University and Community in Nineteenth Century Sydney

Professor John Smith 1821-1885

EDITED BY ROY MacLEOD

Figure 1 *The Late Professor Smith.*
(From his obituary tribute in
The Sydney Mail, *17 October 1835, p. 828).*

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PROFESSOR JOHN SMITH 1821–1885

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Front cover Professor John Smith (Detail), c. 1885, by Archibald Reid (1844–1908), of Aberdeen. This formal portrait was commissioned by the Royal Society of New South Wales, and is today on deposit in the Mitchell Library (ML 981). It is currently unrestored, and is reproduced with the kind permission of both institutions.

Back cover John Smith and friends on the Lane Cove River, c. 1860. A group of people elaborately arranged to produce an informal effect. Smith adopted a scientific pose in many of his photographs, showing himself timing the exposure of the plate. In this more leisured atmosphere he has wisely assumed a more relaxed position. From a stereographic wet collodion glass plate negative, each image approx. 7.7 x 7.5 cm. (Smith Collection, Sydney University Archives).

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Figure 2 *John Smith as a young man.*
(Photographer unknown, from School of Chemistry, University of Sydney, 1852–1978 *(Sydney University, 1978).*

PREFACE

IN AN AGE in which we record increasing appreciation of the colonial contribution of our academic pioneers and predecessors, it is gratifying to bring colleagues together to reflect upon the life and work of Professor John Smith, one of the three founding professors of this University, and the man to whom Sydney owed its first vision of academic science. Given the range of his enterprise, it is particularly fitting that our tribute to him should have formed the basis of a workshop held on his centenary in 1985, and be sponsored by two of the most distinguished learned societies of Sydney. It is rewarding in the highest degree that this composite portrait of Smith should appear in the University History Project monograph series.

Many have helped in commemorating this man of colonial endeavour. The Editor wishes to express his special appreciation to the President and Council of the Royal Australian Historical Society, and especially to Dr. Hazel King and her volunteer assistants who helped greatly to make the 'Smith workshop' a success; to the President and Council of the Royal Society of New South Wales, for their co-sponsorship; and to Ms. Christa Ludlow, Ms. Melanie Oppenheimer and Ms. Ruth Bennett of the Department of History, University of Sydney, for their help in preparing these papers for publication. Mr Mark Matheson designed the volume, and Dr. Graham Holland prepared the index. Dr Deborah Campbell, unable to be with us at the workshop, has nonetheless contributed an essay, for which we are grateful. Grants-in-aid of publication were received from Westpac Banking Corporation and from the Utah Foundation, whose generosity it is always a pleasure to acknowledge. We would also record our thanks to Professor Cliff Turney, editor of this series, and to Professor John Ward, Vice-Chancellor, without whom this appreciation of Smith would not have reached the public Smith himself sought to serve.

Roy MacLeod
Sydney
St. Andrew's Day, 1987

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INTRODUCTION

ROY MACLEOD

'THE SERVICES OF SOME MEN are not appreciated by their fellow citizens until the men themselves have passed away'. So, on 13 October 1885, the *Sydney Morning Herald* began its tribute to the late Professor John Smith, MA, MD, HonLLD, MLC, C M G , one of the first three professors of Sydney University, one of the 'worthiest . . . of our citizens: a man thoroughly identified with the cause of Australian progress'.[1] A century later, we commemorate the man and his work. In so doing, we consider some of the many elements that went to shape the context of culture and learning in the colonial metropolis of New South Wales.

The papers in this collection arise from the third of a series of Workshops devoted to the history of 'Scientific Sydney', held at 'History House' under the co-operative auspices of the Royal Society of New South Wales and the Royal Australian Historical Society.[2] This Workshop took place on 12 October 1985, the centenary of Smith's death. This proved a timely occasion. For nearly a decade, scholars have been 'rediscovering' the place of science in Australian colonial life and thought. That rediscovery has led in many different directions. Today, institutions of teaching and research, museums and scientific societies, as well as pioneering figures of individual disciplines, are all beginning to receive due, if long-delayed, recognition. At the same time, we are slowly beginning to fathom the influence that science – whether as rhetorical image, ideology or active instrument – actually played in colonial life. That influence, it is now clear, helped redraw the map of knowledge in metropolitan Europe.[3] At the same time, it played a fundamental role in shaping Australian expectations.

The Sons of Australasia's Clime
Shall soon redeem their country's shame
No more this penal 'Land of Crime',
But Nurse of Science, Truth and Fame.[4]

Thus the *Sydney Gazette* rhapsodised in 1824, granting to colonial science a particular function. That function, epitomised in the twinned concept of 'secular liberalism', was cultivated in the everyday programmes of 'practical men', whose badge was not birth but education; whose institutions conveyed the sanctions and cautions of colonial government; and whose faith in the future rested upon the values inherent in the ideology of 'progress'.

Among such 'colonial improvers' – whether pastoralists, professors, or members of the 'urban gentry' of professional and business men – there were those who welcomed the cultural legitimacy the patronage and pursuit of science could bestow.[5] The natural sciences set a high frontier. Their study could, in principle, render the Book of Nature more clear, through a better appreciation of the 'land of contrarities' – that much was sure.[6] More important, perhaps, the sciences, if properly pursued (and endowed) would accelerate the rise to maturity and responsible government of a colonial culture in which moral leadership was at a premium. As John Woolley put it in 1861: 'We have learned that no accidental impulse can precipitate an infant colony into a nation. Boundless pastures,

bottomless depths of alluvial soil, inexhaustible mines are not the sole conditions of greatness; material without moral resources are less than of avail'.[7] Science, as both ideology and instrument, would provide the necessary resources, providing certain reasonings against philistinism, materialism, and the legacy of convictism. Its Enlightenment discourse — the language of reason, stability and order, so important to a young colony 12,000 miles from England — would sustain the new nineteenth century language of colonial nationalism — the vocabulary of progress, fortitude, and the dignity of hard work.

If this was the 'programme', what were its prospects? Until the late nineteenth century, colonial science had an uneven reputation. Higher education in the colony was limited, and predominantly classical; the circumstances of colonial life militated against the 'learned leisure' so important to scientific research. The practice of science was relegated to an elite, often distanced from practical life, or so historians have believed. Certainly, historical emphasis on everyday conditions of work, trade, disease, crime, punishment, and religious sectarianism has tended to contribute over many years to the historiographical 'marginalisation' of the history of science among university scholars.[8] We have neglected the importance of the cultivation of cultural capital, and the utility of private science as played to public benefit.

In this context the current re-awakening of interest in Australian science owes much to the renewed study of individuals who were central to the colonial endeavour. With this discovery has come a re-interpretation of their work. That work was, in many respects, monumental — and the monumentalism of their achievement can still be seen in the 'citadels' and 'cathedrals' of science in sandstone and brick that surround us today. The museums, galleries, laboratories and libraries, technical colleges and public buildings of Sydney stand testimony to these men and their age. Colonial science sought to elevate the colonial self-image, inevitably nursed, in A.D. Hope's phrase, by the caterpillars of the State; its quest sought, and finally embraced, the philosophy of 'adaptive compromise' fundamental to the European experience in Australasia.

To some in the Australian colonies, science could be a refuge, a shelter for the solitary mind. But for others it afforded the means and ends whereby men could explore a continent, contrive a nation. For John Smith, coming to Sydney in 1852, the challenge of advancing knowledge in a lonely, often alien environment, was no less keen that the challenge of seeing that knowledge applied. In juxtaposition to the 'gentlemen collectors' of his day, he conceived and opened a chemical laboratory, promoted the use of the camera, plumbed the city's water supply, and gave force and direction to the cardinal debates that shaped colonial medical reform and secondary education. At a time when there were few men of scientific competency in New South Wales, he was among the most visible: Member of the Legislative Council, Dean of Medicine, author and correspondent of the *Sydney Morning Herald*, for many years, virtually Minister of Education, and for over thirty years, an officer of the Royal Society. His colleague and successor, Archibald Liversidge, recalled his 'quiet, unobtrusive, conscientious' manner.[9] Today, historians look for contradictions in the lineaments of this leadership. We may find Smith uncertain in his chemistry; overtaken in his pedagogy; misguided, perhaps, in his views on medical reform. But if he becomes, on closer study, less a 'colonial hero' or 'scientific saint', he becomes all the more intelligible as a man who bore the tensions and seized the opportunities presented to people of ability and intellect, in a distant outpost of Britain, where the writ and self-assurance of metropolitan methods scarcely ran.

In the following papers, we have assembled studies of different aspects of Smith's life and character — seven authors, searching less for a theme, than for a composite portrait. As such, this does not, nor could it, satisfy the need for a proper biography of Smith, and can at best only indicate the remarkable range

and diversity of the man's interests and services. We await a fuller study, to which these essays may form a useful introduction. In the meantime, among the neglected pioneers of 'scientific Sydney' we find in Smith a cicerone to the colony of New South Wales during the critical period between 1850-1885, a period in which Manning Clark saw the triumph of the 'colonial bourgeoisie'. Through his work we find built and unveiled the foundations that link the University and the community, as clearly now as a century ago.

Notes

1 *Sydney Morning Herald*, 13 October 1885.

2 For the papers and abstracts of earlier Workshops, see the *Journal of the Royal Society of New South Wales, 118* (1985), 165-211.

3 See Roy MacLeod, 'On Visiting the "Moving Metropolis": Reflections on the Architecture of Imperial Science', *Historical Records of Australian Science, 5* (1982), 1-16.

4 *Sydney Gazette*, 29 April 1824.

5 Cf. Deborah Campbell's comprehensive 'Culture and the Colonial City: A Study in Ideas, Attitudes, and Institutions: Sydney, 1870-1890' (Unpublished Ph.D. thesis, University of New South Wales, 1982).

6 Cf. George Seddon, 'Eurocentrism and Australian Science: Some Examples', *Search, 12* (1981), 446-450.

7 J. Woolley, 'The Schools of Art and Colonial Nationality: A Lecture', (Sydney, 1861), 5.

8 Ann Mozley Moyal, *Scientists in Nineteenth Century Australia: A Documentary History* (Sydney: Cassell, 1976), has long been a standard account. See also her recent *A Bright and Savage Land* (Sydney: Collins, 1986). Thanks to the Bicentennial, more work is presently underway. Cf. Roy MacLeod, 'On the Reconstruction of Colonial Science, 1850-1900', Lecture to the Royal Australian Historical Society, May 1984; Roy MacLeod (ed.), *The Commonwealth of Science: ANZAAS and the Scientific Enterprise in Australasia, 1888-1988* (Melbourne: Oxford University Press, 1988).

9 A. Liversidge, Obituary Tribute, 4 November 1885, *Journal and Proceedings of the Royal Society of New South Wales, 19* (1885), 151.

