and difficulties and the intellectual vacuity inherent in some aspects of military service will understand the value of an organization recently created here with the title of *Service de Documentation Scientifique.* It is prepared to receive scientific publications, to make abstracts and translations and distribute them to a list of readers now in war work and for the most part deprived of library facilities. It will assemble articles on given subjects, utilize microfilm techniques in distributing copies of articles in full and provide many of the other services of a lending library.

Although many scientific journals are of course being received, it seems worth while to point out that reprints are of considerable value also and would be welcomed if mailed to Professor Joliot, Service de Documentation Scientifique, 18, rue Pierre Curie, Paris. Authors of scientific articles being currently published can contribute most helpfully by sending reprints in duplicate.

At the present time the following fields receive special attention: Physics, Physical Chemistry, Chemistry, Physics in Technology and Chemical Engineering, Physiology, Pharmacodynamics, Epidemiology, Hygiene and Nutrition. There is no implied rejection of other fields in natural science, but the fields mentioned are of special interest.

The values of such an undertaking are self-evident, and the above information for those who deplore the effects of war upon fellow scientists in France and upon science will probably require no special pleading.

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SCIENTIFIC BOOKS

CHEMISTRY

A History of Chemistry. By F. J. MOORE, Ph.D., late professor of organic chemistry in Massachusetts Institute of Technology. Revision prepared by William T. Hall, associate professor of analytical chemistry in the Massachusetts Institute of Technology. Third Edition. xxi + 447 pp. 94 illustrations. New York and London: McGraw-Hill Book Company, Inc. 1939. $3.00.

THE popularity of the late Professor Moore's "History of Chemistry," which was first published in 1918, is attested by the fact that it has now entered its third edition with an increase in size from 292 to 447 pages and in number of illustrations from 74 to 94. The continuation of the book through its second and third editions is due to the labors of Professor Hall, who has been assisted in the choice of new material and the reading of proof by his colleague of Massachusetts Tech., Professor Tenney Davis. The present work shows several important departures from the method of treatment pursued in previous editions. One of these innovations is the devotion of more space to the work of American chemists, for the reason stated in the preface that "in the German books on the history of chemistry, which have been either directly or indirectly the sources of much information in all books on the subject, the work of American chemists has been neglected. . . . More attention in this book is, therefore, paid to the story of American chemistry than is customary in short histories."

The purpose thus announced is commendable, provided the proposed sketch of American chemistry be made to fit into the general picture of world chemistry without impairing its perspective. This necessitates maintaining the same balance of treatment in describing domestic achievements as is followed in depicting foreign accomplishments. Unimportant developments are to be rejected, while major attainments must not be ignored. The violation of this principle of balance, which was so well maintained by Dr. Moore in the first edition of his book, is the reviewer's chief criticism of the new material introduced into the present volume. Fifteen lines, for example, are devoted to a sketch of Amos Eaton (an interesting but very insignificant figure in the history of world chemistry), while immediately afterwards only seven lines are devoted to Schönbein, a much more important chemical personage. The case for American chemistry could have been made much stronger if, instead of Eaton, readers were informed a little about J. W. Draper or Charles Goodyear, men of vastly greater chemical influence who find no mention in the pages of this new edition.

Histories of chemistry, as of other sciences, contain many inaccuracies that are simply copied without verification by one writer from another. The noted French chemist Dumas once wrote that Priestley died as a result of poison accidentally taken at a meal, and this erroneous statement with other inaccuracies has been copied and recopied so many times by French writers that the fiction, in France at least, has become almost an established article of belief. We Americans must not cast stones, however, for a goodly number of Priestley legends are being perpetuated right here at home. For example, on page 80 of the present volume it is said that after Priestley arrived in America, Benjamin Franklin tried to persuade him to live in Philadelphia. This statement is perhaps based on a remark of the late Dr. Lyman Newell (*Jour. Chem. Education,* 9: 682) that Franklin, who had been friendly to Priestley in England, "made strenuous

efforts to have the 'honest heretic' locate in Philadelphia instead of in Northumberland." The reviewer has been unable to determine who first gave rise to this pleasing phantasy. It is too bad to brand it as a figment of the imagination; Franklin died in 1790 and Priestley did not arrive in America until 1794.

