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Michael K. Organ

University of Wollongong, morgan@uow.edu.au

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W.B. Clarke as Scientific Journalist

Michael Organ*

Abstract

This paper comments on W.B. Clarke's role as a scientific journalist in Sydney, 1839–1878. It also argues that Clarke has been misrepresented over time because large sections of his published work — specifically anonymous and signed newspaper articles — have not been considered in analyses of his life and assessments of his place in the history of Australian science.

Introduction

On 12 March 1847, a lead article appeared in the *Sydney Morning Herald* entitled 'The Intellectual Barrenness of New South Wales'. Though unsigned and exhibiting evidence of journalistic exaggeration, it bore the mark of that ubiquitous parson and scientific crusader, the Reverend W.B. Clarke. It made a scathing attack on the lack of encouragement given to matters of science and intellectual development within the colony of New South Wales, and was based on a comparison with that other (former) British colony, the United States.¹

The article followed a personal attack against Clarke launched by the Sydney newspaper *The Atlas* on 16 January, questioning his right to publish so freely — and anonymously — within the *Sydney Morning Herald*. Clarke, and the editor of the *Sydney Morning Herald*, initially replied to these charges during January–February.² Then, on 12 March, he lashed out with a general attack on the intellectual state of the colony, in the following terms:

We really blush to think that this colony has not been able to exhibit one single public school worthy of the name; that those institutions which were once set foot on, to serve as such, have, with scarcely an exception, fallen into decay or lassitude; and that no society exists which may be called in any sense national; that not even a periodical, save a newspaper, is able to maintain more than an ephemeral

existence; and that there is not one solitary channel in which the interesting facts of scientific enquiry, agricultural experiment, or mechanical ingenuity, can be handed down to our children, registered for reference, or conveyed to other nations as a proof and evidence that this great and ambitious colony has yet been emancipated from convict indifference, or the fumes of rum and tobacco.

Harsh words indeed, in part echoing the 1829 comments of Archdeacon Scott following the failure of his plan to implement a comprehensive system of education within the colony, or to foster a body such as a Royal Society.³

So far as schools are concerned, Clarke is obviously here referring to the King's School, Parramatta, as well as Sydney's Australian College, St James's Grammar School, and Sydney College (now Sydney Grammar School). The King's School had operated since 1832, however it had fallen into disrepute during the mid-'forties when its master became insolvent; John Dunmore Lang's Australian College had opened in 1831 and existed intermittently until 1854, closing between 1841–6 due to the depression; the Sydney College took students between 1835–48. Private tutorship was also popular due to the lack of success of these and other institutions, the most successful being Rev. Mr Forrest (Campbelltown), Mr Cape (Sydney), Mr Woolls (Parramatta) and the Sydney Ladies' School run by the Misses Deane.⁴

In Clarke's mind New South Wales, following sixty years of white settlement, had little to show in the way of intellectual development, especially after comparison with the United States. It is accepted that the Americans had 200 years' advantage, yet Harvard College emerged in 1636, only about twenty years after settlement. Australia had nothing remotely like it in its first fifty years.

Despite Clarke's assertions, New South Wales was obviously not an intellectual wasteland in 1847, however it did have its failings and our concerned parson was able to use select examples to enforce his argument. It was a fact that schools opened and closed with regularity, and there were real problems with the local education system in that year. Most children of the wealthy were sent to England for a comprehensive education and the possibility of further study, though individuals such as William Windeyer and David Scott Mitchell survived local schooling during this period to be amongst the first undergraduates at the University of Sydney four years later. The influx of free

* 26 Popes Road, Woonona, NSW 2517.

immigrants after 1835 and the cessation of convict transportation in 1840 had meant that by 1844 there were 25,676 school-age children in the colony, of which about 13,000 were receiving no formal education.⁵

Clarke had for many years been an educator. He taught at his father's school between 1824 and 1831, eventually becoming principal there, and also preached on the subject of religious education. During 1833 he had published in London a work entitled *The Duty and Interest of Educating the Children of the Poor in the Principles of the National Religion*. Shortly after arriving in New South Wales he was headmaster of King's School, Parramatta for a brief period between July 1839 and December 1840, and he lectured on geology at St James's Grammar School, Sydney, during 1843.

By 1847 Clarke held a real fear that the children of the colony would not, in the foreseeable future, have the same educational opportunities as their parents had had in Britain. His article brought together private concerns regarding education and the pursuit of science in the colony. It came after more than a decade of public quarrelling over Governor Bourke's moves toward a National school system based on the Irish model. Vehement Protestant protests were led by the Bishop of Australia, W.G. Broughton, and supported by Governor Gipps. However Clarke's editorial was one of the last salvos in the churches' attack, and a dual system of National and Denominational schooling was introduced by the new Governor, Fitzroy, in 1848, following on from the recommendations of the Lowe committee four years previously.

In comparing Americans with Australians, Clarke noted:

It is their intellectual superiority. It is, that with all their search after dollars, and their ambitious pursuit after commercial enterprise, they have a feeling that if their country is to maintain its position amidst the contending rivalries of the older nations, it must not be simply by the strong arm, but by the refinement of the mind; by proving themselves worthy of the intellectual as well as the commercial conquests that await them.

Noble sentiments, and obviously reinforced in Clarke's mind following his personal experiences with the visiting scientists of the United States Exploring Expedition during 1839–40, especially with brilliant young geologist James Dwight Dana. As regards the economic development of the colony of New South Wales, Clarke somewhat sarcastically boasted:

So far as the growth of wool, or the production of tallow, or the increase of illicit spirits may go — so far as the consumption of tobacco and brandy and rum may be taken as items in the history of our advancement, no doubt New South Wales exhibits remarkable development and indefatigable perseverance.

Clarke's article also addressed the lack of a national scientific or literary society and associated avenue for publication, which issue was especially irksome for the prolific Clarke. He was concerned not only for the ultimate fate of his own researches, but also for future generations of Australians, and not only in the area of science.

What had caused Clarke to write so publicly on these issues, and to declare the 'painful thoughts' he held for the land which he would adopt as his own? Why was this Anglican clergyman not only involved in, but actively promoting, public controversy? Why should he proclaim New South Wales intellectually barren when he knew such a statement to be an exaggeration? To answer these questions we need to understand some of the personal complexities of this scientist/journalist, and also something of the climate in which he was operating.

The Life of W.B. Clarke

William Branwhite Clarke was born on 2 June 1798 at East Bergholt, Suffolk, England. After receiving an education at the local school where his father was headmaster, William entered Jesus College, Cambridge, in 1817. He eventually received a B.A. in 1821 (which converted to an M.A. in 1824) and was ordained a priest of the Church of England in 1823. Whilst at Cambridge he was much influenced by the geologist Reverend Professor Adam Sedgwick, then at the outset of his notable career and already an enthusiastic proponent of this relatively new branch of science. In 1839 Clarke emigrated to Australia with his family. After a long and active career, he died on the morning of 16 June 1878, at St Leonard's, Sydney.

W.B. Clarke is an enigma. Two major biographical works and a number of minor discussion papers have appeared on this man who is regarded by some as the 'Father of Australian Geology' and 'the nestor of Australian philosophers',⁶ yet these works only present fragments of his multi-faceted personality and wide-ranging scientific endeavours. Most have spoken warmly of Clarke, though in recent times criticisms have appeared. The real Clarke has never been

fully revealed, giving rise to a lack of appreciation of his true place in the annals of Australian science and a misunderstanding of his *modus operandi*. Until the complete gamut of his work is displayed and studied, the allocation of praise, or criticism, must be tempered.

