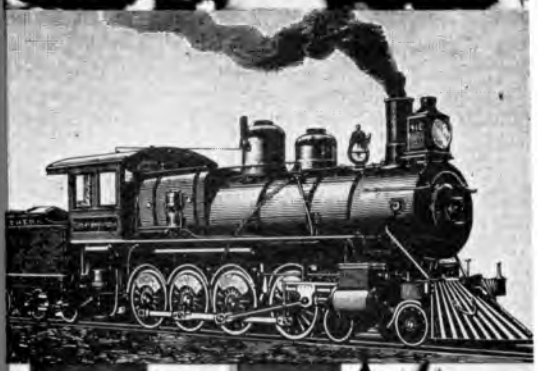
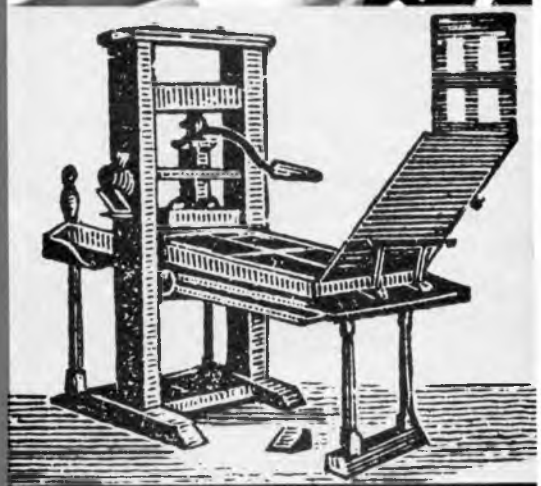
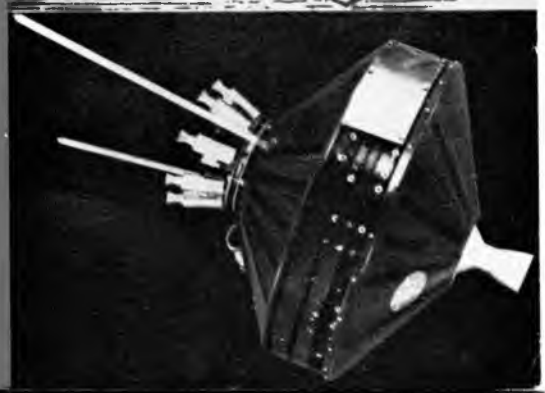
SCIENCE, TECHNOLOGY & HUMAN VALUES







NATIONAL ENDOWMENT FOR THE HUMANITIES

NATIONAL ENDOWMENT FOR THE HUMANITIES

The National Endowment for the Humanities is an independent Federal agency created by Congress in 1965 to support research, education, and public activity in the humanities.

The establishment of the agency resulted from an increased awareness that it is appropriate and necessary for the Federal government to complement and assist the support for the humanities provided by state and local governments and private sources.

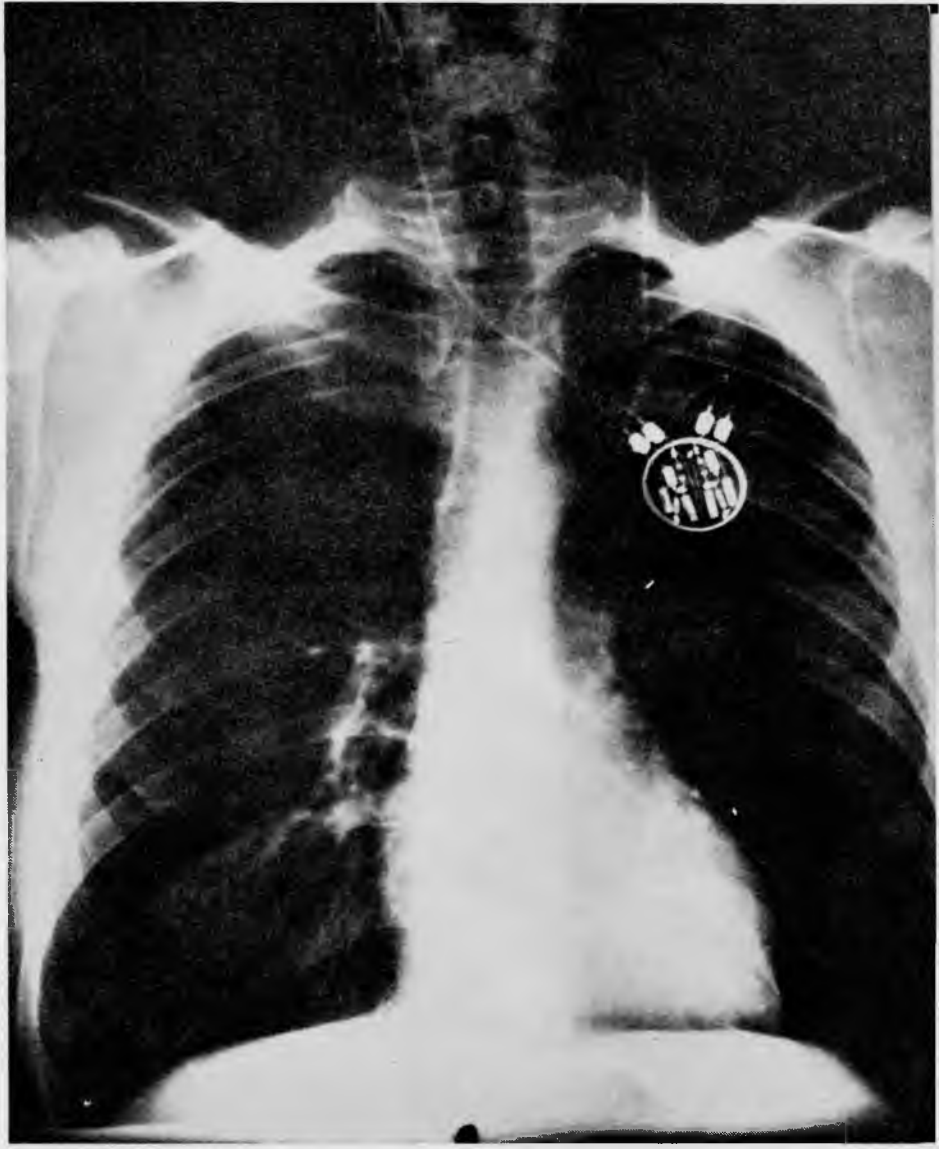
The Act which established the Endowment provided for its direction by a Chairman appointed by the President for a four-year term, subject to Senate confirmation. The Chairman is assisted by the National Council on the Humanities, comprised of 26 distinguished private citizens appointed by the President for six-year terms, with one-third of the members appointed every other year. The Chairman of the Endowment, currently Joseph D. Duffey, also serves as Chairman of the National Council.

