Book Review Section

Compiled by John Jenkin*

Marie Boas Hall, *All Scientists Now: The Royal Society in the Nineteenth Century* **(Cambridge Univ. Press, 1984), 261 pp., illus. ($66.50).**

It was Restoration fashion to use literary invention to satirize established authority; it has since become comparatively fashionable to use history to legitimate established institutions. In so doing, we sometimes give deeper texture to practices of comparatively recent origin. The result, however, often overlooks the crossways and implications of what Hobsbawm has called the 'invention of tradition'.

Some of the most established traditions in our field concern the 'reform' of ancient scientific institutions and the creation of new ones, for scientific disciplines increasingly 'professionalized', specialized, and self-renewing. The last decade has seen many attempts to 'place' this development within the history of our modern culture of science. Some of these have explored the foothills of the scientific establishment during the nineteenth century. An account of the summit — the Royal Society of London — in this period has so far eluded us. It is therefore with a mixture of interest and anticipation that one turns to Marie Hall's account of the Royal Society, the first attempt to provide a conspectus of the 'reformed Society' since Sir Henry Lyon's administrative history in 1944 and Dorothy Stimson's *Scientists and Amateurs* in 1948. Forty years on, there is surely much to report. Brave enough to attempt the task, Hall nobly continues a tradition long ago established by Thomas Birch, Bishop Sprat and Charles Weld. Now we are to see a comprehensive survey of the Society in the nineteenth century by the hand of one who has done much to make known its origins in the seventeenth. Initial enthusiasm, alas, gives way to disappointment.

Hall's book is 'insider history'; it is written almost exclusively from Society archives and from within. It gives careful attention to the 'business' of the Society, and appears uncritically to accept rather than analyse political strategies which, within the space of two lifetimes, transformed a gentlemen's club, open to the ridicule of Grub Street, into an Academy, an object of respect if not veneration in its neo-classical building in Burlington House. *That* it did so is carefully explained by the operation of electoral reforms, by its encouraging a virtually monopsonistic relationship with government, by its reaching (indeed, sharing) accomodation with other learned societies of London. *How* it did so is a far more fascinating story. And it is in the political intrigues, the adroit manoeuvres of the cliques that determined the public presence of the Society, that we see an institution, modelled in many respects on the Westminster system whose seasons it followed, achieve its Whiggish ascendancy. In charting its new course, Hall gives a fair reading of the archives, but with such mastery of self that she rarely asks the question 'why?'

Why was there such a convenient relationship between reform in Parliament, the Royal Colleges and the Royal Society? Why were the Society's internal politics watched with such interest by the professions, the government and the Press? Hall's story is of uniform linear motion — a progression from amateurism to professionalisation, from darkness to light, from corruption to purity, from a dubious eighteenth century legacy to 'a truly scientific society'. The story is, at one level, surely some of that; but what was involved in the change, in Bagehot's language, from a Society neither 'dignified' nor 'efficient', to one that was both? Surely the career of Davis Gilbert, moving between the worlds of politics and science, reflects much more than this? What role was there for 'cabinet' government at a time of changing party allegiances, in both science and politics? What was the role of the Society in the van of medical reform, led by men, themselves prompted by interests in the provinces, pressing for greater public recognition and approval in the metropolis? And what role was exerted by pressure groups seeking in the Society to accommodate new intellectual positions, yet intent on preserving degrees of freedom for what Thackray and Morrell have called 'Gentlemen of Science'? What influence had individual Presidents and Secretaries — men of the stature of Stokes, Huxley and Foster — in their long periods in office, in shaping not only what *was* science, but what was seen to be 'scientific'? What role had the clubs and coteries — of which the Huxley-Hooker faction, working through the X-Club, is only the most obvious — in determining whether the Society would in fact be an 'aristocracy open to all the talents', albeit one excluding most fields of engineering, the social sciences and the humanities?

By the close of the nineteenth century, the Royal Society had become, in all but name, a 'department of science', carefully co-opted by government on a host of imperial, naval and military issues. In turn, the Society carefully ensured its establishment status by a ready acquiescence in government inquiries, and by the judicious deployment of honorary fellowships to royals, to foreign ministers, and even to Prime Ministers. Through its channels passed a great deal of what would later be called 'cultural diplomacy'. Through its flexible 'select' committee structure (itself a legacy of the eighteenth century) it could mobilize intellectual leadership quickly, and focus it intensively. That leadership reflected important changes in the 'interlocking directorship' of British science, linked increasingly closely to the universities, themselves undergoing rapid development in the disciplines of science. The history of these largely informal

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networks, underwriting the formal structures observable from the surface, form the history of the British scientific enterprise.

From time to time, glimpses of this trajectory appear in Hall's account. But for the most part, what we are given is an entertaining story of chapters and verses, awaiting an interpretative, integrative thesis. A company history that says nothing of the wider marketplace leaves much to be desired. And perhaps nowhere is this missing dimension more evident than in the author's treatment of the Society's international commitments. By the third quarter of the century, particularly under Michael Foster's secretaryship, the Society sought and gained wide imperial, as well as international, influence: from its formal sponsorship of the International Catalogue of Scientific Literature, to its advice to British India, to its encouragement of what Huxley called 'a federation of English-speaking men of science'. But what were the implications of this, as seen from 'Britain, overseas'?

It is in this respect that the history of the Royal Society becomes of special importance to Australians. The Society holds a place in Australian culture that is at once prophetic and powerful. On the one hand, one finds a metonymic affinity between the 'virtuosi' of eighteenth century London and the destiny of *Terra Australis*. Every schoolchild knows the scientific justification for Cook's voyages, and no one can easily escape the Royal Society's interest in virtually every aspect of Australian exploration and discovery.

But this is not all. Since the legendary Gulliver, in Herbert Carter's classic allusion, 'wandered in the bush' and found his bearings in what is now New South Wales, historians have pondered the meaning of Swift's fantasy for our settler colonies. In the half century since Marjorie Nicolson sagely identified the strange scholars of Laputa with the savants of Gresham College, we have seen our own institutions acquire, through historical retrospection, the formal certainties of established tradition. By the late nineteenth century, in both emulation and imitation, no colony of Australia was without its own Royal Society, modelled in procedures, policies (and often, alas, in politics) upon its metropolitan parent. We were to have, too, our own Balnibarians, our Grand Academy of Lagado and our 'Flying Island'. And our Laputans who solve equations, but who cannot, metaphorically speaking, build houses. And were we not also to command our savants to make publicly accountable their private interests?

From this perspective, the Royal Society awaits Gulliver's return. He could well report developments which reflect the Royal and its ambitions in a totally new light. From our quarter, there is much to be said about Australians who served in the Society's concept of 'greater Britain', and about the role of Australia itself in serving British interests. It is perhaps unfair to expect specific mention of the 24 FRSs in Australia elected during the nineteenth century or of the 13 FRSs in Australian and New Zealand universities (some 40% of all science professors), arguably a greater proportion of eligible University men than in England at the time. But it is less unfair to expect some mention of the 'imperial saga' of the Society — from Cook, Banks, Darwin and Fitzroy, to Hooker and Huxley, from Brisbane and Franklin to Denison — whose explorations of the southern continent were formative to science and expressive of British policy. No doubt Canadian, South African and Indian historians could make similar claims. If the Royal Society held the sceptre, in many fields the periphery held sway.

Historians, both British and Australian, have still much to say about the intellectual dependencies implied by the institutions of British science, and the responsibilities and obligations fostered through the Royal Society and its officers. To those pioneer gatherings — from Sir John Eardley-Wilmot's Royal Society of Van Diemen's Land (1844), through those in Victoria (1859), South Australia (1880), Queensland (1884) and Western Australia (1914), which established 'Royal Societies' or (like the Philosophical Society of New South Wales) acquired the 'Royal' prefix (1866) — the twinned metaphors of community and discovery formed vital bridges between government and university, between public and private science, and between culture and practice. They expressed both Empire loyalty and a developing sense of cultural independence, responsive both to colonial nationalism and, by the end of the century, through the Australasian Association for the Advancement of Science, to the interests of 'nationhood' as well.

From their perspective, to view the Royal Society as a metropolitan or even British institution alone is parochial and unnecessarily self-limiting. It is not well to neglect the enormous reciprocal contribution of the Society and its Fellows (whether British or not) to the objectives of Empire and the spirit of Commonwealth.

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D.J. Mulvaney and J.H. Calaby, *'So Much that is New': Baldwin Spencer 1860–1929* (Melbourne Univ. Press, 1985), 492pp., illus. ($33.50); Tigger Wise, *The Self-Made Anthropologist: A Life of A.P. Elkin* (George Allen and Unwin, Sydney, 1985) 286pp., illus. ($29.95 or $14.95).

If one day somebody decides to write a comprehensive history of anthropology in Australia, *'So Much that is New'* and *The Self-Made Anthropologist* will undoubtedly be vital sources of information. Both are well researched and thoroughly

documented biographies, and their respective subjects, Baldwin Spencer and A.P. Elkin, were both major figures in the development of Aboriginal studies. Spencer's writings (1899–1927) on the tribes of central and northern Australia became classics of ethnography. Elkin, as well as writing an anthropological best-seller called *The Australian Aborigines: How to Understand Them*, dominated Australian anthropology for nearly a quarter of a century as professor of anthropology at Sydney University (1934–1956). Consecutively, their careers span the period during which the study of 'the Australian native' was transformed from a part-time activity of amateurs to a vocation for full-time professionals.

In 1887, at the age of 27, Walter Baldwin Spencer was appointed to the foundation chair of biology at Melbourne University. He was an Englishman, born in Manchester and educated at Oxford, where he carried out research on the pineal eye of lizards. In 1894, as biologist and photographer with the Horn Scientific Expidition to Central Australia, he struck up a friendship with Frank Gillen, postmaster at Alice Springs and enthusiastic collector of native artifacts. Although Spencer had attended Taylor's lectures on anthropology in Oxford and had helped classify the Pitt-Rivers' ethnological collection, it was only after he returned to Melbourne from Central Australia and assumed responsibility for editing the expedition's report that he began to develop a serious interest in Aboriginal studies. Spencer regarded parts of the report submitted by the expedition's anthropologist, an anatomist from the University of Adelaide, as inadequate or dubious (e.g. that subincision of the penis was a birth control measure). Accordingly, be began corresponding with Gillen in an attempt to ensure a more reliable record. Their budding collaboration came to full flower in the summer months of 1896–7 when Spencer re-visited Alice Springs and, with Gillen, observed the final phase of a remarkable Aranda ceremony inducting young men into a secret male cult. On returning to Melbourne, Spencer began drafting chapters for a joint work, published in 1899 with the title *The Native Tribes of Central Australia.*

In 1901, Spencer and Gillen journeyed from Oodnadatta in South Australia to Borroloola in the Gulf of Carpentaria. Their buggy was drawn by rotating pairs of horses named 'Fison and Howitt', 'Fraser and Taylor', and 'Lang and Lubbock', all names of well-known contemporary anthropologists. The expedition lasted almost a year, in the course of which they recorded anthropological data among Aboriginal communities living at white settlements along the Overland Telegraph Line or on cattle stations. The results were published in 1904 in a second joint work, *The Northern Tribes of Central Australia.*

Towards the end of 1911, Spencer visited the Top End of the Northern Territory for a few weeks as part of a 'Preliminary Scientific Expedition', formed to advise the Federal Government on northern development. At the beginning of 1912 he returned to Darwin to take up an appointment as Special Commissioner and Chief Protector of Aborigines, on leave of absence from Melbourne University for 12 months. The main ethnographical outcome of these two visits was *The Native Tribes of the Northern Territory*, published in 1914 with Spencer as sole author. Gillen, after a period of failing health and a frustrated wish to carry out further fieldwork, had died in 1912 at the age of 57.

Spencer retired from his chair in 1920. In 1923, and again in 1926, he re-visited Alice Springs and, on the basis of his inquiries, revised and amplified various parts of *The Native Tribes of Central Australia.* The new version, entitled *The Arunta: A Stone Age People*, was published in 1927, with Gillen still acknowledged as co-author. In 1929 Spencer made an expedition to Terra del Fuego, where he died of a heart attack at the age of 69.