Elena Grainger's 1982 biography presented the personal side of the man, revealing a picture of Clarke in his youth, his early education and interest in natural history, science, literature, and poetry; a tumultuous affair of the heart in 1830–1; lengthy separation from wife and family during the 1840s and 1850s; constant financial problems, parish duties, and ill-health; and peaceful domesticity in retirement, surrounded by family and friends. However, her book was sadly deficient in its analysis of Clarke's lifework in the fields of science and natural history, and has been criticized for this.⁷

James Jervis's lengthy, fragmented biography of 1944 attempted to cover all the bases — from Clarke's family life through to his early travels in Europe, his subsequent scientific and literary aspirations and dissertations, and his involvement in matters of religion, politics and exploration in New South Wales. In the end, it was more a collection of notes and references (and valuable at that) than a cohesive biography. Jervis was also deficient in his analysis of Clarke's writings for local newspapers, merely concluding that 'it would be impossible to list all Clarke's journalistic contributions, but this was valuable work, as it gave publicity to the latest scientific thought and work'.⁸

Perhaps the failings of these and other authors who have commented upon Clarke at length, and tried to bring to public attention his considerable involvement in the development of science in nineteenth-century Australia, is that they failed to lift the very real veil of secrecy that Clarke himself drew over many aspects of his public life, especially his journalism. The aforementioned biographies were therefore based upon an incomplete record; they cannot claim to be definitive, once we accept that his numerous newspaper articles must be considered in any assessment of his work.

W.B. Clarke was a complex man, like his contemporaries T.L. Mitchell and Ludwig Leichhardt. Publicly he enjoyed the image of a kindly Anglican parson, well liked by his parishioners, and was generally perceived as a scientist of note and sometime public commentator. Privately he was constantly torn between duty to church and family, and an overwhelming desire to promote and expand

the frontiers of colonial science. However he was also human — his health was fragile; he was passionate, easily provoked, and could be harshly labelled a whinger; an 1840s scandal over the misappropriation of school funds hung over his head; and like his friend and neighbour, the artist Conrad Martens, he liked a nip or two of wine.

Clarke's personal problems were eased somewhat when his family returned to England in January 1842, leaving him free to pursue his geological and meteorological investigations, though the financial strain was thereby increased. Maria Clarke was homesick and the three children needed a comprehensive education, something that William believed the colony could not provide. The family did not return to Australia until December 1856, after Clarke had suffered a mild stroke and his parishioners were moved to raise the necessary funds for their passage from England. Throughout the period of separation, William was forced to support his family with money sent from the colony. This proved to be an almost unbearable strain on his always meagre income as a parish priest, a small sum which was supplemented by payments for his journalistic endeavours. It was not until 1862 that he received some public acknowledgement and financial reward for his scientific work, though he was paid for his geological surveys in the Australian goldfields during 1851–3.

W.B. Clarke and Newspapers

Much of Clarke's work as a public commentator related to his journalism, but for the first two decades of his residence in the colony this aspect of his life he preferred to keep hidden. Possibly he had been advised to do so by Bishop Broughton shortly after his arrival, however this is only conjecture. Even though his published comments were mainly of a scientific or religious nature, problems of litigation were as real then as now. It is therefore unfortunately the norm for his numerous newspaper articles, reviews, and even letters to editors, to appear unsigned or cryptically signed if they contained the merest hint of a personal criticism — which many did!⁹ In the small-town environment of Sydney during the 1840s, anonymity was a necessity. Though difficult to maintain, it offered a degree of personal protection. It also, however, led to abuses, of which W.B. Clarke could on occasion be fairly accused.

Clarke's journalism caused him some trouble. As a clergyman he had a certain public image to uphold, and duties to perform — he

must be seen to be religious, understanding, aloof yet not distant, and beyond reproach morally. As a religious figure he should be concerned only with matters of the spirit. Yet the reality of the times meant that politics and religion were very much intertwined in the colony, and clergy were looked to for guidance and leadership in more than just spiritual matters. Clarke was not a typical colonial cleric. He saw himself as a scientist, a rare bird in a former penal colony. He was an inveterate worker, opinionated and passionate, venting his spleen through anonymous newspaper articles, and maintaining a prolific correspondence with friends both in Australia and abroad on matters of science until the day of his death.¹⁰

The lack of money to finance publication of his findings was a constant source of aggravation to Clarke, however throughout his time in Australia he continued to write and to seek such avenues. His publications culminated in his *Researches in the Southern Goldfields* (Sydney, 1860), and his *Remarks on the Sedimentary Formations of New South Wales, illustrated by References to other Provinces of Australasia*, the fourth edition of which was completed on 2 June 1878, only two weeks prior to his death.

For the many Australian works known to be Clarke's, he has been accorded the title 'Father of Australian Geology', as it was in this field of science that he published most and owned up to most publicly. Yet Clarke's geological writings in Australian and overseas journals represent less than a quarter of his total published output during the period 1819–78.¹¹ The remainder consists of works on meteorology, natural history, astronomy, theology, Australian exploration, literature, poetry, politics and a miscellany of other topics. The quality of his geological output therefore needs to be assessed in this light. Perhaps he spread himself too thin.

Almost half of the more than 500 published works by Clarke that I have identified appeared in Australian newspapers between 1839 and his death. He doubtless contributed others to British dailies and literary and religious journals prior to his emigration in 1839, though the task of locating and identifying these is daunting, and almost impossible where they are unsigned. So far as his Australian journalistic forays are concerned, we are aided by the fact that Clarke confined himself to a few Sydney newspapers such as the *Sydney Morning Herald*, *The Australian*, and *The Empire*. Articles were often reprinted in other colonies, however, and these are more difficult to track down.

Clarke's published papers, whether in learned journals or in the popular press, always bore the mark of an extremely well read individual with an analytical, enquiring mind. They usually contained a liberal smattering of quotations, and were well referenced. They varied from clear and lucid to confused and wordy. Price Warung, one of the most perceptive of Clarke's biographers, noted in 1895 that, 'as a prose writer, he wrote too much to write brilliantly'.¹² Even when he was defending a personal criticism, as in a letter to an editor, Clarke would often meander and waver before eventually getting to the point. In some cases his pen could be as sharp as those of the most venomous of the colony's political snakes, such as Robert Lowe, one-time editor of *The Atlas*. For example, of John Calvert's *Gold Rocks of Great Britain and Ireland, and a General Outline of the Gold Regions of the World, with a Treatise on the Geology of Gold* (London, 1854), Clarke wrote in review:

It is an immense collection of apocryphal and half-invented statements, mingled with just enough truth to make them at first glance, palatable to the covetous. . . . [Calvert] may be a pretender and a rogue, trying to excite the formation of gold companies on insufficient or distorted data, or, which is far more likely, endeavouring to write himself into notoriety by his skill in medieval archery — i.e. — "drawing the long bow". . . . We wish our mineral surveyor would leave the word "geology" out of his writings. . . . He has got hold of the word, but has yet to learn its meaning.¹³

In using such strong language, Clarke opened himself to criticism from those in the colony who thought his journalism not proper behaviour for a parson, and his services to colonial science not deserving of public accolade or monetary reward. A certain 'X.Y.Z.' was to comment in 1850 in a letter to the editor of the *Herald* during a debate on artesian wells:

The scientific W.B.C. runs some risk of damaging his reputation by the quibbling and angry spirit which he is too fond of exhibiting. His carelessness (for I cannot believe it to be ignorance) is also censurable.¹⁴

In most instances Clarke sought to defend these charges, even if anonymously, and in doing so often tended to aggravate the situation. As a public commentator he was both respected and despised, and those who held negative opinions would periodically give

public vent to these, as did 'A.D.M.' in 1847 and 'Historicus' (William Bland) in 1862.¹⁵

Some of the deficiencies of previous biographical works on Clarke stem from the almost total neglect of his journalistic endeavours and private papers. Until recently, only a section of Clarke's voluminous correspondence, along with his more easily accessible publications, have been considered in discussions of his role in nineteenth-century Australian society. These publications have included his books and his numerous articles in journals such as those of the Geological Society of London and the Royal Society of New South Wales. We have no way of knowing how much material was destroyed in the Garden Palace fire of 22 September 1882, Clarke's lifetime geological collections (rocks, fossils, maps, plans, sections, field diaries, notes, etc.) and library having been placed in storage there following their purchase by the New South Wales government for £7,000. This collection would undoubtedly have provided a rich archive for future studies, its destruction a hindrance not only to the further delineation of New South Wales geology, but also to subsequent analysis of Clarke's own work in that field.