The Endowment's grantmaking is carried out through its six divisions—Education Programs, Fellowships, Public Programs, Research Programs, Special Programs, State Programs—and the Office of Planning and Policy Assessment.

The programs of the National Endowment for the Humanities are administered in harmony with the goals of Title VI of the Civil Rights Act of 1964 prohibiting discrimination in Federally assisted programs on the grounds of race, color, or national origin; of Title IX of the Education Amendments of 1972 prohibiting certain discrimination on the basis of sex under education programs or activities receiving Federal financial assistance; of section 504 of the Rehabilitation Act of 1973, as amended, prohibiting certain discrimination against qualified handicapped persons, and of the Age Discrimination Act of 1975 prohibiting unreasonable discrimination on the basis of age.

SCIENCE, TECHNOLOGY & HUMAN VALUES

NATIONAL ENDOWMENT FOR THE HUMANITIES
WASHINGTON, D.C. 20506



A carotid sinus nerve stimulator, shown in an X-ray view implanted in a patient's chest.

SCIENCE, TECHNOLOGY AND HUMAN VALUES

Histories of human societies have often celebrated the achievements of scientific inquiry and technical invention. The immortals of science and technology parade through our textbooks like heroes, enriching past societies and paving the way, inevitably, to our own.

But it is only in the twentieth century that scientific technology has become a central characteristic of human life. Never before has the way we work and play, the way we communicate and travel, even the way we are born and die, been so deeply shaped by the intellect and ingenuity of scientific men and women.

Few Americans would dispute the benefits of technological innovations or regret the advances made in the theoretical study of microbiology, genetics, nuclear chemistry and physics. But many are less certain that these advances invariably contribute to the public happiness of our age and nation. Increasingly, some in and out of the scientific disciplines speak of the "limits of scientific inquiry."

Science and technology have been in many ways the victims of their own success. It was World War II which began the massive support of science by the Federal government in the United States, and it was Vannevar Bush, the leader of the mobilization of science in the war effort, who coined the phrase, "the endless frontier," as the future for scientific research in the post-war years. Today about $40 billion is spent on the national research and development program (most of it in military and space activities). "Clearly," the physicist Gerald Holton writes, "any enterprise that employs on the order of one million scientists and engineers, and commands 15 percent of the relatively controllable portion of the Federal budget, must be subject to

Albert Einstein

mechanisms of accountability with respect to its performance and justification, in terms that taxpayers or their representatives can appreciate."

The last two decades have witnessed jolting occurrences: thalidomide; oil spills off France, Britain, Mexico, and the United States; and the Love Canal. Even those scientific innovations which first promised to conquer man's hunger, disease, pain, and ignorance—like organ transplants, genetic engineering, "wonder drugs," electronic telecommunications—have generated troubling side effects and questions about the authority for their use.