This résumé of Spencer's career as an ethnographer does little justice to the richness of detail provided by the biographers, which greatly amplifies Marett's brief memoir in *Spencer's Last Journey* (1931). Two inter-related matters, however, deserve to be highlighted as being of special interest to historians of science; namely, the respective contributions of Spencer and Gillen to their joint works, and their methods of investigation.

According to Mulvaney and Calaby, Gillen's anthropological interests, until he met Spencer, went little beyond collecting Aboriginal artifacts. Early in 1895, when replying to Spencer's questions about the purpose of subincision, he added: 'I shall be glad of any suggestions you can give me as to information about the blacks which would be likely to prove interesting to anthropologists'. Later that year he sent Spencer his collection of *tjurunga*, sacred sculptures looted from secret caches; and, while staying with Spencer in Melbourne a few weeks later, he met Lorimer Fison and A.W. Howitt, amateur anthropologists and leading authorities on the social life of the Aborigines. Gillen returned to Alice Springs fired with enthusiasm. By early 1896, in response to 27 questions raised by Spencer, he had sent the latter about 270 pages of carefully written notes. When Spencer suggested that he should publish a book in his own name, Gillen replied: 'I have undertaken this work seriously, at your instigation. I fully recognize that without your assistance and guidance I could not have accomplished half of what has been done . . . Our agreement in Melbourne was that I continue . . . with your assistance, and the results were to be published in our joint names. I hold you to that agreement old fellow, your generous offer of self-effacement and your belittling your share of the work is characteristic of you. It is this absence of selfishness that makes men love you . . .'

After Gillen's death, his wife complained to Spencer that he had profited unfairly from her husband's work. The charge could hardly be sustained for *The Northern Tribes of Central Australia*

(1904). Gillen had little prior knowledge of the northern tribes, and Spencer took all the notes, wrote up journals and developed all the photographs. In regard to the earlier book, there is no doubt that Gillen provided a good deal of the raw data and inducted Spencer into ceremonial life. Nevertheless, Spencer provided the necessary stimulus for his inquiries, observed the Engwurra ceremony at first hand, worked with informants on kinship and social organization, and drafted the text. In short, *The Native Tribes of Central Australia* was the product of genuine complementarity and collaboration.

The extent to which Gillen was competent in the Aranda language is not entirely clear. Spencer acknowledged that he depended upon Gillen as interpreter and believed that, even though his grasp of grammar was insecure, he knew the language well enough to understand most of what was said. According to T.G.H. Strehlow, however, neither Spencer nor Gillen could speak or understand Aranda. Both used pidgin English as a basis of communication and relied heavily for information and exegesis on young men who had acquired a working knowledge of English through association with cattle men, telegraph operators and the police. Nevertheless, Strehlow (who had the good fortune to learn Aranda as a child on Hermannsburg Mission) acknowledges the accuracy of much of Spencer and Gillen's work, describing it as an indispensable record for any anthropologist writing about Central Australian tribes, and as 'superior to some other Australian anthropological studies that have been written much more recently'.

Adolphus Peter Elkin was born in the Hunter Valley of New South Wales in 1891. After school at Maitland and several years as a bank clerk, he was awarded a church scholarship enabling him to enter St. Paul's College as an Arts student at Sydney University. He graduated in 1915 and was ordained shortly afterwards. His interest in Aborigines appears to have been stimulated during a holiday at Bourke in 1918, when a fellow clergyman showed him his collection of stone implements. In 1922 he successfully submitted a Master's thesis in the Philosophy Department at Sydney University on the subject of 'The Religion of the Australian Aborigines'. A second thesis, this time on Aboriginal myth and ritual and submitted in Elliot Smith's Anatomy Department at London University, earned him a Ph.D. Both theses were based entirely on library research.

After returning to Australia, Elkin made two field expeditions under the auspices of the Australian National Research Council, the first in 1927–8 to the Kimberleys region of northwest Australia, the second in 1930–1 to South Australia. Like Spencer and Gillen on their trip to Borroloola, he covered long distances to visit as many Aboriginal communities as possible, spending short periods at each mission, cattle station or European township, recording basic information on kinship, social organization and religion, and necessarily relying to a large extent on Aboriginal English as a medium of communication. Nevertheless, the quality of his research was consistently high, and it is fair to say that, along with Spencer and Gillen's contributions, his surveys laid good foundations for a less nomadic style of anthropological research that emerged in the 1930s and continues to the present day.

The first department of anthropology in Australia was established at Sydney University in 1926. The foundation professor, A.R. Radcliffe-Brown, resigned in 1931, with the Depression at its lowest ebb and the future of the department uncertain. At this time Elkin was rector of Morpeth, a parish about 200 kilometres north of Sydney. When Raymond Firth, acting head of department, resigned the following year, Elkin was appointed lecturer-in-charge under an agreement which allowed him to administer the department from Mondays to Thursdays and to discharge his pastoral responsibilities from Fridays to Sundays. He was appointed to the chair in late 1933, and in 1938 he and his family left Morpeth to live permanently in Sydney.

Elkin retired in 1956, just before chairs of anthropology began to spring up everywhere. Although his department was a small one by contemporary standards, it produced a respectable number of graduates, some of whom became notable professionals. Another significant legacy was the journal *Oceania*, which Elkin continued to edit almost to the year of his death in 1979, aged 88.

As one reviewer has already remarked, it is somewhat misleading to describe Elkin as 'the self-made anthropologist'. He did, after all, have the benefit of a post-graduate education in the subject. The tag is more appropriate to Spencer, the last of the great amateurs (who financed his anthropological expeditions largely from his own private funds), while within Australia Elkin undoubtedly became the most influential of the early professionals.

'So Much that is New' gives an account of Spencer as biologist, university administrator, museum autocrat, patron of sport and art, as well as anthropologist. While the book does not pretend to be a definitive assessment of his contribution to science in general or Aboriginal studies in particular, it is clearly intended for serious scholars. *The Self-Made Anthropologist* by contrast seems directed towards the more popular end of the market ('Dark, handsome, hypnotically attractive, Radcliffe-Brown had become known around the University as the Flappers' Idol . . .'). Another contrast is in the attitudes of the authors to their respective subjects (which may accurately reflect a contrast between the subjects themselves). Whereas Mulvaney and Calaby present Spencer as a likeable, generous and colourful character, flawed perhaps by political and radical attitudes we would nowadays classify as illiberal, Elkin comes across as a cold, lack-lustre, calculating opportunist redeemed only by a genuine sympathy for the

Aborigines and a determination to improve their lot.

In 1984, the University of Melbourne at long last established a chair of anthropology and, moreover, named it in honour of Baldwin Spencer. Astonishingly, it was placed within the School of Asian Studies, with no provision for the development of Spencer's one substantial contribution to anthropology — the description, analysis and interpretation of the culture of the Australian Aborigines. Mulvaney and Calaby's biography now gives an ironic twist to this piece of administrative ineptness. It seems that Spencer, during his term as Special Commissioner in Darwin, took strong discriminatory action against the Chinese community and expressed a wish to deport 'the whole lot of them because with their opium and spirits they ruin the blacks and are doing no good to the country'.

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T.I. Williams, *Howard Florey: Penicillin and After* (Oxford Univ. Press,1984), 404pp., 19 plates ($50.00).

There have been three biographies of Florey since 1972, by Bickel (a layman), Macfarlane (a scientist and colleague of Florey) and now this one. Also relevant is Macfarlane's *Alexander Fleming: the Man and the Myth*. When I was speaking to Lady Florey about a biography of her husband (after his death) I suggested that a four volume work should be promoted. Even with her great respect and knowledge, she regarded this as a delusion of grandeur. But now we have four volumes, largely covering the same ground and each exemplifying the old adage, 'you don't see what you look at, you look at what you see'. This book covers Florey's first marriage, his interpersonal peculiarities, his pursuit of penicillin and cephalosporin, and his relationships to the Australian National University, the Royal Society and The Queen's College. There is little information about his involvement with the University of Oxford, his service on national bodies, his relationship to his colleagues other than Heatly, Chain, Sanders and Margaret Jennings, or his other fields of research.

Each of the biographers has been attracted to analyse the incompatibility in the first marriage. Miss Read was situated comfortably as a medical graduate and daughter of the manager of an important Adelaide bank, whilst Florey's father was in trade and then bankrupt in Adelaide. All through life, Florey had the options of ambitiously climbing the impecunious ladder of science to fame or of climbing the amiable slope to social élitism and affluence. He stayed faithful to the former and to the long distance attachment to Miss Read, until finance was relatively secure and they married. When the interpersonal relations frayed and more congenial colleagueship offered, he transferred his affections. So what is new or newsworthy about such a situation or so off-key that it requires gentle hints to be dispersed coyly through the text?

Williams also explores the stated purpose of Florey's pursuit of penicillin. Florey is reported to have said that this proceeded from pure curiosity, without any notion of medical usefulness (p.79). Chain echoed this sentiment. There were two reasons why they might have stated this view. After Mellanby, the Secretary of the Medical Research Council, had allotted the contemptuous sum of £25 for Florey's antibiotic research, Florey and Chain were encouraged to apply to the Rockefeller Foundation. They cast it in the field of pure biochemistry; if they had indicated a clinical purpose it would have had to be transmitted through Mellanby, who was minatory when he learnt of Rockefeller's splendid response. Obviously, with a future under Mellanby, the fiction had to be maintained. The second occasion on which Florey expressed the same view was during a putsch at the ANU to establish a Clinical Research Department. He regarded these as having a very low result/cost ratio, and therefore thought that scarce resources should not be so used. Yet in 1936, when he visited the Department of Pathology (not Physiology) in Melbourne, he expressed clearly the hope that a biological product would be found at least equal to the recently discovered sulphonamides. Chain has on occasion indicated that it was he who interested Florey in penicillin but, as the author points out, Florey had known about its antistaphylococcal action from 1929, and Chain reported that Florey seemed to know about it when he raised the question in 1939. It would appear that a statement of convenience in 1940 came to be believed in 1956.

Another topic to which biographers are strongly attracted is the difficulties in the relationship between Florey and Chain. Chain is drawn here as a pushy know-all who was sometimes quite wrong, even in his own biochemical field. Page 103 sets out the 'back extraction' controversy. Because penicillin could be extracted from an acid water medium into ether but was 'lost' while evaporating the ether, Heatly suggested that it be taken back from the ether into neutral water. Chain derided this suggestion, but Florey ruled that Heatly should try it. It worked, and it became a crucial procedure in commercial production and a life-long bitch by Chain. The catalogue of Chain's awkward self promotions is well set out, and he is given credit for helping approach Rockefeller and for some chemical elucidation of the structure of the penicillin molecule for which he was included in the Nobel Prize. Otherwise his achievements are recorded in two unindexed paragraphs on pages 300–1, and his important development of semisynthetic penicillins is also unindexed.

Of greatest interest to this reviewer is 'The Australian Connection'. This account of Florey's rela-

tion to the foundation of the Australian National University is, overall, a chronologically-based account of the several decisions as between Florey and Council of the ANU. In this regard it has some errors and omissions. The Academic Advisory Committee resulted from a visit by me (as Honorary Secretary of the Interim Council) to England in early 1947 after Florey, Oliphant, Hancock and Firth had been in Canberra. It proved impossible to get a 'yes' from any of them, and in the taxi to the station, the Advisory Committee idea was suggested to them. They assented, and on the basis of my report, Council approved its establishment. As the author reports, it served a very useful function.

An important component of the 'troubles' was the personalities of the principal persons. Copland, the first Vice-Chancellor, had no experience of scientific work or organisation, and a real jealousy of intellectual superiors or equals. His attitude to Oliphant was offensive, and he persuaded Hancock to sever his relations with the University. His penchant for public disputation with politicians is mentioned by the author, but his failure to control the architect, Lewis, is not analysed. Lewis was of a puckish, mischievous cast. He seemed to take pleasure in being impertinent to Copland and insubordinate to Oliphant and Florey. When Council finally dispensed with his services, the new firm, Mussen, McKay and Potter got on with the plans expeditiously but then stalled. Enquiry in Melbourne revealed that the senior partner, Mussen, had a block between design and building, and it was necessary to persuade him to cede supervision to McKay. Except for a minor stumble over finance, the building was then completed in good time. The author refers to H.J. Goodes in slighting terms as 'the man from Treasury'; in fact, Goodes was a great supporter of the project. Without him the project may well have failed.