CHAPTER ONE

JOHN SMITH

THE PROFESSOR AND THE SCHOOLS

KENNETH J. CABLE

FEW MEN IN THE COLONY of New South Wales combined, in such exact proportions, contributions which were both scientific and community-based, as John Smith. Smith was a man of his time, the middle part of the nineteenth century. He was a scientist more concerned with science in general than with a single one of its branches; a teacher who tried to teach the method and moral of his subject; a don who did as much for those outside the University as for those within; a seeker after religious truth who sought it in new places; a shy, stiff man whose sense of duty made him a public figure in the political and administrative world; above all, and perhaps most characteristic, a Scotsman who made a career in Britain's colonial empire.

Later times, it is true, remembered him little. In University lore, he was eclipsed by the sensitive Woolley and the domineering Badham. On the academic scene, the names of Liversidge and Threlfall overshadowed his own. It was Anderson Stuart whom men revered as the pioneer of medical education. Smith's work for the schools seemed little beside that of William Wilkins, whose final achievement was to extinguish the Council of Education to which Smith belonged. Even as a Scots professor he could not compare with the great Mungo MacCallum. It is a cruel irony that Smith is now known popularly by the photography that alternately amused and enraged his contemporaries, and that was quite forgotten until its accidental rediscovery less than a generation ago.

Smith was also more than a man of his time. He made a contribution that transcended it. John Smith came to Australia — it was possibly his second arrival — as Professor of Chemistry and Experimental Physics at the newly-founded University of Sydney.[1] This was his initial role in the colony and it remained the crucial one. Everything else flowed from it. First and foremost, he was Professor Smith. But what was the University like? What was a professor expected to do? And what did Professor Smith believe was expected of him?

The University of Sydney was established in 1850 by an act of the Legislative Council of New South Wales.[2] An unsuccessful and somewhat hasty attempt had been made in the previous year to achieve this object. In the intervening months, a committee had worked on the proposal, public debate had ensued and the resulting bill finally became law.[3] The date, 1850, is important. It was the year before the discovery of payable gold near Bathurst and the consequent rush which magnified the population and altered the character of the colony. New South Wales was

reviving slowly from the economic depression of the early 1840s, immigration was increasing and the threat of a renewal of convict transportation had just been averted. Sydney had consolidated its position as the commercial capital of a colony based largely on the export of wool. It was a prosperous town of some 50,000 inhabitants, the largest and most regular urban community in Australia. It was conscious of its significance and it needed to show this to the world — a world which thought of it largely in terms of commerce and convicts.[4] A university should satisfy such a need. So a university was brought into being.

The year 1850 also figures in Australian history as that in which the Imperial Parliament passed the Australian Colonies Government Act. This piece of legislation, the result of long agitation and no little debate, expanded the franchise and elective membership of the local Legislative Councils. What was more important, it heralded the granting of full local self-government and required the several colonies to suggest ways of achieving it.[5] The Act was a challenge to the colonists. How were they to govern themselves, and who was to do the governing?

William Charles Wentworth, the native-born radical of aristocratic background and now the conservative leader in the Council, had no doubts about the matter. Control must be vested in a carefully balanced legislature, wherein the propertied and respectable interests must predominate. This was the stock answer of Wentworth's class. But Wentworth, the local product, came to the fore in an attempt to make provision for local youth to play their part. Why not set up a university to train young Australians — of proper background — to govern young Australia? The connection between Wentworth's championing of a university and Wentworth's concern for the political future was singularly close.[6] More than anything else, this gave an impetus to the foundation of Sydney University.

The general idea of a University emerged from the discussions of 1850. What of the reality? Wentworth was unclear. He suggested a list of professors — some in traditional subjects, others in professional fields. Would they simply examine, or would they teach? If the latter, would they alone teach? If so, to whom? By the time of the passing of the Act, it had at least been determined that a college would be created, wherein these professors would teach. The knottier problem of tuition external to such a college remained unresolved. There were important interests which hoped that the University would be greater and more comprehensive than its teaching college. These were churchmen, with educational establishments of their own. They anticipated that the University and its professors would serve as a benevolent examining umbrella over their own infant institutions. The controversy raged, led by the Anglican Bishop, W.G. Broughton.[7] The admission of clergymen to the new Senate of the University in no way mollified Broughton and did little to placate his fellow churchmen. Meanwhile, the selection of three professors went ahead. Early in 1852, the choice of John Woolley, M.B. Pell and John Smith was made. It was arranged that they would function in the old Sydney College building in Hyde Park. They arrived in September 1852, and began their work, at an inauguration made memorable by a sonorous declamation by Woolley, in the following month.[8]

The teaching college had begun. Its professors were in post. Its small band of students — those colonial hopefuls who would one day rule New South Wales — were in their places. It was now up to John Woolley and his colleagues to defend the new institution and to ensure that it did not become simply one in a string of colleges.

Woolley did so with a burst of nervous energy, indeed passion, that was to exhaust him. He bombarded politicians and senators with heated letters, wrote newspaper articles and spoke incessantly. Within two years he had won the day.[9] The opposition crumbled. Even the Church of England, some of whose laity adopted Woolley's viewpoint, concluded a compromise. Woolley insisted that his was not a mere teaching college, subject to a senatorial governing body. It was *the*

University. Its professors were professors of the University, with the sole right to instruct and examine undergraduates. The victory went to Woolley. Any institutions associated with the University would be for residential and religious purposes only.[10] Their students would attend the lectures of the professors, save for a small range of possibly controversial subjects. The system of affiliated colleges had come into being.

Smith watched these developments with a certain puzzlement. They were of English provenance, these issues of Church and State, of college and University, of sacred and secular, of the teaching university and the examining university. As a Scot, Smith found them somewhat alien to his experience. All Scottish universities were teaching institutions, but none (save St. Andrews) had colleges in the English sense. The Established Church of Scotland, torn apart by the disruption of 1843, did not and could not make the claims of its sister establishment in England. John Woolley, the product of London and Oxford and a fervent reformer before he set foot in Australia, was the expert.[11] Smith naturally left the battle to his senior colleague.

Yet Smith undeniably became involved. Woolley was quick to enlist his aid, recognising his cool, steady judgement and his knowledge of the Scottish system. So did the Scottish-educated doctor, Sir Charles Nicholson, now the driving force behind the University. The result was a series of newspaper letters by Smith, wherein he supported Woolley's concept of an undergraduate, teaching University.[12] By 1854, with the crisis over, Smith had become a public figure. He had given himself a place in the professorial sun.

Of the three founding professors, Smith arrived as the least in status and esteem. John Woolley, the classics professor, was first in rank and reputation. A former Oxford don, author of a textbook on logic, headmaster of two schools, and a clergyman of the Church of England, Woolley was denominated senior professor and the University's academic leader. At 39 he was the oldest of the trio, and was easily pre-eminent in his social and scholarly connections in England.[13] Second in order was Morris Birkbeck Pell, who held the chair of Mathematics and Natural Philosophy. Pell was an American by birth and upbringing, and the youngest of the professors. But he had been first wrangler at Cambridge and a Fellow of St. John's College. In those unreformed days, his eventual marriage compelled his resignation from his fellowship but, in colonial terms, his status was considerable.[14] Smith lacked these distinctions. He was youthful and without reputation. He was not well connected. Marischal College, Aberdeen did not rank high on the academic scale. Sydney wanted a sound, practical scientist, a workhorse in a number of fields. Smith was believed to be such a man. He was not chosen for what he was, but for what it was hoped he would do.[15]

In a sense, all the professors had been so chosen. The reasons for the foundation of the University indicate as much. Professors must be not only teachers, but must also contribute to the colony's well-being. They were to be scholars whom the community could admire, who would ornament the institution and give it (and therefore the colony) prestige in the eyes of the world. They would give sound practical advice and would (preferably without a fee) provide general assistance in educational and cultural matters.

The outward thrust required of the professoriate was made easier by the inward narrowness of the University. Unlike its junior university in Melbourne, Sydney did not expand. Melbourne, founded three years later, was to develop a string of professional schools — Engineering, Medicine and Law. To the bustling southern city, with its gold rush riches, its new and varied population and its confidence in the future, it was no less important to train members of the professions than to produce educated gentlemen.[16] Sydney, older, slower and less adventurous, thought of emulating Melbourne and then did not do so. A few Law lectures and

Figure 3 *University Construction: Timing the Exposure, c. 1858. The professor in full regalia standing in the eastern face of the University buildings, near its southern door. This is the most formal of the images in which Smith portrayed himself as a serious experimenter in the scientific process of photography. (From a stereographic wet collodion negative, each image 7.1 x 7.8 cm. John Smith Collection, University of Sydney Archives).*

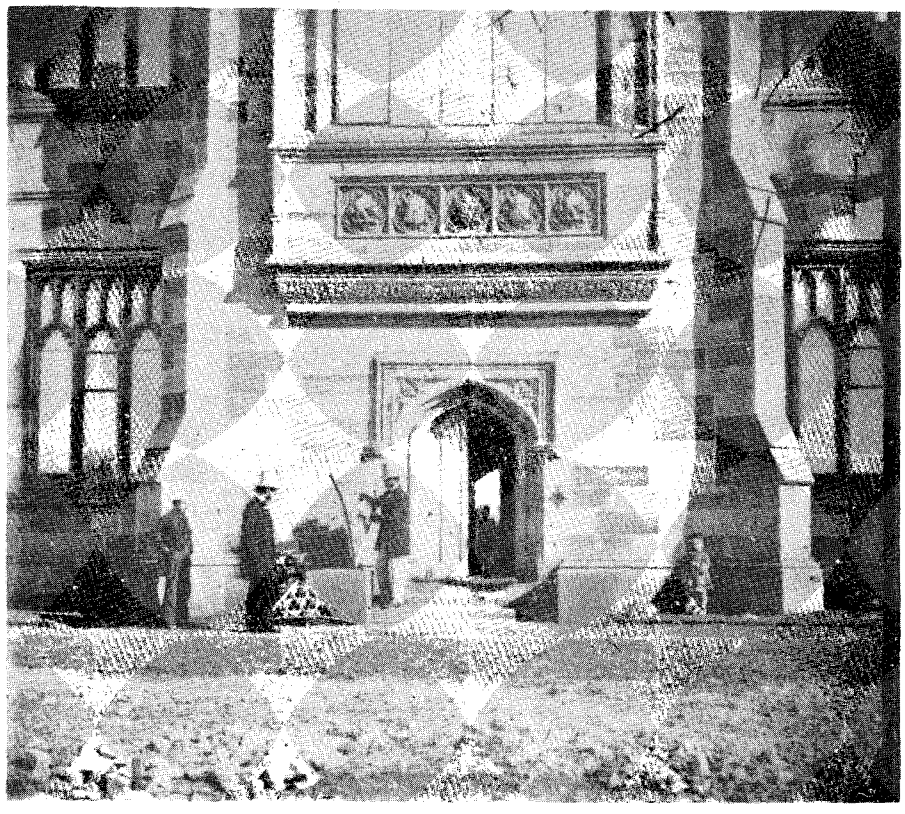


Figure 4 *University Construction, c. 1858. At the southern door of the eastern face of the University. The man on the right of the image has been identified as the architect, Edmund Blacket, who is examining the matrices for the carving above the doorways. (From a stereographic wet collodion negative, each image 7.1 x 7.8 cm. John Smith Collection, University of Sydney Archives)*

Figures 5 and 6
Here Smith has composed the image to focus attention on the 'supposedly' busy stone carver. This carefully arranged spontaneity helped to overcome the limitations of the slow emulsion. The stone carver has been identified as Robert Melvill. Smith is on the extreme right. (From stereographic wet collodion glass plate negatives, each image approx. 7.5 x 8.0 cm. John Smith Collection, University of Sydney Archives).

an examining Medical Faculty were all that was achieved. Smith, Dean of this notional Faculty, did little. Despite vigorous criticism from a parliamentary enquiry, Sydney remained Arts-based.[17] Since, by the 1860s, the local political scene rendered anachronistic any prospect of rule by the young colonial gentry, it failed even to produce many aspiring politicians or civil servants. For a quarter of a century the University, entombed in its grand building on Petersham Hill, remained moribund. If its professors were to meet the expectations of the public, then they must do so beyond their Gothic ramparts.

