which would have been unheard of twenty-five years ago." This short summary, of course, does no justice to the review and analysis of old and new Manus behavior, values, and material ways of life which the book provides in fascinating detail.

But the detail is not the primary purpose of Mead's study. Rather her purpose is to use these "before-and-after" data to test and expand the theories of present-day social science regarding the interplay and interrelations of personality, character, and social organizations and institutions in order to better understand the process of social change and its consequences for mankind in these times of change.

"The Manus experiment itself is unique. The Manus were a people most favorably inclined toward change, conscious that cultural forms differed and could be changed, infused by their upbringing with an aspiration congruent with the more universal and humane forms of Western democracy, with the rare accident of a very gifted leader, and the unique experience of having a million men, members of a modern society intent on their own affairs, enact a large part of the pattern of Western democracy before their eyes." But all experiments are unique; it is the understanding of the variables and parameters which provides the basis for generalizations and new insights. And so too here. What in the upbringing of the Manus made them receptive to democratic values? What inclined them toward change? What were the characteristics of the leader, Paliau, —"speaking in a language which was not his mother tongue . . . [leading] a stranger people whose spirit he admired extravagantly . . ."—what were his characteristics which played an absolutely crucial role? Why was the advent of the American army basic to a basic change in the Manus?

The answers are complex and by no means only in the historical sense of complexity. They are complex because of the complexity of the dynamics of the interplay between persons and their social order. And it is precisely because Margaret Mead utilizes our *systematic* understanding, as we have it today, of these processes that this unique Manus experiment provides generalizable knowledge that is applicable to other circumstances of social change in being and yet to come. For example: "Whenever a people wish to take over some invention or discovery or practice of another people, the real alternatives should be seen as between taking over the new idea in the most abstract form possible, so that it may be incorporated within the old pattern with a minimum of change, or else taking over as much of the culture in which the new idea is imbedded as possible." There are convincing reasons for this argument which can only be adequately (as contrasted to "commonsensely") understood after reading her book. They are so convincing that it behooves, for example, those who plan to bring atomic power to other cultures to plan, even more carefully than they plan their reactor designs, their social designs.

By writing *New Lives for Old* in the way she has, Mead has made a twofold contribution; not only has she substantially added to our understanding of the process of social change and to an understanding of the techniques which will help facilitate it in a humanitarian and stable manner, but she has provided an additional important by-product for realizing our own efforts to create for ourselves new lives for old. Our own social change—if it is to be salubrious—depends in significant part on the mutual understanding of our natural and social scientists.

Mead has deepened this understanding by providing a convincing refutation to the often smug assumption on the part of many "natural" scientists that the social sciences are after all a fuzzy collection of insightful, but still common, sense. Her careful reexamination of her understandings, misunderstandings, and ignorance of the significance of her 1929 data in the light of 1955 theory, and her careful application of the factual knowledge on personality and social dynamics accumulated in the intervening years, are in the best scientific tradition. There can be few readers indeed who will continue to perceive her exposition of the nature of social change, in terms of the relationship between social institutions and personality, as less than scientific in manner and means. As always in science, her conclusions are incomplete, and new unanswered questions emerge. But her enthusiasm and optimism, as they have in the past, will stimulate others to join her in the search for more and better answers.

DONALD N. MICHAEL
National Science Foundation

The Pursuit of Science in Revolutionary America, 1735–1789. Brooke Hindle. Published for the Institute of Early American History and Culture, Williamsburg, Va., by the University of North Carolina Press, Chapel Hill, 1956. 410 pp. $7.50.

Science in the British colonies of America, and its continuation during and after the Revolution, long a neglected subject, has received considerable attention during the last quarter of the century. The objectivity of the research itself has not been without a certain subjective end: it had to be shown that the colonies were not, as was sometimes believed, only an intellectual backwater of the growing empire, but that they could hold their own with the mother country itself. Monographs are now plentiful, books have devoted chapters to some aspects, and our respect for colonial science has increased. The early antics of the American Philosophical Society and Bartram's travels have become as recognized and entertaining a part of American history as the Boston Tea Party. But a full study in book form was missing, and this gap has now been admirably filled by Brooke Hindle's book.