The next Vice-Chancellor, Melville, was much more introspective than Copland, but no less sure of himself. The ante-penultimate blow-up with Florey came, in fact, from Melville's communication of a financial ceiling policy in 1955, at a time when the Medical Research School was in real need of expansion. The attempt to treat Florey's direct-speak memorandum as confidential, almost secret, was disturbing. But the worst incident occurred when the Council requested the Vice-Chancellor, with Ennor if he wished, to go to Oxford in March 1957 to explain the Council's offer to Florey. I was astonished when I received a letter from Oliphant describing the events set out on pages 288–9 and the subsequent letter from Florey. It transpired that Melville, for a purely private reason, had ignored Council's instruction and Ennor had gone alone. Ennor later became Deputy Vice-Chancellor, and subsequently moved into the Public Service.

During the period 1944–1958, the English had, with one slip, been good to Florey. He was elected to the Council of the Royal Society for 1951–53 as a Vice-President, and the Society awarded him a Royal Medal in 1951, Croonian Lecturer in 1954 and its highest award, the Copley Medal, in 1957. Research funds were freely available, an expert group of scientists was at work in his school, and the Presidency of the Royal Society was in the hands of a trusted and loyal colleague. It is a revealing aspect of Florey's character that he did not give up the ANU long before he did.

There are a number of errors in the text. Among a number of misprints there is a confusion of 'absorption' and 'adsorption' (pp. 101–102), and it is important whether 'clinical' on page 124 should be 'chemical'. On page 12 the author refers to the 'John Menzies Library'; this should be the 'R.G. Menzies Building' of the ANU library. On page 7 William Bragg is recorded as an Adelaide graduate who left in search of a more challenging environment; both statements are incorrect. On page 21 Florey is recorded as having diagnosed himself as achlorhydric and of self-prescribing hydrochloric acid to the ruination of his teeth. He informed me that it was Stanton Hicks, later professor of physiology in Adelaide, who committed this double gaffe. On page 109 the present Lady Medawar is recorded as being Miss Jean Raylor in 1939, but in 1939 she was Mrs Medawar and a proud mother. Burnet was awarded a Nobel Prize in 1960, not 1966.

Having acted like a long-time examiner, it is now fair to praise that which is good. The prose is precise and suited to the lay-professional area for which it is cast. In the accounts of technique, it is direct speech and satisfying, and the descriptions of Florey's mannerisms and haunting manner are well done. The author has penetrated his subject's artifically fierce demeanour and given us a glimpse of the man who could weep when his dog died or a co-worker let the side down. And the rigorous discipline of his subject's mind stands out clearly.

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Ann Moyal, *Clear Across Australia: A History of Telecommunications* (Nelson, Melbourne, 1984), 437 pp., illus. ($18.95).

It is, for those whose life has been involved in the public sector, very satisfying to see the emergence of some scholarly and professional works dealing with those major public corporations that have helped shape our society. Such contributions as Professor Ken Inglis' important work on the A.B.C. are now joined by this most readable, thorough and pioneering work. Ann Moyal has provided us with a detailed account of an area that has had little quality documentation to date, apart from the successive reports of Royal Commissions,

Public Accounts Committees and Committees of Enquiry.

Whether statutory corporation or public company, there is a very real obligation on the controlling board of each major institution to see that its key records are preserved in collections such as the University of Melbourne Business Archives. Perhaps more important, however, is the need to ensure that a comprehensive and analytical study of its development and role is produced. The production of such a study is not inexpensive, and the work should not be attempted by amateurs, however able. It should also be pursued, if possible, whilst there are sufficient old hands available to assist in illuminating the factual history and assisting in its interpretation. A well-trained historian can handle the anecdotal material with a wary eye to the need to verify the bias and inevitable unreliability of personal recollection.

A great deal emerges from a book like this, particularly when it is written with a perception and understanding of the patterns of social history. It provides an invaluable general reference to a significant area of our history; and at the same time it deals with a number of special strands of that history. It gives us, for instance, an understanding of the interaction between the engineering and scientific approach to the problem of communication in our vast and lightly populated country on the one hand, and the decision makers in the Parliament and Cabinet on the other. Out of this interaction and the realities of funding have emerged the capital programmes and the systems decisions that affect us all fundamentally. Nowhere is this better illustrated than in relation to those who live outside the great population concentrations of the eastern seaboard.

Geoffrey Blainey's foreword reflects partly on this theme, in terms he has made his own; the isolation of our society from European and Asian events. The story which emerges from Ann Moyal's work is of a gradual reduction in our isolation from each other, as well as from other continents.

The canvas is a large one and is well handled. The obligatory sketch of the colonial post office and the first postmaster of the convict settlement, Isaac Nichols, moves quickly into the age of electric telegraph. This 'most perfect invention' gave an enormous fillip to the burgeoning commerce of Victoria, for example. The early history of the growth of the telegraph system throws light on many of the themes that are continuing ones in Australian communications, such as defence considerations and the fear of Russian attack. It is salutory also to reflect on the problems Charles Todd (sometime assistant astronomer at Cambridge University and first superintendent of the electric telegraph at Adelaide) had with British equipment and techniques.

There is an uncomfortable parallel here with the attitude of British contractors to the 'Colonies' in the post-second war period. This produced a climate that helped the adoption of the Swedish crossbar as the Australian standard, to replace the electro-mechanical, step-by-step systems. The story of this fundamental choice, in the decade of 'white hot technological revolution', and with which the name of Frank O'Grady, Director-General from 1961 to 1965, will always be associated, is well told. This decision, the subsequent licensing of the British-based TEI and STC to produce the equipment in Australia, and finally the victory of L.M. Ericsson, when a tender basis was adopted for purchase of crossbar equipment when the original leasing agreement ran out in 1963, had striking results for the form of the Australian telecommunication manufacturing industry. It also reflected the disastrous slide of British influence in the area. In the 1970s, Australia's standard equipment was crossbar, while 80% of Britain's telephone network was still dependent on the old Strowger equipment. Similarly, the British were still obsessed with valve technology (that generated sufficient radiation to heat a whole suburb) when the Americans were already well down the transistor and solid-state track.

Clear across Australia, whilst remaining readable and alive, provides a detailed account of the long sweep of history it covers. If you are interested in the role of women, telecommunications is an area where the developments have run the whole gamut. It was, earlier, one of the few avenues where 'educated women found entry to a congenial and respected occupation that gave them social status, a sense of community service and responsible authority'. Despite the evidence of Dr Leschen at the Royal Commission of 1908–10 ('frail, nervous, hysterical creatures, whose real purpose was motherhood and whom the clatter of telephone technology might derange'), the 'female telephone attendants' were one of the mainstays of the service, even after Strowger invented his 'girl-less cussless phone'. This was the case right through until the massive automation of the 1960s and 1970s, which then struck deep into the traditional nature of relationships, of jobs and of the structure of the old Australian Post Office.

One major strength of this book is the way it continually opens up areas for further work and examination. It can mention only briefly, in the context of the chapter on the post-war on-rush of technology, the effect in the country of the disappearance of the friendly local community contact, the town's telephonist. One realises, however, that this is but a part of a much needed wider study to examine the factors that have radically altered the social fabric of rural Australia.

Similar conclusions can be drawn from the lucid and detailed way in which the roles of engineer, technician and lineman (and a host of others) are spelled out. The impact operationally, socially and industrially of the spectacular growth in the technical base of communication is well surveyed by the chapters spelling out 'the end of an era' (the

death of the A.P.O., with its 115,000 strong workforce) and the birth of Telecom Australia.

Close as Ann Moyal stands to the events of the most recent period of her work, she has mainly got it right. There have been few occasions in recent years where a near-contemporary account has the feel of an impartial summation. Yet it is nowhere a work that evades conclusions. On the mess of the Common User Data Network venture under the old department in the late 1960s, she is lucid and fair. Not all those involved in the heat of the Black Mountain tower controversy would agree with her parellel with the final acceptance of the Eiffel Tower as the symbol of Paris; many remain with Guy de Maupassant, dubbing their local version also as 'monstrous'. The outline of the head-on collision resulting from Telecom's moves to secure the interconnect and add-on market, and the free market stance of Minister Staley and the coalition, provides greater understanding to the lay reader of some of the key factors that still control the industry today.

The major organisational restructuring of 1981 was a response to the battle for commercial position, and the challenge to Telecom of private sector forces in a climate of strong government interventionist policy. This part of Ann Moyal's review is very properly allied to a useful outline of the place of the Research Laboratories and of research generally in the rapid technological revolution of the past 30 years.

But it is the careful setting out of the industrial crisis of 1981 that puts us particularly in Ann Moyal's debt. She provides us with a thorough account of a particularly interesting piece of contemporary history. This was the crisis that cost Telecom its urbane and many-sided Managing Director, Jack Curtis, and in the end gave the State of Victoria its first-class S.E.C. Chief General Manager, Jim Smith. For one with a long memory and an association with the old Australian Post Office, the parallel with Sir Harry Brown and his minister Eric Harrison is unavoidable. Then, it was Harrison and Robert Menzies who dislodged 'their premier public servant'. In 1981 it was Ian Sinclair and Malcolm Fraser. Neither episode reflects credit on government. We see clearly the dignity with which Curtis emerged from the episode, and the telling observation is made that his 'departure cast a long shadow'.

The sweep of the book takes us through to Bob Brack, the current Chairman, and the recently retired Managing Director, Bill Pollock. This was the duo that worked long and hard in the corridors of power, both in Canberra and in the capitals, to nullify the recommendations arising out of the Davidson Enquiry of 1981-2 for the breaking up of Telecom. In essence, the recommendations were abandoned, and Ann Moyal gives the Telecom pair more than a little credit for the change.

I guess, as an old headquarters P.M.G. man, I have only one regret about the book, and it is personal and Ann is not at fault. Although the index contains many names, it does not contain that of Ernest Wright Easton, the Assistant Director General (Finance and General Services) under the Director-General Sir Giles Chippindall and beyond. The role of the non-engineer but professionally qualified officer was a new one in the early 'fifties. Many officers like myself, David McQuitty of Australia Post and Bill Pollock owe a debt to Easton. Not always liked and often over-compensating, he played a seminal role. He single-mindedly pursued the task of evaluating and providing financial policy advice, even in the days when many thought capital grew on trees. Without him, the Post Office would have emerged very badly indeed from the epoch-making first enquiry of the Joint Committee of Public Accounts, under the redoubtable Professor F.A. Bland. And without him, the essential financial work that preceded the great break-up of the Department would have been very difficult indeed. He deserves a mention, not only for his contribution to these processes but also because he was a staff builder; he developed a team. It also reflects well on Giles Chippindall that he saw the need for developing a corporate management support system leaning heavily towards numeracy and financial expertise.

Many of those who worked and argued with Ern Easton were part of Ann Moyal's team of advisers and informants in the creation of this valuable book. It is a matter of some regret that none thought it worthwhile to mention his name. Most of their own names are there.

Ray Marginson,
Vice-Principal,
University of Melbourne.

L.T. Carron, *A History of Forestry in Australia* (Australian National University Press, 1985), 372 pp., illus. ($39.00).

Dr Carron has given us a meticulously researched and documented history of forestry in Australia. Everyone concerned for the well-being of the residual areas of our forested lands, regardless of their interests and commitments, should welcome this very readable and very balanced record and analysis of the management of the forested lands of Australia, 'from its beginnings' (that is, from European settlement in 1788) up to the 1970s.

In his Preface, Dr Carron notes that 'There are many definitions of "forestry". They all relate, in one way or another, to the wise and sustained fostering, production and use by man of the many values, benefits, services and products of forests'.

