Book Reviews

Science in the Federal Government. A history of policies and activities to 1940. A. Hunter Dupree. Belknap Press of Harvard University, Cambridge, Mass., 1957. x + 460 pp. Illus. $7.50.

The years that are fresh in memory have seen the development, the solution, and sometimes the failure of solution of many a problem concerning the relations between science and the Federal Government, including the wartime concentration of scientific effort in the Office of Scientific Research and Development, the struggle to secure legislation establishing the National Science Foundation, problems of security and loyalty screening, the birth of the Atomic Energy Commission, and the debates over the proper roles of government and industry in the development of atomic power. Without discussing a single one of these contemporary or recent matters, Dupree contributes profoundly—and frequently entertainingly—to an understanding of the administrative, organizational, and policy problems that underlie them. He provides a background, from the Constitutional Convention in 1787 to the outbreak of World War II, of information on the continuously evolving relations between science and government and the unending effort to develop appropriate policy bases for those relationships. The author, a historian now at the University of California at Berkeley, has produced an original, comprehensive, and excellent history that not only tells a fascinating story but also adds greatly to our depth of understanding of the complex relations between science and government.

One of the debates of the Constitutional Convention centered on the proper role of the Federal Government in encouraging learning in the arts and sciences. Powerful voices—Franklin, Madison, Pinckney, and others—wanted the new constitution to give explicit recognition to these obligations. The opposition was not primarily to science and learning per se but to a strong central government. In the end, the dreams of some of the founding fathers of a national university, and of explicit responsibility for fostering science and the arts, were casualties of a majority belief that responsibility for internal improvements belonged to the states and not to the Federal Government.

The theme that runs all through Dupree's book is that the issue debated in the Constitutional Convention has never been settled. Franklin and Madison and Pinckney had as their spiritual heirs every President through John Quincy Adams and, in a later time, Presidents Theodore Roosevelt, Herbert Hoover, and Franklin D. Roosevelt, as well as numerous scientists, bureau chiefs, and scientific organizations. The defenders of the doctrine of states' rights have also had their spiritual heirs, sometimes in the White House, more frequently in Congress, and occasionally among the ranks of leading scientists. Since George Washington's first term as President there has been a continuous effort to resolve the basic problem of federal responsibility and to develop organizational relationships that will allow government to serve science and science to serve the general welfare.

As a consequence of this continuing debate, many of the existing federal scientific activities had to come in through the back door. When Congress was unwilling to adopt legislation that clearly established a scientific agency and defined its function, which was usually the case, it was frequently possible to foster a scientific activity by tacking a rider onto an appropriation bill. When President Jefferson arranged for the Lewis and Clark expedition (which made substantial contributions to several branches of science), a double stratagem was necessary: from the Spanish Government he secured permission for an exploratory party that would "have no other view than the advancement of geography," but, in approaching Congress, which would not have appropriated a penny for the study of geography, he justified the expedition on the grounds of its commercial possibilities. When Congress showed almost complete apathy toward creating the National Academy of Sciences, it was possible for one Senator to slide through an unread bill on the hurried final afternoon of a Lame Duck Congress, thus circumventing the opposition both of Congress and of the nation's leading scientist, Joseph Henry. Dupree defends these stratagems, pointing out that they were not examples of political immorality but necessary consequences of ignorance of science on the part of most Congressmen and of the technical difficulties of legislating scientific bureaus into existence through the ordinary Congressional machinery.

Along with the continuing thread of effort to find solutions to organizational and legislative problems, there is much of specific interest concerning the origins and changing fortunes of federal agencies that now seem to occupy assured and stable positions, the National Bureau of Standards, the Department of Agriculture, the Forestry Service, the Geological Survey, the National Institutes of Health, the Smithsonian Institution, and others; of some that lived for a while and then went out of existence, the Allison Commission, the Bureau of Science in the Philippines, the Science Advisory Board; and of one that never came into existence but that was frequently and sometimes strongly advocated, the Federal Department of Science.

Here, too, are odd bits and interesting sidelights of scientific history. Until 1853 every director of the Bureau of the Mint had some kind of scientific background; in 1805 Jefferson refused to appoint Benjamin Rush to that position because of his lack of training in mathematics. One of the earliest federal research grants to a private institution was in 1830, when the Franklin Institute was asked to study the causes of explosions of steam engines. The balloon observation program of the Army of the Republic was abandoned, not because of technical difficulties, but because of "failure of the Army to incorporate a new procedure into its operations."

The whole history is enlivened and frequently made dramatic by the skillful portrayal of the personalities of major participants and the re-creation of the attitudes, the clash of opinions, and the current problems that shaped their thinking and determined their successes and failures.

DAEL WOLFLE
American Association for the Advancement of Science

The 1955 University of Utah Research Conference on the Identification of Creative Scientific Talent. Held at Alpine Rose Lodge, Brighton, Utah, 27–30 Aug. 1955. Calvin W. Taylor, Principal Investigator. University of Utah Press, Salt Lake City, 1956. 268 pp.

Most of us have had the experience of attending stimulating conferences and of reading, later, the reports of those conferences only to find that the brilliance of the original discourse had become dull and tarnished somewhere between the speech-making and the printing of the report. However, readers

of this report will be pleasantly surprised to find that this document is a successful attempt to reproduce the freshness of spirit which is found when a dozen or more brilliant individuals are assembled for the purpose of struggling with an exciting intellectual problem. I found that once I had started reading the report I could not put it down.

