

The influx of medically trained immigrants was domestically encouraged by the refocusing of immigration policy in favour of attracting 'highly skilled manpower' through a points-based system. While this successfully increased medical immigration to the country, it would be condemned as a global 'brain drain' of skilled individuals by Western countries, especially the United States, the United Kingdom and Canada. This international discourse is the focus of Chapter 6 of the monograph, highlighting the criticisms levelled at industrialised countries which had absorbed nearly 90% of the world's migrant physicians (p. 160). In Canada, this enabled the supplementation of rural and remote health regions with a growing foreign workforce of medical professionals. Two full chapters of the book provide intimate case studies of the development of unique health cultures in rural areas, with Chapter 8 comparing the examples of two resource towns: Sault Ste. Marie, Ontario, and Thompson, Manitoba. The discussion finishes once again with domestic policy review of the novel incentive policies passed in the 1970s to relocate physicians towards underserved areas of the country.

Mullally and Wright employed comprehensive research methods for this work, with quantitative data forming a core part of the evidence. Using the Canadian Medical Directory, the annual returns of the federal Department of Immigration and Citizenship, multiple published reports from medical journals and an abundance of popular news and media resources, the authors compiled a substantial database regarding migrant doctors, their countries of origin, counties of study, location of settlement and general demographic information. The statistics that emerged from these data provide a solid foundation for their assertions about the influx and outflow of medically trained individuals and highlight the quantitative impact of a 'brain gain' on Canadian medical practice and policy. However, the true strength of the work is the combined approach which supplements the hard statistics and policy discussions with the personal stories of men and women which were collected through oral interviews over several years. A glance through the sources demonstrates that this work was years in the making, and the authors took care to follow up on leads and contact numerous external individuals for added insight. One minor limitation to the qualitative content is the high ratio of male voices, which at times overshadows the contributions and experiences of foreign female medical professionals.

Nonetheless, this is a significant work of history which does much to reconceptualise the narratives told about Canadian Medicare. Through its exploration of the ways that foreign-trained doctors settled into Canadian structures of medicine and subsequently moulded those structures over the course of the 1960s and 1970s, *Foreign Practices* provides a new framing for the national Medicare system, one which recognises the contributions of immigrant medical workers and marries the national belief of a home-grown system, with a multilayered transnational understanding.

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Alastair Compston, *All Manner of Industry and Ingenuity. A Bio-Bibliography of Thomas Willis 1621–1675* (Oxford: Oxford University Press, 2021), pp. xvi + 805, £99.99, hardback, ISBN: 9780198795391.

The year 2021 marks the quatercentenary of the birth of Thomas Willis (1621–75),¹ English physician, Sedleian Professor, natural philosopher, Oxford virtuoso, noted neuroanatomist and author of fourteen treatises (1659–75). As a corpus, his writing successfully aimed to define understanding of mid-seventeenth-century medicine, and in turn became an instrument in the evolution of clinical knowledge. Only R.-T.-H. Laennec (1781–1826) has more entries than Willis in Ralph H. Major's

¹A. N. Williams BPNA Webinar Series 2021. "Happy Researches": On the 400th anniversary of the birth of Thomas Willis (1621–75) – A paediatric neurology/neurodisability perspective. <https://vimeo.com/646009501/5552c52257>.

Classic Descriptions of Disease.² Described as ‘the Harvey of the Brain’, Willis was the founder of clinical neuroscience; was one of the first to use, if not indeed to coin, the very term neurology and finally, would be remembered for his ‘circle’.

On this anniversary, an opportunity presents itself for an innovative, scholarly, multidisciplinary book to contextualise fully Willis’ work. This book was written over two decades by an eminent retired professor of adult neurology. Does it live up to the *All Manner of Industry and Ingenuity* of its title?

This book is very enjoyable to read and has considerable depth. It brings together a great deal of material and for that alone is a welcome addition to the published literature on Thomas Willis. It is richly illustrated with many documents that most Willisian scholars will not have previously seen. It taught this reviewer many new facts, not only about seventeenth-century publishing practices, but also about Willis ie. where Willis did his guard duty as part of the 600-strong University Legion (Magdalen College Grove), and surprisingly that in the *Cerebri Anatomie* (1664), he never cites Versalius’ *De Humani Corporis Fabrica* (1543).

The bibliobiography section, a catalogue and not a descriptive bibliography of Willis’s publications, is very extensive and truly fascinating, but not part of a review on medical history. Suffice it to say that it shows in detail not only seventeenth-century publication practices, but also the breadth of Willis’ interests: from chemistry, the workings of the brain or the soul and Willis’ own successful attempt for a system of rational therapeutics. Eighty five of the 103 entries cited in the bibliography come from the author’s, Alistair Compston’s, own collection. In separate, later chapters, the author relates in detail the evolution of Willis’ ideas which is also fascinating as we read of Willis struggling to make sense of what he is observing. Comments made in William Osler’s famous 1916 talk on ‘Willis the anatomist’ about Willis’ writing on fermentation (that ‘Willis studied this mystery and made it still greater in the pages he devoted to it’) do strike a chord.³ Willis’ treatises can be extremely repetitive and disordered, but are rich in metaphor.

This reviewer does not understand why, for a book which is part bibliography itself, in spite of extensive footnotes there is no bibliography specifically listing all sources that were used in its creation. It cites access to unpublished works by John Wing and Phillip Oldfield eg. which are unobtainable.

