

Book Reviews

CHARLES WEBSTER, *The Great Instauration. Science, medicine and reform, 1626–1660*, London, Duckworth, 1975, pp. 630, £13.50.

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Different historical approaches to science and medicine may be related to the author's primary training. Those whose first training has been in science have tended to publish biographies of distinguished scientists, histories of various specialities or well-known institutions: they have edited original texts and studied the priorities or significance of important discoveries. With some exceptions, their historical range has been "restricted" in the sense that their aims have been limited, and their historical perspective narrowed to certain specialized fields. On the other hand, those with basic historical training have tended to discuss medicine and science in broader terms and in relation to other historical trends: they have rarely become involved in what they would dismiss as the "mere technicalities" of the subject. There has, therefore, long been the need for a study covering the inter-relationship between the more specialized spheres of science and medicine together with other historical fields, usually treated by general historians, such as those of theology, philosophy and educational reform. This approach is most urgently needed in the seventeenth century which saw the founding of the Royal Society, and the emergence of the empirical attitude to medicine and science. This omission has now been amply rectified by Charles Webster's study of the rise of science, medicine and reform between 1626 and 1660 in which his historical canvas is as broad as his scholarship is profound. Powered by the driving force of Millenarianism and Utopianism and harnessed to the application of Baconian philosophy, the Puritans created a suitable climate for accelerating the progress of science, medicine, agriculture, technology, statistical analysis, economics and educational reform. In this well-planned and lucidly argued book the interaction between these different disciplines is studied under the following five main headings: the Great Instauration, the Spiritual Brotherhood, the Advancement of Learning, the Prolongation of Life and the Dominion over Nature.

Webster begins by showing how the powerful motivation of Millenarianism with its guarantee of an imminent Utopia intensified the Puritans' search for knowledge, provided an impetus to their reforming zeal and spurred them on to high endeavour for His purpose. Beale, Hartlib, Culpeper, and Worsley were among those who believed that the Millennium was just around the corner, and attainable in their own lifetime. The intellectual climate of the Puritan Revolution was essentially anti-authoritarian, anti-scholastic and enthusiastic for both enlightenment and material progress. Having removed the King of England, the Puritans set about exploiting the health and wealth of mankind and preparing a New Jerusalem for their King of Kings. The importance of religion in the lives of many leading Puritan reformers and scientists may be judged by the fact that Comenius, Boyle, More, Cudworth and Wilkins all wrote on religious matters, and Webster's list may be extended to include Thomas Sydenham's *Theologia rationalis* and, at a later date, John Locke's *On the reasonableness of Christianity*. Thus the Puritan approach to natural philosophy was consciously within the context of their religious views, although some of them such as William Petty eagerly

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sought their rewards in this world rather than the next, the main thrust of Webster's argument is unassailable: it was Puritanism that created an urge to change and reform and facilitated the inventive genius of upstarts such as Petty. But, occasionally, Puritan interpretations of the gospels might hinder research. Thomas Sydenham, for example, believed that attempts to transcend normal perception with the aid of a microscope was immoral and completely outside God's purpose. He thought that we should confine our observations to the "outer husk of things" and desist from probing into Nature's "abyss of cause".

Just as the Millenarian framework was congenial to the spirit of English Puritanism so too was the philosophy of Bacon and Comenius as they offered practical guidelines for fostering research. Indeed Baconianism with its inductive philosophy, anti-authoritarian attitude and its utilitarian aims seemed specially designed for the Puritans, and in their various spheres, Beale, Ray, Graunt, Boyle, and Sydenham all exploited Bacon's most important concept of compiling natural histories, which prevented his philosophy from degenerating into disruptive conflict.

Dr. Webster also brings to light much new information on the contributions to the rebirth of knowledge of Samuel Hartlib and his circle. The achievements of such aristocratic Puritans as Boyle and Culpeper are well known, but he shows how Hartlib encouraged the talents of those born in less exalted circumstances such as Plattes, Dymock and Petty, whose skills, when combined with those of numerous nameless craftsmen, became harnessed to the main-stream of intellectual endeavour.

