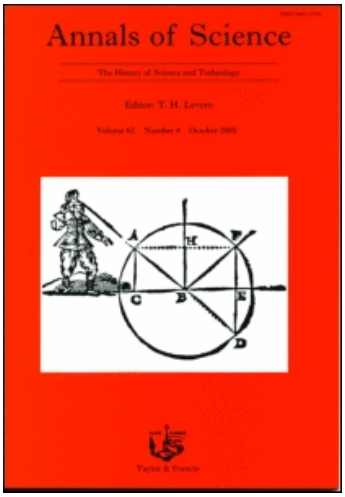

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Book Reviews

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Book Reviews

Biographies

ANITA MCCONNELL, *King of the Clinicals: The Life and Times of J. J. Hicks (1837–1916)*. York, England: William Sessions Ltd, 160 pp., 26 illus. £8, ISBN 1-85072-194-8.

Measurement of body temperature is one of the most useful indications of disease. The change in body temperature is one of the important signs in the rise and decline of a number of diseases and of the body's response to treatment and medications. The clinical thermometer has made the measurement of body temperature not only accurate and convenient for medical professionals but for other caretakers, as well as the patient. The history of the development and manufacture of clinical thermometers and related instruments is an important chapter in the history of medical technology.

Anita McConnell, noted historian of instruments made in London, has given us the sources of all the records and facts about the life and career of James J. Hicks and summed them up in this short illustrated biography. Hicks was the first major manufacturer of clinical thermometers and thermometers applied in meteorology and brewing. He developed the first accurate precision aneroid barometer used by mountain climbers and a host of other scientific and industrial instruments. McConnell's patience in tracking down the records of Hicks' career and tidily describing his life and contributions fills a long-standing need in the history of instruments, a book I would have welcomed over two decades age in my own research. In five chapters ('A working Life', 'The Clinical Thermometer', 'The Aneroid Barometer', 'Other Instruments', 'Making and Marketing at Home and Overseas') and four appendices the author provides the highlights of a very productive life and the grist for others to incorporate these accomplishments into other themes. Producing millions of thermometers required craft skills to be sure, but also the ability to employ and manage employees as needed, to secure the rights to appropriate patents (Hicks won the largest patent law suit heard in the US Circuit Court in 1892), and to expand the business, taking economic risks based on a vision for the future.

The data provided in the book could be added to a computer index of other data about nineteenth-century instrument makers to further enlighten us about the interaction between all instrument and tool manufacturers.

The need continues for the type of research represented by this volume even though it may not be as fashionable as proposing large themes and investigating other social and economic forces impinging on the development of scientific instruments and tools. Without the basic facts and knowledge of those who learned how to make instruments efficiently and on a scale required by the health community we lack the most significant information about medical technology. Understanding the lives and methods of the main protagonists in medical technology provides the foundation and greatest incentive for further studies.

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Social Aspects of Science: Religion

IAN INKSTER, *Scientific Culture and Urbanisation in Industrialising Britain*. Aldershot, Hampshire and Brookfield, Vermont: Ashgate/Variorum, 1997. xiv+ 320 pp. £49.50. ISBN 08607-868-70.

Ian Inkster has always been hard to categorize: historian of education, local historian, historian of science, economic historian, and specialist in Japanese technology. Educated at a comprehensive school at Harlow, one of Britain's 'new' towns, he read economics at the then 'new' university of East Anglia before reading for a doctorate in economic history with Sidney

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Pollard at the University of Sheffield, where he also began the study of Japanese. In 1973 he was enticed to teach economic history at the University of New South Wales, where he eventually held a chair in Social Science and Policy. After some twenty years in Australia, where he published extensively on the economic history of technology in Japan and the role of science and technology in underdeveloped countries, he returned to England as a research professor in International Studies at Nottingham Trent University. He has thereby returned to the Midlands whose eighteenth- and early nineteenth-century scientific cultures formed the subject of his 1977 Sheffield PhD thesis. It was from this that the eleven 'studiously empirical' articles in the present Variorum volume were elaborated and published between 1973 and 1990. Although three of these essays are reprinted from *Annals of Science*, the others were widely scattered in educational journals or volumes of collected essays. Their common theme and the richness of the local archival materials cited (still under-explored by historians of science) more than justifies their appearance under one cover. However, given the profusion of names and societies he discusses, the index might justifiably have been doubled in length from its present six-and-a bit pages.

