Methodist minister.) Alfred, Jr., excelled as a student both in the public schools and at Brooklyn Polytechnic Institute where he completed the college-preparatory course. After some delay in being admitted to the Massachusetts Institute of Technology (which considered him too young when he first applied), he matriculated in 1892 and took a degree in electrical engineering in three years as the youngest member of his graduating class.

Mr. Sloan began his working career as a draftsman in a small machine shop, the Hyatt Roller Bearing Company of Newark, New Jersey. At his urging, Hyatt was soon producing new antifriction bearings for automobiles. In 1898 he married Irene Jackson of Roxbury, Massachusetts. The next year, at age 24, he became the president of Hyatt, where he supervised all aspects of the company's business. Hyatt bearings became a standard in the automobile industry, and the company grew rapidly under his leadership. In 1916 the Hyatt Roller Bearing Company, together with a number of other manufacturers of automobile accessories, merged with the United Motors Corporation, of which Mr. Sloan became President. Two years later that company became part of the General Motors Corporation (itself established in 1908 as the General Motors Company), and Mr. Sloan was named Vice President in Charge of Accessories and a member of the Executive Committee.

He was elected President of General Motors in 1923, succeeding Pierre S. du Pont, who said of him on that occasion: "The greater part of the successful development of the Corporation's operations and the building of a strong manufacturing and sales organization is due to Mr. Sloan. His election to the presidency is a natural and well-merited recognition of his untiring and able efforts and successful achievement." Mr. Sloan had developed by then his system of disciplined, professional management that provided for decentralized operations with coordinated centralized policy control. Applying it to General Motors, he set the Corporation on its course of industrial leadership. The next 23 years, with Mr. Sloan as Chief Executive Officer, were years of enormous expansion for the Corporation and of a steady increase in its share of the automobile market.

In 1937 Mr. Sloan was elected Chairman of the Board of General Motors. He continued as Chief Executive Officer until 1946. When he resigned from the chairmanship in 1956, the General Motors Board said of him: "The Board of Directors has acceded to Mr. Sloan's wish to retire as Chairman. He has served the Corporation long and magnificently. His analysis and grasp of the problems of corporate management, his great vision and rare good judgement, laid the solid foundation which has made possible the growth and progress of General Motors over the years." Mr. Sloan was then named Honorary Chairman of the Board, a title he retained until his death on February 17, 1966. For many years he had devoted the largest share of his time and energy to philanthropic activities, both as a private donor to many causes and organizations and through the Alfred P. Sloan Foundation, which he established in 1934.

Mr. Sloan, as a realist as well as a humanist and philanthropist, looked upon the Foundation as an extension of his own life and work. Although he recognized the inevitability of change that might dictate a different course, he expected that the Foundation would "continue as an operating facility indefinitely into the future...to represent my accomplishments in this life." His accomplishments during his lifetime were of the highest order, and in themselves provide the most dramatic and lasting tribute to his extraordinary talent. Through the Foundation, his accomplishments have been extended and expanded.

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TRUSTEES

COMMITTEES OF THE BOARD OF TRUSTEES

Executive Committee

Harold T. Shapiro, Chairman
Stephen L. Brown
Ralph E. Gomory
Frank Press

Investment Committee

Stephen L. Brown, Chairman
S. Parker Gilbert
Harold T. Shapiro
Ralph E. Gomory
Robert M. Solow

Audit Committee

Lloyd C. Elam, Chairman
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Program Officer

Kathleen E. Christensen
Program Officer

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A. Frank Mayadas
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Program Officer

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Controller

Arthur L. Singer, Jr.
Program Consultant

Michael S. Teitelbaum
Program Officer

Doron Weber
Program Officer

GENERAL INFORMATION

"The greatest real thrill that life offers is to create, to construct, to develop something useful. Too often we fail to recognize and pay tribute to the creative spirit. It is that spirit that creates our jobs. There has to be this pioneer, the individual who has the courage, the ambition to overcome the obstacles that always develop when one tries to do something worthwhile, especially when it is new and different."

—Alfred P. Sloan, Jr., 1941

PROGRAMS AND INTERESTS

The interests and programs of the Foundation are divided into four areas which can be outlined as follows:

Science and Technology

- Fellowships
- Direct Support of Research
- History of Science and Technology

Standard of Living and Economic Performance

- Industries
- Nonprofit Sectors
- The Family and the Workplace

Education and Careers in Science and Technology

- General Education and Training
- Minorities and Women
- Public Understanding of Science and Technology

Selected National Issues and Civic Program

In the following sections, brief descriptions are provided of the Foundation's programs in these four areas, including current directions and plans. Additional information can readily be obtained from the Program Officer responsible for a particular program, as identified on the Foundation's World Wide Web site, http://www.sloan.org.

SCIENCE AND TECHNOLOGY

Science and technology continue as major interests of the Foundation. Fellowships account for expenditures of $5 million annually. Grants for the direct support of research in selected fields and for work in the history of science and technology are important components of the Foundation's program. Special-purpose symposia and workshops in mathematics, science, and technology are also supported as part of the program.

FELLOWSHIPS

Sloan Research Fellowships

One hundred Sloan Research Fellowships are awarded each year in the following fields: chemistry, computer science, economics, mathematics, neuroscience, and physics. These are highly competitive grants given to young faculty members with outstanding research potential on the recommendation of senior scientists.

Dissertation Fellowships

Fifty awards in two fields, economics and mathematics, are made each year to allow especially promising graduate students to concentrate on completing their doctoral research and dissertations. Nominations are solicited from leading graduate departments in these fields.

DIRECT SUPPORT OF RESEARCH

The Foundation seeks to identify areas of research that are scientifically significant but are overlooked by major governmental funding agencies or do not fit well within their program orientations. Among such areas being supported are theoretical neurobiology, molecular evolution, computational molecular biology, astrophysics (Sloan Sky Survey) and limits to knowledge. A new research topic under exploration in 1997 is the global abundance and distribution of marine life. The Foundation is open to suggestions for other topics in science and technology that meet the specified criteria.

Theoretical Neurobiology

A research program in theoretical neurobiology was launched late in 1994 with grants totaling almost $7 million to support five new research centers at Brandeis University, California Institute of Technology, New York University, Salk Institute, and University of California, San Francisco. The program gives young scientists with previous training in mathematics, physics, computer science, and other theoretical areas an opportunity to learn laboratory procedures and work with senior neurobiologists. The aim is to encourage significant research by a new group of theoreticians with intimate knowledge of important neurobiology techniques and problems. The program has attracted strong participants and initial research results are also encouraging.

Molecular Evolution

The Sloan program in molecular evolution, started in 1986, has evolved into a two-part initiative operated jointly with the National Science Foundation: postdoctoral research fellowships and awards for young investigators in the early years of their independent research careers. The underlying science of molecular evolution continues to progress rapidly and both joint programs attract very highly qualified applicants.

Computational Molecular Biology

Postdoctoral awards in computational molecular biology, jointly supported with the Department of Energy, are designed to attract much-needed computational and analytic expertise to the challenging data analysis problems emerging in molecular biology. The first ten such awards for study and research in a molecular biology laboratory were made in 1996.

Sloan Sky Survey

Foundation grants totaling $10 million since 1992 have supported the Sloan Sky Survey. This astronomical survey will produce three-dimensional position and spectrographic information on a million galaxies and one hundred thousand quasars. The specially designed telescope system is completed. Testing and systematic observations begin in 1997.

Limits to Knowledge

This program seeks to explore what is unknown and what is unknowable in a variety of fields. Recent grants supported research on limits to knowledge in oceanography, dynamical systems, anthropology, and in our understanding of the origins of

prehistoric languages and history of science. Extending the program to several fields of biology and possibly economics is under consideration.

HISTORY OF SCIENCE AND TECHNOLOGY

The Foundation has supported a number of major archival projects devoted to collecting and publishing papers, letters, and notes of several eminent scientists: Charles Darwin, Thomas A. Edison, Albert Einstein, and Kurt Gödel. The preparation of scientific biographies has also been supported over the years. During 1996 a biography of Lise Meitner and autobiographical writing of Dorothy Hodgkin were published.

Grants in 1996 initiated an exploration of use of the World Wide Web to encourage those who participated in major scientific or engineering developments to contribute their personal views and recollections.

STANDARD OF LIVING AND ECONOMIC PERFORMANCE

This program aims to improve understanding of the basic forces affecting American economic progress and the U. S. standard of living in an increasingly competitive world economy. Including both manufacturing and service industries, the program now encompasses studies of human resources, globalization, and the role of the corporation. In the nonprofit sector, research is supported on universities and on the assessment of government performance. Another part of this program is devoted to research on various issues concerning the family and the workplace, including studies of the changing nature of work and its effects on both workers and their families.

INDUSTRIES

Industry Centers

The primary objective of this program has been to create academic groups with direct knowledge of industry. About 175 faculty members and many of their graduate students are involved in research at Sloan industry centers; twenty Ph.D.s were completed in the past year. Centers are actively involved with companies, are publishing research studies on their industries, and generally are producing data, observations, and theoretical results useful to American companies and the federal government. The knowledge generated is influencing academic courses and curricula.

Twelve industry centers are now supported by Foundation grants: **International Motor Vehicle Program** (Massachusetts Institute of Technology); **Center for the Apparel and Textile Industry** (Harvard University); **Sloan Steel Industry Center** (Carnegie Mellon University and University of Pittsburgh); **Center for Competitive Semiconductor Manufacturing** (University of California, Berkeley); **Computer Industry Project** (Stanford University); **Program on the Pharmaceutical Industry** (Massachusetts Institute of Technology); **Financial Institutions Center** (Wharton School, University of Pennsylvania); **Center for the Powder Metallurgy Industry** (Worcester Polytechnic Institute); **Retail Food Industry Center** (University of Minnesota); **Program on the Trucking Service Industry** (University of Michigan); **Center for the Study of the Managed Health Care Industry** (Harvard University); and the **Construction Industry Center** (University of Texas at Austin). The newest of the centers (for the construction industry at Texas) was initiated with a 1996 grant. The Foundation plans to develop a second wave of centers, which may include small industries and professional services

industries. Outreach to the industries and universities and efforts to enlarge the community that would benefit from the industry perspective will continue.

Information about the participants, programs, and publications of the centers is available on the Foundation's World Wide Web site.

Human Resources/Jobs/Income

The Sloan Human Resources Network continues to serve as a coordinating center for researchers working on human resource and work organization issues, including those arising within the Sloan industry centers. It unites a diverse group of about 45 faculty members and more than 30 graduate students. Topics studied include the effects on jobs of restructuring and outsourcing, and factors affecting wages. A meeting of the Network planned for early 1997 will be devoted to wage issues.

The Foundation is interested in further research on the effects of new work organization and human resource practices on productivity, wages, and skills and training needed by workers.

Globalization

The design, development, manufacturing, and distribution of many products and services are increasingly allocated internationally regardless of the home base of the company. The Foundation's program to study this widening geographical distribution of production aims to understand the main factors in location decisions of companies in a particular industry and the effects these decisions have on the quantity and quality of jobs and pay. Grants have been made to study such globalization issues for the computer disk industry, the television and personal computer industries, the automobile industry, and the computer services industry. A network to encourage communication among researchers in the field has been established and further research grants may be made for other industries.

Role of the Corporation

This program examines the nature and purpose of the corporation. At the Columbia Law School, researchers are comparing corporate governance in advanced industrialized nations. *The American Corporation Today* (Oxford University Press, 1996), edited by MIT's Carl Kaysen, examines the corporation and its changing nature and role in our society. The research of economist Margaret Blair led to a 1996 grant for the establishment at the Brookings Institution of a program on the role of the corporation emphasizing the increasing importance of firm-specific human capital. The Foundation plans to continue to build the network of researchers concerned with the role of the corporation.

Economics and Other Studies

Foundation-supported research continues at the Industrial Performance Center at MIT, now involving 35 affiliated faculty and 25 graduate students. At the National Bureau of Economic Research, a large number of economists have participated in a program combining field observations and visits to work sites with traditional economic theory. A forthcoming issue of the *Journal of Industrial Economics* will be devoted to papers from this project. The Future Professors of Manufacturing Program at Stanford University, with Foundation support and private contributions, will produce at least 25 new manufacturing specialists, all with industrial experience and high-quality doctoral training.

A book planned by William Baumol and Ralph Gomory will be based on their ongoing research examining how the classical Ricardo model of international trade can shed light on when economic development abroad is helpful or harmful to a home country.

NONPROFIT SECTORS

Universities

This program seeks to improve the understanding of how individual institutions of higher education actually work and also how the collection of the institutions functions as an industry. Foundation-supported researchers at the RAND Corporation expect by the end of 1997 to complete a book on higher education as an industry. Major 1996 grants went to Columbia's Teachers College for the establishment of a Sloan Center for the study of community colleges, particularly as they relate to the economy and the workforce, and to UCLA for a detailed examination of how its own university depart-

ments actually function. Work continued by a number of grantees on the development of an interactive simulation game of a university. The Social Science Research Council is forming new working groups on higher education as a means of increasing interactions among Sloan grantees and of enhancing the diffusion of results and insights gained.

Assessment of Government Performance

Projects in this program aim to produce measures of government performance that are objective, sustainable over time, and measure outcomes that matter to people. With an eye to improving performance, citizen groups outside of government are involved in the design and execution of each project, and also receive project results. With a 1995 grant, the Fund for the City of New York used focus groups to identify those city services New Yorkers care most about. This led to three topics for study: performance measures to evaluate the work of gatekeepers, the people in city agencies with whom citizens first come in contact; assessment, via indicators of vehicle damage and other measurements, of the quality of city-maintained parkways, highways, major thoroughfares, and local streets; and assessment of the street environment. The Urban Institute is continuing its work with the International City/County Management Association and the National Civic League on performance assessment in 43 cities and counties. Studies carried out in 1996 by the New York Public Interest Group Fund will lead to published profiles on each of the 26 New York subway lines using ten indicators of quality of service. Recent funding supports projects at Syracuse University on performance assessment in Syracuse and Onondaga County, and at Rutgers University to conduct assessments of government performance in Montclair, New Jersey and Dayton, Ohio.

Explorations are underway for a possible new project to encourage improvements in the conceptual framework that underlies current official U. S. Government statistics. There is substantial agreement that these data, although very widely used to assess such important aspects of U. S. society as employment and unemployment, inflation, poverty, productivity, and ethnicity, need to be improved .

FAMILY AND WORKPLACE

Workplace Practices and the Family

Both the American family and workplace are in flux. Middle class families are now likely to have both parents at work and the workplace itself is being profoundly changed by the entry of women. Against this background, recent Foundation grants have emphasized part-time careers. Research is ongoing on the intended and unintended consequences of part-time careers in law, accounting, engineering, medicine, computer programming, technical writing, and management. Future plans include the funding of demonstration projects to provide novel approaches to organizing work across the week, month, or year as a means of exploring new models for how work can be structured to meet the goals of both the firm and the family. Also planned is research on the effects on the family of the use of new technology in the workplace and an initial exploration of new ways of working developed by small and medium sized firms as they compete to attract and keep good employees.

Dual-Career Working Families

The Foundation is supporting the development of Centers on Working Families, large multi-disciplinary research centers located at major research universities. They will encourage the growth of a solid academic community that examines middle-class families, produces detailed information about working families, and educates a new generation of scholars with experience and interest in work-family issues. The first such center, Cornell University's Employment and Family Careers Institute, focuses on the experiences and needs of dual career families across the various stages of life. Three or four additional centers are planned. Proposals seeking to understand better everyday life in dual-career households and the experience of children in such environments are also of interest.

The Foundation has supported National Public Radio in developing work-family coverage. Other public outreach opportunities are also planned. One possibility being explored is a documentary on professional and managerial part-time careers that would examine new models for structuring career paths.

EDUCATION AND CAREERS IN SCIENCE AND TECHNOLOGY

Programs designed to educate and interest people in scientific and engineering fields have long been of interest to the Foundation. Under the heading of general education and training, one key area is career choice. Having chosen, there is the problem of retention. As the student population changes, opportunities for learning outside the classroom are increasingly important. There is the effect of immigration of scientists and engineers on careers and on the structure of the workforce. The under-representation of minorities and women in these professions is a continuing problem. Related to and influencing all this is the general public's understanding of science and technology.

GENERAL EDUCATION AND TRAINING

Career Choice

The Foundation's aim is to understand how American students develop interests in and then proceed toward careers in science and engineering. Supported by a major 1992 grant, progress continues on a six-year University of Chicago longitudinal study aimed at understanding how junior and senior high school students develop interests and knowledge about careers and the world of work. Close to 5,000 students, teachers, parents, and others have been involved in twelve school systems throughout the country. A book to be published in 1997 by Cambridge University Press will be a report on the methodology and initial results of this important project.

Having good information about careers is an important basis for making good career decisions. The Foundation program involves grants to professional societies to prepare career materials for college students, showing what it is actually like to be a scientist or engineer. Adapting these materials to create career information packages suitable for pre-college students and effective distribution of these materials are important next steps. Each professional society will prepare videotapes, CD-ROMs, and career brochures, and will also display career information on its website. Nine such grants have been made to professional groups representing chemists, geologists, materials scientists, mathematicians, physicists, and electrical and electronics, chemical, civil, and mechanical engineers. Much of this work is expected to be completed by the end of 1997.

Retention

Talking About Leaving: Why Undergraduates Leave the Sciences (Westview Press, 1997) by Elaine Seymour and Nancy M. Hewitt is a report of Foundation-supported research showing that the most common reasons for students switching out of science and engineering arise not from poor high school preparation, performance scores, or effort expended, but rather from the structure of the educational experience and the culture of the disciplines as reflected in the attitudes and practices of the faculty. Their results are widely cited and are now part of the basic understanding of retention. Why students leave graduate school has been studied with Foundation funding by Barbara Lovitts whose major finding is that attrition is not a function of what students bring to graduate school, but of what happens to them after they get there. Her work, the dissemination of which will be supported by a supplementary 1996 grant, points to departmental failures to integrate new students, to explain the processes and requirements for success, to socialize students into the profession, and to provide adequate advising as the major reasons for the current roughly 50% dropout rate by Ph.D. students.

Learning Outside the Classroom

The Foundation seeks to help make available education outside the classroom, for those motivated to seek it, mainly in science, mathematics, engineering, and other skills and disciplines required in the world of work. This is possible today via asynchronous access to such learning resources as on-line course and library materials. Communication with fellow students, tutors, and faculty is facilitated. Asynchronous means that access to any remote resource is under the student's control and is, so to speak, available "on demand."

Grants in the past three years to establish asynchronous learning networks (ALNs) focus on one of three categories of learners: those living on or near campus; those within commuting distance; and those very far from campus. Since 1993, over forty institutions have received officer or trustee grants to explore how learning is best done in an asynchronous environment. Some have modest goals, such as the development of one or two courses in the new mode. Others are attempting to deliver full degrees or certifications to remote learners, or to explore new outcomes that might be enabled by ALNs for traditional on-campus learners. Information about the location, participants, plans, and accomplishments of these projects is available on the Foundation's World Wide Web site.

Further grants are planned to emphasize larger scale projects with a statewide, regional, or even national focus. The Foundation has also moved to improve information flow in the growing ALN community by a recent grant to Vanderbilt for the development of an ALN web site that will feature news, scholarly and "magazine-style" articles, and on-line workshops. The third annual International ALN Conference will be held in 1997. In order to make ALNs more visible to potential learners and to the public generally, a major 1996 grant is supporting the production of a television documentary on the nature of these computer-based learning networks and their expected impact on education.

Immigration of Scientists and Engineers

Foundation-supported research on the impact on the U. S. economy and workforce of the immigration of scientists and engineers resulted in an important book by David North (*Soothing the Establishment: The Impact of Foreign-Born Scientists and Engineers on America*, University Press of America, 1995). Currently active grants support the development of an overall statistical portrait of the native and foreign-born populations of scientists and engineers in the U. S., an assessment of the roles being played by immigrants in the science and engineering complex of California, and an analysis of the extent to which immigrant scientists and engineers have made exceptional contributions to U. S. science and engineering. It appears timely to identify appropriate writers for a book that would bring together the results of these and other studies. The Foundation is considering support of studies of other factors affecting scientific and engineering careers, such as the rapid growth in the numbers of postdoctoral and adjunct faculty members employed by American universities, the use of imported computer programmers, the declining attractiveness of engineering as a career, and the possibility of alternative professional degrees in the sciences.

MINORITIES AND WOMEN

The Foundation continues to support efforts to ameliorate the underrepresentation of minorities and women in mathematics, science, and engineering.

Minorities

The main focus is on increasing the number of minority Ph.D.s in mathematics, science, and engineering. Grants support efforts of individual faculty members, research groups, and occasionally entire departments, all with demonstrated records of success in producing minority Ph.D.s, to increase the number they produce. The institutions and participating faculty with grants in this program can be found on the Foundation's World Wide Web site. The goal is to increase the number of Ph.D.s awarded to under-represented minorities in these fields by 100 per year from its current level of 400-500 per year.

Another part of this program aims to increase the number of minority students in specialized mathematics and science high schools and to help them succeed once enrolled. Major grants have gone to schools in Alabama, California, Illinois, Mississippi, and Virginia. Additional grants are planned for 1997.

A six-program television series, *Breakthrough: The Changing Face of Science in America*, was aired by PBS in 1996. This Foundation-funded series featured minority scientists and engineers and was seen by an audience of over 10 million people. A 1996 grant supports the production of 27 role model interviews a year with Hispanic scientists and engineers for broadcast on the Hispanic Radio Network and the establishment of an 800-number national outreach service. The Foundation is interested in further such grants serving to motivate minority students to consider careers in science and engineering.

Women

For several years, the Foundation has funded a number of model programs that focus on improving the campus climate for women students in mathematics, natural sciences, and engineering. These programs have included special recruitment efforts, mentoring arrangements, research opportunities for undergraduates, curriculum development, encouragement of faculty and graduate teaching assistants to be sensitive to gender issues in research and teaching environments, and the creation of communities of women students in these technical fields. Such programs have been funded at Cornell University, Dartmouth College, University of California (Davis), University of Maryland, University of Michigan, Purdue University, University of Washington, and Douglass College of Rutgers University.

The Foundation is currently exploring means to implement the newly-adopted goal of improving the retention and career success of women faculty in mathematics, science, and engineering.

PUBLIC UNDERSTANDING OF SCIENCE AND TECHNOLOGY

The goal of this program is to enhance understanding of the world around us through a keener appreciation of the increasingly scientific and technological environment in which we live. In support of this goal, Foundation grants continue to fund a variety of projects making use of books, films, radio, television, CD-ROM, and the Internet.

Books and CD-ROMs

The Sloan Technology Book Series was launched in 1994 with grants to support the writing of books designed to chronicle the development of the major twentieth century technologies. The first books (*Dark Sun* by Richard Rhodes, *Dream Reaper* by Craig Canine, and *Turbulent Skies* by Thomas A. Heppenheimer) were published in 1995. Three more volumes appeared in 1996: *Tube* by David E. Fisher and Marshall Jon Fisher; *The Invention That Changed the World* by Robert Buderi; and *Computer* by Martin Campbell-Kelly and William Aspray. Books on medical imaging, immunology, nuclear power and engineering, Taylorism, and the transistor are to be published in 1997.

In another program, two grants were made in 1996 for books on significant issues of public concern where public understanding and discussion are hampered by lack of knowledge of the underlying science or technology, one on how the health effects of environmental hazards are scientifically evaluated, and the other on the latest scientific research on weight and obesity. Other ongoing projects include a new American history textbook that highlights the role of science and technology in the nation's history, a three volume series and CD-ROM by David P. Billington on the great engineering developments of the last 200 years, of which the first volume (*The Innovators: The Engineers Who Made America Modern*) was published in 1996, and a multimedia edition of Bryan Hayes' field guide to the built environment.

Radio

The Foundation has funded the reporting of technology on National Public Radio and will explore additional ways to use radio to enhance public understanding of key science and technology issues.

Television

With Foundation funding, the PBS historical documentary series *The American Experience* continues its production of technology-related programs. Three shows will air in 1997, on the early years of the telephone, the invention of television, and the building of the New York subway system. A major 1996 grant supports the production by Hedrick Smith of a new four-part series on public television about the changing economic landscape and how American companies, workers, and families are adapting to these new realities. The Foundation is also a partial funder of two television series aimed at informing the public about significant scientific areas, one on the importance of mathematics in understanding and appreciating the world around us, and the other a four-part series on the origin and nature of the universe, hosted by Stephen Hawking. Also supported with 1996 grants is the development of television programs on medical imaging and commercial aviation, both based on volumes in the Sloan Technology Book Series. Other books in the series are also under consideration for such television treatments.

Films

The Foundation made a number of grants in 1996 to the nation's leading film schools to encourage writers and producers to prepare film and television shows about scientists and engineers. This program aims to influence the next generation of film makers to create more realistic and dramatic stories about science and technology and to challenge existing stereotypes about scientists and engineers through the visual media. The Foundation will continue to explore other efforts toward this goal.

SELECTED NATIONAL ISSUES AND CIVIC PROGRAM

The Foundation attempts to contribute to other major issues of our time in a way appropriate to its expertise and size. A special approach to the study and understanding of broadly recognized problems is a requirement for support.

Two major grants were made in 1996, one to the National Academy of Social Insurance in support of its efforts to produce an objective and expert assessment of alternative proposals for partial privatization of the Social Security system, the other to help launch the International AIDS Vaccine Initiative.

Foundation-funded research by Paul Slovic on nuclear energy and the public perception of nuclear power will be the subject of a 1997 book. The Foundation has also provided support for a one-hour documentary on nuclear power to be aired in the spring of 1997 on the award-winning series *Frontline*. Ongoing research resulting from past grants includes projects on illegal gun markets and juvenile violence. One of these, a pilot project in Boston, has led to the creation of a federal computer system to track the illegal sales of guns to young people.

The Foundation continues its tradition of making Civic grants for projects aimed at enhancing the economy of New York City. One approach is to help educational institutions provide specialized education or other assistance to sectors of the economy where they have relevant expertise.

During 1996, the Foundation provided funding for the Industrial Technology Assistance Corporation and The Municipal Art Society to conduct a series of activities intended to bring the design and design-based manufacturing sectors of the New York City economy closer together for the economic benefit of both sectors. The new Center for Finance and Technology, supported with a 1994 grant to New York's Polytechnic University, is now operating with a full schedule of courses and a growing number of degree candidates, as well as many students taking individual courses to gain special knowledge needed for their jobs. There is interest in other such opportunities to invest in projects to improve the City's economy.

The Sloan Public Service Awards program, administered by the Fund for the City of New York, continues to recognize outstanding performance by civil servants.

HOW TO APPLY FOR A GRANT

Applications can be made at any time for support of activities related to the range of interests indicated above. Grants of $30,000 or less are made throughout the year by officers of the Foundation. Officer grants enable the Foundation to respond quickly to proposals for many activities, such as workshops, symposia, and conferences, that fall within its program areas and interests, but require only moderate funding (at most $30,000). Officer grants can also be helpful for the preliminary planning and exploratory stages of major projects.

Grants over $30,000 are made by the Trustees who meet four times a year for that purpose. Letters of application are normally sent to the president or an officer of the Foundation and include, in addition to details about the applicant and the proposed project, information on the cost and duration of the work. Officer grants may not include any overhead charge; for trustee grants, at most fifteen percent of direct project costs can be budgeted for overhead. In the case of new applicants, the proof of tax-exempt status of the organization that would administer the grant should be included unless it is a recognized institution of higher education.

The Foundation's activities do not generally extend to religion, the creative or performing arts, elementary or secondary education, medical research or health care, the humanities or to activities outside the United States. Grants are not made for endowments or for buildings or equipment.

The Foundation has no deadlines or standard forms. Often a brief letter of inquiry, rather than a fully developed proposal, is an advisable first step for an applicant, conserving his or her time and allowing for a preliminary response regarding the possibility of support.

1996 GRANTS AND ACTIVITIES

SCIENCE AND TECHNOLOGY

Science and technology continue as major interests of the Foundation. Sloan Research and Doctoral Dissertation Fellowships accounted for expenditures of over $4.8 million in 1996. Trustee and officer grants also support research in such fields as theoretical neurobiology, molecular evolution, computational molecular biology, astrophysics (Sloan Sky Survey), and limits to knowledge.

Research activities in two fields continued with major support received in prior years: the program in theoretical neurobiology, initiated in 1994 with three-year grants totaling almost $7 million to establish five new research centers; and the Sloan Sky Survey, the recipient of past grants totaling $10 million, now testing a specially designed and constructed telescope and preparing to begin making astronomical observations.

The Foundation's long-term support of research in molecular evolution has evolved into a jointly operated program with the National Science Foundation. Information about recipients of 1996 NSF/Sloan postdoctoral research fellowships and young investigator awards in molecular evolution is given below.

The relatively new program in computational molecular biology, operated jointly with the U.S. Department of Energy, saw its first postdoctoral awards made in 1996. This fellowship program is described and details of the awards are recorded in a following section.

A number of 1996 grants supported research on limits to knowledge. The emphasis here is to explore what is known, unknown but knowable, and unknowable in a variety of fields.

The history of science and technology is another topic of interest to the Foundation, as illustrated by grants in 1996 for projects exploring the use of the World Wide Web as an additional resource for enriching the field.

As in past years, a number of officer grants supported special studies and projects, scientific symposia, and workshops.

Sloan Research Fellowships **$3,500,000**

Initiated 41 years ago, the Sloan Research Fellowship Program aims to stimulate fundamental research by young scholars with outstanding promise to contribute significantly to the advancement of knowledge. Fellowships have gone to over 3,100 scientists and have accounted for expenditures of more than $72 million. Sloan Research Fellows continue to receive numerous prizes and awards in recognition of their major research accomplishments. Twenty-one Fellows have received Nobel prizes and twelve have been awarded the prestigious Fields Medal in mathematics.

Fellowship awards in 1996 were made in six fields: chemistry, computer science, economics, mathematics, neuroscience, and physics. Each fellowship is administered by the fellow's institution and is designed to allow the greatest possible freedom and flexibility in its use. A brochure entitled "Sloan Research Fellowships," available from the Foundation and reprinted on its website, describes the program in detail.

Candidates for Sloan Research Fellowships are nominated by department heads or other senior scientists familiar with their work. Within each discipline, a committee composed of three distinguished scientists reviews all nomination documents and recommends the final selections. Committee members are asked to identify those nominees who show the most outstanding promise of making important research contributions. During 1996, the Foundation awarded Research Fellowships of $35,000 each, over a two-year term, to 100 scholars at 55 institutions. Nominations were reviewed by the following committees:

Chemistry: Jacqueline K. Barton, California Institute of Technology; Samuel Danishefsky, Columbia University; William H. Miller, University of California, Berkeley.

Computer Science: John L. Hennessy, Stanford University; John E. Hopcroft, Cornell University; Richard M. Karp, University of Washington.

Economics: Gary Chamberlain, Harvard University; Kenneth Rogoff, Princeton University; Jose Scheinkman, University of Chicago.

Mathematics: Spencer J. Bloch, University of Chicago; William P. Thurston, Mathematical Sciences Research Institute; Karen Uhlenbeck, University of Texas at Austin.

Neuroscience: Lily Jan, University of California, San Francisco; Darcy B. Kelley, Columbia University; J. Anthony Movshon, New York University.

Physics: Robert J. Birgeneau, Massachusetts Institute of Technology; Saul Teukolsky, Cornell University; Frank Wilczek, Institute for Advanced Study.

FELLOWSHIP RECIPIENTS

Arizona, University of
Physics: Hans-Walter Rix

Barrow Neurological Institute
Neuroscience: Eric T. Vu

Boston University
Economics: Alwyn Young
Mathematics: Dan Abramovich

Brandeis University
Neuroscience: Sacha Nelson
Piali Sengupta

British Columbia, University of
Physics: Douglas A. Bonn

Calgary, University of
Chemistry: Warren E. Piers

California Institute of Technology
Chemistry: Erick M. Carreira
Zhen-Gang Wang
Computer Science: Peter Schroder
Mathematics: Matthias Flach

California, University of, Berkeley
Physics: James C. Davis
Robert G. Jacobsen
Hitoshi Murayama

California, University of, Davis
Mathematics: Jeremy Quastel
Neuroscience: Gregg H. Recanzone

California, University of, Irvine
Mathematics: Svetlana Jitomirskaya

California, University of, Los Angeles
Chemistry: Daniel Neuhauser
Physics: Andrea Ghez

California, University of, San Diego
Physics: Vivek A. Sharma

California, University of, Santa Barbara
Chemistry: Bradley F. Chmelka
Physics: Claudio F. Campagnari

California, University of, Santa Cruz
Mathematics: Jonathan Weitsman

Carnegie Institution of Washington
Neuroscience: Chen-Ming Fan

Case Western Reserve University
Physics: Harsh Mathur

Chicago, University of
Chemistry: Philippe Guyot-Sionnest
Economics: Tomas Philipson
Mathematics: Tatiana Toro

Colorado State University
Chemistry: Marc M. Greenberg

Colorado, University of
Chemistry: Tarek Sammakia

Columbia University
Mathematics: Zlil Sela
Neuroscience: Rafael Yuste
Physics: Marc Paul Kamionkowski

Cornell University
Computer Science: Ronitt Rubinfeld
Mathematics: Reyer Sjamaar
Physics: Daniel C. Ralph

Duke University
Computer Science: Pankaj K. Agarwal
Neuroscience: Michael M. Haglund

Florida State University
Physics: Nicholas E. Bonesteel

Georgia, University of
Mathematics: Valery Alexeev

Harvard University
Economics: David M. Cutler
Neuroscience: Gabriel Corfas

Illinois, University of, Urbana-Champaign
Mathematics: Randy McCarthy
Physics: Peter R. McCullough

Institute for Advanced Study
Physics: Kenneth A. Intriligator

Johns Hopkins University
Neuroscience: Anirvan Ghosh

Maryland, University of
Mathematics: Richard E. Schwartz

Massachusetts Institute of Technology
Economics: Glenn Ellison
Neuroscience: Earl K. Miller
Physics: Frederic Rasio
Uwe-Jens Wiese

McGill University
Mathematics: Henri R. Darmon
Neuroscience: Peter S. McPherson

Minnesota, University of
Chemistry: Christopher J. Cramer
Jeffrey Thomas Roberts
Computer Science: Shang-Hua Teng
Mathematics: Victor Reiner

Montreal, University of
Chemistry: Andre B. Charette

New York University
Mathematics: Tobias H. Colding

North Carolina, University of
Chemistry: H. Holden Thorp
Computer Science: James H. Anderson
Physics: Christopher Thompson

Northwestern University
Mathematics: Tom Ilmanen
Neuroscience: Nelson Spruston

Pennsylvania State University
Mathematics: Diane Henderson

Pennsylvania, University of
Economics: Stephen Morris

Princeton University
Computer Science: Sanjeev Arora
Economics: Anne Case
Physics: Bernhard Keimer
Shivaji L. Sondhi

Purdue University
Chemistry: Jean A. Chmielewski

Queens University
Neuroscience: David J. Fleet

Rensselaer Polytechnic Institute
Mathematics: Gregor Kovacic

Rice University
Physics: Qimiao Si

Rochester, University of
Chemistry: Guillermo C. Bazan

Rutgers University
Computer Science: Martin Farach
Mathematics: Xiaochun Rong

Stanford University
Chemistry: Dale G. Drueckhammer
John H. Griffin
Computer Science: Mary G. Baker
Daphne Koller
Economics: Jeffrey H. Zwiebel

Texas A&M University
Chemistry: Gary A. Sulikowski
Economics: Curtis R. Taylor

Texas, University of, at Austin
Chemistry: Brent L. Iverson
John F. Stanton
Computer Science: David Zuckerman

Toronto, University of
Mathematics: Luis A. Seco
Physics: Michael Luke

Utah, University of
Chemistry: Thomas P. Beebe
Mathematics: Robert Morelli
Neuroscience: Kendal S. Broadie
Physics: Rui-Rui Du

Washington University
Neuroscience: Rachel O. L. Wong

Wayne State University
Chemistry: Robert J. Levis

Wisconsin, University of
Chemistry: Judith N. Burstyn

Yale University
Chemistry: John F. Hartwig
Physics: Samson Shatashvili

York University
Neuroscience: J. Douglas Crawford

1996 DOCTORAL DISSERTATION FELLOWSHIPS

Doctoral Dissertation Fellowships **$1,325,000**

The Sloan Dissertation Program, established in 1984, assists doctoral candidates in two fields of traditional interest to the Foundation: economics and mathematics. Awards allow Fellows to concentrate on completing their doctoral research and writing the dissertation.

Fellowships have been received by 640 graduate students and have accounted for expenditures of over $13.5 million. In 1996, awards covering tuition and fees plus a stipend of $15,000 were made to 25 doctoral candidates in each field. Nominations were solicited from the heads of leading graduate departments of economics and mathematics. They were reviewed and final selections made by the following committees:

Economics: Avinash K. Dixit, Princeton University; Sherwin Rosen, University of Chicago; John B. Taylor, Stanford University.

Mathematics: Luis A. Caffarelli, New York University; Nicholas M. Katz, Princeton University; John Morgan, Columbia University.

FELLOWSHIP RECIPIENTS

Boston University
Economics: Matilde Pinto Machado

Brown University
Mathematics: Seong-Deog Yang

California Institute of Technology
Economics: Robin D. Hanson
Mathematics: Ilia Binder

California, University of, Berkeley
Economics: A. U. Dhammika Dharmapala
Mathematics: Jeffrey F. Brock
Mahan Mitra

California, University of, Los Angeles
Economics: Edmundo Murrugarra
Mathematics: Ted Sweet
Wing-Lok Wan

California, University of, San Diego
Economics: Miguel Costa-Gomes

Chicago, University of
Economics: William Daniel Dupor
Hugo Rodriguez Mendizabal
Mathematics: Michael A. Mandell

Columbia University
Mathematics: Nikolaos Diamantis

Cornell University
Mathematics: Alexander Teplyaev

Harvard University
Economics: Shira B. Lewin
Aviv Nevo
Mathematics: Jason E. Fulman
Ravi Vakil
Alexander Vishik

Illinois, University of
Mathematics: Robert Otto Bauer

Massachusetts Institute of Technology
Economics: Julie Berry
Matthew Eichner
Mathematics: Andras Vasy

Michigan, University of
Economics: Amil Petrin

New York University
Mathematics: Geza Toth

North Carolina, University of
Economics: Christopher Allen Trenholm

Northwestern University
Economics: Paul J. Devereux
Gautam Tripathi

Pennsylvania, University of
Economics: Fabrizio Perri
Mathematics: Michael Movshev
Peter Selinger

Princeton University
Economics: Michael B. Greenstone
Robert Jensen
Mathematics: Denis Kosygin
Jonathan Pakianathan
Christopher McLean Skinner

Rutgers University
Mathematics: Amine M. Asselah

Stanford University
Economics: Thomas Charles DeLeire
Jess William Gaspar
Mathematics: Richard K. Hind

State University of New York, Stony Brook
Mathematics: Joseph Schaefer

Washington, University of
Economics: Jennifer Ward-Batts
Mathematics: David V. Ingerman

Wisconsin, University of
Economics: Alexandra Minicozzi

Yale University
Economics: C. Lanier Benkard
Benoit Perron
Frank Schorfheide
Mathematics: Konstantin Styrkas

THEORETICAL NEUROBIOLOGY

Three-year grants totaling almost $7 million made in 1994 support the continued operation of five research centers at Brandeis University, California Institute of Technology, New York University, Salk Institute, and University of California, San Francisco. The program brings young researchers with strong theoretical backgrounds, often with graduate degrees in the mathematical and physical sciences, into the laboratory world of neurobiology. Such young theoreticians are now participating in training at all the centers and have joined with faculty members in research projects.

A related 1994 grant to the Santa Fe Institute supported a series of three summer workshops. These draw together senior faculty and junior theoretical members of all the Sloan Centers for Theoretical Neurobiology, and also other neuroscientists, for presentation and review of experimental and theoretical results and plans. The second of these workshops was held in 1996.

MOLECULAR EVOLUTION

As the science of molecular evolution continues its rapid progress, Foundation support for research in this field, initiated in 1986, has evolved into an expanded program operated jointly with the National Science Foundation. The program has two parts, postdoctoral research fellowships and awards to young investigators in the early years of their independent research careers.

NSF/Sloan Postdoctoral Research Fellowships in Molecular Evolution

This competitive program is intended for young scientists who can benefit from the freedom to define and pursue their own research programs while developing relevant interdisciplinary knowledge and skills in a host laboratory or field station. Each two-year award carries a budget of $80,000 which provides a postdoctoral stipend, an allowance for research materials, and university overhead of 15%. In 1996, the third year of this program, a careful review of applications led to the following 18 awards. Citations are given in the form: name and affiliation of the Fellow; sponsoring scientist and institution; research topic.

Hiroshi Akashi, University of Chicago; John Gillespie, University of California, Davis; *Weak selection models and codon bias variation among species.*

Kenneth Bischoff, University of California, Davis; Peter Kennelly, Virginia Polytechnic Institute and State University; *Protein phosphorylation in the archaeon Sulfolobus solfataricus.*

John Bishop, University of Washington; Tom Mitchell-Olds, University of Montana; *Evolutionary analysis of chitinase-encoding loci in the plant Arabis fecunda.*

John Braverman, University of California, Davis; Wolfgang Stephan, University of Maryland; *The role of epistatic selection and pre-mRNA secondary structure in molecular evolution.*

Jane Dorweiler, University of Minnesota; Vicki Chandler, University of Oregon; *The evolution of an allele-specific interaction in maize.*

Susan Fuerstenberg, University of Minnesota; Michael Frohlich, University of Michigan; *Molecular evolution of plant homeotic gene expression.*

Alex Greenwood, University of Michigan; Svante Paabo, University of Munich; *Retrieval and repair of Pleistocene DNA sequences.*

Mark Grote, University of California, Berkeley; John Gillespie, University of California, Davis; *Non-neutral models of nucleotide substitution.*

Bryant McAllister, University of Rochester; Brian Charlesworth, University of Chicago; *The molecular evolution of sex chromosomes.*

Mohamed Noor, University of Chicago; Charles Aquadro, Cornell University; *Molecular-genetic and behavioral analyses of sexual isolation in Drosophila.*

Nicole Perna, University of New Hampshire; Fred Blattner, University of Wisconsin; *Estimating rates of recombination around the E. Coli genome.*

Aleksander Popadic, University of Georgia; Thomas Kaufman, Indiana University; *Expression patterns of the millipede Hox genes.*

Jay Schneider, University of Chicago; Diarmaid Foighil, University of Michigan; *Phylogenetic reliability of morphological reductive characters of the molluscan family Cardiidae.*

Peter Sheridan, University of Cincinnati; Jean E. Brenchley, Pennsylvania State University; *The molecular evolution of cold-active enzymes for Antarctic bacteria.*

Scott Snyder, University of Nebraska; Eric S. Loker, University of New Mexico; *Evolution of host-parasite associations among the Schistosomatidae.*

Sarah Tishkoff, Yale University; Andrew Clark, Pennsylvania State University; *Human demographic history inferred from microsatellites embedded in gene trees.*

Andrew Wedel, University of California, Berkeley; Charles Wilson, University of California, Santa Cruz; *In vitro recapitulation of prebiotic RNA evolution.*

Lillian Wolfenbarger, Cornell University; Gerald S. Wilkinson, University of Maryland; *The genetic basis of sexual dimorphism in a stalk eyed fly.*

Young Investigator Awards in Molecular Evolution

These awards provide early funds to support the research careers of newly independent researchers in molecular evolution. Applicants must hold positions on the regular faculties (or their equivalents) of U.S. or Canadian nonprofit public or private institutions of higher education and research, and must be within the first few years of their research careers. Up to five awards per year will be made, each with a total budget of $100,000 over a period of three years. In 1996, the second year of this program, a careful review of applications by an advisory committee led to the following five awards. Citations are given in the form: name of awardee, sponsoring institution and department; title of proposed research plan.

David A. Baum, Harvard University, Department of Organismic and Evolutionary Biology; *The molecular basis of phenotypic evolution.*

David J. Begun, University of Texas at Austin, Department of Zoology; *Population genetics of Drosophila Melanogaster.*

Keith A. Crandall, Brigham Young University, Department of Zoology; *Recombination in molecular phylogenetics.*

Brandon S. Gaut, Rutgers University, Department of Plant Sciences; *Inter-locus, inter-genomic and inter-specific comparisons of nucleotide substitution rates.*

Lisa M. Nagy, University of Arizona, Department of Molecular and Cellular Biology; *Evolution of arthropod morphology: changing patterns of gene regulation.*

MOLECULAR EVOLUTION, OFFICER GRANT

Keystone Symposia on Molecular and Cellular Biology **$10,000**
Westlake Village, CA 91362

Partial support for a symposium, "Mechanical Mechanisms of Evolution." Project Director: Dr. Robert Harwood, Director of Development.

COMPUTATIONAL MOLECULAR BIOLOGY

Sloan/DOE Fellowships in Computational Molecular Biology

A new postdoctoral fellowship program designed to provide an intensive experience in a molecular biology laboratory for computationally sophisticated young scientists was announced in 1995 as a joint venture of the Sloan Foundation and the U.S. Department of Energy. There is exceptional scientific potential in the application of modern computational techniques to complex problems related to data and information arising from the study of human and other genomes. This program aims to increase the number of scientists possessing the cross-disciplinary skills needed to study these problems. Computational molecular biology is taken broadly to include the application of mathematics, statistics, probability, and computer science. The goal is to foster interactions between the mathematical and biological sciences for genome studies and to provide rigorous training for scientists in this new interdisciplinary area.

Up to ten annual fellowships will be awarded, each with a budget of $100,000 over two years, including stipends, benefits, research expenses, and institutional overhead. Funding of these awards is shared by the Foundation and the Department of Energy. A careful review of applications in this first round of the competition resulted in the following ten 1996 awards. Citations are given in the form: awardee; sponsoring senior scientist and institution; proposed research plan.

Jonathan D. Blake; Fred E. Cohen, University of California, San Francisco; *Investigating the suitability of expressed sequence tags in locating and classifying genes.*

Steven E. Brenner; Michael Levitt, Stanford University; *Gene genealogy: tracing the evolutionary flow of protein families through complete genomes using computational approaches.*

David J. Diller; Wim G. J. Hol, University of Washington; *Mathematical modeling of protein crystallization.*

Kenneth W. Foreman; Ken Dill, University of California, San Francisco; *Improving the computational efficiency and applicability of core-directed chain growth.*

Tommi S. Jaakkola; Anthony Fink, University of California, Santa Cruz; *Statistical methods to detect weak protein homologies and predict structure and function of newly discovered proteins.*

Matteo Pellegrini; Todd Yeates, University of California, Los Angeles; *Self-assembly of supramolecular protein structures.*

Teresa Maria Przytycka; George Rose, Johns Hopkins University; *Algorithms for detecting structural similarities of proteins, searching for structural patterns, and related problems.*

Jeffrey J. Regan; Harry B. Gray, California Institute of Technology; *Computational study of electron tunneling in proteins.*

Edward C. Thayer; David Baker, University of Washington; *Improving amino acid sequence comparison through local sequence motif derived profiles.*

Timothy P. Westcott; J. Andrew McCammon, University of California, San Diego; *Simulation of the dynamics of chromatin.*

Cambridge University $200,000
New York, NY 10017

This project is part of the Foundation's effort to stimulate investigation of the limits to knowledge in a range of disciplines. Studies of written texts have led to the construction of family trees of languages and some understanding of the evolution of different languages from common ancestors. But in the absence of texts, what can we know about prehistoric languages? New information from the field of genetics offers the possibility of reconstructing population histories and may be able to throw light on the dispersal of language. The McDonald Institute for Archaeological Research will organize a three-year effort to bring together leading scholars from archaeology, linguistics, and historical genetics to draw up detailed assessments on what is known, what is unknown, and what is inherently unknowable about the early development of the world's languages. Project Director: Professor Colin Renfrow, McDonald Institute for Archaeological Research.

Dibner Institute $300,000
Cambridge, MA 02139

A group of leading historians of science will undertake a two-year research project on the nature and limitations of historical knowledge about scientific ideas and their investigators. Four case studies will be used as the group seeks to understand how past scientists perceived and changed the boundaries of the known, unknown, and unknowable. The studies will focus on: (1) disputes in cosmology during the transition from the Middle Ages to the Renaissance and the movement associated with the rise of modern science to abolish the unknowable (God's hidden mysteries); (2) Newton's theory of matter and the notion and practical reality of forces; (3) the 19th century discovery of the continuous spectrum of optical radiation; and (4) the gene, introduced early in this century but long regarded as a purely hypothetical entity. In each case study, arguments will be examined about what was already known of the scientific entity, what could possibly be known, what would remain, practically or in principle, forever inaccessible, and what actually happened to grant the entity a significant practical reality. The project will be conducted by the Dibner Institute, located at MIT and established to encourage interactions among scholars in the history of science and technology. Project Director: Jed Z. Buchwald, Director, and Professor of History, MIT.

New York University $334,352
New York, NY 10012

This grant supports research at the Courant Institute on physical and biological problems exhibiting chaotic behavior. The object is to understand the limits to predictability and what can and cannot be known about such dynamic models in which large systems of partial differential equations are used to study real world problems. Applications to be considered include the interaction at the atmosphere-ocean interface, the transmission of light in optical fibers, and perhaps also the signaling across nerve circuits in the brain. Periodic seminars will review ongoing mathematical and computing research, and a colloquium series will be organized in which scientists from many fields will be brought together to discuss limits to knowledge in dynamical systems. Project Director: Professor David W. McLaughlin, Director, Courant Institute of Mathematical Sciences.

Woods Hole Oceanographic Institution $211,467
Woods Hole, MA 02543

A multidisciplinary group of scientists at the Woods Hole Oceanographic Institution will explore what is known, unknown, and unknowable about the oceans. Marine systems can be considered dynamic systems involving interactions among physical, biological, and chemical processes. The dynamics of ocean circulation, the biological response of marine populations to environmental variation, and the effects of deep ocean chemical fluxes on the chemical composition of seawater will be among the topics studied, with an emphasis in each case on limits to knowledge. Project Director: James Luyten, Associate Director for Research.

LIMITS TO KNOWLEDGE, OFFICER GRANTS

American Anthropological Association — $27,725
Arlington, VA 22203

To create a working group and publish a series of essays on limits to knowledge in anthropology. Project Director: Dr. Susan N. Skomal, Managing Editor, *Anthropology Newsletter*.

University of North Texas — $30,000
Denton, TX 76203

For preliminary exploration of measures of complexity as they relate to limits to knowledge. Project Director: Bruce J. West, Director, Center for Nonlinear Science.

MATHEMATICS AND SCIENCE, TRUSTEE GRANT

Institute for Advanced Study — $300,000
Princeton, NJ 08540

The initiation of programs in applied mathematics in the Institute's School of Mathematics was supported with substantial 1990 and 1993 grants. Interest in applications was stimulated among the mathematics faculty, visits were encouraged by young mathematicians working in applications, and new research on applied topics was undertaken. Workshops have been held on turbulence, fluid dynamics, applied kinetic theory, quantum computing, mathematics of finance, and material microstructure. Professors Bombieri, Bourgain, Langlands, and Spencer have taken active roles in working with applied mathematicians. Over forty junior and senior visitors to the Institute have been involved in research on mathematical topics arising from the physical sciences, combinatorics, and computer science. The current grant will continue support for a transition period during which funding will be secured in order to make this attention to applied mathematics a permanent part of the Institute. Project Director: Dr. Phillip A. Griffiths, Director.