The basic material on which the report is based consists of 16 papers presented at the conference with varying degrees of formality and a very large amount of spontaneous discussion. The contributors, in editing their own discussion reports, have successfully retained those portions of the discussion which add significantly to the development of ideas presented within the papers themselves. In order to accomplish this purpose, discussion is freely reproduced within the text of many of the papers. Thus, each section of the report presents considerable continuity of ideas and a degree of organization which is usually lacking in such reconstituted material.

It is not feasible here to discuss the content of particular contributions. These vary from highly organized presentations, such as that of Guilford on the structure of human abilities, to speculative and free-flowing presentations which are highly imaginative even if they are not supported by any data.

A valuable feature of the work is a series of reports of committees, which are reproduced in a concluding section. The committees have been successful in gathering together the major ideas presented in the earlier reports and discussions. These committee reports are presented in the same informal manner as the rest of the material and are interspersed with the comments of the audience to which the committee reports were presented.

A final bibliographic section rounds out the report by providing a list of 131 references to which the reader may turn to find support for much that was presented earlier. All in all, one may expect that this report will be considered a major reference work in the area for at least a decade to come.

ROBERT M. W. TRAVERS
Air Force Personnel and Training Research Center

Biographical Memoirs of the Fellows of the Royal Society. vol. 2, 1956. The Royal Society, London, 1956. 345 pp. Illus. + plates. 30s.

This is the second volume of a new series of brief biographies that is a continuation of the *Obituary Notices of Fellows of the Royal Society (1933–1955)*. As in the first volume and as in the older series, each article is accompanied by a full-page photograph or portrait of the subject and a complete bibliography of his publications. The articles, which describe the lives and principal scientific accomplishments of the subjects, maintain the standard of excellence of the older series.

Biographies of the following are presented: Walter Sydney Adams, Gleb Anrep, Oswald Theodore Avery, Henry Frederick Baker, Patrick Alfred Buxton, Sheldon Francis Dudley, Lewis Leigh Fermor, Alexander Fleming, William Michael Herbert Greaves, Arthur Lewis Hall, Henry George Albert Hickling, Harold King, Charles James Martin, John William Nicholson, Robert Cyril Layton Perkins, Richard Friedrich Johannes Pfeiffer, Alexander Oliver Rankine, Sigmund Otto Rosenheim, John Alexander Sinton, William Kingdon Spencer, Edmund Taylor Whittaker, and Robert Williams Wood.—G. DUS.

Dahlak. With the Italian National Underwater Expedition in the Red Sea. Gianni Roghi and Francesco Baschieri. Translated from the Italian by Priscilla Hastings. Eleanor Brockett, Ed. Essential Books, Fairlawn, N.J., 1957. 280 pages. Illus. + plates. $6.

The members of this expedition spent 6 months off the southwestern shore of the Red Sea, among an archipelago of which Dahlak was the largest island. Headquarters was a 135-ton motor vessel. The staff, eight in number, was divided equally into scientific and "sports" groups, but this volume deals almost entirely with the activities of the latter—their failures, successes, and especially their narrow escapes. These sportsmen were armed with shotguns, rifles, arrows, lances, harpoons, spear-guns, and dynamite. They were outfitted with goggles, compressed-air respirators, and fins. It is, thus, the most recent of a long list of volumes dealing with encounters with, and dangers of, the eternal barracudas, mantas, moray eels, and especially sharks. The authors claim that these "direct" methods take precedence, in collecting and scientific results, over the old-fashioned nets and hooks. As proof, they tell of 53 tanks of Formalin, containing 800 pounds of fish and quantities of invertebrates.

Scattered throughout the text are hints of the neglected or half-seized opportunities for behavior observation. Even these notes are negatived by superficial descriptions, lack of identification, and complete absence of an index.

The account of the parturition dance of the mantas is intensely interesting but would have had great significance if the observers could have distinguished and verified the characteristics of newborn mantas. Many cowries were collected, but apparently not a note or painting was made of the complex patterns and coloration of the owners of these shells. Nearly 2 months were spent in search and capture of the strange fish Cefalone. The notes would have been of real value if, before publication, a photograph of the fish had been sent, for naming, to some competent Italian ichthyologist.

A human being, kicking and swimming his way under water from reef to reef and brandishing lethal weapons, has little chance of making worth-while observations. A man running through the jungle, waving arms and legs, could not expect the birds and animals to behave in a natural manner. It is high time that an expedition was given over to trained scientific observers, armed with waterproof paints, paper, and pencils. The results would be beyond any expectation. There is much to be said for the old-fashioned diving helmet, tethered by a hose.

Francesco Baschieri has contributed an appendix which consists of a brief geologic history of the Red Sea, an account of former expeditions, and short generalized paragraphs on groups from plankton to mammals. Some of the photographs are excellent.

WILLIAM BEEBE
New York Zoological Society

American Men of Science. A biographical directory. vol. III, *The Social and Behavioral Sciences.* Jaques Cattell, Ed. Bowker, New York, ed. 9, 1956. 762 pp. $20.

American Men of Science is edited by Jaques Cattell, son of the late James McKeen Cattell, who in 1906 issued the first edition of this directory, which has become an indispensable tool to scientists everywhere.

The present edition is divided into three volumes, of which *The Social and Behavioral Sciences* is the third. This volume contains names of individuals in some fields not included in the eighth edition, published in 1949. Psychologists, geographers, and anthropologists were dealt with in earlier editions, but, in addition to these categories, the present volume also lists workers in the social sciences, some of whom were previously included in the *Directory of American Scholars.* It was originally planned to list historians in the present volume. On advice of the American Historical Association, however, it was decided to omit historians here and include them in the forthcoming new edition of the *Directory of American Scholars.*

The eighth edition of *American Men of Science* contained some 50,000 biographies, which made a book that pressed