the early development of modern scientific medicine.

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Christoph Gradmann, *Krankheit im Labor. Robert Koch und die medizinische Bakteriologie*, Wissenschaftsgeschichte, Göttingen, Wallstein, 2005, pp. 376, €38.00 (paperback 3-89244-922-8).

Robert Koch was awarded the Nobel Prize for medicine in 1905 thanks to his identification of the bacillus associated with tuberculosis. Christoph Gradmann's intellectual biography of Koch, is not, however, the typical celebratory work that one might expect to mark this centenary. Indeed, *Disease in the laboratory* is a paradoxical book, being a biography of Robert Koch without really being a biography at all. What it offers is a new look at the history of microbiology from the perspective of this trail-blazing figure in the field, using various episodes from Koch's life to illustrate different features of this sphere of scientific research. Thus, Gradmann sets out to place Koch's scientific work in its historical context, underlining two important points; first, the radical novelty of medical bacteriology as a field of research, and second, its rapid growth during this period. Indeed, by abandoning medical practice to dedicate himself to microbiological research, Koch was taking a considerable professional risk in the 1870s. Nevertheless, Gradmann hypothesizes that the field of medical microbiology had become so crowded a few decades later, that one of the likely motives for Koch's scientific expedition to East Africa in 1905–7 was to escape the overly competitive research atmosphere of Berlin (and particularly his least favourite disciple, and fellow Nobel laureate, Emil Behring) for the fresh colonial fields of exotic disease.

The book is constructed around Koch's work on tuberculosis (for which he received his Nobel Prize), and more specifically the development and use of tuberculine, the unsuccessful treatment for the disease, launched by Koch in 1890. Here, Gradmann raises a number of interesting practical and ethical questions with respect to Koch's research and his publications. What Koch's contemporaries held against him was not so much his medical experiments on human subjects (on himself and his colleagues in the first instance), but rather his leading the scientific world to believe that tuberculine came out of his research into the curative use of antiseptics, while in reality it was an attenuated strain of the tuberculosis bacillus. Indeed, Koch held out for weeks before revealing the secret, exposing himself to numerous criticisms in the wake of the treatment's rejection by a growing portion of the medical profession. There are, of course, interesting parallels to be drawn with Pasteur's "private science" that Geison has described in his study of Koch's great rival (*The private science of Louis Pasteur*, 1995).

The treatment of Berthold Schmidt (supposedly infected with sleeping sickness by a laboratory rat in 1906) provides an interesting continuation of the theme of the ethics of human experimentation in the early days of medical microbiology. This unfortunate laboratory assistant received an experimental treatment with atoxyl (developed by Ehrlich and tested by Koch in Africa). This treatment and the subsequent doses of mercury medicine illustrate not only the faith in the potential of chemical medicines at this time but also the acceptance of what would come to be regarded as excessively toxic interventions by prestigious doctors such as Dönitz, Wasserman, Ehrlich, and Koch himself.

The closing section of the book deals with Koch's scientific voyages. It starts with Koch's expedition to Egypt and India in 1883 that produced another famous discovery—that of the cholera bacillus. This is followed by an account of Koch's trips to East Africa towards the end of his career to investigate sleeping sickness. While it is necessary to make organizational choices, Gradmann's decision to treat these voyages together despite the fact that they were separated by over twenty years might be a source of confusion to the unwary reader. Nevertheless, there are ample rewards for the careful reader in the form of stimulating reflections on the

interrelations between empire, conquest, war and disease that have been explored in some of Gradmann's earlier publications.

In conclusion, therefore, *Disease in the laboratory* uses Koch as a means to investigate several features of the nascent field of medical microbiology. Thus, a reader who wants the details of Koch's life, including an account of his scandalous second marriage will have to look elsewhere, as will the non-German-reading public. What Gradmann does offer, however, is a serious, thoroughly documented account of Koch's major areas of research placed in context. This contextualization consists at the same time in framing the issues in terms of contemporary research in history of science, and placing Koch's science in the context of nineteenth-century laboratory and clinical experimental practice. Thus, while it may not be appropriate for the uninitiated, Gradmann's "biography" offers a fascinating account for those who want a sophisticated intellectual history of Koch informed by recent approaches in the history of science.

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Alexandra Minna Stern, *Eugenic nation: faults and frontiers of better breeding in modern America*, Berkeley and London, University of California Press, 2005, pp. xiv, 347 illus., £38.95, US$60.00 (hardback 0-520-24443-5); £15.95, US$24.95 (paperback 0-520-24444-3).

Alexandra Minna Stern's *Eugenic nation: faults and frontiers of better breeding in modern America* takes on a number of important and previously neglected tasks: the description and analysis of American eugenics away from the Eastern seaboard (principally in California); during and after the Nazi era; and beyond those movements and debates that were self-consciously "eugenic". She seeks to embed historical understandings of this broader and more diffuse eugenic impulse firmly in the mainstream of American culture and politics, and to disperse any remaining fond illusions that eugenics was a fringe movement, or one that disappeared with the revelations of Nazi atrocities committed in the name of race-improvement and racial purity. In *Eugenic nation*'s six chapters, Stern offers an innovative approach to eugenics, broadly defined. Some chapters work better than others. The book's opening chapter, 'Race betterment and tropical medicine in imperial San Francisco' explores the San Francisco Panama–Pacific International Exposition of 1914 as a text integrating eugenics with tropical medicine in the service of American expansionism. It usefully delineates the intersection of scientific definitions of "race" and racial hygiene with public health and germ theory-based notions of public hygiene and sanitation. This well chosen case study allows Stern to argue that San Francisco was an imperial, as well as a western city, and that its medical and eugenic establishments were fundamentally parallel to and modelled upon those of colonial medicine—a fine contribution to the colonial medicine literature as well as to understandings of eugenics *per se*. Chapter 5, examining the relationship between eugenics and the 1950s' apotheosis of rigidly separate male and female familial roles, also works well. It will be a nice addition to courses on gender and sexuality. Here, moreover, Stern's treatment of self-assessment tests as hegemonic technologies usefully extends existing studies of such tools. On the other hand, Stern's second chapter 'Quarantine and eugenics: gate-keeping on the US–Mexican border'—though a substantial addition to the literature on medicine and immigration—is less successful as a discussion of the eugenic motivations of those gate-keepers. Similarly in Chapter 4, Stern's discussion of linkages between the eugenics and environmental movements in California offers fascinating insights into both, and into a common sense of the fragility of "purity"—but it sketches and suggests, rather than explicating the connection. On a purely mechanical level, her extensive use of abbreviations throughout the volume sometimes leaves the reader floundering in an alphabet soup of capital letters, armed only with a cumbersome 'List of abbreviations'.

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