

Book Reviews

GERARD L'E TURNER, *Nineteenth-century scientific instruments*, London, Sotheby Publications; Berkeley, University of California Press, 1983, 4to, pp. 320, illus., £37.50.

The first thing to be said about this book is that it is an excellent survey of nineteenth-century scientific instruments. Its excellence lies in its value as a guide to the identification of objects. The volume is extremely well produced; the illustrations, which are mainly photographs of instruments, are first class; and Dr. Turner's detailed text irreproachably sound. The book is a general account, and not a catalogue of a single collection, and it covers the physical sciences and related applied sciences, such as surveying, but not medicine or the life sciences. Aspects of medicine were handled in an earlier, less satisfactory volume, *Antique medical instruments*, by Elizabeth Bennion.

Two disciplines separated by a common language, might be said of the study of scientific instruments and the intellectual and social history of science. The latter, in one form or another, has a body of academic practitioners, who examine scientific ideas and scientific culture, who use a number of identifiable historical theories and write for an audience of historians, philosophers, and, sometimes, scientists. Students of instruments, on the other hand, describe the form and use of apparatus by applying recognized cataloguing procedures. They direct their work largely to an audience of museum curators, casual museum visitors, private collectors, and the shared audience of scientists.

The common language between these two bodies of practitioners is science, the rest is silence. The sharing makes for conviviality, a visit to a museum for historians, attendance at a history of science conference by curators and collectors. But, in general, historians of science are to be indicted for their outright failure to take account of instruments when theorizing. Similarly, in the main, curators stand accused of not taking seriously historically sophisticated accounts of science. What makes this situation worse is a tacit agreement on both sides that instruments should be preserved because they do tell us about science past. Apart from a few exemplary studies, however, they have rarely been used to do any such thing.

The origin of the different orientations of the two groups possibly lies in the differing audiences they address. Museum guides and catalogues are almost invariably written to fulfil demands that are pedagogical, antiquarian, and economic, and which arise, ultimately, within the scientific community. The corollary of this is that, by and large, curators use current intellectual categories for organizing the past. For example, many science museums have collections entitled chemistry or physics, which have sub-categories such as, sound, heat, and light, familiar to every scientifically educated visitor. Objects that are adjudicated to have been used in the creation of these modern sciences are allotted to these collections. In a similar way, earlier medical material is often anachronistically classified or displayed. Eighteenth-century thermometers, for example, can be found in museums where they are classified under "diagnostic instruments". A similar museological procedure is used to bring together functionally similar but historically disparate objects. Measuring instruments, for example, might include chemical balances and pint mugs. This classification does not reproduce any *historical* category, but serves the demands of an audience of collectors. Gerard Turner uses both these systems of classification in this book, for example 'Weights and measures' and 'Light', the latter section discussing both laboratory apparatus and binoculars.

Much current museum work seems fundamentally at variance with the historian's task, where the aim is to return the text, the picture, or the object to its context, so that the eighteenth-century balance does not appear next to the twentieth-century micrometer but amongst the laboratory furniture of the Enlightenment. Instead of categorizing objects in the way that they do, it might be historically more accurate for museums to reproduce their own history and produce exhibitions of objects by their acquisition categories; bought, donated, stolen, found, not wanted, etc. Sometimes, usually by accident rather than design, museums do contain collections which form an historical whole, for instance the 'George III' collection in the Science Museum London, which contains not only scientific instruments but many other things beside. But as long as collectors form the eventual audience for books on instruments,

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most of these works will continue to look like variations on the Platonic archetype: the Sotheby's catalogue.

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TIMOTHY LENOIR, *The strategy of life. Teleology and mechanics in nineteenth-century German biology*, Dordrecht, D. Reidel, 1982, 8vo, pp. xii, 314, illus., Dfl.135.00.

A survey of early nineteenth-century German biology is long overdue, and Lenoir's study of the transition from intuitive *Naturphilosophie* to the empirical morphology of the Göttingen school is incisive and important. Lenoir counters older prejudices of the sterility of contemporary science, showing the richness of the "teleomechanist" tradition which grew in reaction to *Naturphilosophie*. He cuts through cruder mechanist/vitalist dichotomies to analyse the changing relationship between embryogenesis, organic unity, and developmental forces. His compass is from the 1790s to 1840s, from Kant's prescriptive unification of teleology and mechanics to Helmholtz's rejection of vitalism. Lenoir details the successive elaborations of the morphological programme by Blumenbach, Kiemeyer, Meckel, von Baer, and Müller—physiologists who accepted an emergent vital force, a concept clarified in the 1830s by Berzelius's theory of catalysis. He highlights the powerful effect Cuvier's work had on members of this group, how they adapted French palaeobiological discoveries to their teleomechanist paradigm, and how von Baer's new embryology—with its homological correlates—came to provide the unifying theme. In the 1840s, functional morphology was finally stripped of the *Lebenskraft* or vital force by Müller's students Helmholtz and DuBois-Reymond (for which they were branded "scum" by the loyal Virchow). But in so doing, these new reductionists did prepare the ground for Darwinism.

This is a bookish non-social study (an application of Lakatos's formulation of the research programme), and Lenoir keeps close to the original texts, thus providing a useful source of primary information on German science. It is essential for anyone interested in the interaction of functional morphology, embryogenesis, and organic chemistry prior to 1850, and provides a fitting complement to Frederick Gregory's study of the later period in *Scientific materialism in nineteenth-century Germany* (1977).

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T. CLIFFORD ALLBUTT, *Notes on the composition of scientific papers*, London, Keynes Press (British Medical Association), 1984, 8vo, pp. 161, £35.00.

"Try to begin with some glimpse into the heart of the matter."

"Do not end anyhow, let your leave taking be easy, gracious and impressive in proportion to the theme."

Sir Clifford Allbutt (1836–1925) will be best remembered as an essayist. This essay is all about the use and abuse of language. It is a classic of medical literature and may be picked up or put down at will, or opened at any chapter for illumination. It has been my practice to recommend this text to young doctors embarking on a research project. There is a hint of Montaigne in style and approach, and there is little doubt that Allbutt, had he not chosen medicine as his primary career, would have made original and lasting contributions to literature. He specifically asks us to go to literature and art to appreciate the fusion of form and content, and is a persuasive advocate of language, truth, and logic.

Allbutt uses language as a living thing, the instrument of clear thought, and recognizes that some of his restrictions on language have been modified by usage. He is a stern grammarian by instinct, whose advice on the ordering of periods, sentences, and paragraphs is exemplary; of the twentieth rather than the nineteenth century, so *that* he is able to admit *that* many a bad sentence is grammatically correct ("Keep down your *thats*: they multiply like lower organisms"). Unfortunately, the English educational system has declined and it is doubtful if