MATHEMATICS AND SCIENCE, OFFICER GRANTS

Brown University — $20,000
Providence, RI 02912

For a symposium on current and future challenges in the applications of mathematics. Project Director: Walter Freiberger, Professor of Applied Mathematics.

Pennsylvania State University — $30,000
University Park, PA 16802

Support for the journal, *Innovations in Materials Research*. Project Director: Rustum Roy, Evan Pugh Professor of the Solid State.

University of California, San Diego — $30,000
La Jolla, CA 92093

For a workshop to assess the state of knowledge of classification of fishes. Project Director: Dr. William A. Nierenberg, Director Emeritus, Scripps Institution of Oceanography.

In coming years, the new Internet environment holds the potential to alter the practice of history of science and technology by broadening access to a vast array of diverse primary sources, enabling many more people to participate in and contribute to the development of the historical record, and creating new outlets for scholarly research. This new environment will be explored by a group of historians of technology who will establish experimental World Wide Web sites, actively maintain the sites for one year, and then evaluate their effectiveness. The subjects and hosts of the sites will be: New York blackouts (Brown University); Boston central artery/tunnel project (Massachusetts Institute of Technology); the computer mouse (Stanford University); polymerase chain reaction (University of California, Berkeley); and electric vehicle drivers and owners (University of California, Los Angeles). In each case, the plan is to create an inviting and informative site with some initial materials on the subject matter and then to invite contributions by those who have participated in the relevant technological developments. Reports to be made at professional meetings of historians will describe experience with the sites. Stanford will provide the core software services and the servers for all members of the project.

To support this project, Trustee grants in 1996 were made to the following institutions:

Brown University — $79,000
Providence RI 02912

Project Director: James T. Sparrow, Ph.D. candidate, Modern U. S. History.

Massachusetts Institute of Technology — $65,000
Cambridge, MA 02139

Project Director: Thomas P. Hughes, Professor Emeritus of the History and Sociology of Science, University of Pennsylvania; Visiting Professor, MIT.

Stanford University — $249,000
Stanford, CA 94305

Project Director: Professor Timothy Lenoir, Chair, Program in History and Philosophy of Science.

University of California, Berkeley — $33,000
Berkeley, CA 94720

Project Director: Paul Rabinow, Professor of Anthropology.

University of California, Los Angeles — $74,000
Los Angeles, CA 90095

Project Director: Professor David A. Kirsch, Graduate School of Management.

STANDARD OF LIVING AND ECONOMIC PERFORMANCE

The goal of this program is to contribute to the understanding of the basic forces that will maintain and improve a high American standard of living in an increasingly competitive global economy. The program spans a wide variety of subjects that affect the ability of U. S. industry to compete in world markets: the vitality of manufacturing and service sector industries; the process of globalization of industrial production; innovation, competitiveness, and productivity growth; the nature and role of the corporation; nonprofit sectors; human resources; and workplace and family issues.

The Foundation launched a major effort within this program in 1990 by establishing interdisciplinary centers at leading research universities to study selected U. S. industries. The objective is to support the growth of an academic community, with scholars from a wide range of specialties, who will develop close contacts with industry and provide realistic research and education on the American industrial sector. The twelfth such center, for study of the construction industry at the University of Texas at Austin, was funded in 1996. Third and final grants were also made to two of the initial group of centers, for motor vehicles at MIT and semiconductor manufacturing at UC, Berkeley.

The creation of centers has been extended to two additional areas. As part of the Foundation's program to understand how individual institutions of higher education actually work and also how the collection of universities functions as an industry, a center for the study of community colleges was established in 1996 at Teachers College, Columbia University. Also established with 1996 grants are the first two Centers on Working Families, at Cornell University and the University of California, Berkeley, to study the many issues involved in the relationships between the workplace and the family.

A number of grants supported the formation of networks to facilitate communication and cooperation among researchers working in various areas supported by the Foundation. Other major 1996 grants, all reported in this section, supported projects on globalization, competitiveness and productivity, the role of the corporation, the university as a system, assessment of government performance, human resource management, and workplace and family issues.

TRUSTEE GRANTS

Columbia University
New York, NY 10027 — **$299,000**

This grant supports a study by the Center on Japanese Economy and Business, Columbia Graduate School of Business, of the strategic role and actual use of software in the key operations of manufacturing and service industries. The study will examine competitive aspects of the role software plays in production and other business functions by pairing U. S. and Japanese companies in at least six industries for which there are Sloan Industry Centers. One aspect of the study is to understand the history and competitive implications of the fact that major Japanese companies continue to use custom software for production processes, whereas their U. S. counterparts have moved mainly to off-the-shelf packaged products. Also to be explored are differences in the use of software from industry to industry and the role of third party service providers. Visits to firms and contacts with customers, suppliers, competitors, industry associations, and government officials are planned. Project Director: William V. Rapp, Professor of Economics and Academic Director, Graduate Program in International Relations, Yale University.

Massachusetts Institute of Technology
Cambridge, MA 02139 — **$950,000**

University of California, Berkeley
Berkeley, CA 94720 — **$972,489**

These grants represent final funding for two of the first group of Sloan Industry Centers. Starting in 1990, prior grants of just under $4 million have gone to the International Motor Vehicle Program at MIT and of $3.2 million to the Center for Competitive Semiconductor Manufacturing at Berkeley. Both have now developed their own communities of faculty, students, companies, and even some governments that contribute to and benefit from their research and educational work. Important books and research reports have been written. Executive courses have been presented for industry representatives. Substantial support has come from companies and company associations in their industries and, for IMVP, also from five country governments

and the European Community. These final grants support the continuation of ongoing work, including doctoral research of graduate students, as well as new projects. IMVP will begin an analysis of the technical contributions that come to the automobile industry from U. S. universities and also a study of the implications for the industry of the emergence of large supply firms and new forms of distribution. The semiconductor industry program at Berkeley will initiate research on efficiency improvement in process equipment. Improvement here offers the most significant opportunity to maintain the industry's cost reduction record. A second research topic will focus on new product development, working with chip firms which do not fabricate, but instead transfer designs to chip foundries, and studying how this version of product design and development compares with a vertical organization's practices. Project Directors: Professor Daniel Roos, Director, Center for Technology, Policy and Industrial Development, MIT; Professor David A. Hodges, Department of Electrical Engineering and Computer Sciences, UC Berkeley.

University of Pennsylvania $390,446
Philadelphia, PA 19104

In the U. S., retail business represents forty percent of the economy and is the largest employer. Yet merchandising, bringing the right product to the right place at the right time, especially for fashion or seasonal goods, is still done as an art. This grant supports a project to bring more scientific order to the art of merchandising of fashion goods. To gain an understanding of best practices, leading retailers in consumer electronics, personal computers, sporting goods, and entertainment items such as books, compact discs, and videotapes, will be studied. Also to be included, but in less detail, are automobiles, apparel, appliances, and hardware. This benchmarking, together with comparative observation and data gathering at major companies (e.g., Dayton Hudson, Benetton, Toys-R-Us, Blockbuster, and Marks & Spencer), should lead to the formulation of scientific merchandising practices and their evaluation in terms of merchandising performance. It is hoped that prescriptive formulations for scientific merchandising will be able to be identified. Project Director: Professor Marshall L. Fisher, Co-Director, Manufacturing and Logistics Research Center, The Wharton School.

University of Texas at Austin $1,980,000
Austin, TX 78712

This grant supports a new Center for the study of the construction industry, a large industry with considerable economic effect and often cited as a prime indicator of strength or weakness of the whole economy. This project differs from the earlier Sloan industry centers in that it will take advantage of an existing activity at the University, the Construction Industry Institute (CII), that has already developed good connections to both builders and building owners. Ninety companies are members of the CII, almost evenly divided between builders and owners. Research projects, mostly technical, have been underway for some time. The new Center's activities will focus initially on the commercial and industrial part of the industry and will start by reviewing the key issues of the industry by means of faculty and student visits to builder and owner companies. Close and detailed contacts with the industry's actual companies will be maintained. Participants will include not only engineering faculty and graduates, but also members of the business school and social science departments. This wide-ranging approach is necessary, for example, in any study of the industry's critical labor issues: shortages of skilled workers in some regions of the country; lagging technical skills and training in new technologies and materials; and often troublesome labor-management relations. University labor economists, human resource specialists, and management faculty, in addition to engineers, are likely to be drawn into such a study, thereby involving and educating a wider group of faculty and students in research on this important industry. Project Director: Richard L. Tucker, Professor of Project Management and Director, Construction Industry Institute.

INDUSTRY STUDIES, OFFICER GRANTS

Columbia University $26,255
New York, NY 10027

Support of a meeting on "Software as a Tool of Competitive Advantage." Project Director: Hugh Patrick, Director, Center on Japanese Economy and Business.

Economic Strategy Institute $28,000
Washington, DC 20005

To provide a forum for presentation of Industry Study Center results. Project Director: Greg Mastel, Vice President, Policy Planning and Administration.

MPC Corporation $10,000
Pittsburgh, PA 15213

To fund additional publicity for the publication of a book, *The Renaissance of American Steel*, from the steel industry center. Project Director: Richard J. Fruehan, Professor of Metallurgical Engineering, Carnegie Mellon University.

Northeast-Midwest Institute $21,840
Washington, DC 20003

To support Capitol Hill forums on economic insecurity and job-displacing technologies. Project Director: Dick Munson, Executive Director.

GLOBALIZATION

TRUSTEE GRANTS

Carnegie Mellon University $318,932
Pittsburgh, PA 15213

Past grants in this Foundation program to understand the effects of globalization of production on the design, development, and manufacture of products, and on jobs, compensation, and changes in skill requirements and training of American workers, have focused on the manufacture of particular products: personal computers, television sets, computer discs, and automobiles. The current grant supports the formation of a network to include not only those working on Sloan-supported projects, but also researchers studying other aspects of globalization. The network will organize workshops and conferences, seed new studies that may be suggested during these sessions, provide meeting opportunities for Ph.D. students and others interested but new to the field, and generally encourage communication and cooperation among those working on globalization issues. Project Director: Professor Richard Florida, Director, Center for Economic Development, Heinz School of Public Policy and Management.

Council on Competitiveness $310,500
Washington, DC 20005

The capacity to innovate is a key competitive strength of the United States. There is concern that our innovation system is at risk due to many factors, one of which is globalization of the R&D process. With this grant, the Council will undertake a study of the dimensions and pace of R&D globalization. First will be the development of a Global Innovation Index, a new benchmarking measure intended to compare some of the vital inputs to national innovation systems. All relevant data relating to the human resource base, information and physical infrastructure, science and technology indicators, and government role will be brought together by a multidisciplinary government, industry, and academic group. Sector-specific investigations will then study innovation in six areas: automotive; advanced materials; health; information and communications; software and multimedia; and transportation services. The final part of the project, expected to be strongly influenced by the index and sector studies, will be the identification of a policy agenda. Project Director: Debra van Opstal, Vice President.

Stanford University **$140,000**
Stanford, CA 94305

The computer software services industry is very large and growing rapidly. It is populated by names like Anderson Consulting, IBM Global Services, EDS, etc. This project will study this complex industry and its practices in order to understand how it operates in global markets. The Stanford group plans an extensive literature review and a series of targeted interviews with industry participants as a means of describing the size and scope of the industry, the strengths of the major firms competing in the industry, and the nature of their competition. A second phase will focus on understanding the industry in a global context. Although some foreign firms compete effectively within the U. S. and internationally, major participants in the industry are U.S. firms who compete globally. How to maintain this relative position over a sustained interval is an important question. Direct contact with the industry will be emphasized in this study, which will become part of the research agenda of Stanford's Sloan Computer Industry Project. Project Director: Tim Bresnahan, Professor of Economics.

University of California, Berkeley **$750,000**
Berkeley, CA 94720

Prior Foundation grants totaling almost $2 million have supported the work of the Berkeley Roundtable for International Economics. BRIE is characterized by its independent perspectives of the industrial and political economic scene. The group has studied manufacturing, international trade, and international production networks. Nineteen Ph.D.s have been produced over the six years of Foundation funding and numerous books and papers have been written. BRIE has worked closely with federal departments, California agencies, and a number of national technology company leaders. Recent insights on production networks in Asia, Europe, and the Americas have been based on studies of industries producing electronics, autos, chemicals, biotechnology products, aircraft, and flat-panel displays. BRIE has been gradually building financial independence for itself and has made major progress in developing an endowment fund. This grant supplies funds to enable the transition to independence to take place. Project Director: Stephen Cohen, Co-Director, BRIE.

GLOBALIZATION, OFFICER GRANTS

Council on Foreign Relations
New York, NY 10021 **$30,000**

Study of globalization of industrial research and development. Project Director: Benedicte Callan, Associate Fellow for Industrial Policy.

Rensselaer Polytechnic Institute
Troy, NY 12180 **$15,812**

To help establish an industry consortium on science and technology in the Americas. Project Director: Herbert I. Fusfeld, Chairman, Advisory Board, Center for the Study of Management and Technology.

TRUSTEE GRANTS

National Academy of Sciences $100,000
Washington, DC 20418

The Academy's Committee on Science, Engineering, and Public Policy (COSEPUP) has been studying the role the U. S. plays on the world science scene and the relationship of that position to economic and social well-being in this country. Part of this work is to do a benchmarking study comparing the status of American academic research with that of other countries. In the background is the claim that leadership, or a position close to leadership, allows the U. S. to either produce new, useful technologies, products, and services first or to move quickly to a competitive position. With this grant, COSEPUP will benchmark two fields: materials science and immunology. (A similar effort for mathematics is already underway.) For each subject, the plan is to appoint a panel composed of leading scientists or engineers from the discipline and neighboring fields, as well as appropriate industrial or business people. It will be for the experts on each panel to identify and apply suitable measures for judging the status of their science. Project Director: Dr. Deborah Stine, Associate Director, Committee on Science, Engineering, and Public Policy.

National Academy of Sciences $238,000
Washington, DC 20418

Related to the previous grant, this project by COSEPUP faces the issue of whether scientific leadership actually does produce a better economy and improved social conditions. Case studies are planned on particular disciplines to understand the pathways from science to the resulting effects on products and services. Also to be studied are related issues, such as the changing educational and human resources needed to capitalize on leading research, and the roles of venture capital and regulation. Work will be expanded on case studies of other fields (computer science, speech recognition, piezoelectric ceramics, optical sensing, and monoclonal antibodies) begun as part of an initial feasibility study of the case study approach. Also, two new cases will be developed in suitably narrow subfields of chemistry and cognitive science. The case studies will be written up as individual reports and used as background for a policy report to be widely disseminated. Project Director: Tom Arrison, Staff Officer.

Resources for the Future $350,000
Washington, DC 20036

The extent to which basic extractive industries continue to form part of the U. S. economy depends in large part on whether domestic producers can achieve high and increasing productivity, while also meeting environmental goals. This study will explore sources of productivity change during the past 3-4 decades in forestry, energy (oil, gas, coal), and mining (selected metals as well as building materials). The impact on productivity of technical progress, changes in work organization and labor arrangements, and environmental and safety regulations will be considered, along with factors contributing to industry-wide productivity, such as R&D expenditures, levels of environmental compliance, capital accumulation, and training of the work force. In each sector, RFF will combine a "top-down" econometric analysis of productivity data at the level of the national industry with a "bottom-up" view based on direct observation of actual industry practice at such sites as tree plantations, oil exploration and drilling centers, and coal mines. Project Director: Robert W. Fri, Senior Fellow.

University of California, Berkeley $241,500
Berkeley, CA 94720

Grants totaling $6.3 million have gone in 1989 and 1992 to support the work of the Consortium on Cooperation and Competitiveness. This combined effort of faculty and students from Berkeley, Columbia, Harvard, and Stanford (and in the last few years, The Wharton School) has brought together a group of scholars whose research interests and efforts focus on the management and use of technologies in companies and across industries. The role of firm capabilities and competencies in firm strategies has been another central theme. The Consortium has worked together on the future of U. S. industrial research, the relationship between companies and the national R&D system, the role of universities in technical advance, the benefits and costs of patents, and a set of mini-industry studies. Over the past six years, the Consortium has produced more than 25 Ph.D.s and a large number of papers and presentations and has organized national conferences for faculty and special meetings for Ph.D. students. This final grant will support these annual conferences and student meetings for another three years. Project Director: Professor David C. Mowery, Haas School of Business.

COMPETITIVENESS AND ECONOMICS RESEARCH, OFFICER GRANTS

Massachusetts Institute of Technology **$30,000**
Cambridge, MA 02139

For a study of intellectual property protection and its role in maintaining technological leadership. Project Director: Dr. Carl Kaysen, Defense and Arms Control Studies Program.

Rensselaer Polytechnic Institute **$30,000**
Troy, NY 12180

Planning study to explore how RPI can contribute effectively to the local economy. Project Director: Faye Duchin, Dean, School of Humanities and Social Sciences.

University of California, Berkeley **$30,000**
Berkeley, CA 94720

Support for a conference on an electronic version of U. S. historical statistics. Project Director: Dr. Richard Sutch, Institute of Business and Economic Research.

Yale University **$30,000**
New Haven, CT 06520

Support for a conference on organizational and economic aspects of bureaucracy. Project Director: Oliver E. Williamson, Professor of Business Administration, University of California, Berkeley.

TRUSTEE GRANTS

Brookings Institution **$400,000**
Washington, DC 20036

Margaret Blair's 1995 book, *Ownership and Control: Rethinking Corporate Governance for the Twenty-First Century*, highlighted the importance of "firm-specific" human capital. This term refers to the special skills and knowledge of employees and the collective organizational capital that enable firms to accomplish their goals, but are not readily transferable if an employee moves to a different company. As part of the Foundation's program to stimulate thinking about the role of the corporation in America, this grant will support a Brookings project on the social role of corporations in an era of human capital. Blair and colleagues will explore how increasing importance of firm-specific human capital alters standard models of the firm in microeconomics and finance. They will also seek practical ways to measure firm-specific human capital in selected corporate sectors and begin to quantify its role in the U. S. economy. The project will include conferences, visitors, a network of academic collaborators, an advisory board, and dialogue with business leaders. Project Director: Margaret M. Blair, Senior Fellow, Economic Studies Program.

University of Maryland **$363,400**
College Park, MD 20742

A 1995 grant supported the formation of a network to help define and enlarge the growing community of researchers examining the fundamental nature and purposes of the corporation. Two workshops resulted in three significant papers and led to several new collaborations among participants. Seminars were held at professional society meetings (The Society of Business Ethics and the Academy of Management) and program events at six other meetings with scholars and business leaders were organized and conducted. Nearly 50 researchers are participating in the network. Network members are working on two books, additional papers and meetings, and have established an active website. This grant will fund an enlarged network, the continuation of ongoing research, and a new focus on empirical research on individual firms and their stakeholders. Project Director: Lee E. Preston, Professor of Business and Public Policy.

UNIVERSITY AS A SYSTEM, TRUSTEE GRANTS

Social Science Research Council **$300,000**
New York, NY 10019

The SSRC will create a new Committee on Higher Education with members, from Foundation-supported projects and others, who are scholars doing research on higher education as a major sector of the U. S. economy, on the university as a system and the system of universities. It will serve as a central point for the sharing of materials, facilitating dissemination and encouraging feedback; allow for the timely formation and operation of working groups with common interests; and create opportunities for individuals to reflect upon research results and write about them for a general audience. Some 35-40 scholars are expected to participate regularly in the activities of the Committee. Project Director: Kenneth Prewitt, President.

Teachers College **$1,765,000**
New York, NY 10027

Community colleges, generally defined as those schools offering a two-year undergraduate degree program, form a $20-30 billion segment of higher education. They number about 1100 institutions and now enroll more undergraduates than four-year colleges. They offer relatively low-cost courses and class times convenient for working adults, and have embraced life-long learning and a significant role in local economic development. Many students, including those with 4-year undergraduate degrees, enroll to acquire skills needed for jobs and return to update these skills. Despite their important role in the overall educational system, much of the existing research on community colleges is carried out by offices of institutional research within community college systems or in state offices serving legislators and others charged with oversight and funding. This grant supports the establishment of a new center for community college research, modeled on other Sloan industry centers. It will build a network of scholars studying the community college industry; synthesize existing research; and conduct new studies, particularly around questions of the role of community colleges in the U. S. economy. Field work will be emphasized, i.e., researchers will visit community colleges and make direct contact with their administrators, faculty, students, and other constituencies, including local employers. About ten Teachers College faculty will participate and four graduate fellows will be funded each year. The role of community colleges in the school-to-work transition and the relationships of community colleges to specific industries are likely initial research themes. Project Director: Professor Thomas R. Bailey, Director, Institute on Education and the Economy.

University of California, Los Angeles **$500,000**
Los Angeles, CA 90095

A 1995 officer grant supported a UCLA seminar involving faculty in the graduate schools of management and education in an examination of how UCLA itself works, what frameworks and models might best describe the university, and whether data exist to verify any functional model. The present grant will support a multidisciplinary team at UCLA to carry out an ambitious effort to document how the university actually works. The study will combine several methods of research: structured interviews of 30-40 key stakeholders; ethnographic accounts based on field work in which researchers make detailed observations of the core processes and social networks in units under study; and analyses of time budgets and other indicators of allocation of effort. The aim is to construct a model of university units and to gain insight into what kinds of changes might bring about desirable outcomes for the university with respect to its basic missions of teaching, research, and public service. The project will include a workshop focusing on methods for studying universities and a closing conference to share case study results with concerned stakeholders in the California system and nationally. Project Director: Dr. C. Kumar N. Patel, Vice Chancellor, Research.

UNIVERSITY AS A SYSTEM, OFFICER GRANTS

American Association of Community Colleges **$29,875**
Washington, DC 20036

To support the preparation of original research contributions for the Fall 1996 meeting of the Research Commission of the AACC. Project Director: Margaret Rivera, Director, Membership and Information Services.

Lehigh University $30,000
Bethlehem, PA 18015

To support a faculty study group developing and exploring models of universities and a Lehigh case study. Project Director: Professor Gordon C. F. Bearn, Department of Philosophy.

Regional Technology Strategies, Inc. $30,000
Chapel Hill, NC 27515

To explore the role of community colleges in the economic development of the inner city. Project Directors: Brian Bosworth and Stuart Rosenfeld, Principals.

Towson State University $21,250
Towson, MD 21204

To survey the literature and hold a workshop on comprehensive colleges and universities. Project Director: Hoke L. Smith, President.

ASSESSMENT OF GOVERNMENT PERFORMANCE, TRUSTEE GRANTS

New York Public Interest Research Group Fund $172,590
New York, NY 10007

The Fund's Straphangers Campaign will conduct a performance assessment of the New York City Transit Authority. A similar effort during the 1980s focused on the subway system and was influential in eliciting major capital investment and significant improvement in subway service and safety. The current plan is to explore the available data sources, develop reliable and meaningful measures of subway and bus performance, and prepare baseline information on the service and performance of the city's subway lines and stations, and of the most-used bus routes. Trained volunteers will

then collect field data for a semiannual survey of bus and subway performance. Among the outcomes to be considered for assessment are: differences between scheduled and actual bus and subway service levels; conditions of subway stations; and aspects of the environment for passengers. Results will be widely distributed and publicized. Public interest groups are expected to use any documented patterns of poor service as the basis for advocacy of appropriate remediation and investment. Project Director: Gene Russianoff, Senior Attorney.

Rutgers University $875,000
New Brunswick, NJ 08903

The National Center for Public Productivity (NCPP) at Rutgers will create and institutionalize citizen-driven, results-oriented performance assessment of the municipal governments of Dayton, Ohio and Montclair, New Jersey. Both cities have long traditions of citizen involvement in municipal government and are committed to increase their use of results-based performance assessment. NCPP has direct connections to the Montclair government and to citizen groups in the city. Their work in Dayton will be led by Paul Woodie, a senior government official there for many years and one of the creators of its widely acclaimed citizen participation system. Government services to be assessed in each city will be determined through discussions with citizen groups and government officials. Project Director: Marc Holzer, Professor of Public Administration and Executive Director, NCPP.

Syracuse University $579,098
Syracuse, NY 13244

Faculty from Syracuse's Maxwell School of Citizenship and Public Affairs will develop the Maxwell Benchmarks Program, a project to select or develop appropriate assessment measures and help citizens of Syracuse and Onondaga Country use these measures to evaluate and effect improvement in the performance of local government agencies that deliver police, fire, sanitation, streets, park, and immunization services. Leaders of the project have excellent connections, through Maxwell School alumni and in other ways, with government agencies and with a wide array of citizen groups which have expressed interest in taking part in the project. Cooperation is assured from

the Coordinator of Neighborhood Services for the Mayor of Syracuse, the Deputy Chief of Police in Syracuse, and the Administrator for Human Services for Onondaga County, among others. The plan includes a curriculum component: making the performance assessment process and the associated connections to government agencies and citizen groups part of an ongoing course in the school of public affairs. Project Director: Professor William D. Coplin, Director, Public Affairs Program.

ASSESSMENT OF GOVERNMENT PERFORMANCE, OFFICER GRANTS

Columbia University **$30,000**
New York, NY 10027

To fund a study of the current status of parks in New York City and explore possible assessment measures. Project Director: Dr. Steven Cohen, Director, Graduate Program in Public Policy and Administration.

National Academy of Public Administration **$30,000**
Washington, DC 20005

To launch a Consumer Report-type rating of the public sector. Project Director: John Scully, Executive Director, Alliance for Redesigning Government.

HUMAN RESOURCES

TRUSTEE GRANT

Cornell University **$415,058**
Ithaca, NY 14853

Deregulation, new technologies, and increased competition in both old-line and new communication services have led to a drop in productivity growth in the telecommunications industry. Changes have followed in the organization of work and human resources management. With this grant, a group from Cornell's School of Industrial and Labor Relations will study the effects of new technologies, new competitors, reorganization, downsizing, and new human resource strategies in old and new telephone, cable, wireless, and information companies. The project will explore how companies are responding to the changes in work environments, job designs, skill requirements, and learning rates, and the effects on jobs and wages. The information will be developed mainly from site visits to many companies. A second project will work at the individual level with an ethnographic inquiry into the changes that team-based work is bringing to skill acquisition and learning. How are these contributing to improved performance of employees? Are old-line regional Bell companies developing human resource strategies that allow them to compete with new lean entries? What are the effects on wages and work arrangements? The entire spectrum of employees will be included in the research. Project Director: Harry C. Katz, Professor of Collective Bargaining, New York State School of Industrial and Labor Relations.

TRUSTEE GRANTS

Boston University **$594,195**
Boston, MA 02215

Mergers of health care providers, layoffs of medical personnel, growth of managed health care organizations, and increases in professional practice partnerships (PPPs) with managed care contracts are among the trends transforming the medical profession. One response has been reduced-hours career options. At the organizational level, creating such options might be a strategy for cutting professional staff and minimizing the negative effects of layoffs. At the employee level, a reduced-hours career might be an effective way to manage the demands of work and family, especially for two-career families. This study focuses on two-career couples in which one spouse is a physician who has voluntarily made a career decision to work reduced hours. It seeks to understand the factors that enter into this decision for families, the consequences of this career decision, and the implications of this career option for managed health-care organizations and PPPs. In-depth interviews and surveys will be conducted to identify the factors considered in making a decision to work a reduced-hours schedule, to examine the outcomes of these decisions, and to understand the effects of many factors, including age, gender, and parental status, on these outcomes. Interviews with HMOs and PPPs will explore the effects on these organizations of reduced-hours work options. Project Director: Professor Lena Lundgren-Gaveras, School of Social Work.

Brown University **$215,035**
Providence, RI 02912

This grant supports a two-year study of the intended and unintended consequences of part-time work for radiologists. How does part-time work facilitate or limit advancement within radiology? To what extent are differences in careers of those who have and have not worked part-time due to organizational constraints rather than individual choice? What are the consequences of part-time work for radiologists themselves and for their careers, families, and practices within which they work? A three-phase study is designed to answer these questions. Phase 1 involves a survey of 2700 radiologists; phase 2 will survey 210 radiology medical practices that employ a sample of the radiologists surveyed in phase 1; and phase 3 will examine, through face-to-face interviews,

the realities and consequences of part-time work for 35 radiologists from phase 1. Project Director: Professor Chloe E. Bird, Center for Gerontology and Health Care Research.

City University of New York **$160,656**
New York, NY 10003

Much is unknown about the effects of job displacement and downsizing on American workers. Numerous gaps, inconsistencies, and unexpected findings exist concerning exactly who is affected, how people recover, and why certain types of employees are particularly disadvantaged in this process. The consequences of job displacement and downsizing on families are not known. This grant supports research designed to document the differential impacts of downsizing and generally to examine and understand better the complete range of economic and social effects of job displacement and downsizing. Project Director: Professor Paul Attewell, Department of Sociology.

Cornell University **$3,000,996**
Ithaca, NY 14853

University of California, Berkeley **$3,086,032**
Berkeley, CA 94720

The Foundation has undertaken to develop a number of major multi-disciplinary, problem-focused centers on working families. Their primary goal will be to create a solid body of scholarship and to produce a new cohort of Ph.D.s committed to exploring the interlocking relationship between family and work, particularly in dual-career households. These grants fund the first two such centers. The Cornell Center will use a life course perspective as its principle of organization. Much of the discussion of work and family has been dominated by the issues faced by only one cohort of families, those who are in the baby bearing and child rearing phase of family development. There are many other phases and many other issues, including the transition to retirement, that need study. Research projects will be pursued by an interdisciplinary team of Cornell scholars. A main goal of the Center will be the training of a new generation of graduate students. It is expected that at least eight dissertations will be supported by research projects undertaken by the Center. The UC Berkeley Center will study the sit-

uations faced by dual-career families that increasingly are in a time bind. As more women work, the family finds itself with fewer hours to share and parents find less time available for children. A "cultures of care" perspective will be used to address such questions as: To what extent, in what way, and with what result, are people cared for? Are people in the home able to be cared for? What are the key sources of support? Are those who give care doing so out of an informal culture of obligation or because they are paid to do so? What difference does a strong culture of care make for happy partnerships and thriving children? The Center will rely on ethnographic descriptions of the day-to-day lives of working families and will be sensitive to the variation in the cultures of caring practiced by different ethnic and racial groups. Research will be conducted by an interdisciplinary team of Berkeley faculty. The Center plans to support two postdoctoral and 8-10 predoctoral students. Project Directors: Professor Phyllis Moen, Director, Bronfenbrenner Life Course Center, Cornell; Arlie R. Hochschild, Professor of Sociology, UC Berkeley.

George Washington University **$626,552**
Washington, DC 20052

This grant supports a research project with two goals: (1) to identify patterns of family coping and choices of time arrangements which promote family well-being, particularly for dual-earner families caught in the "time squeeze" often created by dependent children and elder care responsibilities; and (2) to identify policies and practices within work organizations which are both responsive to family needs and also improve workplace performance. The project will focus on school teachers in U. S. public schools. This is a particularly salient profession to examine since teachers often select this career because of its perceived attractiveness for balancing work and family concerns. Ten schools located in each of four metropolitan districts will be selected, and twenty teachers, along with administrators, union representatives, and family members, will be studied from each school. Four doctoral dissertations will be based on this research. Project Director: Robert Caplan, Professor of Psychology.

McGill University **$119,974**
Montreal, Quebec H3A 2T6

Purdue University **$117,981**
West Lafayette, IN 47907

Conventional wisdom holds that managers with supervisory responsibilities are not able to reduce their weekly hours of work, fulfill their responsibilities, and still remain on a viable promotion track. These projects will study 50 part-time managers, as well as a constellation of people affected by their career choice, including subordinates, colleagues, top management, clients, and spouses. The aim is to examine the consequences of part-time managerial careers on the individual, the organization, and the family. Project Directors: Mary Dean Lee, Associate Professor of Organizational Behavior and Human Resource Management, McGill University; Shelley M. MacDermid, Associate Professor of Family Studies, Purdue University.

Portland State University **$505,000**
Portland, OR 97207

This grant supports a three-year project to examine the coping strategies used by dual-earner families who face responsibility for the care and well-being of their own children, as well as that of their elderly parents. These households are often referred to as the "sandwich generation." Having delayed child bearing and rearing, they now find themselves with responsibilities for both their children and their parents. This burden is compounded by the fact that many of the women in these households are now working, often in demanding jobs, and no longer able to assume easily the responsibility for domestic care. The research will depend on information collected from focus groups, a nationally representative sample, and follow-up in-depth interviews. Project Director: Margaret Beth Neal, Associate Professor of Urban Studies and Planning.

Radcliffe College **$392,995**
Cambridge, MA 02138

This two-year project will explore the interaction of work, as conducted in small to

medium-sized biotechnology firms, with the family life of professionals working there. The role of the community in supporting these working families will also be included. The research team will study specific projects in biotechnology firms in the Boston area, how they are managed, and how the work practices, deadlines, and pressure for results affect the day-to-day lives of the professionals in the workplace. They will at the same time examine the day-to-day lives of these professionals in their homes to learn how they manage and how they make use of such community services as schools and day care centers. Having developed an understanding of the relationship between the demands of the workplace and those of the family, and the roles of the various participants, they will explore what the possibilities are, both at work and in the community, to create better conditions for the family. Project Directors: Dr. Paula Rayman, Executive Director, and Dr. Francoise Carre, Research Program Director, Radcliffe Public Policy Institute.

WORKPLACE AND FAMILY, OFFICER GRANTS

9to5, Working Women Education Fund — $12,000
Milwaukee, WI 53203

Support for production of a public service announcement regarding the Family Medical Leave Act. Project Director: Ellen Bravo, Chair.

Boston University — $29,617
Boston, MA 02215

Support for preliminary research on corporate leadership around work and family issues. Project Director: Dr. Bradley K. Googins, Director, Center on Work and Family.

Princeton University — $30,000
Princeton, NJ 08544

To support research on the evolution of work-family policies. Project Director: Frank Dobbin, Associate Professor of Sociology.

Radcliffe College — $29,156
Cambridge, MA 02138

Support to develop a strategic job redesign project in small and medium-sized firms. Project Directors: Dr. Paula Rayman, Executive Director, and Dr. Francoise Carre, Research Program Director, Radcliffe Public Policy Institute.

EDUCATION AND CAREERS IN SCIENCE AND TECHNOLOGY

The Foundation has a wide-ranging set of programs in this area, including projects on careers and the nature of work in science and engineering, the underrepresentation of women and minorities, and the use of technology for education outside of the classroom. Science and engineering professional societies have been enlisted in an effort to prepare high-quality materials about the nature of careers in their fields. A number of additional grants in this program were made in 1996. The Foundation's efforts to ameliorate the underrepresentation of minorities in mathematics, science, and technology were augmented by several grants in 1996 designed to increase the number of minority Ph.D.s in these technical fields. Helping institutions with successful model programs to improve the campus climate for women students in mathematics, science, and engineering has been the focus of many grants in prior years. A final such Trustee grant was made in 1996. Another component of the Foundation's program is making education available outside the classroom. The effort is aimed at independent learning, mainly in science and technology, by means of electronic technologies that make possible asynchronous access, i.e., access under the learner's control, to remote learning resources. Grants made in 1996 support the continued evolution of this program toward projects designed to deliver full degree or certification courses to remote learners, including those at both home and work sites.

A number of 1996 grants for research on immigration of scientists and engineers to the United States are briefly described in this section.

Enhancing public understanding of science and technology is another interest of the Foundation. Four grants made in 1996 to leading film schools aim to stimulate the writing and production of new film and television shows about scientists and engineers. A major grant supports the production by Hedrick Smith of a new four-part series on public television about the changing economic landscape and how American companies, workers, and families are adapting to these new realities. Assistance was given for the writing of a number of books for the general reader on various topics in science and technology. Books continued to be published in the Sloan Foundation Technology Series. The series focuses on some of the major technologies of the twentieth century and treats their emergence, development, and role in our society.

ENTRY AND RETENTION, TRUSTEE GRANT

University of Maryland **$97,000**
College Park, MD 20742

Foundation grants in past years have supported the research of Barbara Lovitts on the causes and consequences of departure from doctoral programs without completing a degree. Based on surveys of doctoral students and interviews with non-completers at two major universities, she has shown that attrition is not a function of what students bring to graduate school, but rather what happens to them after they have enrolled. Her results suggest that the current very high rate of leaving may be lowered if departments provided better information about graduate programs, made greater efforts to integrate students into the department, and paid more attention to the assignment of advisors to graduate students and their interaction with them. Her data indicate that although students receiving full fellowship support were as likely to stay as to leave, those holding teaching or research assistantships had an increased likelihood of completing the degree. The current grant will support the dissemination of these findings and will also fund further research, especially on market consequences of departure without a degree. Project Director: Dr. Barbara Lovitts, Associate Program Director, Research in Teaching and Learning Program, National Science Foundation.

OFFICER GRANT

University of California, Los Angeles **$30,000**
Los Angeles, CA 90095

For a study of gender differences in enrollment, persistence in, and satisfaction with graduate education in science, mathematics, and engineering. Project Director: Dr. Linda J. Sax, Associate Director, Higher Education Research Institute.

CAREER INFORMATION, TRUSTEE GRANTS

The Foundation has in past years made grants to seven professional societies to support the preparation of career information designed to give college students realistic perspectives on professional careers in science and engineering. The societies are preparing brochures, videotapes, World Wide Web pages, and CD-ROMs. They are creating directories of summer internships and other work opportunities. Members of the societies, from a mix of work environments, are made available, often via interactive bulletin boards on the Internet, to students who have questions about careers and work. The societies are cooperating in order to develop some commonality in their Web and CD-ROM formats. Trustee grants in 1996 extended this program to include chemical and civil engineering societies. In addition, early grants to mathematicians and physicists have been supplemented to allow these groups to add to their original proposals the production of CD-ROMs, videotapes, and World Wide Web sites to conform to what later grantee societies are doing. These four grants are as follows:

American Institute of Chemical Engineers $428,450
New York, NY 10017

Project Director: Stephen R. Smith, Managing Director, Publications and Communications.

American Institute of Physics $150,000
College, Park, MD 20740

Project Director: Dr. John S. Rigden, Director of Physics Programs.

American Mathematical Society $154,600
Providence, RI 02904

Project Director: Dr. Samuel M. Rankin, III, Associate Executive Director.

American Society of Civil Engineers $417,000
New York, NY 10017

Project Director: Michael L. Peralta, Director, Field Operations.

Commission on Professionals in Science and Technology $79,415
Washington, DC 20005

Are science and engineering attracting a larger or smaller share of promising students than in the past? These student choices were last analyzed ten years ago in a study of the National Academy of Sciences which used data through 1985. Significant changes have taken place since then, for example, in labor markets for scientists and engineers, in academic work opportunities, and in the participation of women and foreign-born students. This grant supports a set of activities designed to shed light on the career paths of promising students and their choice of science and engineering careers, comparing behavior and trends in the period 1986-1995 with earlier periods. The activities include a literature review, assembly and analysis of data on both the undergraduate and graduate pools, and student interviews. Before concluding its work, the Commission will convene a workshop to evaluate and refine tentative results and to determine how they might be made most useful. Project Director: Dr. Catherine D. Gaddy, Executive Director.

OFFICER GRANT

Science and Technology Advisory Board $30,000
New York, NY 10019

Partial support for a book, *Scientific Career Transitions: The Essential Career-Renewal Program for Science and Technology Professionals*. Project Director: Stephen Rosen, Chairman.

Goodman Research Group **$400,000**
Cambridge, MA 02139

Hundreds of engineering schools now have in place a variety of special programs for women, ranging from the presence on campus of a student chapter of the Society of Women Engineers to a fully staffed office devoted to support for women students in the school. An evaluation of such programs will be conducted to assess their relative effectiveness in contributing to the recruitment, persistence, and graduation of women engineering majors, and to their plans to continue in engineering beyond graduation, either by entering a graduate engineering program or by starting work in an engineering field. The study will include about 50 schools, half without and the other half with a specified level of special support for women engineering undergraduates. Surveys will be conducted at each institution of all women majoring or intending to major in engineering, as well as of women dropouts from such majors. The extent to which students participate in special programs for women will be noted. Approximately 24,000 students are expected to be involved in the study each year. In addition to the surveys, site visits will be made to ten institutions to conduct student focus groups, observe and interview faculty and administrators, and to see the special programs up close. At sites not visited, data will be collected by means of telephone interviews. This grant funds approximately a third of the total cost of the project. Project Director: Dr. Irene F. Goodman, President.

University of California, Davis **$525,000**
Davis, CA 95616

This is a grant in a five-year Foundation effort to create model programs to promote the success of women students, both undergraduate and graduate, in mathematics, science, and engineering. UC Davis already has an outreach program to high schools to encourage young women to enter engineering fields. The university will now add a program to recruit into engineering and science more upper division women from area community colleges. Efforts will be mounted to enhance retention of women students. These include: creating a first year retreat for women in mathematics and physical sciences, modeled after an existing successful retreat for women in engineering; extending the graduate-to-undergraduate mentoring program into the Division of Mathematical and Physical Sciences; adding undergraduate research positions for women engineering and science students; arranging mentoring for women graduate students by alumni working in industry; and making funds available to encourage attendance of women students at professional meetings. A workshop on classroom climate issues, intended for all teaching assistants, will be developed. A one-day retreat for selected faculty will help augment the existing network of faculty committed to the development and success of this model program for women. A new Center for Women in Science, complementing a similar arrangement in engineering, will also be supported with this grant. Project Director: Professor Debbie A. Niemeier, Department of Civil Engineering.

Illinois State University
Normal, IL 61790 **$29,940**

For a symposium on "Advancing Women in Technology." Project Director: Professor Jane A. Liedtke, Department of Industrial Technology.

National Council for Research on Women
New York, NY 10012 **$30,000**

To fund a special issue of *IQ* and *IQFax*, based on *The Equity Equation* and its accompanying publication, *The Equity Agenda*. Project Director: Mary Ellen S. Capek, Executive Director.

State University of New York at Purchase $30,000
Purchase, NY 10577

To prepare a report on women's experience as faculty members in the sciences and engineering. Project Director: Henry Etzkowitz, Associate Professor of Sociology.

University of Arkansas $8,000
Fayetteville, AR 72701

For a symposium entitled "Women in Evolution." Project Director: Sydney Cameron, Research Assistant Professor, Department of Biological Sciences.

Virginia Polytechnic Institute and State University $30,000
Blacksburg, VA 24061

To complete a study of women who received Ph.D.s in mathematics from American universities during the period 1940-59. Project Director: Professor Margaret A. M. Murray, Department of Mathematics.

Women in Engineering Program Advocates Network $28,570
Seattle, WA 98195

Toward the establishment of a national mentoring program for women science and engineering students to be conducted via e-mail. Project Director: Dr. Carol B. Muller, Associate Dean, Thayer School of Engineering, Dartmouth College.

Women in Engineering Program Advocates Network $2,700
Seattle, WA 98195

Funding for the 1996 WEPAN conference. Project Director: Suzanne G. Brainard, President.

Alabama School of Fine Arts $298,000
Birmingham, AL 35203

Alabama School of Mathematics and Science $255,000
Mobile, AL 36604

These grants are part of a Foundation program aimed at increasing the number of underrepresented minorities attending specialized secondary schools of mathematics, science, and technology and, where necessary, improving the performance of such students at these schools. The Russell Mathematics and Science Center (RMSC) was started in 1991 as part of the Alabama School of Fine Arts, a four-year, public, partially residential high school which already had a strong program in the arts. The RMSC curriculum requires every student to pass courses at the advanced placement level in biology, calculus, chemistry, and physics. With this grant the Center will take steps to recruit an enlarged group of African Americans and to reduce the rate of departure of such students for academic reasons. An eighth grade program will be launched and two new teachers will also serve as recruiters, especially of African American students. To improve retention and permit teaching and learning to be equally effective for all students, RMSC will create a summer enrichment program for incoming students and also provide training in human relations to help faculty and students more effectively address racial issues. The Alabama School of Mathematics and Science (ASMS) is a two-year residential high school that serves junior and senior students from across the state. The School seeks to increase total enrollment to 300 and to bring the percentage of enrolled African American students to the 30% level represented in the college preparatory high schools of Alabama. To move toward these goals, ASMS will conduct six one-week summer mathematics and science programs around the state for rising ninth graders, will keep in touch with these students during their ninth grade year, and will follow up with a two-week residential program for selected students in the group during their tenth grade year. Project Directors: Dr. Michael Froning, Director, RMSC; Dr. David J. Laurenson, Executive Director, ASMS.

Georgia Institute of Technology $120,000
Atlanta, GA 30332

University of California, Berkeley $510,000
Berkeley, CA 94720

University of Maryland $286,730
College Park, MD 20742

University of North Carolina $210,000
Chapel Hill, NC 21599

These four grants are part of a Foundation program aimed at increasing the number of minority Ph.D.s in mathematics, science, and engineering. (Seven such grants were made in 1995.) Individual faculty members, research groups, and entire departments have been supported provided they have demonstrated success in producing minority doctorates and have effective plans to increase that number. Funding is used for a variety of projects, each suited to the particular university setting: recruiting efforts; student stipends; special summer transition courses; mentoring; joint faculty-student research opportunities; and student attendance at professional meetings. The Georgia Tech grant funds the efforts of nine faculty members in aerospace engineering. UC Berkeley will concentrate on the production of minority Ph.D.s by the following departments: Integrative Biology; Molecular and Cell Biology; Chemistry; Electrical Engineering and Computer Science; and Mechanical Engineering. The Maryland funding will be available to eleven faculty members in aerospace, civil, chemical, and mechanical engineering. The UNC grant will apply to the analytical, organic, and polymer divisions within the Chemistry Department. Project Directors: Professor Oliver G. McGee III, School of Aerospace Engineering, Georgia Institute of Technology; Julia Voorhies, Director, Corporate and Foundation Relations, University of California, Berkeley; Professor Darryll J. Pines, Department of Aerospace Engineering, and Dr. Horace L. Russell, Associate Dean, Clark School of Engineering, University of Maryland; Dr. Michael Crimmins, Vice Chair for Graduate Studies, Department of Chemistry, University of North Carolina.

Lincoln University $240,000
Lincoln University, PA 19352

A part of the Foundation's program for increasing the number of minority Ph.D.s in mathematics, science, and engineering, is directed at undergraduate departments with a past record of success in sending their minority graduates into doctoral programs. The Chemistry Department at Lincoln University, the country's oldest historically black university, has such a record and plans to increase the number of their majors going on for Ph.D.s from the current average of two per year to as many as ten by the year 2000. This grant will be used for recruiting efforts, student support, attendance of students at professional meetings, increased research opportunities for chemistry majors, and various enrichment programs such as visiting speakers, workshops on graduate studies and the graduate record examination, and a journal club. Project Director: Professor S. C. SubbaRao, Chairman, Chemistry Department.

Self-Reliance Foundation $234,544
Santa Fe, NM 87501

Hispanics are seriously underrepresented in science and engineering. Students need to learn that there are now many successful Hispanic research scientists and engineers. As early as possible, they should identify the courses of study needed to pursue such careers. They need to be made aware of scholarship and other financial aid programs and learn how to take advantage of these opportunities. This grant supports the production over a period of two years of 27 four-minute radio interviews per year with Hispanic scientists and engineers to be broadcast over the Hispanic Radio Network. The aim is to reach Hispanic students and their parents, to feature the human side of doing science and engineering, to inform the students how to go about preparing for careers in science and engineering, and to make them aware of the opportunities that exist in these fields. The grant also funds a Spanish-language 800-number telephone outreach service that will enable callers to get current news regarding scholarship and internship opportunities, as well as other information about educational resources. Project Director: Molly Multedo, Executive Director.

Society for Advancement of Chicanos and Native Americans in Science $75,555
Santa Cruz, CA 95064

This Society is an organization devoted to encouraging Chicano, Latino, and Native Americans to pursue graduate education in science. It conducts programs for K-12 teachers and for undergraduates. This grant funds the production of biographies of 100 Chicano, Latino, and Native American scientists, to be used to give students from these communities some realistic examples of what work as a scientist means and to motivate them to consider science-related careers. The biographies will be widely distributed to K-12 teachers and will be given prominence at the Society's meetings. They will also be available directly to students on the Society's World Wide Web site. Project Director: Dr. William Y. Velez, President, and Professor of Mathematics, University of Arizona, Tucson.

Board of Education of City of New York $12,000
Brooklyn, NY 11201

To plan for the creation and implementation of programs that will improve the likelihood of success of students entering each of the three City specialized science high schools through the Math/Science Institute. Project Director: Jacqueline Charity, Educational Consultant, Office of the Chancellor.

Catalyst, Inc. $28,230
New York, NY 10003

Support to conduct preliminary research on women of color in middle and upper corporate management. Project Director: Dr. Mary Mattis, Vice President for Research and Advisory Services.

Heritage College $30,000
Toppenish, WA 98948

To position Heritage College to become a feeder school for American Indian and Hispanic Ph.D. students. Project Director: Dr. Thomas Claudson, Chair, Science and Technology Division.

Massachusetts Institute of Technology $15,000
Cambridge, MA 02137

Partial support for a workshop on politics of race and ethnicity categories in the Census. Project Director: Melissa Nobles, Assistant Professor of Political Science.

National Consortium for Graduate Degrees for Minorities in Engineering and Science $11,200
Notre Dame, IN 46556

To fund the production and distribution of a guide entitled, *Addressing the Three R's of Graduate School Participation: Recruitment, Retention, Reaffirmation*. Project Director: Dr. Howard G. Adams, Director, Southern Regional Office.

Quality Education for Minorities Network $30,000
Washington, DC 20036

Support for a meeting of universities and specialized mathematics and science high schools to explore creating a university-based summer research apprenticeship program for minority students. Project Director: Dr. Shirley M. McBay, President.

Rutgers University $15,000
New Brunswick, NJ 08903

For the second conference for African-American researchers in the mathematical sciences. Project Director: Dr. Fred Roberts, Director, Center for Discrete Mathematics and Theoretical Computer Science.

Stanford University $30,000
Stanford, CA 94305

To host a meeting of grantees in the Sloan Foundation's minority Ph.D. program. Project Director: Dr. Noe Lozano, Associate Dean of Student Affairs and Director, Engineering Minority Programs.

University of Maryland Foundation $30,000
Adelphi, MD 20783

Support for research on racial and ethnic classification in the census and Federal statistics. Project Director: Professor Judith Lichtenberg, Senior Research Scholar, Institute for Philosophy and Public Policy.

EDUCATION OUTSIDE THE CLASSROOM, TRUSTEE GRANTS

Maricopa Community Colleges Foundation $285,000
Tempe, AZ 85281

With a 1994 grant, Rio Salado Community College successfully developed a project which now teaches computer applications to about 70 "at risk" students with limited financial means, transportation and day care problems, or physical limitations which confine them to their homes or limit their mobility. Some students have completed 16 credits in Computer Usage and Technology and are continuing on to higher certification levels. The current grant will fund the extension of the project across the state of Arizona and to Native American reservations in the region. The college will continue to be very selective in recruiting project participants. Those chosen receive a computer and are connected to the project ALN for communication with instructors and other students. Project Director: Karen Mills, Senior Associate Dean, Rio Salado Community College.

Metropolitan State University $125,000
St. Paul, MN 55106

A 1995 officer grant enabled Metropolitan State University to develop and offer an ALN course in Purchasing Management. This new grant will fund six additional courses and eight workshops for students in local area businesses, and thereby will offer distance learning opportunities as an alternative to existing traditional classroom methods for the purchasing management curriculum. Books and notes are distributed to students and Internet facilities such as Web postings and e-mail are used to support interaction. Project Director: Frederick Manzar, Chair, Marketing Department.

