

Director's Statement

The
Transitional
Decade

In the opening year of this new decade, one fact stands out. American society and our Nation as a whole are moving in new directions. Concurrently, science, science education, and the National Science Foundation are entering a significant and distinct period of transition.

This 20th Annual Report—my first as Director of this unique Federal agency—not only highlights the Foundation's activities for fiscal year 1970, but more important, it identifies the benchmarks for future developments.

What will evolve by the end of the decade I cannot say, but I do know the rate of change—and its potential for good and ill—will accelerate at a rapid pace. How we can plan and guide that change to enrich human life is the central question of our era. This question is a special challenge both to scientists, who by the very nature of their training have a responsibility to be both sensitive and responsive to the wants of their fellowman, and also to those institutions like the National Science Foundation whose calling is to support science as it serves society.

I believe it is particularly timely as we begin the new decade to examine the convictions I share with my colleagues at the Foundation underlying new policies and new programs for the 1970's.

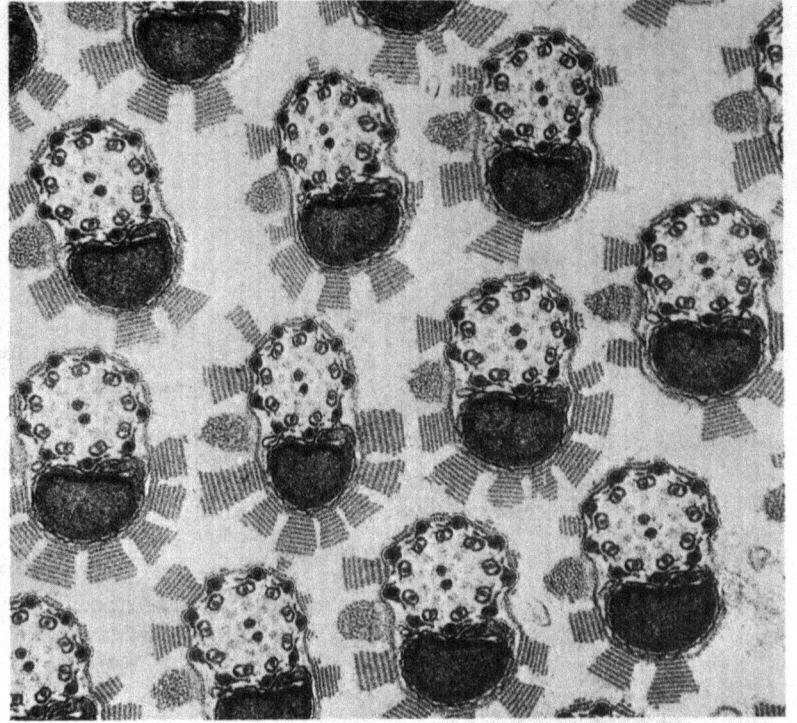
- **PROGRESS IN SCIENCE CANNOT CONTINUE** if its foundations—fundamental research—are weakened. This fact must continue to lie at the heart of the Foundation's programs. To tamper or to compromise with a continuing national investment in knowledge would be to



Photo by Herb Weitman/Washington University.



Photo by University of Alaska.



Microphotograph by David Phillips/Washington University.

cripple future generations by denying them the fruits of today's research.

- **SCIENCE, ENGINEERING AND TECHNOLOGY** must be reexamined as basic tools of service to society. The traditional objectives of science can be—and must be—supplemented by research and education responsive to social needs.
- **WHAT SCIENCE IMPLIES, NOW AND IN THE FUTURE**, is rightfully a matter of growing concern to all Americans. Public participation in the making of policy for science must be encouraged.
- **THE FOUNDATION IS AN APPROPRIATE INSTRUMENT OF LEADERSHIP** for a large segment of American science, and we are prepared to accept that leadership.

Since the decisions we make today will set the new directions for the future, I am keenly aware of the critical role the Foundation should and must play in the immediate years ahead. That role will not be a passive one as long as I am Director.