If Clarke were only a minor figure in the Australian science of his day, one could ask: why bother looking at his correspondence and newspaper articles in such depth? and, why take his 'Intellectual Barrenness' article at all seriously? The fact is, he did have a certain standing in the local scientific community during his lifetime and his surviving manuscript collections are a goldmine not only of information about Clarke himself, but also for anyone interested in the development of the physical sciences in Australia during the second half of the nineteenth century. The omissions of previous writers about Clarke are not really the fault of those authors for, as Professor John Smith of the University of Sydney lamented shortly after Clarke's death:

Considering the great number of separate papers which issued from Mr Clarke's busy brain and pen, it is somewhat remarkable that he did not, except to a limited extent, seek to collect and condense his vast stores of information into convenient volumes for scientific libraries. It is probable that want of means in addition to want of leisure was the chief cause of this apparent neglect, but whatever the cause the fact is to be regretted, for the difficulty of referring to papers scattered over many periodicals and many years is such that practically they drop into obliv-

ion, and it is difficult now to form a just conception of Mr Clarke's enormous labours.¹⁶

Smith's fears that Clarke's 'enormous labours' would not be fully appreciated in the future must have been heightened when he realised the extent of the Garden Palace fire losses. Clarke's newspaper articles — even then unknown to Smith — form a large body of work and have never previously been identified and catalogued. A list of Clarke's more important published works entitled 'Miscellaneous Published Notices and Memoirs', along with a brief biography and an engraved portrait, did appear in *The Sydney Mail* of Saturday, 13 July 1872. The information contained therein had been supplied by Clarke, though it was a summary only of his total output and referred to less than 150 individual works. Even during his lifetime, Clarke himself lamented that newspapers were ephemeral, and he constantly tried to submit his more substantial or important works to overseas journals where they would remain on public record, even if in an abbreviated form. Fortunately he also maintained newscutting files which have survived within the 'Clarke Papers' collection in the Mitchell Library. I have used this material to locate and verify some of his more obscure newspaper articles, though many remain unidentified.

By 1847, when Clarke penned the 'Intellectual Barrenness' article, he had come to realise that the local newspapers were his only real avenue for publication and comment (much as he had used the *Magazine of Natural History* in England during the 1830s), and he praised them as such. After criticizing the intellectual deficiencies of the colony and the deprivations of its people he went further:

But besides her newspapers what has she done?... Is there one single publication which is exclusively devoted to the assertion of the dignity or the enterprise of our people as intellectual, or educated or enquiring people, beyond the sphere of gossiping, politics, and squabbles?... Whither are they to seek, in this far away world, for a glimpse of that refinement, or a spark of that intellectual fire which softens and refines and illumines the whole mass of the social community in the fatherland?

The only scientific society in Sydney at the time was the Australian Floral and Horticultural Society, or Sydney Horticultural Society, which had been in existence since 1836. Unfortunately it was a small specialist

group, chiefly supported by professional gardeners.¹⁷ Clarke was to become a committee member of the more open Australasian Botanic and Horticultural Society which replaced it early in 1848. Scientific lectures and discussions were also held intermittently at the Sydney School of Arts, the mechanics institute that had been in existence since 1833 and claimed 499 members during 1847. It held a small library collection and offered practical classes to those with no formal education.¹⁸

Intellectual cliques also existed, perhaps the most noteworthy being the group around W.S. Macleay, comprising members of the scientific and legal fraternities such as Robert Lowe, T.L. Mitchell, Sir Charles Nicholson and Alfred Stephen. Our lowly parson does not appear to have been privy to its discussions.

With no local scientific journal operating in Sydney during the 1840s, Clarke turned to the newspapers out of necessity. To neglect his many articles and letters to the editor that appeared almost weekly in papers such as the *Sydney Morning Herald* is to seriously underestimate Clarke's role and influence on many aspects of New South Wales society and its perceptions of popular science. For example, his researches in the area of local meteorology have all but been forgotten because they only ever appeared in the Sydney newspapers, and very occasionally in British meteorological journals; yet these same articles were able to generate correspondence and reports from throughout the colony.¹⁹ His years of accumulating data and public promulgation of theories on the weather in the local press greatly influenced later workers such as H.C. Russell, who went on to publish the first Australian weather map in the *Sydney Morning Herald* on 6 February 1877.²⁰

As sometime features editor for the *Sydney Morning Herald* in the 1840s and 1850s, and contributor to *The Australian* in 1844 and *The Empire* in the 1860s, Clarke was responsible for bringing to those papers a decided scientific bent. Journal and newspaper items from all over the world on subjects such as earthquakes, volcanoes, comets, exploration and meteorology appeared, most likely as a result of his intervention. They filled out the local news and advertisements, and were appreciated by a population deprived of the intellectual pursuits that they had taken for granted in England. Original input by Clarke included reviews of scientific texts and journals, reports on scientific debate both in Australia and abroad, and discussions on the discoveries of explorers

such as George Grey, T.L. Mitchell, Charles Sturt, John Lort Stokes, Ludwig Leichhardt, Edmund Kennedy and Edward John Eyre.²¹

Apart from the worthy *Tasmanian Journal of Natural Science*, got up in Hobart with the support of Lt Governor Sir John and Lady Jane Franklin, newspapers were the only local avenue for publication and discussion prior to the creation of bodies such as the Philosophical Society and later Royal Society of New South Wales with their more substantial publications of record after 1857.²² The first journal to appear was the *Sydney Magazine of Science and Art*, published between 1857 and 1859; however, even during the 1860s and 1870s the Sydney newspapers continued to publish, in extract or in full, copies of papers read before these learned societies. For example, W.B. Clarke's paper, 'On the Causes and Phenomena of Earthquakes, especially in relation to Shocks felt in Australia', delivered to the Royal Society of New South Wales on 2 September 1868, appeared in the *Sydney Morning Herald* the following day in an abridged form, and later in the *Transactions of the Royal Society of New South Wales* for 1868. Neither published version included Clarke's comprehensive catalogue of Australian earthquakes (1787–1868) and accompanying maps presented during the talk.

That W.B. Clarke was behind the push for more intellectual content in the *Sydney Morning Herald* and *The Australian*, away from reports of political bickering, fluctuating economic conditions and the moral turpitude of the population, should be acknowledged. The success of his effort is reflected in the fact that many of his articles were given lead status and presented in numbered parts, instead of suffering the indignities of abridgement; while his reviews of scientific texts often took up a complete page, with substantial extracts, and his letters to the editor would lead to stimulating debates that could last for many months.²³ Thus the *Sydney Morning Herald*, *The Australian*, and *The Empire* took on the role of *de facto* scientific journals during this period, though their ephemeral nature severely limited any long-term influence.

The Anonymous Correspondent

Though he never made this public, Clarke was paid a retainer by various editors for his work, perhaps beginning with the *Sydney Gazette* in 1840 and the *Sydney Morning Herald* after 1841. In 1844 he appears to

have been hired by *The Australian* and during that year his writings appeared almost exclusively in that newspaper, usually as a series of feature articles on such diverse topics as 'English Notions of Australia', 'Colonial Emigration', 'Exploration of New Holland', and 'The Injurious Effects of Hail on the Vine'.²⁴ He returned to writing for the *Sydney Morning Herald* in 1845.

While many of his friends and associates in Sydney knew of Clarke's journalistic work, and he had the tacit support of Bishop Broughton, Clarke continued to protect his public anonymity during his most prolific period (1840–60). With it he was able to cross over from concerning himself with mere natural curiosity, into the area of creating and stoking the fires of scientific, religious and political controversy. An example of this manipulation of public perceptions and the power of Clarke's pen is revealed in the role he played in promoting the expeditions of the German explorer and scientist Ludwig Leichhardt during 1844–6, in direct conflict with the interests of his friend Sir T.L. Mitchell, the colony's 'official' explorer. These events are vividly described in E.M. Webster's *Whirlwinds in the Plain: Ludwig Leichhardt — Friends, Foes and History*,²⁵ which outlines how Leichhardt's associates in New South Wales — foremost among them one W.B. Clarke — contrived to create a popular image for the German.

