health administration and legislation between 1770 and 1870, drawing attention simultaneously to the interests of both the state and the nascent medical profession in this area. As for the state, he sees an interest in health care and control with the aim of increasing economic, political, and military power in the tradition of Enlightenment cameralism. As for the doctors, he develops the thesis that their involvement in sanitary reform was a strategy to acquire state-sanctioned professional autonomy and the status of sole experts in questions of health. Accordingly, several issues relevant to medical professionalization are highlighted: the competition by non-academic healers (so-called *Kurpfuscherei*); the problem of fraudulent advertising; the striving for abolition of the dual educational system for surgeons and medical doctors, and the creation of a unified profession, which was eventually achieved with a ministerial decree in 1872 (twenty years later than in Prussia). A link between this so-called "surgeons question" (*Chirurgenfrage*) and Austrian sanitary reform is documented by efforts of organized doctors in the late 1860s to exclude surgeons from admission to public health and forensic services.

Burg's central thesis of a co-operation between the state and the medical profession each to its own benefit—is substantiated from relevant primary sources, such as manuals for public health and medical administration, publications on sanitary reform and policies of doctors' societies, and articles from the early medical periodicals in Austria. His study also provides valuable insights into the responsibilities of Austrian public health officers and sanitary committees at different administrative levels, which extended to general hygiene, action in epidemic and epizootic diseases, and control of health personnel and hospitals. It is therefore a useful contribution both to the historiography of medical professionalization and of public health.

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Susan Wright, *Molecular politics: developing American and British regulatory policy for genetic engineering, 1972–1982*, University of Chicago Press, 1994, pp. xxii, 591, UK and Eire £59.95 (hardback 0–226–91065–2), £23.95 (paperback 0–226–91066–0); USA $75.00 and $29.95; rest of the world $86.25 and $34.50.

The first book worth reading on the recombinant DNA debate was June Goodfield's *Playing God* in 1978. Susan Wright, who started research on the matter then, has now produced her retrospective view of what was, lest we forget, an unprecedented episode in the history of modern science. There was, briefly, a pause in research at the behest of the researchers themselves.

Goodfield saw the episode as part of the process of forging a "new social contract" between science and society. Wright, whose title describes her exhaustively detailed book precisely, interprets it in terms of competing discourses tied to the interests of different groups in a complex policy arena. Her interest is in explaining why the debate was so short-lived. A process which could have raised large questions about the goals and direction of biological science was instead confined largely to technical questions about potential hazards. And it rapidly switched from an insistence that the prerequisite for allowing continued use of gene-splicing techniques was defining how they might be applied safely, to an assumption that the hazards were largely illusory and the problems mainly political and presentational.

So much we have read before, in accounts of U.S. policy from Sheldon Krimsky and others and of British policy from David Bennett and his colleagues. Wright goes further, offering a rigorously worked through comparison of the two countries, covering a longer period, and putting the recombinant DNA discussion in the context of post-war science policy making. The result is an important portrait of how the impulse to safeguard scientific autonomy combined with concerns about national technological competitiveness to bring about

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