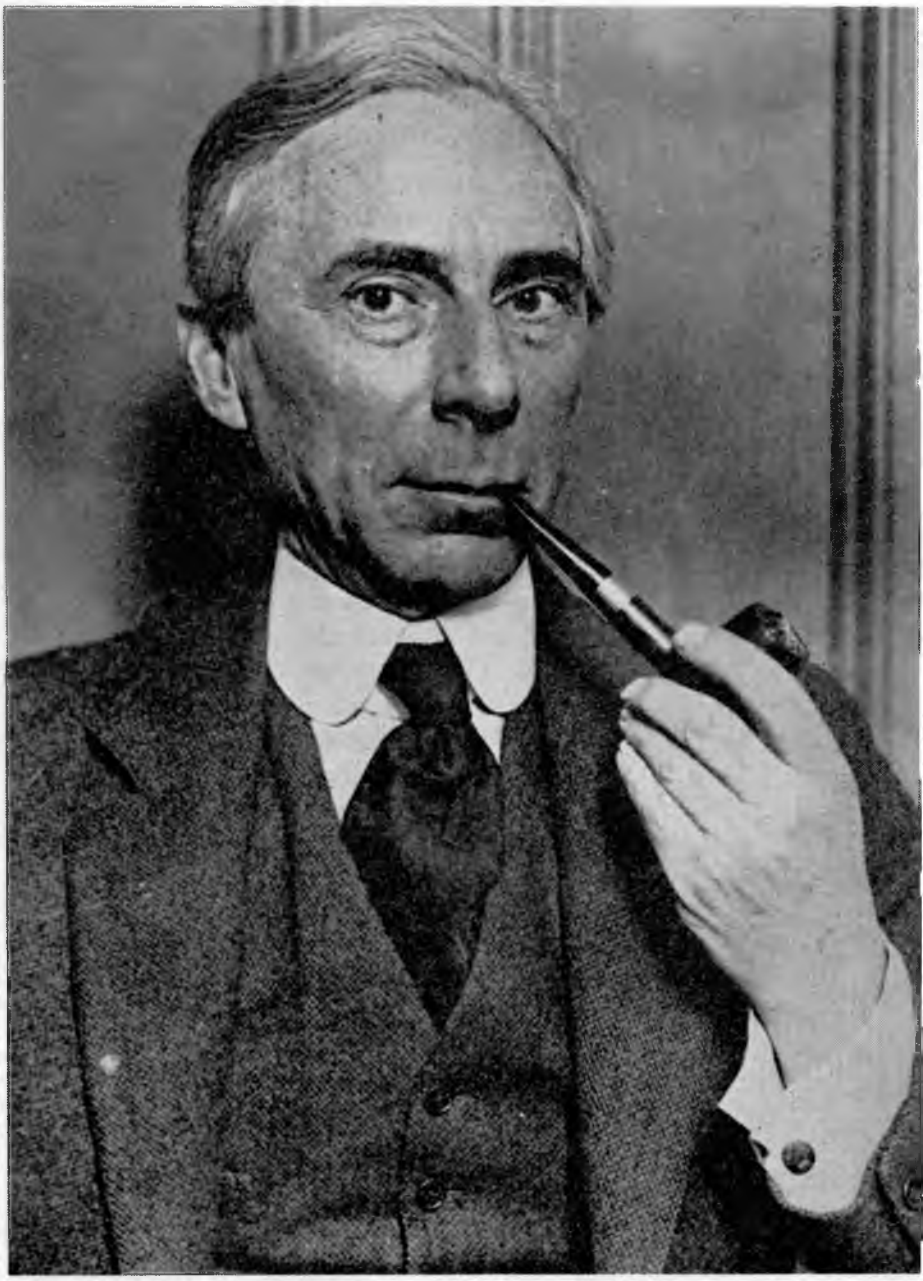
At the same time as questions have been raised about limiting science and technology, others have been raised about limits *of* science and technology to maintain a reasonable quality of life for a burgeoning population. We now have to ask if there are enough energy resources, enough arable land beneath us and ozone layer above us, even to sustain the ordinary haphazard existence of the earth's four billion people. Or will all our calculations be set to nought by the supreme miscalculation of a nuclear holocaust?

It was the scientific community which first signaled the importance of these philosophical and political dilemmas. After Hiroshima, the *Bulletin of the Atomic Scientists* urged a broader public debate on the development of nuclear policy. The Pugwash conferences of the 1950's, sponsored by Albert Einstein and Bertrand Russell, revived older concerns with the social context of scientific work. In the 1960's, issues of

medical care, of economic development, of urban design, and of weapons technology were rather quickly transformed into major issues of public debate in the United States.

As this occurred, scholars and teachers in the humanities began to explore ways of investigating and refining the terms of this debate. Even if science was ever new, humanists reasoned, the ethical and political questions raised were deeply rooted in the traditions of learning in the humanities. In the past decade, two centers for the study of ethical dimensions of biomedicine have emerged at the Institute of Society, Ethics and the Life Sciences at Hastings-on-Hudson, N.Y., and at the Kennedy Institute of Bioethics at Georgetown University in Washington. Each has sponsored major reference works in the field of science and human values, the Georgetown *Encyclopedia of Bioethics* and the Hastings *Foundations of Ethics and Its Relationship to Science*. The American Academy of Arts and Sciences has devoted issues of *Daedalus* to such themes as "Ethical Aspects of Experimentation with Human Subjects," "Science and its Public," and "The Limits of Scientific Inquiry." The American Association for the Advancement of Science reported in 1968 that there were more than a hundred programs and over 900 courses in the science-values field being offered on American campuses. More than two-thirds of the medical schools in the United States now include courses in the social and ethical contexts of medical practice among the requisites for the M.D. degree.

