

Reviews

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Roger Underwood: *A Botanical Journey: The Story of the Western Australian Herbarium*. Department of Conservation and Environment: Perth, 2011. 275 pp., ISBN: 978-1-921703-12-6, \$65.00.

This history marks the move of the Western Australian Herbarium (hereafter WAH) into its new purpose-built accommodation in the Conservation Science Centre. It has the distinction of being one of the few published histories of an individual herbarium. Most herbaria are departments of larger institutions such as botanic gardens. In histories of those institutions the herbarium is invariably relegated to a minor role: the histories of the Royal Botanic Gardens in Kew, Melbourne and Sydney are cases in point.

This book is as much about the history of the discovery of the Western Australian flora and subsequent research on that flora as it is about WAH. It starts with a good narrative description of the discovery and collection of plants in the period before WAH came into being with the amalgamation of three separate government herbaria in 1929. In what follows, due weight is given to both the endeavours of WAH staff and what was happening elsewhere. The work of William Blackall and Brian Grieve, the publications emanating from King's Park, the development of rare plant conservation programs and the flora surveys carried out in other government departments are all highlighted. WAH is consequently well placed within the context of the multitude of botanical research being undertaken in a variety of institutions.

Almost a whole chapter has been devoted to the publications produced by WAH and the databases that have been developed based on the collections, both among the principal means by which information is made available to the public. Individual curators are given prominence in the chapter on leadership, with an assessment of their respective contributions to the development

of WAH. In addition, the book is replete with 'sidebars' in which other staff are featured. There is also a chapter on botanical illustration featuring artists whose work has graced WAH publications. Even though these artists have not been on the staff, the author rightly emphasizes the importance of botanical illustration to taxonomic botany and the exquisite work produced by these artists. One of the most notable features of the book is the large number of photographs especially of the staff and the beauties of the Western Australian flora.

It is refreshing that the book is not primarily devoted to an exposition of those people whose collections have been deposited in WAH. Several such recitations have been published under the guise of histories of various herbaria, asserting the importance of those herbaria without actually discussing their history. The major contributors to WAH's collections can be gleaned from the text and particularly Chapter 8. Nevertheless a more consolidated body of such information would have been welcome: where and when were the collections made and what was their significance other than simply numbers of specimens.

Each chapter has endnotes that are full of fascinating information in amplification of the text. Much of this information, however, should not have been adjunct to the text but included in it. Note 9 to Chapter 5, for instance, describes the inspiration behind the design of Blackall's key to the flora, a key familiar to everyone who studies Western Australian plants. This information, consigned as it is to a note, has been diminished in importance.

There are two areas where the book might have been enriched by further examination. Part of WAH's history is about government priorities and bureaucratic game-playing. Intermittently there are tantalising hints (the 1929 amalgamation; the appointment of survey botanists to the Department

of Conservation and Land Management) but these are left largely unexamined. The author has denied himself the opportunity to tease this out and draw some conclusions about the importance to government of WAH. Likewise the book is somewhat introspective in that it deals with WAH and botanical research within Western Australia. There is, however, a wider context, examination of which would have illuminated the narrative. There is, for instance, a parallel with Queensland where the first appointment of a botanist to government service was also in relation to agriculture, particularly poisonous plants.

Problematic in this book is the lack of documentation. It has a bibliography of eleven pages but it does not include all of the publications cited in the text and the notes. There are surprising omissions, ground-breaking publications such as Ludwig Diels's 1906 work on Western Australian phytogeography and Kevin Thiele's co-authored paper proposing that *Dryandra* be subsumed into *Banksia*. Various annual reports and *Acts* are referred to but are not in the bibliography. Several works are cited without stating which edition has been used.

Most troubling, however, is the almost complete absence of reference to primary and unpublished material. The author notes that correspondence quoted in Chapter 4 was 'taken from files' in WAH and the Western Australian Museum; but what files? Alexander Morrison's 1901 report pointing out the deficiencies in the Department of Agriculture's herbarium; Arthur Hill's confidential report of 1927 recommending the amalgamation of the three herbaria; Charles Gardner's journal and field books; all are referred to but the author gives little if any indication as to where these are or how other scholars might find them. One consequence of this lack of documentation is that it becomes difficult to distinguish what is incorrect (Ferdinand Mueller's hereditary barony was not awarded in 1866: p. 66), from the unsubstantiated assertion (the employment of women in the Western Australian public service: p. 214) and what simply lacks a reliable statement of source (the absence of recognition given to Georgiana Molloy's pioneering work: p. 56). It is as important to cite such original and unpublished material as it is to cite published works.

These issues aside, this book is a welcome addition to the as yet small literature

that constitutes histories of the world's herbaria, and is the first book on an Australian herbarium. It is attractively designed with beautifully reproduced photographs, and succeeds in placing before the public one of Australia's most important if largely unknown scientific institutions.

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Brian Saunders: *Discovery of Australia's Fishes: A History of Australian Ichthyology to 1930*. CSIRO Publishing: Collingwood, 2012. 491 + xi pp., illus., ISBN: 9780643106703 (HB), \$99.95.

In 1938, Sydney University's Professor of Zoology, William Dakin, noted in *Whalemen Adventurers* that less than a century earlier Hermann Melville had proclaimed the whale a fish. 'And probably in this so-called educated world to-day', Dakin lamented, 'only a very small percentage of people think otherwise!'