Clarke was especially keen to present the exploits of local explorers to the public. In questioning why he should develop such an interest, Ann Mozley has succinctly pointed out:

The records of Australian exploration are inextricably linked with the records of her science; all added some detail to the accumulation of observed fact from which an accurate understanding of Australian geography and natural history derived.²⁶

Clarke's writings on Australian exploration, especially those in defence of Leichhardt,²⁷ bore the mark of a crusade, and brought him into conflict with figures such as Sir Thomas Mitchell and John Calvert. Mitchell was eventually to come to an agreement with Clarke in August 1851 that, in the interest of their continuing friendship, they would not discuss comments made of each other in the *Sydney Morning Herald*.²⁸ The aforementioned criticism by 'A.D.M.' had arisen out of Clarke's retelling of the exploits of local explorers and the insertion of critical comment. Some thought this plagiarism.

Thus we see the dichotomy of Clarke — at one moment the serious, private scientist

and priest; at another the public, controversial and sometimes abusive journalist. Undoubtedly he revelled to some extent in this conflict and felt all the better for being able to present his opinions so publicly. Yet there was a price to pay, and his reputation as a man of science suffered accordingly.

Frustration and Controversy

Many of Clarke's controversial comments and much of his stimulation of debate, such as in his long-continued argument with Edward Hammond Hargraves and his supporters over who was the true discoverer of gold in Australia,²⁹ arose out of his frustration with the many problems facing a scientist in Australia in the mid-nineteenth century, and his own perceived lack of progress. Clarke's 1847 outburst echoed an 1842 letter to his mother where he complained, 'this country is so dull, so dead in all that concerns the life of the mind. . .'.³⁰ He was undoubtedly envious when his American friend J.D. Dana's lavish publication on the geology of the United States Exploring Expedition appeared in 1849, with a substantial section on New South Wales and a detailed appendix describing local fossils, plus accompanying plates.³¹

Dana openly acknowledged Clarke's assistance within that work. However, when J.B. Jukes published *A Sketch of the Physical Structure of Australia, so far as it is Known* in London in the following year, based on discussions and fieldwork held four years previously with Clarke and others, our parson was somewhat miffed. Clarke believed that Jukes had not given him appropriate acknowledgement by merely referring to him as 'a friend'. In a later, bitter criticism of the book, Clarke suggested that its findings were out of date and that the text revealed evidence of being hastily written.³² He also accused Jukes of issuing the book merely to upstage his own publication plans, and thereby to claim any accolades.

Clarke did not always welcome rivals. This was especially evident in his cool treatment of Samuel Stutchbury between 1850 and 1855. Clarke wanted to be cock of the walk for geology in Sydney. No doubt he felt isolated, but some of the isolation was of his own making. His aggravation again surfaced in the press in 1861 when, in reply to criticisms by Edward Hammond Hargraves, he wrote:

My own humble claim to a discovery of gold ten years before the finding of those "five little specks" (the description of the "discoverer" himself), has been already

admitted in Mr Hargraves' volume and reasoned on; there is, therefore, no necessity to say more about it. The attempt afterwards to show that that was not a discovery, just as everything I have done during my whole colonial career is ignored, when it suits the purpose of ignoring it, does not affect the truth.³³

While Clarke's earlier comments reveal frustration and annoyance, this latter statement suggests embitterment on his part. Perhaps, after twenty-two years in the colony, his enthusiasm was starting to wane. He was now in his sixties, having survived a stroke in 1856 partially brought on by months of solitary fieldwork in the New South Wales goldfields in 1851–3. The other reasons for disenchantment are obvious enough. He had no resident circle of geologists, young or old, with whom to discuss his work, and he often snubbed those he could have talked to, such as Samuel Stutchbury; lengthy delays with overseas correspondence and publication continued (it would take anywhere from three to five months for a letter to travel between Britain and Australia during Clarke's lifetime, therefore a minimum of eight months could be expected to pass before a reply was received, though longer periods were the norm); the lack of suitable local publication outlets was still an issue; and local scientific societies were struggling to survive. It is no wonder that Clarke's fertile mind strayed from the clarity of science to the emotions of journalism.

The New South Wales and Victorian gold-rushes of the 1850s were in many ways a blessing to Clarke. They brought geological matters to public and government attention; offered him an extra source of income; enhanced his own standing in the community (though he was to waste more than a decade in defending his 'first discoverer' claim); provided an opportunity for him to carry out a geological survey of the country to the north and south of the Cumberland Plain; and raised the international status of Australia from that of penal colony to an important asset of the British Empire. They also injected money and prosperity into the local economy, something that was much needed after the gloom of the 1840s depression. Finally and most importantly, the goldrushes brought geologists, and people interested in geology such as miners and engineers, to the colony. The intellectual isolation and depression of the 1840s was thereby relieved to a degree.

Clarke was not alone in feeling cut off. Previous writers have noted the frustration of

isolation faced by colonial scientists during this period, including W.S. Macleay, Dr George Bennett and P.P. King.³⁴ The New South Wales depression of the early-to-mid-1840s undoubtedly was a hindrance to the pursuit of science and the growth of learned societies, with many of those who would have joined such groups — and who had arrived in the colony with money and dreams of a bright future in a new England — now threatened with insolvency and often forced to return to their homeland. Clarke, ever adaptable, kept up a voluminous correspondence and anxiously sought out visiting scientists and naturalists such as James Dwight Dana (1839–40) and Joseph Beete Jukes and the scientific staff of HMS *Fly* (1842–46) to make up for the lack of residential colleagues. In later years, visitors such as William Stanley Jevons (1859–60) would seek him out.

Clarke as Scientist

When W.B. Clarke arrived in Sydney in 1839, he discovered a small scientific community of dilettantes, with able workers such as the Macleays, the Macarthurs of Camden Park, the Scotts of Glendon, and the Reverend C.P.N. Wilton of Newcastle, all of whom quietly pursued their special areas of interest. In no way, therefore, was New South Wales intellectually barren, though it was a long way from Oxford and Cambridge. Clarke's early involvement with the Australian Museum, the Church Book Society and the Australian Subscription Library soon brought him into contact with what passed for the intellectual community of Sydney, and gave him access to the major public and private library collections in the colony.³⁵

Though he held a degree from Cambridge, Clarke was basically an amateur natural scientist when he first saw Sydney Harbour. He had, however, outgrown dilettantism. He was almost 41 years old and had behind him twenty years as a field geologist and natural historian. He had continually published in British scientific and literary journals during those twenty years, and was an especially prolific contributor to the *Magazine of Natural History* throughout the 1830s. He had seen published in that magazine two substantial papers on natural phenomena (1833–5) and the geology of Dorsetshire (1837–9), numbering 175 and 64 pages respectively.³⁶ His oratory skills were renowned, and a number of pamphlets and booklets were issued by him, both in England and Australia, discussing aspects of theology and religious education, based upon his ser-

mons.³⁷ All the while, he was attending his parish and raising a family.

Clarke's initial, non-scientific aspirations are revealed in his publication of poetry during the 1820s and his unsuccessful application for the position of Professor of English Literature at Cambridge in 1832. After this rebuttal he turned his energies towards the pursuit of geology and the physical sciences. He was not a professionally trained geologist in the modern sense of the word (who then was?), but he knew Sedgwick and probably attended some of his lectures and excursions. He was also an early correspondent of Sir Roderick Murchison. That he was attracted to this new branch of science is obvious from the numerous field trips he made throughout Britain and Europe during the 1820s.