Each of the essays is concerned with what might be termed local history of science, or more generally, provincial, as opposed to metropolitan science. Together, they give empirical flesh to what Inkster had to say in the introductory chapters of his *Science and Technology in History. An Approach to Industrial Development* (1991) as well as in the historiographical essay that introduced the important volume he edited with Jack Morrell, *Metropolis and Province, Science in British Culture* (1983). Looking at the earliest archive-driven essays in the present collection, it can be seen that Inkster was following in the footsteps of the educational historian Nicholas Hans, whose *New Trends in Education in the Eighteenth Century* (1951) uncovered the extent of itinerant science lecturing and science in private schooling in eighteenth-century Britain. Hans was only interested in the Nonconformist context of such formal and informal science teaching. Inkster aimed instead to set it within the context of contemporary politics and class issues, and to establish science as a necessary part of the urban histories of Sheffield, Derby, Liverpool, Rochdale, or even Philadelphia. By building on the work of the Chicago sociologist Robert E. Park on the marginality of immigrant groups within American cities, and on Arnold Thackray's application of this concept to the prosopography of the Manchester Literary and Philosophical Society, Inkster was able to argue that there was a significant amount of mental capital 'generated by relatively small coteries of urbanites whose social position was marginal to that of the commercial and industrial elites of their vicinities as well as to the English elite in the metropolis and the counties' (p. xi). For these coteries in Sheffield and other industrializing towns science provided an identity and a way to integrate their social marginality with established elites. Inkster showed this particularly well in his reappraisal of the itinerant lecturing movement, and of the mechanics institutes, the subjects of the majority of the collected essays.

London was not neglected, however, and in the brilliant analysis of the Askesian Society (first published in *Annals of Science* in 1977) he not only provided a vivid geography of London science between the 1780s and 1820s, but a powerful demonstration of the utility of science to London's marginal men such as William Allen, Richard Phillips, Alexander Tilloch and William Hazeldine Pepys whose informal associations became absorbed into the more formal venues of the Geological Society, the Royal Institution, or the Royal Society. Such informal gatherings and associations, which he uncovered from provincial archives in rich detail, made no rigid distinctions between pure knowledge and its applications, and helped to forge an equipoise across radicalism and the emerging class systems of industrializing Britain. By the 1840s, however, he argued, marginal men had disappeared into the middle classes. The political legalizing of radical dissent produced a redefinition of cultural associations along class lines, and science as an informal cultural cement was dissipated into more formal educational structures. Local scientific communities were then fractured into the more modest general scientific interests of the middle class and their 'Lit & Phil' associations; the 'steam intellect' associations of the working class; the more specialized scientific and technical associations of the industrial middle class; and the learned, professional and occupational associations of the middling class.

Inkster continually uses his rigorously empirical approach to make fruitful comparisons between the scientific culture of different urban communities. His overall conclusion, in this urbane demonstration of the significance of urban history for the historian of science, is that there was a wide dissemination of scientific and technical information throughout the differing

layers of English society during the long eighteenth century, and that this was of enormous advantage to Britain in the process of industrial innovation.

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Instruments and Measurement

G. L'e Turner, *Scientific Instruments 1500–1900. An Introduction.* London: Philip Wilson Publishers, and Berkeley, Los Angeles and London: University of California Press, 1998. 144 pp. 76 colour plts, 30 black & white illustrations. £19.95. ISBN 0-85667-491-5 (UK), 0-520-21728-4 (US).

Scientific Instruments 1500–1900 is a revised edition of the author's *Antique Scientific Instruments* published in 1980. There ought to be a continuous, if small, demand for an introductory work on scientific instruments, and that would be sufficient reason for republishing the book. Anyone questioning the need for a revision need only turn to the bibliography. It is twice as long as in the first edition, with most of the additions being works not yet written when that edition was published—a testimony to the growth of scholarship in this field in almost twenty years. The list of museums and collections has also been extended.

The introduction has been almost completely rewritten but apart from this the structure and text are little changed. Mathematical instruments are covered in four chapters, on astronomy and time-telling, navigational instruments, surveying instruments, and drawing and calculating instruments, together occupying over half the text. The other traditional categories, optical instruments and philosophical instruments, have a chapter each, and there are additional chapters on weighing and measuring, and on medical instruments. Each chapter has its own short introduction. There is a final short chapter of sensible practical advice: on dating instruments, identifying materials, and conservation. For the earlier instruments, that is the mathematical instruments and the microscopes and telescopes, there are brief details of the history of each instrument and of its construction and use. In the nineteenth century the range of instruments becomes too wide for individual descriptions, so the coverage of later optical instruments is briefer and more selective. In the chapter on philosophical instruments the articles are on subjects, mechanics, magnetism, pneumatics etc., rather than on individual instruments. The articles on light and sound are additions to what was in the first edition, but the coverage is brief. The reasons for the arrangement of instruments within a particular chapter are difficult to fathom, except that instruments with similar functions are kept together.