The university professors lived up to the expectations of their community by making a significant impact upon it. Smith's record was less immediate than Woolley's, less convulsive than that of Woolley's successor, Charles Badham; but it was no less important. In some respects, it was the most enduring of the three. And nowhere more than in the field of popular education.

The year 1848 is crucial in European history for its wave of liberal-nationalist revolutions. In Britain it was the year of the last massive public protests of the democratic Chartist movement. It was in the shadow of these events that Wentworth had proposed the creation of a University as a stabilising political force in New South Wales. When he did so, in 1849, Wentworth referred — this time with satisfaction rather than with apprehension — to the fact that in 1848 a system of national elementary education had come into being in the colony.[18] To Wentworth this was the base of the pyramid of which a University might eventually form the apex. It would, equally with the University, but for a much wider group of colonists, be a guarantee of social stability and progress.

Wentworth's satisfaction had been tinged with relief. The idea of a national system of elementary education had been discussed and disputed since its initiation by Governor Bourke in 1833. Bourke had modelled his proposal on the Irish national system. Elementary schools in each district would work to graded syllabuses under the supervision of local committees. Their syllabus would include general non-sectarian religious instruction by the teacher, while the clergy could enter at stated times to teach their distinctive doctrines to children of their own faith. Government funds were provided and a Board oversaw the operation at national level. The Irish national system was an attempt to disseminate basic education, properly structured, and to conciliate the competing churches while divesting them of control. Socially, it sought to heal religious and racial divisions in that troubled country. Bourke, himself an Irishman, hoped to avoid similar schisms in the socially dubious colony of New South Wales. He met implacable opposition from the Church of England, which had long conducted its own schools with state aid. At first some Dissenters, and later most Roman Catholics, joined his Anglican enemies. Bourke's successor, Sir George Gipps, was no more successful. But in 1847 the barrier gave way. Bishop Broughton, faced with the reality of straitened resources and bad schooling, consented to a compromise. On the condition that the Treasury would regulate funds to help the schools of the Churches, the State could set up a local version of the Irish national system.[19] Wentworth had reason to be pleased. The foundation had been laid for a Government school system.

John Smith found himself, as a champion of the unitary University, involved in the school problem. He had an able mentor. His University articles were published in the *Empire*, the radical-liberal newspaper edited by the politician Henry Parkes. The self-educated Parkes was flattered by his association with the newly arrived professor. Smith persuaded Parkes that a colonial university need not be a useless aristocratic survival. In turn, as an educational reformer, Parkes taught Smith much about the struggles of colonial schooling.[20] Smith needed this knowledge. As a Scot, he had an ingrained faith in popular education. But because of his Scottish background, he had little experience of the great religious battles for the control of schools which were so marked a feature of England, Ireland and

Australia. There was no need for the Irish national system in Smith's homeland. Parkes taught him about it in Sydney.

If Smith emerged from the conflict over the University as an educational reformer, so did Woolley. But whereas the classics professor proceeded to concern himself with providing much-needed secondary schooling,[21] the scientist became interested in the basic structure. There was much need of this. The national system was in a troubled state. It had begun well in 1848, when George Rusden had toured the countryside, enlisting parents to set up schools. William Wilkins, the greatest figure in the colony's educational history, arrived to conduct the normal, or training, school at Fort Street. A National Board had begun to supervise local effort and distribute money.[22] Then had come the gold rush. Chaos reigned. A professional commission of enquiry in 1855 found the state of the elementary schools in New South Wales — national as well as denominational — deplorable.[23] Smith's interest was thus quickened. Eventually, his concern bore fruit.

The fruit took a long time to ripen. Smith had many interests. He had to give general lectures — 'Electricity for Young Ladies' was a popular course. There was scientific work for the public utilities. There were the colonial learned societies. Above all, there were masses of enquiries, from all quarters, on every conceivable scientific subject. But, above all, there was the problem of effective basic education.

The National Schools were supervised by a Board, composed of politicians and prominent citizens. This Board had a secretary and an administrative structure. Beneath were the growing numbers of schools, mostly one-teacher, usually in areas not served by the Churches. Each school had its local board, which supervised the teacher and collected funds for buildings and equipment. The Board's powers and means of control were thus limited. To improve the system, Wilkins was appointed superintendent of inspectors. He instituted effective central action by developing a system of inspectors and by promoting bigger schools in urban areas. Gradually, the central Board, working with the masterful and imaginative Wilkins, became a power in the land — the more so because there was no specific Minister for Education. The Colonial Secretary, to whom it was nominally responsible, had a multitude of responsibilities and, besides, was generally the Premier — or, as his contemporaries preferred to call him, Prime Minister. Having made its annual report and received its annual grant, the Board could do much as it pleased.[24] For a man such as Smith, membership of the National Board of Education was the only proper way to serve the schools of the state.

Such a position would create its own problems. Although a statutory body, largely independent of the colonial Parliament, the Board was composed largely of politicians or men with political backgrounds. How was a professor, wholly devoid of political affiliation or guile, to enter such company?

The question was less formidable then than now. In the nineteenth century, politics was less of an occupation and more of a pastime. There were few professional politicians. Most parliamentarians held salaried positions elsewhere, or were self-employed or had independent means. They were a mixed (and often dubious) bag in the Legislative Assembly, a far remove from Wentworth's conception of the gentleman member. In the Legislative Council, things were different. The members of the Upper House were nominated for life. Here were men of wealth and substance, along with the lesser fry of ex-Assemblymen kicked upstairs. Here the citizen — usually the conservative, well-fed citizen — transcended the politician.[25]

It was possible for Smith to contemplate an association with politicians — even to aspire to being made a Legislative Councillor — without severely compromising his professorial dignity. Indeed, the Electoral Act of 1858 provided (on the

British model) that the University itself would return a member to the Assembly when an electorate of sufficient size had been attained. This was still a long way off,[26] but it was a sign that politics and academia were not mutually exclusive. Smith could serve on a Board of Education and a Faculty Board without contradiction.

Smith was appointed a member of the National Board in March 1853, within a few months of his arrival.[27] But his early membership was somewhat notional in character. It was only from 1856, when self-government arrived, that his attention to its work became serious. A conscientious man, Smith found that what had been a tribute to the University professoriate soon turned into a major commitment. Once Wilkins introduced the inspectorate in 1854, there was a chance of reform, and Smith became a reformer. Once Wilkins became secretary in 1863, Smith acted as his adviser. The 1860s saw Smith become an educational force in the community.

During the 1860s the compromise of 1848 was heatedly debated. Could Church schools and national schools survive side by side? How was it possible to endure this duplication in the expanding countryside? Was local initiative the best method to encourage education in a community where central government was of such pre-eminent importance? The politicians had their doubts. A series of attempts to weaken the compromise ruffled parliamentary proceedings from 1858. But there were pressing matters to deal with; above all, the redistribution of the colony's land. Not until 1861 was this issue settled. And education was a tricky subject for politicians whose survival instincts told them to avoid its religious overtones. But the abolition of state aid to public worship in 1862 was a sign of change.[28]

For his part, Smith had no doubts. He disliked any compromise which seemed to pander to denominational divisiveness. In the University, he expressed this belief with clarity. In 1858, for example, he had helped destroy the authority the church college heads had over the religious attainments of non-collegiate undergraduates.[29] In the next year he told a parliamentary enquiry that the one existing Church college, St. Paul's, was useless and should go.[30] In 1862 he even doubted the propriety of establishing a Presbyterian college.[31] He bolstered Woolley in his opposition to the introduction of absentee degrees — these, he feared, would also compromise the unitary University.[32] Taking such a stand on his own territory, Smith could readily take a strong line in the schools.

Reform finally came in 1866, when the Public Schools Act placed both school systems under a single Council of Education. In the new arrangement, the aided Church schools would occupy a minor and restricted place. The Act was the creation of Henry Parkes.[33] One of Parkes' principal advisers was his friend from *Empire* days, Professor John Smith. The Act accorded well with Smith's maturing beliefs about the need for uniformity and effective control, while preserving a degree of local action and religious diversity. With the new Council of Education, John Smith came into his own. No other university professor in nineteenth-century New South Wales would occupy a position of such political importance.

The Council of Education, set up in 1867, endured until 1880. On nine occasions in its fourteen years, Smith was its President. In 1874, he was appointed to the Legislative Council. Until 1876, when a titular minister was at last appointed, Smith was virtually a non-political Minister of Education. William Wilkins was the master of business and the operative head of the system. As a professional educationist, he shaped its character. But Smith and, when he was in office, Parkes, were usually in control.[34]

The Council itself was a compromise. While the declining number of Church schools remained under its aegis, there could be no uniform system. Parkes long resisted further change. Until he was in a position to effect reform, he would not permit another politician to undertake it. While known as an opponent of the

Roman Catholics, he remained wary of arousing Anglican resentment. Smith, a Presbyterian with a growing interest in spiritualism, had little patience with the Church of England. But it was Smith who dealt the Council the blow which heralded its demise and ushered in the modern era of centralised education. As President, he declared that its task was becoming impossible.