The author records the areas of forested lands in Australia, and the impact of settlement, agriculture, mining and its demand for wood and the attrition caused by fire and disease; but he is more concerned to evaluate the wisdom and effective-

ness with which our forested lands have been managed. His text is directed 'beyond the [forestry] profession'. He notes that 'with the wave of concern for "conservation of the environment" which started to gather force around that time [the 1960s] many people began to take a critical personal interest in the forest estate of Australia, its management and its managers'. Dr Carron has faith that the 'confrontation that has been an unhappy feature of the past decade' will be replaced by 'reasonable discussion amongst reasonable people'. He believes that 'an appreciation of the historical course that forestry has followed . . . is essential to reason and reasonableness in it [that discussion]'.

In tracing the history of our forested land, Dr Carron has dealt specifically with those issues which from the 1960s have thrown up major challenges to professional foresters as forest managers; namely, rain-forest management, coniferous (exotic softwood) afforestation, hardwood wood-chip exports, concession areas for the expanding pulpwood industries, surface mining for bauxite in the Jarrah forests of Western Australia and Jarrah dieback, and sand mining (the Cooloola Sands and Fraser Island).

Dr Carron has traced the history of these problems and documented the essence of and factual cores within them. He has not, as a professional forester and senior educator of foresters, been concerned to justify the profession nor to denigrate the profession's critics. He has made it possible for all those involved, and those concerned, to be better informed and to see the issues in clearer perspective.

In his Preface, Dr Carron indicates that under the Australian federal system the states have retained control of the land within their borders and the forests thereon, subject only to certain and sometimes critical residual powers (e.g. export licensing) ceded to the Commonwealth. This pattern of responsibility has left the author little option but to deal separately with the history of forestry in each State. This has led to segregated treatment of certain common issues (for example, wood-chipping for export in N.S.W., Tasmania and Western Australia), although the author develops the impact on the public, the politicians and the profession of the earlier experiences on later developments in the other States.

Dr Carron has dealt with early settlement in a scholarly and literary style, using judiciously selected primary source material. He draws attention to the significance of timbers for naval purposes to the maritime power of Britain. He notes that Governor Phillip, in allotting lands to emancipated convicts, followed a Royal edict to 'reserve to us such timber as may be growing, or grow hereafter, upon the said land which may be fit for naval purposes', echoing the interest of early Rome and ancient Egypt in the cedars of Lebanon.

Dr Carron's treatment of the history of forestry in N.S.W. is typical of the chronological detail he presents for each of the States: first reservations of land for permanent production of wood (1871); first appointment of 'reserve' supervisors (1875); Henry Kendall, the poet, first Inspector of State Forests (1881); the Forest Conservancy Branch (of the Department of Mines!) — 'what might well be taken as the birth of todays Forestry Commission' (1882); the Branch is made a Department under the Colonial Secretary (1889); the first Director General of Forestry appointed (J. Ednie Brown, 1890). The later history is also covered with professional insight and thoroughness. The Royal Commission of 1907–9 is shown to be of far reaching importance to the development of forestry in Australia, but it would have been of interest to have had set out the names and qualifications of the Commissioners, who were confronted with 'sweeping terms of reference' and reported travelling '8500 miles by train, 3700 by coach, 400 by steamer and launch, 316 on horseback and about 400 on foot', as well as arranging 344 meetings and hearing 558 witnesses.

Dr Carron draws our attention to the 1935 Forestry (Amendment) Act, which provided in N.S.W. for 'National Forests' revocable only by Act of Parliament, and which were intended for 'Multiple Use'; that is, 'to produce timber, protect watersheds, provide recreation values, conserve wildlife and provide grazing for domestic animals'. Within two years, seven such forests, totalling 300,000 ha, had been declared. 'The establishment of national forests was an earnest intention of multiple and integrated use and an expression of concern for the environment that anticipated by thirty years that of the "environment movement" of the 1960s'.

The provision of exotic softwood plantations has been seen by foresters in all States as essential to replace and expand the diminishing and always minimal native softwood resources. Dr Carron traces the history of such plantations in each State. The N.S.W. experience in this field typifies the early technical and social problems. As early as 1935 the public was concerned and opposed to the removal of eucalypt forest 'however low its commercial status' for the purpose of coniferous planting. This was to become a major issue in the 1960s.

Of professional interest is the development in N.S.W. through the 1950s and 1960s of intensive forest inventories and growth studies, to enable planning for self sufficiency in timber supply, not only in respect of hardwoods but also of softwoods. Prescriptions for these objectives and the proper silvicultural treatment of the forest stands and the forest environment were incorporated into 'management plans' for all State reserved forests.

We are given an objective appraisal of the softwood afforestation issues as the States rapidly expanded their planting programmes in the light of Commonwealth funding arrangements under the 1967 and later Softwood Forestry Agreement Acts, and of the passionate opposition these programmes have engendered in some quarters.

The hardwood export chip industry, centering on

Eden, became in late 1967 one of the most bitterly contested issues. Dr Carron reviews this issue with remarkable objectivity, and takes us through the political complexities that surfaced as government changed at the Commonwealth level, the granting of export licences being a Commonwealth matter.

The utilization of the prime cabinet timbers of the rainforests became another facet of interaction between the forest authority and the 'environmental movement'. Wingaree and Terania Ck. (1975) became critical areas of confrontation. The abundant literature on this issue is well annotated by Dr Carron. It is unfortunate that the findings of the Judicial Public Review that began its enquires in late December 1979, could not be included in this history before it went to press in 1985.

For Tasmania Dr Carron leads us from the logging of the Macquarie Harbour stands of Huon pine in 1817 and for a decade thereafter, by convict labour, to the present problems of the growing community demand for extensive wilderness areas to be reserved and preserved free of all timber harvesting and other forms of 'exploitation'.

With similar thoroughness Dr Carron takes us through the history of forestry in Queensland, Western Australia, Victoria and South Australia. In Queensland it is of interest to see that the State's extensive National Parks were managed by the Forestry Service from 1908 to 1975, when there were 'more than 300 terrestial national parks and two marine national parks, with a total area in excess of one million hectares, of which one park was more than 500,000 ha . . .'

In Western Australia the great challenge of bush-fire control led in the 1950s to the pioneering, in Australia, of prescribed burning for the reduction of fuel under controlled conditions. The large scale application of this technique by aerial ignition in the 1960s has led to a significant reduction of the incidence and destructiveness of forest fires.

Victoria is seen to have a bush-fire hazard of perhaps even graver proportions due to the combination of climate and forest fuel types. In terms of forest management, it poses particular problems in the fire sensitive sub-alpine ash type eucalypts. The Little Desert land-use issue in Victoria is seen by Dr Carron as a significant turning-point in land-use, in that public opinion had sufficient impact on the political sector to prevent alienation of a substantial area of semi-arid land, including forested land.

South Australia is the state least endowed with native forests. The history of forestry in South Australia is, therefore, virtually the history of the creation of a man-made forest of exotic conifers and of a wood-based industry with strong government involvement.

As earlier noted, the Commonwealth has had a restricted role in Australian forestry, but it is none-the-less important. The author traces the series of voluntary conferences of heads of state forestry services from 1911 to 1949. Throughout this period the Commonwealth became increasingly involved in forestry. A Commonwealth Forestry Advisor was appointed in 1924. In 1926 the Federal Government established the Australian Forestry School and a Federal Forestry Bureau, in 1963 the Forestry Research Institute was formed, leading to the establishment (in 1975) of the CSIRO Division of Forestry Research, and in 1964 the establishment of the Australian Forestry Council made provision for federally-integrated policies and programmes.

The question of professional forestry education in Australia has been a vexed and divisive one for over half a century. Dr Carron has performed a service by his scholarly history of the several schools and his objective appraisal of the evolving pattern of higher forestry education in Australia.

Dr Carron concludes his history by a chapter devoted to 'The Private Sector'. He points out that one fifth of the native forests in Australia are under free-hold or leasehold, and that about 25% (50% in Queensland) of wood from native forests comes from private property. Despite the significance of these figures, the Commonwealth has not agreed to assist the private forestry sector directly. In his chapter on Tasmania, Dr Carron has noted the significance of the Tasmanian Forest Act of 1977, which provides for formal supervision and some control by the State of the utilisation of privately-owned native hardwood forests.

The author has given the forestry profession, and all those concerned for our renewable natural resources, an invaluable record, thoroughly documented and discerningly analysed. Dr Carron's perception, professionalism and scholarship have provided an authoritative and very literary text. Those who love and work for our forest heritage are in his debt.

J.H. Chinner,
Vermont,
Victoria.

Harold Attwood and R.W. Home (Eds), ***Patients Practitioners and Techniques: Second National Conference on Medicine and Health in Australia*** **(Occasional Papers on Medical History Australia, Medical History Unit and Department of History and Philosophy of Science, University of Melbourne, and the Medical History Society AMA (Victorian Branch), Melbourne, 1985), 227 pp. ($15.00).**

Surprisingly, the editors have asked me to review a second collection of essays arising out of a conference on aspects of the history of medicine. I will not repeat my somewhat strident and stringent advice from the first occasion [6(1) (1984), 93–5]. For indeed, if one might hand out awards, this second collection is vastly better than its predecessor, and contains much scholarship of permanent value.

Perhaps the fact that the conference had as a principal purpose the desire to mark the retirement of 'Ding' Dyason lifted the game of contributors and editors alike. Dyason has long striven for academic rigour and social context in the writing of the history of science. Her disciples have learnt well of that lesson. Her own contribution to this collection, 'James Jamieson and the Ladies', is a model of its kind. Dyason corrects earlier, simplistic views of this late nineteenth century practitioner and teacher. He wasn't the misogynist some have depicted him to be. This admirable piece of scholarship brings honour to an able teacher and scholar.

The other essays in the volume follow no clear set of problems; each varies in focus, quality and relevance. The editors have obviously been rigorous in largely excluding inadequate presentations. It means the reader gets value for money.

Graham Edwards discusses Richard Arthur and hypnotism in late nineteenth century Sydney. His point of view is his own present conviction of the value of hypnosis, so I am afraid the narrative of Arthur's excursions is to some extent an exercise in finding former martyrs for a contemporary cause. The complexity of this amazing man and his links with John Mildred Creed, another unusual proponent of unusual causes including defence and cremation, is inadequately handled.

By contrast, Milton Lewis, who is obviously engaged on a major study in medical history in Australia, explores 'Continuity in Australian Psychology'. There are thoughtful, dense observations with some important philosophical clarifications of the meaning of 'psychiatry' in this paper, notably on moral therapy. But are the practitioners of psychiatry listening to this careful investigation into the intellectual roots of the profession? Or even to Robert Finlay-Jones' exploration of the effect of war on the theory and practice of psychiatry. Circumstances clearly forced the hand of practitioners and demanded new theoretical perceptions, whatever the previous dogmas might have suggested.

David Dunstan on health officers in Melbourne and Gregory Tunchon on germ theory support one another in exploring the understanding and application of that doctrine in Melbourne. Both are thoughtful, elaborate and well documented. Both could be models for other, similar enquiries, although the careful, economic calculations of W.A. Sinclair [*Ec. Record*, 51 (1975), 153–73] need to be given greater credence. Sinclair challenges medical triumphalism by asserting that calculations of alternative costs, not new medical knowledge, lay at the heart of the success of the application of germ theory.

Some other readers will find interest in other papers where I did not: for example, a listing of the library of Dr John Maund.

The brief study of geriatric services at Newcastle hospital in the 1950s by Margaret Henry cries out for fuller treatment, which one hopes it will get in other contexts. Similarly, Tony Radford's foray into health service delivery in Papua New Guinea is a delightful piece, though hard to fit with the rest of the collection.

Others confuse or bore the reader with poorly written work, or signal the possibilities of Supreme Court records, or family tax files.

The point seems to emerge that medical history is being set in social and intellectual contexts with clarity and rigour. Anthea Hyslop's discussion of who should care for influenza victims in 1919 at Ballarat is a case in point. Here, medical history becomes political and administrative as well as local in character, but it bears on general questions of social responsibility and institutional growth.

Once more, then, amateur work stands out by comparison when it is inadequate, whoever the author, whereas thoughtful, careful, inter-related work reveals its power once again to illuminate relationships and practices in the past. 'Ding' Dyason surely enjoyed the conference, and I hope has found joy in the published proceedings.