Whales, however, only came in Brian Saunders' extensive history of the discovery of Australian fishes. Soundly researched, clearly expressed and beautifully produced, it aptly complements Roger Swainston's long-awaited *Fishes of Australia: the Complete Illustrated Guide* (2011). Just how long-awaited is a recurring theme through Saunders' tome: the urge to capture, describe, illustrate and categorise the entire fish fauna populating Australia's waters was an erratic and elusive mission that proved incidental to many, but obsessive for a few.

People, indeed, are central to the book. Divided into unequal thirds, the first two sections comprise biographical sketches of the sundry naturalists who contributed ichthyological specimens and descriptions before 1870. Thereafter, working especially from Edgar Waite's archives, *Discovery of Australia's Fishes* provides a more cohesive account of the local and intercolonial networks of taxonomy and exchange that crafted a specifically Australian ichthyology. Working outwards from sometimes obscure primary literature, the author has created a valuable reference work on many figures that flitted across the field, shaping a more in-depth depiction of those who toiled to forge a cohesive discipline.

From early on, however, the reader is left pondering significant questions. Notwithstanding short explanatory interludes, the first sections resemble clipped encyclopaedia entries: naturalists are named and sketched, but rarely located within a wider system. More frustratingly, the work conveys surprisingly little sense of what sort of science ichthyology was. Saunders' answer is implicit in his title: a catalogue of discovery and appropriate nomenclature. But how did ichthyologists, naturalists, or laity *comprehend* fishes before 1930? How did the emerging technologies noted in passing—deep-sea trawling, diving suits, water telescopes, aquaria or radiographs—alter the ways in which fish were *seen*? What were the respective (and changing) roles of comparative anatomy, dissection, osteology, palaeontology, reproductive biology, embryology, life history, field observation, biogeography, hydrography or—in the final phase—ecology in understanding Australia's fishes?

How, indeed, did Australians know the difference between a fish and a whale?

This is not to suggest that the book conveys none of the flavour of ichthyology, or that the author has anything less than a robust command of the zoological record. Saunders deserves credit for conscientiously hunting the fish he names through the literature to determine the current-day validity of historical taxonomies. But what actually comprised a 'species' in an era of elusive type specimens, fading flesh and a babel of descriptive literature? The answer is important given that a trio of early taxonomists—William Macleay, Charles de Vis and Count Castelnau (François Laporte)—have been castigated by their successors and Saunders alike for creating a plethora of categorical nightmares. The profuse and delightful illustrations offer a welcome guide: witness the competing depictions of the Warehou (*Serirolella brama*) on page 362. However, to fully grasp statements such as 'Waite's current fish studies ... represented real advances in the understanding of the Australian fish fauna', representative textual characterisations would have been equally valuable.

The heart of *Discovery of Australia's Fishes* lies in the personal and professional intermingling of the three key Australasian ichthyologists of 1870–1930: Waite, Douglas Ogilby and Allan McCulloch. Their overlapping biographies

provide a detailed and sometimes intimate portrayal of the discipline within local natural history museums. Interweaving their individual narratives is sometimes repetitive, and evokes a sense of insularity that is perhaps as much an authorial decision as historical reality. Given the richness of Waite's papers, a superb model for this text might have been Patricia Morison's *J.T. Wilson and the Fraternity of Duckmaloi* (1997), which encapsulated a fleeting nexus of scientific productivity whilst tracing outward each of its luminaries' trajectories.

Perhaps a more apposite comparator—structurally, if not chronologically—is Libby Robin's *The Flight of the Emu: a Hundred Years of Australian Ornithology 1901–2001* (2001). The differences in periodization are certainly critical: the expropriative networks and intellectual vagaries of nineteenth-century natural history counterpoint the proliferating public interest and institutionalised zoological cadres of the twentieth. Nevertheless, a key to Robin's success was her extrovert historical gaze: ornithology always amounted to more than reshuffling specimen drawers.

Many such connections remain tantalisingly within reach throughout *Discovery of Australia's Fishes*. Saunders records that in 1887 Ogilby wrote a catalogue for the Royal Aquarium at Bondi Beach [Tamarama], adding that the aquarium was 'a popular attraction in the 1880s'. In fact, by 1887 Sydney boasted—albeit briefly—three public aquaria, all making at least a pretence at scientific edification. Yet we gain no sense of either the purpose or clientele of Bondi's displays. Did sharks, for instance, fascinate or repel Victorian Sydneysiders as they did after the 1929–35 Shark Menace Advisory Committee's deliberations? Likewise, the 1881 Marine Biological Station at Camp Cove was among the first dedicated research facilities in Australia. Although short-lived and hardly a productive centre, its vanguard role in the local infrastructure of science deserves more than a single page in a text devoted to antipodean ichthyology.

Saunders sporadically mentions local fish markets as a source for both novel specimens and baseline observations of fish fauna, furthermore acknowledging the importance of the Amateur Fishermen's Association of Queensland in resurrecting Ogilby's career over 1905–10. Making no claim to serve as a social history of fishing,

it is reasonable—if regrettable—that the text eschews the lay taxonomies and folk biology of anglers. Of greater concern, however, is the sidelining of colonial, state and Commonwealth fisheries boards, commissions and inspectorates. As with their agricultural contemporaries, from the late nineteenth century such bureaux acted not only as repositories for instrumental and commercial knowledge. They also furthered local scientific training, exchange and investigations, establishing sites including the Cronulla Fisheries Research Centre, opened in 1905 and peremptorily closed only in 2011. Similarly, there is but passing mention of the acclimatisation movements that—whatever their ecological consequences—pioneered the transoceanic transport of fish and roe, demonstrating the utility of science in providing resources for industry and leisure alike.