This was no exaggeration. As early as 1870, Parkes, in praising the Council in general and Smith in particular, had declared that the Council members, in their first three years, had investigated some 15,000 matters referred to them by teachers and local boards.[35] But from 1875, when financial control passed wholly to the Council, the situation deteriorated. A group of unpaid, part-time members, backed by a small administrative staff, could not cope with the rapid expansion of schools in the childhood boom of the 1870s.[36] By his own declaration, Smith changed the terms, indeed the whole character, of the education debate. Religion was no longer the principal issue. Indeed, efficiency became the key world. And, as Victoria had discovered in 1872, efficiency meant a central bureaucracy, a fully fledged Ministry of Education. Since they could not tolerate such a system, the remaining aided denominational schools would have to go.[37] Smith's declaration was not only that of the harassed administrator. It was that of the professor who had fought and won the battle for a unitary University against divisive denominationalism twenty years earlier. The result was the Public Instruction Act of 1880. It took time. Parkes had to be converted; he had then to await the turn of the political wheel; he had to be sure that the Anglicans would not resist too much: he had to be sure that the Roman Catholics would not over-react. These things happened. John Smith was vindicated and the Council of Education, over which he had presided so deftly and unobtrusively, came to an end. Yet so diverse were the professor's interests that he had left for Europe before the new order had come into effective operation.

Smith had turned to public education in part because his University, in the 1860s and 1870s, was doing relatively little to educate the public. The demise of the Council, strangely enough, coincided with a renewal of activity by the University of Sydney. In 1878 the renaissance of the University began. Two years later, the enormous Challis bequest was announced.[38] Substance was given to revival and expansion. John Smith, in his declining years, found himself more of a University man and less of a community figure than ever before.

Notes

1 *Australian Dictionary of Biography, 6* (Melbourne: Melbourne University Press, 1976), 148-150.

2 14 Vic. c.31.

3 D.S. Macmillan, 'The University of Sydney — the Pattern and the Public Reaction', *The Australian University, 1* (1) (1963), 27-59.

4 G. Nadel, *Australia's Colonial Culture* (Melbourne: Cheshire, 1955), 266.

5 J.M. Ward, *Colonial Self-Government: The British Experience* (London: Macmillan, 1976), chap.7.

6 F.L. Wood, 'Some Early Educational Problems and W.C. Wentworth's Work for Higher Education', *Journal of the Royal Australian Historical Society, 17* (5) (1931), 387-394.

7 K.J. Cable, 'The University of Sydney and its Affiliated Colleges, 1850-1880', *The Australian University, 2* (3) (1964), 183-214.

8 J. Woolley, *Lectures Delivered in Australia* (Cambridge: Macmillan, 1862), 3-24.

9 Cable, *op.cit.*, note 7.

10 18 Vic. c. 37.

11 K.J. Cable, 'John Woolley: Australia's First Professor', *Arts, 5* (1968), 47-64.

12 *Empire*, 18 March 1853.

13 *A.D.B., 6*, 435-437.

14 *A.D.B., 5*, 428-429.

15 This is not to imply that there was doubt about Smith's ability as a teacher at the time of his appointment.

16 G. Blainey, *A Centenary History of the University of Melbourne* (Melbourne: Melbourne University Press, 1957).

17 I. Westbury, 'The Sydney and Melbourne Arts Courses', *Melbourne Studies in Education, 1961-1962* (Melbourne: Melbourne University Press, 1962), 256-284.

18 *Sydney Morning Herald*, 5 October 1849.

19 K. Grose, 'The Educational Compromise of the Lord Bishop of Australia', *Journal of Religious History, 1* (3) (1961), 233-248.

20 A.W. Martin, *Henry Parkes* (Melbourne: Melbourne University Press, 1980), 92-3.

21 Especially the Sydney Grammar School.

22 A.G. Austin, *George William Rusden and National Education in Australia* (Melbourne: Melbourne University Press, 1958). C. Turney, 'William Wilkins — Australia's Kay-Shuttleworth', in C. Turney (ed.), *Pioneers of Australian Education*, vol. 1 (Sydney: Sydney University Press, 1969), 193-245.

23 *Votes and Proceedings of the N.S.W. Legislative Council*, 1855, 22.

24 There were, however, local boards, with some independence of action, for each school.

25 P. Loveday and A.W. Martin, *Parliament, Factions and Parties* (Melbourne: Melbourne University Press, 1966).

26 The first election was held in 1876.

27 *N.S.W. Government Gazette*, 25 March 1853.

28 26 Vic. c. 19.

29 *Votes and Proceedings of the N.S.W. Legislative Assembly*, 1858, vol.2, 453.

30 *Ibid.*, 1859-60, vol.4, 397.

31 *A.D.B., 6*, 149.

32 *Minutes of the Senate of the University of Sydney*, 18 June 1864.

33 Martin, *op.cit.*, note 20, 223-226.

34 *Ibid.*, 228-229.

35 *Ibid.*, 251.

36 This was the 'skew generation', the result of post-Gold Rush marriages.

37 D. Grundy, *Secular, Compulsory and Free* (Melbourne: Melbourne University Press, 1972).

38 H.E. Barff, *A Short Historical Account of the University of Sydney* (Sydney: Angus and Robertson, 1902), 116-118.

CHAPTER TWO

THE STRAYFARING PROFESSOR

JOHN SMITH AND 'LEARNED LEISURE'

CATHERINE SNOWDEN

IF JOHN SMITH had an idiosyncracy as a Professor of Sydney University, it was that he was never there. In 1874, a jocular remark in the *Sydney Punch* referred to his travel tales of 1871-2 currently being serialised in the *Sydney Morning Herald*, as 'strayfaring notes . . .'.[1] It was more a reference to his frequent absence on leave, than a comment on his writings. Smith liked travelling. By 1860, before the first of his three long journeys away from the colony, he had already covered many thousands of miles of sea and land — and this did not include his 'peregrinations in all the Australasian colonies'.[2]

Was there a point to his journeys other than escape from 'the land of the dreary eucalyptus'?[3] Or was this merely a colonial version of the grand tour of the leisured gentlemen of Britain, now by courtesy of Mr Cook?[4] Where does his even more assiduous 'strayfaring' in the colony fit? How conscious was he of the possibility of developing a 'colonial science' or of the contradictions between scientific evidence gathered and studied on the spot, and that studied from overseas with little reference to its Australian context?[5]

Smith insisted (usually when requesting leave from the Senate) that his overseas journeys were necessary for his health, and that they were tours of duty to do with his official public and professional interests — the search for new ideas in the laboratories and minds of Britain and Europe. These, he seemed to argue, were the real source of authority about advances in education, chemistry, geology, the mechanics of water supply or the latest designs of 'philosophical apparatus'.[6] His travels in the colony, however, and the photographs he took, suggest a more innovative approach — that he understood the value of studying and recording local conditions and developing new theories that might make a contribution not only to colonial studies, but also to more universal scientific controversies. Certainly his contemporaries, Gerard Krefft and William Branwhite Clarke took this view; for them photography had an innovative role in supporting and illustrating their arguments about the natural world, using Australian examples.[7]

The connections Smith made between scientific expeditions and leisure offer a key. If he had summed up the essence of his travels, Smith might have referred to a quality that he admired, but thought only too rare: 'learned leisure'. It was an expression he used in 1879, in his Anniversary Address to the Royal Society.[8]

Anxious for members to be more active in the society (which he had helped to reform in 1855), he was encouraging them to contribute more of their spare time to the pursuit of science and its dissemination. He looked for more instructors and fewer listeners. In 1865, in a memorandum to the Senate of the University of Sydney, he had offered a more personal analysis of the connection. The assistant he requested should be 'an enthusiastic follower of Science', one who would be glad of the University's short working day and the cumulative four months a year vacation, and one who would

make use of this leisure time in travelling over the colonies (much as I have done) to make himself personally acquainted with the scene and object of his labours.[9]

The overseas journeys offered few insights into the connection between science and photography, for if Smith practised his craft then, he gave no hint of it. His comments on the photographic activities of a travelling companion up the Nile allowed him to pose as an expert by claiming rather exaggeratedly that 'Mr R. . . . carried away with him a series of the finest stereoscopic negatives ever taken on the Nile'.[10] Smith did use a manipulated version of that man's photograph of Philae as a frontispiece to his *Wayfaring Notes*. He was happy to buy his photographs too, for by the 1860s, the relative ease and cheapness of the wet collodion process had released hundreds of commercial photographers into the view trade. Only obliquely, and in speaking of the pillaging of sarcophagi at Thebes, does Smith foreshadow the way photographs might save original environments from destruction by avid collectors, yet still convey information to the laboratories and museums of Europe.[11]

It is the colonial expeditions and the photographs that he took while on them that best reveal the connections Smith made between science and leisure. By the 1850s holidays were expanding for a larger section of the Sydney work force. In the early years of the decade, most white-collar workers had gained a significant concession: Saturday afternoon off.[12] Smith was part of a more privileged group, that today we might identify as a professional or intellectual middle class — 'the experts'. It was men such as these who had the leisure to engage in scientific excursions — and to take up that expensive, time consuming and troublesome pastime of photography.

There continues to be a great deal of controversy about the emergence or even the existence of such a group. Whether a popular term has a theoretical logic, that is, whether differentiating a professional class from the rest of the petty bourgeoisie or from other workers is justified (or mere reification) remains a problem. In a recent article in *Arena*,[13] Peter Beilarz identifies in the late nineteenth century members of an emerging professional middle class who, operating in a scientific mode, intervened in another aspect of everyday life — domestic work.[14] In doing so, they attempted to reconstruct both ideology and practice. In the midst and aftermath of goldrush Sydney, John Smith was a member of that small but expanding salaried middle class with specialist skills and an uncommon ability to negotiate free time. They were equally anxious to regulate the spare time of others.