The National Endowment for the



Bertrand Russell

Humanities has actively supported the development of this interest in the relationship of science and technology to human values. Since its first awards in this area in 1970, the Endowment has granted more than $24 million to support over 300 projects in research, education, and public programs to advance the understanding of these issues by American citizens. The Endowment has also supported scholarly work in the disciplines which underlay the science-values field: the history, philosophy, and sociology of science, and the emerging fields of the history and philosophy of technology.

The NEH continues to emphasize its commitment to the study of Science, Technology and Human Values. The Endowment is particularly interested in programs which go beyond the analysis of specific conflicts to look at the philosophical and historical underpinnings of the scientific and technical activity in this and other cultures, and how these relate to other currents of belief and practice. We want also to encourage the creation of archival collections and other resources which will sustain research in these areas in the future.

The National Endowment for the Humanities invites applications for support for work in the area of science, technology and human values in all its divisions and programs. As you read through the brief accounts of each division below, consider which most closely approximates the kind of programs you may have in mind, and please consult the NEH staff members listed for further information.

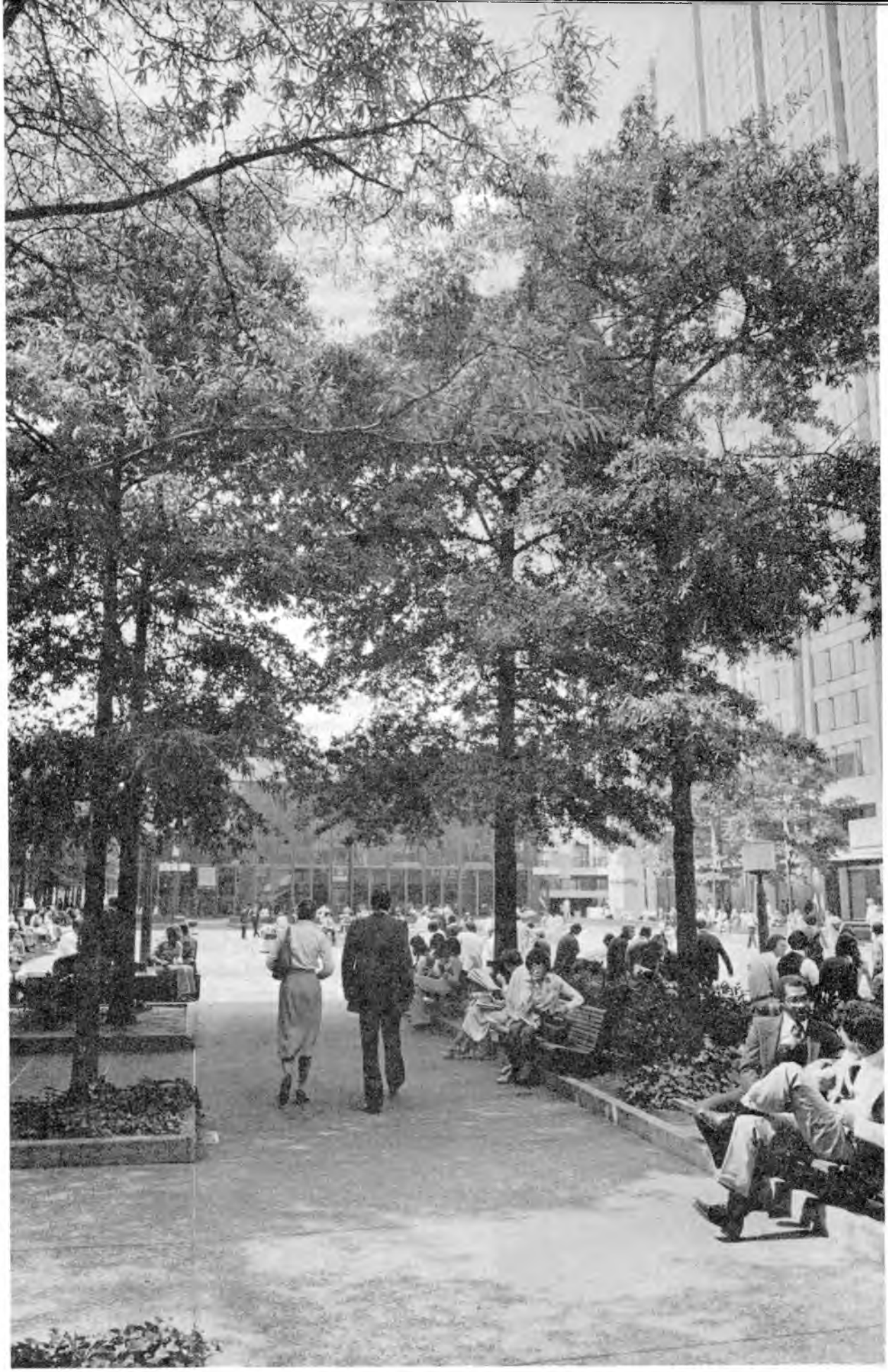
The Endowment's activities in Science, Technology and Human Values have been coordinated through the **Division of Special Programs.** In recent years it has supported the publication of The Encyclopedia of Bioethics; an interdisciplinary research project of scientists, philosophers, and historians on the foundations of ethics and its relationship to science; a national research-design project on aging; a collaborative research and education program on ethical problems in engineering; and a quarterly review of the field of science, technology and human values.