Discovery of Australia's Fishes is an important and useful contribution to the history of Australian science. Consistently readable, flawlessly edited, designed with flair and robustly bound, it provides a valuable historical compendium of Australian fish species and their taxonomists. However, as an interpretation of the science of ichthyology—or its connections beyond museum collections—rather too much has slipped through the net.

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Elizabeth Finkel: *The Genome Generation*. Melbourne University Press: Carlton, 2012. 274 pp., ISBN: 978-0-522-85647-7, \$32.95.

At a recent conference I heard a commentator describing a colleague's paper as 'dazzling', explicitly as both a compliment and a criticism. After reading Finkel's *The Genome Generation* I am tempted to apply the descriptors 'breath-taking' and 'dizzying' in much the same double-edged fashion. The book literally took my breath away with its scope, the wealth of information about different aspects of genome research, dizzying in its detail. As a scientist-turned-writer in a former life, I couldn't help but admire—and feel wistfully envious of—the adroit way in which Finkel wove hard science and personal anecdotes about AIDS, Sci-fi films, Lamarckism and genetically modified foods into a coherent

information-packed narrative about the promise and perils of genomic research in less than 300 pages. But like the commentator who charged the dazzle with obscuring rather than illuminating the topic of a colleague's paper, the historian in me inevitably found the book's whirlwind pace exhausting and wished that the author had taken time to reflect on effects and implications of information overload that she seemed intent on delivering in each chapter.

One of the best things about this book was its geographic reach beyond the USA and Europe. To be sure the usual suspects of genetics, molecular biology and genomics from these lands—Mendel, Morgan, Watson and Crick, Craig Venter and Eric Lander—took their bows, but they shared the stage with, and indeed ceded the spotlight to others. Being Australian, Finkel naturally featured Australian researchers such as John Mattick and Robert Furbank prominently, but she did so in an informative and illuminating way and without falling into the trap of producing a book about 'genome research down under' (although that might be a commendable goal in its own right). Personally I found the parts about Mattick's maverick personality and Furbank's tinkering with photosynthesis to be some of the most engaging sections of the book. On the whole, Finkel's book follows the action where it happened or is happening. Her poignant chapter on AIDS, for instance, is located primarily in sub-Saharan Africa—mainly in Botswana—because it is, as she observes, the epicenter of the epidemic, while the chapters addressing world hunger and tracing human ancestry out of necessity wander to different corners of the world.

As to my earlier criticism that the book felt rushed, perhaps the reason for this is that the book seems to have been written in something of one. Only four years separate *The Genome Generation* from Finkel's last book on stem cell research, and that amount of time seems too short to do justice to the range of topics and the amount of research that the book has attempted to cover. I could easily envisage each of the seven chapters expanded into a book-length treatment, each requiring at least the same time devoted to it that Finkel gave the whole, but that opinion is probably more reflective of my biases as a historian of science than of her choices as a science journalist. Finkel concludes her book with the hope that

it will empower readers to know what questions to ask about genome research, and ultimately I think that it is in providing the springboard for posing such questions that her book has the greatest value for the historical community.

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Bernard Elgey Leake: *The Life and Work of Professor J. W. Gregory FRS (1864–1932): Geologist, Writer and Explorer.* Geological Society, London, Memoir 34, 2011. 248 pp., ISBN: 978-1-86239-323-3, \$150.00.

John Walter Gregory spent a mere four-and-a-half years of his 47-year working life in Victoria as foundation Professor of Geology in the University of Melbourne, but in that short time he exerted an immense influence on Victorian science, which lasted for many years after his departure. Gregory was London-born of a middle-class family. His father died when Gregory was twelve. After leaving school he followed in his father's footsteps becoming a sales clerk in the wool trade, but having an interest in geology, which he studied at night, eventually graduating in 1891 with a BSc from the University of London. He had been employed as an assistant in the Geology Department at the British Museum (Natural History) from September 1887. A workaholic, he had completed and published a monograph on Maltese fossil echinoids before he gained his first degree, and submitted it for his London DSc in 1893. At the Museum he was required to work on fossil echinoids, corals and bryozoans, quickly becoming an authority on these groups, although he was not really very interested in palaeontology. In his spare time he undertook field-work around London, and published papers and articles arising from that work. Following field-work in the Alps, on behalf of the Museum, he also became an expert petrologist. His first indirect contact with Australia was to work on Australian echinoderms in 1889 and 1890.

Gregory's reputation as a general geologist and explorer was established in 1896 following the publication of his book on his exploration of the eastern branch of the 'African Rift Valley', the term which he coined. He had been sent to

Africa by the Museum as part of a larger expedition, but organised his own expedition when that expedition was abandoned. His reputation was further enhanced following his involvement with the Conway expedition to Spitzbergen, which also engendered a lifelong interest in glacial geology.