The reasons for his move to the colony were numerous — health, financial, and scientific — though perhaps the challenge of being the first recognized (and experienced) geologist to reside in Australia and actively work at delineating its geological history was the deciding factor. It should be remembered that Clarke arrived in the colony not with any official brief to search for gold or other economic deposits, but with the intention of delineating the basic geology of the carboniferous (sedimentary) formations and obtaining fossils for friends such as Professor Sedgwick. This vast undertaking did not leave time for the leisurely pursuit of gold, and Clarke should not be blamed for failing to announce publicly the 'discovery' of that rare mineral during the early 1840s. He was no entrepreneur and saw no economic benefits for himself in such an announcement. Governor Gipps, when informed of Clarke's discoveries in 1844, specifically told him to keep quiet lest the local population should throw down their tools and head for the goldfields. The colony during the years 1841–4 did not have excess manpower to support a goldrush at the expense of the burgeoning sheep and cattle industries. Also, Clarke did not feel any sense of public duty to impart his hard-won scientific knowledge to local officials. He would gain more kudos by presenting it to overseas associates and journals.

Clarke was a natural gatherer of information — his *Magazine of Natural History* articles are testament to that — and not necessarily an original thinker. He was to become a focus in the colony for the collection and dissemination of information regarding the physical sciences of geology, palaeontology and meteorology, bringing together all the findings of previous workers and laying a solid foundation for the future. It is for this reason that he indeed deserves the accolade

'Father of Australian Geology', given him shortly after his death. There is no doubt that he was looked to for guidance on most matters concerning local geology, though this waned in his later years. As the limits of settlement within New South Wales expanded and new colonies were formed (Victoria and Queensland appeared in 1851 and 1859 respectively), it was necessary for others to take up the mantle (viz. Professor McCoy and also the Victorian Geological Survey after 1852). However in the first two decades of his residence, his advocacy and work in the field raised the status of Australian geology among the local and overseas communities. He was involved in publishing some of the first local reports on the geology of New Zealand, Western Australia and Queensland during the 1860s.³⁸ As early as November 1844, he had sent over 4,000 specimens of rocks and fossils to Professor Sedgwick for study and cataloguing, along with appropriate field notes, and he continued to send samples and drawings overseas for identification through to his final days.³⁹

Clarke was diligent in maintaining overseas contacts, with both individuals and scientific societies. Despite coming into some conflict with Sir Roderick Murchison over the gold discoveries in the early 1850s, he endeavoured to maintain cordial relations with the great man,⁴⁰ and by the end of that decade both were warmly referring to each other within their publications. Murchison praised Clarke for his discovery of the first evidence of Silurian fossils in Australia, and Clarke used Murchison's support to back up his theories on the origin of Australian gold deposits, against the criticism of authors such as Simpson Davison.⁴¹ T.G. Vallance points out that Clarke had originally cultivated Sedgwick, but with little worldly reward.⁴² Correspondence between the two almost ceased following the gold discoveries and Clarke turned to Murchison, Sedgwick's antagonist. Both shared a desire for glory and Clarke's cultivation of Sir Roderick paid off handsomely. It was unfortunate that in England, Murchison was given more credit than the 'colonial parson' (or any of the other claimants such as Strzelecki and the surveyor O'Brien) for the scientific discovery of gold in Australia, on the grounds that he had intimated in 1844 that that mineral could be found in rocks adjacent to the Australian cordillera, basing his scheme on a comparison with Russia and the Urals. Furthermore, Murchison's views were published that year and in 1846, well before the official discoveries.⁴³ Clarke, on the other hand, while having located specimens of gold in 1841 and

1844, did not make such discoveries known in public journals. Despite anonymous intimations by him regarding the auriferous potential of the colony in the *Sydney Morning Herald* as early as 1847, and especially during 1849, he missed out on the accolades that were eventually heaped upon Edward Hammond Hargraves following his announcement of the discovery of gold in May 1851.⁴⁴ So also did Strzelecki, whose gold discoveries were published in the House of Commons papers during 1841 but received little attention.⁴⁵ Hargraves' success lay not in discovering gold, but in creating a goldrush — a claim Clarke could never make.

Despite some questioning of his geological skills and reputation, as in England where it was suggested that a parson should stick to his pulpit, Clarke continued to publish articles on gold and mining in the *Sydney Morning Herald* throughout 1851. He occasionally went public, though for some reason many of his pieces remained unsigned.⁴⁶ He freely dispensed knowledge on quartz crushing and other practical aids to the gold miners of the colony, and his June 1851 pamphlet, *Plain Statements and Practical Hints respecting the Discovery and Workings of Gold in Australia*, was much sought after.⁴⁷

Clarke's skills as a natural historian and field geologist — emphasizing the importance of observation and compilation of data over a lengthy period — held him in good stead during the gold-rush era, for he was immediately able to inform the Colonial Secretary of possible sites for future goldfields. He even claimed a role in the discovery of the Victorian and New Zealand goldfields.⁴⁸ Many practical miners came to appreciate his gold-field reports and articles when they were published in the Sydney papers in 1851–3, and even later when a selection was belatedly issued in book form during 1860.

Clarke's emphasis on field observation also brought him into conflict with the Victorian palaeontologist Frederick McCoy during 1860–1, when that learned gentleman pontificated on the age of the Australian coal beds, based largely on his view of the palaeontological evidence and his studies of the Victorian coalfields. Clarke, while deferring to McCoy's skills as a palaeontologist, knew from stratigraphic field evidence alone that McCoy was wrong with regard to the New South Wales coalfields. He stated so bluntly in articles published in the *Transactions and Proceedings of the Royal Society of Victoria* and the *Magazine of Natural History*, to which McCoy replied in kind.⁴⁹ Once again the parson was embroiled in public controversy, dogmatically proclaiming a

Palaeozoic age for the New South Wales coalfields. Despite the disagreement, Clarke and McCoy continued to correspond and to publish jointly on matters of local geology.⁵⁰

The early 1840s had therefore marked a period of preliminary investigation, acclimatization and consolidation of contacts for Clarke. The late 1840s saw the initial fruits of his labour: his first original publications on Australian geology appeared, and the pattern for future work was set.⁵¹ Rocks and fossils would be sent to England, America, Europe and even India, where they would be identified and/or classified (in association with field data supplied by Clarke), and allocated an age. He would then use the palaeontological information to build further upon his substantial field evidence — modifying a theory here, expanding upon another there, or even completely changing an opinion in the light of new evidence. His lifework exhibited this aspect of progressive change and refinement, despite the restraints of isolation. For example, Clarke's problems in proving the existence of Mesozoic or Secondary formations in Australia were not resolved until the 1860s,⁵² and he had major difficulties in delineating the age of the Australian coalbeds, though he soldiered on to almost get it right with the assistance of palaeontologists such as F. McCoy, L.G. de Koninck and O. Feistmantel.⁵³ His perseverance is reflected in his *Sedimentary Formations* . . . (4th edition) of 1878 — a 166-page book with maps, sections and appendices, which had developed from a 16-page essay originally published in 1867.⁵⁴

Clarke was especially proficient at disseminating the theories of others on a variety of topics besides geology. He developed an interest in the earth sciences at a time when they were in their infancy. He was primarily a natural historian, especially concentrating on geology after his arrival in Australia and subsequently attempting to make that topic his own. Murchison criticized him in 1852 for continuing to expound the theory that 'the outbursts of auriferous chains have any definite relation to the quadrature of the circle . . . the N. and S. theory has gone much out of fashion'.⁵⁵ Yet Clarke openly published this criticism in full — perhaps because it also contained Murchison's praise that 'your silurian discovery rejoices me', which perhaps made up for the humiliation surrounding the outdated gold theory that Murchison had but recently enthused about.