In an elementary book such as this there would have been little to gain by a major revision of the text. The illustrations, however, are entirely new and vastly improved. There are more colour photographs and the quality of reproduction is better. The engravings reproduced in the original edition have gone, but they have been replaced by a much larger number of black-and-white photographs. The book is also in a larger format, and the typography is improved. The major criticism is of the index, which is revised and extended, but most of the names of instrument makers have been removed, and it is printed in almost illegible small type. Some details from the first edition have not been checked adequately—the North Western Museum of Science and Industry has been replaced by the Museum of Science and Industry in Manchester, and in Edinburgh the Royal Scottish Museum is now subsumed within the National Museums of Scotland as the Royal Museum.

Within the constraints of one small volume the author achieves as much as is possible, but all too often it serves to remind the reader of the inadequacy of words alone to describe an instrument and explain its function. Diagrams would have made it much easier to visualize how an instrument works, but they would have turned the book into something much weightier. The term scientific instrument has the meaning one would expect in this context. The book covers collectable instruments, those which sell in the auction houses and dealers' showrooms. Nineteenth-century instruments, especially those primarily for entertainment rather than professional use, are described less thoroughly, and the industrial instruments of the latter part of the century are not mentioned at all. As always the commonest of all scientific instruments, clocks and watches, are considered to be a separate subject and are omitted, except for chronometers because of their navigational use.

It is indeed a book primarily for the novice collector and would-be collector, but it will also

be of value for those with longer experience for few of us have great depth of knowledge across the whole range of instruments. It is a clear and concise introduction to the subject as understood by collectors and enthusiasts, and in this niche it has no competition.

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Editions and Selections

E. A. Fellmann, and G. K. Mikhajlov, (editors), with B. Bosshart, A. P. Juškevič and J. Kh. Kopelevič, *Leonhardi Euleri commercium epistolicum cum Johanne (I) Bernoulli et Nicolao (I) Bernoulli* (*Leonhard Euler, Briefwechsel mit Johann (I) Bernoulli und Niklaus (I) Bernoulli*), *Leonhardi Euleri opera omnia*, series quarta A, vol. 2. Basel: Birkhauser, 1998. X+ 745 pp, figures. ISBN 3-7643-5271-X.

The 200th anniversary, in 1909, of Euler's birth was the occasion to initiate a long-cherished plan: the Swiss Society of Natural Sciences in 1910 decided upon the publication of Euler's works in three series totalling 43 volumes (now 72 volumes) in their original languages. The fourth series will contain Euler's correspondence, series IV A, and manuscripts, notebooks and adversaria, series IV B, approximately 10 to 13 volumes. The fact that modern readers are educated predominantly in the natural sciences rather than in philology was anticipated at the end of the century: the letters written in Latin being accompanied by translations.

The second volume of series IV A (*commercium epistolicum*) contains Euler's correspondence with his teacher Johann Bernoulli (1667–1748) and the latter's nephew Niklaus (I) Bernoulli (1687–1759), the Latin letters being followed by German translations by B. Bossard and E. A. Fellmann. The problems that such translations bring are set out on pages 2 and 3. The editors of the volume are E. A. Fellmann and G. K. Mikhajlov, with the collaboration of B. Bosshart, A. P. Juškevič (died 1993) and J. K. Kopelevič. The editors also undertook the writing of a general introduction and a separate introduction to each of the two sets of letters. The appendices give a short correspondence of Johann Bernoulli with the Petersburg Academy, consisting of twelve letters, an unpublished text from Johann Bernoulli's *Hydraulica*, and a paper of Niklaus Bernoulli on the sum of reciprocal square numbers. Euler and Johann Bernoulli corresponded from 1727 to 1746, and 38 letters are in existence. Euler's correspondence with Niklaus Bernoulli was of shorter duration (1742–1745, 11 letters) but of wide significance. A great deal of the correspondence with Johann Bernoulli was previously published in *Correspondance mathématique et physique de quelques célèbres géomètres du XVIIeme siecle* (St Pétersbourg 1843) and in supplementary publications of G. Eneström in *Bibliotheca mathematica* (1903–1911). The correspondence with Niklaus Bernoulli becomes generally available only through the present volume.

The principal topics in the correspondence included logarithms of negative numbers, geodesics, gamma and zeta functions, series, differential equations, elliptic integrals, the calculus of variations, partitio numerorum, partial differentiation, families of curves, principles of mechanics, and hydromechanics.

The editorial introduction contains some familiar old items, such as the origin of the name Euler, p. 7; the inordinately long, psychologically unconvincing, and when all is said and done superfluous account of the Bernoulli brothers' disagreement, pages 30–35; and the recurrent, simplistic, and inaccurate statement that Jakob Bernoulli (re)solved the brachistochrone problem in an 'essential profounder sense', p. 34. A number of carefully devised indexes round off the volume, and offer names, subject matter and bibliography.

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