In 1899, following the death of Sir Frederick McCoy, Professor of Natural Science, the Council of the University of Melbourne resolved to establish a new Chair of Geology and Mineralogy. They wanted a person who could co-operate with future expansion of mining and engineering education in the University. Gregory applied, previously having unsuccessfully sought a Chair at Oxford, and the London selection committee regarded his qualifications as being far above any other applicant, and recommended him despite his lack of experience in mining or engineering geology.

Gregory arrived in Melbourne in February 1900 to find no teaching facilities in the form of a building or laboratory or any teaching collections, and no hope of these problems being rectified in the short-term owing to a University financial crisis. However, Gregory set to improving his knowledge of mining and the geology of Victoria by travelling widely, visiting mines and collecting specimens. In March 1901, Gregory with two others was appointed by the Victorian Government to a committee to inquire into the working of the Geological Survey of Victoria. Their report was accepted by the Victorian Cabinet in July 1901 and Gregory was asked to accept the temporary appointment of Director of Geological Survey to implement the recommendations. Gregory received permission from the University to undertake these extra duties and continued as Director until shortly before his departure from Melbourne. He improved staff employment conditions, reinvigorated the geological mapping program, and established a new series of publications to publish the work of Survey—*Memoirs*, *Bulletins* and *Records*—and these continued for nearly 100 years afterwards. He contributed reports to all three as well as publishing papers in the *Proceedings of the Royal Society of Victoria*.

In December 1901, Gregory undertook a five-week expedition to Lake Eyre with his assistant H.J. Grayson and five students. The resulting book *The Dead Heart of Australia* (1906) became

a classic and the title was imbedded in the Australian psyche.

Gregory had a strong interest in geography, and when asked to write some texts for use in Victorian schools produced a series of text books for students as well as a book for teachers. He also wrote a book, *The Geography of Victoria: Historical, Physical and Political* (1903), an important reference that remained in use until superseded in 1940 by Hills' *Physiography of Victoria*. All these books appeared in the one year along with many other articles, papers and reports and are typical of Gregory's immense output. As Leake shows, Gregory had a habit from his earliest years of working long hours after dinner into the early hours of the next morning and utilising any spare moments that he had in writing, particularly when travelling.

Gregory's wife Audrey never liked Australia. She suffered from poor health and hated the heat and dust of Melbourne. In deference to his wife's health, Gregory looked for a post back in Britain and succeeded in obtaining the new Chair of Geology at the University of Glasgow. He resigned the Melbourne Chair in June 1904, citing as reasons the lack of suitable accommodation and equipment, although as Leake emphasizes, based on family correspondence, it was his wife's health that was the real factor, and the reasons given in his letter of resignation were more to assist his successor. The loss of such an energetic and productive Professor, who had acquired an FRS during his time at Melbourne, shocked the University and was a major factor in the subsequent provision of better facilities for geology. Before his departure in September, Gregory was appointed to a committee to advise the Government on agricultural and mining education. The committee's recommendations were important and led to the establishment of the Faculty of Agriculture at the University, and to improvements in teaching of mining at this and other places of technical training.

This is an important account of one of the most prolific geologists of the 19th and 20th centuries. It is published in an A4 paper format, making it awkward for reading, with each chapter complete in itself, including references. At the end of the volume there is a complete bibliography of Gregory's 33 books, 428 articles and papers, resulting in some duplication of references. Leake had access to family

correspondence and papers, so the biography is exhaustive both in terms of Gregory's private and public lives. Leake analyses Gregory's published ideas and conclusions in considerable detail and provides present day views and interpretations of them, so as to place them in a modern context.

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Derelie Cherry: *Alexander Macleay: From Scotland to Sydney*. Paradise Press, Kulnura, NSW, 2012. x + 452 pp., ISBN: 978 0 646 55752 6 (HB), \$59.95.

Alexander McLeay (1767–1848) is best known to historians of science as an early secretary of the Linnean Society of London, the gatherer of an important collection of insect specimens, and the father of the philosophical naturalist William Sharp Macleay, proponent of the quinary system of classification. The final phase of Alexander's career brought him to Sydney as colonial secretary, the senior government official under the governor. Elizabeth Bay House, the elegant mansion he built overlooking Sydney Harbour, is now a historic house museum.

Very readable and with much interesting matter, Cherry's handsomely produced volume will appeal to readers interested in colonial Sydney, and especially to regular visitors to Elizabeth Bay House. But as a biography of Alexander McLeay it is distinctly inadequate. It is built on much too narrow a base of primary and secondary sources at the expense of both detail and context. The text is far too heavily peppered with 'would have', 'must have', 'probably, and 'perhaps'. While there are many things that can never be known, this device is no substitute for fact checking. For example, when McLeay gave a fete for the officers of *Beagle* and *Zebra* in January 1836, Cherry asserts that 'Charles Darwin was presumably amongst the party who received Alexander's generous hospitality on that occasion'. But that Darwin was on the return journey from Bathurst on the day of the fete (23 January) is well documented.

The lack of depth in research is reflected in the awkward structure of the book. The first of nine chapters covers McLeay's family background and his life up to his departure for Sydney in 1825. The Scottish background is covered in some detail but his London years are too sketchy.

We learn almost nothing about the wine business he came to London to be a partner in and not much either about the government's Transport Board of which he rose to be secretary until its abolition in 1817. There are passing references to the Linnean Society, which remain unexplained until we reach Chapter 6, 'Patron of Natural History', after his career as colonial secretary in Sydney has come and gone. His botanical interests are grouped in the following chapter.