I believe it important to acknowledge as the hallmarks of the Foundation's orientation towards the future, certain new emphases we have or are in the process of refining. Broad as they are, these emphases

may best be viewed from the perspective of how NSF invests in people, in knowledge, and in the institutions which bring the two together.

Investing in People

Over the years, the Foundation has invested in people primarily through the education of scientists and prospective scientists, and to a modest extent, non-scientists. This is still the case, although numerous adaptations to meet our nation's changing needs are taking place. Among the anticipated program modifications we will stress are:

—Alternative doctoral degrees, specialized master degrees, and continuing education programs which will provide training more attuned to the contemporary needs of colleges and industry.

—Curricula for students not intending to make science a career.

—Institutes for teachers which will better enable science teachers and their local school administrators to develop and adapt new courses, materials, and methods within their own school systems.

—Public participation in science policy issues through greater involvement by State and local governments, industrial interests, and private citizens in applying science to their particular problems.

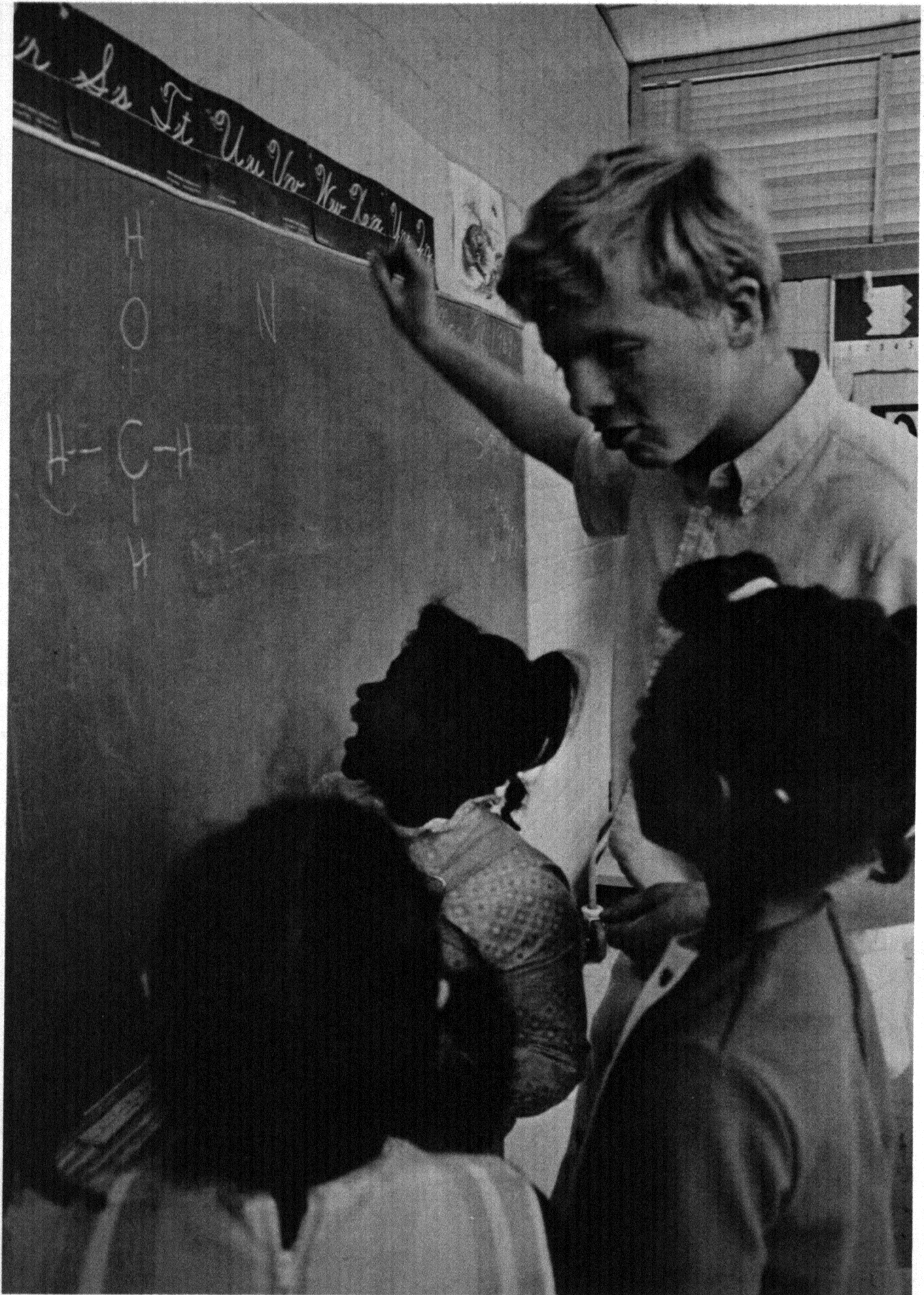


Photo by Floyd Clark/Caltech.



Photo by Robert Bradfield/Cornell Alumni News.

Investing in Knowledge

The core mission of NSF is, and will remain, to advance the progress of science. One specific and central function is, of course, the support of scientific research; in fact, NSF is the only agency charged with this primary responsibility.

