the demolition of controls on research almost as soon as they were in place. They also ruled out serious attention to debates about the ultimate implications of the techniques. Twenty years on, the advent of the human genome programme makes the need for that wider debate keener still. Anyone who wishes to enrich their understanding of the forces ranged against it should read Wright's book.

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M Norton Wise (ed.), *The values of precision*, Princeton University Press, 1995, pp. 372, illus., $49.50 (0–691–03759–0).

There is not a lot of medical history in this volume but there is much for the medical historian. The papers in this excellent book were first presented at a number of "workshop" sessions at Princeton University in 1991–92. The thematic nature of the workshop, 'Values of precision' (note the plural), has resulted in a collection of essays which genuinely cohere around their subject. The significance of values, as opposed to value, is that the authors address not only the merits of precision in scientific measurement but the ways in which precision is valued morally or for its disciplinary uses within military or industrial contexts. The work is divided into three parts each of which is followed by a lucid and informative commentary by the editor who is careful to draw attention to the problems of exporting precision (making it travel), standardization and the fact that, alien though standardization and precision must once have been in the west, they are now so embedded in the cultural fabric that they are commonplace and taken for granted.

The sense that standardization was once alien is beautifully conveyed in Ken Alder's essay in the first section which is on the Enlightenment. Alder describes the tortuous route by which the metric system was introduced into a French economy extremely localized in its weights and measures. Also in this section are valuable essays by Andrea Rusnock on attempts to determine the population in the Ancien Régime and by Jan Golinski on Lavoisier's commitment to precision measurement in chemistry. That all three papers in this section are about France is no coincidence. The quest for exactitude, universalization and standardization was endemic among the French advocates of Enlightenment. In England this was not so, as Golinski so elegantly demonstrates by detailing Priestley's dismissal of Lavoisier's numbers.

Lavoisier's chemistry, however, was both the immediate victor and symbol of what was to come. The quest for precision dominated the industrial societies of the nineteenth century and this is the subject of the next section. Indeed so holy did the pursuit of precision become that, as Simon Schaffer shows in his study of electromagnetism, the English could regard "accurate measurement" as their science (the reader will be drawn into Schaffer's paper by the initial quote from a military officer's manual). There are also essays here by Katheryn Olesko on precision in Germany and by her again, jointly with Frederic Holmes, on Helmholtz and the graphical method in physiology. All the chapters in this section repay study. Particularly rewarding for the historian of clinical matters is Theodore Porter's splendid piece on Victorian life insurance. Porter paints a wonderful picture of actuaries presenting their skills as based upon mathematical training but not reducible to it. Their gentility, experience and judgement, they said (and with much justification), was essential to their profession. The comparison with many Victorian clinicians hardly needs inviting (Wise's elaboration of Porter's paper is well worth reading).

Similar comparisons leap out from section three, 'Mass distribution', which includes a technical and detailed paper by Graeme Gooday on energy metering which should not be missed. The contempt with which late nineteenth-century academic physicists viewed the instruments of electrical engineers is beautifully paralleled by the disdain with which some clinicians regarded what they perceived as attempts to mechanize the healing

art. In a slightly different form, similar themes appear in Andrew Warwick's paper on computation which convincingly raises the curtain behind numerical tables to reveal the *deus ex machina* to be numerous skilled underlabourers doing sums. The other piece in this section, George Sweetnam's essay on the diffraction grating, usefully takes the reader into industry and the work ethic. More collected volumes from these workshops are promised. If they match the precise standard of this one they cannot appear too soon.

Christopher Lawrence, Wellcome Institute

Catherine A Neill and **Edward B Clark,** *The developing heart: a 'history' of pediatric cardiology*, Developments in Cardiovascular Medicine, vol. 163, Dordrecht and Boston, Kluwer Academic Publishers, 1995, pp. vi, 169, illus., £40.00, $62.00, Dfl. 95.00 (0–7923–3375–6).

The quotation marks in the subtitle of this book are appropriate for its claim to be a historical work is tenuous indeed. Rather it should be regarded as source material for history.

To justify these comments it is necessary first to point out its historiographical shortcomings. Of these the first is the authors' almost exclusive reliance on secondary sources for any work written before the last fifty years or so. The account of these earlier years is, in any case, cursory but, even allowing for this brevity, there are some notable omissions. Thus, when dealing with the development of ideas about the pathogenesis of congenital heart disease, there is no reference at all to the important work of Johann Friedrich Meckel and Carl Rokitansky. Another notable omission is the failure to comment on the long debate about the mechanism of cyanosis in congenital heart disease. The, to us, obvious explanation that it is due to a veno-arterial shunt failed to convince many physicians, including Thomas Peacock who discussed the problem at length and concluded that the mechanism was venous stasis.

Perhaps the most serious omission is the failure to refer to James Brown's monograph. It was, of course, Brown's misfortune that he wrote in the few years immediately preceding the dramatic developments in diagnosis and treatment which are the main theme of this book. However, many authorities would agree that, as a picture of the "state of the art" at that time, Brown's book was unsurpassed.

Enough has been said about this book's shortcomings and it is necessary to comment on what I believe to be its real significance. It is best regarded as a memoir by two experienced paediatric cardiologists giving an account, largely from personal experience, of the developments in the last few decades in the embryology, pathology, clinical features, treatment—indeed all aspects—of congenital heart disease. If it is read as such, there is much of interest in it to the cardiologist but perhaps not to the historian without a medical background; technicalities abound especially as the authors have boldly taken their story right up to the present day (the latest reference is 1994). An engaging feature is the frequency of asides on topics such as the books read by healthy and ailing children and references in the non-medical literature to children with heart disease. There must be few books on paediatric cardiology or its history which include references to Lewis Carroll and Beatrix Potter and quotations from Anton Chekhov's *A doctor's visit* and Anna Sewell's *Black beauty*. And, where else could one find an account of the foundation of the Harriet Lane Home, the site of Helen Taussig's famous clinic?

P R Fleming, London

Myer H Salaman, *Experiment and interpretation: a pathologist reflects on thirty years of cancer research*, London and Atlantic Highlands, NJ, Athlone Press, 1995, pp. ix, 246, £17.95 (0–485–11470–4).

For the historian of medicine interested in the working practices of cancer researchers, in their experiments and their interpretations of