Also, the Division has supported, through its Youth Programs, a study of women and technology, a midwestern regional high school program on the impact of energy on history, and a research project on the local social impact, during the Depression, of the construction of the Gauley Tunnel in West Virginia. Through Special Projects, there has been support for courses on science, technology and

The Encyclopedia of Bioethics *was published with support from the Endowment's program in Science, Technology and Human Values. The four-volume work spans the disciplines of the sciences, philosophy, religion, jurisprudence, the social sciences and history. It is the first comprehensive source of information in a field that is itself new.*

Photograph: Morton Broffman

Contrasting approaches to urban design are evident in these scenes.



Photographs: Morton Broffman

Aristotle, Hippocrates, Sir Isaac Newton, Sigmund Freud.
The Endowment is interested in programs which examine the philosophical and historical underpinnings of the scientific and technical activity in Western and other cultures, and how these relate to other currents of belief and practice.

Photographs and prints: National Library of Medicine

medicine under the Courses by Newspaper project.

The **Division of Research Grants** has supported historical and cultural studies of the role of science and technology in American life, an oral history project on the Textile Workers Union of America, the organization of an archival collection on women in medicine, and an editing project on the correspondence of Charles Darwin.

The **Division of Fellowships** has provided grants for a study of science and religion, for a history of American forensic psychiatry, for a study of philosophical conceptions inherent in the development of quantum theory, and for a project on international law and the environment. This division has regularly supported summer seminars for medical practitioners, as well as summer seminars for college teachers in the sciences and the humanities.

The **Division of Education Programs** has supported a number of curriculum-planning programs designed to develop community college and university programs in technology and society, a program to explore the interpretation of humanistic imagination and scientific creativity, a project to strengthen the teaching of the history of industrial technology, and several projects to establish humanities courses in medical schools. Through its "Consultant Grants" it has assisted a number of professional and other schools in the development of courses and programs in the sciences and the humanities.

The **Division of Public Programs** has supported a pilot public television series on ethical and medical aspects of the care of the dying, a museum program on the development of transportation in the United States and the social and technological consequences of that

development, and an exhibition by a zoological society on man and the natural world.

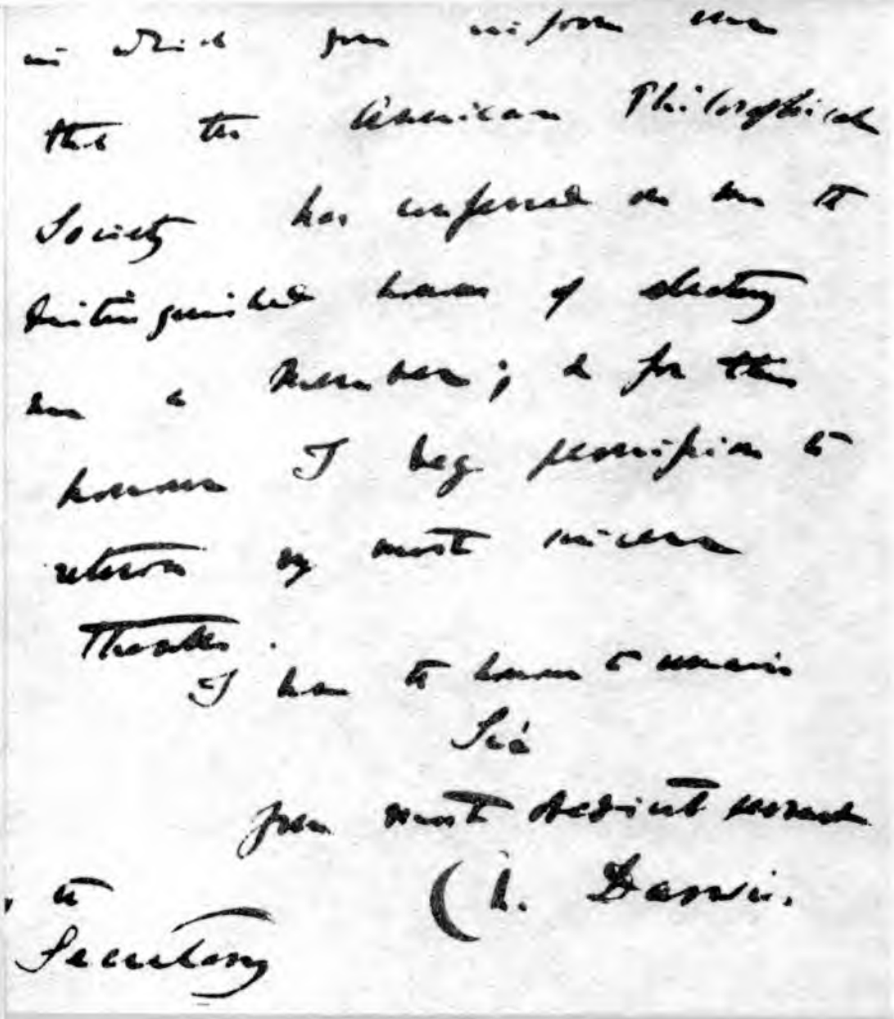
Those are examples of the Endowment's dedication to furthering an understanding of science in our society, to bringing those from the sciences and the humanities into closer working relationships, and to probing the mutual interaction of technological developments and human values. The Endowment now commits well over $4 million a year in the science-humanities area, with significant grant expenditures in each of its divisions. The additional support given to public programs in the sciences and humanities at the state level through grants from the State Humanities Committees, each with its own budget, further amplifies the breadth and intensity of the Endowment's concern.