Brian Dickey,
School of Social Sciences,
The Flinders University of South Australia.

V.A. Edgeloe, *The Waite Agricultural Research Institute: The First Fifty Years, 1924–1974* (Waite Agric. Res. Inst., 1984), 208 pp., illus. ($34.35).

Within seven years of its foundation, the Waite Agricultural Research Institute was being described as 'the Mecca of agricultural scientists from all States of the Commonwealth'. It had certainly lost no time in establishing itself as Australia's premier agricultural research institute. Yet, by modern standards, it was staffed and funded on an extremely modest scale. When the Institute's foundation Director, Professor A.E.V. Richardson, made his first report to the Council of the University of Adelaide in December 1924, he envisaged an organisation with the following staff: a plant pathologist, an agronomist, a research chemist, an assistant chemist, a field officer, a laboratory attendant, three of four postgraduate students, a clerical officer and a typist. In addition, the University had already appointed Richardson and J.A. Prescott to chairs in Agriculture and Agricultural Chemistry respectively. Because the cost of these recommended appointments would have exceeded the Institute's income of £8,275, they were approved only in principle, and Richardson was asked to delay some of them until sufficient money became available.

By the time that the Institute's third Director, Dr J. Melville, made his final report (1973), the total staff had grown to 262 (excluding current vacancies), and there were by then six departments plus

students, preserves and enhances what might be called the Sydney tradition. The accounts of the other subjects are always interesting, despite a tendency in some to the personal and exhaustive, varying in the weight given to actual achievements and their influence on the development of the disciplines, which have ranged from significant through notable to profound in the rare case.

Sydney University admitted women students in the 1880s. Smith (Physics) and Liversidge (Chemistry) took the lead. Mellor also records *(loc. cit.)* that 'Further evidence of his [Liversidge's] progressive outlook on education is to be found in his attitude to the question of the admission of women to the University. Liversidge was one of the few who agreed to the admission of "this disturbing element", as the then Chancellor called it, into his classes'. Sydney was in this respect well able to hold its own with other institutions.

The book is sober, grave, tempered, balanced and accurate, and generally a document of record. That is as it should be. We cannot but applaud. But we should look also for the sub-culture of anecdotal history, the unconsidered trifles of the diarist and the irreverent gossip of the students. They are not entirely neglected and come down to us polite and sanitised, so that their ghostly subjects might nod and smile and take no offence. With a few exceptions, and welcome they are, we do not have very much to record the engaging eccentricities of some of the great Sydney figures. Charles Fawsitt is there boiling up his coins each morning to purge them of the contamination of their pre-Fawsitt contacts, but not the same man telling newly appointed lecturers that 'when interviewing young lady students, they must ensure absolutely that the door is open'; nor the busy activity before physics lectures, when there were bets on how many times the lecturer would give that staccato cough which seemed to slice his lectures into bright memorable quanta of information. Such are, like Hamlet's players, 'the abstract and brief chronicles of the time'.

A place is found for the *Private Eye* view of Science in Sydney. We get the flavour in 'A Science Alphabet', reprinted from the *Science Journal* of 1919. The letters A and H will illustrate:

A is for Algy, professor of Bot,
If you stamp in his lectures he gets in a scot,
H is for Harker, no notes need be taken,
It's all in the text book — unless I'm mistaken.

The un-named poetaster of 1919, turning from the laboratory bench to delve uncertainly for his stuggling rhymes, would have been warmed to see them given a new life sixty years on.

The reviewer has a suggestion for the next edition of *Ever Reaping Something New*. In considering (p.53) the Wilkinson plan for Science Road, the re-erection of the splendid facade of the old head office of the Commercial Banking Company of Sydney and its effect on the chemists who moved into the new space, we might well share the views of Francis Lions. In a spirited parody of Kubla Khan he wrote of the building and some of its occupants, Mellor, Thomas Iredale and Fawsitt:

There with the stone from a worn-out bank,
Corinthian columns, rank on rank,
With ancient architectural swank,
It rose in mystery.
'It must be good', declared the Vice,
'The labs shall all be clean and nice.
Eliminate the rats and mice!'
'There'll be room for David P,
A magnet, and a cup of tea.
Whilst up above, tall Tommy I
Shall teach the students bye-and-bye
The mysteries of dx — dy
And how to solve a Sargent's pie.'
And to the endless corridor
Shall be a room complete with polished floor,
Wherein shall stand a chair twice three feet high
Whose top shall seem to touch the very sky.
And there shall sit the Prof in awful state
Before the trembling maidens who must wait
To hear his doleful voice pronounce their fate,
Without a chance to scream or try blackmail,
Tricked by an open door, compelled to fail.

Ever Reaping Something New is attractively produced in a large page size and generously illustrated with photographs of people and places. There are reproductions of University notices and gems from the archives, such as a question from a physics examination paper of 1888, which starts with a quotation from 'The Merchant of Venice' and proceeds to invite candidates to write notes on: 'Could Bassanio see more than one image in each of Portia's eyes?'

The book has warmth and character. It appeals at two levels. At one it is a source of names, achievements and facts which will be sought as information, given them with a feeling for the *genius loci.* At the other, to those who have come through the Faculty, it will have something of the effect of the School Mag on former students — to bring on bouts of inaccurate reminiscence. The efforts of editors and chapter authors at both levels are greatly to be welcomed. We are much in their debt.

D.P. Craig,
Research School of Chemistry,
Australian National University.

Scott Whineray (Ed.), ***Beatrice (Hill) Tinsley, 1941–1981, Astronomer: A Tribute in Memory of an Outstanding Physicist*** **(Massey University and N.Z. Institute of Physics, 1985), 97 pp., illus. ($5.00).**

It always comes as a surprise to read in an overseas journal an obituary of an Australasian scientist (or a note on a prestigious award to one) when the name is unknown, leaving one mystified and strangely disoriented. A similar feeling came to Dr

Scott Whineray at Massey University in New Zealand when, in 1983, he read of the establishment of the Beatrice M. Tinsley Prize by the American Astronomical Society, to be awarded for an outstanding contribution to the advancement of astronomy and astrophysics and in honor of Beatrice Tinsley's exceptional contributions towards our understanding of the evolution of the Universe; for Beatrice Tinsley was a New Zealander.

Beatrice Muriel Tinsley (née Hill) was born in England in 1941, but she was raised and educated 'with all the virtues and certainties of provincial New Zealand in the stable 1950s, although with a sense and even a firsthand knowledge of larger horizons' (p.13). After their marriage in 1961, her husband obtained a physics appointment in Dallas, Texas, and Beatrice found herself in an environment unsympathetic to a woman with aspirations of an academic career. She journeyed to Austin, Texas (200 miles away) each week, and in 1967 was awarded her Ph.D. with a thesis entitled 'Evolution of Galaxies and its Significance for Cosmology', a work which 'marked the beginning of modern detailed studies of galactic evolution' (p.90).

The Tinsleys adopted two children, and for six years Beatrice gave her major attention to them and to her husband and home, although she also published some papers in astrophysics and cosmology. During these years the personal conflict between her domestic role and her desire to devote more time to astronomy came to a head, and she and her husband ultimately decided on divorce, the children remaining with Brian Tinsley. In 1975 Beatrice accepted an appointment at Yale University, and in 1978 she was promoted to a full professorship (of Astronomy). Here she was able to give full expression to her great abilities and energy, and she undertook a prolific series of projects, which expanded in many directions the study of stellar and galactic evolution and its relationship to cosmology: for example, initial and later stages of stellar evolution, chemical evolution of galaxies, and the origins of supernovae and their relation to evolution and nucleosynthesis. She published nearly 100 papers, many as sole author. In addition, a great many people were stimulated and inspired by her vitality and enthusiasm; at Yale and in the wider discipline she became a genuine and highly-regarded academic leader.

A melanoma was discovered early in 1978 and Beatrice Tinsley died of cancer in March 1981, at the age of 40 and at the height of her career. As a tribute to her memory, Dr. Whineray has assembled a modest collection of items related to her life: an interesting chapter from the centenary history of her high school, extracts from her M.Sc. and Ph.D. theses, a *Scientific American* article, her last paper, a list of her publications, and statements and obituaries published after her death. I found the collection absorbing. Not only was Beatrice Tinsley's scientific career notable and very productive; it also embodied to a special degree the problems and agonies of (prospective) female scientists in the middle of the 20th century. If the collection inspired others to undertake a closer study of the life of Beatrice (Hill) Tinsley it will have been doubly valuable.

John Jenkin,
Physics Department,
La Trobe University.

Ian & Tamsin Donaldson, *Seeing the First Australians* (Allen & Unwin, Sydney, 1985), 216pp., illus. ($17.95 pb).

This collection is concerned with the various ways in which some whites have perceived Aborigines, 'the first Australians'. It reveals how these were never neutral, but were conditioned by preconceptions Europeans and their Australian descendants had about Aborigines: for the most part, those who looked saw what they had thought they would find. Accordingly, it tells us as least as much about the Europeans as about the people they observed, and reflects something of the relationships of power between the two peoples. As a collection of essays by prehistorians and archaeologists, anthropologists, art historians, a linguist and a historian, it only incidentally addresses European 'ways of seeing' from the perspectives of the historian or philosopher of science. It investigates some of the ground explored by Bernard Smith, in his pathfinding 1960 study *European Vision and the South Pacific*, and other scholars such as Kenelm Burridge, and deals effectively with two periods: that of early European exploration and settlement of the continent, and the closing decades of the 19th century.

Europeans did not come 'cold' to the shores of eastern Australia, as Smith himself and Glyndwr Williams show in essays which add little to their earlier writing on the subject. On the contrary, their visions of the new land and its inhabitants were very strongly influenced by certain peculiarly 18th-century ideas and beliefs. As David Mackay, in his recent *In the Wake of Cook: Exploration, Science and Empire 1780–1801*, has argued, the European exploration of Australia was profoundly influenced by scientific attitudes and methods. From Cook onwards, expeditions included groups of skilled scientists, who were instructed to gather useful scientific information by accurate observation and measurement. This reflected two important strains in 18th-century science: the belief in empirical and 'objective' study, and the utilitarian belief that science should serve humankind by gaining knowledge of natural forces and so extend domination over them.

However, the way in which explorers such as Cook and Banks saw the Aborigines and, to a lesser extent, the native plants and animals, was affected more by two well-established European intellectual

traditions concerning non-European societies. First and most important, the school of primitivist thought which reflected some sympathy and respect for peoples such as Aborigines; and second, the scientific and philosophical conception of the universe as a vast ordered chain of being, which facilitated the presupposition of a link between higher primates and man and assigned Aborigines to the most rudimentary stage of human development. Furthermore, their depictions of Aborigines were coloured by the neo-classical ideals then dominating European art and taste.

Some of the writings and pictorial representations furnished by the early voyagers affected how Aborigines would be seen by those who followed in their wake. In the early years of white settlement, European ways of seeing continued to be determined by the primitivist tradition, but were increasingly affected by what James Urry calls here the continued 'shock of experience'. Urry's interesting contribution looks forward to European pastoral expansion into the hinterland, but should have been followed by an examination of the vision of settlers, missionaries, government officials and pseudo-scientists (such as phrenologists), whose perceptions of Aborigines so crucially influenced the nature of black-white relations during the colonial period.

Some of their beliefs were assimilated by the proponents of evolutionary theory from the 1870s onwards. In examining this new scientific theory, John Mulvaney has shown how it was transformed into a social and cultural rationalisation of European superiority, thus underpinning an ideology justifying European dominance and the subjugation of Aborigines and other non-European peoples. As Mulvaney points out here, the apparently scientific basis of Social-Darwinism constituted its appeal, and the theory had a tremendous impact on government policy (although he ascribes too early a date to its influence, and overlooks the continuing importance of other racial ideologies). Darwin influenced a generation of armchair anthropologists, who came to regard Australia as a type of anthropological laboratory with Aborigines as 'living representatives of our common ancestors'; they found followers in Australia eager to apply their methodology and to gather the 'facts' to authenticate their pseudo-scientific theories of evolution. These early anthropologists also inscribed in European and Australian museums their racist interpretation of Aboriginal society, conditioning the way in which several generations of white Australians were to view Aborigines.