To build on our past scientific accomplishments, research support for the various scientific disciplines should be reasonably adequate. But how is adequacy to be decided? What are the criteria to be used? With the funds available to NSF, in a time of limited funding, we must first allocate our resources to achieve proper balance among the various scientific fields. We then must focus more sharply by considering such factors as the scientific opportunities made possible by the development of new scientific knowledge, instruments, and techniques, the impact of the research proposed on other fields, the applicability of the proposed investigations to societal or environmental problems, and its relationship to other NSF and Federal agency research programs.

I would be less than candid if I implied that these considerations result in any clearcut answer as to the best program balance for NSF research in the future. But I anticipate increased emphasis in the following areas:

Disciplinary Research Support . . . predictable funding stability at a satisfactory level for disciplinary research support is one of our most important goals; our best scientists must be assured adequate support and we cannot afford to ignore younger scientists of promise.

Interdisciplinary Research . . . expanding problem-oriented research and related training activities is an important step in responding to the Nation's pressing social needs; the program of Interdisciplinary Research Relevant to the Problems of Our Society (IRRPOS) is the Foundation's catalyst effort in this.

Specialized Research Facilities and Equipment . . . increasing capital commitments in specialized research facilities is a must when the economy becomes more stabilized; the frontiers of science can only advance when adequate tools are available.

