

reviews

Enlightening chemistry

R. V. Jones

Photo: Royal College of Physicians of Edinburgh



William Cullen (1710-90), from the original by William Cochrane

THE Scottish intellectual enlightenment in the eighteenth century is rightly attracting attention among current historians of science in the US. A few months ago we had from Richard Olson an interesting book on *Scottish Philosophy and British Physics 1750-1880* (*Nature*, 258, 285; 1975) on the effects of the Scottish common sense tradition on the development of British physics. And now we have from A. L. Donovan of the University of West Virginia a study of the interaction of two great Scots chemists of the enlightenment, William Cullen (1710-1790) and his pupil Joseph Black (1728-1799).

Donovan gives a good picture of the intellectual state of Scotland and its universities in the eighteenth century, and one of his aims is to demonstrate that "the advancement of scientific

Philosophical Chemistry in the Scottish Enlightenment: The Doctrines and Discoveries of William Cullen and Joseph Black. By A. L. Donovan. Pp. x+343. (Edinburgh University: Edinburgh, January 1976). £7.

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knowledge was a matter of both philosophical and practical concern in eighteenth century Scotland". He was drawn to study the question of how Black came to discover 'fixed air' (carbon dioxide) and this in turn led him to investigate William Cullen, with whom Black worked in Glasgow after graduating in arts and medicine. This was at about the time when, thanks largely to Cullen, chemistry was becoming a university study in its own right instead of being merely part of natural philosophy on the one side or medicine on the other.

If anything, Black was more of a natural philosopher, as shown by his work on specific heat and latent heat; but it was the medical need to find a solvent for renal stones that led him to recognise that chalk contained 'fixed air' which could be released as a gas by heat or acids, but which could also be transferred from one substance to another in solution without being released as effervescence. Donovan has gone to much scholarly trouble to trace this development in Black's mind—perhaps all the more interesting because it occurred against the background of



Joseph Black (1728-99) by David Martin

Black's acceptance of the Phlogiston theory which Lavoisier's work later forced him to abandon.

Black's influence, of course, extended beyond chemistry, and the last chapter of the book surveys his interaction and friendship with John Robison and James Watt, to whom Black's concept of latent heat was especially relevant. And when Watt invented the condensing steam engine Black (who in later life weighed every golden guinea that his students paid him in fees to check that they had not been cheating by filing the coins) lent him one thousand pounds to develop the engine.

Donovan has produced a useful, detailed, and well annotated study of an important phase of the Scottish scientific heritage. □

SURELY the function of a book is communication between the author and reader. In this respect far too many contemporary scientific texts are deficient. They seem to operate on the assumption that the message is there—if you look hard enough. Aggregates of papers each by a different author with little editing or editorial comment are particularly prone to this elitism. It is then a happy event to find this book. It arose out of the course in advanced immunology sponsored by the Department of Immunology at the Royal Postgraduate Medical School and contains an amplification of the lecture notes. There has, however, been much

Immunology in vogue

A. J. S. Davies

The Immune System: A Course on the Molecular and Cellular Basis of Immunity. By M. J. Hobart and Ian McConnell. Pp. xxiii+357. (Blackwell Scientific: Oxford and London; Lippincott: Philadelphia and Toronto, 1975.) £5.00

useful editorial grading and cross-linking.

There are four major sections, each

containing several chapters, on immunochemistry, immunobiology, immunogenetics and immunopathology. Each section has a chatty editorial introduction by no means as prolix as their designation 'preambles' would suggest. The range of topics is considerable although by no means comprehensive. In the immunopathology section for example, there are chapters on the so-called tumour immunology, immunodeficiency diseases, and auto-allergic conditions but nothing on parasitic disease.

The illustrations, with the exception of one or two rather indeterminate electron micrographs (for example, on