Miami-Dade Community College $119,480
Miami, FL 33132

Four high-enrollment courses (English Composition, Introduction to Biology, Humanities, and Social Environment), all required for degree-seeking students, will be converted into an ALN format and made available to learners who, although within commuting distance, find it difficult because of job and family responsibilities to attend regular classes. In addition to books and other print material, the College plans to use videotaped and audiotaped lectures, learning software, Internet Web resources, e-mail, and computer conferencing through networked computers. Project Director: Judy Lever-Duffy, Director, Information Technology Center, Homestead Campus.

Michigan State University $72,000
East Lansing, MI 48824

This exploratory project will use an ALN as a means of improving performance of undergraduates, especially those in the lower half of the class, in two high enrollment physics courses. Recitation sections are replaced by an ALN and a Physics Learning Center where students can get personal assistance. On-line homework and quiz software will be used to determine which students need special help. Each student's progress, difficulties encountered, and interactions over the ALN will be the basis for creating a customized mentoring program available to all students, but expected to be especially useful for those at-risk. Project Director: Professor Edwin Kashy, Department of Physics.

New Jersey Institute of Technology $450,000
Newark, NJ 07102

With the help of a 1993 grant, NJIT has successfully used an ALN format to offer all core courses for both the B.A. in Information Science and the more rigorous B.S. in Computer Science. The new grant will fund making available via ALNs humanities courses and other electives for these degrees, as well as new courses for the corresponding masters degrees. Postgraduate certifications, including one in Telecommunications, will be created. New ALN courses will be provided to help students from a variety of undergraduate backgrounds enter and succeed in the popular M.S. in Industrial Engineering program. Overall, about 35 new courses will be created, resulting in NJIT's projection of 2000 ALN course registrations per year. Project Director: Professor Starr Roxanne Hiltz, Department of Computer and Information Science.

New School for Social Research $260,000
New York, NY 10011

The New School, a division of the New School for Social Research, concentrates on adult and continuing education. It has developed distance learning techniques and now has a substantial ALN program which makes many of its courses available to learners across the country. This grant funds a careful assessment of the support services required by remote students participating in such an ALN learning environment. Universities have evolved intricate systems for providing support services (such as orientation programs, academic advising, financial aid, library services, and so on) for their on-campus students. These need review and modification, where appropriate, for distant learners. New services not necessary in traditional environments may need to be developed. The New School will work with other members of the ALN community to define the parameters of the problem; to design, develop, and pilot proposed support services; to create a data collection and analysis model to assist administrative decision-making; and to disseminate findings to the community. Project Director: Stephen J. Anspacher, Director, Distance Learning.

New York University $900,000
New York, NY 10003

NYU's School of Continuing Education, with a 1994 Foundation grant, created and has now successfully offered a 16-credit graduate advanced professional certification in Information Technology. The learning materials include video on demand and so require students to have ISDN high speed connections either at home or at the workplace. The new grant funds the development of twenty interactive video courses that will make possible new certifications in Applications Development, Client/Server Technologies, Networking Technologies, Project Management, and Lotus Notes Applications Development, all through an ALN approach. Ten more courses will be developed by NYU with separate funding and by the fall of 1998 it expects to enroll at least 1000 students each year in these thirty courses. Part of this grant will be used to upgrade the telephone based remote enquiry and registration system to handle these large numbers. IBM employees may make up half the student population for the first few years and IBM will contribute funds for software development within the project. Other students will be home learners or recruited from other corporations to be approached by NYU. Project Director: Dr. Richard Vigilante, Director, Information Technologies Institute, School of Continuing Education.

New York University $150,000
New York, NY 10003

The first International Conference on Asynchronous Learning Networks was held in 1995 in Philadelphia. It was limited to 100 attendees, including representatives of Foundation-supported projects. Sharing of information was focused through sessions on student issues, faculty concerns, marketing and advertising, and technology. This NYU grant supported a much expanded second conference held November 1-3, 1996 in New York City. Project Director: Dr. Richard Vigilante, Director, Information Technologies Institute, School of Continuing Education.

Pace University $207,230
New York, NY 10038

Pace is well known for its adult education focus and numerous late afternoon and evening courses on campus or at work sites. As part of its interest in serving adult learners, it will convert and offer in an asynchronous learning network six for-credit and fourteen short, non-credit telecommunications courses. The former are graduate courses and part of the traditional on-campus masters sequence. Those successfully completing the six ALN courses will be awarded a graduate certification in Telecommunications and may apply all six courses to the masters degree. The short courses offered at Pace and work sites are mainly one-day overviews of such topics as fiber optics, global networking, asynchronous transfer mode, etc. It is estimated that the interest in these courses will allow them to be offered to more than 3000 students per year. Project Director: Dr. David Sachs, Assistant Dean, School of Computer Science and Information Systems, and Professor of Office Information Systems.

Stanford University $600,000
Stanford, CA 94305

The Educational Program for Gifted Youth (EPGY), developed by Professor Suppes at Stanford, provides mainly freshman and sophomore college-level mathematics and physics courses to over 1100 highly qualified secondary school students in 45 states and 5 countries using instructional software and networked computers. Course material is on a CD-ROM connected to a multimedia computer. Students listen to an instructor while watching synchronized text and graphics appear on the screen. E-mail is used to interact with Stanford-based faculty and also to submit homework and project assignments. The courses have been especially useful for students in smaller communities where Advanced Placement courses are not available. This new grant will enable EPGY to develop and offer eighteen new courses so that a very able student, even in the largest school systems, will be able to complete most of the undergraduate college curriculum in mathematics and physics while still in high school. Three courses in quantum mechanics and a course in partial differential equations are examples of the new offerings. Project Director: Professor Patrick Suppes, Director, Education Program for Gifted Youth.

University of California, Berkeley $2,028,500
Berkeley, CA 94720

With a 1994 grant, UC Berkeley Extension developed a nine course ALN sequence for a certification in Hazardous Materials Management. An additional 16 ALN courses in a variety of subjects were developed by the Extension unit at their own expense. These courses are offered over the America On-Line network. AOL has provided extensive programming and systems support and has promoted the Berkeley courses to its subscribers. Features include the Sample Classroom, which allows a student to try out an on-line course before actually enrolling; a Golden Bear Room, a real-time "chat room" for instructor office hours; and message boards for communication between students and instructors, as well as among students in specific courses. The current grant will allow the University to establish a significant presence on AOL, to be known as UC Berkeley Extension Online, which will feature a total of 175 courses at the end of three years. The grant supports another 100 courses and the Extension unit will produce 50 more using their own resources. Some courses will be part of coherent sequences (e.g., courses leading to a certification in Computer Information Systems); others will be stand-alone and work-related (e.g., Marketing Essentials); some will be basic mathematics and science (e.g., Analytic Geometry and Calculus); and still others will aim at personal enrichment (e.g., Tragedies of Shakespeare). Annual enrollments of 5000 students are expected in these courses. Since UC Berkeley Extension offers nearly 3000 courses and enrolls about 75,000 students annually, the ALN offerings will be a small part of this major extension unit. Nevertheless, it will meet a real need in the adult-learning area. It will also teach us something about creating national awareness of such an ALN program as well as what ingredients are needed for an effective support system to service such a large number of widely distributed learners. Project Director: Mary S. Metz, Dean, University Extension.

University of Maryland University College $219,449
College Park, MD 20742

Within the University of Maryland System, its University College is the only unit that has a mission of providing educational opportunities for working adults. Degrees up to the masters level can be earned and many courses are offered through some kind of

remote learning and independent study. Much of their distance education centers on television, an area in which they were pioneers and are among the leaders. The number of ALN courses currently offered is quite small. This grant will enable the College to convert and offer ten upper division accounting courses in an ALN format. The ten courses include all the areas covered on the national CPA examination. Accounting is a subject of interest to the population the College serves and about 1000 enrollments in these courses are expected. Project Director: Susan Nickens, Associate Dean, Academic Affairs.

University of Wisconsin-Stout **$289,676**
Menomonie, WI 54751

This university has an array of programs leading to professional and business careers. One of the best known is the program in Hospitality and Tourism. In 1995, UW-Stout used a Foundation officer grant to convert an existing course, Hospitality Industry Law and Liability, to an ALN format and deliver it to regularly enrolled students. Key faculty received training in the use of Lotus Notes and developed experience in using this technology. Discussions were held with industry representatives to ascertain the potential need for ALN on-site classes. With the new grant, five courses plus two certifications (in Sanitation and Safe Food Handling and Safety and Security in Hospitality and Tourism) will be developed and offered remotely to learners anywhere in the country. Project Director: Dr. Richard E. Anderson, Special Assistant to the President.

Vanderbilt University **$184,500**
Nashville, TN 37235

This grant supports the development of a World Wide Web site devoted to asynchronous learning networks. The site will provide news and columns in a lively format, popular essays, refereed scholarly articles in an on-line journal, as well as on-line workshops and a knowledge repository that is accessible world-wide. The idea is to serve researchers and practitioners, both Sloan grantees and others, working and interested in ALNs. Project Director: John Bourne, Professor of Electrical and Computer Engineering.

Vanderbilt University **$133,000**
Nashville, TN 37235

Vanderbilt's School of Engineering offers an on-campus Masters degree in Management of Technology which requires 30 hours of course work and a Masters paper. The Foundation's grant partially funds the modification of these courses into an ALN format, making them available not only to on-campus but also off-campus students, mainly professionals working in industry. Vanderbilt students will thereby get the benefit of interacting with practicing engineers. Courses will be delivered over the Internet, with course materials available on the World Wide Web. Project work by student teams and class discussions will be conducted using the Webnotes conferencing system. Project Director: John Bourne, Professor of Electrical and Computer Engineering.

Western Governors Foundation **$500,000**
Denver, CO 80202

The Western Governors Association is an organization whose members are the chief executives of eighteen western states. It has initiated the development of the Western Governors' University (WGU) concept. WGU expects to have a central location with support centers distributed across the region. Different delivery mechanisms for educational resources are anticipated, including self-study, video, and ALNs. The providers of educational content will be both higher education institutions, including community colleges, and industry. WGU intends to begin in 1997 with two offerings: a workplace certification (probably Electronics Technician) and an A.A. degree (probably General Studies). The current grant supports design of the initial academic programs, student services to be offered, and the local support centers; implementation of software needed for responding to inquiries about the university, registering and enrolling in courses, making payments, and advising of students; and other activities involved in getting WGU started. Project Director: Tom Singer, Vice President.

EDUCATION OUTSIDE THE CLASSROOM, OFFICER GRANTS

Brooklyn Arts Council, Inc. $25,000
Brooklyn, NY 11201

To prepare a full proposal for a two-hour television program on ALN. Project Director: Lorraine Boyd, Executive Director.

Florida International University $30,000
Miami, FL 33199

To develop and deliver one ALN course in Energy Conversion. Project Director: Osama A. Mohammed, Professor of Electrical and Computer Engineering.

Illinois Institute of Technology $30,000
Chicago, IL 60616

Support to prepare and offer one ALN course, "Advanced Power Systems Analysis," for the utility industry. Project Director: Professor V. C. Ramesh, Department of Electrical and Computer Engineering.

Lesley College $26,970
Cambridge, MA 02138

To convert and teach one graduate course to teachers via ALN. Project Director: Dr. Jean Moon, Director, Center for Mathematics, Science and Technology in Education.

Michigan State University $30,000
East Lansing, MI 48824

To expand ALN activities to address student retention and efficiency issues. Project Director: Edwin Kashy, Professor of Physics.

Pennsylvania State University $30,000
University Park, PA 16802

Planning support for Penn State's "World Campus." Project Director: Dr. James Ryan, Vice President for Outreach and Cooperative Extension.

University of Hawaii at Manoa $30,000
Honolulu, HI 96822

Support for the creation and offering of an ALN course in Technology and Society. Project Director: Professor Jaishree Odin, Liberal Studies Program.

University of Illinois $28,500
Champaign, IL 61820

Support for special sessions at the Frontiers in Education 1997 Annual Conference. Project Director: Burks Oakley, II, Professor of Electrical and Computer Engineering.

University of Illinois $25,000
Champaign, IL 61820

To host a meeting for Sloan ALN grantees. Project Director: Burks Oakley, II, Professor of Electrical and Computer Engineering.

University of Michigan $30,000
Ann Arbor, MI 48109

Support for the development and delivery of an ALN course in Mechanics of Polymeric Structures. Project Director: Edward G. Borbely, Director, Center for Professional Development.

University of Michigan $25,390
Ann Arbor, MI 48109

Planning grant for the Michigan Virtual Auto College. Project Director: Mark Hass, Director, Program Development and Academic Outreach.

University of Minnesota $30,000
Minneapolis, MN 55455

To create and offer two Internet ALN courses in electrical engineering. Project Director: Dr. Brian Duren, Department of Independent Study.

University of Oregon $20,000
Eugene, OR 97403

Support for a conference to plan a telematics curriculum for northwestern states. Project Director: Deanna Robinson, Professor of Journalism and Communication.

University of Pennsylvania $30,000
Philadelphia, PA 19104

Support for one ALN course for off-campus delivery. Project Director: Keith W. Ross, Associate Professor of Systems Engineering.

Vanderbilt University $29,952
Nashville, TN 37235

Planning grant for an on-line ALN journal and newsletter. Project Director: Professor John Bourne, Center for Innovation in Engineering Education.

Vanderbilt University $30,000
Nashville, TN 37235

For preliminary work on the assessment of Sloan ALN projects. Project Director: Professor J. Olin Campbell, Center for Innovation in Engineering Education.

OFFICER GRANT

Commission on Professionals in Science and Technology **$29,656**
Washington, DC 20005

Support for a workshop on postdoctoral appointments. Project Director: Catherine D. Gaddy, Executive Director.

IMMIGRATION OF SCIENTISTS AND ENGINEERS, TRUSTEE GRANTS

An appropriation of $1 million was approved by the Foundation in 1992 to support a new research program on the immigration of scientists and engineers to the United States. Proposals were invited from a wide range of researchers in relevant fields and then evaluated on a competitive peer-reviewed basis. This led to seven research grants, almost all of which have now been completed and published. In June 1995, a related grant was made to Princeton University to create, from existing Census and National Science Foundation data, a statistical profile of the native-born and foreign-born science and engineering workforce of the United States. These Sloan-supported projects formed the core of a special session on the immigration of scientists and engineers, organized by the American Association for the Advancement of Science at its 1996 annual meeting. In late 1995 a list of additional topics was circulated to supplement those covered by the research projects already underway, and proposals were invited for projects on these topics. Five projects were recommended for funding by external reviewers. These 1996 grants are listed below, in each case with the research topic and project director identified. All but the UCLA grant were funded from the original 1992 appropriation.

Council for Human Development **$159,189**
Arlington, VA 22202

Research Topic: Foreign Biomedical Scientists at NIH: An Ethnographic Study of Recruitment and Employment Patterns. Project Director: Dr. Sergio Diaz-Briquets, Executive Director.

Oak Ridge Associated Universities **$80,459**
Oak Ridge, TN 37831

Research Topic: Postdoctoral Appointments in the 1990s. Project Director: Dr. Michael G. Finn, Senior Economist.

Population Reference Bureau, Inc. **$44,405**
Washington, DC 20009

Research Topic: How Much Overseas Money Do Overseas Science and Engineering Graduate Students Bring to the U. S.? Project Director: David S. North, Senior Associate.

University of California, Los Angeles **$165,108**
Los Angeles, CA 90024

Research Topic: Immigrants in the Science and Engineering Complex in California. Project Director: Roger Waldinger, Professor of Sociology.

University of Missouri-St. Louis **$109,301**
St. Louis, MO 63121

Research Topic: Differential Employment Patterns of Native and Foreign-Born Science and Engineering Doctorates: Implications for Displacement. Project Director: Professor Sharon G. Levin, Department of Economics.

TRUSTEE GRANTS

American Film Institute $283,600
Los Angeles, CA 90027

New York University $178,881
New York, NY 10012

University of California, Los Angeles $153,600
Los Angeles, CA 90024

University of Southern California $172,500
Los Angeles, CA 90089

These grants to four leading film schools are intended to stimulate their students to write and produce new film and television shows about science and technology. The schools plan to establish annual screen writing awards for scripts that treat science and technology themes, or scientists and engineers, in a more accurate and compelling fashion. Awards in film production will enable promising candidates to complete a film that explores science and technology issues or characters, to submit it to agents and studios, and perhaps to show it at an annual festival. Workshops will be organized on science and technology issues and themes. Seminars will be held to bring scientists and engineers to talk to cinema and television students about the narrative possibilities and the excitement and challenges involved in their work. Special tours of science laboratories for student film writers may be arranged. These programs all aim to influence the next generation of film makers to create more realistic stories about science and technology, to challenge existing media stereotypes about scientists and engineers, and to establish science and technology as legitimate and entertaining subject matter in the mass media. Project Directors: James Hindman, Co-Director, AFI; Mary Campbell, Dean, Tisch School of the Arts, NYU; Robert Rosen, Chair, Department of Film and Television, UCLA; and Marlene Loadvine, Executive Director of Development, School of Cinema-Television, USC.

Catticus Corporation $460,000
Berkeley, CA 94710

This grant supports the development and production of a one-hour documentary for public television based on *Naked to the Bone* by Bettyann Kevles. This new book in the Sloan Technology Book Series describes the evolution of medical imaging technologies. Telling a dramatic story of technological progress and the people who made it possible via television will bring it a much wider audience than might normally be reached by a book. The TV script focuses on computer assisted tomography (CAT scans) and magnetic resonance imaging (MRI), technologies that have revolutionized health care, and shows the benefits they have produced for patients. It also explores some of the complex issues raised by these new technologies. KQED, San Francisco's public television station, has agreed to be the presenting station for the broadcast, which will be shown widely throughout the PBS television network. Project Directors: Bill Jersey, Executive Administrator, and Michael Schwarz, Executive Producer.

Columbia University $125,000
New York, NY 10027

This grant supports the work of Inge Goldstein, an epidemiologist at Columbia University's School of Public Health, and Martin Goldstein, a professor of chemistry at Yeshiva University, on the writing of a book on the health effects of environmental pollution. The book is intended for the general public. It will deal with toxic waste dumps, asbestos, radon, lead, nuclear power plants, and general environmental pollution by industrial chemicals. The focus is on the real impact that environmental pollution has, or does not have, on the health and lives of average citizens. One goal of the book is to provide readers with a clearer understanding of the power and limitations of science to evaluate health risks so that their perceptions of risk will be based more on rational analysis and less on emotion. Project Director: Dr. Inge F. Goldstein, Lecturer in Epidemiology.

Educational Broadcasting Corporation (WNET/13) $320,000
New York, NY 10019

The British Broadcasting Company and WNET/13, New York City's public television station, are producing a four-part series on the origin and nature of the universe, to be hosted by the renowned theoretical physicist Stephen Hawking. The series includes the following programs: *The Heaven of the Heretics*, an overview of history's long-evolving picture of the universe; *The Trouble with Hubble*, which describes scientific work on the Big Bang theory; *Cosmic Quandaries*, a look at how the discovery of black holes has led to a search for a unifying theory of physics; and *The Unbounded Universe*, where differing theories of the universe's structure are investigated, including Hawking's own view of time which suggests that the universe has no beginning or end. WNET will develop a World Wide Web site to help viewers explore topics in the series in greater depth. Posters and a teacher's guide about the show will be very widely distributed to junior and senior high schools across the country. The BBC, PBS, and WNET have together raised over $3 million for the production of this series. This grant supplies supplementary funding. Project Director: William R. Grant, Executive Producer.

ETV Endowment of South Carolina, Inc. $3,500,000
Spartansburg, SC 29302

This grant supports the work of Hedrick Smith and his production team to research, develop, and produce a four-part series for public television on the changing economic landscape in the United States and how companies, workers, and families are adapting to these new realities. The series, to be aired in 1998, will focus on the corporate strategies of downsizing, outsourcing, and globalized production, the rationale for these strategies, and their impact on managers, workers, and communities. Also to be examined is how the working family is adapting to the stresses of the dual career household and associated child care problems and time pressures. The series will also consider educational reforms, effective worker retraining programs, and strategies that seek larger solutions to the problems of the changing requirements for workers. Real-life examples will be used to put a human face on many crucial issues of our time and viewers will gain a better understanding of the profound economic and social changes that are transforming our nation. Project Director, Hedrick L. Smith, Producer, Hedrick Smith Productions, Inc.

Institute for Technology Assessment $126,000
Washington, DC 20007

This grant supports the writing of a book on weight and obesity. Recent breakthroughs in molecular biology have uncovered several genes that play a role in appetite, metabolism, and fat storage. By learning how these genes function, scientists are tracing out the biochemical pathways in the body that control weight. Medical researchers, epidemiologists, and doctors are all developing new information on diet, exercise, metabolism and fat stores, drug therapies, and weight-loss programs. From all this research a new understanding of weight is emerging. The planned book is intended to teach the general public about this area of science that has relevance to their lives, and that has been for so long a victim of a great deal of myth and misinformation. Project Director: Robert Pool, Science Writer.

Princeton University $130,760
Princeton, NJ 08544

A previous grant supports the writing by David Billington of three books that chronicle the great developments in American technology over the last two centuries. The first book, *The Innovators: The Engineers Who Made America Modern*, was published in 1996. In writing the second volume, *The Entrepreneurs*, it became clear that the development of the automobile was not only central to America, but that the automobile industry was closely linked to the steel, electrical, oil, rubber, and concrete construction industries. The automobile therefore serves as Billington's organizing theme for the period 1876-1939. The current grant will allow for the production of a CD-ROM on the automobile as a companion to the second volume of the series. Project Director: Professor David P. Billington, Department of Civil Engineering and Operations Research.

Sigma Xi, The Scientific Research Society $128,200
Research Triangle Park, NC 27709

Brian Hayes, a columnist and editor for *The American Scientist*, has received some past Foundation support for the preparation of a book, *Infrastructures: A Field Guide to the Industrial Landscape*. We live in an environment where most of what is to be seen is

man-made. The book will guide readers through this fascinating and mysterious landscape. The current grant will enable Hayes to complete his research and writing and also to prepare a multimedia edition of the text for distribution in CD-ROM format and via the World Wide Web. Project Director: Bryan Hayes, Former Editor, *American Scientist*.

WGBH Educational Foundation $150,000
Boston, MA 02134

This grant provides supplementary funding to research and produce a one-hour television documentary on nuclear energy, planned for broadcast as a *Frontline* feature in the spring of 1997. The show will focus on the reasons why the United States has rejected the nuclear option as a method of generating power. It will examine the history of nuclear energy and probe issues of risk analysis and risk perception, comparing U. S. policies and attitudes to those of other countries, such as France and Japan. Project Director: Jon Palfreman, Producer.

PUBLIC UNDERSTANDING OF SCIENCE AND TECHNOLOGY, OFFICER GRANTS

Catticus Corporation $30,000
Berkeley, CA 94710

To develop a full-length treatment for a one-our television documentary on medical imaging technologies based on Bettyann Kevles' book, *Naked to the Bone*. Project Director: Michael Schwarz, Producer.

Cultural Environment Movement $30,000
Philadelphia, PA 10104

To prepare a report based on a television 1973-1995 database showing how science and technology, and scientists and engineers, have been portrayed in the media. Project Director: George Gerbner, President.

KCET Community Television of Southern California $30,000
Los Angeles, CA 90027

Research and script development for a three-part series based on *Turbulent Skies*. Project Director: Blaine Baggett, Director of Public Affairs and Feature Documentaries.

Max-Planck-Institut für Wissenschaftsgeschichte $27,000
Berlin, Germany

To turn a doctoral dissertation on the intellectual history of bacteriology into a consumer book. Project Director: J. Andrew Mendelsohn, Visiting Scholar.

Pequot Library Association $29,500
Southport, CT 06490

Support for travel and research for a book on infectious protein diseases by Richard Rhodes. Project Director: Mary Freeman, Director.

University of Colorado $5,000
Boulder, CO 80309

To complete research and writing of a book on "unity in diversity." Project Director: Eric B. Kraus, Professor Emeritus.

University of Illinois at Urbana-Campaign $30,000
Champaign, IL 61820

To complete a biography of John Bardeen. Project Director: Linda Hoddeson, Professor of History.

TECHNOLOGY BOOK SERIES

The Foundation is sponsor of a series of books intended to broaden public understanding of important modern technologies. Books in the Sloan Foundation Technology Series describe the development of specific technologies, including the circumstances of their emergence, their early development and use, their applications, and their actual and potential impacts on society.

The first six books in the series are as follows:

Craig Canine, *Dream Reaper: The Story of an Old-fashioned Inventor in the High-Tech, High-Stakes World of Modern Agriculture* (Knopf, 1995)

T. A. Heppenheimer, *Turbulent Skies: Commercial Aviation in the Twentieth Century* (Wiley, 1995)

Richard Rhodes, *Dark Sun: The Making of the Hydrogen Bomb* (Simon & Schuster, 1995)

Robert Buderi, *The Invention That Changed the World: How a Small Group of Radar Pioneers Won the Second World War and Launched a Technological Revolution* (Simon & Schuster, 1996)

Martin Campbell-Kelly and William Aspray, *Computer: A History of the Information Machine* (Basic Books, 1996)

David E. Fisher and Marshall Jon Fisher, *Tube: The Invention of Television* (Counterpoint, 1996)

Series books expected to be published in 1997 include the following:

Stephen S. Hall, *A Commotion in the Blood: A Century of Using the Immune System to Battle Cancer and Other Diseases* (Henry Holt)

Robert Kanigel, *The One Best Way: Frederick Winslow Taylor and the Enigma of Efficiency* (Viking)

Bettyann Holtzmann Kevles, *Naked to the Bone: Medical Imaging in the Twentieth Century* (Rutgers University Press)

Robert Pool, *Beyond Engineering: A New Way of Thinking About Technology* (Oxford University Press)

Michael Riordan and Lillian Hoddeson, *Crystal Fire: The Birth of the Information Age* (Norton)

Books on other technology-based topics are being prepared for the Series. Also planned is an anthology of writings tracing the history of ideas about technology, edited by Richard Rhodes. This book will provide a general social, cultural, and intellectual context for the individual stories, both technical and human, surrounding particular technologies.

SELECTED NATIONAL ISSUES AND CIVIC PROGRAM

The Foundation is interested in contributing to study and research on major issues of our time, but in a way appropriate to its expertise and limited size. This ordinarily requires a special approach in order that a meaningful contribution can be made to widely recognized issues and problems. The Foundation will support work in areas where such an approach can be developed, with the goal of enhancing understanding of complex issues of national importance. Projects approved in previous years include research on the effect of the legal status of drugs in modern industrial societies, a study of the deep oceans as waste depositories, a large survey to understand the public perception of nuclear power, analysis of the long-term cleanup of radioactive waste at nuclear reactor facilities, development of a set of social indicators of the position of children in the United States, and studies of illegal gun markets in American cities and their connection to juvenile violence. Two 1996 grants, described below, support projects to develop an AIDS vaccine and to study the partial privatization of the Social Security system.

A number of civic grants, mainly supporting projects aimed at enhancing the economy of New York City, are also described in this section.

SELECTED NATIONAL ISSUES, TRUSTEE GRANTS

International AIDS Vaccine Initiative **$3,000,000**
New York, NY 10018

In the United States, AIDS became the leading cause of death among men aged 25 to 44 and the third leading cause of death among women in the same age bracket as of 1994. More than 750,000 adults living in the U. S. are reported to be infected with AIDS. The epidemic is much worse in other regions of the world. According to the Joint United Nations Programme on HIV/AIDS, in sub-Saharan Africa more than three million people have died of AIDS and almost 13 million adults, including six million women of child-bearing age, plus perhaps one million children are infected. In South and Southeast Asia, the epidemic is expanding rapidly. Notwithstanding the general experience that only vaccines have been able to control other virulent viral diseases, and despite the existence of promising approaches, U. S. and worldwide investment in developing an AIDS vaccine is relatively small. Well over 90 percent of public sector investment on AIDS is devoted to treatment rather than prevention. Nevertheless, considerable scientific knowledge about the biology and pathogenesis of HIV has now been accumulated, resulting in the recognition of several promising routes to the development of a safe and effective preventive vaccine that would be inexpensive to produce in quantity. The Rockefeller Foundation has taken the lead in creating the International AIDS Vaccine Initiative (IAVI), a global effort to accelerate the development of such a vaccine for use throughout the world. With the aid of an international Board of Directors and a Scientific Advisory Committee of widely known and highly respected researchers from around the world, the plan is to focus on targeted, goal-driven research that will move as quickly as possible to clinical trials. Laboratory work will be supported as preparation for such trials. Major additional investment will eventually be needed. The Sloan Foundation grant will help launch this major initiative. Project Director: Dr. Seth Berkley, President, Interim Board of Directors, IAVI; Associate Director, Health Sciences Division, The Rockefeller Foundation.

National Academy of Social Insurance
Washington, DC 20036 **$350,000**

Current concerns about the long-term fiscal balance of the Social Security system have led to serious proposals for partial or total privatization of the system. One such proposal emanated from a significant minority of the divided 1996 governmental Advisory Council on Social Security. This grant supports analysis of the pros and cons of alternative proposals for privatization by a balanced and intellectually strong panel established by the National Academy of Social Insurance. The panel is co-chaired by Michael Boskin, Chair of the President's Council of Economic Advisors in the Bush administration, and Peter Diamond, Professor of Economics at MIT. It includes leading experts in economics, actuarial science, law, finance, fiscal policy, income distribution, and retirement policy. Several members have direct and in-depth experience in private-sector pension management. Some also serve on the official Advisory Council on Social Security. The project is expected to be completed by mid-1998. Project Director: Virginia P. Reno, Research Director.

Industrial Technology Assistance Corporation $333,500
New York, NY 10022

The aim of this grant, as well as the next to the Municipal Art Society, is to strengthen design-based manufacturing in the City. For many manufacturers, especially those that are design-based, a New York City location gives them the significant advantage of being in the midst of a center of design talent and a concentration of design-oriented consumers. ITAC has a staff of industrial engineers and manufacturing specialists and a record of accomplishment providing technical assistance to New York manufacturers. It will launch NYConnect, an information source to connect New York City designers, manufacturers, marketers, and sources of capital, with the objective of expanding design-based manufacturing in the City. NYConnect will develop and manage a data-base of manufacturers, designers, marketers, and potential investors; provide a search and matching service to assist companies find others that can offer manufacturing capability, provide design services, supply suitable marketing outlets, or make invest-ments; and establish a website to enable local and worldwide companies to access the information in its database. Project Director: Sara Garretson, Executive Director.

Municipal Art Society $192,358
New York, NY 10022

With this grant, the Municipal Art Society (MAS) will carry out a number of activities with the aim of bringing closer together designers and design-based manufacturers of New York City. It will explore the feasibility of a New York Design Center to provide a central location in the City where designers and manufacturers could meet and where their products could be displayed and promoted. Workshops will be organized on design and related manufacturing issues in the City. Tours of New York manufacturers will be arranged for architects and interior designers. The report *Designed in New York: Made in New York*, produced by the MAS with previous Foundation funding, will be broadly disseminated. MAS will arrange a series of high-profile media events related to the report's release, the initiation of its facility tours, and the launching of NYConnect by the Industrial Technology Assistance Corporation. Project Director: Linda R. Cox, Director, Planning Center.

Hunter College $29,970
New York, NY 10021

Support for a book on the impacts of smuggling of people from China to New York City. Project Director: Professor Peter Kwong, Department of Urban Affairs and Planning.

Mitretek Systems $30,000
McLean, VA 22102

To explore security certification processes for financial services. Project Director: Dr. Barry M. Horowitz, President.

Municipal Art Society $30,000
New York, NY 10022

To support collaboration with the Industrial Technology Assistance Corporation in order to promote strengthening of design-based manufacturing in the City of New York. Project Director: Linda Cox, Director, Planning Center.

New York Academy of Sciences $30,000
New York, NY 10021

For the commissioning of papers for a series of seminars on technology and economic development in the Tri-State Region. Project Director: Dr. Rodney W. Nichols, President.

Polytechnic University $25,000
Brooklyn, NY 11201

A planning grant for the development of a program in technology and merchandising. Project Director: George Bugliarello, President.

TRUSTEE GRANTS

Council on Foundations — $40,000
Washington, DC 20036

Independent Sector — $7,500
Washington, DC 20036

New York Regional Association of Grantmakers — $10,500
New York, NY 10018

The Foundation Center — $195,000
New York, NY 10003

The Council on Foundations (COF) is the foundation community's national organization, whose mission is to promote responsible and effective philanthropy. It provides publications and research reports, conducts workshops, seminars, and an annual conference, and maintains an active government relations staff. Independent Sector (IS) is mainly concerned with government relations, research on the not-for-profit sector, and leadership and management for not-for-profit organizations. The New York Regional Association of Grantmakers (NYRAG) is one of 24 regional associations of foundations affiliated with the COF. Concentrating on the Greater New York area, it supplies programs and information focusing on local foundation activities. The Foundation Center (FC) disseminates information about foundation programs and interests to grant seekers and the general public. It operates four libraries located in Cleveland, New York, Washington, and San Francisco, and coordinates 200 cooperating collections. It distributes publications, including *The Foundation Directory* and *Foundation Giving* and maintains a computer database on foundation grants. A grantmaker service program provides telephone references, research, and custom computer searches for foundations. The first three of the above grants are for annual membership dues; the fourth is a three-year renewal of support. Project Directors: Dorothy S. Ridings, President, COF; Sara E. Melendez, President, IS; Barbara Bryan, Executive Director, NYRAG; Sara L. Englehardt, President, FC.

FINANCIAL REVIEW

The financial statements and schedules of the Foundation for 1996 and 1995, which have been audited by KPMG Peat Marwick LLP appear on pages 108 to 115. They include balance sheets, statements of activity and cash flows, and schedules of management and investment expenses.

Investment income for 1996 was $35,435,979, a decrease of $1,491,730 from $36,927,709 in 1995. After the deduction of investment expenses and provision for Federal excise tax, net investment income was $30,244,284 in 1996 as compared with $32,119,170 for the prior year. Investment expenses during 1996 totaled $4,183,695 of which $3,534,205 represented investment advisors fees. The provision for Federal excise tax amounted to $1,008,000. The total of these deductions from investment income in 1996 was $5,191,695 versus $4,808,539 in 1995.

Grants authorized (net of grant refunds) and management expenses during 1996 was $56,607,502, which was $26,363,218 greater than 1996 net investment income. Of this total, grants authorized (net of refunds) amounted to $52,938,417 while management expenses were $3,669,085. Since the Foundation's inception in 1934, the cumulative excess of grants and expenses over the Foundation's net investment income has amounted to $94,256,686.

Grant payments in 1996 were $47,389,062 compared with $40,590,535 for the prior year. Together with management expenses, investment expenses, federal excise taxes paid and other charges, the total of cash expenditures net of grant refunds in 1996 was $56,399,216 while in 1995 the amount was $48,203,358.

Grants authorized and payments made during the year ended December 31, 1996 are summarized in the following table:

Grants unpaid at December 31, 1995	$54,191,192
Authorized during 1996	53,093,731
	107,284,923
Payments during 1996	47,389,062
Grants unpaid at December 31, 1996	$59,895,861

The market value of the Foundation's total assets was $1,003,375,395 at December 31, 1996 including investments valued at $1,002,800,229 as compared with total assets of $935,191,343 at December 31, 1995.

AUDITORS' REPORT

Report of KPMG Peat Marwick LLP
Independent Auditors

The Board of Trustees
Alfred P. Sloan Foundation:

We have audited the accompanying balance sheets of the Alfred P. Sloan Foundation as of December 31, 1996 and 1995, and the related statements of activity and cash flows for the years then ended. These financial statements are the responsibility of the Foundation's management. Our responsibility is to express an opinion on these financial statements based on our audits.

We conducted our audits in accordance with generally accepted auditing standards. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by the management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of the Alfred P. Sloan Foundation as of December 31, 1996 and 1995, and the changes in its net assets and its cash flows for the years then ended in conformity with generally accepted accounting principles.

Our audits were made for the purpose of forming an opinion on the basic financial statements taken as a whole. The supplementary information included in the schedules of management and investment expenses for the years ended December 31, 1996 and 1995 is presented for purposes of additional analysis and is not a required part of the basic financial statements. Such information has been subjected to the auditing procedures applied in the audits of the basic financial statements and, in our opinion, is fairly stated in all material respects in relation to the basic financial statements taken as a whole.

KPMG Peat Marwick LLP

February 7, 1997

BALANCE SHEETS
DECEMBER 31, 1996 AND 1995

	1996	1995
Assets		
CASH	$ 40,620	$ 91,568
INVESTMENTS:		
Fixed income	258,573,769	212,400,645
Equity	640,466,189	636,196,494
Other	103,760,271	86,272,777
TOTAL INVESTMENTS	1,002,800,229	934,869,916
OTHER	534,546	229,859
Total	**$1,003,375,395**	**$935,191,343**
Liabilities and Net Assets		
GRANTS PAYABLE	$ 59,895,861	$ 54,191,192
DEFERRED FEDERAL EXCISE TAX	2,014,200	1,689,878
NET ASSETS–UNRESTRICTED	61,910,061	55,881,070
Total	941,465,334	879,310,273
	$1,003,375,395	**$935,191,343**

See accompanying notes to financial statements.

STATEMENTS OF ACTIVITY
YEARS ENDED DECEMBER 31, 1996 AND 1995

	1996	1995
INVESTMENT INCOME:		
Interest	$ 20,124,090	$ 21,767,373
Dividends	15,311,889	15,160,336
	35,435,979	36,927,709
LESS:		
Investment expenses	4,183,695	3,708,539
Provision for Federal excise tax	1,008,000	1,100,000
	5,191,695	4,808,539
Net investment income	30,244,284	32,119,170
EXPENSES:		
Grants authorized (net of refunds of $155,314 in 1996 and $230,064 in 1995)	52,938,417	52,575,014
Management expenses	3,669,085	3,475,093
	56,607,502	56,050,107
EXCESS OF EXPENSES OVER NET INVESTMENT INCOME	(26,363,218)	(23,930,937)
NET GAIN ON DISPOSAL OF INVESTMENTS	72,626,541	78,270,835
INCREASE IN UNREALIZED APPRECIATION OF INVESTMENTS, NET OF DEFERRED FEDERAL EXCISE TAX	15,891,738	76,763,402
	88,518,279	155,034,237
INCREASE IN NET ASSETS	62,155,061	131,103,300
NET ASSETS AT BEGINNING OF YEAR	879,310,273	748,206,973
NET ASSETS AT END OF YEAR	$941,465,334	$879,310,273

See accompanying notes to financial statements.

STATEMENTS OF CASH FLOWS
YEARS ENDED DECEMBER 31, 1996 AND 1995

	1996	1995
Cash flows from operating activities:		
INCREASE IN NET ASSETS	$ 62,155,061	$131,103,300
ADJUSTMENTS TO RECONCILE INCREASE IN NET ASSETS TO NET CASH USED IN OPERATING ACTIVITIES:		
Net gain on disposal of investments	(72,626,541)	(78,270,835)
Increase in unrealized appreciation of investments	(16,216,060)	(78,330,002)
Increase in deferred federal excise tax	324,322	1,566,600
(Increase) decrease in other assets	(304,687)	439,048
Increase in grants payable	5,704,669	12,214,543
Net cash used in operating activities	(20,963,236)	(11,277,346)
Cash flows from investing activities:		
Proceeds from sale of investments	968,994,967	1,029,959,261
Purchase of investments	(948,082,679)	(1,018,674,651)
Net cash from investing activities	20,912,288	11,284,610
NET (DECREASE) INCREASE IN CASH	(50,948)	7,264
CASH AT BEGINNING OF YEAR	91,568	84,304
CASH AT END OF YEAR	$ 40,620	$ 91,568

See accompanying 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 management expenses, including post-retirement benefit expense, are recorded on the cash basis, the effect of which on the accompanying financial statements is not materially different from the accrual basis. Grants are accrued when authorized by the Trustees. Certain accounting estimates are a routine part of financial statements prepared by management and are based upon management's current judgements.

In 1995 the Foundation adopted the provisions of Statement of Financial Accounting Standards (SFAS) No. 124, "Accounting for Certain Investments Held by Not-For-Profit Organizations." Gains or losses on disposal of investments are determined on the first-in, first-out basis. Market value for traded securities is based on quoted market prices. Real estate and other investments of limited marketability are reported at estimated fair values based upon appraisals by the managers of the various interests.

2. INVESTMENTS

Investments at December 31, 1996 are summarized as follows:

	Cost	Market	% of Total
	$258,082,981	$ 258,573,769	25.8
Fixed Income	552,931,716	640,466,189	63.8
Equities	91,075,546	103,760,271	10.4
Other	$902,090,243	$1,002,800,229	100.0

At December 31, 1995 the market value of the investments exceeded cost by $84,493,926.

3. FINANCIAL INSTRUMENTS WITH OFF-BALANCE SHEET CREDIT OR MARKET RISK

The Foundation's investment strategy incorporates certain financial instruments which involve, to varying degrees, elements of market risk and credit risk in excess of the amounts recorded in the financial statements. These instruments include financial futures, forward foreign currency contracts, loaned securities and securities sold, not yet purchased.

The Foundation is subject to market risk associated with the changes in the value of the futures contracts. Below is a table summarizing the long and short exchange-traded financial futures positions at the end of December 1996 and 1995.

	December 31, 1996		December 31, 1995	
Index Futures Contracts	Number of Contracts	Value (Millions)	Number of Contracts	Value (Millions)
S&P 500				
Long			225	$69.7
Short	474	$178.0	183	57.0
U.S. Treasury Futures				
Long	2,416	311.5	93	10.5
Short			77	9.3
Non-US Index Futures				
Long	217	5.1		
Short	28	3.9		

These amounts, however, may differ from the Foundation's future cash requirements as the Foundation may close out futures positions prior to settlement and thus be subject only to the change in value of the futures contracts since the contracts are valued daily using the mark-to-market method. The net appreciation in the market value is recognized as received. The margin requirements on deposit with a third party for futures contracts were approximately $10.9 million at December 31, 1996 and $6.7 million at December 31, 1995.

In addition, the Foundation's investment advisor engages from time to time in options (puts and calls), swaps, futures and forwards, for the purpose of hedging, risk management and return enhancement or to implement investment strategies in a more efficient manner. The value of these transactions at December 31, 1996 is approximately $21.7 million. Such transactions are subject to market risk as described above and, to varying degrees, risk of loss, arising from the possible inability of counterparties to meet the terms of the contract. Required collateral is held by a third party.

The Foundation purchases forward foreign currency contracts as a hedge against fluctuations in currency prices. Forward foreign currency buy and sell contracts held as of December 31, 1996 were valued at approximately $36.0 million and $35.8 million, respectively, and, as of December 31, 1995, at approximately $52.6 million and $52.9 million, respectively. Such contracts involve, to varying degrees, risk of loss arising from the possible inability of counterparties to meet the terms of the contract.

Through a securities lending program managed by a custodian firm, the Foundation loans certain stocks and bonds included in its investment portfolio. The custodian firm has indemnified the program. The Foundation's gross securities loaned to certain borrowers at December 31, 1996 and 1995 amounted to $27 million and $20 million, respectively.

Securities sold, not yet purchased ($82.8 million and $66.4 million at December 31, 1996 and

December 31, 1995, respectively) are recorded net in the Foundation's investment accounts. These securities have market risk to the extent that the Foundation, in satisfying its obligations, may have to purchase securities at a higher value than recorded. Required collateral is held by a third party.

Management does not anticipate that losses, if any, resulting from its market or credit risks would materially affect the financial position of the Foundation.

4. FEDERAL EXCISE TAX

The Foundation is liable for federal excise taxes of 2 percent of its net investment income, which includes realized capital gains, for the year. However, this tax is reduced to 1 percent if certain conditions are met. The Foundation met the requirements for the reduced tax for the years ended December 31, 1996 and 1995. Therefore, current taxes are estimated at 1 percent of the net investment income for 1996 and 1995.

Deferred taxes represent 2 percent of unrealized appreciation of investments at December 31, 1996 and 1995, as qualification for the 1 percent tax is not determinable until the fiscal year in which gains are realized.

5. 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 the purchase of annuities for employees. Retirement plan expense was $292,829 and $268,446 in 1996 and 1995, respectively. In addition, the Foundation provides certain health care and life insurance benefits to its retirees. The cost of providing nonpension benefits to retirees was $86,662 and $81,313 in 1996 and 1995, respectively, on a pay-as-you-go basis.

6. LEASE

The Foundation's lease for its office space expires December 31, 1998. The lease contains an escalation clause which provides for rental increases resulting from increases in real estate taxes and certain other operating expenses. Rent expense amounted to $397,487 and $405,778 in 1996 and 1995, respectively. At December 31, 1996, base rent commitments aggregate approximately $808,600 and are payable at approximately $404,300 annually.

	1996	1995
Management Expenses		
Salaries and employee benefits:		
Salaries	$2,062,328	$1,989,132
Employees' retirement plan and other benefits	785,273	710,858
Total	2,847,601	2,699,990
Rent	397,487	405,778
Program expenses	508,881	493,500
Office expenses	419,845	408,910
Reports and publications	51,531	51,711
Professional fees	93,230	50,714
Total management expenses	4,318,575	4,110,603
Less management expenses allocated to investments	649,490	635,510
Management expenses	$3,669,085	$3,475,093

Investment Expenses		
Investment management fees	$3,534,205	$3,073,029
Management expenses allocated to investments	649,490	635,510
Investment expenses	$4,183,695	$3,708,539

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INDEX OF GRANTS

ALFRED P. SLOAN FOUNDATION

Alfred P. Sloan, Jr.
1875-1966

LIFE OF ALFRED P. SLOAN, JR.

Alfred Pritchard Sloan, Jr., was born in New Haven, Connecticut, May 23, 1875, the first of five children of Alfred Pritchard Sloan, Sr., and Katherine Mead Sloan. His father, a machinist by training, was then a partner in a small company importing coffee and tea. In 1885 the family moved to Brooklyn, where it was particularly active in the Methodist Church. (Young Alfred's maternal grandfather was a Methodist minister.) Alfred, Jr., excelled as a student both in the public schools and at Brooklyn Polytechnic Institute where he completed the college-preparatory course. After some delay in being admitted to the Massachusetts Institute of Technology (which considered him too young when he first applied), he matriculated in 1892 and took a degree in electrical engineering in three years as the youngest member of his graduating class.

Mr. Sloan began his working career as a draftsman in a small machine shop, the Hyatt Roller Bearing Company of Newark, New Jersey. At his urging, Hyatt was soon producing new antifriction bearings for automobiles. In 1898 he married Irene Jackson of Roxbury, Massachusetts. The next year, at age 24, he became the president of Hyatt, where he supervised all aspects of the company's business. Hyatt bearings became a standard in the automobile industry, and the company grew rapidly under his leadership. In 1916 the Hyatt Roller Bearing Company, together with a number of other manufacturers of automobile accessories, merged with the United Motors Corporation, of which Mr. Sloan became President. Two years later that company became part of the General Motors Corporation (itself established in 1908 as the General Motors Company), and Mr. Sloan was named Vice President in Charge of Accessories and a member of the Executive Committee.

He was elected President of General Motors in 1923, succeeding Pierre S. du Pont, who said of him on that occasion: "The greater part of the successful development of the Corporation's operations and the building of a strong manufacturing and sales organization is due to Mr. Sloan. His election to the presidency is a natural and well-merited recognition of his untiring and able efforts and successful achievement." Mr. Sloan had developed by then his system of disciplined, professional management that provided for decentralized operations with coordinated centralized policy control. Applying it to General Motors, he set the Corporation on its course of industrial leadership. The next 23 years, with Mr. Sloan as Chief Executive Officer, were years of enormous expansion for the Corporation and of a steady increase in its share of the automobile market.

In 1937 Mr. Sloan was elected Chairman of the Board of General Motors. He continued as Chief Executive Officer until 1946. When he resigned from the chairmanship in 1956, the General Motors Board said of him: "The Board of Directors has acceded to Mr. Sloan's wish to retire as Chairman. He has served the Corporation long and magnificently. His analysis and grasp of the problems of corporate management, his great vision and rare good judgement, laid the solid foundation which has made possible the growth and progress of General Motors over the years." Mr. Sloan was then named Honorary Chairman of the Board, a title he retained until his death on February 17, 1966. For many years he had devoted the largest share of his time and energy to philanthropic activities, both as a private donor to many causes and organizations and through the Alfred P. Sloan Foundation, which he established in 1934.

Mr. Sloan, as a realist as well as a humanist and philanthropist, looked upon the Foundation as an extension of his own life and work. Although he recognized the inevitability of change that might dictate a different course, he expected that the Foundation would "continue as an operating facility indefinitely into the future...to represent my accomplishments in this life." His accomplishments during his lifetime were of the highest order, and in themselves provide the most dramatic and lasting tribute to his extraordinary talent. Through the Foundation, his accomplishments have been extended and expanded.

CONTENTS

TRUSTEES

COMMITTEES OF THE BOARD OF TRUSTEES

Executive Committee

Harold T. Shapiro, Chairman
Stephen L. Brown
Ralph E. Gomory

Investment Committee

Stephen L. Brown, Chairman
S. Parker Gilbert
Ralph E. Gomory
Harold T. Shapiro
Robert M. Solow

Audit Committee

Lloyd C. Elam, Chairman
Stephen L. Brown
Dennis Weatherstone

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President

Stewart F. Campbell
Financial Vice President and Secretary

Hirsh G. Cohen
Vice President

Jesse H. Ausubel
Program Officer

Kathleen E. Christensen
Program Officer

Maureen Gassman
Assistant Secretary

Ted Greenwood
Program Officer

A. Frank Mayadas
Program Officer

Gail M. Pesyna
Program Officer

Christopher T. Sia
Controller

Michael S. Teitelbaum
Program Officer

Doron Weber
Program Officer

GENERAL INFORMATION

"The greatest real thrill that life offers is to create, to construct, to develop something useful. Too often we fail to recognize and pay tribute to the creative spirit. It is that spirit that creates our jobs. There has to be this pioneer, the individual who has the courage, the ambition to overcome the obstacles that always develop when one tries to do something worthwhile, especially when it is new and different."

—Alfred P. Sloan, Jr., 1941

PROGRAMS AND INTERESTS

The programs and interests of the Foundation are divided into four areas outlined as follows:

Science and Technology

- Fellowships
- Direct Support of Research
- History of Science and Technology

Standard of Living and Economic Performance

- Industries
- Nonprofit Sectors
- Dual-Career Working Families

Education and Careers in Science and Technology

- Education for Scientific and Technical Careers
- Education for Minorities and Women
- Public Understanding of Science and Technology

Selected National Issues and Civic Program

In the following sections, brief descriptions are provided of the Foundation's programs in these four areas, including goals, current directions and plans. Additional information can readily be obtained from the Program Officer responsible for a particular program, as identified on the Foundation's World Wide Web site, www.sloan.org.

SCIENCE AND TECHNOLOGY

Support of science and technology continues as a major component of the Foundation's program. Fellowships, direct support of research in selected fields, and work in the history of science and technology are basic parts of this program.

FELLOWSHIPS

Sloan Research Fellowships

These highly competitive and prestigious awards are intended to enhance the careers of the very best young faculty members identified by peer review as possessing truly outstanding scientific research potential. Currently 100 grants are awarded annually in six fields: chemistry, computer science, economics, mathematics, neuroscience, and physics.