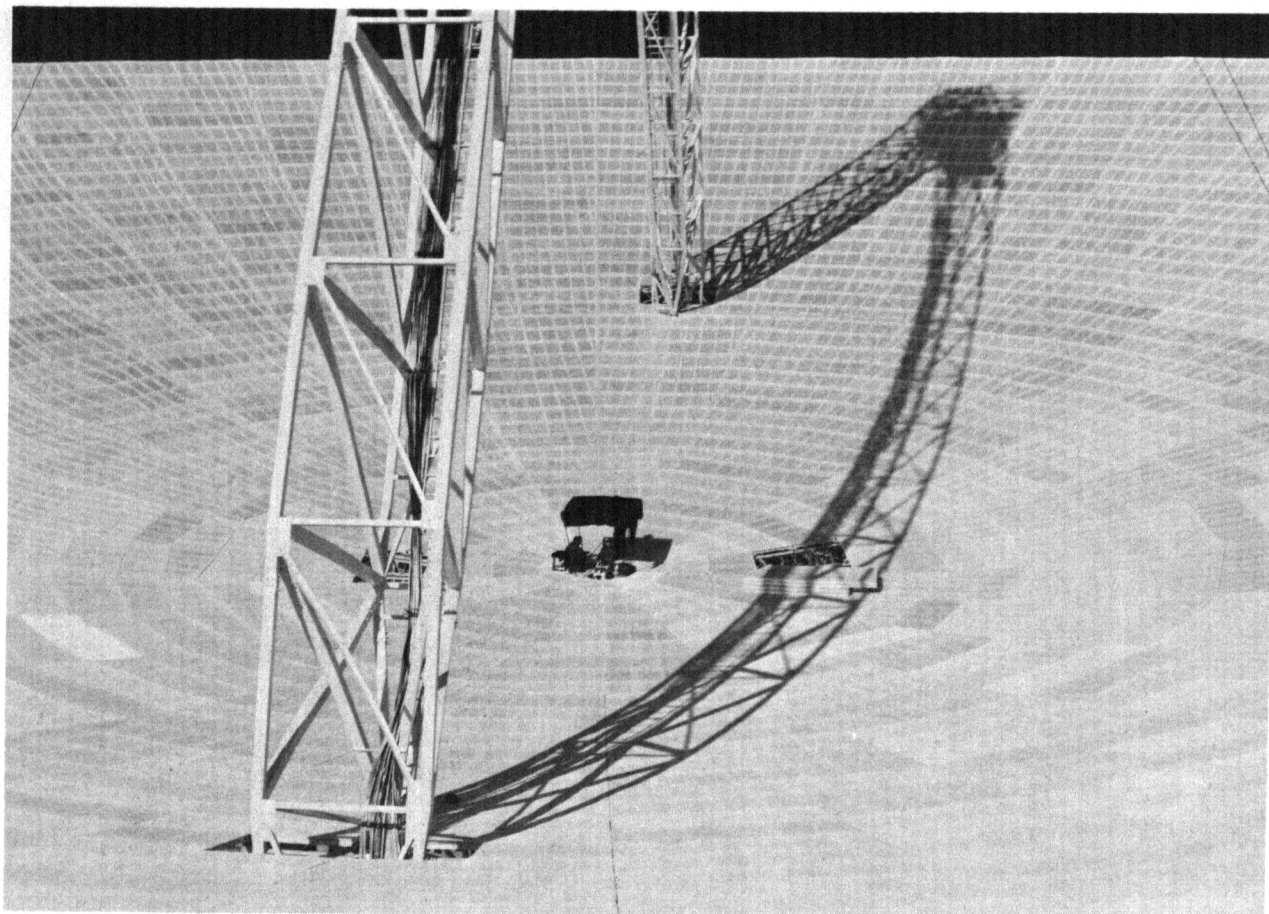


Photo by National Radio Astronomy Observatory.

Investing in Academic Institutions

Given the complex difficulties facing the Nation's colleges and universities, I cannot offer a short answer to the hard problems of maintaining and improving institutional effectiveness. The Foundation and our institutions of higher education are inextricably bound together but, as every college president knows, NSF is not a major benefactor of the institution's general health.

We do help in small ways through the provision of annual formula funds for science to be used at the discretion of colleges and universities, and increasingly through flexibility given institutional officials in administering research and education programs. Most significantly, NSF has strengthened science on a broad front in more than 30 universities and in individual areas of science at 54 other universities through large-scale development grants. Successful as these programs have been, we believe future emphases should be along somewhat different lines, for example:

