

## Book Reviews

After an introduction on the role of colonial medicine in India, each of the following essays deals with a particular aspect of the subject. One takes up the role of British doctors in their assigned duty to protect the health of British soldiers on one hand and Indian prisoners on the other. Three deal with particular diseases—smallpox, cholera, and plague—chosen for the political controversy they aroused rather than their importance as a cause of death. A final essay on “health and hegemony” is a Gramscian analysis of the blend of coercion and consent that finally led to a general, if slow, acceptance of Western medicine in India. Each essay has many fascinating insights into the politics of medicine in nineteenth-century India and into the place of Western medicine in any cross-cultural setting at that time.

In spite of a wealth of detail and the author’s deep understanding of Indian politics in the British period, the treatment as a whole is mildly unsatisfying. The crucial problem is its lack of a biological base. Western medicine and Indian medicine alike were trying to intervene in an ecological relationship between pathogens and human beings, but although Arnold cites and quotes liberally from nineteenth-century medical opinion, he does not set that opinion against present biomedical knowledge.

Arnold’s acknowledged theoretical indebtedness is revealing. He mentions Michel Foucault, Antonio Gramsci, Susan Sontag, and Edward Said—none of them scientists or historians of science—and he assumes that his readership will be familiar with their work. He writes, for example, that: “Anyone who sets out to try to write a history of the body is inevitably indebted to Michel Foucault”. From the perspective of the natural sciences, most biologists who write about the body have never heard of Foucault; and few of those who have would feel much indebted to him.

The title itself is a problem; the verb “to colonize” has a biological as well as a political meaning. *Vibrio cholerae* and *variola major* certainly colonized Indian bodies in the nineteenth century. It is harder to see the sense in which British medical officers might have

done so. “Colonize” and “colonialism” are, indeed, used in several different senses. On p. 112, jails and Indian military establishments were “were progressively colonized by Western medical and sanitary practices”. At another point “colonialism” too becomes an actor in history, as in: “Colonialism used—or attempted to use—the body as a site for the construction of its own authority, legitimacy, and control.” (p. 8).

Interesting as the book is in its treatment of the politics of medicine, it would have been stronger still if the author had paid more attention to the biology and less to Foucault.

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**Kenneth L Caneva**, *Robert Mayer and the conservation of energy*, Princeton University Press, 1993, pp. xxiii, 439, £33.00, \$49.50 (0–691–08758–X).

Robert Mayer, a German physician and amateur scientist, was one of the dozen-odd individuals simultaneously groping toward the principle of the conservation of energy during the 1840s. Mayer’s priority rests upon his ingenious calculation of the mechanical equivalent of heat (1842), his new ontological conception of force (energy) as an entity capable of existing independently of any material substrate, and his extension of the conservation principle to embrace the energy-economy of the living organism (1845). In this important new book, Kenneth Caneva offers a detailed reconstruction of Mayer’s route to the conservation of energy, as well as an exciting analysis of the intellectual context out of which Mayer’s thought developed.

Caneva’s findings about Mayer are original and provocative. He argues persuasively that Mayer, as a Christian theist, pursued his new ontology of force partly as a counterweight to the threat of philosophical materialism. Ironically, that doctrine assimilated the new concept of force all too easily, leaving Mayer increasingly isolated by the 1860s in his anti-

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materialist, anti-Darwinian stance. Caneva also shows that although Mayer had come to believe as early as 1840 that force could not be destroyed, he still believed as late as 1843 that it could be created, perhaps by organisms as part of their life processes, and certainly in systems “ordered with divine wisdom” (p. 42) like the solar system, in the form of solar heat and light.

Caneva subjects the context of Mayer’s thought to impressive scholarly analysis. In some of the most useful sections of the book, he examines the German literature on medicine, physiology, physics, and chemistry for insights, analogies, and implicit appeals to conservation principles that Mayer might have found significant. Justus Liebig plays a large role in Caneva’s discussion, and he shows that the development of Liebig’s thought and Mayer’s was closely intertwined during the early 1840s. In a final chapter Caneva analyses possible associations between Mayer and *Naturphilosophie*, in one of the most useful and penetrating overviews ever written of that notorious movement. Historians of science who have no direct interest in the conservation of energy will also find these

discussions invaluable.

Caneva presents in effect a long, running meditation about the relationship between context and creativity. He portrays the development of Mayer’s thought not as a determinative process of influence and causation, but as a progressive “crystallization of meaning”, in which Mayer himself continuously reassessed and redefined his original insights. In that crystallization Mayer was led by a series of analogies drawn from the intellectual milieu, which the historian can recognize and explicate. Caneva acknowledges that the surviving sources permit no definitive reconstruction of Mayer’s thought and its development. The admirable judiciousness of that conclusion, however, leaves hanging the ultimate problem of Caneva’s meditation: do the historical limits on our ability to reconstruct Mayer’s thought really stem from the want of sources, or from the ineluctable mystery of scientific imagination? Either verdict pays its own tribute to Caneva’s important and provocative treatment.

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