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The Search and the End Product

Human groups that admit of a multiplicity of values and purposes are inevitably confronted by two perplexing tasks: they must assign relative weights to individual goals and allocate priorities in the use of their group's resources. A democratic society assumes that ordinary citizens as well as policy makers are, at least on an intuitive level, capable of making such evaluations in a rational and commensurable fashion and that they do so not wholly on the basis of individual self-interest. What are the most suitable common measures on which a society can base its decisions? Specifically, what are appropriate indices for comparison when we deal with science and its possible applications?

Support for the broad spectrum of scientific research now greatly exceeds a just-noticeable fraction of our national budget. Thus it becomes necessary to decide each year what fraction of a finite amount of resources is to be allocated to the search itself, to research facilities, and to the communication and application of research results already available, and how much is to be set aside for the education of the young. One must also decide how much is to be allocated to the various component parts of the total scientific effort, and it is here that groups who are interested in different end products make themselves heard.

Most scientists are notably and justifiably reluctant to extrapolate from their laboratory experience to the benefits that society may eventually derive from their search. They would feel uneasy were they asked to prescribe an ideal "mix" of physical, life, and behavioral sciences. On the other hand, they are also aware that easily measurable quantities are not always the most useful ones. They are, therefore, not overly impressed by the fact that it is obviously easier to assess the cost of research, of an education—or for that matter of human well-being and freedom—than to estimate the value of these commodities; accurate ledger entries do not necessarily constitute correct bases for decision making.

This state of affairs threatens to leave us without a common language —we might almost say without a common currency other than the dollar. We can, of course, take the view that the values involved are intangible and imponderable and that only a nation adequately trained in science might get more than a vague impression in terms of attitudes, expectations, and hopes. Can we really do no better job of translating what science has wrought than to refer to megatons or appliances on a per capita basis? Here is a challenge to the ingenuity of our scientific advisory boards and science administrators. Here also is a challenge to social scientists and humanists. Let us look for new significant indicators of scientific and technological progress. Let us try to convey how the search for scientific knowledge constitutes, in modern societies, one of the most basic commitments to a better future for mankind. There is little chance that we shall find an all-encompassing index or formula, but we need to experiment with a variety of partially valid yet broadly comprehensible measures.

We can scarcely hope to achieve voluntary planning for the benefit of both a free science and a free society as long as we have so few tools for convincing our fellow citizens that without search today there may be no end products tomorrow.—WALTER A. ROSENBLITH, *Massachusetts Institute of Technology*.