The social-Darwinist belief that Aborigines were a dying race influenced, and was disseminated by, photographers and painters in the late 19th and early 20th centuries. As most whites in south-eastern Australia saw less and less of Aborigines, their attitudes towards them were more and more determined by these image-makers. Margaret Maynard discusses the impact of popular attitudes on portraiture, and Helen Topliss examines how Tom Roberts' Aboriginal portraits relate to his other paintings. Their essays are followed by perhaps the most stimulating contributions in the book, by prehistorian Isabel McBryde and anthropologist Nicolas Peterson. McBryde examines the life and work of an amateur ethnographic photographer, who, through re-enactments of traditional Aboriginal life, was concerned with producing a vision of pre-contact society and with creating a record of his Aboriginal subjects as 'representatives' of this 'passing race'. Other photographers, Peterson shows, contributed more to the construction of a popular image of Aboriginals via the new medium of postcards, most of which bolstered notions of European racial superiority by vividly portraying Aborigines as a 'dying race'.

This attractive and well-illustrated book extends our knowledge of how Europeans saw Aborigines in the 18th and 19th centuries, but it nonetheless has serious weaknesses. Not only do we learn little of how Aborigines were perceived between about 1820 and 1870, but we also get no idea of how Europeans other than male explorers, scientists and artists, saw them. Just as importantly, this collection fails adequately to provide the social and political context in which Europeans saw Aborigines, and any study which ignores this is seriously deficient. Consequently, the essayists here were also unable to explore satisfactorily how 'ways of seeing' were, as the editors note, 'a kind of power . . . implying a relationship of subject to object, observer to observed'. The editors also point out that the 'ways of seeing' are not only historical but are embedded in present-day society, and particularly in academic study of Aboriginal society; but regrettably this matter, as much else in this useful collection, does not get the serious and sustained treatment it deserves.

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M.J. Blunt, *John Irvine Hunter of the Sydney Medical School, 1898–1924* (Sydney Univ. Press, 1985), 135pp., illus. ($18.00).

The story of the Hunter legend is one of the most remarkable in the hundred-year history of the Sydney Medical School. A brilliant undergraduate career was followed in 1922 by Hunter's appointment to the Challis Chair of Anatomy at the age of 24, one of the youngest professors ever to be appointed at the University of Sydney. The extraordinary, almost spell-binding impression, he made upon his seniors, both at home and abroad, and the growing international recognition and popular acclaim for his work were then to be suddenly heightened to legendary status by his tragic

death from typhoid fever in London at the age of 26. This small book by Professor Blunt, himself recently retired from the Challis Chair, recounts the story of Hunter's life and seeks to find the basis for the development and persistence of the Hunter legend.

Hunter was born in Bendigo, Victoria on 24 January, 1898. When he was 11 years old his parents separated and his father left home, never to be seen again by the family. For a time Hunter lived with relatives in Albury, N.S.W., before rejoining his mother who had, by this time, moved to Sydney where she kept a boarding house. After completing his secondary schooling at the Fort Street Boys' High School, Hunter entered the Sydney Medical School in 1915. Although clearly an able student at school, the peculiarly outstanding qualities of intellect and personality that were to mark his subsequent career only became evident after he had entered the medical course. The slender family income made it necessary for him, in the second year of the course, to begin coaching his fellow students, at first those in his own year but soon even some in the year ahead. His grasp of his subject and his remarkable capacity for exposition made his coaching classes so successful that it sometimes become necessary to hire the nearby Darlington Town Hall to accommodate those seeking to learn from him. The extra income from the private tuition enabled him to enrol at Wesley College when it opened in November 1917. To his newly-acquired College activities he added involvement in wider undergraduate affairs, particularly Union debating. He was said to be capable of 'electrifying audiences with his speeches: to hard facts he added a vibration'. Hunter's abilities as a teacher soon gained University recognition, and during the clinical years of the medical course he served as a Student Demonstrator in Anatomy. Despite all these and many other calls on his time, he still managed an outstandingly distinguished undergraduate career, and in April 1920 he graduated top of his year with the University Medal.

In August 1920, only a few months after his graduation, Hunter was appointed Associate Professor of Anatomy. Early in 1921 the University most generously awarded him a year's leave of absence on full pay to enable him to study and work abroad, and this period was subsequently extended to 18 months. This was a difficult time for the Medical School. In addition to the great postwar influx of medical students, the School had just lost its two most influential members of staff: Anderson Stuart, the founder and longtime Dean of the School, had just died, and J.T. Wilson had resigned to take the Chair of Anatomy in Cambridge. It seems as though there was a vaguely formulated plan to groom Hunter to succeed Wilson in the Challis Chair in the expectation that he would, before long, finally bring the Sydney Medical School to world notice after forty years of its existence.

Hunter spent his time abroad mostly in England but also on the Continent and in the United States. He was lionized by the leading anatomists of the day: in England by Wilson, who was to become President of the Anatomical Society of Great Britain and Ireland during Hunter's stay, by the distinguished Australian Elliot Smith of University College London, and by Sir Arthur Keith of the Royal College of Surgeons. At University College, Hunter was appointed to an Honorary Lectureship in Anatomy and elected to membership of the Anatomical Society. While he was still abroad, and some months before his return to Australia in February 1923, he accepted the University's offer of appointment to the Challis Chair.

In 1920 and early in 1921 Hunter was already active in research, in particular making a study of a case of early primary ovarian pregnancy. During his stay in London he carried out work on the comparative anatomy of the oculomotor nucleus in the midbrain and, with Elliot Smith, published a reconstruction of the Piltdown skull. This skull had been discovered some years before by Charles Dawson in gravel beds at Piltdown in Sussex. Elliot Smith and Hunter did not appreciate that the skull was a forgery and it was only much later that the forgery was uncovered.

It was, however, only after his return to Sydney early in 1923 that the work on the innervation of skeletal muscle brought Hunter to world attention. There had already been a proposal that skeletal muscle had a dual nerve supply and that a contribution from the sympathetic nervous system could possibly be responsible for the control of muscle tone. The experiments that Hunter carried out in collaboration with the orthopaedic surgeon, N.J. Royle, appeared to provide strong evidence in favour of the view that section of the sympathetic nerves could alleviate the excessive muscle tone in spastic paralysis. In April 1924, officials of the American College of Surgeons happened to visit Sydney. The visitors were so impressed by Hunter and Royle's work that the College subsequently invited them to give the fifth J.B. Murphy Oration to the Congress of the College that was to be held at the Waldorf-Astoria Hotel in New York. In October that year Hunter and Royle gave a dual oration before a very large audience of surgeons from both the United States and overseas. A series of invited lectures at centres in the United States and Canada followed. After his triumphal American progress, Hunter proceeded to England to begin another series of lectures; but soon after his arrival in England he became ill from typhoid fever, and he died within a few days, on December 10, 1924.

The shock of Hunter's death caused a remarkable emotional response from all levels of society. There was wide press coverage throughout Australia; the N.S.W. Parliament passed a motion of regret; there were memorial orations and memorial eulogies in scientific journals at home and abroad. Two of the leading portrait artists of the time, Sir

John Longstaff and W.B. McInnes were commissioned to paint portraits.

More than sixty years later it is difficult to appreciate the impact that Hunter had upon his contemporaries. Soon after his death, much of his research work, particularly his studies on the dual innervation of skeletal muscle, was shown to be incorrect. Hunter's early death precluded any lasting influence on the organization of research in the Medical School, and he left no colleagues or students to carry on his work. The impact of his personality lives on only in the memory of those of his contemporaries who still survive.

This account of Hunter's life and work is more a popular than a scholarly contribution to historical research, although it can undoubtedly be read with profit by anyone interested in the history of the Sydney Medical School. Professor Blunt tells the story of Hunter's life simply and without any truly critical assessment of his place in the history of the Medical School. What is lacking is any general account of the intellectual and research environment that prevailed in the University and in the Medical School at the time. The leading academics of the day, especially those in the Medical School (Anderson Stuart, J.T. Wilson and D.A. Welsh), remain shadowy figures in the background. It would have been helpful to know more about the intellectual and social climate that enabled a very young graduate, brilliant in many ways but barely trained in research and with only a limited research output, to gain such a position of recognition and influence among the leading figures of his day.

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Patrick Armstrong, ***Charles Darwin in Western Australia: a Young Scientist's Perception of an Environment*** **(University of Western Australia Press, Nedlands, 1985), 80 pp., illus. ($11.50).**

H.M.S. *Beagle,* in the fifth year of her most celebrated voyage, cast anchor in King George's Sound on 6 March 1836 and remained there for eight days. In this little book, Dr Armstrong chronicles Darwin's activities during these days which, he claims, have been 'surprisingly little documented'. He has based his account on Darwin's writings, published and unpublished, from which he quotes extensively, enriching it with information from Captain Fitzroy's records and with his own knowledge of the King George's Sound area. He began with the idea that this study would be mainly of interest to people who knew this part of Australia and 'who might feel that the reactions of a great scientist, at an early point in his career, to their environment were of some consequence'. As his studies in the Darwin archives at Cambridge and Down House continued, however, he became convinced that Darwin's experiences in Australia, including Western Australia, were of some importance in the development of the world view that was eventually manifested in the *Origin of Species.*

In the first chapters of the book, Armstrong concentrates on his first set of objectives: 'to provide . . . a factual description of Charles Darwin's visit to Western Australia; to examine the way in which he observed the Western Australian environment and the manner in which he recorded it'. After discussing Darwin's method of working while on the voyage and the kind of observations he made, Armstrong attempts, as far as possible, a day by day account of how Darwin spent his time, whether sightseeing, witnessing a corroboree, collecting specimens or doing quite a remarkable amount of geology; in particular investigating the peculiar structures at Bald Head reported by previous travellers. This Armstrong does with a wealth of detail and great enthusiasm, and the result is an enjoyable narrative. Chapter 4, on the geology, might daunt some readers because, for example, if you do not know what a trappean dike or plutonic rocks are, even the accompanying photograph is likely to leave you guessing, clear though it is to a geologist. Nevertheless, there is much to interest the general reader, especially one who knows the area. For, although almost all this material is available in Darwin's published works, it is scattered, and it is interesting and useful to have it assembled together, making, as it were, a companion volume to Jock Marshall's *Darwin and Huxley in Australia.*

The last two chapters, which both appear under the heading 'The effect of the visit on Charles Darwin's development' are less successful, partly because they do not satisfy the expectation of new insights raised, perhaps unintentionally, in the Introduction, and partly because both are very speculative and in the end do not claim very much at all, despite the confident ring of the heading and the wildly extravagent ideas hinted at. In addition, Chapter 5 is vitiated by a serious weakness in evidence. It is suggested that, when he was in Western Australia, the idea of transmutation was 'at least at the back of Darwin's mind'. Perhaps it was, although modern scholarship tends strongly to the conclusion that Darwin did not come to accept transmutation until after his return to England. However, Armstrong's conclusion is partly based on what is at best an extremely misleading interpretation of the second volume of the first edition of Charles Lyell's *Principals of geology.* He seems to believe that Lyell had tentatively accepted the idea of transmutation in that work. No-one would deny that *Principles of geology,* which Darwin used extensively throughout the voyage, had an enormous and multifaceted influence on him and on the development of his theory of evolution. This influence, however, was exerted through Lyell's geology and his discussion of the geographical distribution of plants and animals, their migrations, isol-

ation by means of natural barriers, struggle for existence, extinction, fossil forms and so on, all of which were seen through non-evolutionary eyes. Lyell at this time saw species as stable, and discussed transmutation only to reject it. He believed that there was no evidence for it, considerable evidence against it, and that the facts of migration, competition and population explosion in favourable circumstances, made it impossible. How new species arose he did not know, and he framed no hypotheses on this point. (Of course, that very discussion could have influenced Darwin, but this is not what is claimed.) Armstrong takes it that 'succession of species' entails evolution, but Lyell's idea of perpetual succession of extinctions and 'creations' was not evolutionary at all. In the last chapter of the book Armstrong simply points out that material from Australia was subsequently useful to Darwin in his arguments for evolution based on geographical distribution and isolation by natural barriers.