This produces a fragmented view, which fails to draw important threads together. For example, we learn on page 18 that in 1791 he married Elizabeth, daughter of James Barclay who 'was thought to be a brewer' related to the banking family. Much later (p. 239) we are told that Robert Barclay was one of the sponsors of McLeay's membership of the Linnean Society in 1794 and 'may have been related' to McLeay's wife. The Linnean Barclay was Robert Barclay of Bury Hill, the partner in Barclay and Perkins, London's largest porter brewery. Sharp and McLeay were beer as well as wine merchants. There must be scope to make these connections more explicit. Similarly on page 18 we find McLeay and his as yet small family renting premises on Stockwell Common near Lambeth in 1794 and later (p. 283) that Stockwell was noted for its commercial gardeners and nurserymen. Is there any causal link?

A more balanced and detailed biography would have devoted three or four chapters to the period before McLeay's departure for Sydney. A fuller understanding of McLeay's life in London would have helped to gauge the upheaval and sense of sacrifice in moving with his wife, numerous daughters, extensive library and renowned insect collection to the raw conditions of Sydney in the convict era. But it would also have suggested some continuities. A study of the signatories to McLeay's 1809 Royal Society election certificate—James Edward Smith, founder and president of the Linnean Society, and a dozen others, nearly all of them with entries in the *Oxford Dictionary of National Biography* (a source not consulted by Cherry)—could have contributed to an analysis of his social and intellectual world in London. Furthermore, McLeay was subsequently a signatory on other Royal Society election certificates (freely available online). In 1829, the arctic explorer W. E. Parry arrived in Sydney as commissioner

of the Australian Agricultural Co., the largest landed enterprise in the colony. McLeay was a signatory to his 1821 election certificate. Did McLeay play any part in the offer of the A. A. Co. job? What were their dealings in New South Wales? When McLeay was retired as colonial secretary in 1836, he was succeeded by Edward Deas Thomson. McLeay was a signatory to Edward's father John Deas Thomson's election certificate in 1820. What role did such links play in establishing McLeay's place in colonial society?

A more focused approach to McLeay's life could have been built around a series of themes, such as the dynamics of his relation with his eldest son William and his unsatisfactory relation to money. These two themes collide painfully during the economic crisis of 1843–44. In 1812, McLeay and several relatives established a private bank in Caithness. This failed in 1825. Cherry mentions several land transactions in Scotland, which have some relation to the operation of the bank but give no insight into the reasons for its failure. She says nothing of the other private Scottish banks that failed in the 1820s, nor does she discuss the records surviving from the last years of the Caithness Bank. What role did McLeay in London play in the operation of the bank? Were Barclay connections relevant? Did McLeay's shift from mercantile activity to civil service reflect a higher capacity for administrative work than business acumen? In New South Wales, McLeay acquired extensive land holdings by grant and purchase. It was this that left him so vulnerable in 1843. A more detailed and systematic analysis of his land operations and how these related to his mounting debt to William would have helped to explain the anguished outburst in his Will where he spoke of William's 'rapacious ungrateful unnatural and cruel conduct'.

Numerous colour plates illustrate portraits and places associated with McLeay. Several photographs illustrate plants 'that would have fascinated Macleay', etc. Yet not a single illustration represents his insect collection, none of the specimens, or the elegant furniture, or any page from the surviving annotated auction catalogues. A family tree would have been helpful.

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Brett M. Bennett and Joseph M. Hodge (eds):

Science and Empire: Knowledge and Networks of Science Across the British Empire, 1800–1970. Palgrave Macmillan: London, 2011. xvii + 341 pp. + index, ISBN: 978-0-230-25228-8, £65.00.

With the publication of this small but impressive contribution to Palgrave Macmillan's new series on 'Britain and the World', the discipline of 'Science and Empire' may be said to have come of age. A generation that, in the words of Neil Ferguson, has become accustomed to seeing the world in terms of the 'West and the rest', will now be introduced to an imperial history that highlights nuance and novelty, reciprocity and subtlety; one in which the principal actors are not caricature imperialists—gentlemanly or otherwise—but players in a global theatre, in which European expansion, mediated by political and economic ideologies, is routinely held hostage to the practical difficulties of raising crops, cultivating herds, quarrying minerals, and moving people and produce across oceans and continents.

Since the 1960s, we have seen the writing of science and empire imitate political history, in which science has been seen as the servant of Empire, or as a civilizing influence, its goals set by the terms of imperial rule. In the 2000s, as globalization has become the new imperialism, science has become idealized as international, while still a function of nations, a spur to transnational integration if also a source of global inequality. We are accustomed to seeing the relations between science, technology, commerce, and national interest played out simultaneously, as if by different classes of instruments in the same orchestra.

In a similar way, the history of science and empire has been written as exemplifying the past in the present. In redefining the roles of metropolis and periphery, we see the ways in which science actually works, not least in its global interdependencies. Nature compels us to think locally, as well as act globally; not least because our livelihoods are local, even if our reward systems are global.

What David Wade Chambers and Richard Gillespie a decade ago called a 'polycentric communications network' has become an all-important feature of our age. Networks are the

ways by which we inform each other, and arbitrate recognition, while we move from the specific to the general, from the quotidian to the enduring.

