

professional life. Nonetheless, it is striking that Cushing always seems to have expected more. Bliss does not shy away from the consequences of such ambition: Cushing's relationship with his family suffered because of his workaholic lifestyle.

Early on in the Great War, Cushing travelled to France with a Harvard medical team. His war diary, subsequently published to critical acclaim in 1936, is a fascinating and important account of a surgeon's experiences in France. Bliss builds upon that historical treasure further by revealing, surprisingly, that Cushing was initially unenthusiastic about this venture. In the remaining chapters, Bliss covers the last years of Cushing's life: from failed plans for a national institute of neurology, to book collecting, the marriages of his children, and the tragic death of one of his sons. It is an engrossing account.

I enjoyed this book immensely and have had no trouble recommending it to others. Still, there is something dissatisfying about it as well. Before I started reading, it was obvious to me that Harvey Cushing was a "great man". But could Bliss have said more? To be sure, his expository narrative style is elegant, but is there an argument in this book? His footnotes tell of diligent archival research, but there is little suggesting Bliss is troubled by his project's rather polemic nature. Despite the fact that there is now a considerably sophisticated secondary literature on the nature of biography and autobiography, there is no real indication here that Bliss possesses critical insight or theoretical knowledge of his chosen genre. Surprising this, since he is quick to denigrate Fulton's earlier biography, implying that it suffered because Fulton wrote it in an intoxicated stupor. However, for me, Fulton's biography reads like many other biographical works from that era and earlier, and I am not convinced that Bliss's book is altogether different. Indeed, one merit of Fulton's study is that it captures the social perception and reception of Cushing's ideas and techniques abroad in ways that Bliss's account does not. Though Bliss's research is remarkable, it is noteworthy that it is based mainly in North

American archives (perhaps excusable since Cushing kept copies of much that he wrote). Still, there are archival sources elsewhere that would have subtly changed this representation of Cushing, and in consequence have produced an even broader perspective.

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**Elliot S Valenstein**, *The war of the soups and the sparks: the discovery of neurotransmitters and the dispute over how nerves communicate*, New York, Columbia University Press, 2005, pp. xviii, 237, illus., £19.50, \$31.00 (hardback 0-231-13588-2).

The 1936 Nobel Prize in Physiology or Medicine was awarded to Henry Dale of London and Otto Loewi of Graz for their separate but synergistic discoveries of the role of acetylcholine in the transmission of neural impulses in the autonomic nervous system. It provided scientific authority and legitimacy to the concept of chemical neurotransmission. However it was to be a further two decades before the idea was widely accepted by more than a few faithful adherents, whilst many, if not most, neurophysiologists continued to believe that most, if not all, neural transmission was electrical. During the 1930s, 1940s and early 1950s, debates between these two groups frequently enlivened meetings of the Physiological Society, and became known jocularly as 'Spark versus Soup': hence the title of this book.

This volume records the history of much of the work on chemical neurotransmission, starting from the development of the neurone doctrine, through the Nobel Prize winning work, up to the modern day concepts of "first messengers" and neuromodulators, and with a final epilogue of historical reflections based on the author's active career of almost fifty years in neurobiology. Throughout there is a strong biographical emphasis on the main players, including Dale, Loewi, Walter Cannon, and

their colleagues and successors, particularly Wilhelm Feldberg and John Eccles.

Early chapters set the scene by describing in particular the influence of the Cambridge department of physiology, especially that of John Langley and Walter Gaskell. The significance, or otherwise, of the work of Thomas Renton Elliott, often credited with the first articulation of chemical neurotransmission, is thoroughly discussed, and the importance of the autonomic nervous system emphasized. Gradually, the various pieces of the jigsaw puzzle of chemical neurotransmission are uncovered: Dale and Ewins' discovery of acetylcholine in an extract of the fungus ergot and their demonstration of its powerful depressor effect in the parasympathetic nervous system; Loewi's observations of *vagusstoff* and *acceleransstoff*, chemical substances apparently released on neural stimulation; Dale and Dudley's most important discovery, whilst looking for histamine, that acetylcholine was a normal constituent of the mammalian body; and the increasing evidence that *vagusstoff* was indeed acetylcholine. In 1933 came the arrival in Dale's laboratory of Feldberg, a refugee from Hitler's Germany, who brought with him the eserinated leech muscle preparation that finally provided a sensitive bioassay for acetylcholine. It was only a short matter of time before compelling evidence of acetylcholine release after nerve stimulation was compiled and the work was recommended by the Nobel Committee for the Prize. Meanwhile in Harvard, Cannon and his assistants, firstly the Belgian Zenon Bacq, and then the Mexican, Arturo Rosenblueth, were doing parallel work on the sympathetic nervous system. Here the work was complicated by the dual responses seen by stimulation of the sympathetic nervous system, excitatory in some systems, inhibitory in others. To explain this Cannon and Rosenblueth devised a complicated theory of sympathin-E (to account for the excitatory effects) and sympathin-I (to account for the inhibitory effects) secreted by sympathetic fibres. Although Dale always acknowledged Cannon's work in showing that a chemical was liberated