Such aspiring professionals saw themselves as new men and were self-conscious about their special status. It was certainly offended professional pride that William Stanley Jevons displayed when he described the efforts at the Sydney Branch of the Royal Mint to get him to teach his professional skills to 'clerks who have no particular education and not a scientific idea in their heads . . .'.[15] Whatever the ambiguity about their ambitions, whether self interest or altruism,[16] the thrust was certainly towards enhancing the cultural life of a community 'where politics, professional occupations and mercantile pursuits engross the whole population' or to counteract, as one unkind visitor put it, the 'leaden influence of

. . . ledger and day book'.[17] The editor of the first volume of the *Sydney Magazine of Science and Art* identified an expanding class of 'gentlemen of leisure' who would pursue science 'for its own sake' and 'devote both time and money to its advancement'.[18] The Society even managed, with some ingenuity, to include 'Popular Amusements' among its concerns, arguing that the character of a people may be inferred from its amusements, particularly its manly sports. 'Science', the editorial claimed, 'could never have retained its spoils unless they were held by strong and brave men'.[19]

Clearly the same men who patronised the learned societies were anxious to improve not just their own leisure time, but to regulate the increasing leisure time of others. The clearest personal exposition Smith made of the dangers of unregulated leisure are in his *Wayfaring Notes* of 1865. There his approving quotations from the *Saturday Review* castigate British sportsmen on the Nile who were conducting wholesale slaughter of the bird life and, even worse it seems, setting a 'fool's fashion' among idle young men.[20]

He was not alone in seeing the rationalisation of leisure as a kind of moral force. In the 1870s, for example, men such as Frederick Eccleston Du Faur saw the Grose Valley as a site for raising the cultural and moral standards of the leisured young men of the city . We should not be surprised to find that when he set up his scientists' and artists' camps in the Valley in 1876, photography was recognised for its dual scientific and moral uses. The carriage of sixty heavy glass plates and processing equipment along barely cleared tracks allowed the commercial photographer Joseph Bischoff to record scientific and artistic views of the valley; it also provided honest exertion for several young men.[21] These activities were easily linked to loftier ideals — the patriotic advertisement of Australia's uplifting landscape (in competition with the famous Yosemite photographs), as well as the promotion of the colony's new railways at the forthcoming Chicago Exhibition — and indeed, Du Faur's own favourite scheme, a national park for New South Wales on the model of Yellowstone.

The naturalist William Woolls chose another mountain area, Mt Tomah, as his site, and spoke of the virtues of the mountains with their eucalyptus-laden air and abundance of unfamiliar plant specimens as an ideal place for improving the condition of both body and mind.[22] Both Smith and Robert Hunt photographed in the area, particularly Kurrajong in the 1860s in the pursuit, it seems, of health and scientific discovery — including analysis of the nearby rivers. (See Figure 9).

To professional scientists, photography had two sides. Most obviously, it was a tool in recording scientific discoveries, a quality that had been expected of it even before its secrets were released to the public in August 1839.[23] Forty years later, the Russian scientific explorer, Nikolai Miklouho-Maclay admitted that whether he liked it or not, 'it was necessary for a naturalist and much more for a traveller' to learn 'this absolutely necessary art' and become a photographer himself.[24] In this role, photography was an essential link in the transport of illustrations to Europe. It was a view that Smith had espoused in the mid-1860s when he submitted his geological photographs and specimens of the Botany sandstone to the Paris Exhibition.

In the hands of amateurs, and at least during the era of the wet collodion plate, photography was identified, perhaps rather defensively, as a scientific activity in itself. On the Sydney scene, amateur photographers of a scientific bent differentiated sharply between those who merely practised the skills of photography, and those who understood or experimented with photochemistry. Jevons saw it as a comparison between alchemists and scientists. He made this clear in a letter to his cousin, Henry Roscoe, who, with R.W. Bunsen, had been researching the chemical action of light between 1854 and 1855.[25] He congratulated his cousin on his work,

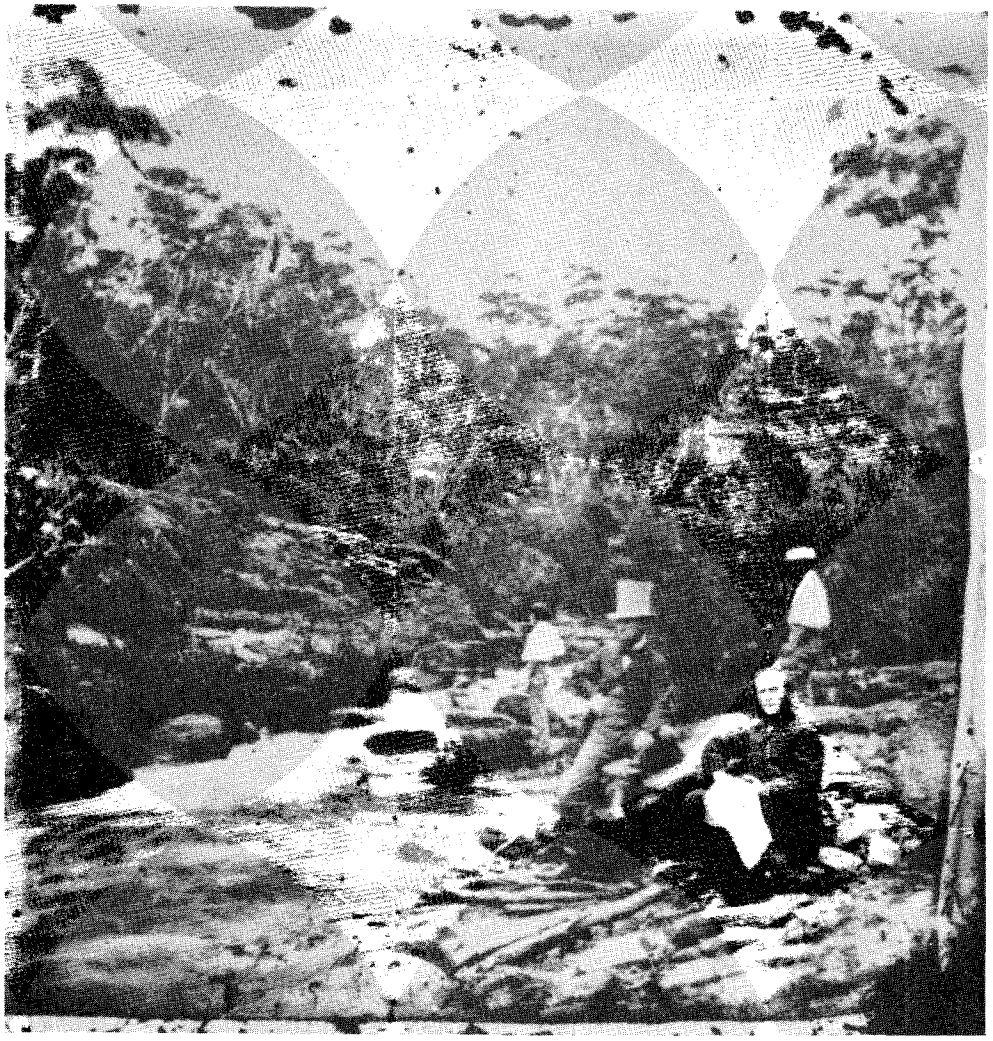


Figure 7 *Professor Smith on the Lane Cove River, c. 1864. The Lane Cove River was popular with scientific expeditions for picnics and photography. Here Smith is accompanied by Robert Hunt and probably two laboratory assistants from the University. This image is from a stereographic glass plate negative using the wet collodion process. The photographer had to prepare the negatives just before exposure and process them while they were still wet. (Each image approx. 7.7 x 7.5 cm. John Smith Collection, University of Sydney Archives).*

Figure 8 *Sandstone, Lane Cove, 1865. This image of the columnar sandstone formations on high ground at Lane Cove was taken using a dry plate negative. Since the plates could be prepared long before use and processed later in a darkroom, they were ideal for the cliff scaling, expeditionary photographer. (Robert Hunt Collection, Historic Photograph Collection, Macleay Museum, University of Sydney).*

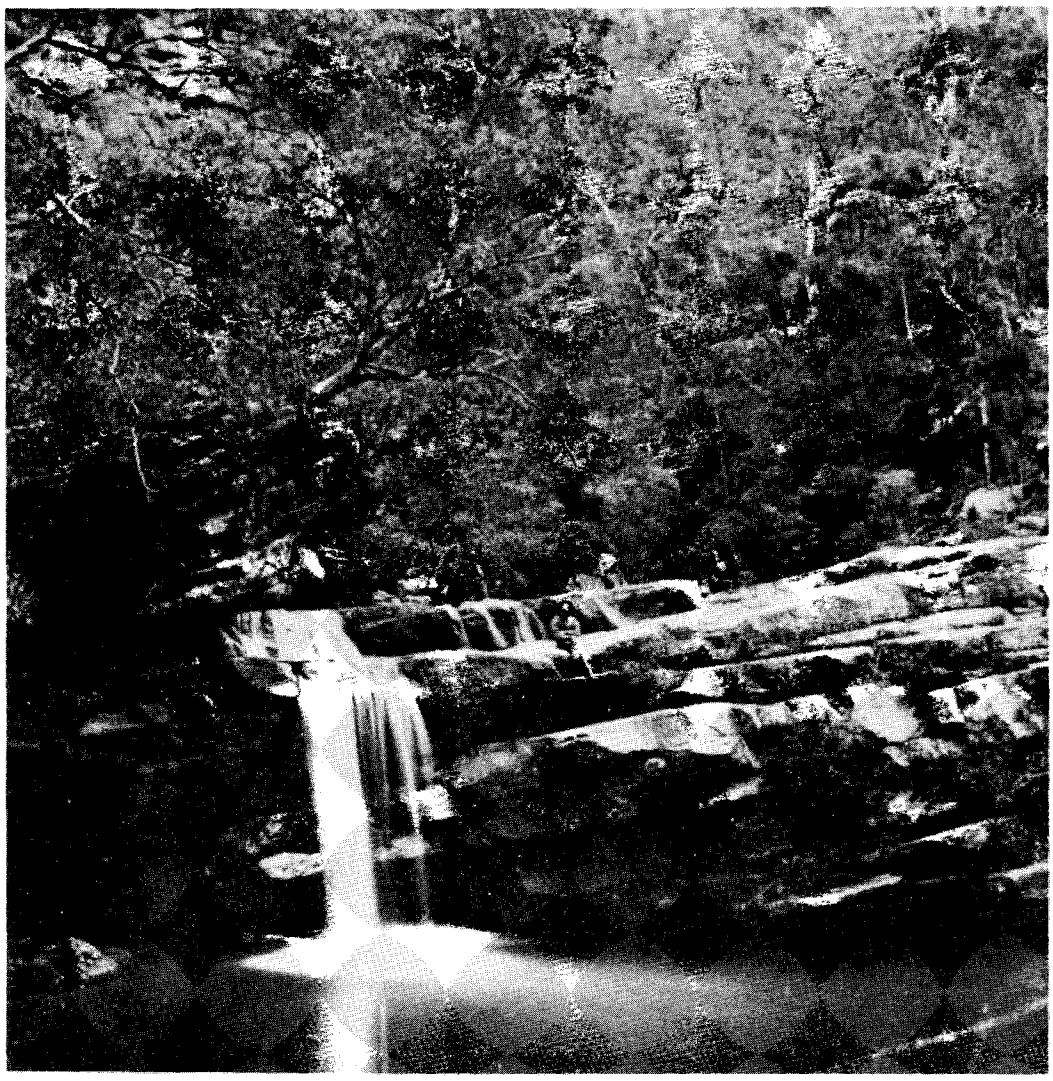


Figure 9 *Little Wheeny Creek, Kurrajong. Smith was a frequent visitor to Kurrajong to visit his friend James Comrie of Northfield and to test the volume and composition of nearby watercourses. There are many images of rivers and waterfalls in the Smith and Hunt Collections, but any scientific use of them is unknown. (From a stereographic wet collodion negative. John Smith Collection, University of Sydney Archives).*

