Letters

Manpower in Biomedical Science

Information provided in the editorial by Dael Wolfle and in News and Comment by Greenberg concerning the federal budget for science (5 Feb., pp. 561, 582) heightens the fears and frustrations of those who are concerned about the growing manpower crisis in biomedical sciences. Wolfle notes that the President's request calls for increases in biomedical research of 51 percent for NSF, 8 percent for NIH, and 5 percent for NASA and, further, that since 1955 the R&D budget has grown, on the average, 20 percent per year. R&D programs, by and large, consume manpower. Support for training the people necessary to mount R&D programs not only started late but has increased at a distressingly slow rate, according to the findings of every responsible survey of manpower needs made in the last decade. Senate Report No. 1460 (on Departments of Labor and HEW Appropriations Bill, 1965) states:

> Testimony made it abundantly clear to the committee that research manpower is a broad area of program need for which adequate provision is not now being made. A greater effort to increase the pool of research manpower is . . . probably the most urgent program need now faced in health research.

Under the President's request, NIH training programs—presently far too modest, with the possible exception of those of the Institute of Mental Health —can be expanded little or not at all; most of the 8-percent increment requested by the President will be dissipated by increased costs. Implementation of the ambitious programs proposed in the so-called DeBakey report ["A National Program to Conquer Heart Disease, Cancer and Stroke," *Report of the President's Commission on Heart Disease, Cancer and Stroke* (Government Printing Office, Washington, 1964)] will put significant additional strains on the manpower pool. If adequate support for training additional manpower is not forthcoming *now* (remember it takes from 7 to 10 years to produce a competently educated researcher), expanding federal research and service programs will contribute substantially to the impairment, if not the ruination, of many institutions desperately trying to obtain, retain, and train biomedical scientists. For this they need training grants. It would appear from the Senate report cited above that Congress is more perceptive than the administration; its recommendation that "the Department [of HEW] take a more realistic view of its obligations to provide an ample supply of trained manpower for research, education, and service" is to be commended. Training is less spectacular than R&D, but it is a conservation activity essential to the protection of the resources which alone offer hope of conquering heart disease, cancer, and stroke.

ROLAND H. ALDEN
University of Tennessee Medical Units, Memphis

Research and Purpose

I doubt if anyone has given more constructive thought to the role of basic research in this country than has Alan Waterman, nor with more results. Yet his introduction of the term "free basic research" into the discussion ("The changing environment of science," 1 Jan., p. 13) could do a disservice to science and scientists. There are three points I want to make.

1) The problem arises from the oft-stated desire of university scientists for "free" funds to do research with. This is nonsense. Money is something that is given in exchange for goods or services. There are no "free" funds legally available to scientists or to anyone else. It is not logical, nor will it long remain economically useful, to urge the allocation of federal appropriations to scientists without the requirement of accountability.

2) What makes research basic is not the objective or lack of one. As Allen Astin has stated it, basic research is "characterized only by the intensity or depth of the inquiry" (in *Symposium on Basic Research*, D. Wolfle, Ed., AAAS, 1959, p. 144). Research upon the structure of matter, the cure of cancer, the mechanism of photosynthesis, the development of lubricants, can be basic or not to the degree that it is done well, that new concepts are developed and their correctness established, and that new avenues of study are opened up. The idea that quality of endeavor is the important and distinguishing characteristic is not limited to science. It is expressed in everyday terms in an old song: "It ain't what you do, it's the way that you do it, that's what gets results" (Oliver and Young, copyright 1939, Leeds Music, New York).

3) Is it important to have an understood and clearly stated objective for a research endeavor? I believe it is. Waterman cites Archimedes, Galileo, Newton, Jenner, and Pasteur, noting that each worked upon problems of technological importance. He could have come much further into the present. It would be no compliment to Calvin to say that his work on photosynthesis did not have a clearly defined objective, or to Woodward, or to Ziegler, or to the Nobel prize winners of the coming years. It has been my experience that all research workers of great ability have clearly defined objectives, and that they will expound them at the drop of a hat. It is the ineffective research worker who often has no well-defined objective and who speaks obscurely of obtaining basic information, of "contributing to knowledge."

Some time ago, I suggested a statement that summarizes the points I am trying to make: "It is no handicap to good research to have a purpose in mind."

SAM R. HOOVER
2017 Hillyer Place, NW, Washington, D.C.

With respect to Paul Klopsteg's editorial, "Justifying basic research," and Alan Waterman's related article, "The changing environment of science" (both in the 1 January issue), let me, as a social-scientist observer of science, allude to the difficulties that representatives of science seem to have in reaching agreement on how to justify basic research.

In the 1963 hearings of the House Select Committee on Government Research, Leland Haworth warned that in arguing basic research as the foundation on which all technology rests (a point often made in justification) "it