What were the solid achievements during Puritan dominance? Though many of their schemes never got beyond the planning stage, the English Puritans can claim an impressive list of achievements. Durham College was established, mechanical coinage introduced, the Down survey completed, pioneering studies were undertaken on the London bills of mortality, Trinity College Dublin was extended, the Council of Trade established and the Navigation Acts were framed. The scientific study of agriculture was almost entirely the work of Puritans, whereas medicine was dominated by such Anglican Royalists as Harvey, Scarburgh, Wren, Willis, Ent, Bathurst, Power and Charleton. But these latter achievements do not detract from Webster's argument as, obviously, Royalists too benefited from anti-scholastic trends, from the application of Baconianism and the general encouragement of science during the interregnum. But Webster does not attempt to assess the effect of the Civil War on scientific progress: it was after all the greatest catastrophic event during the thirty-four years of his study. Sir George Clark has shown that war accelerated technological progress by creating demand and improving standardization: it led to progress in ballistics, surgery, mathematics and navigation. Is it possible that the war itself, by disrupting education and breaking up conventional modes of thought, jolted Parliamentarians and Royalists alike out of orthodox pathways, and unburdened by scholastic learning, acted as a spur to scientific endeavour?

There is some evidence to suggest that the Oxford Philosophical Club was not quite such a homogeneous body under the leadership of Wilkins of Wadham. Both Purver and Frank have referred to a group of Royalists at Trinity centred around John Lydall and including Richard Highmore, Ralph Bathurst, John Aubrey, the brothers William and Thomas Willis. An earlier Trinity group included William Harvey, Nathaniel

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Highmore, George Bathurst, and Hannibal Potter. Another group of Royalists at All Souls “esteem’d themselves either virtuosi or wits”, and met to drink coffee at Tillyard’s apothecary’s shop next to All Souls. They included Peter Pett, Thomas Millington, Timothy Baldwin, Christopher and Matthew Wren, George Castle, William Bull and John Lamphire. In the aftermath of wartime bitterness it is reasonable to suppose that sub-groups of natural philosophers were drawn together by their shared political, religious and collegiate allegiances. It is possible that further research may show that the Oxford Philosophical Club was, in effect, made up of several smaller working groups. This diversion does not, however, alter Webster’s main thesis. Nor does his doubtful assertion that “equilibrium was restored at both universities with remarkable speed under the new regime”. After the Civil War the Royalist University carried on in the Laudian tradition exactly as before. Unyielding Royalists saw no reason to change either their religious convictions, their academic standards or their political allegiance simply because their army had been defeated in the field. University Independents tried to “re-educate” them by preaching, but their rantings were dismissed with jocular scorn: it took two years before Parliament was able to assert its authority in Oxford, and then only by imprisonment and forcible ejections. But these minor quibbles are unrelated to Webster’s main theme which he develops with impeccable scholarship. There is a succinct conclusion, eight appendices, an extensive bibliography: the footnotes are where they should be at the end of each page, and there are the useful references to those currently working in the field of seventeenth-century medicine and science. Original, stimulating and scholarly, Charles Webster’s *The Great Instauration* is a seminal contribution to our knowledge of the seventeenth century, and will long remain essential reading for scientists and historians alike.

R. M. MACLEOD, J. R. FRIDAY and C. GREGOR, *The Corresponding Societies of the British Association for the Advancement of Science 1883–1929. A survey of historical records, archives and publications*, London, Mansell, 1975, pp. xxii, 147, £5.95 (\$15.00).

Dr. Roy Macleod, whose research unit in the social history of science at Sussex University is becoming increasingly well known, now provides us with a most useful book. He and his colleagues have selected the 160 local scientific societies which became “corresponding members” of the Conference of Corresponding Societies, created by the British Association in 1883, and which retained membership for at least one year between 1883 and 1929. Together they encouraged a great deal of provincial interest in science, more than was hitherto thought to exist.

There has been so far no overall survey of these local societies, but in the present book only archival material is presented. Each society is listed, with information arranged under the following headings: current address (if applicable), history, archives, publications, lists of members, and there is a very brief introductory description. There are also appendices containing a chronological list of the societies; the number founded each decade; and the growth in membership. Medical societies are not included.

A remarkable amount of data is here made available and it will provide historians with years of research into a topic which so far has been much neglected. It is to be hoped that Dr. Macleod will also be able to provide similar details of medical societies in Britain.