The author admits the biographical account is ‘without original research or identification of new archival material’ (p. 3), emphasising ‘no claim is made to having provided a comprehensive summary of the recent literature’ (p. 3). It is unclear what literature search strategy was used here. The author explains ‘even with filters, an Internet search on Thomas Willis [received] several million hits’ (which this reviewer does not dispute but neither sees as a valid argument). This reviewer found that a PubMed search using ‘Thomas Willis’ gave 155 results, some of which were found in the footnotes. The author acknowledges that ‘with few exceptions, recent scholarship on Thomas Willis and his times has not rigorously been included’ (p. 3). Similarly, ‘Authorities on book history will readily identify material that ought to have been mentioned’ (p. 3). Perhaps for such an expensive, long-planned and substantial book, the necessary professional experts could have been commissioned.

Readers of Willis have long been frustrated by seventeenth-century translations (often very wide of the original Latin), and with many omissions. These translations, and there being no move to correct systematic errors, mean that for Willis’ translated works, there are no perfect copies. It is noteworthy that one major treatise – *Affectionum quæ dicuntur hystericæ et hypochondriacæ* (1670) – has never been translated into English at all. It is a shame that Compston’s book largely restricts itself to seventeenth-century translations and the few new ones are not by Latinists. A Latinist would have commented that five terms Willis used to describe distinct grades of mental retardation – ‘*stulti, stolidi, fatui, fungi and bardi*’ – are derived from line 1 088 of *Bacchide*, by the Roman comic playwright Plautus (c. 254–184 BCE).

Concerning John Locke (1632–1704), there is no mention of the importance to Locke of Willis’ highly influential ideas, either of the Tabula Rasa or also of support for the learning disabled, both of which were transmitted through Locke’s writings.

²Ralph H. Major, *Classical Descriptions of Disease: With Biographical Sketches of the Authors* (London: Baillière, Tindall and Cox, 1932).

³H. Viets, ‘A Patronal Festival for Thomas Willis (1621–75) with Remarks by Sir William Osler’, *Annals of Medical History*, 1, 2 (1917), 118–24.

Unfortunately, this book only partly interrogates the underlying principles that drove Willis within medical practice. The author cites Willis' preface of his *Treatise on Fevers* (1659) with the 'aim to adapt general Notions from particular events'. But Willis' aim was far bolder. A 2002 *Lancet* paper by this reviewer is cited but not fully appreciated (as well as having a misspelt co-author).⁴ This explains how a mother lost four infants through seizures and after a post mortem and interpretation, Willis' devised treatment led to three surviving healthy children. Any currently practicing paediatrician knows that this is still highly unlikely within present twenty-first-century clinical practice. The diagnosis does not matter here, only that Willis' intervention, at least in this case series, apparently worked. It is thus the first full realisation of the idea within clinical neuroscience that drives all medicine to this day ie. an intervention, based upon state-of-the-art medical knowledge, clinical observation and investigation up to and including post mortem (when being put all together) led to prevention of suffering, progressive disability and death. One particular curiosity of this intervention, a Fontanelle, is a now obsolete French term being defined in the Oxford English Dictionary as 'An artificially created or naturally occurring opening in the skin through which pus or other body fluids can drain'⁵ (It is not to be confused with the term 'fontanelle' currently used to describe an anatomical feature of the infant human skull). Why this term is significant is because the English Civil War denied Willis the opportunity to train abroad and there has always been a question mark about how much Willis' practice may have been adversely affected by this, but the author does not discuss this. Yet here Willis is using a continental practice. Is this possibly due to the influence of his friend Sir William Petty (1623–87) or indicative of a deeper personal understanding by Willis of contemporary continental practice? This is just one case, as an illustrative example. What other examples of continental practice are buried within the original Latin text? We do not know. Why did the author not take this approach, taking the defining short segments of the original Latin texts, one for each speciality? There is surely much more to discover from within here.

Thomas Willis' works are foundational within clinical neuroscience, psychology, psychiatry, epidemiology and endocrinology. Books beget books. This reviewer believes this could have been a golden opportunity for a more definitive book based upon completely new translations by Latinists, with interpretation from medical historians and input from appropriate current medical specialists and others. These foundational texts deserve nothing less. Nevertheless, this impressive book clears ground for a future challenge.

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Aro Velmet, *Pasteur's Empire: Bacteriology & Politics in France, Its Colonies, & the World* (New York: Oxford University Press, 2020), pp. xiv + 306, \$78.00, hardback, ISBN: 9780190072827.

Aro Velmet's *Pasteur's Empire: Bacteriology & Politics in France, Its Colonies, & the World* is as broad in its conceptual reach as its title suggests. Velmet covers specific activities of Pastorian scientists working all over the French Empire, and discusses those Pasteur Institutes outside the Empire, such as the one in Athens, and the relationships, both competitive and collaborative, between the Pasteur Institutes as a body and other international scientific organisations such as the Rockefeller Foundation. The author convincingly demonstrates that Pastorian scientific responses to plague, tuberculosis, yellow fever and the production of intoxicants, specifically rice wine, were shaped by 'interimperial and international networks'. Velmet further contends that said networks were in turn, and increasingly as time went on, shaped by an 'interplay between microbial and global politics' (p. 16). This book is informative, thought

⁴A.N. Williams and L.B. Birmingham, 'The Art of Making the Ineffective Effective', *The Lancet*, 359 (2002), 1937–9.

⁵Oxford English Dictionary. 2021. <https://www.oed.com/>. Accessed 22 February 2021.