Sloan Dissertation Fellowships

The goal of this program is to expedite completion of the Ph.D. in mathematics and economics. These fields normally lack research assistantships to support the dissertation year. Fifty awards are made each year, with nominations solicited from leading graduate departments.

DIRECT SUPPORT OF RESEARCH

The Foundation seeks to identify areas of research that are scientifically significant in which its support can make a difference. This ordinarily means that there are no significant government funders. Areas currently supported are molecular evolution, theoretical neurobiology, computational molecular biology, astrophysics (Sloan Sky Survey), and limits to knowledge. A possible new research area, currently under exploration, involves a "Census of Fishes" to study the global abundance and distribution of marine life.

Molecular Evolution

The goal of this program has been to contribute substantially to making molecular evolution a significant field of science. Expenditures totaling over $11 million since 1986 have supported postdoctoral training programs and young investigator awards, scientific conferences, and the founding of the Society for Molecular Biology and Evolution. The program, now operated jointly with the National Science Foundation, will conclude in 1998 with the field of molecular evolution well established, progressing rapidly, and developing important new applications in the biotechnology and pharmaceutical industries.

Theoretical Neurobiology

This program aims to accelerate the development of theory in neurobiology. The plan has been to bring young theoreticians from the physical, mathematical, and computer sciences into neurobiology as a means of encouraging the addition of theoretical insights to the substantial data-producing capabilities of experimenters. Most of the work is aimed at higher level integrated neural systems.

Grants in 1994 totaling almost $7 million supported five new research centers at Brandeis University, California Institute of Technology, New York University, Salk Institute, and University of California, San Francisco. Young scientists are given an opportunity to learn laboratory procedures and work with senior neurobiologists. The program has attracted strong participants, initial research results are encouraging, and each of the Centers received three-year renewal grants in 1997.

Computational Molecular Biology

The goal of this program is to produce scientists who can link the theoretical and practical tools of molecular biology with the power of modern computational techniques. In what is now a joint program with the U.S. Department of Energy, up to ten two-year postdoctoral awards are made each year to bring mathematicians, computer scientists, and physicists into quantitatively sophisticated molecular biology laboratories.

Sloan Sky Survey

This project's goal is to provide a new and vastly more detailed archive of the objects that make up the universe. Foundation grants totaling $10 million have supported a consortium of universities and laboratories in the Sloan Sky Survey. A specially designed telescope has been constructed that will provide three-dimensional locations for one million galaxies and one hundred thousand quasars. Systematic observations are expected to begin in 1998.

Limits to Knowledge

The goal of this program is the exploration of what is known, unknown, and unknowable in a variety of fields. In each field, research on limits to knowledge is funded in the context of specific current problems of that field. Grants have supported such studies in plant

molecular biology and genetics, ecology, computational economics, prehistoric linguistics, and other fields.

Marine Science

The goal of this project is to explore whether the Foundation might help develop a major new international observational program to assess the abundance and distribution of marine life, a "Census of the Fishes." Initial grants have been made to obtain the views of experts on the scientific value, technical feasibility, estimated cost, and interest of diverse stakeholder communities in this project, with the expectation that these studies will be completed during 1998 as a basis for decisions concerning the future of this new program.

HISTORY OF SCIENCE AND TECHNOLOGY

The goal of this program is to preserve the raw material of history by supporting archival projects now centered on Charles Darwin, Thomas A. Edison, and Kurt Gödel, and via new projects based on the World Wide Web.

Archival Program

This program aims to preserve and make available to scholars a complete collection of papers, letters, and notes of Darwin, Edison, and Gödel. Volume 12 of The Correspondence of Charles Darwin and the fourth volume of the Edison papers have been completed. Additional work is ongoing on these projects as well as on the preparation of the final volume of Gödel's collected works. Making these archives available electronically is an important part of the projects. A biography of Thomas Edison is expected to be completed in 1998.

Web Sites

The goal of this program is to explore a new way of creating an historical record of major technical and scientific events. A series of grants have supported the opening of web sites devoted to important technical or scientific developments so that all who were involved can contribute their recollections, papers, and points of view of what actually took place. Historians at five universities are operating web sites on such topics as the development of the computer mouse, polymerase chain reactions, and Northeast electric power blackouts. Six professional societies have received grants to establish web sites for the documentation of recent history in physics, geophysics, meteorology, and chemical, civil, and mechanical engineering.

STANDARD OF LIVING AND ECONOMIC PERFORMANCE

The overall goal in this program is to contribute to an understanding of the basic forces affecting American economic progress and the U.S. standard of living in the increasingly competitive world economy. The main sections of the program deal with industries, nonprofit sectors, and dual-career working families.

INDUSTRIES

Industry Centers

The goal of this program is to build an academic community with direct knowledge of and interest in various industries. Twelve centers are now supported by Foundation grants for study of the following industries in both manufacturing and service sectors: motor vehicle, apparel and textile, steel, semiconductor, computer, pharmaceutical, financial services, powder metallurgy, retail food, trucking, managed health care, and construction. About 200 faculty members and an equal number of graduate students are involved in research. Since 1994, 85 new Ph.D.s have finished their work and many are continuing their research in new academic positions.

Centers are in close contact with companies, are publishing research studies on their industries, and generally are producing data, observations, and theoretical results useful to American companies and to government agencies.

The Foundation plans to develop a small number of additional centers, perhaps for the study of a professional service industry, a utility industry, or one of the new industries related to the Internet. Outreach to the industries and universities and efforts to enlarge the community that would benefit from the industry perspective will continue.

Human Resources/Jobs/Income

The goal of this program is to build understanding of best practices in the changing workplace and the effects of changes on jobs and income. Research using an industry-by-industry focus, making use of Sloan Industry Center resources and researchers linked in the Sloan Human Resources Network, has studied aspects of the high performance workplace, which has had a number of positive effects, but not in all cases. Divergence of incomes among workers on low or high educational levels is currently being studied.

The Network held a meeting on wage issues in 1997 and plans another in 1998, this time organized by industry, to allow specific identification within each industry, for example, of which technologies are affecting jobs and raising or lowering wages. Projects exploring income effects and studying links among technology, changing skill requirements, and wages are also planned.

Globalization

The goal here is to provide a fact-based picture of globalization, primarily within specific industries. The Foundation's program to study the widening geographical distribution of production seeks to identify the main factors in company location decisions and the effects of these decisions on jobs and wages. Grants have been made for research on such globalization issues in a number of industries, including the computer disk drive and the flat panel display industries. Studies of additional industries and developing new ways to study the effects of globalization are planned.

Role of the Corporation

The goal of this program is to contribute to understanding the nature and purpose of the corporation. Research by Margaret Blair at the Brookings Institution relates the theory of the firm to the "team production problem," arguing that the main reason firms exist is to organize production activity depending on the inputs and coordinated efforts of many different individuals. An ongoing project at Columbia School of Law is focused on the approach of different countries to issues of corporate governance, and another at the University of Colorado has analyzed the impact of large block shareholders on corporate performance. Grants during 1998 are expected to bring new perspectives into this program.

Other Work and Outreach

Recent grants support the work of Kenneth Arrow on venture capitalists, of the National Research Council's Science, Technology, and Economic Policy Board on industrial innovation, of Stanford University's Future Professors of Manufacturing Program, and at New York University on the Gomory-Baumol theory of international trade. Research continues on productivity in the service sector at Columbia University and on a theory of cross-national production networks by the Berkeley Roundtable on International Economics. *Bottom-Line America*, a four-part television series about the changing economic landscape in the United States, produced by Hedrick Smith, will air on PBS early in 1998.

NONPROFIT SECTORS

Universities

The goal of this program is to produce understanding of how institutions of higher education actually work. A book on higher education as an industry has been completed as part of a Foundation project at the RAND Corporation. The center for the study of community colleges, established at Teachers College, Columbia University with a major Foundation grant in 1996, now involves about a dozen faculty and is studying how community colleges relate to particular industry sectors.

Development continues on an interactive university simulator as yet another way to understand the working of a university. Study of its own departments, the basic production units of universities, is ongoing at UCLA. As part of the Foundation's interest in increasing interactions among these grantees and others studying universities, a grant to the Social Science Research Council supports the operation of a network of researchers on higher education.

Assessment of Government Performance

The goal for this program is to encourage the creation and use of measures of municipal government performance that objectively measure outcomes about which people care. Measures of how effectively a municipality is doing its job should be available and intelligible to citizens so they can have a factual basis from which to press for good performance. Six grants have funded projects in municipalities around the country to show that meaningful measures can be developed and that citizens can be involved in assessments of such governmental functions as public transportation, crime control, fire protection, park safety, solid waste collection, street maintenance, and snow removal.

A December 1997 grant to the Government Accounting Standards Board will support activities leading to the possible issuance of performance measures by local and state governments. Additional grants in this program are planned.

DUAL-CAREER WORKING FAMILIES

A dramatic change has taken place in the ways that middle-class Americans organize their work and family lives. As women have increasingly become workers outside the home, the

dual breadwinner family has become commonplace. The Foundation's program in this area is organized into four categories: Centers on Working Families; professional part-time careers; work and everyday lives of working families; and public understanding of working families.

Centers on Working Families

The goal of this program is to create an academic community with direct knowledge of the conditions under which middle class dual-career families live and work. Two centers now exist: The Center on Parents, Children and Work at the University of Chicago; and the Employment and Family Careers Institute at Cornell University. A third center, at the University of California, Berkeley, has been funded and will commence operations in the fall of 1998. Thirty-two faculty, two post-docs, and twelve graduate students are currently engaged in multidisciplinary research on middle-class working families. Faculty at the Centers are publishing research studies and providing data and insights helpful to understanding the profound changes within middle-class America.

The Foundation plans to establish two additional centers in 1998.

Professional Part-Time Careers

The goal here is to understand how well and for whom part-time work actually works. Grants support ongoing research projects that are examining the nature and viability of part-time careers in law, medicine, public accounting, management, management consulting, computer programming, engineering, and technical writing. Results of this research are expected in 1998 and a conference on part-time careers is planned.

Work and Everyday Lives of Working Families

The goal of this program is to understand how the nature of work shapes the everyday experiences of the family, and how dual-career families provide for the routine activities of managing a family and running a household. Past grants supported projects to study the coping strategies of working families where one or both parents work as research scientists in biotechnology firms and as financial executives on Wall Street.

In 1998, the Foundation plans to support projects to produce ethnographies of the everyday lives and household economies of middle-class parents working under different conditions. A detailed understanding of the work and home lives of employees should be useful to firms, industry associations, and unions in making decisions about work practices and human resource policies.

Public Understanding of Working Families

The goal of this program is to enhance public understanding of the issues faced by working families. Radio, television, books, and conferences will be used to make the public aware of the issues faced by working families. Foundation grants led to Arlie Hochschild's well-received book, *The Time Bind: When Work Becomes Home and Home Becomes Work* (Henry Holt, 1997), and to the creation of a work-family beat on National Public Radio. A national conference on working families will be held in November 1998. Further grants in this area are planned.

EDUCATION AND CAREERS IN SCIENCE AND TECHNOLOGY

This major Foundation program is divided into the following sections: Education for Scientific and Technical Careers; Education for Minorities and Women; and Public Understanding of Science and Technology.

EDUCATION FOR SCIENTIFIC AND TECHNICAL CAREERS

Career Choice

The goal here is to understand how young people develop their ideas of occupations, professions, and the world of work. Supported by a major 1992 grant, progress continues on a University of Chicago longitudinal study in eleven middle and high school districts in widely varying socio-economic communities across the U.S. This research has found that young people now have higher educational expectations and occupational aspirations than at any time in the last 50 years. This cuts across all the variables, including gender, race, ethnicity, and social class. Interestingly, students who expect to be homemakers have fallen to less than one percent. This study will be completed in 1998, including results on how students decide and what influences them to aim at scientific and engineering careers. A book on early research results is due to be published by Cambridge University Press in 1998 and a second book, focusing on changes in expectations and aspirations, is being completed.

Information About Careers

The goal of this program is to make available realistic information about the nature of work in science and engineering careers. Career decisions today are made largely in the absence of realistic information about the life at work of scientists and engineers. Since 1994 the Foundation has made nine grants to leading professional societies, representing various mathematical, physical science, and engineering disciplines, to support the preparation and distribution of career information. Each society is preparing a videotape, a CD-ROM, and web pages, and all are closely coordinating activities to create a high-quality set of materials for students, parents, family, and counselors. These materials will be attractively packaged as the Sloan Career Cornerstone Series, and will be widely distributed. All videotapes are expected to be completed by March 1998, with CD-ROMs following about six months later. In 1998, advertising and distribution of these materials will be a priority.

Retention

This program aims to increase understanding of why student attrition in higher education is so high, especially from the fields of science and engineering. The influential work by Elaine Seymour and Nancy M. Hewitt, *Talking About Leaving: Why Undergraduates Leave the Sciences* (Westview Press, 1997), reported on Foundation-sponsored research on undergraduate switching out of science. Barbara Lovitts of the University of Maryland is completing a book manuscript on attrition from graduate school and efforts to make her results widely known are underway. The Foundation seeks additional opportunities to fund and disseminate useful research.

Learning Outside the Classroom

The goal of this program is to make available quality higher education and training anytime and anywhere for anyone who is motivated to seek it. Support has gone mainly to institutions of higher education, ranging from community colleges to elite universities, to provide learning opportunities through Asynchronous Learning Networks (ALNs). These make possible electronic access at any time to remote learning resources, including not only texts but also instructors and other students. Learners can be on-campus, within commuting distance of a campus (so visits are possible), or very far from any support center.

ALN has now become quite prominent in higher education. By the end of 1998, Foundation-supported projects will have produced over 500 faculty-years of ALN teaching experience and over 10,000 students will have participated in ALN education. Grants for high quality ALN projects leading to full degrees will be emphasized in 1998, along with projects exploring new ways to deliver ALN education and training to industry. The Foundation-sponsored web site, aln.org, will be expanded and the creation of an ALN society explored.

New Professional Masters Degrees

The goal of this program is to explore and, if indicated, bring into being a new type of masters degree in the sciences that equips people for work outside academia. Suitable scientific training, if made available in graduate schools, could be very useful for obtaining satisfying jobs in business and industry. The Foundation plans to support exemplary efforts in this direction at a number of U.S. universities.

Postdocs and Adjuncts

This nascent program aims to find out the basic facts about the rapidly changing situation of postdocs and adjuncts. During 1997, two Foundation-supported workshops, one on postdocs

and another on adjunct and part-time faculty, were held. Each generated substantial interest from universities, scientific and engineering societies, and government agencies. Future projects will develop needed research and analysis on the causes and impacts of recent trends in the postdoc and adjunct categories, and also will seek to gain better understanding of the views of young scientists in these positions.

Immigration of Scientists and Engineers

This program aims to establish and assemble the basic facts about foreign scientists and engineers working in the U.S. Competitive research awards were made by the Foundation in 1993 and 1996 to study various issues in this area. As a result, for example, reliable estimates are now available for the percentage of foreign science and engineering students receiving Ph.D.s who stay on in the U.S. Currently active grants support the development of an overall statistical portrait of the population of scientists and engineers in the U.S., both native and foreign-born, and an assessment of the roles being played by immigrants in the science and engineering complex of California. Further projects to produce data and analyses to allow better understanding of this topic are of interest.

Many questions and problems have also arisen as a result of the great increase in the proportions of graduate students and postdocs in U.S. science and engineering departments. For example, nearly 50 percent of total graduate students in engineering, 40 percent in the physical and mathematical sciences, and 30 percent in the life sciences are now foreign students. The number of foreign postdocs increased from 12,500 in 1980 to 26,000 in 1995; over one-half of all postdocs now are foreign nationals on temporary visas. During 1998, attention will also be paid to the roles and impacts, both positive and negative, of foreign students in U.S. universities.

MINORITIES AND WOMEN

Minorities

The main goal of this program is to increase the number of underrepresented minority Ph.D.s in mathematics, science, and engineering by 100 per year. The major part of this effort seeks out faculty who have shown they can successfully recruit, mentor, and graduate minority doctoral students. Grants are provided to increase the number of students recruited. Undergraduate departments with a strong record of sending their minority graduates on for Ph.D.s are also funded to encourage programs to increase the number of such students.

Since minority students are underrepresented in most of the specialized secondary schools devoted to science and mathematics, a small number of grants have gone to such schools, with the *goal to ensure that minority populations have equal access to and derive equal benefits from these specialized schools.* Such projects now are ongoing at six secondary schools in Alabama (2), California, Illinois, and New York City (2). During 1998, additional grants in this program, both to universities and specialized secondary schools, are planned.

Women

The goal for this program is to remove barriers to success for women faculty in the fields of mathematics, science, engineering and technology. The Sloan Pre-Tenure Leave Fellowship Program will provide funding to untenured, tenure-track faculty in these fields who face urgent family responsibilities. It will enable them to take a leave with salary, or, after a leave, to resume a research program. A small number of colleges and universities have been invited to participate in a pilot program during 1998. If this pilot proves successful, the plan is to expand the program in 1999.

PUBLIC UNDERSTANDING OF SCIENCE AND TECHNOLOGY

The goal of this program is to enhance people's lives by providing a better understanding of our increasingly scientific and technological world. The program also aims to convey some of the challenges and rewards of the scientific and technological enterprise and of the lives of the men and women who undertake it. In striving to achieve this overall goal and reach a wide general audience, the Foundation program makes use of various media, including books, television, radio, films, theater, CD-ROM, and the Internet. Further grants using these media are planned for 1998.

Books

The Sloan Technology Book Series, launched in 1994 with grants to support the writing of books on major twentieth century technologies, saw five new titles appear in 1997, bringing the published total to 11 volumes. Books on inventer Edwin Land, the Optical Science Corporation's satellite project, and fiber optics, as well as an anthology of technology edited by Richard Rhodes, are slated for series publication in 1998. The Foundation's program also includes books designed to inform people about the scientific basis of issues that are often confusing or controversial. Two such books appeared in 1997, on "mad cow disease" and the Ebola virus. New grants for the writing of books on the Gulf

War Syndrome and on the search for an AIDS vaccine were made in 1997.

Other ongoing book projects include a new American history textbook that seeks to incorporate science and technology into the narrative of the nation's history, a three-volume series and CD-ROM by David P. Billington on the great engineering developments of the last 200 years, biographies of Hans Bethe, John Bardeen, and Nikola Tesla, autobiographies of John Wheeler and Charles Townes, and volumes on domestic technology and the industrial landscape.

Television

In 1997, two documentaries based on books in the Sloan Technology Series were broadcast on public television, one linked to *Tube*, the other to *Naked to the Bone*. Four Foundation-supported shows on the inventions of the telephone and television, on the building of the New York subway, and on Andrew Carnegie and the technological development of metal making, all aired as part of the PBS historical series *The American Experience*. A renewal grant was made for three other shows linked to Sloan books. Two one-hour documentaries on the invention of the transistor, based on the series book *Crystal Fire*, and on Frederick Taylor and the legacy of scientific management, based on *The One Best Way*, were also supported in 1997.

The Foundation partially funded a number of television productions, some already aired and others scheduled for 1998, aimed at informing the public about significant scientific areas: *Stephen Hawking's Universe*, on the origins and nature of the universe; *Life By The Numbers*, a seven-part series on ways in which an understanding of mathematics can help in everyday life; *Nuclear Reaction*, a Frontline documentary about nuclear power; and *Into the Future*, a film of special interest to librarians and archivists about the challenges of digital preservation.

The Foundation is also exploring the feasibility of a science news service for cable and local television news shows and the possible use of commercial television for promotion of public understanding of science and technology.

Radio

Support was renewed in 1997 for technology reporting by National Public Radio. The subject of technology has come to be a prominent part of NPR's three popular news

magazines, *Morning Edition*, *All Things Considered*, and *Weekend Edition*. Another grant will fund nine one-hour radio documentaries on new developments in genetics. On commercial radio, a 1997 grant will support more science and technology coverage to be broadcast on the CBS network.

Films

The goal here is to influence the next generation of film makers to create more realistic and compelling stories about science and technology and to challenge the existing stereotypes about scientists and engineers through the visual media. In 1996 the Foundation made grants to the following four of the nation's leading film schools: The American Film Institute; UCLA's School of Theater, Film and Television; USC's School of Cinema-Television; and NYU's Tisch School of the Arts. These institutions, which serve as feeders into the Hollywood system, will try to stimulate their top students to write and produce new film and television shows about scientists and engineers.

In 1997, the schools launched this program by establishing annual awards in film production and screen writing and an annual colloquium on science and technology. The American Film Institute received a special grant to make science and technology the theme of its renowned Television Writer's Workshop. Two new schools, Columbia University and Carnegie Mellon University, were added to the film program in 1998.

The Foundation also has a long-term goal of getting more pilot scripts dealing with science and technology into development at the major Hollywood studios and networks. David Milch, the executive producer and co-creator of the Emmy-winning *NYPD Blue*, is working with the Foundation to develop a new network television show featuring scientists and engineers. Further work on this project is planned for 1998. Also to be explored are the establishment of a major professional screen writing award in science and technology and the setting up of referral services to link Hollywood writers and producers with working scientists and engineers.

Theater

In 1997 the Foundation made an officer grant to the Ensemble Studio Theater to help with the production of a new play about the Wright Brothers called *Flight*. The Foundation will continue to seek new opportunities for science and technology in the theater in 1998.

SELECTED NATIONAL ISSUES AND CIVIC PROGRAM

SELECTED NATIONAL ISSUES

The goal of this program is to contribute to other major issues of our time in a way appropriate to the Foundation's expertise and size. There will undoubtedly be many problems of importance to which, lacking expertise or a special approach, the Foundation should not attempt to contribute. Grants in recent years include:

Privatization of Social Security

The goal is to produce an objective and expert assessment of proposals for partial privatization of the Social Security system. A grant to the National Academy of Social Insurance supports work of an outstanding group of experts whose report, expected in 1998, will analyze the advantages and disadvantages of various privatization proposals.

International AIDS Vaccine Initiative

The goal of this project is to accelerate the development of an AIDS vaccine. A Foundation $3 million grant in 1996 helped launch the Initiative, which has focused the attention of our own and other governments on the need for a vigorous and concerted HIV vaccine development program and has itself made a number of grants for scientific work on AIDS vaccines.

Illegal Gun Markets and Juvenile Violence

The goal of this program was to increase understanding of the epidemic of gun-related youth violence. One of the projects, although designed as a scientific study of the supply of guns to juveniles, led as a byproduct to the development of a successful police intervention program that worked in Boston and then in Minneapolis to sharply reduce youth homicides.

CIVIC PROGRAM

The goal of this program is to make a contribution to the Foundation's home area, New York City. Grants in recent years include:

Linking Educational Institutions

The goal here is to assist educational institutions to provide specialized education or other assistance to sectors of the City's economy where they have relevant expertise. The Center for Finance and Technology at Polytechnic University, initiated with a 1994 grant, has seen steadily increasing course enrollments and numbers of degree candidates. Another grant of this type was approved late in 1997 to the Fashion Institute of Technology. Explorations will continue with other educational institutions whose faculties may be able to reach out to assist city businesses.

Linking Economic Actors

The goal of this program is to bring together clusters of economic actors when their interaction would be mutually beneficial. In 1996, the Foundation provided funding for the Industrial Technology Assistance Corporation and the Municipal Art Society to cooperate in bringing together the design and design-based manufacturing sectors of the New York economy. A useful database, NYC Design/Production Link, is being developed and an action plan, *Designed in New York/Made in New York*, has been released. A 1997 grant to Greenpoint Manufacturing and Design Center encouraged the launching of a new Product Development Center to help bring promising product design concepts into production in the City. In 1998, the Foundation will explore possibilities for using information developed at the Sloan Textile and Apparel Industry Center to contribute to New York City's garment industry.

Sloan Public Service Awards

The goal of this program is to recognize outstanding performance by civil servants in New York City. From some 250,000 civil servants working for the City, six persons are selected each year for Sloan Public Service Awards in recognition of their exceptional achievement.

HOW TO APPLY FOR A GRANT

Applications can be made at any time for support of activities related to the range of interests indicated above. Grants of $30,000 or less are made throughout the year by officers of the Foundation. Officer grants enable the Foundation to respond quickly to proposals for many activities, such as workshops, symposia, and conferences, that fall within its program areas and interests, but require only moderate funding (at most $30,000). Officer grants can also be helpful for the preliminary planning and exploratory stages of major projects.

Grants over $30,000 are made by the Trustees who meet four times a year for that purpose. Letters of application are normally sent to the president or an officer of the Foundation and include, in addition to details about the applicant and the proposed project, information on the cost and duration of the work. Officer grants may not include any overhead charge; for trustee grants, at most fifteen percent of direct project costs can be budgeted for overhead. In the case of new applicants, the proof of tax-exempt status of the organization that would administer the grant should be included unless it is a recognized institution of higher education.

The Foundation's activities do not generally extend to religion, the creative or performing arts, elementary or secondary education, medical research or health care, the humanities or to activities outside the United States. Grants are not made for endowments or for buildings or equipment. Information about the Foundation's programs is available at www.sloan.org.

The Foundation has no deadlines or standard forms. Often a brief letter of inquiry, rather than a fully developed proposal, is an advisable first step for an applicant, conserving his or her time and allowing for a preliminary response regarding the possibility of support.

1997 GRANTS AND ACTIVITIES

FELLOWSHIPS

Sloan Research Fellowships **$3,500,000**

Initiated 42 years ago, the Sloan Research Fellowship Program aims to stimulate fundamental research by young scholars with outstanding promise to contribute significantly to the advancement of knowledge. Fellowships have gone to over 3,200 scientists and have accounted for expenditures of more than $75 million. Sloan Research Fellows continue to receive numerous prizes and awards in recognition of their major research accomplishments. Twenty-three Fellows have received Nobel prizes and twelve have been awarded the prestigious Fields Medal in mathematics.

Fellowship awards in 1997 were made in six fields: chemistry, computer science, economics, mathematics, neuroscience, and physics. Each fellowship is administered by the fellow's institution and is designed to allow the greatest possible freedom and flexibility in its use. A brochure entitled "Sloan Research Fellowships," available from the Foundation and reprinted on its website, describes the program in detail.

Candidates for Sloan Research Fellowships are nominated by department heads or other senior scientists familiar with their work. Within each discipline, a committee of three distinguished scientists reviews all nomination documents and recommends the final selections. Committee members are asked to identify those nominees who show the most outstanding promise of making important research contributions. During 1997, the Foundation awarded Research Fellowships of $35,000 each, over a two-year term, to 100 scholars at 49 institutions. Nominations were reviewed by the following committees:

Chemistry: Jacqueline K. Barton, California Institute of Technology; Samuel Danishefsky, Columbia University; William H. Miller, University of California, Berkeley.

Computer Science: John L. Hennessy, Stanford University; John E. Hopcroft, Cornell University; Richard M. Karp, University of Washington.

Economics: Gary Chamberlain, Harvard University; Kenneth Rogoff, Princeton University; Jose Scheinkman, University of Chicago.

Mathematics: Spencer J. Bloch, University of Chicago; David McLaughlin, New York University; Karen Uhlenbeck, University of Texas at Austin.

Neuroscience: Darcy B. Kelley, Columbia University; Anthony Movshon, New York University; Lawrence Zipursky, University of California, Los Angeles.

Physics: Robert J. Birgeneau, Massachusetts Institute of Technology; Saul Teukolsky, Cornell University; Frank Wilczek, Institute for Advanced Study.

FELLOWSHIP RECIPIENTS

Boston University
Physics: Michael F. Crommie

Brandeis University
Neuroscience: Gina G. Turrigiano

Brown University
Economics: Moshe Buchinsky
Mathematics: Gyorgy Haller

California Institute of Technology
Computer Science: James Arvo
Physics: Emlyn W. Hughes

California, University of, Berkeley
Chemistry: Carolyn Bertozzi
Computer Science: Eric A. Brewer
Economics: Hilary W. Hoynes
Christina Shannon
Physics: Young-Kee Kim
David S. Weiss

California, University of, Davis
Chemistry: Alexei A. Stuchebrukhov

California, University of, Irvine
Chemistry: James S. Nowick

California, University of, Los Angeles
Chemistry: James R. Heath
David C. Myles
Mathematics: Greg Hjorth
Ricardo Perez-Marco
Neuroscience: Susana Cohen-Cory

California, University of, Riverside
Physics: Antonio H. Castro Neto

California, University of, San Diego
Chemistry: Robert E. Continetti
Mathematics: Kate Okikiolu
Neuroscience: William R. Schafer
Physics: Dimitri N. Basov

California, University of, Santa Cruz
Chemistry: Joseph D. Puglisi
Neuroscience: Andrew D. Chisholm
Yishi Jin
Physics: Puragra Guhathakurta

Chicago, University of
Economics: Judith A. Chevalier
Physics: Alex Eskin

Colorado State University
Chemistry: Peter K. Dorhout

Colorado, University of
Physics: Leo Radzihovsky

Columbia University
Chemistry: J. Eric Gouaux
Mathematics: Shou-Wu Zhang
Neuroscience: Vincent P. Ferrera
Ning Qian
Jian Yang

Cornell University
Computer Science: Srinivasan Keshav
Jon Kleinberg
Brian C. Smith
Physics: Philip C. Argyres
Eanna Flanagan

Duke University
Neuroscience: Richard Daniel Mooney

Florida State University
Physics: Vladimir Dobrosavljevic

Georgetown University
Physics: Jeffrey S. Urbach

Harvard University
Economics: Edward L. Glaeser
Neuroscience: Bruce M. Hood

Illinois, University of, Champaign-Urbana
Chemistry: Martin Gruebele
Jeffrey S. Moore
Physics: Aida Xenia El-Khadra

Illinois, University of, Chicago
Chemistry: Lucio Frydman

Institute for Advanced Study
Physics: Wayne Hu
John March-Russell

Johns Hopkins University
Economics: Christopher D. Carroll
Neuroscience: Ernst Niebur

Maryland, University of
Physics: Markus A. Luty

Massachusetts Institute of Technology
Chemistry: Christopher C. Cummins
Gregory C. Fu
Computer Science: Julie Dorsey
David R. Karger
Seth J. Teller
Mathematics: Michael P. Brenner

McGill University
Mathematics: Lisa Claire Jeffrey

Michigan, University of
Economics: Susanto Basu
Mathematics: Karen E. Smith

Nebraska, University of
Chemistry: David B. Berkowitz

New Mexico State University
Physics: Viatcheslav Solomatov

New York University
Mathematics: David J. Muraki
Estaban G. Tabak

Northwestern University
Economics: Wolfgang Pesendorfer
Mathematics: Vladimir Voevodsky

Oklahoma State University
Mathematics: Zhenbo Qin

Oklahoma, University of
Physics: Sheena Murphy

Pennsylvania State University
Chemistry: Michael J. Natan
Mathematics: Dmitri Burago

Pennsylvania, University of
Chemistry: Norbert F. Scherer
Physics: Jordi Miralda-Escude
Steven T. Myers

Princeton University
Computer Science: Edward W. Felten
Mathematics: A. Shadi Tahvildar-Zadeh
Physics: Stephen E. Thorsett

Rockefeller University
Neuroscience: Peter Mombaerts

South Carolina, University of
Chemistry: Catherine J. Murphy

Stanford University
Computer Science: Nick McKeown
Neuroscience: Liqun Luo

Texas A&M University
Mathematics: David C. Dobson

Texas, University of, Austin
Mathematics: Alan W. Reid

Texas, University of, Houston
Neuroscience: Ruth Heidelberger

Toronto, University of
Mathematics: Boris Khesin
Physics: Thomas Mason

Utah, University of
Neuroscience: Andres Villu Maricq

Washington State University
Chemistry: Lai-Sheng Wang

Washington, University of
Chemistry: Karen I. Goldberg
Mathematics: James Zhang
Physics: Gerald T. Seidler

Wisconsin, University of
Chemistry: Laura L. Kiessling
Arun Yethiraj
Mathematics: Paul A. Milewski

Yale University
Chemistry: John L. Wood
Neuroscience: Anna W. Roe

Doctoral Dissertation Fellowships

$1,350,000

The Sloan Dissertation Program, established in 1984, assists doctoral candidates in two fields of traditional interest to the Foundation: economics and mathematics. Awards allow Fellows to concentrate on completing their doctoral research and writing the dissertation.

Fellowships have been received by 690 graduate students and have accounted for expenditures of over $14.9 million. In 1997, awards covering tuition and fees plus a stipend of $15,000 were made to 25 doctoral candidates in each field. Nominations were solicited from the heads of leading graduate departments of economics and mathematics. They were reviewed and final selections made by the following committees:

Economics: Avinash K. Dixit, Princeton University; Sherwin Rosen, University of Chicago; John B. Taylor, Stanford University.

Mathematics: Luis A. Caffarelli, New York University; Nicholas M. Katz, Princeton University; John Morgan, Columbia University.

FELLOWSHIP RECIPIENTS

California Institute of Technology
Economics: Dean V. Williamson

California, University of, Berkeley
Economics: Giovanni Peri
Mathematics: Michael Kleber
Dmitry Roytenberg

California, University of, Los Angeles
Mathematics: Su Gao
Thomas Graber

California, University of, San Diego
Economics: Alejandro Gaviria

Carnegie Mellon University
Economics: Edward Nelson

Chicago, University of
Economics: Marco Bassetto
Alexander Monge
Adriano A. Rampini
Mathematics: Andrew H. Kresch

Columbia University
Mathematics: Yang Liu
Cormac O'Sullivan

Cornell University
Economics: Todd Keister
Mathematics: Robert Battig

Harvard University
Economics: Marianne Bertrand
Matthew Ellman
Mathematics: Matthew Emerton
Michael Hutchings
Leonard E. Positselski

Illinois, University of, Chicago
Mathematics: Junda Hu
Seunghun Lee
Bryan Mosher

Massachusetts Institute of Technology
Economics: Jeffrey R. Kling
Andrea Repetto
Annette Vissing-Jorgensen
Mathematics: Konstanze C. Rietsch

Michigan, University of
Economics: Susanna Loeb
Merrell Hora

Minnesota, University of
Mathematics: Tai-Peng Tsai

New York University
Mathematics: Carlos Garcia
Matthew Killough

North Carolina, University of
Economics: Alison Aileen Aughinbaugh

Northwestern University
Economics: Kevin Hasker

Ohio State University
Mathematics: Igor Iskhakov

Pennsylvania State University
Mathematics: Serge Ferleger
Philip Foth

Pennsylvania, University of
Economics: Morris A. Davis

Princeton University
Economics: Gordon B. Dahl
Gilat Levy
Mathematics: Diego G. Cordoba
Kannan Soundararajan

Stanford University
Economics: Sergei Leonidovich Severinov
Matthew Shou-Chung Shum
Scott Jonathan Wallsten

Texas, University of
Mathematics: Hongqiu Chen

Wisconsin, University of
Economics: Peter Arcidiacono

Yale University
Economics: Alex Stevens Maynard
Mathematics: Van H. Vu

MOLECULAR EVOLUTION

Foundation support for research in this field was initiated in 1986. Operated jointly with the National Science Foundation since 1994, the program is made up of two parts: post doctoral research fellowships; and awards to young investigators in the early years of their independent research careers.

NSF/Sloan Postdoctoral Fellowships in Molecular Evolution

This competitive program is intended for young scientists who can benefit from the freedom to define and pursue their own research programs while developing relevant interdisciplinary knowledge and skills in a host laboratory or field station. Each two-year award carries a budget of $80,000 which provides a postdoctoral stipend, a special allowance for research materials, and university overhead of 15%. In 1997, the fourth year of this program, the following 17 awards were made. Citations are given in the form: name and sponsoring institution of the Fellow; sponsoring scientist; title of proposed research plan.

Daniel Barbash, Cambridge University; Michael Ashburner; *Genetic and molecular basis of species formation in Drosophila.*

Donald Baskerville, Whitehead Institute, MIT; David P. Bartel; *Examining the origins of enzymes.*

Richard Broughton, Cornell University; Richard G. Harrison; *Applying multiple locus genealogies to molecular evolution and species divergence.*

Wes Burrows, San Diego Zoo; Oliver A. Ryder; *DNA sequence variation of the Y chromosome in great apes.*

Paulyn Cartwright, Harvard University; Elizabeth Kellogg; *Molecular mechanisms of sex determination in the evolution of flowering plants.*

Belinda Chang, Harvard University; Michael J. Donoghue; *Reconstructing ancestral pigment proteins in vitro to investigate the molecular evolution of wavelength sensitivity.*

Melissa Fleming, University of Alaska; Joseph A. Cook; *Evolutionary history and distribution of ermine and mink subspecies in southeast Alaska.*

John Huelsenbeck, Smithsonian Institution; Michael Braun; *Testing models of cladogenesis in a phylogenetic context using fossil and living bivalves.*

Susan Jacobs, University of Texas; Wen-Hsiung Li; *Evolution of the X-linked color vision gene in squirrel monkeys.*

Seung Kim, Indiana University; Loren H. Riseberg; *Transfer of genetic adaptations between sunflower species.*

Ichiro Matsumura, Indiana University; Andrew D. Ellington; *Do enzymes behave like antibodies?*

Matthew Olson, Vanderbilt University; Dave McCauley; *Evolution of male-sterility genes and their effects on population sex ratios, colonization dynamics, and genetic diversity in an herbaceous plant.*

Daniel Oppenheimer, University of Chicago; Nipam H. Patel; *Using baculovirus vectors to study the evolution of segmentation in arthropods.*

David Parichy, Washington University; Stephen L. Johnson; *Mutational analysis of pigment pattern diversification in cyprinid fishes.*

Joseph Peters, Johns Hopkins University; Nancy L. Craig; *Dissecting specific interactions between mobile DNA elements to understand bacterial evolution.*

Kenneth Petren, Princeton University; Peter R. Grant; *Genetic differentiation of hybridizing Darwin's finches.*

Paul Rawson, University of California, San Diego; Ronald S. Burton; *Coevolution of nuclear and mitochondrial cytochrome C oxidase genes in a marine copepod.*

Young Investigator Awards in Molecular Evolution

These awards provide early funds to support the research careers of newly independent investigators in molecular evolution. Applicants must hold positions on the regular faculties (or their equivalents) of U.S. or Canadian nonprofit public or private institutions of higher education and research, and must be within the first few years of their research careers. Up to five awards per year will be made, each with a total budget of $100,000 over a period of three years. In 1997, the third year of this program, a careful review of applications by an advisory committee led to the following five awards. Citations are given in the form: name of awardee, sponsoring institution and department; title of proposed research plan.

Charles F. Delwiche, University of Maryland, Department of Plant Biology;
Isolation and molecular phylogenetic analysis of the dinoflagellate peridinin-type plastid genome.

Jeffrey G. Lawrence, University of Pittsburgh, Department of Biological Sciences;
Evolution of coenzyme B12 biosynthetic pathways.

Spencer V. Muse, University of Missouri, Division of Biological Sciences;
Multilocus evolutionary analysis.

Grace E. Panganiban, University of Wisconsin, Department of Anatomy;
Comparative analysis of arthropod and vertebrate limb development.

Michael D. Purugganan, North Carolina State University, Department of Genetics;
Molecular evolution of floral homeotic genes.

MOLECULAR EVOLUTION, TRUSTEE GRANT

American Academy of Arts and Sciences $64,000
Chicago, IL 60637

Findings from molecular evolution, for example, the more than 99% identity between humans and chimpanzees in DNA sequences known to be associated with functional genes, are leading to major new understandings of the evolutionary history of the human species. This grant partially supports a two-day conference on the topic of "Our Evolutionary Place in Nature." Leaders will be brought together from a wide array of fields, including molecular evolution, genomic research, paleontology, and primate behavior. There will also be a series of public lectures designed for a more general audience. Project Director: Dr. Morris Goodman, Department of Anatomy and Cell Biology, School of Medicine, Wayne State University.

MOLECULAR EVOLUTION, OFFICER GRANT

Gordon Research Conferences $10,000
West Kingston, RI 02892

Support for graduate student participation in the Gordon Conference on Molecular Evolution. Project Director: Professor Walter M. Fitch, Department of Ecology and Evolutionary Biology, University of California, Irvine.

THEORETICAL NEUROBIOLOGY, TRUSTEE GRANTS

Brandeis University $1,068,039
Waltham, MA 02254

California Institute of Technology $1,157,037
Pasadena, CA 91125

New York University $958,000
New York, NY 10011

Salk Institute for Biological Studies $1,114,421
La Jolla, CA 92037

University of California, San Francisco $1,225,937
San Francisco, CA 94143

Grants totaling almost $7 million made in 1994 supported the formation and operation of five research centers at these institutions. The aim was to bring young researchers with strong theoretical backgrounds, often with graduate degrees in the mathematical and physical sciences, into the laboratory world of neurobiology. For example, NYU has concentrated on theoretical vision neuroscience. Two new assistant professors who had been trained theoretically and worked on vision problems were appointed. Post- and pre-docs were added to their laboratories, and close research connections were established between faculty of the Courant Institute of Mathematical Sciences and the Center for Neural Science. The initial success of all five of these programs, in the recruitment of highly qualified young theoreticians, the effectiveness of their laboratory and other training, and in the development of research initiatives, led in 1997 to the above renewal grants for continuation of their activities. Project Directors: Professor Eve Marder, Department of Biology, Brandeis; Professor Richard A. Andersen, Division of Biology, Cal Tech; Professor Robert Shapley, Center for Neural Science, NYU; Professor Thomas D. Albright, Director, Vision Center Laboratory, Salk Institute; Professor Stephen G. Lisberger, Department of Physiology, UC, San Francisco.

California Institute of Technology $150,000
Pasadena, CA 91125

Three Foundation-supported summer workshops to bring together senior faculty and younger theoreticians of the five Sloan Centers for Theoretical Neurobiology have been held in past years at the Santa Fe Institute. They have significantly aided the integration of the new group of theoreticians into the neurobiology community and have also led to collaborative research involving scientists at different centers. This grant supports the first such workshop to be held on the campus of one of the Centers. Project Director: Professor Richard A. Andersen, Division of Biology.

THEORETICAL NEUROBIOLOGY, OFFICER GRANT

Salk Institute for Biological Studies $10,000
La Jolla, CA 92037

For meeting expenses and travel and hotel costs to the Neural Information and Coding Workshop for those invited from other institutions than the Sloan Centers. Project Director: Anthony M. Zador, Professor for Biological Sciences.

COMPUTATIONAL MOLECULAR BIOLOGY

Sloan/DOE Fellowships in Computational Molecular Biology

This postdoctoral fellowship program, a joint venture of the Sloan Foundation and the U.S. Department of Energy, is designed to provide an intensive experience in a molecular biology laboratory for computationally sophisticated young scientists. Recognizing the exceptional scientific potential in applying modern computational techniques to complex problems related to data and information arising from the study of human and other genomes, the program aims to increase the number of scientists possessing the cross-disciplinary skills needed to study these problems. Computational molecular biology is taken broadly to include the application of mathematics, statistics, probability, and computer science. The goal is to foster interactions between the mathematical and biological sciences for genome studies and to provide rigorous training for scientists in this new interdisciplinary area.

Up to ten annual fellowships will be awarded, each with a budget of $100,000 over two years, including stipends, benefits, research expenses, and institutional overhead. The initial fellowships in this program were awarded last year. A careful review of applications in the second round resulted in the following seven 1997 awards. Citations are given in the form: awardee; sponsoring senior scientist and institution; proposed research plan.

Mark A. Abney; Carole Ober, Center for Medical Genetics, University of Chicago; *Genetic analysis of complex traits in large pedigrees.*

Grenmarie Agresar; Michael A. Savageau, Department of Microbiology and Immunology, University of Michigan Medical School; *Canonical nonlinear methods for modeling and analyzing gene circuits and spatial variations during pattern formation in embryonic development.*

Kevin Atteson; Junhyong Kim, Department of Biology, Yale University; *Analysis of molecular data using statistical and evolutionary approaches.*

Michael Eisen; David Botstein, Department of Genetics, Stanford University; *Development of tools for the analysis of gene expression data measured on DNA microarrays: application to cancer.*

Boris Fain; Michael Levitt, Department of Structural Biology, Stanford University; *Sampling protein shapes with collective residue motion.*

Robert Mau, Jr.; Frederick R. Blattner, Department of Genetics, University of Wisconsin; *The search for biological significance from statistical analysis of the complete genome of Escherichia coli.*

Thomas I. Milac; Maynard V. Olson, Department of Medicine, University of Washington; *A mathematical model of the mating signal transduction pathway in the yeast Saccharomyces cerevisiae.*

LIMITS TO KNOWLEDGE, TRUSTEE GRANTS

Columbia University — $272,715
New York, NY 10027

This grant supports an exploration of limits to knowledge in economics. As general optimization models for rational agents become increasingly large and complex, the computations required for a solution often grow beyond available resources. The implications of this intractability for some important applications will be investigated, as will methods to reduce the rate of growth of the required calculations as a problem's dimension increases. Project Director: Professor Joseph F. Traub, Computer Science Department.

Princeton University — $250,000
Princeton, NJ 08544

Rockefeller University — $250,000
New York, NY 10021

University of California, Riverside — $250,000
Riverside, CA 92521

These three grants support research and seminars on limits to knowledge in biology. The Princeton project will explore how considerations of scale and spatial levels in key ecological systems may impact what is known and knowable about ecosystems. At Rockefeller, research will focus on "erroneous" reactions in chemical kinetics in cells and on the phylogenetic reconstruction of protein sequences. The former may shed light on what is knowable about the cell. The latter will explore the limits for sequence reconstruction in light of missing data. A web site will be created to disseminate studies and results, and to establish links with other researchers. The UC Riverside group will explore limits to knowledge in evolutionary biology by studying two issues: the historical problem of inferring a particular gene genealogy; and the relation between gene and phenotype. This project will also include workshops and an international dialogue on limits to knowledge in biology as suggested by examples in population genetics, molecular evolution, and conservation biology. Project Directors: Professor Simon A. Levin, Department of Ecology and Evolutionary Biology, Princeton; Assistant Professor Marcelo Magnasco, Center for Studies in Physics and Biology, Rockefeller; Professor Michael T. Clegg, Botany and Plant Sciences Department, UC, Riverside.

MARINE SCIENCE, TRUSTEE GRANT

National Academy of Sciences — $86,306
Washington, DC 20048

A "Census of the Fishes," were it to be undertaken, could be expected to yield not only greatly increased scientific understanding of the oceans, but also information useful for the management of fisheries, marine pollution, and other ecological concerns. This grant supports an international conference, convened by the Ocean Studies Board of the National Research Council, to explore the feasibility of organizing a comprehensive program whose purpose would be to assess and explain the global distribution and abundance of marine life, especially fish. This NRC project, together with the work supported by the officer grants listed below, are initial exploratory efforts to determine what potential role, if any, the Foundation might play were such a large-scale observational program in oceanography proven to be both timely and of great potential scientific value. Project Director: Morgan Gopnik, Director, Ocean Studies Board.

MARINE SCIENCE, OFFICER GRANTS

New England Aquarium — $30,000
Boston, MA 02110

To conduct a workshop exploring assessment of non-fish nekton in a census of marine life. Project Director: Jerry R. Schubel, President.

Ocean Trust — $30,000
Alexandria, VA 22314

To assist in obtaining fishing industry perspectives on a possible census of fishes. Project Director: Thor J. Lassen, President.

Rutgers University $30,000
New Brunswick, NJ 08903

Support for a workshop to consider the scientific and technical aspects of a census of marine benthic species. Project Director: J. Frederick Grassle, Director, Institute of Marine and Coastal Sciences.

University of California, San Diego $30,000
La Jolla, CA 92093

To explore technological aspects of a marine fish census. Project Director: Jules J. Jaffe, Associate Research Oceanographer, Scripps Institute of Oceanography.

Woods Hole Oceanographic Institution $30,000
Woods Hole, MA 02543

For a workshop on models and observations relating to the abundance and distribution of fishes. Project Directors: John H. Ryther and John H. Steele, Scientists Emeriti.

MATHEMATICS, SCIENCE, AND POLICY, OFFICER GRANTS

Cornell University $30,000
Ithaca, NY 14853

Assistance for preparation of a book on "The Deep Hot Biosphere." Project Director: Thomas Gold, Emeritus Professor.

Harvard University $26,046
Cambridge, MA 02138

For follow-on study and outreach on a national assessment of U.S. technology policy. Project Director: Lewis M. Branscomb, Professor Emeritus.

University of Pennsylvania $10,000
Philadelphia, PA 19104

Partial support for the Third International Workshop on DNA Computation. Project Director: Harvey Rubin, Associate Professor of Medicine and Microbiology, School of Medicine.

University of Texas at San Antonio $30,000
San Antonio, TX 78249

Support of research on the "Scientific Laws of Architecture." Project Director: Nikos Salingaros, Professor of Mathematics.

TRUSTEE GRANTS

American Geophysical Union $133,400
Washington, DC 20009

American Institute of Chemical Engineers $137,000
New York, NY 10017

American Institute of Physics $133,400
College Park, MD 20740

American Meteorological Society $133,400
Boston, MA 02108

American Society of Civil Engineers $137,000
Reston, VA 20191

American Society of Mechanical Engineers $137,000
New York, NY 10017

In 1996 the Foundation made five grants to support the establishment of World Wide Web sites in the history of technology by individual historians based at universities. The fundamental idea behind these projects was to experiment with the new Internet environment as a means of broadening access to a vast array of diverse primary sources, enabling many more people to participate in and contribute to the development of the historical record, and also creating new outlets for scholarly research. These six 1997 grants extend this effort by supporting the establishment of websites by professional societies for the documentation of selected developments in the recent history of geophysics, physics, meteorology, and chemical, civil, and mechanical engineering. The societies will create informative and inviting sites with some initial materials, maintain the sites, publicize them widely, and invite participants to contribute their experiences to the historical record. Among the topics being considered for these sites are: meteorite impacts and the extinction of dinosaurs (AGU); the Greenland ice sheet drilling projects of the 1970s to mid-1980s (AIP); the Atlantic experiment of 1974 and its impact on tropical meteorology (AMS); the changes in beverage containers, 1965-1990 (AIChE); the Washington DC Metro Transit System (ASCE); and development of the artificial heart and related equipment (ASME). The societies will exchange experiences regarding the operation of the sites. After two years, they will evaluate the utility of the new websites and report on whether the practice can be institutionalized. Project Directors: Eugene Bierly, Director, Education and Research, AGU; Spencer R. Weart, Director, Center for History of Physics, AIP; Richard E. Hallgren, Executive Director, AMS; Stephen R. Smith, Managing Director, Publications and Information Technology and Services, AIChE; Marla Berman, Director, Educational Activities, ASCE; Thomas J. Perry, Director, Engineering Education, ASME.

University of Virginia $101,929
Charlottesville, VA 22903

Nikola Tesla was a major figure in the electrical revolution that transformed American society at the opening of the twentieth century. He invented an alternating current motor which permitted electricity to be used in American homes and businesses and established the basic system for distributing electrical power essential to today's utility grids. He was also a pioneer in electronics and was among the first to demonstrate the principle of tuned radio circuits. Despite Tesla's extraordinary technical achievements (and his near-mythic grip on the public imagination which has led to Tesla fan clubs, web sites, and upcoming films), there has been no critical and reliable study of his inventions and his role in American society. This grant supports research and writing of a biography that will include an analysis of how Tesla created his inventions and drew upon the science, culture, and business milieu of the America of his time. The book, to be published by Princeton University Press, will also use Tesla's career as an opportunity to reflect upon the role of heroic inventors in creating modern American culture. Project Director: Professor W. Bernard Carlson, Division of Technology, Culture and Communication.

