

beyond merely verbal ones, which we have noticed, is the omission of about a page dealing with Mallard and Le Chatelier's theory of the speed of propagation of combustion in gases. It is unfortunate that the statements in regard to the work of Helier and of Pelabon (pp. 207 and 232) on false equilibria have not been modified in view of Bodenstein's conclusions published two and a half years ago. It appears, however, from the preface that the revision was completed before that time, so that recent work of importance had to remain unnoticed. Besides the work does not profess to be exhaustive and the selection made presents all the types most admirably.

ALEXANDER SMITH.

THE CHEMICAL ESSAYS OF CHARLES WILLIAM SCHEELLE. Translated from the transactions of the Academy of Sciences at Stockholm with additions. First published in English by J. Murray, 32 Fleet St., London, in 1786. With a sketch of the life of Karl Wilhelm Scheele, by John Geddes McIntosh. Reissued by Scott, Greenwood & Co., 19 Ludgate Hill, London, E. C. 1901. xxx + 294 pp. 8vo. Price, 6 shillings.

The first collection of the chemical essays published by Scheele in the *Memoirs of the Royal Academy of Sciences*, Stockholm, was issued at Dijon in 1785, and filled two small volumes; the translation from the Swedish and the German (for Scheele wrote and published in both languages) was made by Madame Picardet, and her manuscript was revised by the prominent chemist Guyton de Morveau. It is interesting to note that the lady afterwards became Madame de Morveau.

Then appeared the English edition of 1786 named in the title-page of the book under review; this was followed by a Latin edition by E. B. G. Hebenstreit (Leipzig, 1788-1789), and finally by a German edition edited by S. F. Hermbstädt, published at Berlin in 1793, and reissued in 1891. As Scheele died May 21, 1786, the only one of these collections published in his lifetime was the French edition of 1785.

None of these contain, however, one of Scheele's most important researches "On Air and Fire," in which he describes the discovery of oxygen; this appeared in German, at Upsala and Leipzig in 1777; an English translation (with notes by Richard Kirwan and Joseph Priestley) followed in 1780. Finally in 1892, A. E. Nordenskiöld published, at Stockholm, Scheele's "*Nachgelassene Briefe und Aufzeichnungen*," a sumptuous volume of 491 pages royal 8vo, illustrated with portraits and facsimiles.

Scheele's remarkable discoveries are well known, their chronological sequence is approximately as follows :

1770, tartaric acid ; 1771, hydrofluoric acid ; 1774, chlorine, oxygen, and barytes ; 1775, benzoic and arsenic acid ; 1776, uric acid ; 1777, sulphuretted hydrogen ; 1777, action of light on silver salts ; 1778, arsenite of copper, "Scheele's Green," molybdic acid ; 1779, composition of graphite ; 1780, sugar of milk, lactic acid, mucic acid ; 1781, composition of "scheelite," tungstic acid ; 1783, glycerin, prussic acid ; 1784-1785, citric, malic, oxalic and gallic acids.

And the poor apothecary, who accomplished all this in fifteen years, died before he was 44 years of age !

The reprint under review exactly reproduces the contents of the original edition, which does not contain a complete list of Scheele's papers ; the new work might have been made more valuable by including additional treatises, notably those on air and fire.

In arranging the chronological list of Scheele's discoveries, the reviewer assigns 1774 as the date for the isolation of oxygen, though he is aware that Scheele's biographer, Nordenskiöld, endeavors to prove that the gas was known to the Swedish chemist before 1773.

Scheele's essays are written, of course, in the language of the phlogistic theory, and this in some measure obscures their real meaning, when read by chemists of the present day. But by re-writing a paragraph or two in modern style, carefully avoiding later knowledge, it is interesting to note how clearly Scheele expressed himself.

The publishers of this reprint have done their part well, making a handsome volume ; the editor has supplied a rather scanty biography, without a bibliographical note or comment, omitting all reference to the facts mentioned in the volume by Nordenskiöld. The reprint would have been increased in value by the addition of a portrait of the Swede. The volume has an index.

HENRY CARRINGTON BOLTON.

ANNUAIRE POUR L'AN 1902, PUBLIE PAR LE BUREAU DES LONGITUDES.
16mo. 700 pp. Paris. 1902. Price, 1 fr. 50 c.

This volume differs from its well-known predecessors in containing revised tables of coinages, the census of Europe made in 1900, articles on wireless telegraphy by Poincaré, on polyphase