derivatives for the characterization of functional groups. There are also very complete tables of physical constants to aid the identification of organic compounds as well as schemes for the recognition of typical groups. These sections are preceded by an account, about 150 pages in length, of techniques for handling small quantities of material. Operations such as crystallization, distillation, extraction and chromatographic separation are described in considerable detail and there are some useful descriptions and diagrams of suitable apparatus. A small section on infra-red absorption spectra is also included.

From the authors' introduction, it appears that the book is designed to be used not only by practising organic chemists but also by students who are starting practical organic chemistry. In this, it is possible that the authors have gone too far in their enthusiasm, for it is extremely doubtful if any beginner can efficiently acquire a competent technique in the handling of semimicro amounts, without having previously undergone the discipline of well-founded instruction in the art of crystallizing, distilling and purifying larger amounts.

The intention of the editors of the series of volumes under the title of "Organic Analysis" is stated to be to present an up-to-date picture of techniques for the estimation of organic compounds, and reliable and critical information about new methods and procedures. This is a high standard to maintain over a series of volumes, but it is evident that Vol. 3 in no way falls below the standard set by the previous volumes. The general content of Vol. 3 may be gauged from the titles of the reviews; determinations of organic acids, of acid anhydrides, of amines and amides, and of olefinic unsaturation. The volume is completed by a review of the applications of analytical mass spectrometry to organic analysis, and by one on the analytical characterization and determination of some commercially important classes of synthetic organic coating resins. These reviews are of special interest to the analyst, but can be read and used with profit by organic chemists with more general interests. In particular there is a satisfying and critical survey of methods of estimating unsaturated linkages; it covers not only methods based on saturation of the double bond, but also those depending on what the authors call 'instrumental methods', among which are infra-red and ultra-violet absorption, and chromatographic methods.

W. J. HICKINBOTTOM

SCIENCE AND THE UNITED STATES GOVERNMENT

Science in the Federal Government

A History of Policies and Activities to 1940. By A. Hunter Dupree. Pp. xi+460. (Cambridge, Mass.: The Belknap Press of Harvard University Press, 1957.) 7.50 dollars.

IN this book Mr. A. H. Dupree gives a readable and scholarly account of the relations between the Government of the United States and scientific work during the first hundred and fifty years of the Federal Union. It is a picture of the place which science has taken in the growth of the American nation and, concerned rather with the organization of both science and government and the formulation of

policy than with the advance of science itself or with technical invention, it makes an admirable complement to Prof. J. W. Oliver's recent "History of American Technology" (see *Nature*, 179, 338; 1957). The development of the Smithsonian Institution, the American Philosophical Society in Philadelphia, the National Academy of Sciences, and the later Carnegie Institution of Washington, the Rockefeller Foundation as well as the Tennessee Valley Authority and the Office of Scientific Research and Development and other bodies created to meet the needs of the country in the Second World War are all seen to fall into their natural places. Mr. Dupree's leisurely narrative provides a background which explains points that sometimes puzzle those overseas regarding the antecedents of that series of reports, following on "Research: A National Resource" and continuing with "Science: the Endless Frontier" and "Science and Public Policy", which emphasized the profound concern of the United States Government to-day with the function and use of science.

The book is, however, something much more than a complement to these reports or to the recent description of the present organization of the Federal Government for scientific activities which the National Science Foundation has published. Mr. Dupree rarely discusses developments, such as Mr. D. K. Price discusses in "Government and Science". He is content to record the facts in such guise that the situation comes alive, and for this reason his book will be of wide interest outside the United States. Essays which display so penetratingly the reactions between science and government are all too rare, and although Mr. Dupree's canvas is ample, this account of the American scene is calculated to assist the understanding of the British scene also, and not least to convey more than a hint to the British scientist on how to handle such relations.

There is indeed nothing that really approaches this book in covering the relations between science and government in Britain over the same period. Prof. Armytage gave some sidelights in "Civic Universities", but no book on the Civil service has covered this aspect, and Dr. D. L. S. Cardwell's recent study of the organization of science in England also passes it over, though it was noticed in some of the studies stimulated by the Perkin centenary last year. It will surprise many to learn from Mr. Dupree's book how long the history of science in America is, how deep the roots of science go both into science and government, and from what early days the United States Government has been concerned to foster science. Well produced as well as written, with ample bibliographical references, and a chronology as well as an adequate index, it will interest all those concerned with the relations between science and government. For a book which illumines those complex relations and their dangers, there are two curious omissions. There is no mention of either the American Association for the Advancement of Science, although *Science* is freely quoted, nor of de Tocqueville, though de Tocqueville's remarks on the influences of democracy upon science in America, and his observations that the democratic principle does not induce men to cultivate science for its own sake and on the neglect of theoretical and abstract knowledge in the United States, are highly relevant to Mr. Dupree's account and endorse his concluding argument.

R. BRIGHTMAN