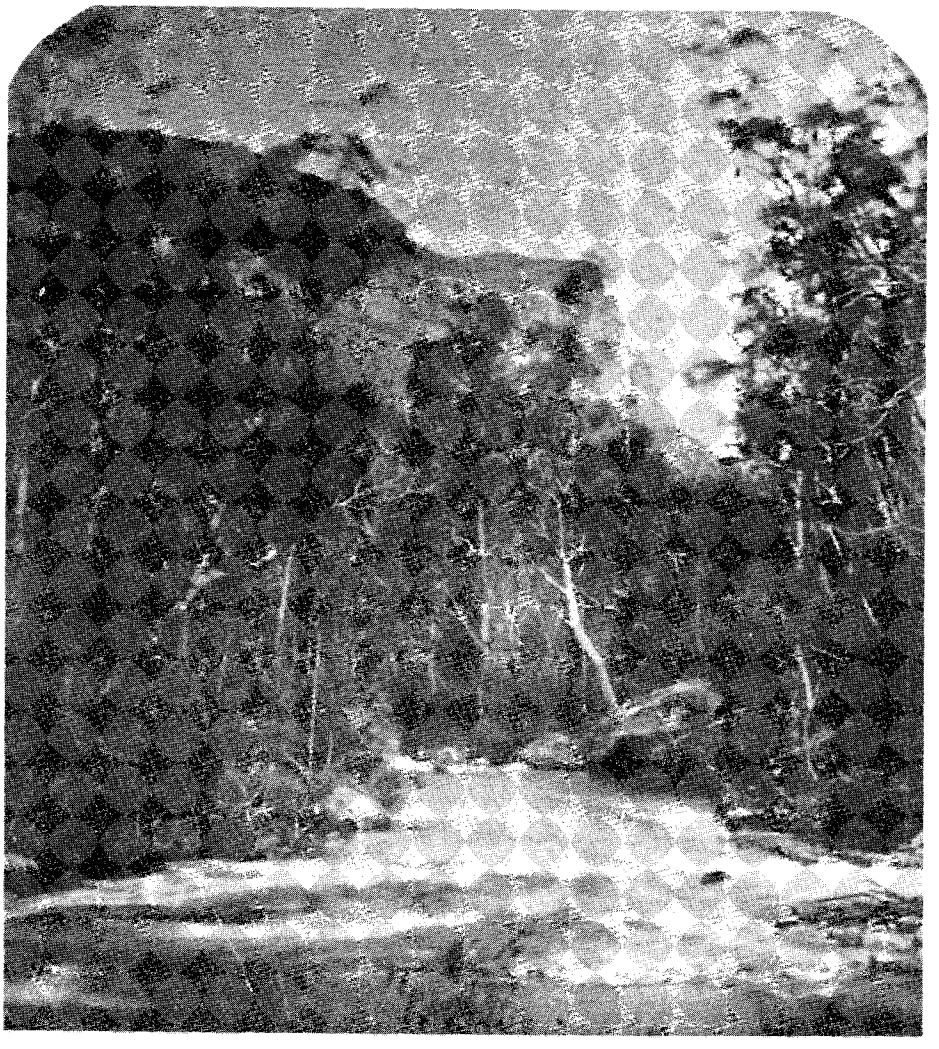


Figure 10 *Grose Valley Exploration, c. 1858. Naturalists and photographers made use of the bridle track being constructed along the Grose Valley from 1857 to 1860. (John Smith Collection, University of Sydney Archives, and from the Robert Hunt Collection, Historic Photograph Collection, Macleay Museum, University of Sydney).*

Figure 11 *Grose Valley Exploration, c. 1858.*

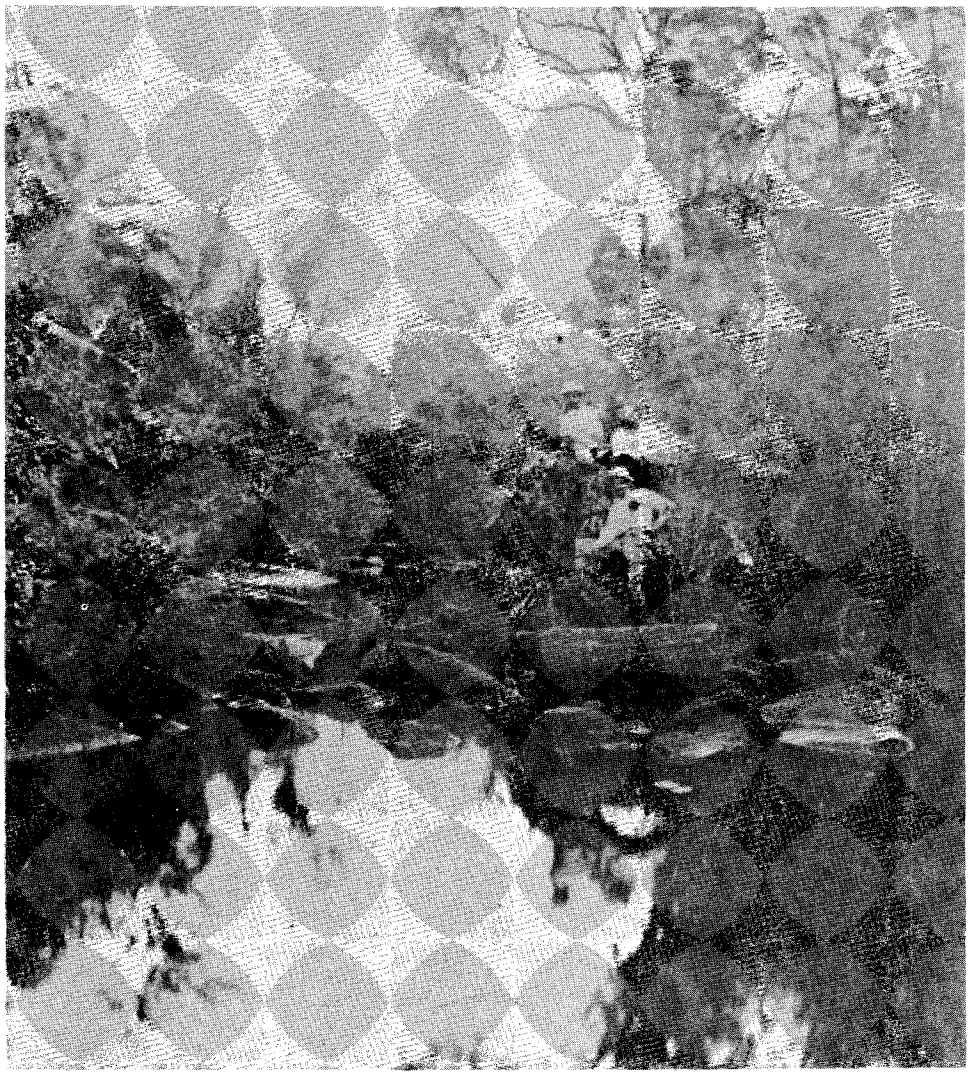
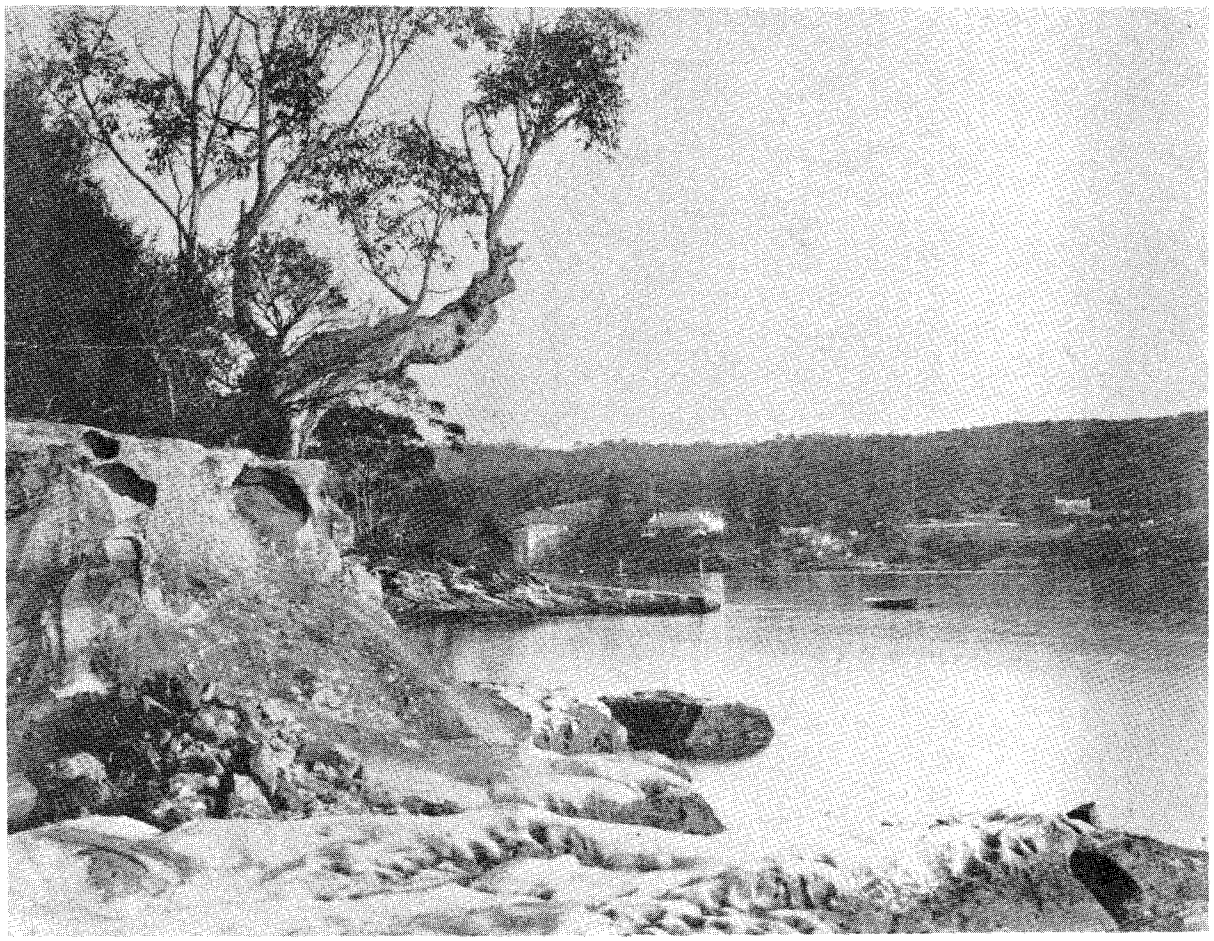