HISTORY OF SCIENCE AND TECHNOLOGY, OFFICER GRANTS

Harvard University $30,000
Cambridge, MA 02138

For travel, research and writing of a book on Galileo's Daughter. Project Director: William J. H. Andrews, Curator, Collection of Historical Scientific Instruments, Science Center.

Roosevelt University $30,000
Chicago, IL 60605

To complete a book on 18th and 19th century technologies and systems originating the information revolution. Project Director: Daniel R. Headrick, Professor of Social Sciences.

Rutgers University $29,250
New Brunswick, NJ 08903

To complete the digital scanning of the Edison papers microfilm. Project Director: Robert Rosenberg, Director, Edison Papers Project.

University of Illinois $10,000
Champaign, IL 61820

To edit and prepare a manuscript about the history of silicon. Project Director: Richard L. Wentworth, Director & Editor-in-Chief, University of Illinois Press.

University of Wisconsin $29,998
Madison, WI 53706

Support for a book on "Why American Universities Vary in Their Capacity to Make Major Discoveries in Biomedical Research." Project Director: Professor J. Rogers Hollingsworth, Departments of History and Sociology.

STANDARD OF LIVING AND ECONOMIC PERFORMANCE

INDUSTRIES

INDUSTRY CENTERS, TRUSTEE GRANTS

Massachusetts Institute of Technology $750,000
Cambridge, MA 02139

The MIT Program on the Pharmaceutical Industry (POPI) was established with a 1991 Foundation grant. Funding for this industry study center was renewed in 1994. This is a final grant supporting continued work at the center. More than 30 faculty from MIT and other universities have been involved in POPI research. By mid-1997 some 20 doctoral students completed their degrees and have moved on to academic positions at universities or to consulting, where they continue to work on issues related to the management of the pharmaceutical industry. There has been extensive interaction of faculty and students with individuals and firms in the industry, both through research projects and also as a result of executive courses, symposia, and meetings. POPI's research has focused mainly on manufacturing and marketing. The current grant will fund a number of research projects on drug discovery and development. Efforts will continue to attract and involve graduate students. A book on the pharmaceutical industry is being completed and research results will be disseminated widely. Project Director: Dr. Stan N. Finkelstein, Senior Research Scientist, Sloan School of Management.

Worcester Polytechnic Institute $241,211
Worcester, MA 01609

A 1993 Foundation grant supported the establishment at WPI of a center for the study of the powder metal industry. This small industry is composed mostly of small companies. Powder metal parts are key components in automobiles, aircraft, and other mechanical products. Four major studies have been completed, on cost estimation procedures, globalization, interfirm relationships, and value creation. The first of these produced new cost estimation algorithms now being used in the industry. The center has become a focus for studies of management and technical aspects of this industry. Support from companies now accounts for the major part of the center's budget. This renewal grant will fund continued research on cost estimation and some new work on buyer-seller relationships, customer satisfaction, and management views of competitive advantage. Project Director: Diran Apelian, Howmet Professor of Engineering.

The eight grants listed below support a coordinated project to study the role of technological innovation processes and other factors in the performance of specific industrial sectors. Using a common analytical framework, each Sloan Industry Center will examine systematically all the factors that may have influenced its industry's recent performance, starting at the most general, national level (e.g., political climate, fiscal and monetary policies) and proceeding to changes within individual firms (e.g., reorganization, supplier and customer relationships). The work will culminate in a conference held at the National Academy of Sciences and with publication of the individual industry analyses. The participating universities and the industries studied at their Centers include: Carnegie Mellon (Steel); Harvard (Apparel and Textile); Michigan (Trucking Service); Minnesota (Retail Food); MIT (Pharmaceutical); Penn (Financial Institutions); Stanford (Computer); UC, Berkeley (Semiconductor); UC, San Diego (Hard Disk Drive); and Worcester Polytech (Powder Metallurgy). Of these ten, three required no additional funding in order to participate in the study. The other seven plus the National Academy of Sciences make up this set of grants.

Carnegie Mellon University $14,300
Pittsburgh, PA 15213

Project Director: Professor Richard J. Fruehan, Department of Materials Science and Engineering.

Harvard University $7,930
Cambridge, MA 02138

Project Director: Professor Peter Doeringer, Department of Economics, Boston University.

National Academy of Sciences $26,542
Washington, DC 20418

Project Director: Dr. Stephen A. Merrill, Executive Director, NRC Board on Science, Technology and Economic Policy.

Stanford University $19,831
Stanford, CA 94305

Project Director: Professor Timothy Bresnahan, Department of Economics.

University of California, San Diego $16,730
La Jolla, CA 92093

Project Director: David McKendrick, Visiting Assistant Professor, Graduate School of International Relations and Pacific Studies.

University of Michigan $28,553
Ann Arbor, MI 48109

Project Director: Professor Chelsea C. White, III, Department of Industrial and Operations Engineering.

University of Pennsylvania $27,000
Philadelphia, PA 19104

Project Director: Professor Patrick T. Harker, Chairman, Department of Operations and Information Management.

Worcester Polytechnic Institute $28,000
Worcester, MA 01609

Project Director: Associate Professor Chickery Kasouf, Department of Management.

INDUSTRY STUDIES, OFFICER GRANTS

Brookings Institution $30,000
Washington, DC 20036

Initial funding for a new forum on the financial services industry and a new journal. Project Director: Robert E. Litan, Director, Economic Studies Program.

Michigan State University $30,000
East Lansing, MI 48824

For study of labor and productivity measures of the North American iron ore industry. Project Director: Professor Peter J. Kakela, Department of Resource Development.

University of Wisconsin $29,852
Madison, WI 53706

To initiate a collection of industry studies of wage inequality. Project Director: Craig A. Olson, Professor of Business and Industrial Relations.

HUMAN RESOURCES, OFFICER GRANTS

Editorial Projects in Education $6,500
Washington, DC 20008

Support of additional marketing of "The School to Work Revolution." Project Director: Lynn Olson, Senior Editor.

Women of Enterprise Inc. $30,000
Sacramento, CA 95814

To stimulate research on the relationship between leadership diversity and corporate performance. Project Director: Beatrice A. Fitzpatrick, President and Founder, The Fitzpatrick Group Inc.

GLOBALIZATION, TRUSTEE GRANTS

Carnegie Mellon University $191,000
Pittsburgh, PA 15213

The Indian software industry has received considerable attention as an example of how skilled service jobs in U.S. firms can move overseas. This grant supports a systematic study of this industry. The different types of software firms and the supply of human capital will be delineated. Linkages to the U.S., for example, the kind of work that is outsourced and the manner in which projects are carried out, will be investigated. Possible scenarios for evolution of the industry and connections with the U.S. will be formulated. The methodology will involve use of commercial data sources to develop a profile of over 250 software firms in India and to detect trends. Data analysis will be complemented with a number of detailed case studies, based on visits to firms and on-site interviews, both with Indian companies and with their U.S. customers. Project Director: Ashish Arora, Assistant Professor of Economics and Public Policy.

Harvard University $249,574
Cambridge, MA 02138

This project by the Harvard Center for Textile and Apparel Research will make use of the detailed examination of the industry that the Center has made over the past six years. The industry is led by lean retailers who have been able to reduce inventories, replenishment times, stock-outs, and leftover merchandise. These objectives of the market-controlling retailers determine not only the production plans and organization of manufacturing suppliers but also their location. The Harvard group plans to use their already established connections to retailers, manufacturers, and textile suppliers, as well as several available data sets, to understand the changing patterns of the flow of apparel toward the U.S. and changes on the domestic side of this industry. A model will be produced that will enable manufacturers to determine where and when apparel should be sourced abroad or nearer to its selling point. Project Director: Janice Hammond, Professor of Business Administration.

University of California, Berkeley $180,000
Berkeley, CA 94720

A study of globalization in semiconductor chip manufacturing will be supported by this grant. This industry has a complex mix of products, is extremely capital intensive, and supports a large and thriving equipment manufacturing industry. Specific goals of this project include: to document historical trends in the geographical distribution of wafer fabrication capacity; to illuminate the perspectives of managements investing in these sites and why the sites were selected; to understand the key factors that drive the siting of semiconductor chip plants; to predict the location of such plants to be constructed over the next 3-5 years; and to draw conclusions as to the policies and efforts by local governments and supplier industries that will influence the future siting of semiconductor facilities. Project Director: Professor Robert Leachman, Engineering Systems Research Center.

GLOBALIZATION, OFFICER GRANTS

Council on Competitiveness $30,000
Washington, DC 20005

Support for a conference on innovation in a global context. Project Director: John N. Nicholson, President.

Yale University $26,000
New Haven, CT 06520

For a study of implications of emerging "Mekong economies" to U.S. business. Project Director: Associate Professor Mark Mason, School of Management.

ROLE OF THE CORPORATION, OFFICER GRANTS

Brookings Institution $30,000
Washington, DC 20036

To analyze the impact of large-block shareholders on corporate performance. Project Director: Sandra Z. Riegler, Foundation Relations Director.

New York University $10,000
New York, NY 10012

Partial sponsorship of a conference on the "Power and Influence of Pension and Mutual Funds." Project Director: Edward V. Regan, Distinguished Fellow.

New York University $13,000
New York, NY 10012

For a planning session on human capital research issues. Project Director: Professor Samuel Estreicher, School of Law.

New York University $5,500
New York, NY 10012

To produce a research agenda on corporate investment in intangibles. Project Director: Baruch Lev, Professor of Accounting and Finance, Stern School of Business.

Saint Mary's College of California $30,000
Moraga, CA 94575

To complete research and produce a book on "fiduciary capitalism." Project Director: Professor James P. Hawley, School of Economics & Business Administration.

Tufts University $8,450
Medford, MA 02155

To publish a book about the role of directors and trustees. Project Director: Brian O'Connell, Professor of Public Service.

University of Wisconsin $29,144
Madison, WI 53706

To support research on the rise of large-scale corporations in the late 1800's. Project Director: Assistant Professor Colleen Dunlavy, Department of History.

COMPETITIVENESS AND INNOVATION, TRUSTEE GRANTS

Carnegie Mellon University $199,900
Pittsburgh, PA 15213

A study will be undertaken of the effect academic scientific research has had and continues to have on the steel industry. This is one of a series of grants designed to exhibit, across a number of industries and disciplines, close connections and successful relationships between university research and economic output. Also worthy of examination are cases where those relationships seem possible and fruitful but have not yet developed. This study is enhanced by the six-years of experience of the CMU and University of Pittsburgh Foundation-sponsored Center for the Steel Industry. The research plan includes intensive case studies of technologies recently introduced in this industry. The flow of people into the industry and other mechanisms for transferring knowledge, such as publications, conferences, patents and licenses, consulting and joint university-company projects will be explored. The study will look at a number of academic disciplines whose outputs affect the steel industry. Data and observations will be obtained from site visits to companies and from universities. Project Director: Wesley M. Cohen, Associate Professor of Economics and Social Sciences.

National Academy of Engineering Fund $400,000
Washington, DC 20418

A 1996 grant to the Academy's Committee on Science, Engineering, and Public Policy supported studies of several disciplines and industries asking whether academic sciences and engineering are making important contributions to the national economy. This new grant enlarges this activity to cover more disciplines and industries, some from the service sector. Panels of academic members of the Academy from engineering disciplines and from companies whose products and services may benefit from those disciplines will seek a detailed understanding of the current flow of usable knowledge, techniques, and graduates into particular industries. They will also study disciplines not now succeeding in transferring technical knowledge to what would seem to be likely target industries. Among the cases to be considered are aircraft and small engines, materials processing, logistics and distribution services, multimedia and network systems, telecommunications services, and biomedical services. Project Director: Proctor Reed, Associate Director of Program Office.

COMPETITIVENESS AND INNOVATION, OFFICER GRANT

National Academy of Sciences $30,000
Washington, DC 20418

Partial support for an assessment of how changes in the U. S. health care market will affect technological innovation. Project Director: Kenneth Shine, President, Institute of Medicine.

UNIVERSITIES, OFFICER GRANTS

City University of New York $30,000
New York, NY 10003

To support research and writing on higher education. Project Director: Louis Menand, Professor of English, The Graduate Center.

College of William and Mary $29,500
Williamsburg, VA 23187

Support for a conference on part-time and adjunct faculty in the university. Project Director: David Leslie, Professor of Education.

University of Pennsylvania $30,000
Philadelphia, PA 19104

To provide data required for a university simulator. Project Director: Professor Robert Zemsky, Director, Institute for Research on Higher Education, Graduate School of Education.

ASSESSMENT OF GOVERNMENT PERFORMANCE, TRUSTEE GRANT

Financial Accounting Foundation $359,750
Norwalk, CT 06856

Six past grants have funded projects in municipalities around the country designed to assist in the development of measures of government performance, in the involvement of citizens in this process, and in the use of these measures to effect assessment of and greater citizen satisfaction with municipal services. This grant supports a possible administrative mechanism through which municipalities could be required to employ performance assessment and to involve citizens. The Government Accounting Standards Board (GASB) was organized by the Financial Accounting Foundation in

1984 as an independent body to establish standards of financial accounting and reporting for state and local governments. Its standards must be used in annual governmental financial reports if the auditor of these reports wishes to say that they are presented "in accordance with generally accepted accounting principles." GASB is exploring the possibility of issuing a standard requiring governments to report on their performance, to do so in ways that would be intelligible and helpful to ordinary citizens, and to involve citizens in deciding what and how to measure. Were this to come to pass, state and local governments would have to be responsive. This grant supports experimentation by GASB in measuring and reporting service efforts and information on accomplishments, a necessary step before it is able to decide whether to issue a new standard. Project Director: James Fountain, Assistant Director for Research.

ASSESSMENT OF GOVERNMENT PERFORMANCE, OFFICER GRANT

Fund for the City of New York $30,000
New York, NY 10013

For a workshop of Sloan Foundation grantees in the municipal government performance assessment program and selected others. Project Director: Barbara Cohn, Vice President.

CENTERS ON WORKING FAMILIES, TRUSTEE GRANT

University of Chicago $2,788,388
Chicago, IL 60637

Two centers on working families have already been established with Foundation support, one at Cornell University focused on work-family issues across the life course, and the other at the University of California at Berkeley that examines cultures of care across race, class, and ethnicity. This grant supports a third such center. The University of Chicago will examine how dual-career working parents manage the social and moral development of their children. The Center will study how the characteristics of one's career, including its autonomy, flexibility, cognitive demand, intensity, and compensation, influence the quality of relationships in the household and the socialization of children in working families. How these families use their time and resources will be examined, as well as the impacts of the choices made on the quality of family relationships and on the well-being of the children. The Center will make use of data and results of a Foundation-supported longitudinal study of how high school and college students form ideas about work and career. A great deal of information about these young people, their families, schools, and communities will provide useful background material for the Center's research. Project Directors: Professor Linda J. Waite, Department of Sociology, and Dr. Barbara Schneider, Senior Social Scientist, NORC.

PROFESSIONAL PART-TIME CAREERS, OFFICER GRANTS

Boston University $14,600
Boston, MA 02215

To conduct comparative analysis of part-time vs. full-time doctors on selected measures. Project Director: Dr. Lena Lundgren-Gaveras, Center on Work and Family.

Loyola University $18,536
Chicago, IL 60611

For a conference on Alternative Work Arrangements. Project Director: Professor Peter Whalley, Chair, Department of Sociology and Anthropology.

WORK AND EVERYDAY LIVES OF WORKING FAMILIES, TRUSTEE GRANTS

Boston College $235,020
Chestnut Hill, MA 02167

In supporting research on issues faced by dual-career families over the past few years, the Foundation has funded a diverse group of scholars in a variety of disciplines, including sociology, anthropology, psychology, labor economics, social work, business administration, and industrial relations. It has also played a role in developing a body of scholarly research on working families, research that does not neatly fall within conventional disciplinary boundaries. In the process, a community of work-family scholars has been created. Coming as they do from many different disciplinary backgrounds, they do not have existing journals and research meetings or other established means of communication on work-family issues. This grant supports the development of an on-line electronic network for this group of work-family researchers. The Work and Family Research Network will include a website to report on work and publications at Foundation-sponsored projects, a research literature database searchable by key words, a newsgroup to support on-line discussions of work-family issues, and a monthly newsletter that will provide articles on research topics and items of general information. Project Director: Marcie Pitt-Catsouphes, Director of Policy and Research Development, Center for Work and Family.

Graduate School and University Center, CUNY $282,432
New York, NY 10036

This grant supports research on children's caregivers and the emotional dynamics of their employers' families. Many two-career urban couples have the resources to hire in-home caregivers (variously called nannies, housekeepers, or babysitters) for their young children. Such employees make it possible for parents to pursue demanding careers, but their employment can alter the shape and texture of family life in ways that are as yet little understood. Adding a paid caregiver, who brings her own personality and values into an intimate family setting, can be a complicated emotional experience. Julia Wrigley's book, *Other People's Children*, treats the complex relationships between parents and caregivers. She will extend this work to examine the complicated

emotional dynamics of in-home care from the multiple perspectives of the parents as employers, caregivers as employees, and the children. Project Director: Professor Julia Wrigley, Department of Sociology

Teachers College, Columbia University **$412,341**
New York, NY 10027

A large number of studies have been conducted on women and the workplace, many investigating the effects on family well-being of women's participation in work. Very few have explored the complex psychological processes engaged in by women when negotiating career and family demands. Very little is known about how women differ in their abilities to deal with these complex relations and how these differences effect their performance at work and in the home. Internal conflicts between wanting to achieve at work and yet not wanting to neglect their children have repercussions on both family life and workplace performance. This grant supports a two-year study of conflicted achievement in successful career women. A sample of 300 women will be collected and studied in order to throw light on whether conflicted and non-conflicted achieving women behave differently from each other at work and at home. Project Director: Patricia M. Raskin, Department of Social, Organizational, and Counseling Psychology.

University of Maryland **$671,800**
College Park, MD 20742

This grant supports a very detailed study of a week in the lives of dual-career families. A time diary and ethnographic methods will be used to examine how members of 250 families spend their time for seven consecutive days. Information will be obtained from all members of each household, including children. The emotional management of tasks will be considered. The time diary data will be supplemented by in-depth interviews and direct observations in order to understand the meaning of the time-use patterns by different members of the family. Project Director: John Robinson, Professor of Sociology.

University of Pennsylvania **$169,276**
Philadelphia, PA 19104

The number of hours worked for pay has profound consequences for the family, as the more hours worked, the fewer the hours available for household or family responsibilities. The issue of hours worked is especially important for those dual-career couples where both members of the couple are typically college graduates with high time-demand careers. This grant supports research on how the number of hours worked varies by occupation, in both the United States and selected European nations. Also to be studied is the extent of control professionals and managers have over the total number of hours they work, the timing of those hours, and the strategies they use for coping with high demand careers. Project Director: Jerry Jacobs, Professor of Sociology.

WORK AND EVERYDAY LIVES OF WORKING FAMILIES, OFFICER GRANTS

City University of New York **$10,000**
New York, NY 10003

Partial support for a conference on qualitative methods in psychology, with particular focus on work-family issues. Project Director: Kay Deaux, Distinguished Professor.

Families and Work Institute **$29,750**
New York, NY 10001

Support for a conference and the preparation of a report on situating work-family issues as part of strategic planning. Project Directors: Arlene A. Johnson, Vice President, and Ellen Galinsky, President.

Georgetown University **$30,000**
Washington, DC 20057

For socio-linguistic research on the language at work of mothers and fathers. Project Director: Deborah Tannen, University Professor, Department of Linguistics.

$29,751

Purdue University
West Lafayette, IN 47907

For creation of the Midwestern Work-Family Resource Center. Project Director: Professor Shelley M. MacDermid, Director, Center for Families, Department of Child Development and Family Studies.

$28,000

Working Today
New York, NY 10011

To produce a report on issues critical to new media professionals. Project Director: Sara Horowitz, Executive Director.

PUBLIC UNDERSTANDING OF WORKING FAMILIES, OFFICER GRANTS

$23,700

Wellesley College
Wellesley, MA 02181

Partial support for a conference on "The Future of Work and Family." Project Director: Nancy Marshall, Associate Director, Center for Research on Women.

$30,000

WNYC Foundation
New York, NY 10007

Support for pilot programming on working families. Project Director: Gene Bryan Johnson, Acting Director, News.

EDUCATION AND CAREERS IN SCIENCE AND TECHNOLOGY

EDUCATION FOR SCIENTIFIC AND TECHNICAL CAREERS

CAREER INFORMATION, OFFICER GRANTS

Commission on Professionals in Science and Technology **$27,756**
Washington, DC 20005

For a workshop and report on employment outcomes of doctorates in science and technology. Project Director: Catherine D. Gaddy, Executive Director.

Dartmouth College **$30,000**
Hanover, NH 03755

Support for development of "Information Gathering, Career Services, and Recruiting Services for Natural Science and Engineering Ph.D.s." Project Director: Geoffrey M. Davis, Assistant Professor of Mathematics.

Purdue University **$30,000**
West Lafayette, IN 47907

To conduct and establish a career-training short course for doctoral students in the sciences. Project Director: Harry Morrison, Dean, School of Science.

ENTRY AND RETENTION, TRUSTEE GRANT

Carnegie Mellon University **$160,140**
Pittsburgh, PA 15213

A 1995 grant to Carnegie Mellon supported a study of factors influencing decisions of undergraduate women to enroll and persist in the computer science major. The university also planned to make changes that would improve computer science courses for its women students. In the light of study findings that women have less prior experience with computers than their male colleagues, courses have been introduced that allow inexperienced students to catch up without greatly lengthening their education. These

courses also provide entry portals for students transferring into the program. They are expected to be effective in recruiting women into the department. The current grant allows an extension of the study to more students, evaluation of the recent and other anticipated interventions, and dissemination of study findings and resultant curricular changes to other computer science departments around the country. Project Director: Dr. Allan Fisher, Associate Dean for Undergraduate Education.

LEARNING OUTSIDE THE CLASSROOM, TRUSTEE GRANTS

Carnegie Science Center $83,626
Pittsburgh, PA 15212

With a 1992 Foundation grant, the Carnegie Science Center successfully developed the Carnegie Science Academy, an organization in which high school students with strong interests in science and technology could plan and run their own programs, with the Center providing both infrastructure support and continuity. Using the computer expertise of their own members and assistance from several local Internet firms, Academy members have created a website designed for teenagers around the country with interests in science and technology. This grant supports the development and start-up of this framework into a national "virtual science academy," including on-line conferencing with expert speakers, chat rooms to enable members to "talk" to one another, and facilities allowing teen members to post science/technology questions to be answered by volunteer experts. Most of the activities are to be run by the students themselves, although assistance from local companies will continue to be sought. Project Director: Denise L. Turso, Director, Carnegie Science Academy.

Johns Hopkins University $250,000
Baltimore, MD 21205

This grant supports the development in asynchronous learning network (ALN) form of the entire curriculum of the Master of Public Health (MPH) degree. The School of Public Health now offers a Graduate Certificate Program in Public Health for mid-career health professionals in which about half the course work is delivered to students at their home locations with the remainder requiring on-campus work. Students completing the certificate program earn 35 credits toward the 80-credit MPH degree. The certificate courses will be re-engineered so they are more interactive and do not require campus attendance. Full ALN versions of the remaining 15 courses will be developed. Appropriate technical and administrative infrastructure will be put in place to support a "far-from-campus" ALN for students seeking the MPH degree. Project Director: Professor Henry Mosley, Chairman, Department of Population Dynamics.

Massachusetts Institute of Technology $170,000
Cambridge, MA 02139

As part of MIT's recent interest in increasing its emphasis on off-campus learners, a new Center for Advanced Educational Services (CAES) has been organized and several activities are underway to deliver education to remote learners through interactive television. This grant supports the creation of four courses in decision sciences in the form of an asynchronous learning network suitable for off-campus students employed in industry or government. The courses are Optimization, Introduction to Logistics, Applied Operations Research, and Engineering Risk-Benefit Analysis. It is planned to begin offering the courses to a pilot group in the spring of 1998. Project Director: Richard C. Larson, Professor of Electrical Engineering, and Director, CAES.

New York University $225,000
New York, NY 10003

Vanderbilt University $60,000
Nashville, TN 37240

These grants supported the 1997 3rd International Conference on Asynchronous Learning Networks, organized and hosted by NYU and held in New York City. Based on experience gained in past years, more hands-on workshop sessions were planned. Vanderbilt, through its Foundation-funded ALN web site, provided the conference announcement, e-mail advertising, capabilities for abstract submission, feedback facilities, slides and audio from the conference, and publication in its *Journal of Asynchronous Learning Networks* of selected conference papers. As a second activity, distinct from the conference, Vanderbilt will create ALNTalk, an ongoing electronic conference. The idea is to select topics of importance and conduct two-week on-line discussions, which

would be archived, searchable, and made available to the entire ALN community. Project Directors: Dr. Richard Vigilante, Director, Information Technologies Institute, School of Continuing Education, NYU; John Bourne, Professor of Electrical and Computer Engineering, Vanderbilt.

Pennsylvania State University **$1,300,000**
University Park, PA 16802

This project will launch the Penn State "World Campus," a university unit that will mainly use the ALN approach to offer a large number of degree, certificate, and continuing education programs. The primary focus is reaching off-campus learners in homes and workplaces, although some improvements in cost-effectiveness and learning quality for traditional on-campus students are also expected. With this grant, ALN certification programs will be developed in such areas as Geographic Information Systems and Advanced Power Engineering. Masters degrees in chemical dependency counseling, biostatistics, and global business administration will also be supported in the initial phase of development of the "World Campus," which is planned to include up to 30 different programs involving as many as 300 courses. Project Director: Dr. James H. Ryan, Vice President for Outreach and Cooperative Extension.

Regional Technology Strategies, Inc. **$276,352**
Chapel Hill, NC 27515

Regional Technology Strategies (RTS) is a coordinating body for the Consortium for Manufacturing Competitiveness (CMC), a group of mainly southern community colleges supplying technical and vocational education for enterprises in their regions. A 1995 grant enabled each of six CMC colleges to learn about ALN and then to develop and deliver one or two courses to serve local manufacturing industries. This grant supports the creation of additional ALN courses, also aimed at skilled technicians and business administrators, and the expansion of the program to two more colleges. RTS will seek agreements so that all courses can be generally available, thereby making it possible for a manufacturer in any of the local regions to have access to the entire collection of asynchronous networked learning material. Project Director: Dr. Stuart Rosenfeld, President.

Rensselaer Polytechnic Institute **$120,500**
Troy, NY 12180

RPI will convert to ALN format four courses: Physics 1, Calculus 1, Computer Science 2, and Introductory Chemistry. The ALN versions will be offered as an option for on-campus students. Some off-campus learners, including advanced high school students and working professionals, will also participate. As part of this project, the possible use of ALNs to improve efficiency in on-campus education will be explored. Dr. Jack Wilson, Dean, Continuing and Undergraduate Education.

Research Foundation of State University of New York **$1,300,000**
Albany, NY 12246

Past Foundation grants have enabled SUNY state colleges and regional community colleges to gain experience in the development and delivery of ALN courses. During the spring term, the SUNY Learning Network (SLN) involved nine SUNY campuses and enrolled nearly 300 students in 19 courses. The current grant will enlarge the number of campuses at the rate of about ten per year, resulting in over 200 on-line courses over a two-year period. Each college will focus on courses representing its special strength and emphasis. This expansion of the SLN creates the beginnings of a New York State "virtual university," providing a single ALN course catalog, a single point of entry for any remote learner desiring education in a wide variety of disciplines, a single unifying software interface independent of subject or originating campus, and one group, at SUNY Central, responsible for advertising, recruitment, registration, and technical aspects of running the Network. Project Director: Dr. Christine E. Haile, Associate Vice Chancellor for Technology Services.

University of Florida **$135,000**
Gainesville, FL 32611

With the help of this grant, the University of Florida will develop an ALN Master of Science in Information Systems, to be offered jointly by the Electrical and Computer Engineering and by the Computer and Information Sciences departments. Students will be able to complete several 3-course certificate programs and credit these to

advanced degrees. Learning materials will include books, web-based notes, video, audiotapes, and CD-ROMs. On-line classes will be linked through a computer conferencing system accessible by use of an Internet browser. The first ALN classes in this program are expected to be available in the summer of 1998. Project Director: Associate Professor Haniph Latchman, Department of Electrical and Computer Engineering.

University of Illinois at Chicago **$350,000**
Chicago, IL 60612

A 1995 Foundation grant enabled the establishment of the Sloan Center for Asynchronous Learning Environments (SCALE) at Urbana/Champaign. SCALE supplies funding for university faculty to explore on-campus teaching through asynchronous learning networks in many disciplines. This ongoing project has allowed over 100 faculty to gain experience with ALNs. The university has now set up a new unit, UI OnLine, to provide a large number of ALN courses and programs to off-campus learners. The current grant supports the development of a major UI OnLine program devoted to the health professions. It will include a six-course core public health certificate program, ten courses toward a Doctor of Pharmacy degree, six courses toward certificates in nursing, and a six-course certificate program in health information management. Given the large number of faculty knowledgeable about ALNs through SCALE, the university expects UI OnLine to include as many as 30 certificate and degree programs within three years. Project Director: Burks Oakley II, Associate Vice President for Academic Affairs and Professor of Electrical and Computer Engineering, University of Illinois, Urbana.

University of Missouri-Columbia **$150,000**
Columbia, MO 65211

Based on experience with ALNs for on-campus students, the university is interested in developing courses for off-campus learners. This grant will support the addition of an ALN masters degree in waste management to the university's program in environmental engineering. Faculty from civil, chemical, and agricultural engineering will develop the new ALN courses. Several government and industrial organizations have expressed interest in this program. Classes are expected to be available early in 1998. Project Director: Richard Potter, Director, Continuing Engineering Education.

University of Pennsylvania **$100,000**
Philadelphia, PA 19104

This grant supports the development of six ALN courses that will be made available to off-campus learners as part of an interdisciplinary masters degree program in telecommunications and networking. Penn's approach makes use of Lectures-on-Demand, which allows listening to pre-recorded lectures while viewing slides and other course materials over the Internet. On-line discussions can be held with the instructor and other students. Project Director: Associate Professor Keith W. Ross, Department of Systems Engineering.

University of Wisconsin **$150,000**
Madison, WI 53707

The University's Extension Division has a long history of providing education at a distance, mainly through correspondence and more recently, televised courses. Five campuses in the state system now offer courses toward a bachelor of science degree in nursing by means of interactive television. They have been experimenting with the ALN approach. This grant supports the conversion into ALN format of five courses needed for the B.S.N. degree. They are expected to be available for off-campus students by the fall of 1998. Project Director: Dr. Kevin P. Reilly, Provost and Vice Chancellor.

Villa Julie College **$100,000**
Stevenson, MD 21153

Based on successful completion of a project supported with a 1995 officer grant, Villa Julie College will now develop a program for Microsoft Certified Developer, using commercial computer-based training CD-ROMs and a simple asynchronous learning network. Certifications of this kind are recognized in software-intensive environments across many industries. If this one-year project is successful, the certification would become a regular offering of the college and be available to companies in the Baltimore area, some of which have already expressed interest in providing access for their employees. Project Director: Michael P. Rogich, Director, Center for Advanced Technology.

LEARNING OUTSIDE THE CLASSROOM, OFFICER GRANTS

Charter Oak State College $30,000
Newington, CT 06111

Support to develop and deliver four ALN courses. Project Director: Merle W. Harris, President.

City University of New York $29,830
New York, NY 10003

To develop and deliver two ALN courses in Education Administration. Project Director: Professor Anthony Picciano, Department of Curriculum and Teaching, Hunter College.

Council for Adult and Experiential Learning $10,000
Chicago, IL 60604

Partial support for a meeting of the Council, two Bell companies, and unions to agree on an approach to ALN communications degrees. Project Director: Pamela Tate, President.

Council for Adult and Experiential Learning $20,000
Chicago, IL 60604

Support for a project to define and implement an ALN A.A.S. (Telecommunications) for the industry. Project Director: Pamela Tate, President

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Drexel University $30,000
Philadelphia, PA 19104

For planning a proposed project on delivery of integrated knowledge. Project Director: Richard H. Lytle, Dean, Information Science & Technology.

Massachusetts Institute of Technology $30,000
Cambridge, MA 02139

Support for initial stages of an asynchronous learning network for decision technologies. Project Director: Richard C. Larson, Director, Center for Advanced Educational Services.

Saint Joseph's College $29,978
Standish, ME 04084

To convert three courses to asynchronous learning network format. Project Director: Elizabeth Schran, Director of Foundation Relations.

University of Oxford $30,000
New York, NY 10016

Support for a planning project on the marketing and dissemination of selected Sloan-supported ALN courses and programs in Europe. Project Director: Jonathan Darby, Director, Technology-Assisted Lifelong Learning.

NEW PROFESSIONAL MASTERS DEGREES, TRUSTEE GRANTS

Georgia Tech Foundation $350,042
Atlanta, GA 30332

University of Southern California $360,726
Los Angeles, CA 90089

The 1995 report on graduate education of the national academies' Committee on Science, Engineering, and Public Policy suggested that graduate schools of arts and sciences might consider a different kind of graduate degree, less oriented toward research and requiring less time to complete. These two grants explore this possibility. Georgia

Tech will establish new master's degree programs in bioinformatics, involving faculty from the departments of biology, mathematics, and computing, and in human-computer interaction, with faculty participating from psychology, computing, and other departments. USC will establish new master's degree programs in computational biology, in environmental science and technology, and in physics for business applications. These options are intended to offer useful alternatives to the Ph.D. degree. Suitably designed master's degrees may serve to fuse scientific fields at a level of depth and complexity hard for undergraduates to achieve. In many cases, the fusion will be with computer or information sciences. The Georgia Tech degrees and those at USC in computational biology and in environmental science and technology are of this kind. A master's degree might also integrate study in the natural sciences and mathematics with knowledge and training in management, law, or other professional domains. USC's program in physics for business application will involve faculty from physics, information science, operations research, and finance. Preliminary indications are that strong job markets will exist for graduates of these new master's degree programs. Project Directors: Anderson D. Smith, Associate Dean and Professor, Georgia Tech; Professor Hanz Bozler, Chair, Department of Physics and Astronomy, USC.

IMMIGRATION OF SCIENTISTS AND ENGINEERS, TRUSTEE GRANT

Georgetown University **$309,353**
Washington, DC 20057

With this grant, Georgetown's newly created Institute for the Study of International Migration will initiate a study of immigration of scientists and engineers to the U.S. The three researchers involved (Drs. Susan Martin, Andrew Schoenholtz, and Lindsay Lowell) were the senior staff members of the U.S. Commission on Immigration Reform, which completed its work in 1997. Their principal research focus will be on engineers, with special attention to those involved in information technology, i.e., electrical engineering, computer science, and software engineering. The scope of such immigration and its impacts will be assessed. In addition, a set of international comparisons will be developed against which U.S. experience might be compared. Project Director: Dr. Susan Forbes Martin, Executive Director, Institute for the Study of International Migration.

IMMIGRATION OF SCIENTISTS AND ENGINEERS, OFFICER GRANT

Boston University **$24,960**
Boston, MA 02215

Support of a workshop on immigration of scientists and engineers to the USA. Project Director: Professor Robert E. B. Lucas, Department of Economics.

GENERAL, OFFICER GRANTS

American Society of Mechanical Engineers **$15,000**
New York, NY 10017

Support for a conference on "Mechanical Engineering Education for Global Practice." Project Director: Dr. Chor W. Tan, Managing Director, Education.

National Humanities Center **$30,000**
Research Triangle Park, NC 27709

Partial support for an independent assessment and appraisal of the Fulbright Program. Project Director: W. Robert Connor, Director.

MINORITIES, TRUSTEE GRANTS

Battle Creek Public Schools $218,500
Battle Creek, MI 49105

The Battle Creek Mathematics and Science Center provides enriched and advanced coursers in mathematics, science and technology to approximately 350 students in a three-county region of Michigan. Although this region is 17 percent minority, with the largest concentration being African Americans in the city of Battle Creek, the Center's graduating class has averaged about 7 percent minority. The Center aims to have both the incoming and graduating classes reflect the composition of the population it serves. This grant supports efforts to achieve this goal. In addition to covering a part of the salary of a newly appointed Counselor at the Center, the grant will also fund a variety of recruitment and retention programs. New recruitment programs include identifying and targeting talented minority students, and offering them special after school, evening, and Saturday programs in mathematics, science, and test-taking skills. Summer workshops for rising ninth grade minority students accepted into the Center and professional development programs to help Center teachers work more successfully with inner city students are expected to improve retention. Project Director: Connie Duncan, Interim Director, Battle Creek Area Mathematics and Science Center.

Board of Education of the City of New York $152,650
Brooklyn, NY 11201

The Math/Science Institute prepares students, primarily from school districts that are underrepresented in the three City-wide specialized math and science high schools, to perform competitively on the entrance exam and thereby achieve acceptance at one of these schools. Sixty three of these MSI students, 70 percent of whom are African American or Latino, have been accepted at Bronx High School of Science on the basis of their high academic potential and their scores on the entrance exam. This grant initiates a program to help these students succeed by offering them special opportunities designed to increase reading, writing, computer, research, study, and other skills. Currently enrolled students will serve as peer mentors. Counselors will be available to students and their parents on an ongoing basis to discuss progress in school and to advise on opportunities for college, including financial aid. The cost of this program will be made part of the school's budget over a four-year period. Project Director: Christine Scott, Assistant Principal Administration, and Director of College Guidance, Bronx High School of Science.

Board of Education of the City of New York $120,000
Brooklyn, NY 11201

This grant will launch an initiative by Stuyvesant High School, one of three highly selective specialized math and science schools in New York City, to improve the performance of their African American and Latino students. An intensive orientation before school begins and a weekend retreat early in the fall term will be organized. Teachers will be assigned to be one-on-one mentors. Seminars will be held for parents. A special guidance counselor will work with the target students. In order to reverse the low participation of these students in advanced courses and research competitions, Stuyvesant will provide special encouragement and advice and ensure participation of minority teachers. The program aims over three years to significantly increase such measures as the number of minority students in the honor society and in advanced math and science classes, and who graduate on time. The cost of the program will be made part of the school's budget over a four-year period. Project Director: Jinx Cozzi Perullo, Principal, Stuyvesant High School.

The following eleven grants all serve the Foundation's goal of increasing the number of underrepresented minority Ph.D.s in mathematics, science, and engineering. In each case, faculty have been identified who can successfully recruit, mentor, and graduate minority doctoral students and funds have been made available to increase the number of such students. The specific aim of each university's program is cited below together with the project director's name and title.

Auburn University $120,000
Auburn, AL 36849

To continue a program to increase the number of minority students receiving Ph.D.s from the Materials Research and Education Center. Project Director: Dr. James Brown, Assistant to the President for Minority Affairs.

City College of City University of New York $150,000
New York, NY 10031

To increase the number of minority Ph.D.s graduated by the Center for Analysis of Structures and Interfaces. Project Director: Professor Daniel Akins, Department of Chemistry.

City College of City University of New York $270,000
New York, NY 10031

To increase the number of minority Ph.D.s in bioengineering. (This project also includes a special component in which four high-achieving juniors will be recruited each year, engaged in summer laboratory research, and supported in their senior year while they complete the undergraduate engineering degree and earn a Certificate in Biomedical Engineering. These students will then be very highly qualified for Ph.D. programs in biomedical engineering.) Project Director: Professor Sheldon Weinbaum, Director, Department of Mechanical Engineering.

Cornell University $240,000
Ithaca, NY 14853

To increase the number of minority Ph.D.s in applied mathematics, biometry, ecology and evolutionary biology, and statistics. Project Director: Professor Carlos Castillo-Chavez, Department of Plant Breeding and Biometry, and Director, Mathematical and Theoretical Biology Institute.

Cornell University $120,000
Ithaca, NY 14853

To increase the number of minority Ph.D.s in chemistry. Project Director: Professor Hector D. Abruna, Department of Chemistry.

Meharry Medical College $210,000
Nashville, TN 37208

To increase the number of minority students receiving Ph.D.s in biochemistry, microbiology, pharmacology, and physiology. Project Director: Dr. John Wilson, Assistant Dean, School of Graduate Studies and Research.

Michigan State University $330,000
East Lansing, MI 48824

To increase the number of minority students receiving Ph.D.s in signal processing, communications, computers, and controls. Project Director: Percy Pierre, Professor of Electrical Engineering.

New Mexico State University $150,000
Las Cruces, NM 88003

To increase the number of minority Ph.D.s in molecular biology. Project Director: Professor Glenn D. Kuehn, Department of Chemistry and Biochemistry.

Texas A&M University $450,000
College Station, TX 77843

To increase the number of minority students receiving Ph.D.s in chemistry, civil engineering, industrial engineering, entomology, and wildlife and fisheries science. Project Director: Dr. Robert Kennedy, Vice President for Research.

University of Delaware $120,000
Newark, DE 19716

To increase the number of minority Ph.D.s in chemical engineering. Project Director: Professor Andrew Zydney, Department of Chemical Engineering.

University of New Mexico $390,000
Albuquerque, NM 87131

To increase the number of minority Ph.D.s graduated by the Departments of Chemical and Nuclear Engineering, Electrical Engineering, and Mechanical Engineering. Project Director: Dr. Paul Fleury, Dean of Engineering.

North Carolina A&T State University $75,000
Greensboro, NC 27411

University of Puerto Rico-Mayaguez $135,000
Mayaguez, PR 00681

University of Puerto Rico-Mayaguez $150,000
Mayaguez, PR 00681

These three grants emphasize another aspect of the Foundation's minority program: to identify undergraduate departments with a strong record of sending their minority graduates on for Ph.D.s and to support them to increase the number of such students. The grant to North Carolina A&T State University aims to add to the number of minority graduates in physics who continue on for doctorates. The grants to the University of Puerto Rico-Mayaguez aim to increase the number of graduates from the Departments of Biology and Chemistry and from the Department of Chemical Engineering going on for Ph.D.s. Project Directors: Caesar Jackson, Assistant Professor and Chair, Department of Physics, NCA&T; Professor Mildred Chaparro, Department of Biology, Puerto Rico-Mayaguez; and Professor Jose Colucci-Rios, Director, Department of Chemical Engineering, Puerto Rico-Mayaguez.

MINORITIES, OFFICER GRANTS

American Association for the Advancement of Science $30,000
Washington, DC 20005

To study recent changes in policies and practices of research universities with respect to graduate admission and financial aid for underrepresented minorities seeking to pursue Ph.D.s in science and engineering. Project Director: Dr. Shirley Malcom, Head, Directorate for Education and Human Resources Program.

Michigan State University $30,000
East Lansing, MI 48824

For the planning of an Engineering Research and Graduate Education Center. Project Director: Percy Pierre, Professor of Electrical Engineering.

Raven Radio Foundation, Inc. $30,000
Sitka, AK 99835

To fund four half-hour radio programs on Native Traditions and Western Science. Project Director: Kenneth Fate, Program Director.

WOMEN, TRUSTEE GRANT

University of California, Los Angeles $112,000
Los Angeles, CA 90024

Professor Nina Byers has begun to create a web-based, multimedia archive of information about women physicists who have made significant contributions to physics up to 1975. As of June 1997 the archive documented contributions of approximately 30 women physicists. Largely a volunteer effort, the archive is quite incomplete. This grant will support one year of work to bring new citations on line, add biographical and historical material, and to compile additional information on women physicists already identified and also those not yet included in the archive. Project Director: Professor Nina Byers, Department of Physics and Astronomy.

PUBLIC UNDERSTANDING OF SCIENCE AND TECHNOLOGY

TRUSTEE GRANTS

American Association for the Advancement of Science $125,000
Washington, DC 20005

California Oak Foundation $126,500
Oakland, CA 94612

These two grants are part of the Foundation's program to encourage the writing of books on subjects of broad interest where public understanding is hampered by lack of clear scientific knowledge. The AAAS grant supports the writing of a book-length study by Jon Cohen, a leading AIDS reporter from Science magazine, chronicling the search for an AIDS vaccine. This book will not only explain the unique scientific challenges and the complex interplay of science and politics posed by the HIV virus, but also explain a great deal about immunology and the difficulties of vaccine development as they relate to other diseases. The California Oak Foundation grant supports the work of author and science journalist Jeff Wheelwright in the preparation of a book that examines the scientific basis of Gulf War Syndrome. The book will bring a historical perspective to the controversy surrounding the causes of the Syndrome, will attempt to teach how science works, and will set the impatience of individual sufferers against the agonizing slowness of exposure assessment, toxicology, and epidemiology. Project Directors: Jon Cohen, science reporter/writer, AAAS; Jeff Wheelwright, author, COF.

American Communication Foundation $115,000
Mill Valley, CA 94941

National Public Radio $340,946
Washington, DC 20001

SoundVision Productions $350,000
Berkeley, CA 94704

These three grants make use of radio as the medium by which the Foundation aims to provide the public with a better understanding of our increasingly scientific and tech-

nological world. The American Communications Foundation, a nonprofit production company, will produce forty 3-minute radio segments to be broadcast on the CBS radio network as part of Charles Osgood's The Osgood File. The show airs four times each morning on 350 commercial stations nationwide. The series of independent segments will not only focus on science and technology, but also include other topics related to the Foundation's program, such as industry studies, work-family issues, underrepresentation of minorities in science and engineering, and immigration of scientists and engineers.

The grant to National Public Radio renews support for a strong reporting "beat" on technology that was initiated with a 1992 grant and renewed for the first time in 1994. Two NPR reporters are now assigned to cover technology stories. In this renewal period increased attention will be paid to technologies of everyday life and a biweekly feature will be prepared on how everyday technologies work, including questions such as how a light bulb or the television remote control work and what goes on underground in a big city. NPR will continue to cover leading-edge sectors such as biotechnology, the Internet, digital commerce, smart highways, and the technologies underlying food production and safety.

The grant to SoundVision supports the production of a major radio series about the latest scientific and technological developments in genetics, including an exploration of the impact of genetic science on the individual and on society. The series will consist of nine one-hour documentaries and a two-hour radio "Town Hall" or open-air discussion about such issues as DNA and behavior, prenatal genetic testing, gene therapy, and the commercialization of genetics. The aim is to demystify genetic science for the general public, explaining the scientific bases of genetics and heredity that underlie many recent discoveries and technologies. There will also be an examination of the complex social and ethical issues accompanying these new discoveries. Project Directors: Cynthia Perry, President, ACF; Anne Gudenkauf, Senior Editor, Science Desk, NPR; Bari Scott, Executive Producer, Genome Radio Project, SoundVision.

American Film Institute — **$100,000**
Los Angeles, CA 90027

Carnegie Mellon University — **$160,000**
Pittsburgh, PA 15213

Columbia University — **$119,250**
New York, NY 10027

Film is another medium by which the Foundation aims to increase the public's understanding of science and technology. These three grants all relate to the goal of influencing the next generation of film makers to create more realistic stories about science and technology and to challenge the existing stereotypes about scientists and engineers throughout the visual media. The grant to the American Film Institute renews funding for a Television Writer's Workshop focusing on science and technology. An intensive three-week workshop on this theme was held for the first time in 1997. It attracted strong student, faculty, and industry interest. Its success has led to this renewal for a second year. The AFI plans to bring in a major television director from one of the current hit shows to oversee the curriculum and faculty and to provide a direct tie to the television industry. In addition, there will be a major focus on creating pilot shows that deal with scientists and engineers.

The grants to the Carnegie Mellon School of Drama and the Columbia Film Division bring these two leading film schools into the Foundation's program to stimulate the top film students across the country to write and produce new film and television shows about science and technology. The schools will establish annual awards in film production and screen writing and an annual film colloquium on science and technology. Carnegie Mellon plans to make a single screenwriting award of $25,000 for a script that deals with science and technology themes. The film department will also dedicate one year of the Television Project, in which students produce original 15-minute films, to episodes that revolve around some aspect of science and technology or the lives of scientists and engineers. Columbia will establish two screen writing awards of $10,000 each for scripts that deal with science and technology in an original manner. One major film production award of $15,000 will be given for a 15-minute film that explores sci-

ence and technology themes or characters. A film seminar will be organized in which scientists and engineers from the Columbia faculty will discuss the personal and professional nature of their work. Project Directors: Debra Henderson, Director of Education and Training Programs, AFI; Peter Frisch, Drama Department Head, CMU; Lewis Cole, Chair, Film Division, School of Fine Arts, Columbia.

Catticus Corporation $507,658
Berkeley, CA 94710

Twin Cities Public Television, Inc. $500,000
St. Paul, MN 55101

WGBH Educational Foundation $1,875,000
Boston, MA 02134

These grants all make use of public television as a medium through which to increase public understanding of science and technology. Catticus will write, produce and broadcast a one-hour PBS documentary about Frederick Winslow Taylor and the legacy of scientific management, based on Robert Kanigel's book on this subject published in 1997 in the Sloan Technology Book Series. The documentary will tell the story of Taylor's efforts to codify and apply his principles of management to the American workplace, an endeavor that helped shape our modern world and that continues to exert its influence.

Twin Cities will create a one-hour documentary about the invention and impact of the transistor. The show will build on the 1997 book by Michael Riordan and Lillian Hoddeson published in the Sloan Technology Book Series. The documentary will provide a tour of the key moments in transistor history: the discovery by Bardeen, Brattain, and Shockley at Bell Labs 50 years ago; production of the first solid state products; development of silicon transistors and integrated circuits; the birth of Silicon Valley; and the newest advances in the field. It will show the complex interplay of social and technical factors relating to business, weapons, science, technology, and personal psychologies that led to the invention. It will give viewers an understanding of how the technology they use everyday works and will look forward to what can be expected in the future.

WGBH will research, produce, and broadcast three new technology-related shows over the next two years as part of *The American Experience*, its popular and critically acclaimed history series. The three shows, which will have extensive web sites, are all linked to Sloan-supported books. They include *Dark Sun*, based on the Richard Rhodes book about the making of the hydrogen bomb; *Saved by the Wireless*, about wireless telegraphy and the early days of radio, linked to a forthcoming book by Susan Douglas in the Sloan Technology Book Series; and the *Influenza Epidemic of 1918*, which will draw on the John Cairns book, *Matters of Life and Death*. This grant renews support for television productions on *The American Experience* and continues the Foundation's interest in incorporating more technological perspective into the traditional social and political view of the country's history. Project Directors: Bill Jersey, Producer, Quest Productions, Berkeley, and Michael Schwarz, Executive Producer, Kikim Media, San Francisco, Catticus; Ira Flatow, President, ScienCentral, Inc., Twin Cities; Margaret Drain, Executive Producer, WGBH.

Consortium for Mathematics and Its Applications $124,982
Lexington, MA 02137

This grant supports an effort by the Consortium and the Charles Dana Center for Mathematics and Science Education at the University of Texas to organize a program that will promote service to the community by college mathematics departments and their students. The aim is to encourage mathematicians and their students to contribute, through mathematics, to everyday problems. Successful examples of such contributions will be collected and made widely known; presentations and discussions of mathematics-based service will be made at local, regional, and national meetings of professional societies; and an annual service prize will be announced and presented from examples submitted by departments of mathematics. Project Director: Professor Frank R. Giordano, Department of Mathematics, U. S. Military Academy.

PUBLIC UNDERSTANDING OF SCIENCE AND TECHNOLOGY, OFFICER GRANTS

Cine Information, Inc. $29,925
New York, NY 10024

To study library use of Sloan-supported books and to improve library marketing and distribution. Project Director: Marcie L. Setlow, Producer, Setlow Media, Inc.