Hindle has not just compiled a book out of the existing monographs. He has gone over the whole field anew, searching at the sources, reading unpublished, as well as published, forgotten, as well as remembered, material, extending his studies into the first years after the Revolution. The source material consulted in different libraries is impressive. Years of work have gone into the gathering alone.

His final year is 1789, a convenient date to separate the mercantilist from the industrialist period. We are now able to see in detail the story of British colonial and revolutionary science unfolding, and make the acquaintance of the "natural history circle," the naturalists and physicians, teachers and travelers, experimenters and theoreticians of the period. We meet Bostonians, Philadelphians, Charlestonians, the circle around Franklin, Rust and Bartram, the founders and early members of the American Philosophical Society and of other clubs. Due emphasis is placed on the transit of Venus of 1769, the first organized scientific effort in the colonies, and in which their astronomers showed that they were worthy colleagues of their European associates. The last section of the book. "The new nation," lets us have a look at the physicians during the Revolutionary War, the attempts at natural history and natural philosophy in the young republic, and includes the early experiments with steamboat and balloon. There are many and interesting illustrations.

This book is truly an achievement and throws new light on the forces that made American intellectual history. Will the manner in which the author conceived his task always satisfy his readers? I, for one, with all appreciation for the precious wealth of information contained in the book and its careful arrangement, would gladly have missed some of the minor facts in order to obtain a better understanding of the true highlights of this American science, of those works that were real contributions to the world's science or technique. Such contributions

existed, and we do not just mean Franklin's—for instance, there was Godfrey's quadrant, a predecessor of the sextant, and Croghan's treasure trove of bones near the Ohio, one of the beginnings of paleontology. All these facts are mentioned in the book, but just as facts among many others. The emphasis is not always there.

The reader will thus occasionally have to do his own evaluation, and I believe that he will be richly rewarded for his efforts. I hope that a similar thorough labor of love and perseverance will one day be done for French Canadian science and for the science of New Spain—both necessary for a correct understanding of American mercantilist science as a whole.

D. J. STRUIK
Department of Mathematics, Massachusetts Institute of Technology

Techniques Générales du Laboratoire de Physique. vol. 1. J. Surugue. Centre National de la Recherche Scientifique, Paris, 1955. 671 pp. Illus. F. 2,400.

The graduate student embarking on a research career in experimental physics usually has had little experience in laboratory techniques and instrument design. Formal courses to fill this gap are not always available, and recourse to the literature is often the only means of obtaining the necessary information for the solution of experimental problems. The same need will confront the experienced researcher who leaves his field of specialty and borrows methods from related fields with which he is less familiar.

Although some textbooks on laboratory techniques are available, it is interesting to read a French treatise on this important subject, for the approach and techniques vary greatly from country to country. The volume here reviewed, which is published by the French equivalent of the U.S. National Science Foundation, consists of ten chapters written by different authors who are specialists in their respective fields. As might be expected, the chapters vary in clarity and approach, and no attempt seems to have been made to assure complete coverage of all the techniques used in physics. On the other hand, I noticed a great deal of valuable information not easily available elsewhere. I was particularly impressed with the first chapter, on general principles for the construction of scientific apparatus, in which precise theoretical discussions on the stability of mechanical systems and on deformation theory are mixed with practical advice on precision techniques for use of the lathe and milling machine. The next two chapters on glass blowing and vacuum techniques do not differ substantially from similar chapters in English texts, while the fourth chapter on production and measurement of high temperatures is very detailed—almost 100 pages—and contains many tables and theoretical discussions. The next three chapters deal with the general subject of optics, with emphasis on the properties of optical materials, the mounting of optical components, the alignment of optical systems, and other optical techniques not very familiar to the average experimenter. The treatment of light sources, filters, and photoelectric cells is complete and up to date, including discussion of lead selenide and lead telluride cells and of phototransistors. Chapter 8 gives a general description of recording techniques, while Chapter 9 deals with the regulation and rectification of electric currents. The last chapter gives an exhaustive treatment of electronic circuitry from a theoretical and experimental standpoint, but I regret the absence of any reference to transistors.