Following the statement about Franklin, we note another oft-repeated legend that "Priestley discovered carbon monoxide after he came to America." This story has been reiterated so often by various writers that the reviewer, after a long belief in its truth, was finally led to ascertain the facts which, upon inspecting Lowry's excellent "Historical Introduction to Chemistry," were found to be as follows: Lassone first prepared carbon monoxide in France in 1776 by heating zinc oxide with charcoal and reported its property of burning with a blue flame; in 1777 Lavoisier independently prepared the same gas by heating charcoal with alum; in 1785 (nine years before he came to America) Priestley prepared the same gas by heating smithy scale and charcoal, noting, as did Lavoisier, that the inflammable air on combustion yielded fixed air (carbon dioxide), which led him to conclude that it was composed of fixed air and phlogiston; in 1801 Cruikshank, in England, proved the gas in question to be a new compound of carbon and oxygen, which he named gaseous oxide of carbon, but this view was criticized by Berthollet, who argued that the gas must contain hydrogen. Désormes and Clément, in France, proved, however, that no water was formed when the gas was burned, and hydrogen must therefore be absent; in 1849 Stas made the first accurate analysis of the gas, proving it to contain 57.16 per cent. oxygen and 42.84 per cent. carbon.

All this is a far cry from the statement that Priestley discovered carbon monoxide in America. Let us hope that these and other misleading legends about eminent chemists may cease to be published. The repetition of every kind of chemical hearsay is not the history of chemistry. The historians of our science should check quoted statements so far as possible with original sources of information. Students should be trained to cultivate this critical attitude in their history of science courses, and a more complete bibliography of reference works might have been given in the present volume to assist them in such collateral reading. The omission, for example, of a reference to the works of von Lippmann, the dean of historians of chemistry, is an unfortunate oversight.

The quotation on page 16 of the book that to one man science is a sacred goddess and to another only a cow who provides him with butter is not original with Liebig, as stated, but was taken by Liebig from Schiller's famous couplet entitled "Wissenschaft." The misspellings "Société d'Arceuil" (p. 122) and "Genthe" (pp. 335 and 438) are among other minor inaccuracies which should be corrected in a future edition.

The publishers must also do their part in helping to maintain the fine excellence of the first edition of Moore's "History of Chemistry." A comparison of the same illustrations in the first and third editions indicates a marked deterioration in some of the plates. The reinsertion of the list of plates, which is omitted in the present edition, would also be an added convenience.

C. A. BROWNE

BACTERIAL METABOLISM

Bacterial Metabolism. By MAJORY STEPHENSON, Sc.D. Second Edition. 391 pp. London, New York, Toronto: Longmans Green and Company. 1938.

SOMEWHAT chemical, perhaps, for the average bacteriologist, and rather bacteriological for many biochemists, the book illustrates well the position of the worker in this field. Welcomed to neither group by its prophets, yet impelled to be on speaking terms with the subject-matter and disciplines of both, he is blessed with an abundance of problems, theoretical and practical, whose solutions frequently become incorporated in the thought of one or the other of the basic sciences, and in any event supply comfort to the discoverer in his academic solitude.

Perhaps the picture is not quite so dreary, for if one may judge from the bibliography, which covers fifty pages, great numbers of investigators, at one time and another, have invaded this scientific no-man's-land. Many of these have clearly returned unharmed to their own lines. Others have remained as prisoners, perhaps not entirely unwilling, in the other camp. But a third group (and here the metaphor fails) have elected to continue as Miss Stephenson herself has done, in the somewhat nebulous, but none the less fruitful field of bacterial chemistry, or chemical bacteriology, and to make contributions of general and far-reaching importance.

The book includes chapters on "Respiration," "Polysaccharides," "Fermentation," "Decomposition of Proteins," "Nucleic Acid," "Nutrition and Growth," "Nitrogen Fixation," "Autotropic Bacteria," "Bacterial Photosynthesis" and "Enzyme Variation and Adaptation."

The excellence of the chapters on "Respiration" and "Fermentation" perhaps reflect their writer's interest in these particular phases of the subject. Among the past generation of bacteriologists were a few sometimes referred to not quite reverently as "sugar-fermentators." Their aim was to collect all possible kinds of bacteria, or strains of one variety, and all conceivable (or available) carbohydrates, subject each of the latter to the influence of every one of the former, construct