The Program in Science, Technology and Human Values also collaborates with the "Ethics and Values in Science and Technology" [EVIST] program at the National Science Foundation in research programs involving both humanists and scientists. Joint NEH-NSF awards have been made, for example, for a study of value issues in the control of technology, for bibliographies of engineering ethics, and the philosophy of technology, for an examination of the values entering into the pollution control statutes of a large industrial city, for a project to study the ethical problems raised by the use of new technological devices in law enforcement, and for a study of the Recombinant DNA controversy.

The fruitfulness of the NSF-NEH relationship has encouraged the Endowment to seek to develop similar relationships with other Federal agencies that support research and education programs in science and technology.

Photograph: National Institutes of Health

Top: Measuring alterations in lung function that occur with aging. Bottom: Dr. Rosalyn Yalow, winner of the Nobel Prize for medicine and physiology in 1977. The Endowment has supported organization of an archival collection on women in medicine.



The correspondence of Charles Darwin was the subject of an editing project carried out with support from the Endowment. It included letters such as the one above left, which reads:

[To The American Philosophical Society]
Down./Beckenham ["Bromley" *deleted*]./Kent. S.E.
Feb. 5th. 1870

Sir

I beg leave to acknowledge the receipt of your letter of Oct. 15th, in which you inform me that the American Philosophical Society has conferred on me the distinguished honour of electing me a Member; & for this honour I beg permission to return my most sincere thanks.

I have the honour to remain—/Sir/Your most obedient servant/
Ch. Darwin
To the Secretary
[Recipient's notations: "*Read March 4. 1870*" "*accepts*" "340"]

Print: National Library of Medicine

Opposite: *Working conditions in textile mills and other industrial plants stirred the nation's social conscience in the early 1900s. The Endowment supported an oral history project on the Textile Workers Union of America which made a permanent record of employees' experiences in mills such as this one. In contrast the Fairmount Waterworks at Philadelphia was often cited as an example of how the nation's industrial development could take place in harmony with aesthetic considerations. This print shows a portion of the machinery of the waterworks, which was a popular subject for 19th century artists.*