Figure 12 *Saturday Afternoon Off? Lane Cove River, c. 1857. This stereograph of a group of people at the head of the Lane Cove River is from the Hunt Collection. It has a marked similarity to one in the W.S. Jevons Collection, copies of which are in the Mitchell Library, and illustrates the collective nature of mid-nineteenth century photography. (Robert Hunt Collection, Historic Photograph Collection, Macleay Museum, University of Sydney).*

Figure 13 *Doorway in the North Side of the Quadrangle, University of Sydney, 1858. Robert Hunt stands near the ladder. This was probably one of the experiments using the Norris dry collodion stereographic plates that Smith tabled at the December 1858* conversazione *of the Philosophical Society of N.S.W. (John Smith Collection, University of Sydney Archives).*



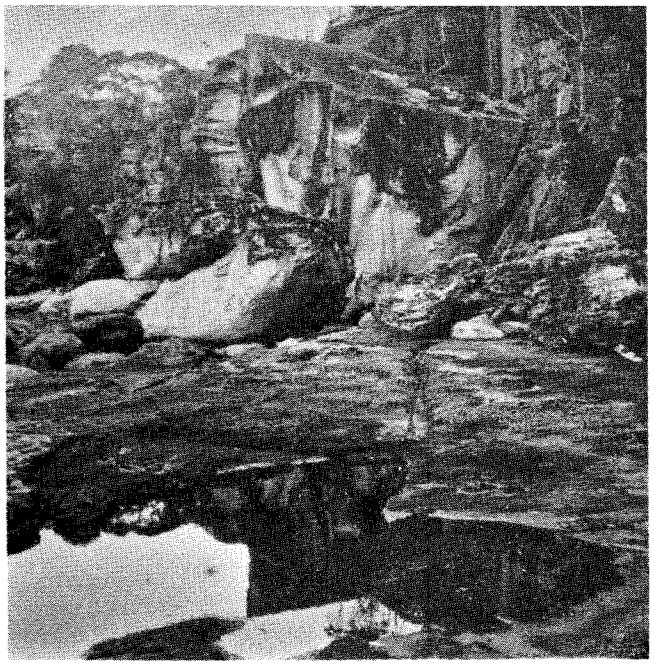


Figure 14 *Kirribilli Point, looking across to Neutral Bay, c. 1857. From a salt print in an album, taken from a wet plate negative. (Robert Hunt Collection, Historic Photograph Collection, Macleay Museum, University of Sydney).*

Figure 15 *Hunters Beach, Middle Harbour, 1865. The cliffs of the harbour were a constant inspiration to early photographers for their scientific interest as well as their beauty. They also had the advantage of keeping still as photographers experimented with the slow emulsion dry plates. This image appears as a stereographic dry plate negative in the John Smith Collection, and in the Robert Hunt Collection as a stereographic albumen print mounted on card. (University of Sydney Archives and Macleay Museum, University of Sydney).*

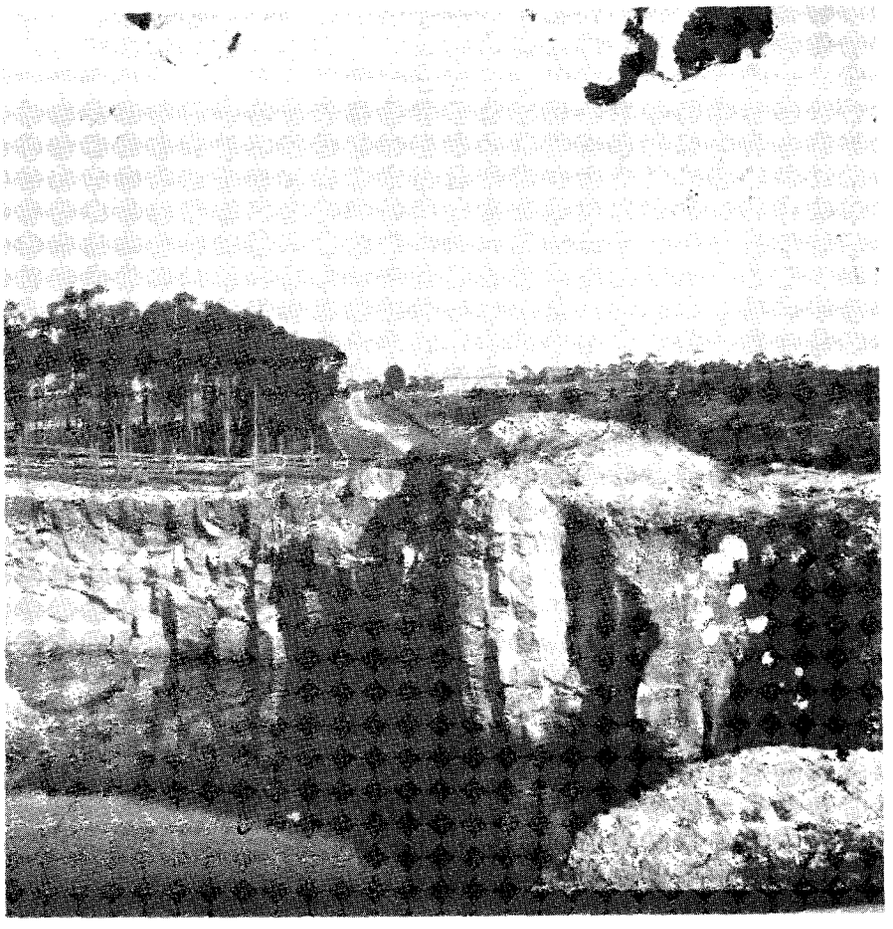


Figure 16 *Sandstone Quarry, possibly at Five Dock, 1865, which Rev. W.B. Clarke, John Smith and Robert Hunt visited together. From a dry plate stereographic glass negative. (John Smith Collection, University of Sydney Archives).*

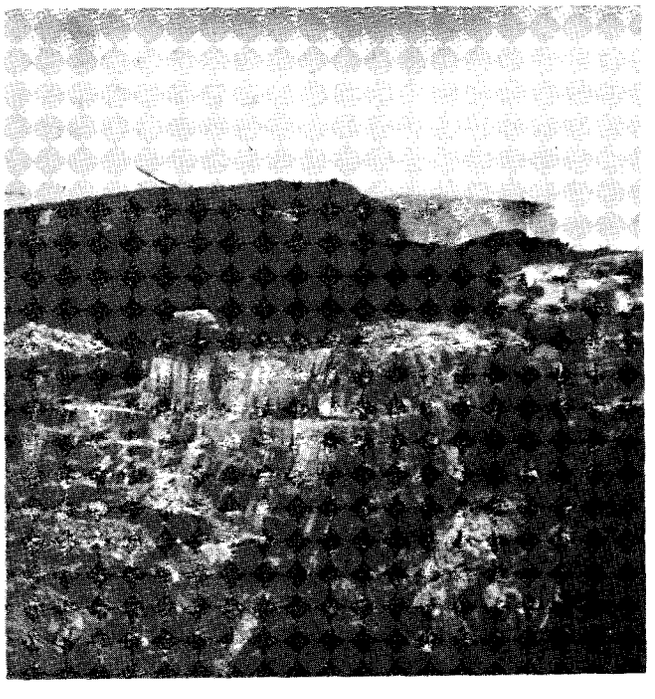


Figure 17 *Sandstone Quarry at Meriberi, north of Ben Buckler, Bondi, May 1865. This is one of a series that Smith and Hunt took using the 'English Dry Plate' and possibly the improved tannin process. Rev. W. B. Clarke tabled some of these images in his lecture of May, 1865. (John Smith Collection, Sydney University Archives, and Robert Hunt Collection, Historic Photograph Collection, Macleay Museum, University of Sydney).*

in laying the foundations of a new branch of Science, about which Photographers and others who are continually engaged with its effects, have as little real knowledge or understanding as the old alchemists had of chemistry in general a hundred years or so back.[26]

Because he experimented in collaboration with others (and showed his work collectively), Smith's work as an expedition photographer cannot always be separated from the efforts of those who went with him. The most important of these collaborators was Hunt, who like Jevons, worked at the Sydney Branch of the Royal Mint.

Although it was undoubtedly more interesting to go photographing with a companion, it was also helpful in dealing with the wet collodion process, the photographic technique that wayfaring amateurs favoured between the 1850s and 1880s. This process had superseded both the daguerrotype and the calotype by the mid-1850s. The first of these, the creation of an image on a polished copper plate, was extremely troublesome for travellers, for to achieve even moderate success required the transport of huge amounts of equipment. It was also expensive, not least because each exposure produced only a single, one-off image and because patents applied to its use. The calotype process offered more hope. Introduced to the world at the same time as the daguerrotype, it used today's familiar negative/positive technique. Its fibrous paper negative, however, did not deliver the precise, astonishingly clear image that people had come to expect from a photograph.

The wet plate solved many of these difficulties. Using an emulsion of wet collodion on glass, in which to suspend the light sensitive silver salts, the photographer could create a robust negative. From this could be made an infinite number of prints of great sharpness, especially when the glossy albumen printing process superseded the softer calotype print in the mid-1850s. The scientist who used the wet collodion method now had access to a technology that allowed him to communicate precise and detailed images of his discoveries to any number of colleagues, friends and relatives. It was this technique, as Krefft and Clarke and later Maclay realised that allowed them to transport a special kind of scientific evidence to Europe.

Many wayfaring amateurs used a twin-lens camera, or a single-lens camera adapted to make two successive exposures. This allowed them to present their photographs as stereograms, cards with a twin image that could be examined through a stereoscopic viewer to give an enlarged, three-dimensional effect. This presentation enabled them to use relatively light cameras and plates on their expeditions but provided sufficient detail to give the image status as a scientific document. It also provided one of the common entertainments of the nineteenth century.

For amateur practitioners in the field, however,the wet collodion process, had its drawbacks. The articulate Jevons, for instance, has recorded his misgivings:

My photographs never attain perfection . . . I always work out of doors in a tent, which is far more difficult than working in a comfortable dark room with all the conveniences of a laboratory.[27]

Later, while photographing by himself on the Victorian goldfields, he found it so 'laborious, time consuming and annoying' that he sent his camera and equipment back to Melbourne.[28]

These comments would have been familiar to any wayfaring photographer for there was a catch to the beguiling wet collodion process. The plate was only sensitive when it was wet. Since it had to be prepared just before exposure and processed while still moist, the photographer had to take all his processing equipment with him and set up a darkroom on the spot. Under these circumstances, expedition photography could be unstable, often needing constant repetition and

frequently attended by failure. This is best illustrated in Jevons' account of a trip to Willoughby Falls with Robert Hunt, and William McCutcheon in November 1858.[29] Armed with their Saturday afternoon off and a considerable amount of baggage, they departed in Hunt's racing skiff, *Terror*. On the way, inspired by the waterworn cliffs of Middle Harbour, they decided to try a photograph using Jevons' lighter equipment. After an hour and a half's work and four trials they failed to make a perfect image. When Jevons described this event, and the approach to Willoughby Falls the next day, including an ascent from the shore dragging their equipment up the cliffs 'by main force', he was describing the limitations of the wet collodion process only too accurately.

