

## GENERAL SCIENCE

# Propose Powerful Role for NSF

The National Science Foundation is expected to emerge as a powerful force in the direction of science if recommendations proposed to Congress materialize—By Charles A. Betts

► A BLUE RIBBON PANEL sponsored by the National Academy of Sciences recommended a major increase in Federal support of science and a greatly expanded role for the National Science Foundation.

The report of the 15-member panel of scientists, engineers and economists, headed by Dr. George B. Kistiakowsky, Harvard University, was presented to the Committee on Science and Astronautics of the House of Representatives. The panel had been asked by the Committee to make the study, and a congressional hearing was scheduled.

## Key Document

It is expected that this report will be one of the key documents used to implement an overall review by the Congress of the scope and function of the Government in science. Most specifically, forthcoming legislation should redefine the broad, generalized function of the National Science Foundation spelled out in the implementing legislation of 1950. Out of this the NSF should emerge as one of the most powerful forces in the future direction of science. The report indicates support for NSF control over basic research, even in space, atomic energy and defense research programs.

The Academy, established as an advisory group in 1863, had been asked by the Committee to consider:

1. What level of Federal support is needed to maintain for the United States a position of leadership through basic research in the advancement of science and technology and their economic, cultural and military applications?

2. What judgment can be reached on the balance of support now being given by the Federal Government to various fields of scientific endeavor, and on adjustments that should be considered, either within existing levels of over-all support or under conditions of increased or decreased over-all support?

A summary of the report found a "common viewpoint" in a "surprising number" of individual papers prepared by the panelists. The broad conclusions, therefore, represent a consensus.

The recommended expansion in Federal expenditures for basic science ranged up to as high as 15% of the total Federal budget for research and development, although there was sentiment for using the "historic ratio of 9% as a guide."

If Congress should up the ante to 15%, a spokesman estimated this to mean an increase of from \$990 million to \$1,650 million annually for basic science.

A key central theme and a hint for the future, therefore, is that the "Government should recognize that, on the whole, science in the United States today enjoys premi-

nence, and that what is done in the future should be based on expanding and improving the present situation."

Generally, the argument for support of science as a distinct element of our culture is treated by the panelists as less persuasive than arguments based on the useful applications of science and its contribution, for example, to such areas as national defense, public health, economic growth and education.

The panel's discussion of basic research and its applications leads, in turn, to the view that basic research "as a whole" is not a proper focus for budgetary decision. It should be considered both in its role of reaching the politically defined goals of society and in its ability to increase the broad base of scientific and technological knowledge which underlies the Nation's welfare, economic growth and security, now and in the future.

Particular attention was given by the panel to how to increase support for physical sciences, "which now find themselves caught in a squeeze as a result of their traditional dependence for support on mission-oriented agencies whose missions are not likely to expand in the future."

Panelists suggested two courses. One is for the agencies themselves to "take broader interpretation of the basic research they may need." The other is to expand the role of the National Science Foundation. At least half the individual papers support such expansion.

However, said the panel, "the second course by no means excludes the first." There lies a broad recommendation that the NSF be given overall control of Federal agency basic research projects.

In the case of "little science"—the support of individual investigators in universities—it was suggested that this might continue about as it has in the past.

## Panel Recommendations

The panel stated further:

"Two courses for providing increased support to the physical sciences are open, and probably both should be followed. The first, recommended by several panelists, is that the mission-oriented agencies, at times such as this when budgets are rather stationary, should devote a larger fraction of their budgets to basic research. This implies that they incline toward a broader interpretation of what kinds of basic research they deem relevant to their missions than is sometimes the case now; or even that Congress extend the mission of the agency to include the pursuit of certain branches of basic science, if this is necessary.

"The second course, which by no means excludes the first, is to make the National

Science Foundation a much larger agency than it now is—so large that it can eventually become the 'balance wheel,' or even the main umbrella, for the support of basic research—especially in the physical sciences—that is too remote to merit support from the mission-oriented agencies. Such a specific policy with respect to the future growth of the National Science Foundation involves a major political decision by Congress and by the Executive Branch, as formidable and far-reaching as its decision has been with respect to expansion of the National Institutes of Health."

Members of the Academy's Panel on Basic Research and National Goals who participated in the preparation of the report to Congress are: Dr. Kistiakowsky, chairman; Lawrence R. Blinks, Stanford University; H. W. Bode, Bell Telephone Laboratories; Harvey Brooks, Harvard University; Frank L. Horsfall Jr., Sloan-Kettering Institute for Cancer Research; Harry G. Johnson, University of Chicago; Arthur Kantrowitz, Avco-Everett Research Laboratory; Carl Kaysen, Harvard University; Saunders MacLane, University of Chicago; Carl Pfaffman, Brown University; Roger Revelle, Harvard University; Edward Teller, University of California, Berkeley; John Verhoogen, University of California, Berkeley; Alvin M. Weinberg, Oak Ridge National Laboratory; and John E. Willard, University of Wisconsin.

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**THEORY PROVED**—P. W. Anderson and P. L. Richards of Bell Telephone Laboratories inspect the instrument used in their experiment which confirmed recent theories that superfluidity and superconductivity are related and explainable by the quantum mechanics concept that matter has the properties of waves as well as particles.