There are numerous subjects of interest to experimental physicists which are not treated by the authors of this volume, such as techniques of atomic and nuclear physics or calorimetry or low temperature physics. There are also important omissions within the areas covered. A more detailed index, and more liberal use of references would have improved the usefulness of the work even more. The work does not deal with fundamental principles and methods of measurement, systems of units of physical quantities, or theory of errors. Within its scope, however, it provides refreshingly clear and comprehensive information, and it is hoped its designation as volume 1 indicates the existence of plans for additional volumes that will handle the subjects omitted here with the same elegance, precision, and detail as is manifested in the treatment of the subjects of this volume.

I. ESTERMANN
Office of Naval Research

New Books

Annual Epidemiological and Vital Statistics, 1953. pt. 1, *Vital Statistics and Causes of Death;* pt. 2, *Cases of and Deaths from Notifiable Diseases.* World Health Organization, Geneva, 1956. 571 pp. $10.

United States Army in World War II. The Technical Services. The Medical Department: Hospitalization and Evacuation, Zone of Interior. Charles McKittrick Smith. Office of the Chief of Military History, Dept. of the Army, Washington, D.C., 1956 (order from Supt. of Documents, GPO, Washington 25), 503 pp. $4.

The Trickster. A study in American Indian mythology. Paul Radin. Philosophical Library, New York, 1956. 211 pp. $6.

Abacs or Nomograms. An introduction to their theory and construction illustrated by examples from engineering and physics. A. Giet. Trans. and revised by J. W. Head and D. H. Phippen. Iliffe, London; Philosophical Library, New York, 1956. 225 pp. $12.

Television Engineering, Principles and Practice. vol. II, *Video-Frequency Amplification.* BBC Engineering Training Manuals. S. W. Amos and D. C. Birkinshaw. Iliffe, London; Philosophical Library, New York, 1956. 270 pp. $15.

Facing the Atomic Future. E. W. Titterton. Macmillan, London, 1956 (order from St Martin's Press, New York). 379 pp. $5.

The Petroleum Refinery Engineer's Handbook. J. F. Strachan. Philosophical Library, New York, 1956. 168 pp. $15.

Miscellaneous Publications

(Inquiries concerning these publications should be addressed, not to Science, *but to the publisher or agency sponsoring the publication.)*

Venereal Diseases. A survey of existing legislation. 44 pp. $0.70. *Expert Committee on Psychiatric Nursing, First Report.* WHO Tech. Rept. Ser., No. 105. 43 pp. $0.30. *Joint FAO/WHO Conference on Food Additives.* Geneva, 19–22 Sept. 1955. WHO Tech. Rept. Ser., 107. 14 pp. $0.30. *Expert Committee on Biological Standardization, Ninth Report.* WHO Tech. Rept. Ser., No. 108. 20 pp. $0.30. World Health Organization, Geneva, 1956.

Services Available to Industry in New Jersey. A list of representative sources of advice and assistance to New Jersey industry for aid in solving industrial problems. Ruth Bates Ahrens and Robert K. Bogardus. Bur. of Engineering Research Bull. No. 38. Rutgers University, New Brunswick, N.J., 1956. 94 pp.

British Association for the Advancement of Science, Annual Meeting. Sheffield, 29 Aug.–5 Sept. 1956. The Association, London, 1956. 103 pp.

The Strength to Meet Our National Need. A statement approved by representatives of the constituent member organizations of the American Council on Education on 20 Mar. 1956, for presentation to the President's Committee on Education beyond the High School, together with major addresses presented at the conference and other pertinent material. Charles G. Dobbins, Ed. American Council on Education, Washington, 1956. 125 pp. $1.50.

National Leadership Development Conference in Trade and Industrial Education, Conference Report. Fort Collins, Colo. 1–12 Aug. 1955. Circ. No. 477. U.S. Department of Health, Education, and Welfare, Office of Education, Washington, 1956. 118 pp.

Current Literature on Venereal Disease. An annotated bibliography (special issue). *First International Symposium on Venereal Diseases and the Treponematoses.* U.S. Department of Health, Education, and Welfare, Public Health Service, Washington, 1956. 164 pp.