Ensemble Studio Theatre, Inc. $12,500
New York, NY 10019

To complete production and marketing for a new play about the Wright brothers. Project Director: Curt Dempster, Artistic Director.

Historic House Trust of New York City $30,000
New York, NY 10021

To research and write a book about domestic technology. Project Director: Nancy Zeigler, Development Director.

Institute for Science & Interdisciplinary Studies $30,000
Amherst, MA 01002

For travel and research in preparation for a book on corporate research and development. Project Director: Robert Buderi, author.

Massachusetts Institute of Technology $12,000
Cambridge, MA 02139

For research assistance to complete a memoir. Project Director: Howard W. Johnson, President Emeritus.

National Association of Science Writers $12,652
Greenlawn, NY 11740

Closing costs and promotion of *A Field Guide for Science Writers*. Project Director: Mary Knudson, Secretary.

Radio and Television News Directors Foundation $30,000
Washington, DC 20036

A planning grant to establish a science news service for cable, local cable and local news shows. Project Director: Eric Swanson, Executive Director.

Rockefeller University $15,000
New York, NY 10021

To complete a book of portraits of renowned scientists. Project Director: Abraham Pais, Professor of Physics.

Teachers College, Columbia University $1,800
New York, NY 10027

To complete documentation for a book on information in a technology-based economy. Project Director: Ernst Z. Rothkopf, Professor.

University of California, Los Angeles $10,000
Los Angeles, CA 90024

To design and place two full-page ads announcing winners of the Sloan film program. Project Director: Rosalee Sass, Director of Development.

University of Miami $30,000
Coral Gables, FL 33124

For research and writing of a book, *A Brief History of Life on Other Worlds*. Project Director: Professor David E. Fisher, Geological Sciences.

University of Oxford $7,700
Oxford OX1 2JA, UK

For research and travel for the writing of a biography of Dorothy Hodgkin. Project Director: Georgina Ferry, Science Writer.

Whitehead Institute for Biomedical Research $30,000
Cambridge, MA 02142

Partial support of a conference entitled "The Human Genome Project: Science, Law and Social Change in the 21st Century." Project Director: Eric Lander, Director, Center for Genome Research.

SLOAN TECHNOLOGY BOOK SERIES

The Foundation is sponsor of a series of books intended to broaden public understanding of important modern technologies. Books in the Sloan Technology Series describe the development of specific technologies, including the circumstances of their emergence, their early development and use, their applications, and their actual and potential impacts on society.

The first eleven books in the series are as follows:

Craig Canine, *Dream Reaper: The Story of an Old-Fashioned Inventor in the High-Tech, High-Stakes World of Modern Agriculture* (Knopf, 1995)

T. A. Heppenheimer, *Turbulent Skies: The History of Commercial Aviation* (Wiley, 1995)

Richard Rhodes, *Dark Sun: The Making of the Hydrogen Bomb* (Simon & Schuster, 1995)

Robert Buderi, *The Invention That Changed the World: How a Small Group of Radar Pioneers Won the Second World War and Launched a Technological Revolution* (Simon & Schuster, 1996)

Martin Campbell-Kelly and William Aspray, *Computer: A History of the Information Machine* (Basic Books, 1996)

David E. Fisher and Marshall Jon Fisher, *Tube: The Invention of Television* (Counterpoint, 1996)

Stephen S. Hall, *A Commotion in the Blood: Life, Death, and the Immune System* (Henry Holt, 1997)

Robert Kanigel, *The One Best Way: Frederick Winslow Taylor and the Enigma of Efficiency* (Viking, 1997)

Bettyann Holtzmann Kevles, *Naked to the Bone: Medical Imaging in the Twentieth Century* (Rutgers University Press, 1997)

Robert Pool, *Beyond Engineering: How Society Shapes Technology* (Oxford University Press, 1997)

Michael Riordan and Lillian Hoddeson, *Crystal Fire: The Birth of the Information Age* (Norton, 1997)

Books on other technology-based topics are being prepared for the Series. To be published in 1998 are books on Edwin Land and the invention of the Polaroid camera, on fiber optics and lasers, and on the development of a commercial satellite constellation for personal wireless communication. Also planned is an anthology of writings tracing the history of ideas about technology, edited by Richard Rhodes. This book will provide a general social, cultural, and intellectual context for the individual stories, both technical and human, surrounding particular technologies.

SELECTED NATIONAL ISSUES AND CIVIC PROGRAM

SELECTED NATIONAL ISSUES, TRUSTEE GRANTS

Brookings Institution **$253,400**
Washington, DC 20036

There is general agreement that improvements are needed in the conceptual underpinnings of key Federal statistics, including employment and unemployment, inflation, productivity, poverty, and other measures. This grant supports an 18-month project organized by Brookings for work on how current conceptualizations of productivity of the service sector can be improved. Five important sectors will be studied: finance; insurance; retail trade; transportation; and telecommunications. University-based researchers will participate as will professional staff of key Federal statistical agencies. Project Director: Barry Bosworth, Senior Fellow, Economic Studies Department.

Initiative for a Competitive Inner City **$300,000**
Boston, MA 02111

This project aims to develop economic strategies focused on attracting for-profit business and job development to America's inner cities. Research will center on the retailing industry. Critical to increasing the flow of private investment in inner city retailing is providing decision makers the data they need to make informed business judgments about the risk and return of inner city investments. The Initiative for a Competitive Inner City (ICIC) plans to fill some of the key market information gaps that impede private sector investment, and to provide a framework within which to assess inner-city retail markets and consumer demand. Two major outputs are planned: a benchmark study of inner city retailing that details strategies that successful retailers have used to benefit from the competitive advantages and to address the disadvantages of the inner city; and a statistically valid model of inner city consumer demand that attempts to adjust for the discrepancy between recorded household income and actual purchasing power. Project Director: Michael E. Porter, Founder, Chairman & CEO of ICIC, and Professor of Business Administration, Harvard Business School.

SELECTED NATIONAL ISSUES, OFFICER GRANT

American University — $30,000
Washington, DC 20016

Partial support for a conference on linked worker/firm data. Project Director: Associate Professor Julia Lane, Department of Economics.

CIVIC PROGRAM, TRUSTEE GRANTS

Fashion Institute of Technology — $150,000
New York, NY 10001

This grant assists the Fashion Institute of Technology (FIT) in launching a new two-year Bachelor of Fine Arts degree in Computer Animation and Interactive Media. The new program will help ensure that New Yorkers have the skills to fill the many jobs available in animation and interactive media design and that the "new media" industry can continue to thrive in the city. The emphasis at FIT will differ somewhat from that of the existing bachelor's degree in computer graphics at both Pratt Institute and Parsons School of Design. The significantly lower tuition cost of attending FIT, part of the State University of New York system, also makes access to this new industry available to a much larger group of New Yorkers. Project Director: Assistant Professor Terry Blum, Coordinator of Computer Graphics.

Greenpoint Manufacturing and Design Center — $150,000
Brooklyn, NY 11222

A new Product Development Center will be established by Greenpoint Manufacturing and Design Center (GMDC) to help bring promising and innovative product design concepts into production in New York. This project supplements efforts by the Municipal Art Society and the Industrial Technology Assistance Corporation, each supported with 1996 Foundation grants, to build better connections between the design and design-based manufacturing communities of the city. GMDC's building, located in Brooklyn, has brought together hundreds of artists and small design-based manufacturers, including woodworkers, cabinet-makers, and lighting manufacturers. The companies benefit from close contact and can share supplier knowledge, expensive machines, and even employees. GMDC owns and manages a shared machine shop, a wood recycling business, and a group marketing service for its tenants. It is regularly approached by designers and inventors seeking referrals for assistance with engineering, manufacturing, financing, or marketing of new ideas. This grant will enable GMDC to offer a new service of bringing promising concepts to market by using its own capabilities and contacts, for those designers or inventors seeking this sort of assistance in exchange for licensing or other sharing arrangments. Project Director: J. David Sweeney, CEO.

CIVIC PROGRAM, OFFICER GRANTS

Corporate Data Exchange — $30,000
Brooklyn, NY 11217

To help the New York Industrial Retention Network launch its transition planning services. Project Director: Adam Friedman, Executive Director.

New York Botanical Garden — $30,000
Bronx, NY 10458

With community involvement, to develop five abandoned city lots into gardens. Project Director: Paul Evans, Director, Bronx Green-up Program.

South Bronx 2000 Local Development Corporation — $30,000
Bronx, NY 10451

For the completion of Phase 1 of a feasibility study of establishing a recovery facility for serial materials in the South Bronx. Project Director: Dr. David Muchnick, President.

ADDITIONAL GRANTS

TRUSTEE GRANTS

Council on Foundations $40,000
Washington, DC 20036

Independent Sector $10,500
Washington, DC 20036

New York Regional Association of Grantmakers $10,500
New York, NY 10018

The Council on Foundations (COF) is the foundation community's national organization, whose mission is to promote responsible and effective philanthropy. It provides publications and research reports, conducts workshops, seminars, and an annual conference, and maintains an active government relations staff. Independent Sector (IS) is mainly concerned with government relations, research on the not-for-profit sector, and leadership and management for not-for-profit organizations. The New York Regional Association of Grantmakers (NYRAG) is one of 24 regional associations of foundations affiliated with the COF. It supplies programs and information focusing on foundation activities in the Greater New York area. These grants are for annual membership dues. Project Directors: Dorothy S. Ridings, President, COF; Sara E. Melendez, President, IS; Barbara Bryan, Executive Director, NYRAG.

OFFICER GRANT

The Foundation Center $30,000
New York, NY 10001

For partial support of phase two of the Center's website development. Project Director: Sara L. Engelhardt, President.

1997 FINANCIAL REVIEW

ALFRED P. SLOAN FOUNDATION
1934

FINANCIAL REVIEW

The financial statements and schedules of the Foundation for 1997 and 1996, which have been audited by KPMG Peat Marwick LLP appear on pages 94 to 101. They include the balance sheets, statements of activity and cash flows, and schedules of management and investment expenses.

Investment income for 1997 was $44,002,090, an increase of $8,566,111 from $35,435,979 in 1996. After the deduction of investment expenses and provision for Federal excise tax, net investment income was $37,603,472 in 1997 as compared with $30,244,284 for the prior year. Investment expenses during 1997 totaled $4,852,618 of which $4,148,784 represented investment advisors fees. The provision for Federal excise tax amounted to $1,546,000. The total of these deductions from investment income in 1997 was $6,398,618 versus $5,191,695 in 1996.

Grants authorized (net of grant refunds) and management expenses during 1997 was $42,572,387, which was $4,968,915 greater than 1997 net investment income. Of this total, grants authorized (net of refunds) amounted to $38,654,250 while management expenses were $3,918,137. Since the Foundation's inception in 1934, the cumulative excess of grants and expenses over the Foundation's net investment income has amounted to $99,225,602.

Grant payments in 1997 were $49,775,547 compared with $47,389,062 for the prior year. Together with management expenses, investment expenses, federal excise taxes paid and other charges, the total of cash expenditures net of grant refunds in 1997 was $59,721,602 while in 1996 the amount was $56,399,216.

Grants authorized and payments made during the year ended December 31, 1997 are summarized in the following table:

Grants unpaid at December 31, 1996	$59,895,861
Authorized during 1997	39,031,839
	98,927,700
Payments during 1997	49,775,547
Grants unpaid at December 31, 1997	$49,152,153

The market value of the Foundation's total assets was $1,101,586,214 at December 31, 1997 including investments valued at $1,100,696,901 as compared with total assets of $1,003,375,395 at December 31, 1996.

AUDITORS' REPORT

Report of KPMG Peat Marwick LLP
Independent Auditors

The Board of Trustees
Alfred P. Sloan Foundation:

We have audited the accompanying balance sheets of the Alfred P. Sloan Foundation as of December 31, 1997 and 1996, and the related statements of activity and cash flows for the years then ended. These financial statements are the responsibility of the Foundation's management. Our responsibility is to express an opinion on these financial statements based on our audits.

We conducted our audits in accordance with generally accepted auditing standards. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by the management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of the Alfred P. Sloan Foundation as of December 31, 1997 and 1996, and the changes in its net assets and its cash flows for the years then ended in conformity with generally accepted accounting principles.

Our audits were made for the purpose of forming an opinion on the basic financial statements taken as a whole. The supplementary information included in the schedules of management and investment expenses for the years ended December 31, 1997 and 1996 is presented for purposes of additional analysis and is not a required part of the basic financial statements. Such information has been subjected to the auditing procedures applied in the audits of the basic financial statements and, in our opinion, is fairly stated in all material respects in relation to the basic financial statements taken as a whole.

KPMG Peat Marwick LLP

February 6, 1998

BALANCE SHEETS
DECEMBER 31, 1997 AND 1996

	1997	1996
Assets		
CASH	$ 347,877	$ 40,620
INVESTMENTS:		
Equities	632,686,430	640,466,189
Fixed income	281,402,768	258,573,769
Other	186,607,703	103,760,271
TOTAL INVESTMENTS	1,100,696,901	1,002,800,229
OTHER	541,436	534,546
Total	**$1,101,586,214**	**$1,003,375,395**
Liabilities and Net Assets		
GRANTS PAYABLE	$ 49,152,153	$ 59,895,861
DEFERRED FEDERAL EXCISE TAX	1,986,666	2,014,200
	51,138,819	61,910,061
NET ASSETS–UNRESTRICTED	1,050,447,395	941,465,334
Total	**$1,101,586,214**	**$1,003,375,395**

See accompanying notes to financial statements.

STATEMENTS OF ACTIVITY
YEARS ENDED DECEMBER 31, 1997 AND 1996

	1997	1996
INVESTMENT INCOME:		
Interest	$ 22,205,854	$ 20,124,090
Dividends	21,796,236	15,311,889
	44,002,090	35,435,979
LESS:		
Investment expenses	4,852,618	4,183,695
Provision for Federal excise tax	1,546,000	1,008,000
	6,398,618	5,191,695
Net investment income	37,603,472	30,244,284
EXPENSES:		
Grants authorized (net of refunds of $377,589 in 1997 and $155,314 in 1996)	38,654,250	52,938,417
Management expenses	3,918,137	3,669,085
	42,572,387	56,607,502
EXCESS OF EXPENSES OVER NET INVESTMENT INCOME	(4,968,915)	(26,363,218)
NET GAIN ON DISPOSAL OF INVESTMENTS	115,300,130	72,626,541
(DECREASE) INCREASE IN UNREALIZED APPRECIATION OF INVESTMENTS, NET OF DEFERRED FEDERAL EXCISE TAX	(1,349,154)	15,891,738
	113,950,976	88,518,279
INCREASE IN NET ASSETS	108,982,061	62,155,061
NET ASSETS AT BEGINNING OF YEAR	941,465,334	879,310,273
NET ASSETS AT END OF YEAR	$1,050,447,395	$ 941,465,334

See accompanying notes to financial statements.

STATEMENTS OF CASH FLOWS
YEARS ENDED DECEMBER 31, 1997 AND 1996

	1997	1996
Cash flows from operating activities:		
INCREASE IN NET ASSETS	$108,982,061	$62,155,061
ADJUSTMENTS TO RECONCILE INCREASE IN NET ASSETS TO NET CASH USED IN OPERATING ACTIVITIES:		
Net gain on disposal of investments	(115,300,130)	(72,626,541)
Decrease (increase) in unrealized appreciation of investments	1,376,688	(16,216,060)
(Decrease) increase in deferred federal excise tax	(27,534)	324,322
(Increase) in other assets	(6,890)	(304,687)
(Decrease) increase in grants payable	(10,743,708)	5,704,669
Net cash used in operating activities	(15,719,513)	(20,963,236)
Cash flows from investing activities:		
Proceeds from sale of investments	981,150,841	968,994,967
Purchase of investments	(965,124,071)	(948,082,679)
Net cash from investing activities	16,026,770	20,912,288
NET INCREASE (DECREASE) IN CASH	307,257	(50,948)
CASH AT BEGINNING OF YEAR	40,620	91,568
CASH AT END OF YEAR	$ 347,877	$ 40,620

See accompanying 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 management expenses, including post-retirement benefit expense, are recorded on the cash basis, the effect of which on the accompanying financial statements is not materially different from the accrual basis. Grants are accrued when authorized by the Trustees. Certain accounting estimates are a routine part of financial statements prepared by the management and are based upon management's current judgements.

Gains or losses on disposal of investments are determined on the first-in, first-out basis. Market value for traded securities is based on quoted market prices. Investments of limited marketability are reported at estimated fair values based upon appraisals by the managers of the various interests.

2. INVESTMENTS

Investments at December 31, 1997 and 1996, are summarized as follows:

	1997		1996	
	Cost	Fair Value	Cost	Fair Value
Equities	$ 555,004,709	$ 632,686,430	$552,931,716	$ 640,466,189
Fixed Income	275,882,168	281,402,768	258,082,981	258,573,769
Other	170,476,726	186,607,703	91,075,546	103,760,271
Total	$1,001,363,603	$1,100,696,901	$902,090,243	$1,002,800,229

3. FINANCIAL INSTRUMENTS WITH OFF-BALANCE SHEET CREDIT OR MARKET RISK

The Foundation's investment strategy incorporates certain financial instruments which involve, to varying degrees, elements of market risk and credit risk in excess of the amounts recorded in the financial statements. These instruments include financial futures, forward foreign currency contracts, loaned securities and securities sold, not yet purchased.

The Foundation is subject to market risk associated with the changes in the value of the futures contracts. Below is a table summarizing the long and short exchange-traded financial futures position at the end of December 1997 and 1996.

	December 31, 1997		December 31, 1996	
Index Futures Contracts	Number of Contracts	Value (Millions)	Number of Contracts	Value (Millions)
S&P 500				
Long	2	$ 0.5	–	–
Short	(605)	(148.0)	(474)	($178.0)
U.S. Treasury Futures				
Long	2,248	324.3	2,416	311.5
Non-U.S. Index Futures				
Long	64	5.0	217	5.1
Short	(28)	(2.7)	(28)	(3.9)

These amounts, however, may differ from the Foundation's future cash requirements as the Foundation may close out futures positions prior to settlement and thus be subject only to the change in value of the futures contracts since the contracts are valued daily using the mark-to-market method. The net appreciation in the market value is recognized as received. The margin requirements on deposit with a third party for futures contracts were approximately $12.2 million at December 31, 1997 and $10.9 million at December 31, 1996.

In addition, the Foundation's investment advisor engages from time to time in options (puts and calls), swaps, futures and forwards, for the purpose of hedging, risk management and return enhancement or to implement investment strategies in a more efficient manner. The value of these transactions at December 31, 1997 is approximately $19.5 million and $21.7 million at December 31, 1996. Such transactions are subject to market risk as described above and, to varying degrees, risk of loss, arising from the possible inability of counterparties to meet the terms of the contract. Required collateral is held by a third party.

The Foundation purchases forward foreign currency contracts as a hedge against fluctuations in currency prices. Forward foreign currency buy and sell contracts held as of December 31, 1997 were valued at approximately $35.9 million and $35.7 million, respectively, and, as of December 31, 1996, at approximately $36.0 million and $35.8 million, respectively. Such contracts involve, to varying degrees, risk of loss arising from the possible inability of counterparties to meet the terms of the contract.

Through a securities lending program managed by a custodian firm, the Foundation loans certain stocks and bonds included in its investment portfolio. The custodian firm has indemnified the program. The Foundation's gross securities loaned to certain borrowers at December 31, 1997 and 1996 amounted to $38 million and $27 million, respectively.

Securities sold, not yet purchased ($90.4 million and $82.8 million at December 31, 1997 and December 31, 1996, respectively) are recorded net in the Foundation's investment accounts. These securities have

market risk to the extent that the Foundation, in satisfying its obligations, may have to purchase securities at a higher value than recorded. Required collateral is held by a third party.

Management does not anticipate that losses, if any, resulting from its market or credit risks would materially affect the financial position of the Foundation.

4. FEDERAL EXCISE TAX

The Foundation is liable for federal excise taxes of 2 percent of its net investment income, which includes realized capital gains, for the year. However, this tax is reduced to 1 percent if certain conditions are met. The Foundation met the requirements for the reduced tax for the years ended December 31, 1997 and 1996. Therefore, current taxes are estimated at 1 percent of the net investment income for 1997 and 1996.

Deferred taxes represent 2 percent of unrealized appreciation of investments at December 31, 1997 and 1996, as qualification for the 1 percent tax is not determinable until the fiscal year in which gains are realized.

5. 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 the purchase of annuities for employees. Retirement plan expense was $322,802 and $292,829 in 1997 and 1996, respectively.

In addition, the Foundation provides certain health care and life insurance benefits to its retirees. The cost of providing these benefits to retirees was $83,915 and $86,662 in 1997 and 1996, respectively, on a pay-as-you-go basis.

6. LEASE

The Foundation's lease for its office space expires December 31, 1998. The lease contains an escalation clause which provides for rental increases resulting from increases in real estate taxes and certain other operating expenses. Rent expense amounted to $408,027 and $397,487 in 1997 and 1996, respectively. At December 31, 1997, base rent commitment is approximately $404,300.

	1997	1996
Management Expenses		
Salaries and employee benefits:		
Salaries	$2,253,249	$2,062,328
Employees' retirement plan and other benefits	831,897	785,273
Total	3,085,146	2,847,601
Rent	408,027	397,487
Program expenses	471,206	508,881
Office expenses	461,217	419,845
Reports and publications	53,167	51,531
Professional fees	143,208	93,230
Total management expenses	4,621,971	4,318,575
Less management expenses allocated to investments	703,834	649,490
Management expenses	$3,918,137	$3,669,085
Investment Expenses		
Investment management fees	$4,148,784	$3,534,205
Management expenses allocated to investments	703,834	649,490
Investment expenses	$4,852,618	$4,183,695

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INDEX OF GRANTS

1998 ANNUAL REPORT

ALFRED P. SLOAN FOUNDATION

Alfred P. Sloan, Jr.
1875-1966

LIFE OF ALFRED P. SLOAN, JR.

Alfred Pritchard Sloan, Jr., was born in New Haven, Connecticut, May 23, 1875, the first of five children of Alfred Pritchard Sloan, Sr., and Katherine Mead Sloan. His father, a machinist by training, was then a partner in a small company importing coffee and tea. In 1885 the family moved to Brooklyn, where it was particularly active in the Methodist Church. (Young Alfred's maternal grandfather was a Methodist minister.) Alfred, Jr., excelled as a student both in the public schools and at Brooklyn Polytechnic Institute where he completed the college-preparatory course. After some delay in being admitted to the Massachusetts Institute of Technology (which considered him too young when he first applied), he matriculated in 1892 and took a degree in electrical engineering in three years as the youngest member of his graduating class.

Mr. Sloan began his working career as a draftsman in a small machine shop, the Hyatt Roller Bearing Company of Newark, New Jersey. At his urging, Hyatt was soon producing new antifriction bearings for automobiles. In 1898 he married Irene Jackson of Roxbury, Massachusetts. The next year, at age 24, he became the president of Hyatt, where he supervised all aspects of the company's business. Hyatt bearings became a standard in the automobile industry, and the company grew rapidly under his leadership. In 1916 the Hyatt Roller Bearing Company, together with a number of other manufacturers of automobile accessories, merged with the United Motors Corporation, of which Mr. Sloan became President. Two years later that company became part of the General Motors Corporation (itself established in 1908 as the General Motors Company), and Mr. Sloan was named Vice President in Charge of Accessories and a member of the Executive Committee.

He was elected President of General Motors in 1923, succeeding Pierre S. du Pont, who said of him on that occasion: "The greater part of the successful development of the Corporation's operations and the building of a strong manufacturing and sales organization is due to Mr. Sloan. His election to the presidency is a natural and well-merited recognition of his untiring and able efforts and successful achievement." Mr. Sloan had developed by then his system of disciplined, professional management that provided for decentralized operations with coordinated centralized policy control. Applying it to General Motors, he set the Corporation on its course of industrial leadership. The next 23 years, with Mr. Sloan as Chief Executive Officer, were years of enormous expansion for the Corporation and of a steady increase in its share of the automobile market.

In 1937 Mr. Sloan was elected Chairman of the Board of General Motors. He continued as Chief Executive Officer until 1946. When he resigned from the chairmanship in 1956, the General Motors Board said of him: "The Board of Directors has acceded to Mr. Sloan's wish to retire as Chairman. He has served the Corporation long and magnificently. His analysis and grasp of the problems of corporate management, his great vision and rare good judgement, laid the solid foundation which has made possible the growth and progress of General Motors over the years." Mr. Sloan was then named Honorary Chairman of the Board, a title he retained until his death on February 17, 1966. For many years he had devoted the largest share of his time and energy to philanthropic activities, both as a private donor to many causes and organizations and through the Alfred P. Sloan Foundation, which he established in 1934.

Mr. Sloan, as a realist as well as a humanist and philanthropist, looked upon the Foundation as an extension of his own life and work. Although he recognized the inevitability of change that might dictate a different course, he expected that the Foundation would "continue as an operating facility indefinitely into the future...to represent my accomplishments in this life." His accomplishments during his lifetime were of the highest order, and in themselves provide the most dramatic and lasting tribute to his extraordinary talent. Through the Foundation, his accomplishments have been extended and expanded.

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COMMITTEES OF THE BOARD OF TRUSTEES

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Harold T. Shapiro, Chairman
Stephen L. Brown
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Investment Committee

Stephen L. Brown, Chairman
S. Parker Gilbert
Ralph E. Gomory
Harold T. Shapiro
Robert M. Solow

Audit Committee

Lloyd C. Elam, Chairman
William E. Hoglund
Dennis Weatherstone

ADMINISTRATIVE OFFICERS AND STAFF

Ralph E. Gomory
President

Stewart F. Campbell
Financial Vice President and Secretary

Hirsh G. Cohen
Vice President

William B. Petersen
Vice President and Chief Investment Officer

Jesse H. Ausubel
Program Director

Kathleen E. Christensen
Program Director

Maureen Gassman
Assistant Secretary

Ted Greenwood
Program Director

A. Frank Mayadas
Program Director

Gail M. Pesyna
Program Director

Christopher T. Sia
Controller

Michael S. Teitelbaum
Program Director

Doron Weber
Program Director

GENERAL INFORMATION

"The greatest real thrill that life offers is to create, to construct, to develop something useful. Too often we fail to recognize and pay tribute to the creative spirit. It is that spirit that creates our jobs. There has to be this pioneer, the individual who has the courage, the ambition to overcome the obstacles that always develop when one tries to do something worthwhile, especially when it is new and different."

—Alfred P. Sloan, Jr., 1941

PROGRAMS AND INTERESTS

The programs and interests of the Foundation are divided into four areas outlined as follows:

Science and Technology

- Fellowships
- Direct Support of Research
- History of Science and Technology

Standard of Living and Economic Performance

- Industries
- Nonprofit Sectors
- Dual-Career Middle-Class Working Families

Education and Careers in Science and Technology

- Education for Scientific and Technical Careers
- Education for Minorities and Women
- Public Understanding of Science and Technology

Selected National Issues and Civic Program

In the following sections, brief descriptions are provided of the Foundation's programs in these four areas, including goals, current directions and plans. Additional information can readily be obtained from the Program Director responsible for a particular program, as identified on the Foundation's World Wide Web site, www.sloan.org.

SCIENCE AND TECHNOLOGY

Support of science and technology is a major component of the Foundation's program. Fellowships, direct support of research in selected fields, and work in the history of science and technology are basic parts of this program.

FELLOWSHIPS

Sloan Research Fellowships

These awards are intended to enhance the careers of the very best young faculty members in specified fields of science. Currently 100 grants are awarded annually in six fields: chemistry, computer science, economics, mathematics, neuroscience, and physics.

Sloan Dissertation Fellowships

The goal of this program is to expedite completion of the Ph.D. dissertation in mathematics and in economics. Nominations are solicited from leading graduate departments in these fields. The final awards in this program will be made in 1999.

DIRECT SUPPORT OF RESEARCH

The Foundation provides support in selected areas of research that are of scientific significance and where its support can make a difference. This usually means that there are no major government funders. Areas in this program include molecular evolution, theoretical neurobiology, computational molecular biology, astrophysics (Sloan Sky Survey), limits to knowledge, and marine science (Census of Fishes).

Molecular Evolution

The goal of this program has been to contribute to making molecular evolution a significant field of science. Foundation grants since 1986 have helped the field become highly visible in science. New understandings of the origins of life, the evolutionary relationships among living species, and of powerful ways of developing medically useful molecules via biotechnology have emerged. The Society for Molecular Biology and Evolution was created. There are no plans for substantial further funding in this area beyond 1998 when the program, now operated jointly with the National Science Foundation, concludes.

Theoretical Neurobiology

The goal of this program is to accelerate the development of theory in neurobiology. The plan is to bring young theoreticians from the physical, mathematical, and computer sciences into neurobiology. Major grants in 1994 supported creation of five research centers in theoretical neurobiology at Brandeis University, California Institute of Technology, New York University, Salk Institute, and University of California, San Francisco. The young scientists learn experimental methods and work with senior neurobiologists. The program has attracted strong participants and new scientific results are emerging. Each of the Centers received three-year renewal grants in 1997.

Computational Molecular Biology

The goal of this program is to produce scientists who can link the powerful theoretical and practical tools of molecular biology with the power of modern computational techniques. In a joint program with the U.S. Department of Energy, up to ten two-year postdoctoral awards are made each year to facilitate the transition of young mathematicians, physicists, and other quantitative scientists into computational molecular biology. Based on the success of the program in its first three years, the Foundation is exploring avenues for building upon the current postdoctoral program.

Sloan Sky Survey

The goal of this project is to provide a new and vastly more detailed archive of the objects that make up the visible universe. Foundation grants have supported the design, building, and operation of a special telescope that will provide three-dimensional locations for one million galaxies and 100,000 quasars. Systematic observations begun in 1998 have already demonstrated the extraordinary power of the tools developed for the survey.

Limits to Knowledge

The goal of this program is the exploration of what is known, unknown, and unknowable in a variety of fields. Research has been funded on limits to knowledge in a broad spectrum of academic areas. Grants have supported such studies in plant molecular biology and genetics, ecology, computational economics, history of science, and prehistoric linguistics.

Census of Fishes

The goal of this project is to explore whether the Foundation might catalyze a major new international observational program to assess and explain the abundance and distribution of marine life. Initial grants have focused on obtaining expert views on the scientific value, technical feasibility, estimated cost, and interest of diverse stakeholder communities (scientists, commercial fishers, environmentalists, and government agencies) in this project. These having been favorable, the Foundation plans to continue small-scale grants related to the Census and to explore cooperation with U.S. government agencies, other foundations, and international organizations on the major support such a vast undertaking would require.

HISTORY OF SCIENCE AND TECHNOLOGY

The goal of this program is to preserve the raw material of history by supporting archival projects now centered on Charles Darwin, Thomas A. Edison, and Kurt Gödel, and via new projects based on the World Wide Web.

Archival Program

The goal of this program is to preserve and make available to scholars complete collections of the papers, letters, and notes of Darwin, Edison, and Gödel. Work continues on volumes 11-14 of The Correspondence of Charles Darwin as well as on making the entire collection available electronically. The fourth volume of the Edison papers was published and work is underway on volume five and on the electronic edition. The Edison web site has received wide praise. A final volume of the collected work of Kurt Gödel is in preparation.

Web Sites

The goal of this program is to use the World Wide Web to develop and diffuse a wholly new way of creating an historical record of recent major technical and scientific events. Initial grants have supported the creation of over 30 web sites by ten professional societies, six universities, and a museum, on a wide variety of topics ranging from the development of the artificial heart to the planning, construction, and early operation of the Trans-Alaska pipeline. The goal is to create interactive sites attracting contributions by participants in the actual scientific or technical development to which the site is devoted. A conference is planned for 1999 to bring together Sloan grantees and others to discuss the use of the Web for the recent history of science and technology, to evaluate experiences, and to chart future directions.

STANDARD OF LIVING AND ECONOMIC PERFORMANCE

The goal is to contribute to the understanding of the basic forces affecting American economic progress and the U.S. standard of living in the increasingly competitive world economy. This program is divided into three main areas: industries; nonprofit sectors; and dual-career middle-class working families.

INDUSTRIES

Industry Centers

The goal of this program is to build an academic community with direct knowledge of and interest in various industries. Thirteen Centers have been established with Foundation grants for study of the following industries in both manufacturing and service sectors: apparel and textile, computer, construction, financial services, information storage, managed health care, motor vehicle, pharmaceutical, powder metallurgy, retail food, semiconductor, steel, and trucking. In 1998, over 230 faculty members and more than 160 graduate students and post docs were engaged in Center activities. Since 1994, 119 Ph.D.s have been awarded and most are continuing their industry-related research in academic positions. Centers, in close contact with companies, are publishing research studies on their industries that include data, observations, and new conceptualizations useful to American companies and government departments. They also make feasible the study of such major issues as wages and globalization at an industry level

The Foundation plans to add the effect of changing technology on worker skill requirements to the topics investigated by the Centers. It will also consider funding study of additional industries.

Human Resources/Jobs/Income

The goal of this program is to build understanding of best practices in the changing workplace, and the effect of these changes on jobs and income. Major changes affecting the American workplace in the past decade include far greater global competition, downsizing, and increases in outsourcing, temporary work, and wage inequality. Study of the effects of these new conditions has been supported with an industry-by-industry focus and making use of Sloan Industry Center resources and researchers. Human resource and labor economics researchers have been brought into factories and offices to understand how people work.

During 1999 there will be further study of wage inequality and its causes. Research is ongoing to understand in more detail for a given industry the effect of new technology on the reorganization of work and on the higher skills required of workers. Additional industry-based studies of such issues affecting jobs and income are planned.

Globalization

The goal of this project is to provide a fact-based picture of globalization, primarily within specific industries. Grants have been made to study company location decisions and the effects of these decisions on jobs, wages, and the company's competitive position in such industries as computer flat panel display, auto, computer disk file, semiconductor manufacturing, personal computer, and computer software. Globalization in the flat panel display industry, studied by researchers at the University of Minnesota, involved visits to 60 firms, 8 government agencies, and 3 industry consortia in the U.S., Japan, Taiwan, Korea, and Europe. A book on this industry, *Profits Without Glory*, is expected to appear in 1999.

Role of the Corporation

The goal of this program is to contribute to understanding the nature and purpose of the corporation in a changing world. The Foundation has sought to stimulate the examination of the corporation as a central and characteristic institution of American society, and to put it into an historical and global context. Studies of different systems of corporate ownership, structure, control, and decision-making, and how they affect a company's ability to generate wealth, its economic efficiency, the division of economic surplus, job creation, or corporate survival have been carried out mainly by researchers in three fields: law, economics, and business. The Foundation has supported work in each of these areas and plans to continue supporting innovative work, in these fields and others, on the basic issues of the nature and purpose of the corporation.

Other Work and Outreach

Foundation grants have supported a variety of other projects with the general goal of understanding aspects of the competitive world economy: work of Kenneth Arrow on venture capitalists; Stanford's program to produce new professors of manufacturing; research on international trade by Ralph Gomory and William Baumol; education in entrepreneurship at Berkeley's Haas School of Business; and Hedrick Smith's television series "Surviving the Bottom Line."

NONPROFIT SECTORS

Universities

The goal of this program is to produce understanding of how institutions of higher education actually work. With Foundation support, the RAND Corporation has completed *In Pursuit of Prestige*, a forthcoming book which describes how the quest for prestige structures much of the organization and decision-making in higher education. A research team at UCLA is completing a detailed case study about the basic production units of the university, its departments. The interactive university simulator, CyberCampus, is in final testing and this video game is expected to be available in late 1999. The Sloan Community College Research Center at Teachers College, Columbia University, established with a Foundation grant in 1996, continues its research on this major sector of higher education. The Foundation is interested in new research on the emergence of for-profit higher education.

Assessment of Government Performance

The goal of this program is to encourage the creation and use of measures of municipal government performance that objectively measure outcomes that matter to people. These measures should be available and intelligible, so citizens can have a factual basis from which to judge performance. Demonstration projects have been funded concerned with such issues as the smoothness of streets and the quality of public transportation service in New York City, the development of processes to enable community members to assess and react to city government performance, police performance measurement, and housing code enforcement. Three projects concern the development of administrative mechanisms by means of which municipalities could be encouraged or required to employ and involve citizens in performance assessment. For example, the Urban Institute is exploring ways that state governments encourage or require local governments to track their own performance, report it to their citizens, and involve citizens in feedback to agencies. The Foundation is interested in additional promising projects in this program.

DUAL-CAREER MIDDLE-CLASS WORKING FAMILIES

The goal of this program is to understand how dual-career families live. There have been vast changes in the ways middle-class families organize their work and family lives. In the past, the traditional family had two jobs. The husband had a full-time paid job in the world of work, the wife a full-time unpaid job bringing up the children, developing ties

with the community, and taking physical care of the home. Today in a two-career family there are three jobs, two work jobs and the home job, but still only two people. This is the fundamental cause of stress. The Foundation seeks to understand what is happening under this stress. Clearly, family life is changing. We want to understand these changes. In addition, we want to understand what can be done to ease the stress. Improvements should be possible because, while the fundamental arithmetic of the family has changed, the institutions of the workplace, neighborhood, and home have remained relatively unchanged. In the main, workplaces retain the structure they had when all employees were full-time males. Repair services and neighborhood land use patterns continue to assume full-time homemakers available to run the house and chauffeur the children. Child care is still catch as catch can. Opportunities should exist for improvements.

This program is organized into three main parts: (1) efforts focused on research and understanding of these work and family life changes by Sloan Centers on Working Families and the Ethnographies of Everyday Life program; (2) efforts aimed at improving the work and home environments in the programs on Alternate Workplace Structures and Reduced Hours of Household Labor; and (3) efforts directed to enhancing Public Policy Directions for Working Families and Public Understanding of Middle-Class Families.

Centers on Working Families

The goals of this program are to understand the needs of working families and to make the study of middle-class working families a normal part of research in the social sciences. Four multi-disciplinary centers have been established to carry out research on working families, to produce the next generation of scholars by means of doctoral and postdoctoral programs, and to disseminate widely their research findings. These include the Employment and Family Careers Institute at Cornell University, the Center on Parents, Children, and Work at the University of Chicago, the Center on Working Families at University of California, Berkeley, and the Center for Ethnography of Everyday Life at the University of Michigan. Currently 42 faculty, 6 postdocs, and 19 graduate students are involved in work at these Sloan Centers. It is planned to establish a fifth such research center in 1999.

Ethnographies of Everyday Life

The goal of this project is to describe and understand the everyday lives of middle-class families by use of ethnographic studies. A special effort is now being made to engage anthropologists in the study of the everyday lives of middle-class American working families. A major grant has been made to San Jose State University to conduct anthropological research on such families in the Silicon Valley. It is planned to support additional ethnographic studies in 1999.

Alternate Workplace Structures

The goal of this program is to create workplace models based on the realities of workers who have family responsibilities. The Foundation supports research exploring innovative ways work hours can be reduced or autonomy over the pacing and location of work can be enhanced, as well as studies to understand the actual impact of reduced hours/high autonomy arrangements on specific business outcomes. Ten projects have been funded on reduced hours, specifically on part-time careers in selected professions, including accounting, computer programming, law, management, medicine, and technical writing. It is planned to support additional studies of innovative reduced hour, high-autonomy work arrangements and their impacts on business outcomes in 1999.

Reduced Hours in Household Labor

The goal of this program is to ease the demands of domestic work, particularly for families with two paid jobs. Domestic labor takes at least two forms — the physical labor necessary to maintain a house and household, and the emotional labor necessary to care for a family. The initial plan for this new area is to understand what new business ventures, architectural plans, and other innovations could do to minimize the physical labor and time required to run a household.

Public Policy Directions for Working Families

The goal here is to identify federal, state, or local laws and regulations that limit choices available to working families. In 1999, a small number of analytic papers will be commissioned on the ways current laws and regulations inhibit rather than facilitate choice for working families. If these studies are fruitful, a research conference on new directions in law and legislation for working families may be organized.

Public Understanding of Working Families

The goal of this program is to make the coverage of issues faced by working families a normal part of daily news on radio, television, and in the print media. Arlie Hochschild's 1997 book,

The Time Bind, published with Foundation support, generated intense public debate on the time tradeoffs between work and home and resulted in cover stories in several national magazines. Grants to National Public Radio and WNYC have encouraged public discussions of work and family issues. There is interest in additional opportunities to support such work aimed at public understanding.

EDUCATION AND CAREERS IN SCIENCE AND TECHNOLOGY

This program is divided into the following sections: Education for Scientific and Technical Careers; Education and Training for Minorities and Women; and Public Understanding of Science and Technology.

EDUCATION FOR SCIENTIFIC AND TECHNICAL CAREERS

Career Choice

The goal is to understand how young people develop their ideas of occupations, professions, and the world of work. Of special interest are the influences on young people that lead them to aim or not aim at science and engineering careers. The plan is to go directly to middle and high school age students, interview and follow them, and their parents, friends, and teachers, as they learn about work and begin making choices. Researchers at the University of Colorado and the University of Washington studied career choice among college students, mainly in science and engineering. Their most prominent finding is the lack of information students have on professions, occupations, and jobs. Many followed career paths by default without adequate information for a timely informed decision. In a Foundation-supported major project at the University of Chicago now close to completion, an extensive longitudinal survey of middle and high school students showed that those aiming for careers in science or engineering make this decision early and are quite persistent. A first book on this work is expected from Yale University Press in 1999.

Information About Careers

The goal of this program is to make available realistic information about the nature of work in science and engineering careers. Recognizing that career decisions today are made largely in the absence of such information, the Foundation has made grants to nine professional societies, representing various physical science and engineering disciplines, for the preparation of videotapes, CD-ROMs, and web pages on career information in their fields. Each videotape, for example, shows interviews of 12-15 professionals with a range of educational attainment and work experience and explores their lives at work. The CD-ROMs include more thoughts of these scientists and engineers on choosing a career and professional advancement, as well as an extensive database of potential employers. This collection of materials, known as the Sloan Career Cornerstone Series, when completed early in 1999, will be distributed by Kendall-Hunt Publishing Co.

Retention

The goal of this program is to increase understanding of why student attrition in higher education is so high, especially from the fields of science and engineering. The influential work of Elaine Seymour and Nancy Hewitt on reasons why undergraduates switch out of science and engineering was an early Foundation-supported project in this program. Barbara Lovitts has completed a book manuscript on attrition of students in graduate programs. A study is underway at Carnegie Mellon University of factors influencing decisions of undergraduate women to enroll and persist in computer science majors.

New Master's Degrees

The goal of this program is to explore and, if deemed appropriate, bring into being a new type of master's degree in the sciences that equips people for work outside academia. Graduate schools continue to concentrate on producing research-oriented Ph.D.s even as prospects for stable research positions in academia have dimmed. Believing that scientific training of the kind graduate schools can provide could equip people very well for satisfying jobs outside academia, the Foundation has supported the creation of new professional master's degrees in diverse scientific fields at Georgia Institute of Technology, University of Southern California, Michigan State University, University of Wisconsin, and the University of Arizona. Depending on the success of these early programs, additional exemplary efforts at other universities may be of interest.

Learning Outside the Classroom

The goal here is to make available quality higher education and training anytime and anywhere for anyone who is motivated to seek it. Grants have gone to institutions of higher education to encourage their use of Asynchronous Learning Networks (ALNs), which make possible electronic access at any time to remote learning resources such as instructors, fellow students, text, and software. Many institutions, from community colleges to elite universities, have by now participated in this program. Sloan-supported projects have by year-end 1998 provided more than 1,000 faculty-years of ALN teaching experience and have been used for course work by 20,000 students. Grantees, having continued to enlarge their ALN programs with non-Sloan funding, will have provided some 40,000 courses by the end of the academic year 1998-99 and will be offering 35 full degree programs. Where comparisons have been made, usually when the same course is taught both off and on campus, learning outcomes using an ALN compare favorably with the traditional classroom model.

Major recent grants have gone to Stanford University for an M.S. Electrical Engineering degree and to Pace University, with support from major phone companies and also major unions, for the development of an Associate degree in Telecommunications. ALN has now become quite prominent in higher education and will be the subject of a major new program at the U.S. Department of Education with an initial budget of $10 million for this fiscal year. In 1999, the Sloan Foundation will focus on making ALN teaching easier for the "average" faculty member, will collect learning effectiveness data, and will emphasize the creation of visible large university ALNs such as University of Illinois OnLine, World Campus at Pennsylvania State University, and the State University of New York Learning Network.

Postdocs and Part-Time/Adjunct Faculty

The goal of this nascent program is to learn the basic facts about the rapidly changing career situation of postdocs and part-time/adjunct faculty. The contingent workforce of part-time/adjunct faculty has now grown to comprise nearly one-half of the total U.S. college/university faculty. Two Sloan-supported workshops have explored the causes and consequences of this rapid growth. It appears that postdocs are more apt to be in the sciences and especially the biomedical sciences, whereas adjuncts and part-timers are more prevalent in professional schools, in the social sciences and humanities, and in public two-year community colleges rather than in research universities. During 1999, the Foundation plans to continue its discussions with the National Institutes of Health and the National Research Council on the rapidly changing situation of postdocs.

Immigration and Science and Engineering Careers

The goal of this program is to establish and assemble the basic facts about the foreign scientists and engineers working in the U.S. The number of such persons has expanded dramatically over the past five years. A 1998 grant supported a workshop at Georgetown University's Institute for the Study of International Migration to consider the current state of data on such immigration, the gaps therein, and suggestions for further research. During 1999, a number of Foundation-supported studies are expected to be completed and new ways to improve the factual and statistical base in this area will be explored.

EDUCATION FOR MINORITIES AND WOMEN

Minorities

The primary goal of this program is to increase the number of underrepresented minority Ph.D.s in mathematics, science, and engineering by 100 per year. The Foundation seeks faculty whom it believes can successfully recruit, mentor, and graduate minority students with Ph.D.s in these fields. Such faculty are invited to become part of the Sloan Ph.D. Network. The Foundation provides financial support to minority students who enter Ph.D. programs to work with members of the Network. In addition, grants are made to a small number of undergraduate departments with a strong record of sending their minority graduates on for Ph.D.s in these fields so that they can increase the number of such graduates.

A secondary goal of this program is to ensure that minority students have equal access to and derive equal benefits from the country's specialized mathematics and science high schools. Minority students are strongly underrepresented in most of the 56 such schools in the country. Foundation grants made to ten of these schools have generally been successful in achieving increased minority enrollment and academic performance. In 1999 there will be an effort to encourage other schools to make use of the methods that have been developed by these Sloan grantees.

Women's Programs

The goal of this program is to remove barriers to success for women faculty in the fields of mathematics, science, engineering, and technology. The Sloan Pre-Tenure Leave Fellowship Program, a pilot phase of which was initiated in 1997, provides funding to untenured tenure-track faculty in the above fields faced with urgent family responsibilities. It enables them to take a leave with salary or to resume research after a leave. A number of colleges and universities are participating in the program and its pilot phase will continue through 1999 to determine if expansion is warranted. Also in 1999 it is planned to investigate the feasibility of extending a special mentoring program, funded in 1994 at Kansas State University, in which the goal was to help new women faculty members obtain an initial research grant.

PUBLIC UNDERSTANDING OF SCIENCE AND TECHNOLOGY

The goal of this program is to enhance people's lives by providing a better understanding of the increasingly scientific and technological world in which we live. The program also aims to convey some of the challenges and rewards of the scientific and technological enterprise and of the lives of the men and women who undertake it. The program employs books, television, radio, films, CD-ROM, the Internet, and other media to reach a wide nonspecialist audience.

Books

The Sloan Technology Book Series makes available to the general public readable and accurate accounts of major twentieth century technologies. One new title appeared in 1998, *Insisting on the Impossible: The Life of Edwin Land*, on the inventor of the Polaroid process, bringing the published total in the series to 12 volumes. Books on the Optical Science Corporation's satellite project and the development of fiber optics, as well as an anthology of technology writings edited by Richard Rhodes, are slated for series publication in 1999. A number of the earlier books in the series have now appeared in paperback versions.

The autobiography of physicist John Wheeler and a biography of Nobelist Dorothy Hodgkin were published in 1998. The Foundation program also includes books to inform people about the scientific basis of issues that are often confusing or controversial. One such book appeared in 1998: *Strangers in the Night: A Brief History of Life on Other Worlds.* Books on the genetics of behavior, the search for an AIDS vaccine, and the Gulf War Syndrome are forthcoming. Ongoing Foundation-supported writing projects include a new American History textbook that will incorporate science and technology into the narrative of the nation's history, a three-volume series and CD-ROM by David Billington on the great engineering developments of the last 200 years, biographies and autobiographies of scientists and engineers, volumes on home technologies and the built environment, and a book analyzing science and government relations.

Radio

With Foundation support, the subject of technology has come to be a prominent part of National Public Radio's news magazines. "The DNA Files," a new series of one-hour documentaries on recent developments in genetics was broadcast on NPR. A 1998 grant

will establish a technology desk for "The World," a daily one-hour global current affairs show co-produced by the BBC World Service, WGBH in Boston, and Public Radio International. A Foundation grant led in 1998 to the CBS network broadcasting many segments about science and technology on commercial radio. More such opportunities to use radio to inform people about scientific and technical aspects of the world will be explored in 1999.

Public Television

A number of television documentaries, some on PBS's The American Experience, have been related to books in the Sloan Technology Series. "Influenza 1918," linked to *Matters of Life and Death* by John Cairns, aired in 1998. "Dark Sun: The Making of the Hydrogen Bomb," based on the series book with the same title by Richard Rhodes, was broadcast early in 1999. With Foundation support, three new documentaries based on other technology series books will soon be broadcast on PBS. These include programs on Frederick Taylor and scientific management, the invention and impact of the transistor, and the history of commercial aviation. The Foundation was also a partial funder of two television series aimed at informing the public about significant scientific areas: "Life by the Numbers" and "Nerds 2.01: A Brief History of the Internet." The development of a science news service for television is being explored, as are additional television programs based on books published with Foundation support.

Commercial Television and Films

The two main foci of this program are film schools and Hollywood producers. *The goal of the film schools program is to influence the next generation of film makers to create more realistic and dramatic stories about science and technology and to challenge existing stereotypes about scientists and engineers through the visual media.* With Foundation support, prizes are now awarded at six leading film schools to stimulate their top students to write and produce new film and television shows about scientists and engineers. These include the American Film Institute; UCLA's School of Theater, Film and Television; Carnegie Mellon University's film program; Columbia University Film Department; NYU's Tisch School of the Arts; and the USC School of Cinema-Television. In 1998, all six schools made Sloan awards in film production and screen writing and held well-attended and well-received film seminars on science and technology that included the writer Arthur C. Clarke, actor Tom Hanks, and director Robert Zemeckis. All the schools also participated in the first Sloan Film Summit which featured a screening of award-winning student films.

The goal of the Hollywood Producers program is to pilot scripts dealing with science and technology themes into development at the major Hollywood studios and networks. David Milch, the executive producer and co-creator of the Emmy-winning *NYPD Blue,* is working with the Foundation to develop a new network television show featuring scientists and engineers. Work to produce the pilot script is ongoing. In 1998, Milch and writer-producers for *ER* and *Babylon Five* participated in a lively television panel, "Entertaining Science," as part of the Film Summit. During 1999, the Foundation will consider the establishment of a major professional screen writing award in science and technology.