This was not the first nor last time that Clarke presented views that had elsewhere been discarded. His amassing of physical data and subsequent attempts at interpreta-

tion led to his presenting theories on the relationship between certain weather phenomena and volcanoes; between earthquakes and hurricanes; earthquakes and volcanoes; and even the effect of forest vegetation on climate.⁵⁶

Despite the frustration that caused him in 1847 to write of the intellectual barrenness of New South Wales, Clarke continued to work hard to foster scientific research and to bring the results to public attention. As Vice-President of the Royal Society of New South Wales between 1867 and 1877 (the Governor was President ex-officio), he helped build up that group and left it on a sound footing when he died. Clarke was a powerful figure in colonial science right up until his last days, and he undoubtedly enjoyed this standing. However in hindsight his record is not unblemished, and recent critics such as T.G. Vallance, David Branagan, and T.A. Darragh have pointed out some of the negative aspects of his career. Vallance suggests that Clarke the geologist was an industrious plodder, not in the same intellectual class as J.D. Dana, J.B. Jukes, W.S. Macleay or W.S. Jevons: he was 'a small fish in a small pond. What makes him interesting is that it was practically a one-fish pond.'⁵⁷

Branagan is rightly critical of Clarke's coolness towards Samuel Stutchbury, whom he dismissed before even meeting the man. For example, in the weeks just prior to Stutchbury's arrival in the colony in November 1850, Clarke wrote rather off-handedly in a *Herald* editorial:

Instead of Mr Bristowe, it is now understood that a naturalist of some eminence, Curator of a Museum in England, is to come out; but it is very unlikely that that gentleman will feel himself ready to undertake a geological survey, though highly useful as an observer and collector.⁵⁸

Clarke had hoped that a geologist experienced in field survey work, such as his friend J.B. Jukes, or the Mr Bristowe referred to above (both formerly involved with the Geological Survey of the United Kingdom and Ireland) would have obtained the position. He thought Stutchbury not experienced enough for the job in hand and held this position throughout Stutchbury's period of employment. Clarke went on to suggest that his own 'voluntary' services would prove more useful in the long term. Whilst Clarke's antagonism towards Stutchbury has been interpreted as jealousy, it is more likely that he was simply upset at the second-class treatment the colony received from the Home

government in the lack of sufficient finances and what he considered appropriate personnel provided for the local Geological Survey. Stutchbury, a man of 'perfectly modest unassuming accommodating disposition',⁵⁹ was the physical embodiment of this policy and bore the brunt of Clarke's ire.

W.B. Clarke could be not only vain, but also petty, as in refusing to share his geological map of New South Wales with R. Brough Smyth during the 1870s.⁶⁰ Darragh is especially critical of Clarke on this matter, citing jealousy and frustration in issuing his own map as reasons for not co-operating with the Victorian, Smyth. However, one could just as easily defend Clarke's right to publish the results of his many years of work in the field under his own name and not in the abbreviated form proposed by Smyth.

On the one hand, the major accomplishments and successes of the New South Wales Geological Survey in the period 1874–1930 by workers such as C.S. Wilkinson, J.E. Carne, and T.W.E. David can in part be attributed to the ground-breaking work and standards set by W.B. Clarke. David later remarked of Clarke's work on the New South Wales coal measures that 'he left little for others to do'.⁶¹ However, Vallance has pointed out that Clarke *was* the New South Wales Geological Survey during the period 1840–74, with only Samuel Stutchbury (1851–55) and the two coalfield examiners W. Keene and J. McKenzie carrying out official surveys apart from his official and unofficial work.⁶²

Clarke's presence, personal egotism and public image as the 'official' colonial geologist were perhaps reasons why a government geological survey was not set up in New South Wales until 1874, many years after the Victorian equivalent had been created in 1852.⁶³ His wanting to have his finger in all the geological pies could be argued to have stifled the pursuit of geological science in New South Wales during the 1850s and 1860s. His unhelpfulness and even outright hostility towards Samuel Stutchbury is on record, yet he was also the main advocate of a local geological survey. While the Home Office dithered — failing to appreciate that after 1840 New South Wales was no longer a penal colony — Clarke continued to pursue his research, to make public his findings, to communicate with knowledgeable overseas workers, openly to seek comment and criticism — though not easily to accept it — and in his later years to encourage young workers in the field, such as Richard Daintree and C.S. Wilkinson.

Clarke's systematic collecting of fossils and despatch of samples to overseas palaeontolo-

gists resulted in numerous important publications culminating, in the year of his death, in Ottokar Feistmantel's definitive work on the 'Geological and Palaeontological Relations of the Coal and Plant-bearing Beds of Palaeozoic and Mesozoic Age in Eastern Australia and Tasmania'.⁶⁴ This major work on Australian palaeontology — with the stratigraphy as much Clarke's as Feistmantel's — followed on the work of L.G. de Koninck⁶⁵ and answered the personal brief that Clarke had been given by Sedgwick and others upon leaving England:

I came to this country in 1839, commissioned to ascertain, for the satisfaction of some of my colleagues at home, the extent and character of the carboniferous formation.⁶⁶

That he was ultimately successful in achieving this goal and fostering the study of colonial geology is unquestionable, and especially meritorious when we consider the isolation and intellectual environment within which he was forced to work, the variety of topics to which he addressed himself, and his on-going commitment to his parish which took up so much of his time.

New South Wales — Intellectually Barren?

That New South Wales was intellectually barren in 1847 is a damning criticism and obviously an exaggeration, yet there was a deal of truth in the claim and one such as Clarke was qualified to make it, even if at the time he had been a resident for less than eight years. Causing him rancour in that year was the failure of the churches to defeat the introduction of a non-denominational system of education. He was also aware of the pace of change in science overseas, and in his quest to involve the fifth continent in these changes he felt frustration due to lack of support, physical isolation and local pettiness. Nevertheless, science was an adventure during Clarke's lifetime. This was undoubtedly one of the reasons he emigrated to Australia. In addition, the thrill of the chase, the knowledge that he was breaking new ground, spurred him on to continue his researches in the field and revelations in print. The 1847 article was W.B. Clarke the journalist speaking. Then, as now, the use of hyperbole and distortion of the truth to emphasize a point were common devices used by the local dailies. That Clarke was speaking from the heart, and not merely stirring the pot, is clear from the tone of the article.

New South Wales was not intellectually barren in 1847, but neither was it a fertile field for scientific or artistic endeavour. Primary schooling was available to only half the population; there were no secondary institutions of distinction; no university; no national society or scientific journal; and intellectual pursuits were low on the government's list of matters to be addressed. Australia was 'a country where highly educated men are comparatively rare', as Colonel Mundy pointed out after a brief residence in 1846–51.⁶⁷ The shortcomings within all levels of the education system were obvious, and the colony's position as a field station for Britain was an accepted reality. Clarke fought hard to change this after the 1860s, when he realised he would never return to England, though prior to that he was as guilty as any in sending information overseas. It could be asked whether he had any real option to pursuing such a course?

Science was not the only intellectual pursuit that was deprived during this period. The local arts also suffered as a result of the 1840s depression, following an initial flourishing in the late 'thirties. Just two months after Clarke's 'Intellectual Barrenness' article appeared, a committee was got up to plan Sydney's first art exhibition, successfully held the following July. The *Herald* welcomed the announcement, though it tempered its report with comments in a vein similar to Clarke's:

We rejoice . . . that at last the higher and more influential inhabitants of Sydney have come forward to promote an object which will tend powerfully to the elevation of public taste, and the progress of public improvement. The apathy of the citizens of Sydney, with regards to anything like intellectual enjoyment, has long been the prolific theme of censure. . . . To men of high education and refined tastes, there will ever be a kind of repugnance to join in the formation of elementary societies fitted for a state of society so rude which exists in this colony.⁶⁸

This extract reveals another problem facing Clarke and the colony, namely class distinction and the convict stain. Class-consciousness and the exclusion of ex-convicts from 'polite' society, in a city with such a small population, meant that Sydney would struggle to support a group such as a Royal Society. South Australia and Victoria did not share this problem to the same degree, as their societies were not convict-based. Fortunately change, though slow to come, was just around the corner, spurred on by the gold

discoveries of 1851 and their role in breaking down old class structures. Clarke's work as a scientific journalist also played a part in this process, helping gradually to chip away at the penal colony stigma attached to New South Wales during his lifetime.

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Notes

Abbreviations used in these notes include: *Aust*, The Australian; *JRAHS*, Journal of the Royal Australian Historical Society; *JPRSNSW*, Journal & Proceedings of the Royal Society of New South Wales; *MNH*, Magazine of Natural History; *SG*, Sydney Gazette; *SMH*, Sydney Morning Herald; *JGS*, Journal of the Geological Society of London; *JGSA*, Journal of the Geological Society of Australia; *TPRSV*, Transactions and Proceedings of the Royal Society of Victoria.