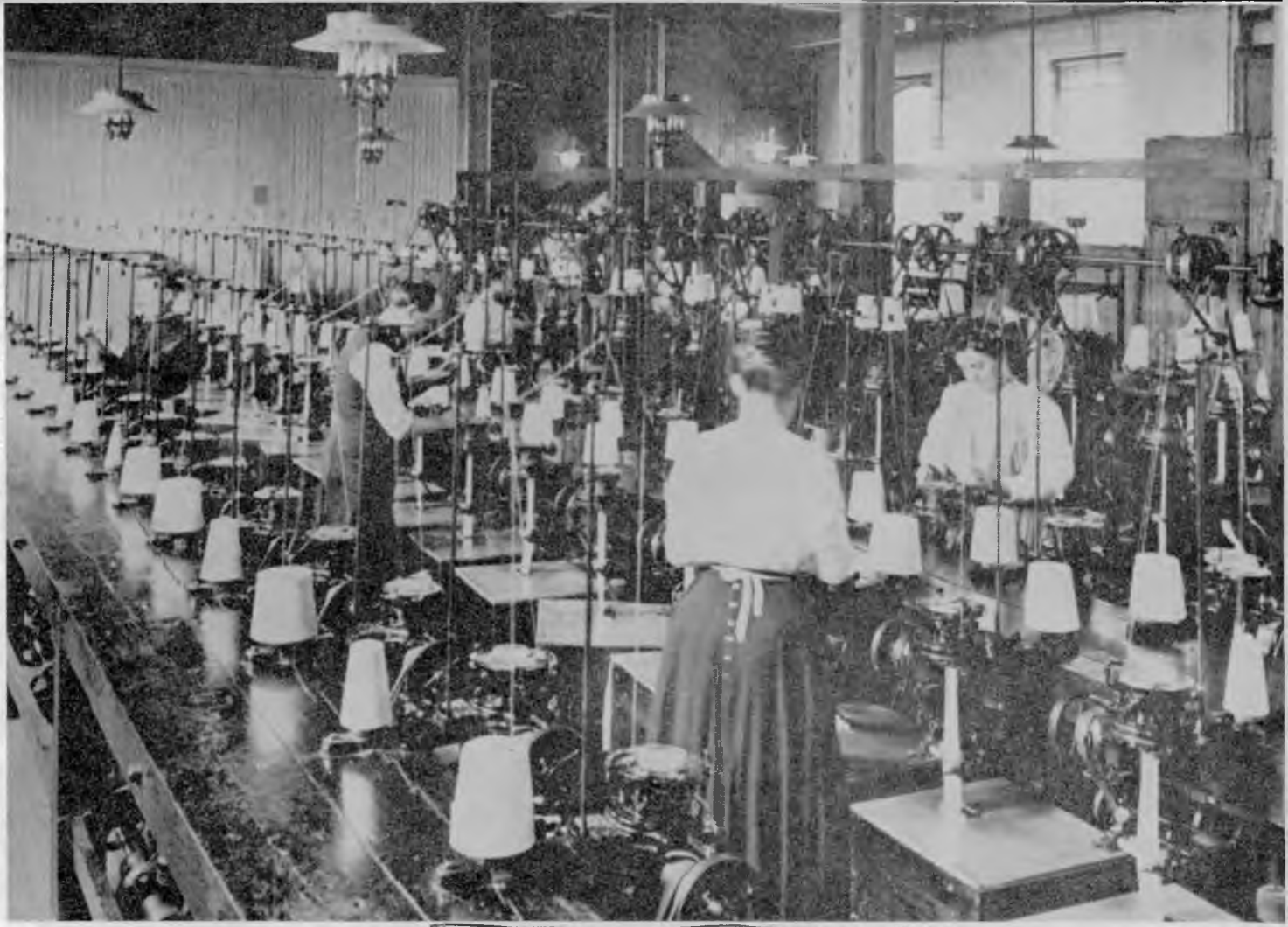
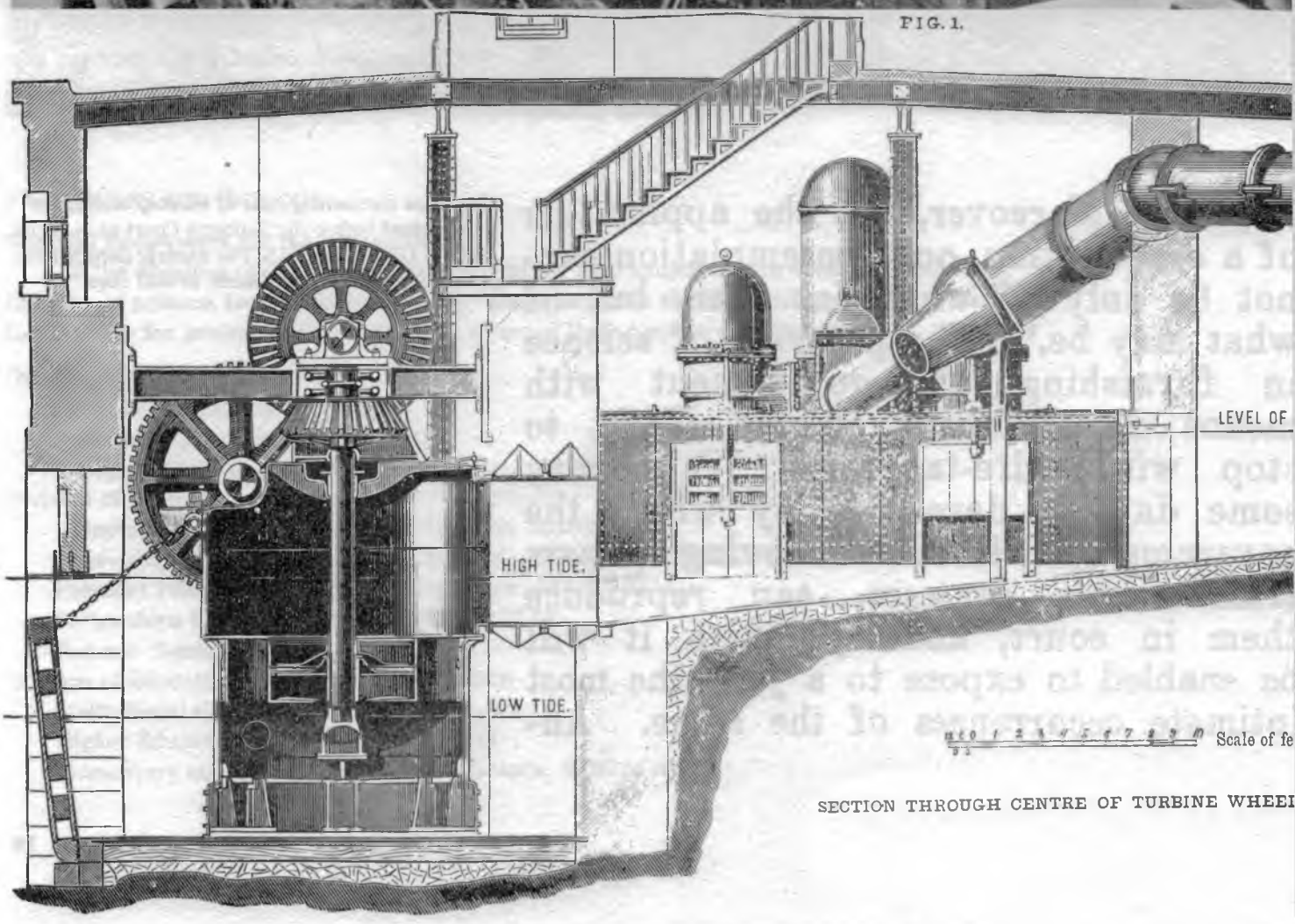


FIG. 1.



