

A NEW HISTORY OF CHEMISTRY

A History of Chemistry

Vol. 3. By Prof. J. R. Partington. Pp. xxiii + 854 (71 illustrations). (London: Macmillan and Co., Ltd., 1962.) 126s.

THE scope and general character of Prof. Partington's massive four-volume work have been indicated in a review of Volume 2 (*Nature*, 194, 222; 1962). That volume, the first to appear, dealt mainly with the period 1500–1700; it is now followed with surprising promptitude by Volume 3, which is chiefly concerned with the development of chemistry during the crucial eighteenth century. The first three chapters show how the flowering of chemistry in France during that century had its burgeoning in the preceding century through the labours of a series of laborants, teachers and writers, many of whom had a leading interest in the application of chemistry to medicine: among them may be named Beguin, Davisson, C. Bourdelin, Blaise de Vigenère, Le Fèvre, Glaser, Thibaut and N. Lemery. A mere glance at the later galaxy of chemists who furthered the progress of chemistry in France in the course of the eighteenth century enables one to achieve some understanding of the distant roots of that provocative opening of Wurtz's *Histoire des Doctrines Chimiques* (1866): "La chimie est une science française. Elle fut constituée par Lavoisier, d'immortelle mémoire". Lavoisier's crowning achievements are reached of course much later in this volume, after discussions of the antecedent investigations of Black, Scheele, Priestley, Cavendish and others. In the valuable chapter on Lavoisier, account has been taken of recent researches; but here, as elsewhere, Prof. Partington bases his treatment on original sources; moreover, his critical attitude of mind is evident in the estimate he gives of Lavoisier's work viewed in its relationship to contemporary ideas.

The important contributions of Scandinavian chemists are considered in two chapters with the headings "Borrichius to Bergman" and "Scheele". Of Scheele the author truly remarks: "Every chemist who has attempted research will look over the record of Scheele's discoveries outlined above with astonishment and admiration. Astonishment at the great volume of discoveries which he made in his short life in such disadvantageous circumstances; admiration of the way in which he carried out his work and the fundamental importance of it all". An account of eighteenth-century chemistry in Germany contains also a short section dealing with some Dutch chemists of this period; the erudite Boerhaave, however, so prominent a figure among the chemists of the early eighteenth century, finds only numerous scattered references in Volume 3, supplementing the specific notice in Volume 2.

As already indicated, Lavoisier's epoch-making conclusions were based largely on the research work of Black (Scotland), Scheele (Sweden) and Priestley and Cavendish (England). Not the least valuable feature of Volume 3 is the discerning analysis, very fully documented, of the experimentation and writings of these pioneers and of their chief contemporaries: this is a wide and complex field of which Prof. Partington has an unsurpassed knowledge, and his conclusions will be helpful to all students of immediate pre-Daltonian chemistry.

Before taking up the theme of Dalton and the atomic theory, Prof. Partington smooths the path into the nineteenth century by discussing the later

aspects of the chameleonic theory of phlogiston, the foundations of stoichiometry, and the position of chemistry at this time in Great Britain and Ireland. Here, a welcome feature lies in an authoritative contribution to the perennial Higgins–Dalton controversy. This, we may perhaps hope, has reached a final judgment in a recent detailed review of the evidence which has been undertaken by Prof. Partington in collaboration with Prof. T. S. Wheeler of Dublin. To quote from that judgment: William Higgins's claims to have anticipated Dalton, "put forward seven years after the publication of Dalton's theory, really originated in statements by Davy in 1811 . . . Dalton was led to his atomic theory quite independently of Higgins . . . Higgins did not attach any importance to the atomic weights, which are a cardinal feature of Dalton's theory, nor did he propose any methods by which they could be determined".

From what has been said, it will be clear that in this volume Prof. Partington has produced a masterly exposition of the development of chemistry during the eighteenth century. His distinctive approach, blending the topographical and biographical aspects, emphasizes two leading features of historical science which are often overlooked: these are the international character and the humanistic appeal of this great discipline.

JOHN READ

LAVOISIER ON AIR

Lavoisier—The Crucial Year

The Background and Origin of His First Experiments on Combustion in 1772. By Henry Guerlac. Pp. xix + 240 + 11 plates. (Ithaca, New York: Cornell University Press; London: Oxford University Press, 1961.) 36s. net.

IN three important memoranda Lavoisier recorded the experiences which convinced him only in 1772 that reagent air was involved in combustion and calcination: *le pli cacheté* of November 2, a partial preliminary draft of October 10 and a later form which the great French chemist modified for publication. From a reconsideration of these with all related events and writings, Prof. Guerlac advances two chief conclusions. First, that Lavoisier, certainly influenced by Hales and perhaps also by Priestley's *Directions* (1772) on the preparation of soda-water, was quite unaffected by Dr. Black or any other pneumatic chemist across the Channel; secondly, that the youthful Parisian genius was led to postulate a chemical role for air by contemplation of calcination rather than combustion.

The author of such confessedly 'intricate argument' inevitably conflicts with other experts such as Meldrum and Metzger (who share his dedication), Fourcroy, Speter and McKie; indeed, at one point (p. 102), he must even "set aside . . . testimony from Lavoisier's own pen". On innocence of Dr. Black he may perhaps protest too much; thus at one place (p. 23) it is doubtful if Lavoisier "had ever heard of him" in 1772, while at another (p. 93) the Frenchman in August is hustling out a priority note against the great Scot's views on latent heat.

On these and other issues the evidence on both sides is fully and fairly set forth. There are some most interesting re-appraisals of de Morveau, Turgot, Sage, Mitouard and other contemporary philosophers. Print, illustration and index are first class; the appendix reprints leading texts from the actual manuscripts.