1. Besides being a criticism of the colony, this article was also a commentary on geologist Charles Lyell's *Travels in North America; with Observations on the United States, Canada, and Nova Scotia* (London, 1845). A reading of this book, with its revelations on the intellectual progress of America, was one of the catalysts that caused Clarke to write the article under discussion.
2. *SMH*, 21 January and 4 February 1847. The writer of *The Atlas* article criticizing Clarke is unknown as it was merely signed 'A.D.M.'. While Clarke may have been aware of the identity of the author, he was never named in public. *The Australian* of 30 January even suggested that the Surveyor General, Sir T.L. Mitchell, was the culprit, yet Clarke rejected this view in an article in the *Herald* of 4 February entitled 'The Australian and the Surveyor General'.
3. Scott's plan had failed due to local parochialism and his own personal unpopularity. See S.H. Smith and G.T. Spaull, *History of Education in New South Wales, 1788-1925* (Sydney, 1925), p.48, and D.C. Griffiths (ed.), *Documents on the Establishment of Education in New South Wales, 1789-1880* (Melbourne, 1957).
4. D.C. Griffiths, op. cit. (n.3), pp.187-8.
5. *Report of the Select Committee of the Legislative Council* (Sydney, 21 June 1844). This committee on education in the colony was chaired by Robert Lowe.
6. James Jervis, 'Rev. W.B. Clarke, M.A., F.R.S., F.G.S., F.R.G.S., "The Father of Australian Geology"', *JRAHS*, 30 (1944), 345-458; Elena Grainger, *The Remarkable Reverend Clarke: The Life and Times of the Father of Australian Geology* (Melbourne, 1982); Price Warung, 'Rev. W.B. Clarke, M.A., F.R.S., the Nestor of Australian Philosophers', *The Cosmos Magazine*, 1 (1895), 532-9; Ann Mozley, 'W.B. Clarke', *Australian Dictionary of Biography*, vol. 1 (Melbourne, 1969); David Branagan, 'Samuel Stutchbury and Reverend W.B. Clarke — Not Quite Equal and Opposite', in *100 Years of Australian Scientific Explorations*, ed. P. Stanbury (Sydney, 1978), pp.89-98; Ann Moyal, 'A Bright and Savage Land': *Scientists in Colonial Australia* (Sydney, 1986).
7. T.G. Vallance, *The Australian Geologist*, 45 (August 1983), 19-20; *Geological Magazine*, 121 (1984), 374-8; M.R. Banks, *Historical Records of Australian Science*, 6(1) (1984), 91-2.
8. James Jervis, op. cit. (n.6), p.457.
9. Clarke's first known journalistic writings in New South Wales are two letters to the editor (*SG*, 10 and 29 August 1839) entitled 'Popish Oaths' and 'Dr Ullathorne and Dr Murray', both signed simply 'Latimer'. His first leading article was also on a religious subject, being titled 'The Sabbath Observance Report' (*SMH*, 21 August 1841). Known 'anonymous' letters to the editor by Clarke bore signatures such as 'Plutus' (geological), 'Latimer' (religious), and signs such as a cross in a circle.
10. A large part of W.B. Clarke's extant correspondence and diaries are located in the Clarke Family Papers, Mitchell Library, State Library of New South Wales, Sydney. Various letters are also to be found in private and public collections throughout the world, though no listing has yet been compiled. See *Draft Guide to the Papers of the Clarke Family*, Mitchell Library, ML MSS139/1. Difficulties in transcribing Clarke's handwriting have hindered investigations of his few extant diaries and voluminous correspondence.
11. Many previous biographical writers on Clarke have based their assessment of his researches on the list of publications contained in Robert Etheridge, Jnr, and R. Logan Jack, *Catalogue of Works, Papers, Reports, and Maps, on the Geology, Palaeontology, Mineralogy, Mining and Metallurgy, etc., of the Australian Continent and Tasmania* (London, 1881), pp.25-34. The 25% figure is based on an analysis of the more than 500 published works by or involving Clarke that I have now identified.
12. Price Warung, op. cit. (n.6), p.538.
13. *SMH*, 29 May 1854. See also issue of 6 June.
14. *SMH*, 16 February 1850.
15. See 'Rewards for Public Services' (*The Empire*, 8 December 1862) by 'Historicus' (William Bland), which was critical of the £5,000 voted to Clarke by a Parliamentary Select Committee in reward for his various geological researches, especially with regards to the New South Wales goldfields.
16. *JPRSNSW*, 13 (1879), 9.

17. J.H. Maiden, 'A Contribution to a History of the Royal Society of New South Wales (With Information in Regards to Other New South Wales Societies)', *JPRSNSW*, 43 (1919), 215-361.
18. D.C. Griffiths, op. cit. (n.3), pp.199-204.
19. See 'Tornado at Parramatta', *SMH*, 24 December 1841; 'Meteorology, Nos. 1-20', *SMH*, 15 January - 17 June 1842; 'Spring Equinox 1842', *SMH*, 13 October 1842; 'The Late Storm', *Aust*, 25 January 1844; 'Meteorology - Notes on the Condition of the Year 1844', *SMH*, 24 January 1845; 'Meteorology: Conditions of the Year 1845 in the Northern Hemisphere, compared with the Nearly Corresponding Period in Australia', *SMH*, 2 March 1847; 'Law of Storms', *SMH*, 6 & 17 May 1847, et seq.
20. For comments on Clarke's meteorological work in the colony, see H.C. Russell, *Climate of New South Wales, Descriptive, Historical & Tabular* (Sydney, 1877), pp.3, 22-27; H.C. Russell, 'Astronomical and Meteorological Workers in New South Wales, 1788 to 1860', *Proceedings of the Australasian Association for the Advancement of Science, Sydney, 1888*, pp.45-94; Robert J. McAfee, 'Meteorology in New South Wales: Its Beginnings, 1788-1850', *Weatherfront*, 1978, pp.3-10; David Williams, 'Meteorology. A series of articles, printed in the Sydney Morning Herald during 1842, by W.B. Clarke' (unpublished manuscript); Moyal, op. cit. (n.6); pp.129-30.
21. See his three-part review of P.E. Strzelecki's *The Physical Description of New South Wales* (*SMH*, 16 March, 27 March and 3 April 1846); George French Angas's *Savage Life and Scenes in Australia and New Zealand*... (*SMH*, 9 July 1847); J.B. Jukes's *A Sketch of the Physical Structure of Australia, so Far as it is at Present Known* (*SMH*, 21 December 1850); the *Tasmanian Journal of Natural Science* (*SMH*, 14, 24, & 27 June and 4 & 16 July 1842); and the *Papers and Proceedings of the Royal Society of Van Diemen's Land* (*SMH*, 31 August 1850 and 25 January 1854). For material on local explorers see *The Australian*, July 1844, and *SMH*, August-September 1842, October-December 1846, 25 January 1848, 15 March-18 May 1848, 26 April 1848.
22. The Australian Philosophical Society (19 January 1850-30 July 1855) and the Philosophical Society of New South Wales (30 July 1855-12 December 1866) were precursors of the Royal Society of New South Wales. Papers of the Philosophical Society of New South Wales were published in the *Sydney Magazine of Science and Art* between 1857 and 1859, and in local newspapers (*SMH* and *The Empire*). Some papers from the period 1862-65 were published by the Royal Society of New South Wales in an 1866 compilation entitled *Transactions of the Philosophical Society of New South Wales, 1862-65*. See also J.H. Maiden, op. cit. (n.17).
23. For example, a series of three articles on the United States Exploring Expedition of 1838-42 (*Aust*, 18, 20 & 24 April 1844); six articles on fossil bones (*SMH*, 8 October-9 December 1842); and twenty articles on meteorology as applicable to Australia (*SMH*, 15 January-17 June 1842); reviews of C.P. Hodgson's *Reminiscences of Australia, with Hints on the Squatter's Life* (*SMH*, 23 January 1847) and Charles Sturt's *Narrative of an Expedition into Central Australia* (*SMH*, 4, 9 & 28 June 1849); and numerous letters on 'Supply of Water' and 'Artesian Wells' in the *Sydney Morning Herald* during the period December 1849 to May 1850, between Clarke and anonymous correspondents such as 'AA', 'XYZ' and 'WTG'.
24. *Aust*, 4, 7, 10 & 15 May 1844; 25, 27 & 28 May 1844; 9, 17 & 25 July 1844; 6 & 13 August 1844.
25. Melbourne University Press, 1980.
26. Ann Mozley, *A Guide to the Manuscript Records of Australian Science* (Canberra, 1966), p.viii.
27. *Aust*, 9 & 25 July 1844; 'Kennedy and Leichhardt', *SMH*, 1 October 1850; 'Leichhardt', *SMH*, 18 January 1851; 'Leichhardt and the Desert', *SMH*, 30 July, 5 & 24 August, 10 September & 20 October 1858.
28. E.M. Webster, op. cit. (n.25), p.252.
29. Hargraves had published a book in England in 1855 in collaboration with Simpson Davison, entitled *Australia and its Gold Fields*, which Clarke believed did not give due credit to his discoveries. Davison's 'New Theory of the Origin of Gold' within that text also raised Clarke's ire.
30. W.B. Clarke to Mrs Clarke, 2 June 1842; Clarke Family Papers, Mitchell Library MSS139/4. Cf. Mozley, op. cit. (n.26), p.xi.
31. J.D. Dana, 'Geological Observations on New South Wales', in *United States Exploring Expedition ... under the Command of Charles Wilkes, U.S.N., Vol. X, Geology* (Philadelphia, 1849), pp.449-537; plus Appendix 1 - *Description of Fossils*, 'Fossils of New South Wales', pp.681-720 & plates 1-20.
32. *SMH*, 21 December 1850.
33. 'Hargraves Against the World', *The Empire*, 4 February 1861.
34. A. Mozley, op. cit. (n.26), p.x.
35. Clarke served as curator and secretary at the Australian Museum, 1841-43, and remained a trustee until retirement in 1874; see Ronald Strahan, *Rare and Curious Specimens* (Sydney, 1979). He had a lot of input into the Museum's opening geological display of November 1854 and the accompanying *Catalogue of the Natural and Industrial Products of New South Wales* (Sydney, 1854).
36. 'On Certain recent Meteoric Phenomena, Vicissitudes in the Seasons, and prevalent Disorders, contemporaneous, and in sup-