Theater

The goal of this program is to engage leading theater artists and playwrights to create new works about scientists and engineers that will break down the barrier between "the two cultures." In 1998, the Ensemble Studio Theatre received a major three-year grant to establish a new program focused on science and technology plays. This will lead to the annual creation, development, and presentation of three full-length and five one-act original plays dealing with science and technology themes, as well as a collection of ten works by younger writers. In 1999 the connection between theater and science will be explored further .

SELECTED NATIONAL ISSUES AND THE CIVIC PROGRAM

SELECTED NATIONAL ISSUES

The goal here is to contribute to other major issues of our time in a way appropriate to the Foundation's expertise and size. To contribute to an already widely recognized problem, the Foundation should have a special approach.

Privatization of Social Security

The goal is to produce an objective and expert assessment of proposals for partial privatization of the Social Security system. A 1996 grant to the National Academy of Social Insurance supports work of an outstanding group of experts. Their December 1998 report offers a balanced appraisal of the advantages and disadvantages of the various proposals that have been offered.

International AIDS Vaccine Initiative (IAVI)

The goal of this project is to accelerate the development of an AIDS vaccine. The Foundation made a $3 million grant in 1996 to help launch IAVI, an initiative to help focus attention and resources on the development and testing of candidate HIV vaccines. IAVI has influenced our and other G-8 governments, as well as the World Bank, to recognize the importance of vigorous vaccine development programs. It has itself made a number of grants for scientific work and with an investment of $9 million, it will place on a fast track to human testing two of the most promising vaccine approaches.

Illegal Gun Markets and Juvenile Violence

The goal of this program is to produce understanding of the epidemic of gun-related youth violence. A project at Carnegie Mellon University is now collecting its third wave of data documenting access to and participation in illicit gun markets by high-risk youth in Pittsburgh, PA and Rochester, NY. A joint Harvard University and Duke University project has completed data collection in eight cities. A two-volume report now being prepared and expected to be published in 1999 will describe the national epidemic of youth violence and its local variants, provide an explanation of why the epidemic developed so quickly, and suggest ways to identify early and respond effectively to such epidemics. Harvard grantees, working with local police, developed an effective police intervention program that worked to reduce gun-related youth violence in Boston. It also showed positive results in Minneapolis and is now being introduced into Baltimore and other cities.

Federal Statistics

The goal of this project is to improve the conceptual underpinnings of Federal economic statistics. Many such statistics have become increasingly problematic, especially as the economy has come to be dominated by hard-to-measure service activities and information technologies. A 1998 grant to the Brookings Institution supports work to improve conceptualization and measurement of productivity in the now-dominant service sector of the U.S. economy. A 1998 officer grant enabled the American Statistical Association to convene a high-level workshop of Federal and non-governmental experts to discuss what was needed. A proposal emerged for an ASA committee of leading experts on economic statistics to work closely with the main Federal statistical agencies on an ongoing basis. This initiative has been welcomed and is being funded by the Bureau of Labor Statistics and the Bureau of Economic Analysis. The Foundation is interested in additional promising activities in this area.

Inner-City Retail Industry

The goal is to generate factual information about inner-city retail markets that can be used by private sector businesses to assess opportunities and improve competitiveness in these locations. This project, conducted by Michael Porter's "Initiative for a Competitive Inner-City (ICIC)," is producing a comprehensive and detailed analysis of the retailing industry in America's inner cities. So far it has estimated the inner-city retail market at $85 billion, analyzed the sales performance of inner-city retailers, and identified specific retailing opportunities. The study concludes that at least 25% of the total retail demand in inner cities is currently being met by shoppers purchasing products outside their local neighborhoods. If stores were established in the inner cities to meet this demand, they would employ up to 300,000 people nationwide. Still in process is a study of best practices of inner-city retailers, strategies for small independent retailers, and a survey of household purchasing patterns.

CIVIC PROGRAM

The goal of this program continues to be to make a contribution to the Foundation's home area, New York City. One part of this program assists educational institutions to provide specialized education or other assistance to sectors of the city's economy where they have relevant expertise. Such grants have gone to Polytechnic University, the Fashion Institute of Technology, New York City Technical College, Pratt Institute, and LaGuardia Community

College for new educational programs or projects involving outreach to assist city businesses. A second part of this program brings together clusters of local economic actors when their interaction would be mutually beneficial. One effort links New York designers, manufacturers, marketing organizations, and financial sources by a database, the Design-Production Link, launched in 1998 with Foundation support. Another, via a grant to Greenpoint Manufacturing and Design Center, supported the development of a new Product Development Center to help bring promising and innovative product design concepts into production in New York.

Sloan Public Service Awards

The goal of this program is to recognize outstanding contributions by outstanding civil servants. From some 250,000 civil servants working for the City, six persons are selected each year for Sloan Public Service Awards in recognition of their exceptional achievement.

HOW TO APPLY FOR A GRANT

Applications can be made at any time for support of activities related to the range of interests indicated above. Grants of $30,000 or less are made throughout the year by officers of the Foundation. Officer grants enable the Foundation to respond quickly to proposals for many activities, such as workshops, symposia, and conferences, that fall within its program areas and interests, but require only moderate funding (at most $30,000). Officer grants can also be helpful for the preliminary planning and exploratory stages of major projects.

Grants over $30,000 are made by the Trustees who meet four times a year for that purpose. Letters of application are normally sent to the president or an officer of the Foundation and include, in addition to details about the applicant and the proposed project, information on the cost and duration of the work. Officer grants may not include any overhead charge; for trustee grants, at most fifteen percent of direct project costs can be budgeted for overhead. In the case of new applicants, the proof of tax-exempt status of the organization that would administer the grant should be included unless it is a recognized institution of higher education.

The Foundation's activities do not generally extend to religion, the creative or performing arts, elementary or secondary education, medical research or health care, the humanities or to activities outside the United States. Grants are not made for endowments or for buildings or equipment. Information about the Foundation's programs is available at www.sloan.org.

The Foundation has no deadlines or standard forms. Often a brief letter of inquiry, rather than a fully developed proposal, is an advisable first step for an applicant, conserving his or her time and allowing for a preliminary response regarding the possibility of support.

1998 GRANTS AND ACTIVITIES

FELLOWSHIPS

Sloan Research Fellowships **$3,500,000**

The Sloan Research Fellowship Program aims to stimulate fundamental research by young scholars with outstanding promise to contribute significantly to the advancement of knowledge. Over a 43 year period, fellowships have now gone to over 3,300 scientists and have accounted for expenditures of almost $80 million. Sloan Research Fellows continue to receive numerous prizes and awards in recognition of their major research accomplishments. Twenty-three Fellows have received Nobel prizes and thirteen have been awarded the prestigious Fields Medal in mathematics.

Fellowships awarded in 1998 were made in six fields: chemistry, computer science, economics, mathematics, neuroscience, and physics. Each fellowship is administered by the fellow's institution and is designed to allow the greatest possible freedom and flexibility in its use. A brochure entitled "Sloan Research Fellowships," available from the Foundation and reprinted on its website, describes the program in detail.

Candidates for Sloan Research Fellowships are nominated by department heads or other senior scientists familiar with their work. Within each discipline, a committee of three distinguished scientists reviews all nomination documents and recommends the final selections. During 1998, the Foundation awarded Research Fellowships of $35,000 each, over a two-year term, to 100 scholars at 53 institutions. Nominations were reviewed by the following committees:

Chemistry: Jacqueline K. Barton, California Institute of Technology; Jon C. Clardy, Cornell University; William H. Miller, University of California, Berkeley.

Computer Science: John E. Hopcroft, Cornell University; Richard M. Karp, University of Washington; Barbara Liskov, Massachusetts Institute of Technology.

Economics: Gary Chamberlain, Harvard University; John Geanakoplos, Yale University; Kenneth Rogoff, Princeton University.

Mathematics: David W. McLaughlin, New York University; Peter Sarnak, Princeton University; Karen Uhlenbeck, University of Texas at Austin.

Neuroscience: Darcy B. Kelley, Columbia University; Anthony Movshon, New York University; S. Lawrence Zipursky, University of California, Los Angeles.

Physics: Robert J. Birgeneau, Massachusetts Institute of Technology; Scott Tremaine, Princeton University; Frank Wilczek, Institute for Advanced Study.

FELLOWSHIP RECIPIENTS

Arizona, University of
Chemistry: Jacquelyn Gervay
Physics: Matthias Steinmetz

Baylor College of Medicine
Neuroscience: Michael C. Crair

Boston College
Chemistry: John T. Fourkas
Mark L. Snapper

Boston University
Economics: Stephen G. Donald

British Columbia, University of
Chemistry: David H. McConville

Brown University
Mathematics: Yan Guo
Physics: Xinsheng Ling

California Institute of Technology
Physics: Michael E. Brown

California, University of, Berkeley
Chemistry: James K. McCusker
Computer Science: Joseph M. Hellerstein
Economics: Aaron Edlin
Mathematics: Bjorn Poonen
Neuroscience: Yang Dan
Jack L. Gallant
Physics: Shamit Kachru

California, University of, Davis
Mathematics: Gregory J. Kuperberg

California, University of, Irvine
Mathematics: Panagiota Daskalopoulos
Ludmil Katzarkov
Neuroscience: Qun-Yong Zhou

California, University of, Los Angeles
Chemistry: Yves Rubin
Mathematics: Ming Gu
Neuroscience: Dean Buonomano

California, University of, San Diego
Chemistry: Patricia A. Jennings
Neuroscience: Yukiko Goda

California, University of, San Francisco
Chemistry: Thomas S. Scanlan

California, University of, Santa Barbara
Chemistry: Steven K. Buratto
Timothy J. Deming
Mathematics: Felix Otto

California, University of, Santa Cruz
Physics: Dennis Zaritsky

Chicago, University of
Economics: Casey B. Mulligan

Clark University
Physics: Arshad Kudrolli

Colorado, University of
Chemistry: Christopher N. Bowman

Cornell University
Computer Science: Gregory Morrisett
Neuroscience: Michael Spivey-Knowlton
Physics: Dong Lai

Dartmouth College
Computer Science: Daniela Rus
Neuroscience: Jennifer M. Groh

Duke University
Mathematics: Arlie Petters
Physics: Konstantin Matveev

Florida State University
Physics: Peng Xiong

Harvard University
Computer Science: Steven Jacob Gortler
Physics: Juan Maldacena

Illinois, University of
Chemistry: Yi Lu
Mathematics: Susan Tolman

Indiana University
Chemistry: David E. Clemmer
Mathematics: Matthew J. Gursky

Iowa, University of
Neuroscience: Ralph Adolphs

Johns Hopkins University
Mathematics: William P. Minicozzi
Neuroscience: Alfredo Kirkwood

Massachusetts Institute of Technology
Computer Science: Daniel Spielman
Madhu Sudan
Mathematics: Lars Hesselholt
Physics: Victoria M. Kaspi
Krishna Rajagopal
Washington Taylor

Massachusetts, University of
Chemistry: Vincent M. Rotello

Michigan State University
Chemistry: Marcos Dantus

Michigan, University of
Mathematics: Lizhen Ji

Minnesota, University of
Chemistry: J. Ilja Siepmann
Economics: Lee E. Ohanian

New York University
Mathematics: Yu Chen
Neuroscience: Eero Simoncelli

North Carolina, University of
Chemistry: Joseph M. DeSimone
Mathematics: Michael L. Minion

Northwestern University
Neuroscience: Catherine S. Wooley

Notre Dame, University of
Chemistry: Sharon Hammes-Schiffer
Physics: Peter Schiffer

Pennsylvania State University
Computer Science: Paul E. Plassmann

Pennsylvania, University of
Chemistry: Andrew Marshall Rappe
Neuroscience: Thomas D. Parsons

Princeton University
Computer Science: Jaswinder Pal Singh
Economics: Pinelopi K. Goldberg
Yacine Ait-Sahalia
Mathematics: George Pappas
Zoltan Szabo
Physics: Suzanne T. Staggs

Rice University
Computer Science: Sarita V. Adve
Alan L. Cox
Physics: Alexander J. Rimberg

Rochester, University of
Physics: Kevin Scott McFarland

Rockefeller University
Chemistry: Andrej Sali

Salk Institute
Neuroscience: Samuel L. Pfaff
Paul A. Slesinger

Stanford University
Mathematics: Kefeng Liu
Physics: Scott Thomas

SUNY-Stony Brook
Chemistry: Clare P. Grey
Physics: Igor Aleiner

Texas A&M University
Chemistry: Daniel Romo

Texas, University of
Mathematics: Fernando R. Villegas

Utah, University of
Chemistry: Sheila David
Mathematics: Wieslawa Niziol

Virginia, University of
Physics: Paul Fendley

Washington University
Neuroscience: Lawrence H. Snyder

Waterloo, University of
Physics: Donna T. Strickland

Wisconsin, University of
Economics: Derek A. Neal
Physics: Cary B. Forest

Yale University
Economics: Benjamin Polak
Physics: Sean E. Barrett

Doctoral Dissertation Fellowships — $1,425,000

The Sloan Dissertation Fellowship Program, established in 1984, assists doctoral candidates in two fields of traditional interest to the Foundation: economics and mathematics. Awards allow Fellows to concentrate on completing their doctoral research and writing the dissertation.

Fellowships have been received by 740 graduate students and have accounted for expenditures of over $16.3 million. In 1998, awards covering tuition and fees plus a stipend of $15,000 were made to 25 doctoral candidates in each field. Nominations were solicited from the heads of leading graduate departments of economics and mathematics. They were reviewed and final selections made by the following committees:

Economics: Avinash K. Dixit, Princeton University; Claudia Goldin, Harvard University; John B. Taylor, Stanford University.

Mathematics: Luis A. Caffarelli, University of Texas at Austin; Nicholas M. Katz, Princeton University; John Morgan, Columbia University.

FELLOWSHIP RECIPIENTS

Boston University
Economics: Eva Gutierrez

Brown University
Economics: Karsten T. Hansen

California Institute of Technology
Economics: Roberto Weber
Mathematics: Siddhartha Gadgil

California, University of, Berkeley
Economics: Eric Roth Emch
Mathematics: Matthew Baker
Sergey Barannikov

California, University of, Los Angeles
Economics: Maria B. Jerez
Mathematics: Chad Sprouse
Chiu-Kwong Wong

California, University of, San Diego
Economics: Aaron Smith

Chicago, University of
Economics: Tomoyuki Nakajima
Edward J. Vytlacil
Mathematics: Nathan Dunfield

Columbia University
Mathematics: Titus Teodorescu

Cornell University
Mathematics: Denis Hirschfeldt

Duke University
Mathematics: Benjamin McKay

Harvard University
Economics: Mark Gregory Duggan
Spencer Glendon
Mathematics: Mira Bernstein
Adam Logan

Illinois, University of, Chicago
Mathematics: Wai Yan Pong

Johns Hopkins University
Mathematics: Guoling Tong

Maryland, University of
Mathematics: Krishnan Shankar

Massachusetts Institute of Technology
Economics: Mark A. Aguiar
Esther Duflo
Emmanuel Saez
Mathematics: Daniel K. Dugger

Michigan, University of
Mathematics: Victor Scharaschkin
Jeremy Tyson

Minnesota, University of
Economics: Dirk Krueger
Mathematics: Hans Ulrich Walther

New York University
Economics: Levent Kockesen
Mathematics: Jinho Baik

Northwestern University
Economics: Elie T. Tamer

Pennsylvania State University
Mathematics: Dmitry Tamarkin

Princeton University
Economics: Piti Disyatat
David Sang-Yoon Lee
Ronny Razin
Mathematics: Jonathan P. Hanke
Alexandru Dan Ionescu
Jeff Alan Viaclovsky

Purdue University
Mathematics: Paul A. Loomis

Rochester, University of
Economics: Nezih Guner

Stanford University
Economics: Patrick J. Bayer
Monika Piazzesi
Michael J. Pries

Washington, University of
Economics: Ramanan Laxminarayan

Yale University
Economics: Federico M. Bandi
Mathematics: Maxim Vybornov

DIRECT SUPPORT OF RESEARCH

MOLECULAR EVOLUTION

This program, operated jointly with the National Science Foundation since 1994, is made up of two parts: postdoctoral research fellowships; and awards for young investigators in the early years of their independent research careers.

NSF/Sloan Postdoctoral Fellowships in Molecular Evolution

These fellowships are intended for young scientists who can benefit from the freedom to define and pursue their own research programs while developing relevant interdisciplinary knowledge and skills in a host laboratory or field station. Each two-year award carries a budget of $80,000 which provides a postdoctoral stipend, a special allowance for research materials, and university overhead of 15 percent. In 1998, the fifth year of this program, the following 18 awards were made. Citations are given in the form: name and sponsoring institution of the Fellow; sponsoring scientist; title of proposed research plan.

Lisa Borgeshi, University of California, Davis; Richard Grosberg; *Molecular evolution of self/non-self recognition in the invertebrate chordate botryllus schlosseri.*

Christopher Burge, Massachusetts Institute of Technology; Philip Sharp; *Evolution of sequences involved in RNA splicing.*

Chi-hua Chiu, Yale University; Gunter Wagner; *Evolution of hoxa-11 regulation and the fin-limb transition.*

John Deiner, University of California, Santa Cruz; Charles Wilson; *Structural and evolutionary studies of the ALU domain of the signal recognition particle.*

Amy Denton, University of California, Riverside; Michael Clegg; *The history of natural selection and other evolutionary processes in the chalcone synthase genese of two grass species.*

Edward Driggers, Stanford University; Alfred Spormann; *Directed evolution of enzymes that accelerate environmentally important reactions.*

Carolyn Ferguson, Washington University; Barbara Schaal; *Using gene genealogies to assess effects of hybridization between species of phlox plants in the Ozarks.*

Dawn Field, University of Oxford; E. Richard Moxon; *Adaptive evolution in a bacterial pathogen.*

Timothy Heuer, Massachusetts General Hospital; Jack Szostak; *Selection of protein molecules that bind biologically important small molecules: a study of functional and structural protein diversity and evolution.*

Stephen Irvine, Yale University; Frank H. Ruddle; *Gene regulation and evolution of the vertebrate jaw.*

Fredericka Kaestle, University of Michigan; Andrew Merriwether; *Y chromosome and mitochondrial DNA variation in the Pacific: evidence for prehistoric population movements.*

Yingquing Lu, Duke University; Marcy Uyenoyama; *Evolving genes of self-incompatibility in natural populations of solanaceous species.*

Bobbie McCaig, University of Georgia; Jeffrey Meagher; *Evolution of structural components of plants.*

Daniel Seufert, Pennsylvania State University; Billie Swalla; *Genes involved in tail development in marine invertebrates.*

Erik Shultes, Whitehead Institute for Biomedical Research; David Bartel; *Measuring the effects of natural selection on RNA structure.*

Mark Siegal, Stanford University; Bruce Baker; *Molecular evolution of the sex-determination pathway in insects.*

Jeffrey Streelman, University of New Hampshire; Thomas Kocher; *DNA simple sequence repeats as conduits of evolutionary change.*

Willie Swanson, Cornell University; Charles Aquadro; *Molecular evolution of reproductive genes: Drosophila male accessory gland proteins and their female receptors.*

Young Investigator Awards in Molecular Evolution

Each of these awards, $100,000 over a period of three years, is intended to support the research careers of newly-independent investigators in molecular evolution. In 1998, the fourth year of this program, a careful review of applications by an advisory committee led to the following five awards. Citations are given in the form: name of awardee, sponsoring institution and department; title of proposed research plan.

Hiroshi Akashi, University of Kansas, Department of Systematics and Ecology; *Population genetic tests of natural selection in molecular evolution.*

Hope Hollocher, Princeton University, Department of Ecology and Evolutionary Biology; *Developmental and evolutionary analysis of hybrid female sterility rescue between Drosophila melanogaster and Drosophila simulans.*

Paul Lewis, University of Connecticut, Department of Biology; *The structure of phylogenetic landscapes.*

Paul Sniegowski, University of Pennsylvania, Department of Biology; *Two experimental approaches to the evolution of mutation rates.*

Clifford Zeyl, Wake Forest University, Department of Biology; *Molecular mechanisms of evolutionary change in saccharomyuces cerevisiae.*

MOLECULAR EVOLUTION, OFFICER GRANT

Smith College $7,260
Northampton, MA 01063

Support for a symposium: Evolutionary Relationships Among Eukaryotes. Project Director: Assistant Professor Laura Katz, Department of Biological Sciences.

THEORETICAL BIOLOGY, TRUSTEE GRANT

Institute for Advanced Study $400,000
Princeton, NJ 08540

Known for its leading role in mathematics and physics research, the Institute is taking its first step into the biological sciences. The Foundation's grant helps match a contribution from a private individual for this new program in theoretical biology. The field chosen is immunology and related viral and prion medical research. The first appointment is the mathematician and biochemist Martin Novak who has led a group at Oxford, has developed close ties with experimental laboratories, and has contributed to the understanding of drug resistance in HIV-1 therapy and HIV-1 viral dynamics. It is hoped that the Institute's work will exhibit to the academic community the depth and variety of scientific and mathematical challenges in this field of theoretical biology and thus attract other researchers to develop an interest in applications of mathematics to immunology and medicine. Project Director: Dr. Phillip A. Griffiths, Director.

COMPUTATIONAL MOLECULAR BIOLOGY

Sloan/DOE Awards in Computational Molecular Biology

This postdoctoral fellowship program, a joint venture of the Sloan Foundation and the U.S. Department of Energy, provides an intensive experience in a molecular biology laboratory for computationally sophisticated young scientists. There is exceptional scientific potential in applying modern computational techniques to problems related to data arising from the study of human and other genomes. The program aims to increase the number of scientists possessing the cross-disciplinary skills needed to study these problems.

Each two-year fellowship award carries a total budget of $100,000, which includes stipends, benefits, research expenses, and institutional overhead. A careful review of applications in the third year of the program resulted in the following nine 1998 awards. Citations are given in the form: awardee; sponsoring senior scientist and institution; proposed research plan.

Voichita Maria Dadarlat; Carol B. Post, Purdue University; *Exploring the protein PVT conformational space through isothermal compressibility calculation.*

Marie Dannie Durant; Lee Silver, Princeton University; *Reconstructing chromosomal evolution in mice and humans.*

Susan K. Gregurick; John Moult, Center for Advanced Research in Biotechnology; *Ab initio protein tertiary structure prediction: comparative-genetic algorithms combined with graph theoretical methods.*

William Noble Grundy; Manuel Ares, Jr., University of California, Santa Cruz; *The computational discovery and modeling of introns.*

James Lyons-Weiler; Masatoshi Nei, Pennsylvania State University; *Processing signals in evolutionary molecular waveforms.*

Elena Rivas; Sean Eddy, Washington University, St. Louis; *Pseudoknot prediction in RNA secondary structure.*

Maria Celeste Sagui; Thomas A. Darden, National Institute of Environmental and Health Sciences; *Development of multigrid methods for molecular dynamics simulations of proteins.*

Felix B. Sheinerman; Barry Honig, Columbia University; *Systematic study of protein-protein complexes.*

Vesteinn Thorsson; Leroy Hood, University of Washington; *Protein modeling with hidden Markov models and analysis of gene networks.*

COMPUTATIONAL MOLECULAR BIOLOGY, OFFICER GRANTS

Mathematical Sciences Research Institute $20,400
Berkeley, CA 94720

Support for a conference on genomics. Project Director: Professor Richard Karp, Department of Computer Science, University of Washington, Seattle.

Princeton University $20,000
Princeton, NJ 08544

Partial support for workshops on DNA computing and on directed evolution. Project Director: Professor Laura Landweber, Chair, Department of Ecology and Evolutionary Biology.

ASTROPHYSICS, TRUSTEE GRANT

Institute for Advanced Study $125,000
Princeton, NJ 08540

Our understanding of the far reaches of the universe (and therefore far back in time) has only recently begun to be informed by experimental data. Terrestrial and space optical telescopes can penetrate to remote dim objects. Radio astronomy and microwave readings allow measurement to reach to within a short time after the big bang. Theoretical astronomers can now begin testing their conjectures about the origin and structure of the universe against these first sets of real data and can plan for the use of even larger flows of data in the next several years. This grant supports a Sloan Summit on Origins in which five of the world's leading theoretical astronomers will join John Bahcall, senior permanent member of the Institute, for a year of discussions and research. They will be joined by students, post-docs, and junior faculty from the Institute and neighboring institutions to add an educational element. Among the issues to be discussed are the origin of galaxies, active galactic nuclei, stars and planets, and of the universe itself. Project Director: John N. Bahcall, Professor of Natural Science.

LIMITS TO KNOWLEDGE, OFFICER GRANT

Florida Atlantic University $30,000
Boca Raton, FL 33431

For completing a book testing limits to knowledge of early Greek history. Project Director: Marjorie Peyton, Visiting Scholar, College of Arts and Letters.

MARINE SCIENCE, TRUSTEE GRANTS

The following grants are funded from an appropriation authorized by the Trustees for additional studies of various aspects of the feasibility of a proposed "Census of the Fishes." This comprehensive project would aim to assess and explain the global distribution and abundance of marine life. Were it to be undertaken, it could be expected to yield not only greatly increased scientific understanding of the oceans, but also information useful for the management of fisheries, marine pollution, and other ecological concerns. A brief description of each grant is given to indicate how it contributes to the continued exploration of the feasibility of this project.

Dalhousie University $24,000
Halifax, Nova Scotia

To assess what is known about diversity, abundance, and distribution of squids and related marine animals, and to create a possible data management framework. Project Director: Ronald K. O'Dor, Chair, Biology Department.

Environmental Defense Fund $30,000
New York, NY 10010

To provide environmental perspectives on a possible marine census. Project Director: Douglas Hopkins, Senior Attorney and Manager, Oceans Program.

National Fisheries Conservation Center — $10,000
Ojai, CA 93023

To assess and evaluate recently identified research priorities for stock information in U.S. commercial fisheries. Project Director: Dr. Brock Bernstein, President.

New England Aquarium — $30,000
Boston, MA 02110

To hold a workshop and prepare a report on issues relating to tagging of marine animals in connection with a possible marine census. Project Director: Gregory S. Stone, Director, Conservation Programs.

Rutgers University — $30,000
New Brunswick, NJ 08901

For exploration and development of databases on the benthic environment pertinent to a census of marine life. Project Director: J. Frederick Grassle, Director, Institute of Marine and Coastal Sciences.

University of California, San Diego — $30,000
La Jolla, CA 92093

For an exploratory meeting on partnerships for observations of the global oceans. Project Director: Dr. Charles F. Kennel, Director, Scripps Institution of Oceanography.

University of Southampton — $75,000
Southampton, UK SO17 1BJ

To form a study group and hold a workshop on a census of marine life. Project Directors: Professor John Shepherd, Director, Southampton Oceanographic Centre, and Dr. Colin Bannister, Centre for Environment, Fisheries and Aquaculture Science, Lowestoft Laboratory, Suffolk.

University of Washington — $34,849
Seattle, WA 98195

To conduct a workshop on the value of remote species identification techniques for a marine census. Project Director: Julia K. Parrish, Research Assistant Professor, Zoology Department.

OTHER SCIENCE, OFFICER GRANTS

International Institute for Applied Systems Analysis — $30,000
Laxenburg, Austria

For research and writing on the acquisition and operation of memories in an evolutionary context. Project Director: Cesare Marchetti, Institute Scholar.

National Academy of Sciences — $25,000
Washington, DC 20418

To fund the work of the Committee on Human Rights of the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine. Project Director: Carol Corillon, Director, Committee on Human Rights.

TRUSTEE GRANTS

During the past two years the Foundation made a series of grants to support the establishment of World Wide Web sites in the history of science and technology by individual historians based at universities and by six professional societies. The fundamental idea behind these projects was to experiment with the new Internet environment as a means of broadening access to a vast array of diverse primary sources, enabling many more people to participate in and contribute to the development of the historical record, and also creating new outlets for scholarly research.

The following seven grants extend this effort to additional professional societies and to organizations with special expertise in electrical engineering and computer science. The grant to Stanford University supports a conference planned for mid-1999 to bring together all the Sloan grantees as well as others concerned with use of the Web for the recent history of science and technology. The purposes of the conference are to share and evaluate experiences, and to chart future directions.

American Society for Microbiology **$122,000**
Washington, DC 20005

To establish a web site for the documentation of the recent history of microbiology. Project Director: William C. Summers, Professor of Therapeutic Radiology, Molecular Biophysics, and Biochemistry and Genetics, Yale University.

American Society for Virology **$128,000**
Milwaukee, WI 53226

To establish a web site for the documentation of the recent history of virology. Project Director: Professor Sandra Schlesinger, Department of Molecular Microbiology, School of Medicine, Washington University, St. Louis.

American University **$129,967**
Washington, DC 20016

To establish a web site for the documentation of the recent history of electrical engineering and computer science. Project Director: Thomas J. Bergin, Director, Computing History Museum.

Institute of Electrical and Electronics Engineers **$138,000**
Piscataway, NJ 08855

To establish a web site for the documentation of the recent history of electrical engineering and computer science. Project Director: Dr. Michael N. Geselowitz, Director, Center for the History of Electrical Engineering.

Smithsonian Institution **$136,275**
Washington, DC 20560

To establish a web site for the documentation of the recent history of electrical engineering and computer science. Project Director: Bernard S. Finn, Curator, Department of Electricity and Modern Physics.

Stanford University **$57,500**
Stanford, CA 94305

To plan and conduct a conference on the use of Internet sites for recording the recent history of science and technology. Project Director: Professor Timothy Lenoir, Program in History and Philosophy of Science.

University of California, Los Angeles **$124,000**
Los Angeles, CA 90095

To establish a web site for the Society for Neuroscience for the documentation of the recent history of neuroscience. Project Director: Lawrence Kruger, Professor of Neurobiology.

HISTORY OF SCIENCE AND TECHNOLOGY, OFFICER GRANTS

Herman H. Goldstine — $25,000
Bryn Mawr, PA 19010

For assistance in researching and writing a book about a seminal case in the history of the computer. Project Director: Herman H. Goldstine, Executive Officer, American Philosophical Society.

Michigan State University — $29,213
East Lansing, MI 48824

To prepare an historical account of the launching of the Minority Engineering Effort. Project Director: Dr. Percy Pierre, Professor of Electrical Engineering.

Rockefeller University — $30,000
New York, NY 10021

Support to assist in the creation of a web archive. Project Director: Joshua Lederberg, University Professor.

Stanford University — $27,500
Stanford, CA 94305

For the preservation and dissemination of the five original websites of the Science and Technology in the Making project. Project Director: Professor Timothy Lenoir, Program in History and Philosophy of Science.

STANDARD OF LIVING AND ECONOMIC PERFORMANCE

INDUSTRIES

INDUSTRY CENTERS, TRUSTEE GRANTS

University of California, San Diego — $1,750,000
La Jolla, CA 92093

This grant supports the establishment of the Center for the Study of the Information Storage Industry. The Center will continue and broaden the work done at UC, San Diego under a 1995 grant for research on globalization in the computer disk file industry. The computer storage industry is a $55 billion segment within the computer industry. Its largest portion, the hard-disk drive segment, is strongly driven by technological advances and is dominated by U.S. firms. However, virtually all final assembly manufacturing is in Southeast Asia. The new Center will continue research on patterns of globalization within the storage industry with special emphasis on Japan, the U.S., and Southeast Asia. Studies will be conducted on the role of regulation and public policy in driving globalization, and on trends and best practices in fast product development and release to manufacturing. Interaction with researchers at Emory University and the University of Singapore, developed during the earlier grant, will be expanded. Project Directors: Professors Peter A. Gourevitch and Roger E. Bohn, Graduate School of International Relations and Pacific Studies.

Harvard University — $1,324,411
Cambridge, MA 02115

MPC Corporation — $935,000
Pittsburgh, PA 15213

University of Michigan — $1,800,000
Ann Arbor, MI 48109

University of Minnesota — $1,500,000
Minneapolis, MN 55455

These grants renew support for the Managed Care Industry Research Center (Harvard), the Center for Competitiveness in the Steel Industry (MPC), the Trucking Industry Program

(Michigan), and the Retail Food Industry Center (Minnesota). Each of the centers has made direct contacts with companies and people in its industry, has assembled data, produced important research results, involved faculty and students, developed collaborations with different segments of the industry, and will build on this work in the renewal period.

New topics to be studied at Harvard include the emerging labor force and human resource issues in managed healthcare, the expanding role of provider-sponsored organizations, and the role of information technology in managing health care.

The steel industry center, located at Carnegie Mellon University and the University of Pittsburgh, will study issues of supply of raw materials and production machinery. Key concerns are the supply of scrap iron and the availability and cost of electrical energy for mini-mills, which are now the growth sector of this industry and in which U.S. plants are world leaders. The human resource research program will broaden to study labor issues in the industry and the current role of unions. Wages and overall benefits will also be a focus.

The University of Michigan Trucking Industry Program plans to extend its on-the-road survey of drivers to other regions of the country. Analysis of the resulting data is expected to produce a comprehensive portrait of truck drivers. The collected data include: work histories; job and trip characteristics; information on compensation, regulations, and use of technology; views on employers and unions; and future opportunities in the industry. Research on innovation, new technology, and operations will be continued and extended. A benchmarking study of less-than-truckload carriers has ended its pilot phase and will become a full scale survey. In addition, a graduate transportation curriculum will be initiated at the University of Michigan for which the data and work of the Center will form an essential base.

The Minnesota Retail Food Industry Center plans a major survey of 500 supermarkets based on its observations and data gathering in a preliminary study. This will be an initial step in a longitudinal study to explore such issues as management training and effectiveness, technology use, labor practices, marketing, supplier relations, financial results, and measures of customer satisfaction. The center will also look at both the efficiency and safety aspects of the distribution chain from farm to customer, will study food retailing in other countries, and will initiate research on restaurants, the other major retail food source. Project Directors: Professor Joseph P. Newhouse, Director, Division of Health Policy Research and Education (Harvard); Professor Richard J. Fruehan, Co-Director, Center for Iron and Steelmaking Research, Carnegie Mellon University (MPC); Professor Chelsea C. White, III, Department of Industrial and Operations Engineering (Michigan); Professor Jean D. Kinsey, Department of Applied Economics (Minnesota).

INDUSTRY CENTERS, OFFICER GRANTS

Massachusetts Institute of Technology **$20,000**
Cambridge, MA 02139

To help support promotion of the book, *The Productive Edge: How U.S. Industries are Pointing the Way to a New Era of Economic Growth*. Project Director: Richard K. Lester, Professor of Nuclear Engineering, and Director, Industrial Performance Center.

University of California, Berkeley **$28,500**
Berkeley, CA 94720

Support for a study of technological discontinuities. Project Director: Michael Borrus, Co-Director, Berkeley Roundtable on the International Economy.

University of Minnesota **$30,000**
Minneapolis, MN 55415

Support for writing and other dissemination for the Flat Panel Display Industry Study. Project Director: Assistant Professor Stefanie Ann Lenway, University of Houston.

HUMAN RESOURCES/JOBS/INCOME, TRUSTEE GRANTS

Georgia Tech Foundation **$243,800**
Atlanta, GA 30332

The research supported by this grant will examine how specific technologies, mainly information technologies, have altered the organization of work and changed the skills

required of workers in the paper products industry. Six plants will be studied, paired by products, so that different organizational and human resource management plans and styles can be compared. Interviews will be carried out with business and operations managers, process engineers, and manual workers. At each plant, personnel and business data will be used to study changes in promotion opportunities, new-hire qualifications, and job tenure, as well as product demand, competitive pressures, and other factors that have influenced the introduction of new technologies. Assistance from the Institute of Paper Science and Technology, the industry's national technical center, located at Georgia Tech, has been arranged. Project Director: Steven P. Vallas, Associate Professor of Sociology.

Industrial Relations Research Association **$239,200**
Madison, WI 53706

The Sloan Human Resources Network, centered at MIT, consists of human resource and labor economics academics. The Network has organized a number of workshops, some on issues that arose out of work at Foundation-supported industry centers. Observations and data obtained directly from companies, usually organized by industry, have been central in most Network studies. A number of books have been published as a result of Network workshops. This grant will support moving the Network into the Industrial Relations Research Association, the professional society whose interests and membership are closest to that of the Network. Project Director: Thomas A. Kochan, Professor of Management, Massachusetts Institute of Technology.

Massachusetts Institute of Technology **$220,709**
Cambridge, MA 02139

This grant supports a set of studies of how computers affect skills in certain businesses. Case studies, one in hospitals that use computerized nurse stations and another with a retail bank's customer representatives, will explore the effect of computers on output and quality of service, efficiency of workers, job requirements, and on development of new products or services. The bank study will also look at the impact of electronic retail banking and web-based sales services. Each of these studies will examine training, recruiting, and screening of new hires. Project Director: Professor Frank Levy, Department of Urban Studies and Planning.

GLOBALIZATION, TRUSTEE GRANT

Columbia University **$427,374**
New York, NY 10027

A group of Columbia University researchers will study the globalization of the banking industry. Changes in location of business operations (back office, currency trading, product development, marketing, investment) will be explored. The work will look at changing technological capabilities, cost reduction, market proximity, regulatory requirements, availability of suitable people, and other factors. It will also study changes in the number and quality of jobs and compensation at the new and old locations. The group will be able to apply to the globalization study their firsthand knowledge of and contact with a set of American and foreign banks obtained from work on an earlier grant that studied the relationship between technology, mostly computers, and productivity in the service sector. Project Director: Associate Professor Michael van Biema, Graduate School of Business.

OFFICER GRANT

University of California, Irvine **$30,000**
Irvine, CA 92697

Support for a study of computer industry globalization in Latin America. Project Director: Kenneth L. Kraemer, Director, Center for Research on Information Technology and Organizations.

ROLE OF THE CORPORATION, TRUSTEE GRANTS

Claremont Graduate University **$120,000**
Claremont, CA 91711

This grant supports the writing of a popular history of the American corporation by Jack Beatty, senior economics editor at The Atlantic Monthly and author of *The World According to Peter Drucker*. The book, an anthology of readings, will cover the corporate foundations of America from 1600 to the modern period. It will chart the rise of the American corpora-

tion and show its centrality in American life. Aimed at a serious lay reader, it will examine the role of companies not just in terms of economic growth, but also in terms of people and the nation's wider political and societal contexts. Project Director: Eric Pollard, Director, Peter F. Drucker Archives.

Economic Policy Institute **$115,900**
Washington, DC 20036

Two main activities will be carried out under this grant. EPI will organize a conference for union and academic researchers from a variety of disciplines on the role of employee organizations within the corporation. How to contribute most effectively to the employee voice within the corporation, how employee participation in corporate governance as part of labor management partnerships has worked, and what role unions and workers should play in the allocation of funds contributed by employees to pension funds are among the questions to be addressed. EPI will also prepare a baseline literature survey of what is known about the effect on share price, and on other financial measures of corporate success, of such corporate policies as investments in training, downsizing, high performance workplace practices, compensation structures, and environmentally motivated investment. Project Director: Dr. Eileen Appelbaum, Associate Research Director.

George Washington University **$215,000**
Washington, DC 20052

Much recent scholarly research on topics related to the role of the corporation has been produced in law schools and has been based primarily on an economic approach to legal analysis. As a means of broadening this approach, an intensive summer program will be organized to expose participants not only to economics, but also to the important ideas from other disciplines such as sociology, psychology, politics, history, etc. that could be incorporated into their legal work. Scholars and those involved in making legal decisions might then be able to deal in a more balanced way with concerns and motivations beyond individual wealth maximization, and to develop more reasonable expectations about how people involved in legal disputes might behave under different circumstances. Conferences will also be held to discuss papers produced by those writing in this nontraditional vein. Project Director: Professor Lawrence E. Mitchell, School of Law.

Stanford University **$131,583**
Stanford, CA 94305

After a company meets all its contractual obligations, the return to the owners of common stock depends solely on what's left over, or the residual. Because of this so-called residual claim of the shareholders, only common stock owners are thought to have the incentive to make decisions that maximize a firm's value. Corporate law has evolved to give control, exercised through voting rights, only to them. However, scholars have argued that other stakeholders (for example, preferred shareholders or employees who develop firm-specific human capital) are often also important residual claimants. Yet their residual interest is not linked to control. Why different participants in the firm, particularly shareholders and employees, have the control rights they have, and the effect of these arrangements on economic efficiency, will be explored in this project. Project Director: Bernard S. Black, Professor of Law.

University of Wisconsin **$196,530**
Madison, WI 53706

Corporations were very different in the 1800's and this project will describe their early characteristics and historical development. Preliminary research on the comparative history of corporate charters and incorporation in the U.S., Britain, France, and Germany during the nineteenth century, supported by a Foundation officer grant, will be expanded to study original source materials in all four countries. Understanding why rates of incorporation were so different among these industrializing countries and how and why patterns of corporate governance changed are aims of this research. Corporate charters, incorporation laws and handbooks, and records of individual firms will be compiled in a web-accessible database as a means of stimulating further research into the history of corporations. Project Director: Colleen A. Dunlavy, Associate Professor of History.

ROLE OF THE CORPORATION, OFFICER GRANTS

Brookings Institution $30,000
Washington, DC 20036

Study of how corporate investments in human capital and other intangible assets generate economic wealth. Project Director: Margaret M. Blair, Senior Fellow, Economic Studies Program.

Centre for Development and Enterprise $30,000
Johannesburg, South Africa

To support, for comparison with the U.S., a workshop on the role of the corporation in South Africa. Project Director: Ann Bernstein, Executive Director.

Claremont Graduate University $30,000
Claremont, CA 91711

To research and write a full proposal for an anthology of writings on the rise of the corporation. Project Director: Eric Pollard, Director, Peter F. Drucker Archives.

Georgetown University $30,000
Washington, DC 20057

To support an academic conference on team production in business organizations. Project Director: Lynn A. Stout, Professor of Law.

Harvard University $22,000
Cambridge, MA 02138

Support to do research and write a book on Japanese and U.S. corporate governance. Project Director: J. Mark Ramseyer, Mitsubishi Professor of Japanese Legal Studies, Harvard Law School.

Massachusetts Institute of Technology $30,000
Cambridge, MA 02139

To support preliminary work on employees as stakeholders in corporations. Project Director: Thomas A. Kochan, Professor of Management.

Persephone Productions, Inc. $30,000
Arlington, VA 22201

To produce and air a short television piece on the role of the corporation. Project Director: Bonnie G. Erbe, Chief Executive Officer.

University of Colorado $30,000
Boulder, CO 80309

To conduct an exploratory study of the meaning and importance of firm survival. Project Director: Sanjai Bhagat, Professor of Finance.

ECONOMICS RESEARCH, OFFICER GRANT

University of Maryland Foundation $30,000
Adelphi, MD 20783

To explore the feasibility of a needs-based measure of standard of living. Project Director: Jerome M. Segal, Research Scholar, Institute for Philosophy and Public Policy.

UNIVERSITIES, TRUSTEE GRANTS

Bowdoin College $46,575
Brunswick, ME 04011

As one part of its program to understand how institutions of higher education actually work, the Foundation has supported a project to simulate their operation via the computer. An interactive game, "CyberCampus," has been developed and is expected to be marketed sometime in 1999. This project supports research on the model underlying CyberCampus in order to explore its behavior from the perspectives of economics and game theory and perhaps to suggest possible refinements. Publications in the technical literature should serve to bring this fresh style of analysis of higher education based on simulation to a wider audience. Project Director: Assistant Professor Andreas Ortmann, Department of Economics.

University of Pennsylvania $13,536
Philadelphia, PA 19104

This grant, from an appropriation approved by the Trustees, supports the provision of data on American universities as part of a Foundation project on the development of a computer-based game simulating the workings of a university. Project Director: Robert Zemsky, Director, Institute for Research on Higher Education.

UNIVERSITIES, OFFICER GRANTS

University of Michigan $10,000
Ann Arbor, MI 48109

To prepare a brief report on issues of new information technologies and intellectual property created at universities. Project Director: Professor Bernard A. Galler, Electrical Engineering and Computer Science Department.

University of Virginia $30,000
Charlottesville, VA 22903

To conduct a preliminary study of the for-profit segment of U.S. higher education. Project Director: David W. Breneman, University Professor and Dean, School of Education.

ASSESSMENT OF GOVERNMENT PERFORMANCE, TRUSTEE GRANTS

Fund for the City of New York $2,921,000
New York, NY 10013

With a substantial 1995 Foundation grant, the Fund for the City of New York set out to develop methodologies that provide reliable, nonpartisan, and objective assessment of the effectiveness of New York City government agencies. They selected target areas based on what residents and small business owners identified as of critical importance. An initial street rideability assessment has been completed and is to be published. Study of the street-level environment — 20 items are considered, including the condition of street lights, traffic signals, fire hydrants, abandoned buildings, vacant lots, and graffiti — is ongoing. An assessment of gatekeeping functions of City agencies will rate the accessibility, courtesy, knowledgeability, responsiveness, and timeliness of agencies' initial interactions with the public. With this renewal grant, the Fund will continue this work at an increased pace. It will conduct assessments and issue reports on road rideability and on citizen ratings of the gatekeeping performance of city agencies annually. Street-level environment data will be collected several times a year. The Fund will also initiate work assessing public safety matters. The budget includes funds to create and maintain an internet presence, to create a library and resource center, to host a meeting of grantees in this program, and for a large-scale dissemination effort. Project Director: Barbara Cohn, Vice President.

New York Public Interest Research Group Fund $369,385
New York, NY 10007

A 1996 grant supported the NYPIRG Fund's Straphangers Campaign to launch a new transit performance measurement project directed at the New York City public transit

system. Reports rating subway and bus lines, assessments of subway announcements and car cleanliness, and a report on public telephones in the subways have been well received by the public and have influenced investment allocations of the Metropolitan Transit Authority. This new grant will fund an expanded program for another two years, including some additional items yet to be selected, e.g., use of MetroCards, subway station temperature and humidity, and service on selected crosstown Manhattan buses. A fax broadcast network for transit service alerts will be created. The project website will be enhanced. The project will hold a meeting of representatives of organizations around the country to share what they have done and encourage others to initiate similar assessment programs. Project Director: Eugene Russianoff, Senior Attorney.

Urban Institute **$260,000**
Washington, DC 20037

The Foundation's program on results-oriented assessment of government performance includes support of administrative mechanisms by which municipalities could be encouraged or required to adopt and involve citizens in performance assessment. This grant will support an exploration of ways state governments could promote such policies. States have many options to encourage, and even to require, municipalities within their jurisdiction to use citizen-based performance assessment. The project will identify what actions various states have taken, determine how effective these have been, and develop methods states could use to require performance assessment and citizen involvement. A report will be issued summarizing current state legislation, results at the local level, and recommendations for state actions to expand the use of citizen-based performance assessment. Project Director: Blaine Liner, Director, State Policy Center.

ASSESSMENT OF GOVERNMENT PERFORMANCE, OFFICER GRANT

Citizens League **$30,000**
Minneapolis, MN 55415

To study ways to ensure effective local government performance assessment with citizen involvement. Project Director: Dr. Lyle Wray, Executive Director.

DUAL-CAREER MIDDLE-CLASS WORKING FAMILIES

CENTERS ON WORKING FAMILIES, TRUSTEE GRANT

University of Michigan **$2,862,628**
Ann Arbor, MI 48109

This grant supports the establishment of a fourth Sloan Center on Working Families. The three existing centers, at Cornell University, the University of Chicago, and the University of California at Berkeley, are directed by sociologists who primarily focus their research efforts on behavioral changes to middle class patterns of work and family. The University of Michigan center will be led by an anthropologist, will focus on the cultural aspects of contemporary American families, and will have its methodological orientation in ethnography. Activities organized by this new center will be concerned with (1) ethnographic investigations into the changing meanings of work and family as cultural categories; (2) the processes of stress and reconfiguration of meanings created by the increasing divergence of older cultural models; (3) the new rituals in the home and workplace in response to these changes; and (4) the cultural meanings of individual identity in the context of these changes. Project Director: Thomas E. Fricke, Associate Research Scientist, Survey Research Center, Institute for Social Research, and Associate Professor of Anthropology.

CENTERS ON WORKING FAMILIES, OFFICER GRANTS

Boston College **$29,998**
Chestnut Hill, MA 02167

Support for Sloan Foundation researchers to attend the conference to establish the International Work/Life Network. Project Director: Dr. Marcie Pitt-Catsouphes, Director, Center for Work and Family.

Cornell University **$18,807**
Ithaca, NY 14853

Support for a two-day meeting for Sloan Work-Family grantees. Project Director: Dr. Phyllis Moen, Ferris Family Professor of Life Course Studies.

Wellesley College **$6,300**
Wellesley, MA 02181

Additional support for the conference: The Future of Work and Family. Project Director: Dr. Nancy Marshall, Associate Director, Center for Research on Women.

ETHNOGRAPHIES OF EVERYDAY LIFE, TRUSTEE GRANTS

Colorado State University **$206,700**
Fort Collins, CO 80523

Much of the Foundation-supported research on the everyday lives of dual-career families has focused on the strains and stresses experienced by these families as two people try to manage not only two work positions but also the third job of taking care of the family. Some of this research has begun to identify strategies working families are using to handle their multiple responsibilities. This project aims to discover the qualities within middle-class, dual-earner families that promote their resilience, as well as features within their workplaces that support or facilitate this resilience. Detailed interviews will be conducted with one hundred couples who consider themselves successful and satisfied in blending their work and family responsibilities. Project Director: Dr. Toni Zimmerman, Human Development and Family Studies.

San Jose State University **$342,801**
San Jose, CA 95172

This project involves three San Jose anthropologists in a two-year intensive ethnographic field study of the everyday lives of middle-class two-career families. It will identify (1) dimensions of work; (2) how they affect family life; (3) the facets of family affected; (4) the processes by which families manage the exigencies of work; and (5) how elements of family life are exported from home into the workplace. The project will pay attention to the role of technology in mediating work/family relationships, as well as the significance of cultural variations in family backgrounds. Project Director: Charles N. Darrah, Associate Professor and Chair, Department of Anthropology.

ETHNOGRAPHIES OF EVERYDAY LIFE, OFFICER GRANT

American Anthropological Association **$30,000**
Arlington, VA 22203

To contribute to legitimizing the study of middle-class working families as a subject within anthropological research. Project Director: Dr. Susan Skomal, Managing Editor, *Anthropology Newsletter*.

ALTERNATE WORKPLACE STRUCTURES, TRUSTEE GRANT

University of Iowa **$240,999**
Iowa City, IA 52242

Past research has concentrated on the effects of family-friendly employment conditions on business. This project will assess the effects on the family. Family-friendly policies include flexible schedules, telecommuting, and part-time work arrangements. The project will determine the impact of family-sensitive employer policies on job mobility and wage growth over time, and the effects of such policies on the parenting practices and emotional well-being of the mothers and their children. The project will study 325 women first interviewed when employed and pregnant in 1991-2, and subsequently interviewed when their children were six and twelve months old. By gathering retrospective data, project researchers will be able to assess the effects of family-friendly policies on the women, their careers and earnings, their children's well being, and the effects on their families over a period of seven years. Project Director: Professor Jennifer Glass, Chair, Department of Sociology.

ALTERNATE WORKPLACE STRUCTURES, OFFICER GRANT

Macquarie University **$30,000**
New South Wales, Australia

Support to write a monograph and an article on effective business-based work and family strategies. Project Director: Associate Professor Graeme Russell, School of Behavioural Sciences.

