The Contract State

Brewster C. Denny

A few years ago, books and articles which pointed to the great impact of government research and development on the society and education and to the compelling need for a national science policy were exciting, bold, and avant-garde. Then for a while the writing of such books and articles became fashionable but retained the freshness and challenge. We may now be approaching a point at which they will be commonplace.

The three books reviewed here deal variously with the problem of science and public policy. One, H. L. Nieburg's **In the Name of Science** (Quadrangle, Chicago, 1966. 444 pp. $7.95), is fairly typical of the vigorous breed of books on science and public policy which cite horror stories, raise pungent questions, and urge action. Richard J. Barber's **The Politics of Research** (Public Affairs Press, Washington, D.C., 1966. 175 pp. $4.50) is of a somewhat similar vein, less exhortative and less provocative, somewhat better organized, more careful, and makes specific recommendations for change. **The Politics of American Science, 1939 to the Present** (Rand McNally, Chicago, 1965. 295 pp., illus. $3.75), edited by J. L. Penick, Jr., C. W. Pursell, Jr., M. B. Sherwood, and D. C. Swain, is a useful collection of documents in a field in which basic documentary collections have so far been very few. None of these books contains the broad political and philosophical analysis of Don K. Price's two excellent books in the field (*Government and Science*, New York University Press, 1954, and *The Scientific Estate*, Belknap Press of Harvard University Press, 1965), the rigorous case-study analysis of the Harvard studies on the weapons acquisition process (Merton J. Peck and Frederick M. Scherer, *The Weapons Acquisition Process: An Economic Analysis*, Harvard University Press, 1962, and Frederick M. Scherer, *The Weapons Acquisition Process: Economic Incentives*, Harvard University Press, 1964), or Bruce L. R. Smith's major case study of the RAND Corporation (Harvard University Press, 1966). And unfortunately, if only because of the increasing number of such books, they cannot have the impact of such stimulating potboilers on the subject as C. P. Snow's *Science and Government* or, more recently, Amitai Etzioni's *The Moon-Doggle*.

Nieburg's *In the Name of Science* is an angry book which raises, often sharply, some of the critical problems in what he calls "the contract state." The book is highly critical of many government agencies, particularly NASA and the Air Force, and is particularly hard on what Nieburg calls "the proliferation of quasi-public corporations, both profit and non-profit, springing from the soil of R&D spending (such as Bell-comm, Aerospace Corporation, or Comsat Corporation)" (p. 192).

It is probable that some of the individuals and institutions which Nieburg criticizes will wish a rebuttal and perhaps in some cases correction and clarification, but that, happily, is not the role of a brief review. What is significant in the book is its vigor and some very good phrase-making, some of which hits targets with an unerring accuracy. For example, describing the impact of the "contract state" on universities, Nieburg says, "Faculty quality and morale, and basic research of all kinds, especially in genetics and biology, applied areas of medical, consumer, and industrial research, all the soft sciences and the humanities are strained by the undercurrents of public R&D. The whole system of values is distorted, creating pressures for professors, like their industrial counterparts, to become wildcatters and salesmen writing proposals and brochures in search of government or foundation contracts" (p. 227). Nieburg fails to stress, however, that a favorable side-effect of all this activity has been the upgrading of the intellectual profession and the development of a living wage for professors. Referring to the Congressional response to Administration efforts to reform the contract state, he charges that Congressional leaders "by some curious reverse-twist of psychology . . . have undertaken a vicious series of assaults upon the marginal abuses of government contracting and grants to universities. As if acting out its guilt feelings about the abuses of contracting, Congress fastens upon the universities standards conspicuously lacking in contracts with profit firms" (p. 227). His vigorous attack on the government's attitude toward university overhead allowances is one of the most devastating to appear in print. It probably should have been accompanied by equally caustic criticism of universities for their usual unwillingness to talk tough to Congress and to government agencies about questions of public and academic policy involved in important contract and grant negotiations and legislation. He might also have noted higher education's failure to meet critical needs in public policy research and education as institutions rather than as loose associations of grand duchies and free-lance entrepreneurs called departments, institutes, and professors. A strong feature of the book is the highlighting of the Bell report, the significant study on Government Contracting for Research and Development commissioned by President Kennedy. This is a candid, thorough, and important study which deserves greater attention. (It is unfortunate, incidentally, that the Rand McNally book of readings devotes only a relatively small amount of space to this report's significant conclusions.)

Nieburg offers little in the way of counterproposals. But then he did not set out to do that. Because, among other things, there are too many sharp, oversimplified, irrelevant, and inaccurate "good-guy-bad-guy" distinctions, the book will make some people angry, some justly, some not. But if hard, tough writing about the tremendously important ramifications of the contract state for the welfare of the nation and its institutions can stimulate public concern, thoughtful analysis, and appropriate action, then Nieburg's book is a useful contribution to the growing literature.

Richard J. Barber's *The Politics of*

The reviewer is professor of public affairs and director of the Graduate School of Public Affairs at the University of Washington, Seattle.