SECTION THROUGH CENTRE OF TURBINE WHEEL

Justice Louis Brandeis

The Endowment is also seeking ways of assisting professional organizations in sciences and medicine. A significant development in recent years within those organizations has been the creation of special committees to examine pertinent questions of ethics and values in their fields, and to organize sessions on value issues as part of their annual meetings. The Endowment is prepared to assist such efforts. Major steps in that direction have already been taken in a grant to the American Association for the Advancement of Science (funded jointly with NSF), and in a grant to Rensselaer Polytechnic Institute for a project on engineering and ethics, one result of which has been a consideration of ethical problems at meetings of professional engineering societies.

The relationship between the sciences and the humanities has entered a new era of cooperation and mutual interaction, at the personal, the public, the professional and the academic level. The National Endowment for the Humanities is committed to fostering and assisting that relationship.

[474] Moreover, "in the application of a constitution, our contemplation cannot be only of what has been, but of what may be." The progress of science in furnishing the government with means of espionage is not likely to stop with wire-tapping. Ways may some day be developed by which the government, without removing papers from secret drawers, can reproduce them in court, and by which it will be enabled to expose to a jury the most intimate occurrences of the home. Ad-

Questions concerning uses of wiretap technology were raised before the Supreme Court as early as 1928, in Olmstead v. U.S. The excerpt (left) is from Justice Louis Brandeis' dissent in that case.

Photograph: National Institutes of Health

Experimental mice are examined in the course of Recombinant DNA research. Documentation of DNA research controversies is being assisted under a joint NEH-National Science Foundation grant to the Massachusetts Institute of Technology.

PROCEDURES FOR INQUIRY

National Endowment for the Humanities

All the divisions of the National Endowment for the Humanities are open to proposals in the area of science, technology and human values. Inquiries should be addressed to divisions listed below for projects falling within the scope of their respective programs.

Division of Research Grants *(Mail Stop 350)*
- General Research: 202/724-0276
- Research Resources: 202/724-0341
- Research Materials: 202/724-1672

Division of Fellowships *(Mail Stop 101)*
- Independent Study and Research Projects: 202/724-0333
- Fellowships for Young Humanists and College Teachers: 202/724-0333
- Resident Fellowships for College Teachers: 202/724-0333
- Fellowships for the Professions: 202/724-0376
- Summer Seminars: 202/724-0376

Division of Education Programs *(Mail Stop 202)*
- Institutional Grants: 202/724-0393
- Higher Education Projects: 202/724-0311
- Elementary and Secondary Education Grants: 202/724-0373

Division of Public Programs *(Mail Stop 400)*

Media Program: 202/724-0318 *(M.S. 403)*

Museums and Historical Organizations Program: 202/724-0327 *(M.S. 402)*

Public Library Program: 202/724-0760 *(M.S. 406)*

Division of Special Programs *(Mail Stop 307)*

Youth Programs: 202/724-0396 *(M.S. 103)*

Program Development/Special Projects: 202/724-0398 *(M.S. 401)*

Challenge Grants: 202/724-0267 *(M.S. 800)*

In case of doubt about the appropriateness of a proposal for a particular program within a division, inquiries may be made to the divisions' Deputy Directors who are also members of the Endowment's Interdivisional Committee on Science, Technology and Human Values.

Division of Research Grants: 202/724-0226

Division of Fellowships: 202/724-0238

Division of Education Programs: 202/724-0351

Division of Public Programs: 202/724-0231

Division of Special Programs: 202/724-0261

NEH Divisions/NSF Divisions

Occasions may arise—for projects involving substantial participation by both scientists and humanists—in which there would be an opportunity for joint funding by an NEH divisional program and an NSF divisional program. Examples are as follows:

NEH	NSF
General Research Program Division of Research Grants	History and Philosophy of Science Program, Division of Social Sciences, Directorate for Biological, Behavioral, and Social Sciences
Pilot Grants Program, Institutional Grants Program, Division of Education Programs	Local Course Improvement Program, Division of Science Education Resources Improvement, Directorate for Science Education
Media Program, Museums and Historical Organizations Program, Division of Public Programs	Public Understanding of Science Program, Office of Science and Society, Directorate for Science Education

NEH STHV Program/NSF EVIST Program

All proposals reviewed and approved through the NSF EVIST program are afterward automatically considered by NEH for joint funding of those which involve substantial participation of humanities disciplines.

Inquiries directly to the EVIST program may be addressed to: Director, EVIST, Office of Science and Society, National Science Foundation, Washington, D.C. 20550.

General Information

To receive a listing of all science-values projects which have been supported by NEH and NEH/NSF, or to obtain information about the most appropriate programs for referral of particular project ideas, inquiries may be addressed to: Division of Special Programs, (Science Technology and Human Values), Mail Stop 104, National Endowment for the Humanities, Washington, D.C. 20506.

Cover photographs:

Father and newborn child: Ellen Shub
1946 atomic bomb tests: Library of Congress Collections
Computerized axial tomography (CAT Scan): National Institutes of Health
Model of Pioneer I spacecraft: NASA

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