—Fostering of new multidisciplinary departments

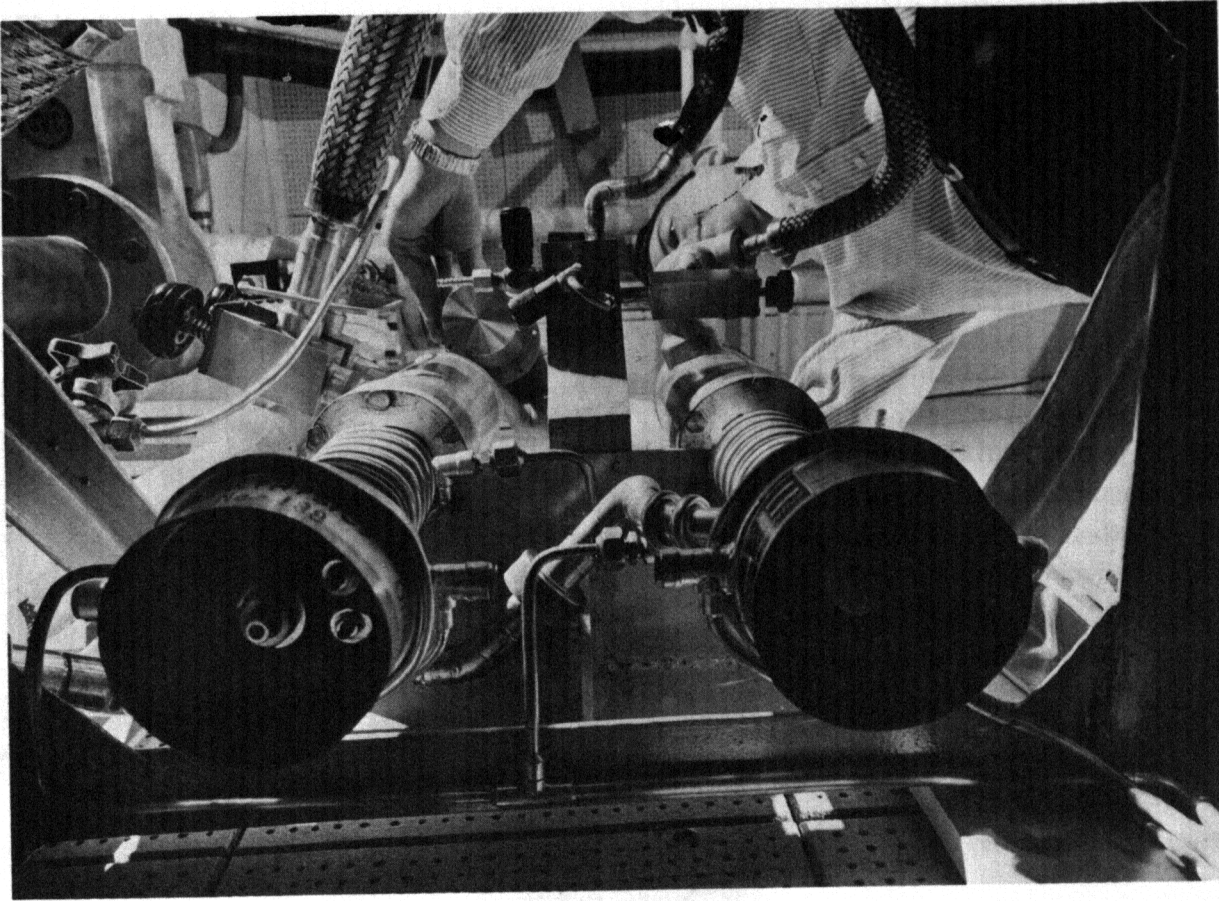


Photo by Herb Weitman/Washington University.

and centers with efforts directed toward specific societal problems. A number of problems believed amenable to this approach have already been identified.

—Strengthening of investments in institutions planning to improve and expand their social sciences. The national demand for social scientists is expected to exceed the foreseeable supply, especially as to the multidisciplinary specialist with abilities to teach and investigate through a wide spectrum of the social sciences.

—Broadening of support to institutions possessing interdisciplinary strengths in scientific research and education with special attention directed toward the improvement of university programs in the computer sciences.

As the new decade unfolds, the Foundation will require a great measure of cooperation and support from the scientific community in handling many of our “new thrust” programs, especially those which relate to the development of problem-oriented institutional capabilities. In addition to support for traditional disciplinary research, NSF will also concentrate other resources upon the solution of acute national difficulties

by identifying areas of research, by actively seeking proposals, and by helping to work out new institutional arrangements. The Foundation's additional lead agency responsibilities in national and international research programs, such as Earthquake Engineering, Arctic Research, and the International Decade of Ocean Exploration, will assume a broader role as the decade progresses.