- posed connection, with Volcanic Emanations. By the Rev. W.B. Clarke, A.M. F.G.S.', *MNH*, 6 (1833), 289–308; *ibid.*, 7 (1834), 193–202, 289–309, 385–90, 609–30; *ibid.*, 8 (1835), 1–28, 129–61, 417–53; 'Illustrations of the Geology of the South-east of Dorsetshire', *MNH*, N.S., 1 (1837), 414–21, 461–9; *ibid.*, 2 (1838), 79–88, 128–36; *ibid.*, 3 (1839), 390–401, 432–8, 483–9.
37. *Paul shewn to be no Unitarian* ... (London, 1836); *The Apostle John Shewn to be no Unitarian* ... (Poole, 1836); *The Reviewer Reviewed* ... (Poole, 1836); *A Plain Epistle, to the author of Animadversions* ... (Poole, 1836); *The Sign of the Times; and the claims of the Church of England to support from its members; considered in two sermons in behalf of the National Society* (London, 1838); *Anniversary Sermon, preached in the Church of St James, Sydney, on Thursday, 24th June 1840* (Sydney, 1840); *A Christmas Offering* (Sydney, December 1840); *The Logic of the Times* (Sydney, 1841).
 38. 'New Zealand — Geological Report', *SMH*, 11 & 12 October 1864; 'Notes on the Geology of Western Australia — Description of Mr Hunt's Specimens, East of York, Western Australia', *Perth Gazette*, 2 April 1866; 'On the Auriferous and other Metalliferous Districts of Northern Queensland', *JPRSNSW*, 1 (1868), 42–57; 'Note on the Geology of the Mary River, Queensland', *JPRSNSW*, 1 (1868), 76–8.
 39. Some of the fossils from Clarke's 1844 collection were described in Frederick McCoy, 'The Fossil Botany and Zoology of the Rocks associated with the Coal of Australia', *MNH*, 20 (1847), 145–57, 226–36, 298–319; and in Dorothy Hill, 'Type Specimens of Palaeozoic Corals from New South Wales in W.B. Clarke's First Collection, and in the Strzelecki Collection', *Geological Magazine*, 74(4) (1937), 145–53.
 40. Robert A. Stafford, 'The Long Arm of London: Sir Roderick Murchison and Imperial Science in Australia', in *Australian Science in the Making*, ed. R.W. Home (Melbourne, 1988), pp.69–101.
 41. R.I. Murchison, *Siluria*, 3rd edition (London, 1859); also 'Sir R.I. Murchison and the Geology of Australia', *SMH*, 26 June 1852. Simpson Davison, 'The Origin of Alluvial Gold', *The Empire*, 8 February 1855; *The Discovery and Geognosy of Gold Deposits in Australia* (London, 1860).
 42. T.G. Vallance, personal correspondence with the author, 7 August 1990.
 43. 'Australia', *Transactions of the Royal Geographical Society*, 14 (1844), xcix-c; 'Comparison of the Geology of Russia and Australia', *Transactions of the Royal Geological Society of Cornwall*, 6 (1846), 324 et seq.
 44. 'Geology — Comparison of Russia and Australia', *SMH*, 28 September 1847; 'Gold Hunting', *SMH*, 16 February 1849, letter to the editor, signed 'Plutus. February 14'; three lead articles on 'Mining', *SMH*, 29 May, 19 July & 16 August 1849; and 'Gold Mining', *SMH*, 19 & 21 December 1849. Though Hargraves 'discovered' gold at Lewis Ponds on 12 February 1851, it was not announced in the Sydney papers until 3 May; see Lynette Ramsay Silver, *A Fool's Gold?: William Tipple Smith's Challenge to the Hargraves Myth* (Milton, 1986).
 45. 'Report by Count Streleski. Appendix C [in] Despatch from Sir G. Gipps ... to the Secretary for the Colonies ...', *Great Britain & Ireland Parliament, House of Commons paper 120*, 9 March 1841.
 46. *SMH*, 5, 15, 18, 20, 25 May 1851.
 47. Sands and Kenny, Sydney, 1851; see also 'Metalliferous Quartz and its Commercial Value', *SMH*, 5 July 1851; 'Gold Working — Associated Minerals, &c.', *SMH*, 25 July 1851.
 48. *Researches in the Southern Goldfields*, pp.290–4; *Illustrated London News*, 3 December 1853.
 49. 'A Communication from the Reverend W.B. Clarke, of Sydney, to His Excellency Sir Henry Barkly, K.C.B., &c., &c., President of the Royal Society of Victoria, on Professor McCoy's "New Toeniopteris" from the Coal-bearing Rocks of the Cape Patterson District in particular, and on the Evidence bearing on the Question of the Age of Australian Coal-beds in general', *TPRSV*, 5 (1860), 89–95; 'Remarks on Professor McCoy's Commentary on a new Toeniopteris, &c.', *TPRSV*, 5 (1860), 209–14; 'On the Age of the New South Wales Coal-fields', *MNH*, 10 (1862), 81–6; 'A Commentary on "A Communication made by the Rev. W.B. Clarke to His Excellency Sir Henry Barkly, K.C.B., &c., &c., President of the Royal Society of Victoria, on Professor McCoy's new Taeniopteris, &c.", &c.', *TPRSV*, 5 (1860), 96–107; 'Note on the Rev. Mr Clarke's "Remarks", &c.', *TPRSV*, 5 (1860), 215–7.
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