For this reason, among many, this book, edited by two young American scholars, is bound to attract serious attention. The book opens with an overview by Joseph Hodge, tracing the scholarship on science and empire from the rise of diffusionist models (Basalla) and modernization theory in the 1960s (a story from which Edward Shils is strangely absent); and through subsequent attempts to cast science variously as a tool of imperial/colonial relations (MacLeod/Worboys), as a tool of empire (Headrick), and as an agency of cultural domination (Prakash). Hodge then goes on to look at the new imperial history, emphasising the two-way traffic between metropole and periphery, and the multiple meanings that informed the interlocking directorates of science. This material, as extended by Richard Grove and Richard Drayton, is now 'required reading' in the subject, and points to the experience of those scientists whose work may have been intended to serve the interests of political control, but which had in consequence far wider social and cultural effects.

Following this introductory chapter, Brett Bennett adds a detailed re-construction of the concept of networks—and networking—from 1800–1970, a bold and ambitious task, which takes careful note of the factors that led British scientists in the metropole and at the periphery to take account of each other and each other's works. A visitor to the library of the Linnaean Society in London cannot fail to be impressed by the sheer amount of information flowing to the metropolis from the furthest ends of the earth—and geologists and astronomers tell a similar story. A country that can send Sir John Herschel to establish an observatory in the Cape Colony so that England can 'control the Southern skies', cannot ignore the importance of 'networking' this information, any more than the strategic rivals of England could avoid taking note of the new 'centres of calculation' (in Bruno Latour's phrase) that followed from the voyages and triangulations of James Cook and the navigators of the polar regions.

In instructing their authors, the editors have asked, how can historians move beyond the

dichotomies of centre and periphery, to produce new categories of analysis that reflect the realities of global interchange. What can be learned from comparing different stages in the rise and fall of the British Empire, how did local actors interact, and how did the efforts of empire produce the world of scientific networks and interaction we see around us today. On each of these questions, these essays shed new light.

Divided into three sections, the editors' overview is followed by a second section with five essays on 'Knowledge and Networks in the Nineteenth and early Twentieth Centuries, and then by a third section with seven essays that take up cases surrounding the End of Empire. John Gascoigne usefully sets the scene with an introductory essay that summons his extensive knowledge of science and the empire to 1850. Brett Bennett follows with an original account of the origins of forestry education in India, while Rajive Tiwari explores the ways in which Western science was received in the Hindi print media of South Asia. Peter Hoffenberg reminds us of the importance of the 'exhibition movement' to Australian colonial identity, and to the local culture of colonial science; while Tamson Pietsch recalls the successes of J. T. Wilson and his fellow anatomists who, like the astronomers before and after, came to link the research agendas of England with Australia and the wider world.

Gregory Barton takes up the story of Albert Howard, an imperial scientist remarkable for his refusal to accept disciplinary boundaries in the field of agriculture, while Sabine Clarke takes us through the making of the Colonial Research Service as a tool of empire. Joseph Hodge comes intriguingly close to replacing the usual 'binaries' of modernisation with the 'hybridities' of knowledge in African agriculture; while Adrian Howkins wrestles with the more topical contest of nations for Antarctic sovereignty, in a race that, regrettably, has never ended. Christian Jennings opens for many a new field of imperial science, in fisheries research in East Africa; while Matthew Heaton deconstructs the decolonization of imperial psychiatry in Nigeria. The book concludes with a sensitive account by Jennifer Gold of post-imperial careers in the UN's FAO and Britain's Colonial Forestry Service, a story with haunting parallels in the post-colonial world of intergovernmental rivalries as told by

the Commonwealth Office and the Royal Society of London.

Overall, these fourteen essays, in all their breathtaking variety, add diversity and colour to a canvas the edges of which are still being drawn. This is not revisionist history, but rather complementary history, drawing in many ways upon subject matter that earlier generations have ignored or dismissed, or have not seen in relation to political and economic issues. In the affairs of empire, and in colonial rule, science operated as a social and economic catalyst—less visible, less costly, and possibly less disruptive than political or military force.

As Michael Worboys suggests in his Epilogue, there are no 'big picture' contributions in this volume; and despite its international success, the field of 'science and empire' has yet to establish its place within the wider, traditional canon cultivated for over a century by anthropology and medicine, linguistics, and cultural studies. For example, James Clifford's concept of 'contact zones', an idea that Peter Galison has translated into science as 'trading zones'—offers analytic categories of imperial practice that are pointedly relevant but strangely absent.

No assessment of the long-term consequences of imperial science is complete without a greater understanding of its effects on traditional learning, in intellectual engagements that ranged from China to India to Africa. However, as Christopher Hitchens once put it, one cannot fight the battle for multicultural tolerance on imperial terrain; and one continues to approach the subject with a sense of caution. Paul Claudel once observed that five years in Asia are enough totally to inhibit a European from putting pen to paper, and there is always a danger that, in using Western standards, we find ourselves writing about a people without before knowing their native language. Even where generalization seems possible, the seemingly familiar can prove a *faux ami*. Fortunately, there are scholars now coming forward in India, Africa, and China, as well as in the West, who are interested in putting Western aspirations into a wider interpretative framework. In this context, there are many connections still to be made.

