COMMENTARY

A RESPONSIBILITY FOR GUIDANCE

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Continuing progress in science and technology is essential to the public welfare and hence is a matter of concern to all the people. To assure this progress is, therefore, clearly a concern of the Federal Government. In modern times, conditions require the government to take a direct and active role. I believe that the role of the Federal Government in science and technology involves three major objectives:

The first is to assure that the scientific and technological health of the country is first-rate; that is, that we have a vigorous and healthy base upon which the whole social and economic progress can flourish. In the long range, our progress depends upon two elements, the constant augmentation of the fund of scientific knowledge derived through research, plus a vigorous program of education with particular emphasis upon higher education, to be sure that we have a constant stream of new scientists and engineers to carry out the various programs that are so essential to us.

A second objective is to develop, or have developed, end items—hardware, processes, etc.—that the Federal Government needs directly for its own purposes. At the present time these fall mostly in the areas of defense and space.

Thirdly, the Federal Government should encourage and, as appropriate, assist in practical developments that are in the general public interest, for which the public as distinguished from the Government, is the customer. These include public health, agriculture, and developments contributing to our general well-being and economic prosperity in such fields as energy, water resources conservation, transportation, and so on where for one reason or another the private sector of the economy cannot or does not carry out the developments by itself.

In pursuing these objectives, cognizance should be taken of the following points:

a. Science and its applications have become such an important part of our culture that they deserve more attention (critical as well as supportive) from the American public and its leadership.

b. The interrelationships between science and education and between both of these and government (at all levels) must be healthy if our scientific advance is to be continued.

c. A central government is quite properly the creature and servant of the people; hence it can and should do those things for which the people see—or are brought by leadership to perceive—a significant need.

d. Support of the scientific enterprise can and should be provided from many sources, including—but not especially—the Federal Government.

e. All those professionally concerned with scientific and technological activity bear a responsibility for making clear these facts: that research and development are separable and separate entities, and that they interact one with the other in ways which are mutually helpful; that science is closer to research, and engineering is closer to development, but that there is much overlap on all sides.

f. Expenditures for development can and should be justified on grounds which relate to end purpose, goal, or mission—and should not be made competitive with expenditures for basic or broadly based applied research.

g. Broad progress, in science and science administration as elsewhere, usually results from the establishment and gradual expansion of particular salients rather than through inch-by-inch advance across a wide front; "imbalances" are therefore inevitable, and even have a certain value as goals to further action.

The complexity of modern technology in our society—to which Government programs in space, defense, and elsewhere are contributors—places a heavy burden on the country's educational facilities. In order to keep pace with developments, our schools must conduct elaborate and costly efforts to update their capabilities as they prepare scientists to cope with the technology of the 1970's and later. At the same time, the quantitative workload of our universities has mushroomed as they educate increasing numbers of scientists and engineers to meet current needs of industry and Government. Now we have reached the point where Government must be prepared to shoulder an even greater share of responsibility for education, first on the basis of traditional concern for national welfare and progress, and secondly because Government requirements themselves constitute one of the factors that are taxing the educational structure to capacity.

The scientific and engineering community bears a heavy responsibility both for helping Federal, State, and local governments to choose wise directions in which to apply their efforts, and for helping to develop greater knowledge, understanding, and initiative among the public at large.

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