from sympathetic fibres, he was never convinced by the sympathin theory, and on the whole it did not receive much support in the UK. It was Raymond Ahlquist, an unsung hero in the history of chemical neurotransmission and one who gets little attention here, who later unravelled the complexities of adrenergic receptors and their differential sensitivity to catecholamines, thus opening up the final elucidation of sympathetic neurotransmission. It was Ahlquist's work that finally discouraged the use of the confusing word "sympathin", an important step more than matched by Dale's proposal, also glossed over here, of the words "cholinergic" and "adrenergic" to describe fibres by the *kind* of chemical (rather than the chemical itself) they might use, because "such a usage would assist clear thinking, without committing us to precise chemical identifications, which may be long in coming" (H H Dale, 'Nomenclature of fibres in the autonomic nervous system and their effects', *J. Physiol.*, 1934, **80**: 10–11).

Sadly, the book is riddled with numerous irritating small errors—for example, within just a few pages in the chapter on Henry Dale, Patrick Laidlaw is incorrectly identified (twice) as Peter; Dale did not head the Wellcome Trust Fund, he was Chairman of the Wellcome Trust; the novelist who founded the George Henry Lewes studentship was George Eliot, not Elliot. There is no such thing as the National Research Committee, it is not now the National Research Council, and Dale was not appointed to it in 1914. He became a member of staff of the Medical Research Committee (later the Medical Research Council) not a member of the Committee, and worked originally in the Central Research Institute that became the National Institute for Medical Research (NIMR) not the Institute of Medical Research, and it was not in Hampstead until 1919. There is no evidence that dissatisfaction at increasing calls to test Burroughs, Wellcome & Co's products led to Dale's departure from the Wellcome Physiological Research Laboratories, and indeed the suggestion that difficulties about the use of the word adrenaline

encouraged him to consider other positions is plain wrong—that debate occurred in 1906, Dale shortly afterwards became the Director of the Laboratories, and remained there for another eight years. These errors, whilst individually small, are cumulatively irritating. Equally the insufficiency of some figure legends, and indeed of some of the figures themselves, detract from the presentation of one of the most riveting stories of modern neuroscience.

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**Sally Sheard and Sir Liam Donaldson, *The nation's doctor: the role of the Chief Medical Officer 1855–1998*, Oxford, Radcliffe, 2006, pp. xxii, 238, illus., £40.00 (paperback 1-84619-001-0).**

Since John Simon's appointment in 1855 as Medical Officer to the General Board of Health there has existed a post for a public health doctor within the British government. In this work, Sally Sheard and Sir Liam Donaldson examine the office of the Chief Medical Officer (CMO), aiming to trace the development of the role and its interpretation by individual incumbents.

Rather than adopt a chronological approach, the authors have chosen to organize their account thematically. After initial chapters dealing with the career of John Simon, the initial underlying principles and surviving practices of the CMO post, and the selection of men for the post (a woman has yet to hold it), succeeding chapters highlight episodes in the tenure of different CMOs in order to explore an enduring aspect of the office. Thus, the third chapter, which examines the importance for health policy of the interaction between CMO, Permanent Secretary and minister, shifts focus between time periods. Other chapters also move backwards and forwards in time. Chapter four, illustrating the combined role of the CMO as manager of a government department and resident expert, is especially fragmented, the non-chronological structure making it difficult

to grasp changing departmental structure. Chapter five covers the relationship of the CMO with the medical profession, chapter six the CMO's importance as a co-ordinator and interpreter of internal and external advice in guiding policy, and chapter seven the CMO's interaction with the public. One drawback of the authors' chosen approach throughout is that it is often disorienting: a linear narrative is taken up intermittently to be quickly dropped, and this is not effectively balanced by the very brief profiles of each of the CMOs at the back of the book. Overall, this tends to obscure a sense of change over time, which lends this volume an emphasis on continuities.

The authors are evidently concerned with the recurring themes they have identified in their analysis of the role of the CMO. This is where Donaldson's agenda as the current CMO makes itself felt. In chapter eight especially, which deals explicitly with the "common threads" (p. 167) running through the role of the CMO from 1855 onwards, it is difficult to escape the sense that Donaldson, at least, is keen to laud the office and draw attention to its pressures and problems. The issues of fair remuneration, access to sufficient staff and resources, and the heavy impact of the National Health Service on the duties of the CMO, are prominent themes, as is the tension between meeting the demands of government and the medical profession while maintaining the confidence of both sides.

These are probably valid insights but, unfortunately, the book lacks the detailed and contextualized historical analysis to bring them to life. There is barely any attempt to consider the political, social or intellectual context within which the CMOs in this story acted. Even the economic background is usually mentioned only in passing—paradoxically, given the concern with depicting the struggle for resources faced by successive CMOs. Statements such as, "The [new] Ministry [of Health] . . . should have provided a centralized administration to integrate existing services [but] it failed to capitalize on its potential power [and services remained] under the control of local government", for example, ignore the