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and late twentieth-century hospital planning. In a relatively short text (125 pp.) there is little room for detailed analysis of some subjects examined or discussion of attendant issues. For example, records of barber surgeons in Norwich date from 1188 and the author outlines various forms of medical licensing up to the late seventeenth century, notes the relatively large numbers of practitioners involved, the significant proportion of episcopal licences granted to women, and refers the reader to published research in this area. But why the Royal College of Physicians sought to impose a “closed system” in Norwich, whether the medical knowledge, practices or patents defended in this way were really superior to that of other “popular healers”, or the possible benefits of these processes to the local population are not discussed.

Chapters on the county’s medieval and modern hospitals include those at Shotesham, which Batty Shaw has shown to be the country’s first cottage hospital, and the Bethel, Norwich, the first hospital for care of the insane to be established in the provinces. However, there is little on the development of these institutions, their services or their impact, although references to assist further study are again provided. Anthony Batty Shaw’s coverage of Norfolk diseases, the local medical societies and eminent figures such as Sir Thomas Browne or Benjamin Gooch is stronger. These are subjects on which he has previously published research, including material in this journal (1970, 14: 221–59) on the Norwich School of Lithotomy. A detailed section on medical education, in particular teaching in a non-teaching hospital, reflects both the author’s historical interest and professional involvement. The balance struck in the subject material selected for this volume might not suit the modern social historian but there is much to attract local interest, including some sixty-one photographs. An additional twenty-four pages of references mean that, if not a comprehensive account of Norfolk and Norwich medicine, this is a very useful guide and an essential starting place for its further study.

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POONAM BALA, *Imperialism and medicine in Bengal: a socio-historical perspective*, New Delhi and London, Sage Publications, 1991, pp. 174, £25.00 (81–7036–245–8 (India), 0–8039–9100–2 (US)).

What was the impact of colonial encounter on medical organization and practice in India? Poonam Bala’s answer, based on a study of the Province of Bengal, is that the outcomes of the interactions between different medical systems, and medicine and imperialism were more complex than usually assumed. She argues that while Western medicine certainly became dominant in terms of its institutionalization, it was not hegemonic and that various Indian systems continued to co-exist and even received official support into the twentieth century. Bala concludes that it is better not to think in terms of an inevitable struggle between incompatible systems, and of Western dominance, but of “phases of competition and accommodation” (p. 145).

Few would dispute that until the second quarter of the nineteenth century Western and indigenous systems “peacefully co-existed” as they bore cognitive and practical similarities in their pluralism, humoralism and pharmaceutical practices. Europeans often regarded indigenous medicine positively and as a potential source of new drugs and ideas; the East India Company employed a number of Indian medical practitioners in various, albeit subordinate, roles. Matters began to change in the 1840s with the insistence that English become the official medical language and were part of the wider utilitarian critique of Indian culture. This continued in the second half of the nineteenth century as British medicine changed professionally and cognitively. The moves in Britain towards a unified profession, supported by the state and based on science and formal training, were emulated in India, though with quite different results. Bala suggests that, instead of a medical monopoly, there was a mixed economy of practitioners and systems. Some Indian practitioners ignored Western medicine and continued to practise and develop indigenous systems, others combined elements of both, and a final group became fully converted to Western theory and practice. A further complication was that each of these different kinds of practitioners were to be found at four different social levels: civil elites, European soldiers, Indian soldiers, and the indigenous population. Bala claims that this diversity shows that the outcome of professionalization strategies depends on the wider social context of medicine and only produces the monopolies seen in Europe in particular

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social conditions. Indeed, growing nationalist activities in the twentieth century led the government of India to operate its medical policies with and through this plural structure up to independence. Others might wish to paint a different picture in which Western medicine and the European model was both more dominant and more contested, yet Bala offers considerable food for thought and new ideas to test in the future.

The constraint on size means that this study is not as empirically strong as it might have been. Also, at several points it relies on a dated, if not inaccurate, picture of the professional, cognitive and practical development of medicine in Britain. For example, the impact of the public health movement within medicine is overstated, and the important recent work on the ideological rather than practical roles of science in medicine has not been taken on board. That said, Bala does provide further comparative support for those historians who have stressed the importance of the wider social, economic and political context in shaping the social organization of medical practice. In addition, her study takes the history of professionalization into the twentieth century and discusses the influence of the growing industrialization of medicine on education, organization and practice.

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GORDON M. SHEPHERD, *Foundations of the neuron doctrine*, History of Neuroscience series, Oxford University Press, 1991, pp. ix, 338, illus., £35.00 (0–19–506491–7).

The brain and spinal cord are made up of nerve cells, supporting tissue, and blood vessels. The essential component of the nervous system is the neuron or nerve cell. Vision and movement, thought and feelings are ultimately based on the action of nerve cells. Nerve cells communicate with one another by fibre-like processes; axons and dendrites, which take their origin from nerve cells.

The idea that the nervous system is composed of individual elements whose processes touch, but do not fuse is called the neuron doctrine. The neuron doctrine was put forward in its final form at the end of the nineteenth century, but the evidence for it was accumulated in over half a century of anatomical, histological, and physiological research. The neuron doctrine has been the basis for all further study of the structure and function of the nervous system, and the nature of neurological disease.

Despite its fundamental importance, the history of the neuron doctrine has received relatively little attention. The most important volume prior to the present one was that of Edwin Clarke and C. D. O'Malley, *The human brain and spinal cord*. Clarke and O'Malley's book contains excerpts from the literature translated into English with critical comments on each. The book presents in an orderly way the evidence that led up to the neuron doctrine. Gordon Shepherd picks up where Clarke and O'Malley left off. Unlike Clarke and O'Malley, who dealt with a much wider range of topics, Shepherd focuses entirely on the neuron doctrine. His format is similar to that of Clarke and O'Malley in that he presents the work of several authors in translation along with a narrative text and appropriate figures. But Shepherd includes many authors not covered by Clarke and O'Malley. In addition to the obvious giants among the histologists, Camillo Golgi and Santiago Ramón y Cajal, Shepherd presents excerpts from the important contributions of Franz Leydig, Sigmund Freud, Fridtjof Nansen, and Michael von Lenhossek among others. The excerpts from original articles and Shepherd's scholarly comment give a balanced and orderly history of the evidence for the neuron doctrine from the earliest discoveries to its final triumph in the hands of the Spanish histologist Ramón y Cajal.

Cajal's brilliant experimentation, his lucid prose, and his orderly and systematic treatment of the entire nervous system, make him stand far above all of his contemporaries as the true founder of the neuron doctrine. But, as Cajal recognized, there were prior contributions from other workers. For example despite Golgi's clinging to a discredited theory in his later years, his experimental contributions were of fundamental importance for the emergence of the neuron doctrine.

The neuron doctrine was at first deeply controversial. In the last half of the nineteenth century many histologists supported an alternative reticular theory of neuronal organization. According to this view nerve cells are not individual elements, but part of a massive net—a reticulum—whose elements fuse. Shepherd's treatment of the reticular theorists is particularly helpful. The book makes it clear that there were in fact two radically different reticular theories. There were those, like Joseph