Research is a brief, concise, informative, and readable treatment of government organization for research. Its early chapters, although presenting little that is new, summarize the important facts about the present situation: the rapidly increasing size of the R&D business, its importance to public and private institutions, the development of "defense supplier firms" which "are in effect little more than government arsenals operated by corporations whose stock is privately owned" (p. 55), the reliance the government places on outsiders "to decide upon its own policies and strategies, to guide the main contours of its largest projects, and to carry out its own research in areas of great national sensitivity" (p. 58), the problem of priorities and allocation of scarce resources, the threat of an R&D pork barrel, and the distorting effects of all these factors on higher education. The book is particularly fresh and informative in its treatment of the tendency of federal programs to be "administered in such a way as needlessly to accentuate trends to industrial concentration and to reinforce monopolistic positions with patent rights on inventions arising out of tax-supported research" (p. 109). Also pertinent and fresh are Barber's accounts of the negligible attention given to putting government-bought knowledge to work by making it publicly accessible and of the fantastically poor internal communication among the myriad government units in the research business. On the latter point Barber notes that "it is sometimes said that if a research project costs less than $100,000, it is cheaper to do it again than to find out if it has been done before" (p. 110).

The Barber volume closes with a provocative chapter on needed changes in government organization and decision-making. The author appropriately and succinctly states the principal problem of priorities when he concludes that the national R&D budget "reflects choices among competing uses and it should represent a set of priorities that embodies our social preferences. At present it does not" (p. 117). He reviews the present organizational structure and praises the changes in the Executive Office of the President and the NSF which flowed from the recommendations of a staff report by Senator Henry M. Jackson's Subcommittee on National Policy Machinery, although he errs in minor matters of fact and emphasis in his account of what happened and what happens. In his specific recommendations for reform, he has a number of useful though not original suggestions, particularly with respect to the Bureau of the Budget. He makes a valuable restatement of the earlier recommendation of others that there is need for what Barber calls an Inventions Development Agency. This suggestion recognizes the need for a federally subsidized agency to fill the gap between basic research and that stage of development at which the hope for practical applications is clear enough to invite extensive public or private expenditures.

Barber picks up two of the most popular proposals for reform, namely a Joint Congressional Committee on Science and that hardy perennial, a Department of Science. It is to his credit that he does not present these as cure-alls but as suggestions for the kinds of reforms that might be considered along with others. But, as is so often the case, discussion of these alternatives tends to overshadow and crowd out the much more difficult analysis of the decision-making process which could result in really useful reforms. Such reforms include those in the budget process, which Barber does discuss briefly, and the assignment of policy leadership in a broad area to a single executive department as executive agent, which he does not. In a book which calls repeatedly for a tighter and less pluralistic government organization, it is curious that the author also advocates a spreading of R&D grants and contracts to a larger number of corporations, universities, and geographical regions. Although he sees the pork-barrel danger in this, he fails to prescribe how to avoid it or to persuade the reader that he proposes anything but a fairer distribution of the largesse.

But the fundamental problem with Barber's useful volume is that he deals extensively with only two of the constituencies which compound the problem of the "contract state," namely political policy makers (the Congress and the Executive) and business and industry, while leaving the scientist, in and out of government, relatively untouched. It was scientists in the NSF and universities who until a few years ago largely ignored Congressional intent and narrowed the NSF's mission effectively to rule out some of the social sciences and to leave largely unperformed the NSF's assigned duties of making thoughtful studies of national science policy and providing government-wide science coordination. It is scientists who prefer the pluralism of the present system, in which they are surely right, at least until a more effective alternative than a Department of Science and a Congressional Joint Committee on Science is proposed. It is scientists who, for the most part, have most sharply raised for public discussion the critical questions of science and public policy. And, most important, it is scientists who primarily comprise the outstanding cadre of science policy makers and administrators in and out of government which has well served both science and policy. These omissions aside, however, Barber deserves thanks for a lucid and succinct statement.

The Politics of American Science, 1939 to the Present is an excellent source book. Every informed reader, of course, will look for favorites which are not there, may find areas of emphasis or neglect which fail to conform to his own taste and sense of priorities, or might question the rationale and organization, or even disagree with the limited comments by the editors. Nevertheless, the collective editorship of Penick, Pursell, Sherwood, and Swain has resulted in a fine collection, strung together well by an editorial framework which arbitrarily but rather reasonably defines sequential historical periods in a way that just happens to divide the book into four more or less equal parts, one assigned to each editor. The collection is particularly valuable because it includes so many materials that are not readily available, from internal government papers, university files, Congressional hearings, newspapers, and reports of special boards and commissions. The collection even includes a Herblock cartoon which—as the work of this great contemporary political scientist so often does—proves that a picture can often be worth at least a thousand words. Other social scientists would do well to emulate the historian's long-standing practice of using political cartoons to depict political impact. The editors have generally excluded excerpts from scholarly monographs or reprints of journal articles, which so frequently characterize source books. The focus is on documents that form an active part of a history of what one editor calls "a changing relationship of great moment in the national life of Americans." The editors see the scientific community

as "an interest group or, more accurately, as a loose confederation of constituencies, operating within the context of a federal (and plural) system. The problems of science that they seek to illustrate are problems of politics" (p. vi).