In an appendix, which seems to be directed to Darwin scholars rather than the general reader, Armstrong claims to have evidence for an earlier date for the beginning of the Red Notebook than Sandra Herbert suggests in *The Red Notebook of Charles Darwin*. Herbert has argued convincingly that Darwin began this notebook on the *Beagle* and continued it, from page 113 on, in England. She estimates that it was begun in May or June 1836. Pages 1–4 and 13 are missing, but a reference to South Africa on page 15 is unlikely to have been made before the *Beagle* reached the Cape of Good Hope on 31 May 1836, more than two months after leaving Australia on 14 March, having in the meantime visited the Cocos-Keeling Islands and Mauritius. Armstrong believes that the notebook was begun soon after the visit to Australia. His evidence is, however, far from convincing. It is of this kind: (1) On 18 March Darwin examined some specimens of 'confervae' from the sea. The first entry surviving in the notebook is a reference to floating marine confervae in a book by Labillardière. (2) Pages 5–7 of the notebook contain references to geological phenomena described in a book by Henslow. Armstrong points out that 'in almost every case some reference to the phenomena mentioned above can be found in Darwin's geological notes of the King George's Sound area. Granite and gneiss rock types, the gradation of one rock-type into another, cleavage, dykes, veins . . .' However, (1) Darwin could surely have come upon the Labillardière reference at any time after his observation of the 'confervae'; and (2) his description of geological features in South Africa include all the phenomena Armstrong lists and at least one other that Darwin notes from Henslow — clay slate — which is not mentioned among the Western Australian phenomena.

It seems just as likely on these grounds that the notebook was begun after arrival at the Cape as two and a half months earlier. The appendix ends in South Africa as pure fantasy, with Darwin and John Herschel (almost converted to transmutation by Lyell also) chatting happily about transmutation over their wine!

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Lionel Gilbert, *The Royal Botanic Gardens, Sydney: A History 1816–1985* (Oxford Univ. Press, 1986), 210pp., illus. ($39.95).

I suspect that very few of the myriad visitors to the open spaces in our major cities stop to ponder the history of these beautiful areas, and how they have withstood the pressures of encroachment by buildings and commerce. Botanical gardens today fulfill a great variety of roles: as research institutions and major centres for botanical advancement, as repositories for botanical diversity, as recreation and reference areas, and 'merely' as oases: places to relax from the pressures of everyday city life. The Royal Botanic Gardens, Sydney, is one of the oldest such areas in the southern hemisphere, and officially dates from 13 June 1816. The events leading up to this foundation, and the chequered history of development up to the present day, are comprehensively documented in this book, which was launched on the 170th birthday of the Gardens' foundation. Lionel Gilbert has unearthed a formidable amount of basic documentation and has skilfully interwoven both major events and trivia into a predominantly chronological essay, from 1788 to the present, often with fascinating vignettes of the major characters involved. Gilbert has himself had a long association with the Gardens, and is one of Australia's most eminent botanical historians. The subject of this book is clearly close to his heart, but the Gardens have not always enjoyed their present level of committed government support. As Neville Wran notes in his foreword, the Royal Botanic Gardens and Domain Trust established by the N.S.W. Government should ensure its place in future history.

The Sydney Botanic Gardens (they acquired their 'Royal' epithet only in 1959), were initially used to explore the cultivation of useful plants by early colonists, and the introductory chapter includes a general perspective of the establishment of botanical gardens throughout the world. The magnificent natural site now furnishes 'a monument to the origins of Australian horticulture and agriculture; botanically a good teaching and research institute; and horticulturally an example of very good gardening' (Hyams and MacQuitty, *Great Botanical Gardens of the World).* The 30 ha. of ground, and slightly larger area of Domain, have developed considerably since some 9 acres of cereals were planted by July 1788 in the site then known as Farm Cove. Although hopes for a pro-

ductive government farm there were soon abandoned, the area continued to be used as a 'clearing house' for the importation of exotic plants and as a nursery for the export of indigenous species.

When Macquarie arrived to become Governor of N.S.W. (on New Year's Day 1810), he organised the building of stone walls to separate the Governor's 'Demesne' from the town, and the arrival of Allan Cunningham (appointed from Kew by Banks as the King's Botanist) in 1816 marked the first experienced botanical appointment in the area. Cunningham's brief from Banks was exhaustive and included a strong injunction to report fully to him. Both he and Charles Fraser (Superintendent of the Gardens and Colonial Botanist) made extensive and valuable collections of plants.

Cunningham returned to England in 1831 and supplied a substantial 'memorandum' on the Gardens, a far-sighted document which has been considered the most significant in their early history as a scientific institution. Major points included: 1) undertaking botanical classification of plants; 2) excursions to 'advance our knowledge of the Botany of New South Wales' and to enrich the Gardens; 3) preparation of a catalogue of the collection and 4) formation of a herbarium. Cunningham's brother, Richard, was largely responsible for implementing aspects of this manifesto, and he prepared a detailed report on the state of the Gardens. Richard Cunningham was killed by aborigines about 20 April 1835 when on an expedition, and Allan Cunningham returned to Australia in early 1837 to take up the post of Colonial Botanist.

An important step occurred with the establishment of a 'Committee of Superintendence of the Botanic Garden and Australian Museum' by Bourke in 1836. This powerful group included the Colonial Secretary, Alexander McLeay, who had a very strong influence on the development of many aspects of Australian science. His influence here is apparent in the responsibilities drawn up for the Committee: no vegetables or fruit trees are to be raised in the Botanical Garden, excepting such as are of so Valuable or Rare a kind, as it may be proper to place there for better preservation'. McLeay also suggested the provision of an Annual Report indicating progress made in the scientific arrangement of the plants. Friction between the Committee and Cunningham led to the latter's resignation. His successor, James Anderson, was not a scientific botanist, but was a good collector and accomplished horticulturist. The problems of appointment of Colonial Botanists over this period well illustrate the conflict that patronage, as in other fields of endeavour, may induce.

Charles Moore, who arrived in Australia in early 1848, remained Director until 1896, and lost little time before producing innovative changes in the management of the Gardens. Lectures in Botany commenced in 1851, and planting arrangements were made to follow natural scientific divisions of flowering plants. A plot of carefully labelled medicinal plants was made, and Moore also initiated a botanical library and a herbarium. However, he had antagonists, and a comprehensive inquiry into the management of the Garden was initiated in 1855. Moore emerged officially exonerated from the ordeal of some 600 questions! In 1893, he published (with E. Betche) his *Handbook of the Flora of N.S.W.*, a work which remained a standard for more than 60 years.

Moore's successor, J.H. Maiden, was a dynamic and respected scientist, whose work and influence gave the Sydney Gardens a world reputation in systematic botany. He had already produced his vast *Useful Native Plants of Australia* (1889), and continued to write scores of scientific papers. His influence was visible also in strictly practical aspects of management, including provision of the first female toilet facilities. Continued work on the herbarium led to the appointment of additional scientific staff to study various groups of plants. Maiden's dynamic 28-year period as Director was followed by a period of little progress, during which the Gardens were administered by a succession of Directors with little scientific distinction, but in recent years their scientific reputation has been enhanced by some eminent scientific staff.

The history and changing fates of the Royal Botanic Gardens, Sydney, are described sympathetically and accurately, and the conflicting potential demands on the area since its establishment are reflected in some more modern events. Many readers will recall the division of the gardens by construction of the Cahill Expressway in the early 1960s, for example. Illustrations in this well-produced book are both sensitively used and of high quality, so that readers lacking personal familiarity with the area are assured of full understanding. References are comprehensive, given separately for each chapter as a series of numbers, and Dr Gilbert has there incorporated a number of comments which will aid the reader seeking even fuller documentation. The index is competent.

This book makes a fine companion to the recent history of the Royal Botanic Gardens, Melbourne, from the same publisher (1982), and reviewed in this journal by D.J. and S.G.M. Carr (5(3), 1982). Together, the two, written in somewhat contrasting styles, are an indispensable adjunct to studying the development of botanical gardens in Australia. This present volume is likely to prove definitive.

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Lynnette Ramsay Silver, *A Fool's Gold? William Tipple Smith's challenge to the Hargraves myth* (Jacaranda Press, Milton, 1986), 170pp., illus. ($14.95).

A Fool's Gold? is a welcome addition to the historical literature on the beginning of the gold rush in Australia, but it raises as many questions as it answers. Working with family papers, Australian archives including the Mitchell Library's W.B. Clarke collection, British documents reproduced by the Australian Joint Copying Project, and secondary sources, Lynnette Silver has accomplished a valuable piece of investigative research in seeking to establish as the true discoverer of payable gold in New South Wales her long-neglected ancestor, William Tipple Smith (1803–1852; arrived NSW 1835). Silver recapitulates the tolerably accurate chronology of earlier gold finds, set forth by previous scholars, before presenting a detailed reconstruction of Smith's career as lapidary, mineralogist, manager of the pioneer Fitzroy Iron Works at Mittagong and the man who in 1848 announced his discovery of paying quantities of alluvial gold near Bathurst; three years before E.H. Hargraves proclaimed the Ophir goldfields on the same site. In a 34-page appendix to her well-illustrated book, Silver also reproduces 27 hitherto obscure documents tracing Smith's unsuccessful attempt to secure a governmental reward for his discovery.

A Fool's Gold? will thus prove indispensible for historians of Australian mining, while for the general reader it is chiefly useful, as David Branagan notes in his foreword, in providing a corrective to the received myth that a single decisive gold strike by Hargraves initiated the transformative wave of mining activity which Geoffrey Blainey has aptly termed 'the rush that never ended.' Historians of science, however, will be disappointed to find that the roles of those with some scientific claim to priority in prediction or discovery — John Lhotsky, Paul de Strzelecki, W.B. Clarke and Roderick Murchison — are given short shrift in comparison with the practical prospectors, Smith and Hargraves, and even secondary actors such as John Lister, William and James Tom and the metallurgist Enoch Rudder. The role of Hargraves' crony Simpson Davison also remains unclear, but the book, while admittedly a monograph, presents graver problems than imbalance of treatment. Most obvious is the author's identification with her forebear Smith, which unfortunately infuses her narrative with a somewhat shrill tone of righteous outrage and combativeness. Worse, it leads her to draw certain unsubstantiated conclusions which will not bear analysis. One is warned in the prologue that the author is a righter of wrongs, intent on setting the record straight; but if truth is the daughter of time, here is history with a vengeance, for Clio hath no vindicator like the resentful descendant. Silver's sympathy for Smith causes not only a plethora of overly-emotive prose: 'lonely, neglected grave,' 'systematic destruction . . . of an innocent and courageous man', but, less excusably, the tendentious implication that there has been a conspiratorial cover-up of facts by most actors in the drama and historians thenceforth.

The usefulness of the book is further mitigated by its many factual errors, which when compounded and built upon in the course of the narrative leave the linkage of events unclear. The author, who castigates previous historians for slipshod research, thus falls far short of her own claim that 'all the statements made in regard to W.T. Smith's activities are supported by documented evidence' (p. xiii). For example, Silver implies (pp. 4, 16) that the British geologist Sir Roderick Murchison was shown specimens of gold collected in Australia by Paul de Strzelecki upon the latter's return to England in 1844, and that these specimens inspired his celebrated prediction to the Royal Geographical Society in that year of the probability of gold occuring in the Great Dividing Range. In fact, Murchison neither saw nor heard anything of Australian gold from Strzelecki at this time, for as the Pole later testified, he, like W.B. Clarke, had been pledged to silence on the matter by Governor Gipps. Murchison's prediction was founded solely on his comparison of the gold-bearing strata of the Russian Urals with the formations of the Australian range as set forth in Strzelecki's collection of rock (not gold) specimens and the manuscript of his *Physical Description of New South Wales and Van Diemen's Land*, published in 1845. Nor, contrary to Silver's claim, did Murchison's rather vague prediction to the R.G.S. specify upon which side of the Great Dividing Range he expected gold to be found. Only in his reiterated forecast to the Royal Geological Society of Cornwall in 1846 did Murchison mention the western flank of the cordillera, for he had by then learned from some other source of gold specimens found in the vicinity of Bathurst.