I firmly believe the Foundation is entering "The Transitional Decade" with vigor, imagination, and a new sense of responsiveness. The more subtle events of fiscal year 1970, indicating the probable directions for the future, underscore my belief. In short, I view the years ahead with confidence and optimism—thanks to an immeasurable degree to the leadership and wisdom of my two distinguished predecessors, Alan Waterman and Leland Haworth, and a deeply committed National Science Board, and staff.

W. D. McELROY
Director

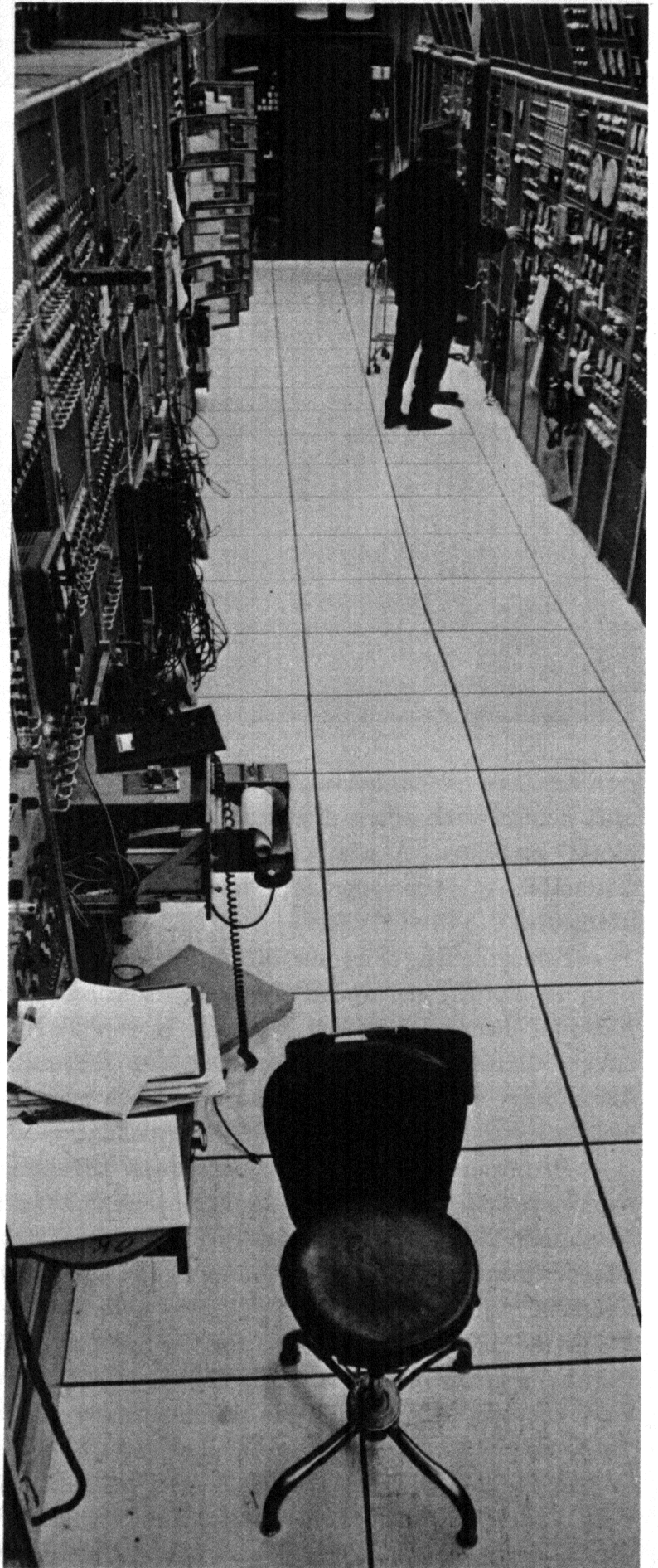


Photo by The Johns Hopkins Magazine.