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Separating the R from the D

National expenditures for Research and Development—now some $16 billion a year—and confusion between the R and the D parts of this total have come to the point of threatening both parts. Many a congressman or taxpayer considers $16 billion far too much to spend on the biology of the bumblebee, or whatever else he chooses as his favorite target, without realizing that the total also buys a great deal that he insists on having. The label *science* has been stretched so far that engineers frequently chafe at the lack of distinction between science and engineering. And when a leading newspaper equates science with a depilatory in the headline "Science supplants preoperative shaving," the public can be expected to rebel at the idea of paying $16 billion a year for "science."

The confusion has developed partly because *research* and *science* seemed commercially useful and impressive terms, and partly because it once seemed good strategy to blur the distinctions between basic and applied research or between science and engineering. An agency that wanted funds for basic research thought that justification in terms of military, health, or other practical and easily understood objectives enhanced its chances of getting those funds.

But confusion and misunderstanding have now gotten to a stage at which it seems necessary to separate the R and the D parts of the R & D budget. Admittedly it is impossible to draw a neat line that unequivocally distinguishes basic from applied research, or applied research from development; the definitions all get fuzzy at the edges. But useful distinctions can be made, and are. For example, the National Science Foundation annually publishes financial data on basic research and on the whole R & D budget.

It would be a contribution to clarity of thinking and would help government officials and taxpayers to understand better what the nation is buying if budgets, financial reports, and articles analyzing trends were to treat basic research and all of the rest of the R & D total as two separate categories. The large category (now about 90 percent of the total) could be debated and decided upon in terms of military necessities, health improvements, space aspirations, and other national goals. The smaller category (now about 10 percent) would be debated and decided upon in terms of its contribution to increasing human knowledge, the values of basic research as an intellectual pursuit, and the expectation that a reasonable portion of the findings would lead to useful applications.

A recent NSF report on national trends in R & D funds (*Reviews of Data on Research and Development*, Number 41, September 1963) provides useful figures on the amounts devoted to basic research since 1953–54. Annual expenditures from all sources increased 244 percent between 1953–54 and 1961–62. Growth of the federal government's contribution has been the most rapid, 335 percent, but not grossly out of line with increases in the amounts from other contributors: 139 percent from industry, 190 percent from colleges and universities, and 286 percent from other nonprofit institutions. The total from all four sources increased from $432 million, or 0.11 percent of the gross national product, in 1953–54, to $1488 million, or 0.28 percent of the gross national product, in 1961–62.

These figures appear reasonable in view of the nation's wealth and its desire to achieve the values that come from basic research. The time has come to discuss and defend basic research and development separately, each in terms of its own costs and its own values.—D.W.