PUBLIC UNDERSTANDING OF WORKING FAMILIES, TRUSTEE GRANTS

Families and Work Institute **$131,000**
New York, NY 10001

The Institute conducted its first National Study of the Changing Workforce in 1992 and the second in 1997. A third is scheduled for 2002. These surveys address issues relating to both work and family. This grant will enable the Institute to make the data from these surveys available to the research community (in universities, government, corporations, and other organizations) and to involve researchers who use these data in shaping the next survey questionnaire. Project Director: James T. Bond, Vice President

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WNYC Radio **$244,000**
New York, NY 10007

This project supports WNYC in extending its coverage of issues faced by working families. Additional news stories will be produced for broadcast on *Morning Edition* and national satellite distribution. Related commentaries will be arranged with WNYC's *On the Line* and *New York & Company*, and National Public Radio's *On the Media*. Two documentaries will also be produced for local distribution and national distribution through a collaboration with Minnesota Public Radio. WNYC's website will be expanded. Project Director: Dean Cappello, News Director.

PUBLIC UNDERSTANDING OF WORKING FAMILIES, OFFICER GRANT

Institute for Women's Policy Research **$29,992**
Washington, DC 20036

Support to write a monograph on conflicting values regarding working mothers. Project Director: Dr. Diana Zuckerman, Director of Research.

EDUCATION AND CAREERS IN SCIENCE AND TECHNOLOGY

EDUCATION FOR SCIENTIFIC AND TECHNICAL CAREERS

INFORMATION ABOUT CAREERS, TRUSTEE GRANTS

Commission on Professionals in Science and Technology **$344,086**
Washington, DC 20005

This grant supports the following activities to be carried out over a period of three years: development of a database on scientists and engineers in the U.S. workforce designed to be accessible to non-experts seeking insights into career trends and prospects; preparation of reports on supply and composition of scientific and engineering professionals, and on current demand; workshops on topics such as emerging fields and changing career paths in science and engineering, and employment outcomes for holders of science and engineering master's degrees; and a workshop designed to bring together grantees, government agencies, educational institutions, professional societies, graduate student and postdoc associations, and others interested in understanding what is now known about recent changes and trends in careers in science and engineering. Project Director: Dr. Catherine D. Gaddy, Executive Director.

American Institute of Mining, Metallurgical, and Petroleum Engineers, **$112,000**
New York, NY 10016

American Institute of Mining, Metallurgical, and Petroleum Engineers **$90,199**
New York, NY 10016

In recent years, grants have gone to nine professional societies to prepare videotapes, CD-ROMs, websites, and print materials designed to provide information about the careers, the nature of work, and the daily work life in mathematics, physical sciences, and engineering. This information has been packaged into a collection known as the Sloan Career Cornerstone Series. These two grants support a variety of efforts to enhance institutional and public awareness of these materials through advertising, conference exhibits, mailings, and other publicity and marketing activities. Project Director: Nellie E. Guernsey, Acting Executive Director.

American Geological Institute $20,000
Alexandria, VA 22302

American Institute of Chemical Engineers $15,000
New York, NY 10017

American Society of Mechanical Engineers $13,500
New York, NY 10017

These three grants, funded from an appropriation approved by the Trustees, provide support for making revisions in the careers videotapes prepared by the professional societies as part of the Sloan Career Cornerstone Series. Project Directors: Christopher Keane, Research Specialist, AGI; Patrick Amaral, Career Services Associate, AICE; Thomas Perry, P.E., Director, Engineering Education, ASME.

INFORMATION ABOUT CAREERS, OFFICER GRANTS

Connecticut Technology Council $30,000
Hartford, CT 06103

To create a system to match student interns with companies in Connecticut. Project Director: Laura Kent, Executive Director.

Minerals, Metals and Materials Society $30,000
Warrendale, PA 15086

Support to create and maintain a central website for the Sloan Careers Cornerstone Series. Project Director: Professor Gerald L. Liedl, Chairman, Department of Materials Engineering, Purdue University.

RETENTION, TRUSTEE GRANTS

American Institutes for Research in the Behavioral Sciences $3,000
Washington, DC 20007

This grant, from an appropriation approved by the Trustees, supports a publication on the subject of the causes and consequences of graduate student departure from doctoral programs without completing a degree. Project Director: Dr. Barbara E. Lovitts, Research Analyst, Pelavin Research Center.

University of Maryland Baltimore County $200,000
Baltimore, MD 21228

A Foundation 1995 grant to the University supported a study of the decisions of African American and Hispanic undergraduate students concerning their choice of major. The sample consisted of students with high aptitude for mathematics, science, and engineering who did not major in these fields. It excluded students who started as majors and either persisted or subsequently switched to other majors. The present grant supports an extension of the study to include 120 additional students from these two groups. Project Director: Dr. Shirley Vining Brown, Senior Research Scientist.

RETENTION, OFFICER GRANT

University of Virginia $8,000
Charlottesville, VA 2906

To fund research costs for a study of structural reasons for gender differences in attrition from computer science. Project Director: Associate Professor Paul Kingston, Chairman, Sociology Department.

NEW MASTER'S DEGREES, TRUSTEE GRANTS

Michigan State University $400,000
East Lansing, MI 48824

University of Arizona $400,000
Tucson, AZ 85721

University of Wisconsin $400,000
Madison, WI 53706

These grants are part of the Foundation's program to encourage the development of a new type of master's degree in the sciences that equips people for work outside academia. Michigan State University plans new MS degree programs in Computational Chemistry, Integrated Pest Management, and Applications of Physics: Modeling and Simulation. In addition, all students will take one common course each semester in a 4-course sequence developed around basics of business, law and regulation, and research management. The University of Arizona will organize professional master's degree programs in Applied Biosciences, Applied Physics, and Mathematical Sciences. Students in these and other science MS programs will take new courses in computing and modeling as well as a cluster of skills-oriented modules covering basics of business administration, regulation, intellectual property rights, and communication skills. The University of Wisconsin will pilot seven new degrees, including master's programs in Environmental Modeling, Biomedical Informatics, and Computational Science. Seminars on professional development are planned and a faculty advisor on career issues will be assigned to each student. Project Directors: Estelle McGroarty, Associate Dean for Student and Academic Affairs, College of Natural Sciences, Michigan State; Eugene H. Levy, Dean, College of Science, Arizona; Dr. R. Timothy Mulcahy, Associate Dean, The Graduate School, Wisconsin.

LEARNING OUTSIDE THE CLASSROOM, TRUSTEE GRANTS

Association of Independent California Colleges and Universities $250,000
Sacramento, CA 95814

This grant supplies funds for the beginning stage of the creation of the California Virtual University. CVU is designed to make all of California's distance education resources available to learners anywhere in the state, and beyond. The strategy is to take whatever distance education is offered by California colleges and universities, organize it in an on-line web-based catalog, and make it available through a convenient interface. Registration, books, and supplies will be accessible through an on-line catalog. Courses and programs leading to degrees and certificates will be the responsibility of the individual institutions listed in the catalog. The CVU's business plan expects by year five to have 240 participating institutions of higher education and, based on revenues from fees to participating campuses, corporate sponsorship, and sales of books and materials, to be self-sufficient by its second year of operation. Project Director: Dr. Stanley Chodorow, CEO, California Virtual University.

Council for Adult and Experiential Learning $500,000
Chicago, IL 60604

A prior grant supported planning activities by CAEL for a new Associate of Arts and Sciences degree for technicians and other front-line workers in telecommunications. The telecommunication industry employs over a million people in the U.S. and is changing under the impact of new technologies and other forces. Employees would benefit from education that better positions them for the new environments in which they will be working. Industry companies and unions cooperated in the development of the degree program. With this new grant, CAEL will implement the newly-defined Associate degree by identifying institutions to provide the courses and grant the degree, and by arranging for publicity, marketing, on-line registration, tuition collection, and other student support functions. Project Director: Pamela Tate, President.

Michigan State University $112,000
East Lansing, MI 48824

A 1996 Foundation grant supported the development of an on-campus asynchronous learning network (ALN) for large physics classes. Consisting of an on-line system for homework and quizzes, and an on-line computer conferencing system for student-to-student discussions about assignments and for interaction with teaching assistants, the resulting ALN produced improved student outcomes. This new grant will allow for workshops to get new faculty involved. Adjustments will be made in conferencing and grading software, as well as in the instant feedback software, in order to improve ease of use and accommodate additional disciplines. Project Director: Michael Thoennessen, Professor of Physics and Astronomy.

Northern Virginia Community College $300,000
Annandale, VA 22003

Two prior grants enabled NVCC to convert their entire course sequence for the A.A.S. degree in Engineering into an asynchronous learning network (ALN) format. This grant supports the conversion of two additional Associate degrees, in Information Systems Technology and Business Management, into an ALN. These degrees are among the most popular at NVCC and it is expected that the ALN versions will attract large enrollments. Beyond the two new ALN degree programs, a portion of the grant will be used to support the creation of about a dozen on-campus ALN courses. This will enlarge the pool of faculty with ALN experience, making it easier to expand the ALN menu of courses in future years. Project Director: Dr. John Sener, Instructional Technologist, Extended Learning Institute.

Saint Joseph's College $280,000
Standish, ME 04084

This college enrolls about 1500 students in their campus programs, and about 4000 adults in 50 states and 23 countries who are pursuing associate's, bachelor's, and master's degrees and certificates through correspondence. The vast majority of the off-campus students are in health-care fields. This grant will enable the college to convert a part of this outreach program into an asynchronous learning network (ALN) format. Sixty courses will be reorganized into an ALN, and six degree and three certificate programs will be offered in this manner. This new ALN program will be exclusively for health professionals, offering degrees such as a B.S. in Long-Term Care Administration, an M.S. in Health Services Administration, and a certificate in Dental Administration. Project Director: Susan Nesbitt, Associate Dean for Technology.

Stanford University $450,000
Stanford, CA 94305

Stanford's Instructional Television Network started almost 30 years ago and today offers 250 graduate courses leading to both master's degrees and certificates. Current enrollment is over 6000, mostly from the Silicon Valley area. This grant supports the development of a full master's degree in Electrical Engineering (Telecommunications) in an asynchronous learning network form. Some students will enroll in a companion certificate program requiring the completion of only five courses. Stanford's system involves video-on-demand lectures coupled with asynchronous computer-networked communication between students and instructors. A total of 30 courses will be offered on-line as a result of this grant. Project Director: Dale Harris, Professor and Executive Director, Center for Telecommunications.

University of Illinois $750,000
Urbana, IL 61801

Foundation support over the years has led all three campuses of the University (at Urbana, Chicago, and Springfield) to become active centers of asynchronous learning network development. An all-university center for this work is UI-OnLine, set up in 1997, and growing rapidly. In 98-99, 160 courses will be offered as part of UI-OnLine and enrollments of more than 4000 students are expected. This grant, together with generous state funding, will allow UI-OnLine to undertake a large-scale expansion. It is planned to add over 400 courses, to include 20 degree and certificate programs, and to enroll as many as 15,000 university students by the year 2002. Project Director: Dr. Burks Oakley, Associate Vice President for Academic Affairs and Director, UI-OnLine.

University of Illinois $600,000
Champaign, IL 61820

With a 1994 Foundation grant, the University set up the Sloan Center for Asynchronous Learning Environments (SCALE) to serve as a focus for ALN educational activities. SCALE has drawn faculty representing many disciplines into learning about ALNs and developing courses in this format. SCALE faculty have begun to explore ways in which "efficiencies" can be achieved through ALNs, e.g., in high-enrollment courses where a sufficient number of teaching faculty is not available and where improvements in learning outcomes in the face of large faculty/student ratios would be significant. With this grant SCALE will explore pedagogical approaches for ALN teaching to make it easier for faculty to develop and teach ALN courses, and will continue explorations into efficiencies resulting from ALNs. Project Director: Professor Lanny Arvan, Department of Economics.

Vanderbilt University $264,000
Nashville, TN 37235

Vanderbilt University $26,900
Nashville, TN 37235

Both these grants, made from an appropriation approved by the Trustees, support outreach projects for asynchronous learning network (ALN) activities. The first grant supports continuation and expansion of the web site, www.aln.org, established at Vanderbilt to serve as a resource for those interested in teaching through ALNs. The site features an electronic journal, a magazine, discussion groups, workshops for those desiring training in ALN pedagogy, and advertising and registration for the annual ALN conference. The smaller grant supports a workshop held prior to the start of the ALN conference. Project Director: John Bourne, Professor of Electrical and Computer Engineering.

Western Governors University $250,000
Salt Lake City, UT 84180

This university, conceived in 1995 by the governors of 18 western states, has passed through design and prototyping stages and is on its way to full implementation as a

private institution. It plans to have no faculty and will use various kinds of televised instruction and independent study via videotape, CD-ROM, and materials published on the web. WGU will act as a central conduit for courses and degrees offered by institutions who elect to join it. It will also offer special WGU degrees based on courses from approved colleges and universities and for which students will demonstrate competency via examinations administered by WGU in local centers distributed among member states. By mid-1998, WGU had two degree programs (an AA and an AAS) and one certification, Electronics Manufacturing Technician. This grant will assist WGU as it adds courses, degrees, and student support services and plans for an expected 12,000 students by the end of 1999. Project Director: Jeffrey Livingston, Chief Executive Officer.

The following seven grants are funded by an appropriation approved by the Trustees for small grants to support various activities involving asynchronous learning networks (ALNs). In each case, the purpose of the grant is indicated and the project director named.

Baruch College, CUNY $30,000
New York, NY 10010

To develop four ALN courses at four CUNY campuses. Project Director: Carroll Seron, Acting Dean.

Education Foundation $30,000
Denver, CO 80204

Support for a study of ALN applicability to small manufacturers. Project Director: Mary Gershwin, Director of Workplace Education.

League for Innovation in the Community College $24,300
Mission Viejo, CA 92691

For a special session on ALNs at the League's conference. Project Director: Dr. Mark Milliron, Vice President and Chief Operating Officer.

Queens College, CUNY $30,000
Flushing, NY 11367

For development of two ALN courses in library science. Project Director: Dr. Thomas T. Surprenant, Graduate School of Library and Information Studies.

Research Foundation of the City University of New York $29,960
New York, NY 10007

Support to develop and offer three ALN courses. Project Director: Professor Anthony Picciano, Department of Curriculum and Teaching, Hunter College.

Salish Kootenai College $15,000
Pablo, MT 59855

Support to convert six courses into ALN format. Project Director: Michael O'Donnell, Director of Distance Education.

University of Baltimore Educational Foundation $30,000
Baltimore, MD 21202

Support to develop four ALN courses toward a master's degree (Youth Services Administration). Project Director: Dr. Ronald Legon, Provost.

Community College Foundation $30,000
Sacramento, CA 95816

Support of a pilot project for asynchronous learning. Project Director: Dr. David R. Springett, President.

Franklin University $30,000
Columbus, OH 43215

Support to develop four ALN courses for a degree in Management Information Services. Project Director: Dr. Paul Otte, President.

National Association of Purchasing Management $27,460
Tempe, AZ 85285

Support for an ALN workshop. Project Director: Terri Tracey, Vice President, Program and Product Development.

Northwest Technical College $30,000
East Grand Forks, MN 56721

Partial support of a Licensed Practical Nursing ALN project. Project Director: Judy Bruce, Dean of Academic Affairs.

Polytechnic University $30,000
Brooklyn, NY 11201

Support to develop and deliver two ALN courses in New Media Technology. Project Director: Professor Ifay F. Chang, Dean for Life-Long Learning and Continuing Education.

Salish Kootenai College $15,000
Pablo, MT 59855

Support for a conference on the applicability of ALNs to Native Indian populations. Project Director: Michael O'Donnell, Director of Distance Education.

HUMAN RESOURCES, TRUSTEE GRANTS

Harvard University $184,000
Cambridge, MA 02138

National Bureau of Economic Research $201,250
Cambridge, MA 02138

These grants support an array of activities by a group of leading economists on the labor market for scientists, an important but difficult topic which to date has attracted the attention of only a few labor economists. Included in this project are: preparation of an edited volume on the economics and policy of science labor markets; creation of a CD-ROM comprising all available data sets of interest to analysts of various science labor markets; holding a series of workshops, meetings, lectures, and conferences designed to bring together researchers and those who might be considered stakeholders in science labor markets; and research on the consumer price index, a continuing problem of economic theory with very large policy implications. Project Directors: Dr. Eric Weinstein, Research Associate, Department of Economics (Harvard) and Professor Richard Freeman, Department of Economics, Harvard University, and Director, Labor Studies Group (NBER).

HUMAN RESOURCES, OFFICER GRANTS

Claremont Graduate University $20,000
Claremont, CA 91711

Support for studies of quality of talent entering the academic profession. Project Director: Jack Schuster, Professor of Education and Public Policy.

United Engineering Trustees, Inc. $30,000
New York, NY 10017

Support for a statistical study of the U.S. information technology workforce. Project Director: Richard Ellis, Consulting Social Scientist.

University of Washington $30,000
Seattle, WA 98195

Support for phase one of a study entitled, "Understanding Recent Experiences and Behavior of High-Quality/High-Potential Students, Graduates and Doctorate-Producing Departments in the Sciences and Engineering: Trends and Implications." Project Director: Associate Professor William Zumeta, Graduate School of Public Affairs.

EDUCATION FOR MINORITIES AND WOMEN

MINORITIES, TRUSTEE GRANTS

The following eight grants are part of the Foundation's program to increase the number of minority students receiving the Ph.D. degree in mathematics, science, and engineering. (Included are four grants funded from an appropriation approved by the Trustees to support grants under $100,000 for this purpose.) At each university, faculty members have been identified who have had some success in working with minority students. The grants support increased activities to recruit minority doctoral candidates as well as various programs designed to improve their adjustment to graduate work and their success in completing the Ph.D. The participating academic departments and the project director are specified for each grant.

American University — **$150,000**
Washington, DC 20016

Mathematics. Project Director: Professor Mary Gray, Department of Mathematics and Statistics.

Lehigh University — **$120,000**
Bethlehem, PA 18015

Electrical Engineering and Computer Science. Project Director: Professor Michael Schulte, Department of Electrical Engineering and Computer Science.

Lehigh University — **$90,000**
Bethlehem, PA 18015

Civil and Environmental Engineering. Project Director: Assistant Professor Horace Moo-Young, Department of Civil and Environmental Engineering.

Stanford University — **$210,000**
Stanford, CA 94305

Aeronautics and Astronautics, Civil and Environmental Engineering, Engineering Economic Systems and Operations Research, and Materials Science and Engineering. Project Director: Dr. Noe Lozano, Associate Dean of Engineering.

Stanford University — **$180,000**
Stanford, CA 94305

Biological Sciences, Applied Physics, and Physics. Project Director: Dr. Hans Anderson, Associate Dean, School of Humanities and Sciences.

University of Michigan — **$60,000**
Ann Arbor, MI 48109

Chemistry. Professor Billy Joe Evans, Department of Chemistry.

University of New Mexico — **$55,000**
Albuquerque, NM 87131

Geochemistry. Project Director: Professor Yemane Asmerom, Department of Earth and Planetary Sciences.

University of Rhode Island — **$18,000**
Kingston, RI 02881

Natural Resources Science. Project Director: Dr. Jose Amador, Department of Natural Resources Science.

Rice University — $66,130
Houston, TX 77251

This grant supports a conference of grantees in the Foundation's minority Ph.D. program. The meeting provides an opportunity for grantees conducting Ph.D.-level programs and those running undergraduate feeder programs to share experiences on recruitment and retention strategies and to benefit from establishing contacts among themselves. Project Director: Richard Tapia, Professor of Mathematical Sciences.

Hampton University — $337,500
Hampton, VA 23668

Heritage College — $60,000
Toppenish, WA 98948

Massachusetts Institute of Technology — $100,000
Cambridge, MA 02139

These three grants are part of the Foundation's program to assist undergraduate programs that have had some success in encouraging minority students to pursue doctoral degrees in the sciences and technology. Hampton's Chemistry Department will restart a two-year master's degree program designed to prepare students for doctoral work. Cooperative arrangements have been worked out with Virginia Polytechnic Institute, University of Rochester, and MIT to ensure smooth transitions for the students into their Ph.D. programs. Heritage College has a large population of Hispanic and American Indian undergraduate students majoring in various science fields. Special efforts, including fellowship support, intensified recruitment, summer courses, and internships with research institutions in the immediate area, will aim to assist students and thus increase their number going on for Ph.D.s. A 1994 Foundation grant supported MIT's minority summer research program for a three-year period. Given its record as a science and engineering Ph.D. feeder, the program is renewed for an additional year by the current grant. Project Directors: Professor Isai Urasa, Department of Chemistry, Hampton; Dr. James Falco, Chair for Science and Technology Division, Heritage; Roy Charles, Assistant Dean for Graduate Education, MIT.

Mathematical Sciences Research Institute — $30,000
Berkeley, CA 94720

To increase participation by minority and women students in the MSRI summer program. Project Director: Dr. David Eisenbud, Director.

National Society of Black Physicists — $30,000
Greensboro, NC 27411

To create an exhibit highlighting African Americans who have made original and significant contributions to physics in the twentieth century. Project Director: Dr. Ronald Mickens, Historian.

University of California, Berkeley — $30,000
Berkeley, CA 94720

To support efforts to ensure continuing diversity among science and engineering graduate students. Project Director: Dr. Z. Renee Sung, Associate Dean of the Graduate Division.

Western Interstate Commission for Higher Education — $30,000
Boulder, CO 80301

To fund the participation of Sloan Scholars and their faculty mentors in the Compact for Faculty Diversity's Institute on Teaching and Mentoring. Project Director: Dr. Ken Pepion, Director, WICHE Doctoral Scholars.

WOMEN, OFFICER GRANTS

Committee for the Equality of Women at Harvard $30,000
Lincoln, MA 01773

To provide partial funding for a conference, Women in Academe: The Next Quarter Century. Project Director: Dr. Lilli Homig, Visiting Research Scholar, Center for Research on Women, Wellesley College.

Purdue University $30,000
West Lafayette, IN 47907

To disseminate the Classroom Climate Workshop for Faculty developed by the Women in Engineering Programs project. Project Director: Dr. Emily Wadsworth, Assistant Director, Women in Engineering Programs.

University of California, Los Angeles $20,000
Los Angeles, CA 90095

To allow Dr. Byers to spend four months as a Visiting Scholar in the History of Science Department at Harvard University. Project Director: Professor Nina Byers, Department of Physics.

PUBLIC UNDERSTANDING OF SCIENCE AND TECHNOLOGY

TRUSTEE GRANTS

Johns Hopkins University $125,000
Baltimore, MD 21218

Part of the Foundation's program to encourage the writing of books on scientific issues of public concern, this grant supports the writing of a book analyzing U.S. science and government relations from 1970 to the present. The role of the federal government as a patron of scientific research will be treated and should be of interest to the general public as well as government policy makers, scientists, and leaders of science-based business and industry. Project Director: Daniel S. Greenberg, Journalist.

American Communications Foundation $205,215
Mill Valley, CA 94941

Public Radio International $330,000
Minneapolis, MN 55403

These two projects make use of radio as the medium by which the Foundation aims to provide the public with a better understanding of our increasingly scientific and technological world. The American Communication Foundation will continue producing programs on science and technology for the Osgood File on the CBS Radio network. It is planned to broadcast 40 three-minute segments over the next 18 months as part of this daily morning show. The programs will include features on the history and future of science and technology, great advances in these fields, and profiles of scientific and technological leaders.

The World, a popular public radio show on global affairs, is produced by Public Radio International, the BBC World Service, and WGBH in Boston. It will create a Technology Desk and hire a full-time technology reporter. The idea is to generate daily stories, monthly features, and an annual series on technology, as well as a new weekly series on emerging technologies. Technology's place in The World's daily news agenda will be assured, and reporters covering economic, social, political, and cultural news stories will be more likely to include related technological issues. Project Directors: Cynthia Perry, President, ACF; Melinda Ward, Senior Vice President, Programming, PRI.

Catticus Corporation **$525,027**
Berkeley, CA 94710

KCET Community Television of Southern California **$500,000**
Los Angeles, CA 90027

Oregon Public Broadcasting **$450,000**
Portland, OR 97219

These grants make use of public television as a medium through which to increase public understanding of science and technology. Catticus will research and produce a one-hour PBS documentary based on Robert Pool's *Beyond Engineering: How Society Shapes Technology*, one of the books in the Sloan Technology Book Series. The main theme of the book and therefore the TV program is, in the author's words, "Modern technology is not simply the rational product of scientists and engineers...Look closely at any technology today, from aircraft to the Internet, and you'll find it truly makes sense only when seen as part of the society in which it grew up."

The KCET project is the production of a four-hour documentary based on *Turbulent Skies: The History of Commercial Aviation* by Thomas A. Heppenheimer, also a volume in the Sloan Technology Book Series. The Foundation's grant funds one hour of this program; the remaining budget has been raised from other sources. PBS has made a major grant and is fully committed to the broadcast and promotion of the series.

Oregon Public Broadcasting will produce a three-hour documentary for public television that chronicles the history and development of the Internet and its impact on the public. The show, "Nerds 2.01: A Brief History of the Internet" is a sequel to the station's series on the personal computer, "Triumph of the Nerds," which aired in 1996. The new show will trace the development of the Internet from its beginnings to the global communication network of today, explaining the key technical breakthroughs, recounting the business battles, and showcasing the revolutionary new culture and its leading personalities. A companion book, with more information and historical documentation, will be published to accompany the broadcast. Project Directors: Bill Jersey, Producer, and Michael Schwarz, Executive Producer, KIKIM Media (Catticus); Blaine Baggett, Vice President, Program Development (KCET); Stephen Segaller, Executive Producer (Oregon).

American Film Institute **$141,000**
Los Angeles, CA 90027

This grant falls within the Foundation's film schools program, which aims to influence the next generation of film makers to create more accurate portrayals of scientists and engineers in commercial film and television. Six institutions are participating in the program: American Film Institute; Carnegie Mellon University; Columbia University; NYU's Tisch School of the Arts; UCLA School of Theater, Film and Television; and the USC School of Cinema-Television. This grant supports a two-day meeting to bring together these participants. Student winners of the Sloan film prize, scientists and engineers who serve on the selection committees, and top administrators will be invited to discuss their experiences. The event will also include leading Hollywood actors, screenwriters, directors, and producers who will discuss the challenges of creating mass entertainment around science and technology. Project Director: James Hindman, Co-Director and Chief Operating Officer.

Center for Science and the Media **$545,000**
Washington, DC 20016

This grant supports the launching of a new service to provide video stories about newsworthy developments in science and technology on local television newscasts, both broadcast and cable. A survey of news directors around the country has found that they lack the resources to cover science and technology news and would air more such news if they could get it from a trusted source. A team of established video journalists will seek out the best science and technology stories each week, assemble a library of science video footage, and develop international distribution outlets. It is estimated that they will reach 30 percent of American television households during the first year. Project Directors: Eliene Augenbraun, President, and Ira Flatow, Vice President and News Director.

Ensemble Studio Theatre Inc. **$504,000**
New York, NY 10019

This grant is part of the Foundation's effort to engage working playwrights and theater directors to turn their creative energies to generating more realistic work dealing with science and technology themes and with scientists and engineers. The Ensemble Studio

Theatre (EST) will establish a new program focused on science and technology plays. EST will conduct seminars and field trips to acquaint working playwrights with scientists and engineers and with major scientific and technological issues. It will also support the creation, development, and presentation of three full-length plays and five one-act original plays, along with a collection of ten works by young writers. There will be at least one fully-realized professional Off-Broadway production of a major full-length play about science and technology each year. Professional actors and directors will give concert readings of the remaining plays. Some plays may go on tour and the most successful will be published and distributed to colleges nationwide. Project Director: Curt Dempster, Artistic Director.

Exploratorium **$134,000**
San Francisco, CA 94123

The Exploratorium will create a seven-month exhibit and four webcasts based on human body imaging technology and its scientific and social implications. These will be tied to *Naked to the Bone* by Bettyann Kevles, a volume in the Sloan Technology Book Series. The exhibition will present anatomical models and modern imaging equipment and trace how models of the human body have evolved throughout history. A series of live webcasts produced at the Exploratorium will link museum audiences, Internet audiences in classrooms and at home, and remote experts. One webcast will be a live examination, with audience participation, of two Egyptian mummies from the collection of the Fine Arts Museum of San Francisco. Project Director: Dr. Goery Delacte, Executive Director.

PUBLIC UNDERSTANDING OF SCIENCE AND TECHNOLOGY, OFFICER GRANTS

American Film Institute **$20,000**
Los Angeles, CA 90027

To support an expansion of the AFI/Sloan seminar into a major Hollywood event. Project Director: James Hindman, Co-Director and Chief Operating Officer.

Catticus Corporation **$30,000**
Berkeley, CA 94710

To research and write a fuller treatment for a documentary based on *Beyond Engineering: How Society Shapes Technology* by Robert Pool. Project Director: Bill Jersey, Producer, and Michael Schwarz, Executive Producer, KIKIM Media.

Dorian Devins **$30,000**
New York, NY 10028

To disseminate a weekly science-based interview show to a wider audience. Project Director: Ms. Dorian Devins, Producer and host of "The Green Room," a WFMU radio show.

Fairfield University **$26,850**
Fairfield, CT 06430

To complete the research and writing of a book on Grand Central Station. Project Director: Professor Kurt C. Schlichting, Department of Sociology and Anthropology.

Harvard University **$30,000**
Cambridge, MA 02138

To prepare an up-to-date introductory college-level physics course. Project Director: Gerald Holton, Professor of Physics.

Princeton University $30,000
Princeton, NJ 08544

Supplementary funding to complete a CD-ROM to accompany the book, *The Entrepreneurs*. Project Director: Professor David P. Billington, Department of Civil Engineering and Operations Research.

University of California, Los Angeles $30,000
Los Angeles, CA 90024

Partial funding for a symposium: Engineering the Human Germline. Project Director: Dr. Gregory Stock, Director, Center for the Study of Evolution and the Origin of Life.

University of California, Los Angeles $6,000
Los Angeles, CA 90095

To compile a filmography of narrative films and television programs that portray science and technology. Project Director: Robert Rosen, Chair, Department of Film and Television.

The Writers Room $30,000
New York, NY 10003

To provide writing space for science and technology writers. Project Director: Donna Brodie, Executive Director.

The following grants have been awarded to individual writers for the indicated projects.

Jennifer Ackerman $30,000
Belmont, MA 02178

For research and writing of a popular book on molecular and cell biology.

Robert L. Garwin $30,000
Yorktown Heights, NY 10598

To modify and rewrite a book about nuclear energy and nuclear weapons.

Robin Marantz Henig $30,000
Takoma Park, MD 20912

For research and writing of a popular book on Mendel's contribution to genetics.

Bettyann Holtzmann Kevles $30,000
Pasadena, CA 91105

To research and write a book about women in space.

Tom Shachtman $25,000
New York, NY 10011

For research and writing of a book on the history of scientific understanding and commercial use of cold.

SLOAN TECHNOLOGY BOOK SERIES

The Foundation is sponsor of a series of books intended to broaden public understanding of important modern technologies. Books in the Sloan Technology Series describe the development of specific technologies, including the circumstances of their emergence, their early development and use, their applications, and their actual and potential impacts on society.

The first twelve books in the series are as follows:

Craig Canine, *Dream Reaper: The Story of an Old-Fashioned Inventor in the High-Tech, High-Stakes World of Modern Agriculture* (Knopf, 1995)

T. A. Heppenheimer, *Turbulent Skies: The History of Commercial Aviation* (Wiley, 1995)

Richard Rhodes, *Dark Sun: The Making of the Hydrogen Bomb* (Simon & Schuster, 1995)

Robert Buderi, *The Invention That Changed the World: How a Small Group of Radar Pioneers Won the Second World War and Launched a Technological Revolution* (Simon & Schuster, 1996)

Martin Campbell-Kelly and William Aspray, *Computer: A History of the Information Machine* (Basic Books, 1996)

David E. Fisher and Marshall Jon Fisher, *Tube: The Invention of Television* (Counterpoint, 1996)

Stephen S. Hall, *A Commotion in the Blood: Life, Death, and the Immune System* (Henry Holt, 1997)

Robert Kanigel, *The One Best Way: Frederick Winslow Taylor and the Enigma of Efficiency* (Viking, 1997)

Bettyann Holtzmann Kevles, *Naked to the Bone: Medical Imaging in the Twentieth Century* (Rutgers University Press, 1997)

Robert Pool, *Beyond Engineering: How Society Shapes Technology* (Oxford University Press, 1997)

Michael Riordan and Lillian Hoddeson, *Crystal Fire: The Birth of the Information Age* (Norton, 1997)

Victor K. McElheny, *Insisting on the Impossible: The Life of Edwin Land* (Perseus Books, 1998)

Books on other technology-based topics are being prepared for the Series. Forthcoming are books on fiber optics and lasers, and on the development of a commercial satellite constellation for personal wireless communication. Also planned is an anthology of writings tracing the history of ideas about technology, edited by Richard Rhodes. This book will provide a general social, cultural, and intellectual context for the individual stories, both technical and human, surrounding particular technologies.

SELECTED NATIONAL ISSUES AND CIVIC PROGRAM

SELECTED NATIONAL ISSUES, OFFICER GRANTS

American Statistical Association $30,000
Alexandria, VA 22314

Support for a workshop on issues in current economic statistics and options for addressing them. Project Director: Ray A. Waller, Executive Director.

Carnegie Mellon University $30,000
Pittsburgh, PA 15213

To support validation research on the economic and environmental impacts of alternative automotive propulsion systems and fuels. Project Director: Lester Lave, Professor of Economics.

Regional Plan Association $30,000
New York, NY 10003

To help launch a regional Y2K initiative. Project Director: Aram Khachadurian, Vice President, Program Development.

CIVIC PROGRAM, TRUSTEE GRANTS

Greenpoint Manufacturing and Design Center $75,000
Brooklyn, NY 11222

The nonprofit GMDC has successfully transformed an abandoned industrial space into a viable location now fully occupied with small manufacturers and artists who benefit from being together. A 1997 Foundation grant assisted GMDC in its next project, the creation of a Product Development Center which commercializes new concepts brought to it by designers and inventors who do not want to become entrepreneurs themselves. GMDC now plans to purchase the abandoned Greenpoint Terminal Market and create space for clean manufacturing, commercial businesses, affordable residences, artist lofts, and community recreational facilities. It is estimated that as many as 1400 permanent jobs would exist in the completed space. The community would also have access to a newly landscaped waterfront. This grant will allow GMDC to go forward with certain necessary predevelopment consulting projects. Project Director: David Sweeny, Chief Executive Officer.

New York City Technical College Fund, Inc. $180,000
Brooklyn, NY 11201

The New York City Technical College, a campus within the City University of New York system, launched in 1996 a Stage Technology Program designed to prepare New Yorkers for careers in the technical aspects of the entertainment industry. Job prospects for graduates of this program, especially the sound technology majors, are excellent because New York City is the center of an entertainment industry which needs a growing number of well-trained people who can get the most out of modern sound technology. This grant supplies partial funding for the purchase of sound equipment to outfit a computer and automation sound laboratory for upper division courses. Project Director: Professor David B. Smith, Stage Technology Department.

Polytechnic University $113,000
Brooklyn, NY 11201

Merchandising and distribution systems are being revolutionized by technology, primarily information technology, but also by the technology of materials and transportation. However, the ability of the retail and merchandising industries to take full advantage of these developments is hampered by the scarcity of technical people working in these industries. Polytechnic University plans to launch a Center for Technology in Merchandising. This Center will prepare engineering students to enter jobs in the merchandising and retailing industry in New York. Courses leading to a Certificate in Merchandising and Distribution will be offered. As a service to industry, the Center will organize forums and conferences, offer workshops and short courses to working professionals, and conduct research and laboratory testing of new concepts and techniques. This grant supports initial planning for the Center. Project Director: Dr. George Bugliarello, Chancellor.

Pratt Institute **$395,100**
Brooklyn, NY 11205

With this grant, Pratt will create a new organization, SPAN, to help small and medium-sized New York City manufacturers improve their products and expand their sales through the use of design. SPAN will offer free design audits to firms to make them aware of the extent to which incorporation of design sensitivity could improve the appeal and marketability of their products. The design services that SPAN will be able to provide include product evaluation and development, prototyping, component sourcing, communication design, and the use of computer graphics and interactive multimedia. The Institute will provide SPAN with space on campus renovated to include design studios, a shop, a conference/presentation room, and offices. This grant supports the new program. Project Director: Peter Barna, Chairman, Industrial Design Department.

Research Foundation of the City University of New York **$527,073**
New York, NY 10007

This grant will help LaGuardia Community College create the Industrial Management Resource Program to provide management training and assistance to manufacturing companies in Queens. The greatest concentration of manufacturers in New York City is in Long Island City, Queens. Most are small businesses and few employ modern management practices. The LaGuardia Urban Center for Economic Development plans to expand its services to develop a new program. The Industrial Management Resource Program will provide opportunities for local companies to share insights about what has worked for them at Best Practices Networking Breakfasts; hold annual conferences on quality management for small businesses; offer certificate courses in partnership with the American Society for Quality and the American Production and Inventory Control Society, courses not now available in New York City; provide performance audits as independent and objective assessments of a company's standing and to identify needed management and work system improvements; offer benchmarking studies for interested companies; establish a library of case studies on best practices of small companies; offer a credit course in Quality Management and accompanying student internships in local companies; and distribute a program newsletter to local companies. Project Director: Wilford Saunders, Director, LaGuardia Urban Center for Economic Development.

Queensborough Community College Fund, Inc. **$30,000**
Bayside, NY 11364

To fund the pilot phase of a new program in New Media Information Technology. Project Director: Professor Bruce Naples, Electrical and Computer Technology.

Young Men's Christian Association of Greater New York **$30,000**
New York, NY 10001

To fund summer internships for the first year of the Harlem "Y" Cybercafe in cooperation with the New York New Media Association. Project Director: Charles Taylor, Administrator, Harlem YMCA.

TRUSTEE GRANTS

Council on Foundations **$45,000**
Washington, DC 20036

Independent Sector **$10,500**
Washington, DC 20036

New York Regional Association of Grantmakers **$10,500**
New York, NY 10018

The Council on Foundations (COF) is the foundation community's national organization, whose mission is to promote responsible and effective philanthropy. It provides publications and research reports, conducts workshops, seminars, and an annual conference, and maintains an active government relations staff. Independent Sector (IS) is mainly concerned with government relations, research on the not-for-profit sector, and leadership and management for not-for-profit organizations. The New York Regional Association of Grantmakers (NYRAG) is one of 24 regional associations of foundations affiliated with the COF. It supplies programs and information focusing on foundation activities in the Greater New York area. These grants are for annual membership dues. Project Directors: Dorothy S. Ridings, President, COF; Sara E. Melendez, President, IS; Barbara Bryan, President, NYRAG.

OFFICER GRANT

Council on Foundations **$30,000**
Washington, DC 20036

Support for the Council's Communications/Legislative Initiative. Project Director: Dorothy S. Ridings, President

FINANCIAL REVIEW

The financial statements and schedules of the Foundation for 1998 and 1997, which have been audited by KPMG LLP appear on pages 96 to 103. They include the balance sheets, statements of activities and cash flows, and schedules of management and investment expenses.

Investment income for 1998 was $38,309,138, a decrease of $5,692,952 from $44,002,090 in 1997. After the deduction of investment expenses and provision for federal excise tax, net investment income was $29,115,524 in 1998 as compared with $37,603,472 for the prior year. Investment expenses during 1998 totaled $5,672,614 of which $4,587,882 represented investment management fees. The provision for federal excise tax amounted to $3,521,000. The total of these deductions from investment income in 1998 was $9,193,614 versus $6,398,618 in 1997.

Grants authorized (net of grant refunds) and management expenses during 1998 was $42,202,935, which was $13,087,411 greater than 1998 net investment income. Of this total, grants authorized (net of refunds) amounted to $38,072,516 while management expenses were $4,130,419. Since the Foundation's inception in 1934, the cumulative excess of grants and expenses over the Foundation's net investment income has amounted to $112.3 million.

Grant payments in 1998 were $40,524,308 compared with $49,775,547 for the prior year. Together with management expenses, investment expenses, federal excise taxes paid and other charges, the total of cash expenditures net of grant refunds in 1998 was $53,539,301 while in 1997 the amount was $59,721,602.

Grants authorized and payments made during the year ended December 31, 1998 are summarized in the following table:

Grants unpaid at December 31, 1997	$49,152,153
Authorized during 1998	38,435,619
	87,587,772
Payments during 1998	40,524,308
Grants unpaid at December 31, 1998	$47,063,464

The fair value of the Foundation's total assets was $1,169,512,005 at December 31, 1998 including investments valued at $1,169,106,459 as compared with total assets of $1,101,586,214 at December 31, 1997.

AUDITORS' REPORT

Report of KPMG LLP
Independent Auditors

The Board of Trustees
Alfred P. Sloan Foundation:

We have audited the accompanying balance sheets of the Alfred P. Sloan Foundation as of December 31, 1998 and 1997, and the related statements of activities and cash flows for the years then ended. These financial statements are the responsibility of the Foundation's management. Our responsibility is to express an opinion on these financial statements based on our audits.

We conducted our audits in accordance with generally accepted auditing standards. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of the Alfred P. Sloan Foundation as of December 31, 1998 and 1997, and the changes in its net assets and its cash flows for the years then ended in conformity with generally accepted accounting principles.

Our audits were made for the purpose of forming an opinion on the basic financial statements taken as a whole. The supplementary information included in the schedules of management and investment expenses for the years ended December 31, 1998 and 1997 is presented for purposes of additional analysis and is not a required part of the basic financial statements. Such information has been subjected to the auditing procedures applied in the audits of the basic financial statements and, in our opinion, is fairly stated in all material respects in relation to the basic financial statements taken as a whole.

KPMG LLP

February 12, 1999

BALANCE SHEETS
DECEMBER 31, 1998 AND 1997

	1998	1997
Assets		
CASH	$ 173,150	$ 347,877
INVESTMENTS:		
Equities	726,335,263	632,686,430
Fixed income	266,200,734	281,402,768
Other	176,570,462	186,607,703
TOTAL INVESTMENTS	1,169,106,459	1,100,696,901
OTHER	232,396	541,436
Total	**$1,169,512,005**	**$1,101,586,214**
Liabilities and Net Assets		
GRANTS PAYABLE	$ 47,063,464	$ 49,152,153
DEFERRED FEDERAL EXCISE TAX	808,457	1,986,666
	47,871,921	51,138,819
NET ASSETS–UNRESTRICTED	1,121,640,084	1,050,447,395
Total	**$1,169,512,005**	**$1,101,586,214**

See accompanying notes to financial statements.

STATEMENTS OF ACTIVITIES
YEARS ENDED DECEMBER 31, 1998 AND 1997

	1998	1997
INVESTMENT INCOME:		
Interest	$ 19,477,040	$ 22,205,854
Dividends	18,832,098	21,796,236
	38,309,138	44,002,090
LESS:		
Investment expenses	5,672,614	4,852,618
Provision for Federal excise tax	3,521,000	1,546,000
	9,193,614	6,398,618
Net investment income	29,115,524	37,603,472
EXPENSES:		
Grants authorized (net of refunds of $363,103 in 1998 and $377,589 in 1997)	38,072,516	38,654,250
Management expenses	4,130,419	3,918,137
	42,202,935	42,572,387
EXCESS OF EXPENSES OVER NET INVESTMENT INCOME	(13,087,411)	(4,968,915)
NET GAIN ON DISPOSAL OF INVESTMENTS	142,012,321	115,300,130
(DECREASE) IN UNREALIZED APPRECIATION OF INVESTMENTS, NET OF DEFERRED FEDERAL EXCISE TAX	(57,732,221)	(1,349,154)
	84,280,100	113,950,976
INCREASE IN NET ASSETS	71,192,689	108,982,061
NET ASSETS AT BEGINNING OF YEAR	1,050,447,395	941,465,334
NET ASSETS AT END OF YEAR	$1,121,640,084	$1,050,447,395

See accompanying notes to financial statements.

STATEMENTS OF CASH FLOWS
YEARS ENDED DECEMBER 31, 1998 AND 1997

	1998	1997
Cash flows from operating activities:		
INCREASE IN NET ASSETS	$ 71,192,689	$ 108,982,061
ADJUSTMENTS TO RECONCILE INCREASE IN NET ASSETS:		
Net gain on disposal of investments	(142,012,321)	(115,300,130)
Decrease in unrealized appreciation of investments	57,732,221	1,376,688
Decrease in deferred federal excise tax	(1,178,209)	(27,534)
Decrease (increase) in other assets	309,040	(6,890)
Decrease in grants payable	(2,088,689)	(10,743,708)
Net cash used in operating activities	(16,045,269)	(15,719,513)
Cash flows from investing activities:		
Proceeds from sale of investments	1,381,783,136	981,150,841
Purchase of investments	(1,365,912,594)	(965,124,071)
Net cash from investing activities	15,870,542	16,026,770
NET (DECREASE) INCREASE IN CASH	(174,727)	307,257
CASH AT BEGINNING OF YEAR	347,877	40,620
CASH AT END OF YEAR	$ 173,150	$ 347,877

See accompanying notes to financial statements.

1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

The accompanying financial statements have been prepared substantially on the accrual basis of accounting. Investment income and investment and management expenses, including post-retirement benefit expense, are recorded on the cash basis, the effect of which on the accompanying financial statements is not materially different from the accrual basis. Grants are accrued when authorized by the Trustees. Certain accounting estimates are a routine part of financial statements prepared by management and are based upon management's current judgments.

Gains or losses on disposal of investments are determined on the first-in, first-out basis. Fair value for traded securities is based on quoted market prices. Investments of limited marketability are reported at estimated fair values based upon appraisals by the managers of the various interests.

2. INVESTMENTS

Investments at December 31, 1998 and 1997, are summarized as follows:

	1998		1997	
	Cost	Fair Value	Cost	Fair Value
Equities	$ 684,012,584	$ 726,335,263	$ 555,004,709	$ 632,686,430
Fixed Income	260,915,899	266,200,734	275,882,168	281,402,768
Other	183,755,108	176,570,462	170,476,726	186,607,703
Total	$1,128,683,591	$1,169,106,459	$1,001,363,603	$1,100,696,901

3. FINANCIAL INSTRUMENTS WITH OFF-BALANCE SHEET CREDIT OR MARKET RISK

The Foundation's investment strategy incorporates certain financial instruments which involve, to varying degrees, elements of market risk and credit risk in excess of the amounts recorded in the financial statements. These instruments include financial futures, forward foreign currency contracts, loaned securities and securities sold, not yet purchased.

The Foundation is subject to market risk associated with the changes in the value of the futures contracts. Below is a table summarizing the long and short exchange-traded financial futures positions at December 31, 1998 and 1997:

	December 31, 1998		December 31, 1997	
Index Futures Contracts	Number of Contracts	Value (Millions)	Number of Contracts	Value (Millions)
S&P 500				
Long	5	$ 1.6	2	$ 0.5
Short	—	—	(605)	(148.0)
U.S. Treasury Futures				
Long	1,041	130.4	2,248	324.3
Short	(58)	(7.2)	—	—
Non-U.S. Index Futures				
Long	88	5.8	64	5.0
Short	(180)	(4.2)	(28)	(2.7)

These amounts, however, may differ from the Foundation's future cash requirements as the Foundation may close out futures positions prior to settlement and thus be subject only to the change in value of the futures contracts since the contracts are valued daily using the mark-to-market method. The net appreciation in the market value is recognized as received. The margin requirements on deposit with a third party for futures contracts were approximately $8.3 million at December 31, 1998 and $12.2 million at December 31, 1997.

In addition, the Foundation's investment advisor engages from time to time in options (puts and calls), swaps, futures and forwards, for the purpose of hedging, risk management and return enhancement or to implement investment strategies in a more efficient manner. The value of these transactions at December 31, 1998 is approximately $20.1 million and $19.5 million at December 31, 1997. Such transactions are subject to market risk as described above and, to varying degrees, risk of loss, arising from the possible inability of counterparties to meet the terms of the contract. Required collateral is held by a third party.

The Foundation purchases forward foreign currency contracts as a hedge against fluctuations in currency prices. Forward foreign currency buy and sell contracts held as of December 31, 1998 were valued at approximately $21.2 million and $21.0 million, respectively, and, as of December 31, 1997, at approximately $35.9 million and $35.7 million, respectively. Such contracts involve, to varying degrees, risk of loss arising from the possible inability of counterparties to meet the terms of the contract.

Through a securities lending program managed by a custodian firm, the Foundation loans certain stocks and bonds included in its investment portfolio. The custodian firm has indemnified the program. The Foundation's gross securities loaned to certain borrowers at December 31, 1998 and 1997 amounted to $22 million and $38 million, respectively.

Securities sold, not yet purchased ($104.3 million and $90.4 million at December 31, 1998 and

December 31, 1997, respectively) are recorded net in the Foundation's investment accounts. These securities have market risk to the extent that the Foundation, in satisfying its obligations, may have to purchase securities at a higher value than recorded. Required collateral is held by a third party.

Management does not anticipate that losses, if any, resulting from its market or credit risks would materially affect the financial position of the Foundation.

4. FEDERAL EXCISE TAX

The Foundation is liable for federal excise taxes of 2 percent of its net investment income, which includes realized capital gains, for the year. However, this tax is reduced to 1 percent if certain conditions are met. The Foundation did not meet the requirements for the reduced tax for the year ended December 31, 1998; however, it did meet the requirements for the reduced tax for the year ended December 31, 1997. Therefore, current taxes are estimated at 2 percent of the net investment income for 1998 and at 1 percent for 1997.

Deferred taxes represent 2 percent of unrealized appreciation of investments at December 31, 1998 and 1997, as qualification for the 1 percent tax is not determinable until the fiscal year in which gains are realized.

5. 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 the purchase of annuities for employees. Retirement plan expense was $365,796 and $322,802 in 1998 and 1997, respectively.

In addition, the Foundation provides certain health care and life insurance benefits to its retirees. The cost of providing these benefits to retirees was $94,091 and $83,915 in 1998 and 1997, respectively, on a pay-as-you-go basis.

6. LEASE

The Foundation's lease for its office space expired December 31, 1998. The lease contained an escalation clause which provides for rental increases resulting from increases in real estate taxes and certain other operating expenses. Rent expense amounted to $391,412 and $408,027 in 1998 and 1997, respectively. The Foundation entered into a new ten-year lease for its office space effective January 1, 1999. This new lease contains an escalation clause similar to the clause in the Foundation's prior lease. Annual rent expense beginning January 1, 1999 will be approximately $633,000. The new lease has a rent step-up clause which stipulates that a rent increase to the base rent will be incurred for the sixth through the tenth year of the lease.

	1998	1997
Management Expenses		
SALARIES AND EMPLOYEES' BENEFITS:		
Salaries	$2,609,297	$2,253,249
Employees' retirement plan and other benefits	968,117	831,897
Total	3,577,414	3,085,146
RENT	391,412	408,027
PROGRAM EXPENSES	474,593	471,206
OFFICE EXPENSES	541,342	461,217
REPORTS AND PUBLICATIONS	55,382	53,167
PROFESSIONAL FEES	175,008	143,208
Total management expenses	5,215,151	4,621,971
LESS MANAGEMENT EXPENSES ALLOCATED TO INVESTMENTS	1,084,732	703,834
MANAGEMENT EXPENSES	$4,130,419	$3,918,137
Investment Expenses		
INVESTMENT MANAGEMENT FEES AND EXPENSES	$4,587,882	$4,148,784
MANAGEMENT EXPENSES ALLOCATED TO INVESTMENTS	1,084,732	703,834
INVESTMENT EXPENSES	$5,672,614	$4,852,618

INDEX OF GRANTS

INDEX OF GRANTS