In any such analysis as Bennett and Hodge propose, there are other potential pitfalls. For example, can one hope to find generalizations

to embrace a scene as diverse as that which London found necessary to divide into administratively different (and in so many ways culturally diverse) Dominions, colonies, Crown Colonies, and dependencies—places that were both subjects and objects of colonization? The environmental consequences of actions based on, or in the absence of, fundamental research is surely just one of the benchmarks by which the British colonial presence has been measured. ‘Trade follows the flag’ was the popular maxim—but science could help secure the interests of trade long before the flag was unfurled. Should there not be at least one chapter on the political economy of empire, and its underpinnings in the docklands, retail companies, and merchant banks?

Then again, what can be said about measuring the ‘efficiency’ and ‘effectiveness’ of the networks of science, whether created deliberately or, borrowing Sir John Seeley’s famous phrase, in ‘a fit of absence of mind’. Differences in geography, climate, soil, vegetation, and the effect of weather on flora and fauna constantly affect scientific as well as commercial outcomes. Profitable opportunities await the prepared mind, and knowledge spreads. But how do we measure relative success or failure?

Similarly, how can we assess British scientific enterprise overseas without taking into account the alternatives—and the reward system—at home? Even more disturbing, can we in this transnational age avoid taking into account (see *Osiris*, 2000) the comparative (and competitive) history of contemporary French, Dutch, German, and latterly, American experience? After all, as our authors make clear, imperial science seldom strayed from serving, and justifying, the interests, security, and prestige of the nation state. In France, a ‘*sciences et empires*’ group, which has been active since the 1980s, contributed to a Franco-Brazilian-Indian-based Commission on ‘Sciences and Empires’, which received recognition by the International Union for the History and Philosophy of Science in 2001. The work of this commission, which has stimulated much fresh research at the ‘periphery’, has also raised important questions of perspective for scholars at the ‘centre’. Few of these challenges are raised in this book, reflecting as it does the work of mainly American and British authors.

If these are among the questions that the book has left unanswered or unaddressed, the book can nonetheless claim to have redeemed its publisher’s promise, of being ‘the most wide-ranging survey of scientific endeavour within the British Empire yet published’. In so doing, it has also made a significant claim for disciplinary space, status, and recognition, one from which historians of science trust that historians of empire will not resile. After nearly fifty years, we have now a field of study called ‘Science and Empire’. Readers of *HRAS* can look forward to the day—long awaited—when no future Cambridge or Oxford ‘History of the British Empire’ will be considered complete that does not devote chapters to the changing roles, sites and circuits of science in shaping the structure, function, and heritage of imperial Britain.

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Darrell Lewis: *A Wild History: Life and Death on the Victoria River Frontier*. Monash University Publishing: Clayton, Vic., 2012. xxiii + 319 pp., illus., ISBN: 9781921867262 (PB), 9781921867279 (web), \$29.95.

Remember the Wave Hill walk-off? The iconic photograph of Gough Whitlam pouring sand into the hands of Gurindji elder Vincent Lingiari, and announcing the return of land to traditional custodians? *A Wild History* tells the underlying stories, detailing ‘the complex interaction[s] between the environment, the powerful and warlike Aboriginal tribes and the settlers and their cattle’ in the Victoria River District from the 1830s to the early 1900s. Noting that, for most Australians, the region and its history remain ‘a vast and largely silent ‘blank’’, Darrell Lewis aims ‘to repopulate the land with some of the main characters and events of the past, and to replace current wild imaginings with a more soundly based ‘wild history’.

Lewis’s observations certainly apply to me, despite my comparatively active engagement with Australian historiography. Jasper Gorge, the setting for bold Aboriginal attacks and ‘a place of legend and mythology for both blacks and whites’? I’d never heard of it. Victoria River Downs (VRD or ‘The Big Run’), the largest of the region’s vast cattle stations? Only via

Ted Egan's wry couplet 'Out on the Barkly Tablelands and across to the VRD, we've got some bloody good drinkers in the Northern Territory'. Lewis's colourful characters counteract this ignorance. Early explorers, land-seekers and prospectors, cattle-duffers, station managers and police mingle with the region's Aboriginal inhabitants, who appear variously as inquisitive interlocutors, fearsome opponents, and ambiguous employees: 'stockmen, domestics, assistants, guides, lovers and trackers'. He also discusses the impacts of introduced cattle on Victoria River District ecology and vividly describes the daily realities of frontier life: 'extreme isolation, desperately slow communication, and rough living and working conditions'.

A Wild History is impeccably researched. In addition to intensive archival investigations, Lewis can draw on forty years' experience in the Victoria River District, working for a variety of government and non-government organisations, completing surveys of historic sites, and helping elderly locals to publish their memoirs of life in the region. These activities gave him unprecedented access to the stories and records of white cattlemen and cattlemen and the memories and guidance of Aboriginal elders, many of whom have now died, 'taking their wealth of untapped knowledge with them'.

Given Lewis's respectful and sympathetic approach to his Aboriginal interlocutors, I was surprised to find that *A Wild History* apparently contains no warning alerting Aboriginal or Torres Strait Islander readers to the fact that the book contains names and images of people now deceased. I was similarly disturbed by the book's front cover, which features a 1910 photograph depicting two armed and mounted men and four Aboriginal people in chains. Although a close examination suggests that one of the mounted men may also be Aboriginal, on first glance this image communicates a simplistic opposition between powerful Europeans and powerless Aborigines, which does not adequately reflect Lewis's awareness of the complexities and contradictions of frontier history.