Since Silver failed to consult original sources for Murchison's predictions, it is little wonder that this confusion has arisen, or that it leads her into the further error of attributing to Murchison an article 'Geology: Comparison of Russia and Australia', which appeared in the *Sydney Morning Herald* of 28 September, 1847 (pp. 12, 89). This was the work of W.B. Clarke, who, unaware of Murchison's predictions and like him influenced by Humboldt's views on the occurrence of metalliferous deposits in meridional mountain chains, had independently worked out much the same comparison between the Urals and the Great Dividing Range on the basis of an abstract of Murchison's book describing the Urals and information supplied from Russia by his own brother. In contrast to Murchison's initial speculation, however, Clarke herein specified the probable location of alluvial goldfields on the western side of the Australian chain, where he had found traces of the metal in 1841. Silver notes but cannot accept Clarke's claim to authorship of this article (p. 11) because of her mistaken conviction

that it was the source of Smith's acquaintance with the Murchisonian views, which Smith himself admitted had inspired his prospecting venture (pp. 135, 137).

The portraits of Clarke and Murchison are distorted, the latter suffering especially from Silver's failure to consult the major corpus of his correspondence. Such a perusal would confirm, for example, as a printed note in G.C. Mundy's *Our Antipodes* (2nd edition, 1852) suggests, that the section of this influential book which describes the gold discoveries was literally dictated to the author by Murchison. In consequence, Mundy hardly emerges as the 'unlikely advocate for both Murchison and Smith' (p. 105) that Silver would have him. Silver might also have explicated the shifting patterns of alliance which evolved between Hargraves, Clarke and Murchison as they strove for recognition of their respective claims to priority as prophets and prospectors during the 1850s. For at stake in this important dispute were the competing knowledge claims of geologists and practical miners. Winning the struggle meant commandeering public opinion, and the subordinate cultural status of colony vis-a-vis metropolis is illustrated by the contrast between the jack-of-all-trades Hargraves triumphing over the scientist Clarke in New South Wales as the harbinger of golden prosperity, and the well-connected savant Murchison being widely credited in England with initiating this profound change in imperial affairs.

Throughout, Hargraves and Murchison demonstrated a mastery of publicity techniques which, coupled with dogged ruthlessness, gave them a large measure of control over posterity's view of Australian gold discovery. Smith prejudiced his own case by initially announcing his discoveries to the home government through the indirect channel of Murchison, though the latter continued to champion Smith's precedence on the ground because it bolstered his own claim to theoretical priority from afar. Smith's subsequent failure to divulge the location of his finds to the authorities in Sydney when given the opportunity some two years prior to Hargraves' eager acceptance of essentially the same offer, and his tragic death in the midst of the agitation to increase Hargraves' reward, sealed his obscurity, not the 'wiles of sophisticated administrators' (p. 108) in complicity with the self-interested propaganda of Hargraves.

While Silver has succeeded in restoring Smith to prominence and further exposing the charlatanism of Hargraves, the latter's niche in history nevertheless remains secure for having irrevocably precipitated Australia's first gold rush in 1851. The roles of Clarke and Murchison have faded in comparison. Clarke is remembered as 'The father of Australian geology' who, if we may believe his testimony, was hushed up on gold by Gipps in a justly famous phrase. Murchison's intense interest in Australia, at once scientific and imperial, began with the fortuitously accurate prognostication regarding gold which helped secure his appointment in 1855 as Director-General of the British Geological Survey and found ongoing expression in his steady promotion of the exploration, development and defence of the continent. *A Fool's Gold?* advances the historical debate on Australia's early gold discoveries, but a thorough, objective study is still required to synthesize the disparate strands of a story which remains, as Murchison described it, a 'Vexata Questio.'

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Hélène Richard, ***Le Voyage de d'Entrecasteaux à la recherche de Lapérouse*** **(Editions C.T.H.S., Paris, 1986), 376 pp., illus. (250 FF).**

It is most pleasing to note the appearance of a serious, scholarly book on D'Entrecasteaux and his 1791–1794 voyage of exploration. D'Entrecasteaux and his work on that voyage have not been prime targets for scholarly research over the years for two very understandable if unacceptable reasons. First, D'Entrecasteaux has been given a popular historical role as a minor actor in a drama about a greater man, the Comte de La Pérouse. D'Entrecasteaux is to the history of French exploration of the South Seas what Henry Morton Stanley is to the history of African exploration. Stanley is popularly known as the man sent to find the missing missionary and explorer David Livingstone, and who, on finding him in the bush, uttered the immortal words, 'Dr. Livingstone I presume'. Yet Stanley was a far more important man than that in history. He was an explorer who contributed greatly to African discovery, examining the sources of the Nile and the Congo.

D'Entrecasteaux is in the same position. He was selected by the French revolutionary constitutional government to go to the Pacific to find the missing explorer La Pérouse and his scientific team, who had been sent to the Pacific and Indian Oceans to complete James Cook's unfinished work, and who disappeared in 1788. That is the popular role he has been given, but like Stanley he was an explorer in his own right, sent out with the support of French scientists to complete what La Pérouse had not finished. This is how D'Entrecasteaux needs to be evaluated and judged: as an explorer in his own right.

Second, D'Entrecasteaux's scientific mission, like that of La Pérouse, was never completed, primarily for political reasons. The mission ended suddenly in the Dutch East Indies in February 1794 when the explorers learnt of the execution of the French monarch. As a result, the vessels were taken over by royalists and the scientific records were impounded, making it unlike other previous

scientific mission where scientists had the opportunity to work continually on their research notes and collections.

Judged by first appearances and by the beginnings of her work, Hélène Richard appears to fall into the trap of accepting and following the lead of popular historical myth makers. She entitles her book *The Voyage of D'Entrecasteaux in Search of La Pérouse* and wastes time and space in an introduction about La Pérouse in which she says nothing new and misses the point about the relationship. As indicated above, D'Entrecasteaux was sent to fill in the gaps of knowledge left by Cook and La Pérouse about Australia, which was becoming of signal interest to Enlightenment scholars. There was little information about Australia in the new French encyclopedia of comprehensive knowledge, and this had to be rectified. The effort to do so became a race between Britain and France, and this would have made a more appropriate and interesting introductory note to the book. There is a whole story of scientific effort and competition between the British Royal Society and French learned societies — the centre of the European Enlightenment — to be told here: how France tried to regain prestige after the humiliating 1763 Peace of Paris made after the Seven Years' War, by despatching Bougainville on a scientific mission to the Pacific to better the work of Anson; how Cook was despatched with Banks to win glory as the scientific discoverers of the Pacific; how La Pérouse and his predecessors were despatched to do a more thorough job than Cook; how Vancouver was despatched by Britain before D'Entrecasteaux left to examine southern New Holland; and so on.

That D'Entrecasteaux is of great importance in this context cannot be denied. The mission he led from 1791 to 1794 was one of the greatest scientific missions ever to leave Europe at that time. D'Entrecasteaux had two research vessels, the appropriately named *Recherche* and *Espérance.* On board were a total complement of thirteen scientists and scientific assistants: eight on the *Recherche* if we include young Fitz, and five on the *Espérance*, as well as scientifically competent naval officers such as de Rossel, who made impressive contributions to knowledge about astronomy and terrestrial magnetism. This team offered scientific expertise in a variety of disciplines and research fields and compared favourably with the team sent out under La Pérouse, which numbered fourteen but did not cover as wide a range of disciplines. And it far outshone the scientific missions sent out by Britain under Cook and Vancouver, who had little in the way of scientific resources on their voyages. Cook had a scientific team of five on his first voyage, primarily with expertise in botany, and five on his second and third voyages, while Vancouver had only one, who was actually a naval surgeon. The work and results of D'Entrecasteaux's scientific team are thus of considerable importance.

When the reader gets past Hélène Richard's introductory material into the text of the book proper, it is pleasing to note that she writes about D'Entrecasteaux's scientific role, aims and achievements, and she has based what she says on wide and detailed researches made in a most scholarly manner. She has sought out and worked on the original records of the voyage. There are two other sources she could have added and considered: Série Marine B4:315 in the Archives Nationales, and Nouvelles Acquisitions Francaises no. 9347 in the Département des Manuscrits at the Bibliothèque Nationale. With regard to her bibliography, I must add that I find the arrangement confusing and historically and archivally illogical. The bibliography of manuscripts consists of two sections: documents conserved in various repositories including the Archives Nationales, and documents of the expedition which also includes the Archives Nationales. I see no reason to put the original records of the expedition, which have been filed in Série Marine BB4:992–994 in the Archives Nationales, into a section separated from Série Marine 5JJl–23, which are the hydrographic and other records of the expedition kept in the same archives.

The text itself is divided into three sections composed of a total of eleven chapters and a conclusion, covering the mounting of the scientific expedition, its equipment and the work conducted by the scientists.

Part 1 has three chapters on the preparations for the mission, which clearly portray the scientific aims of the voyage and the nature of the personnel selected to achieve them. This is a rather long section in relation to the rest of the book. The course of the voyage and the work of the scientists is described in Part 2, which consists of five chapters. The first provides a brief description of the course of the voyage, the second described the geographic scientific work conducted, the third the work of the natural historians, the fourth the anthropology, and the fifth concerns scientific conditions of research ships. Each of these chapters offers a mine of information, although there are some patches which are not clear and show incomplete research. For example, Hélène Richard, quoting from Broc (p. 30), creates the impression that Philippe Buache's ideas about physical geography were destroyed by research, but the matter is not as simple as that. The old ideas were still evident later in the work of Edmunde Mentelle, who held a commanding position in geography teaching in France to 1815.

Part 3 decribes the end of the expedition, the difficult paths the scientists and sailors took to get back to France, and the efforts made by those who remained to write up their researches. What Hélène Richard describes in this section pin-points the basic problem which plagued the mission from the beginning. The vessels left France when all seemed well politically. That September, not long before the ships sailed, Louis XVI accepted the new constitution. Moderation seemed to prevail. But already there was evidence of a strong republican

feeling and indications that many in France sought a break with tradition. On board the research vessels, the division and the potential for trouble was no different. In general, the scientists, led by de Billardière, were revolutionary in spirit. They believed in the idea of a 'new science' and a 'new scientific outlook', not possible in the time of the old regime. There was much on board the vessels with which revolutionary scientists could find fault. The officers were appointed in the old way, by rank according to nobility. Consequently, it is not surprising to find bitter divisions constantly prevailing. Hélène Richard describes these in the last chapter. These happenings could have been married better into the text, and not left until last. Also it would be interesting to know which, if any, of the scientists on the mission were singled out for special mention in the 1795 decree of the National Convention as being scientists worthy of encouragement by the revolutionary government. Some certainly would have qualified politically, especially those who raced to report the errant royalists to the Committee of Public Safety, for prosecution and purging. Such happenings, where certain scientists are politically favoured, do have bearings on scientific methods, aims and results, and these need to be investigated and described.

Much of the book is of interest, but it is not wholly satisfactory for two reasons. First, the treatment given to the research efforts is too short and inconclusive. In the section on geography, for example, Hélène Richard describes the navigational mathematical techniques used to determine position. These are not adequately described. How, for example, did these compare with hour angles measured by chronometers? What was the chronometer error? Which technique was used to draw the maps?

More significantly, Hélène Richard's use of what Germans call an Überblick of scientific achievements made by the expedition, does not seem to provide the clear results needed to show exactly what contributions D'Entrecasteaux's scientists made to knowledge. She has chosen to describe each science in turn, giving examples from the different places visited. The alternative of dividing the material on a geographical basis (Tasmania, Southern New Holland etc.) would give a clearer picture of what D'Entrecasteaux achieved scientifically, where it was achieved, how it was achieved, and where it fits into the history of the development of knowledge about each of the different parts of the South Seas which were separately surveyed by France and Britain in a spirit of scientific competition.

Nevertheless, the research scholar will find this a useful hand-book, containing valuable information on French scientists and science. It is an admirable guide to the documentary records of the voyage, and it will serve well those wanting to write more detailed studies of the specific discoveries and contributions made by D'Entrecasteaux's scientists when they surveyed New Holland and other places in their pristine state.

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