The volume contains some very important and challenging documents. Much of the administrative and policy history of the World War II agencies for research and development is sensitively and economically told through the use of well-chosen and well-abridged documents and a thoughtful editorial road map for those who have forgotten or never knew OSRD, NDRC, NRC, and the wartime activities of Vannevar Bush, Karl Compton, and Leonard Carmichael. From the pages of the volume the thread of administrative history emerges from the early developments to the Atomic Energy Commission, the National Science Foundation, the Office of Science and Technology, the National Institutes of Health, and the National Aeronautics and Space Administration. Not all the history, to be sure, is here. The great effects of the Eberstadt report and of the many major developments in the national security field on the governmental environment and decisions for postwar research and development are largely missing. The role of Congress is treated rather more heavily in the early part of the history than seems warranted, particularly in contrast to the comparatively limited treatment it is given in the later part. In one place, the history of the NSF, the thread of the story is lost somewhat.

Some documents are simply excellent in typifying an attitude, a problem, or a spirit, and provide both variety and substance to a work which also includes a Truman veto message and Bernard Baruch's historic speech to the U.N. on nuclear disarmament. Excellent examples of such varied selections are a delightful excerpt from testimony by Maury Maverick in which he criticizes scientists for being smug (pp. 79–80), excerpts which show the misconceptions that the natural scientist has about social science research, and a fairly full excerpt from an excellent Harvard University document on the new relationships between universities and government and their implications for public policy and academic policy.

The Rand McNally volume is the most important of the three books reviewed here: first, because it does something well that hasn't been done often enough and, second, because the readings make a real contribution to teaching, public discussion, and the advance of research and education on a vital subject still largely neglected by the appropriate scholarly disciplines. For just as basic physical and theoretical research and the training of teachers and scientists had to precede or accompany the scientific development which produced the political, moral, social, economic, and administrative questions raised in these books, so must higher education develop orderly analysis and train the teachers, scholars, and policy-makers to meet these issues. Surely by now the key problems of science and public policy have been raised with sufficient force and clarity. Solutions wait upon a greatly increased commitment of the intellectual community to basic research and educational programs across the full range of problems encompassed by science and public policy.

The Making of an Elite

The word "technocracy" is associated in American minds with an abortive political movement founded by Howard Scott in 1933 and with its antecedent philosophy in Veblen's *The Engineers and the Price System.* In **The Rise of the Technocrats: A Social History** (Routledge and Kegan Paul, London; University of Toronto Press, Toronto, 1965. 456 pp. $9), W. H. G. Armytage, who is head of the Department of Education at the University of Sheffield in England, briefly refers to these matters, but his aim is vastly broader. The technocrats are those who compose the scientific and technological community, both as it exists in and for itself and as it forms the basis of contemporary industry and government. The implicit theme of the book is the transformation of Europe, North America, and now much of Asia from an agricultural to an industrial economy resting on a scientific technology. The explicit subject matter is the associated rise of scientists, engineers, and a technically trained managerial class to the position of a national decision-making elite. In short, Armytage has written what we might call the institutional history of science and technology. The end product of this revolution is the highly collectivized super-industrial state in which power, as C. Wright Mills effectively showed, is controlled by an interlocking system of the industrial management, the political directorate, and the military establishment. The picture is equally accurate for the United States, the Soviet Union, Japan, and the People's Republic of China.

How did this state of society come into being, one that was astonishingly well predicted in Bacon's *New Atlantis*? By means of a minutely detailed, heavily empirical, and thoroughly documented chronicle, Armytage describes the process as a succession of particular events which compose this institutional development. The sheer volume of his material is attested by an index of about 2700 entries for a text of only 358 pages. He begins his account, for reasons that are not at all clear to me, with the establishment of botanical gardens in the 16th century, then moves with an ever-increasing quantity of data into the mainstream of his history. The 17th century saw the establishment of scientific academies and their associated journals. The first of these proved abortive, permanence coming with the Royal Society in England and the Académie des Sciences in France. The technical school is a French creation of the 18th century, originating with the École des Ponts et Chaussées (1749), although the archetype of the contemporary institution is the enormously influential École Polytechnique (1794). The graduate school of science and the technical institute, primarily German inventions, came with the 19th century, along with an unimaginable proliferation of societies, associations, laboratories, schools, departments, agencies, and finally whole ministries of science and technology. By the beginning of the 20th century the transformation was pretty well complete in England, France, Germany, Japan, and at least the eastern United States. By the time of World War II the process had reached a similar stage in the Soviet Union, as it is now nearing it in China.

If the reader has the patience to keep his attention fixed on Armytage's outpouring of facts, he is bound to be fascinated by the ever-accelerating expansion and the seemingly uncontrollable momentum of this development. At the same time, he may very well be confused by the author's oversimplified approach to this complex subject. The sudden and arbitrary beginning,