These caveats aside, I strongly recommend *A Wild History*. Lewis brings to light events and interactions largely unknown even to specialists in an approachable style suited to a wide readership. By turns lively and thought-provoking, his insights into Aboriginal-settler interactions

in a remote and ecologically fragile region have something to offer anyone with an interest in Australia's past and present.

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F. B. Smith: *Illness in Colonial Australia*. Australian Scholarly Publishing: Kew, Vic., 2011. 371 pp., ISBN: 9781921509193 (PB), \$49.95.

I was an early adaptor to the work of Professor Barry Smith. His 1970s publication, *The People's Health 1830–1910*, with its inspired opening sentence 'Patients loom small in medical history', was, for many years, my main source for all questions concerning health and disease in nineteenth-century Britain.

In his latest publication Smith has used a similar approach to examine the vast panorama of ill health in colonial Australia, a project that few academic authors have been willing to tackle. The contents of the book represent, at first glance, an enticing mixture of: the colonial context; unfamiliar medical approaches with stories of individual practitioners and institutions; the effects of disease and ill health at a population wide level, together with individual stories of disease, suffering and, all too often, unnecessary death. However, Smith has declined to take the tempting path of 'presentism' in assessing the effects of colonial approaches to health and disease. He discusses with empathy the effects of (possibly) newly introduced disease on the aboriginal population but also includes an informative discussion, albeit from anthropological sources, of prior tribal understanding and experience of 'ill health'. He correctly points to the, often deserved, lowly status of doctors in the colony but also recounts the vicissitudes of their professional lives with sympathy and understanding. He relates the heart-rending stories of accidents to children but avoids constantly judging the circumstances and subsequent treatment, unacceptable and inadequate though they may sound to twenty-first-century sensibilities. He presents a nuanced account of the many and varied problems involved with attempts to set up and run colonial hospitals, while admitting that, taken on their own terms, many were surprisingly successful.

As in *The People's Health*, Smith has rejected a chronological arrangement of his material in

favour of chapters devoted to specific categories, although these are not solely the age-related categories of his previous publication; rather they represent a slightly confusing mix of: issues ('Isolation', 'Appropriation'; age or relationship categories ('Infants', 'Mothers', 'Children'); diseases ('Tuberculosis and Cancer') together with sundry others ('Irregular Practices', 'Accidents', 'Hygiene', 'Doctors', 'Hospitals'). While organisation of this kind certainly helps to avoid the 'triumphant, sequential structure of traditional medical history' and was indeed 'radical' in the 1970s (to quote the claims in *The People's Health*), the idiosyncratic approach of this latest publication does give rise to duplication and confusion concerning exactly where certain topics should be placed. For example, should the important issue of the status of homeopathy and its practitioners in the colony be discussed in the 'Irregular Practices' chapter or in the chapters on 'Doctors' or 'Hospitals'? A distribution of the issues and stake-holders in this high profile dispute to the various chapters inevitably leads to either repetition or dilution of the points to be made. In this case both seem to have been the result.

In a work containing such rich material concerning the colonial environment, public policy, and individual experience it seems mean spirited to ask for more efficient editing; nevertheless an organizational structure that better reflected the problems to be examined would have made Smith's excellent points more effectively. One example of a seemingly absent editorial hand is the ambitiously titled chapter on 'Tuberculosis, Cancer and the Health Transition', which, while containing important information, is repetitious and unclear in its focus. There is, however an adequate Index, a useful Bibliography and the text is well and thoroughly referenced. There is, however, no Conclusion to the book, risking the possibility of leaving readers with the unfortunate, and inaccurate, impression that they have been presented with unanalysed material.

Nevertheless, I would unhesitatingly recommend this book to anyone who was interested in immersing themselves in the daily detail of the colonists' struggle against disease and early

death. Yet again Smith has caused the patients to 'loom' large in medical history.

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Notices

Winty Calder: *Spotlight on a Travelling Engineer: F. S. Wright, O.B.E., M. Mech. Eng., M.I.E.Aust., consulting engineer.* Jimaringle Publications: Mount Martha, Vic., 2011. ISBN: 9780957738064, 137 pp. [Available from 12 Deakin Drive, Mt Martha, Vic. 3934.]

This is a biography of Frank Wright, a University of Melbourne educated engineer who specialised in calcium products and industrial electrofilters. Written by his daughter, and based on an extensive personal archive, the travels alluded to in the title include journeys across Australia to tackle mining engineering problems.

Norma Curnow: *David Henry Curnow, 1921–2004: A Memoir.* [N. Curnow: Nedlands, WA, 2010]. 265 pp.

David Curnow was the Foundation Professor of Clinical Biochemistry, the first such position in Australia, at the University of Western Australia in 1953. This biography, written by his daughter, outlines a career full of firsts, and leaving a legacy that includes several clinical biochemists disproportionate to the population of Western Australia.

Christobel Mattingly: *A Brilliant Touch: Adam Forster's Wildflower Paintings.* National Library of Australia: Canberra, ACT, 2011. ISBN: 9780644227176, 180 pp., \$29.95.

Known professionally as Registrar of the Pharmaceutical Board of New South Wales, Adam Forster's private passion was for the flora of Australia. He travelled over the state observing wildflowers, and his resulting botanical illustrations, depicted and discussed in this book, have been described as superior to the work of Ellis Rowan.