Although we cannot minimise these problems, especially in the hot sun of the 'photographing season',[30] it is clear that there was some pride in proclaiming the difficulties the photographer had to go through in the service of science. This helped to ensure its place as a scientific activity of some importance — quite apart from the content of the images that could be produced. Jevons has shown that in Australia, as overseas, there was already a tradition that the photographer should be an intrepid traveller struggling with physical danger and technical problems to collect that last image specimen. No doubt this also enhanced the status of photographing as a kind of moral force.

If the Jevons and Hunt experiment on the Middle Harbour rocks had worked, it might have been difficult to decide whose photograph it was. There is the same difficulty in attributing the 'Grose Valley Exploration' photographs of circa 1858. The Valley was particularly accessible to scientific explorers while the Royal Engineers were conducting a trial survey through it and especially after they had completed a bridle track all the way from the Nepean to the Valley of the Lett.[31] Grose Valley images appear severally in Hunt's work as stereographic prints mounted on card, in Smith's as negatives, and in William Macarthur's collection as stereographs pasted in an album.[32] (See Figure 10). None of these have been formally attributed. Jevons may have been on that or a similar expedition too, as he seems to imply in a letter to Henry Parkes in 1882.[33] There has been some attribution of Jevons' photographs perhaps from the earlier Lane Cove expeditions, to Hunt and Smith.[34] It is often difficult to separate Hunt's Nepean photographs from William Hetzer's.[35] Clearly this collaboration was important and not just for companionship or to ease the task of a difficult process. It demonstrated that photography was not just an aberrant or undignified activity , but one in which numbers of sober-minded professional gentlemen worked together to perfect a demanding craft. Photography was clearly not just a companion to science and a serious improvement to leisure but a scientific activity itself.

Smith and his colleagues added to their status by experimenting with a number of different processes. They lost no time in demonstrating their successes in the scientific arenas of the time. Their special arena, the Philosophical Society of New South Wales was, like its counterparts in Aberdeen, Edinburgh and London, a forum for discussions on the development and uses of photography.[36] Smith's (and Hunt's) special contribution was to pioneer the dry plate as the most suitable medium for scientific expedition photography.[37] In the late 1850s very soon after the process became known, Smith and Robert Hunt began to experiment with the dry collodion plates patented in England by Richard Hill Norris.[38] We know from the Minutes of the Philosophical Society of Sydney that Smith used some of these dry plates to take photographs of the more static activities of the construction of the University in 1858.[39] (See Figure 13)

The difficulty with the dry collodion plate was that its emulsion, although producing the sharp image of the wet process, was even slower than wet collodion process — in Europe as long as several minutes. It must have been considerably faster in bright sunshine, perhaps as fast as a minute and a half, and probably

faster once photographers had adopted its successors, the Taupenot and then the tannin processes of the 1860s. Although restricted in their use for moving subjects, these dry plates were extremely convenient for expeditions. They meant that the intrepid cliff scaling photographer could limit his load to a camera and a few glass plates. Processing of the exposed plates could take place in the 'comfortable dark room' that Jevons longed for.

From a number of card stereograms and negatives in the Robert Hunt Collection held by the Macleay Museum, as well as some surviving negatives in the Archives of the University of Sydney, we know that Smith and his colleague were able to exploit the advantages of the dry plate in their geological and water analysis expeditions. It is likely that by the 1860s they were experimenting with improved versions. These used a tannin process demonstrated at the London World Exhibition of 1862 which Smith attended.[40]

The key to these geological images lies in W.B. Clarke's paper, 'On the Transmutation of Rocks in Australasia' read before the Philosophical Society of New South Wales in May 1865 (with it seems, both Smith and Hunt present). During his lecture, Clarke tabled some photographs, among which were images of

some of the most remarkable transmutations which have ever been submitted to the inspection of a geologist . . . a mass of white rock . . . on the top of the cliffs north of Bondi Bay . . . .[41]
(See Figure 17).

Smith and Hunt had provided these photographs.[42] They were part of a series of expeditions in 1865 to several sites of geological interest in the vicinity of Sydney. At the beginning of his lecture, Clark mentions that Smith and Hunt had studied all the formations in those parts of Sydney which he was discussing – including Ben Buckler at North Bondi, Botany North Head, the Five Dock (Figure 6) and Pyrmont quarries, Lane Cove (Figure 7), Middle Harbour and Waverley. Although Clarke confirms in his lecture only that he had visited the Five Dock quarry with Smith and Hunt, it is clear from further remarks that he was working closely with Smith on chemical analysis and synthesis: to reproduce the effects of heat on combustible surfaces in the laboratory, and to obtain analyses of the specific gravity of both the altered and unaltered sandstone from Meriberi (north of Ben Buckler) and the Five Dock quarry.

Clarke's use of the tabled photographs is consistent with his whole argument about the necessity of understanding the environmental details of rocks and fossils. It was an essential part of his geological theory and his disagreements with Frederick McCoy on stratigraphy – that it was not enough to study geological specimens in isolation from their source.[43] In illustrating this point, he consistently made use of supportive photographs. Apart from his 1865 lecture, he used photographs by James Freeman as his submission to the 1867 Paris Exhibition on fossil fish in the Wianamatta beds of the carboniferous formation of NSW,[44] another to complement a gift of a fossil to Richard Owen in 1876.[45]

It was the Bondi formations that Smith photographed so assiduously that illustrated most clearly the main features of the metamorphosis of rocks about which Clarke was theorising. The substance of his lecture was both particular and spectacular. In it Clarke speculated that the formations at several spots in the Sydney vicinity, ranging from the Lane Cove river to the sea near Meriberi, were part of an igneous dyke formed when the mass of the harbour was filled in with continuous deposits of sandstone. It was therefore, he argued, older than 'the present features of the land'. His paper discussed the connections between the obvious physical features of the Sydney vicinity with the causes of igneous action beneath them. This he claimed, provided abundant proof that no part of the earth's crust was stable but that the transmutation he was referring to was produced 'by slowly acting forces and moderate temperatures during long periods

Figure 18
Memorial to Captain James Cook, Botany, c. 1860. This stereograph, unattributed, is from the Robert Hunt Collection. An image of the La Pérouse Memorial, possibly taken at the same time, is in the Smith Collection, University of Sydney Archives. (Robert Hunt Collection, Historic Photograph Collection, Macleay Museum, University of Sydney).

of time', that the solid rock was still undergoing constant change. Finally, his interpretation provided evidence of the 'inconceivable antiquity' of the earth's existence.[46]

In this exposition and illustration of a controversial theory, photographic strayfaring with a camera clearly had much to offer. Smith's (and Hunt's) active work in photographing and analysing natural formations suggests that they were contributing to and attempting to solve the intricacies of geology, water analysis and even water engineering that provided many of the scientific controversies of the day – including attempts to reconcile the teachings of Revelation with the classification of geological formations and the age of the Earth, and with widespread ideas of evolution and Darwin's specific claims of natural selection.

Smith seems to have used photographs as an adjunct to the examination of water and rocks in the environment and in the laboratory. Since he worked so closely with Clarke in examining rocks and fossils in their natural context, we might expect that Smith reached similar conclusions about the significance of such contextual studies. We might expect that, like Clarke, he was admitting the importance of stratigraphy when in 1867 he showed his stereographs and specimens of prismatic sandstone collected from the Botany cliffs. We might consider also that Smith took his many photographs of water courses such as the Nepean to complement his studies of their heights above sea level, flow, capacity and chemical composition.[47] Yet there is no evidence that Smith made any

creative connections between these two forms of evidence. He clarified his views in his discussion at a meeting of the Philosophical Society on Lyell's ideas on evolution, 'Geological Evidence on the Antiquity of Man', he was content merely to 'add a few thousand years to the generally recognised six thousand' (of man's life on earth) and to conclude that there had been a great gap between a previously existing human race, entirely destroyed and subsequently giving way to a new human race.[48]

Smith failed to take up the challenge of synthesising Darwinian ideas and the material evidence before him in the colony, especially in the way that Gerard Krefft with his assiduous use of photographs to support specimens was able to do.[49] For Smith, photography seems to have become an end in itself, merely a pastime, without equipping him to be much more than a gentleman of science occupying himself with a little learned leisure. It was in the public arena, as committee man and member of the Legislative Council that he most exerted his professional skills.

Smith notes with some approval in his Anniversary Address of 1879, that the earlier Philosophical Society had, in 1822, placed a plaque on the rocks at Botany Bay as a memorial to Cook's scientific expedition (Figure 18). It is positioned on the Botany sandstone that Smith chose to exhibit in the Paris Exhibition of 1867. Placed high up on a cliff, the plaque may well have been a symbol of man's aspirations towards scientific learning. To decipher its message, however, seems to have been beyond the vision of most people of ordinary stature. Smith had been content merely to stand on one side and photograph it.

Notes

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1 *Sydney Punch*, 13 February 1874.

2 John Smith, *Wayfaring Notes, Series I* (Sydney: Sherriff and Downing,1865), 2.

3 *Ibid.*, 13.

4 Smith used Cook's Tours for a short time in Italy in 1872. See *Wayfaring Notes, Series II* (Aberdeen: A. Brown and Co., 1876), 159.

5 Ann Mozley Moyal, *Scientists in Nineteenth Century Australia* (Melbourne: Cassell,1976), 204.

6 R.J.W. Le Fèvre, 'The Establishment of Chemistry within Australian Science — Contributions from New South Wales', in A. P. Elkin *et al.*, *A Century of Scientific Progress: The Centenary Volume of the Royal Society of New South Wales* (Sydney: Royal Society of NSW, 1968), 348.

7 Moyal, *op.cit.* note 5, 207-11; 217.

8 *Journal and Proceedings of the Royal Society of New South Wales, 13* (1880), 347.

9 Le Fèvre, *op.cit.* note 6, 353.

10 Smith, *op.cit.* note 2, 96.

11 *Ibid.*, 122-3.

12 Henry Thomas Fox, *Diary* (Mitchell Library Mss.), 1852.

13 Peter Beilharz, 'Theorizing the Middle Class', *Arena*, 72 (1985), 92-105.

14 Beilharz is referring to Karen Reiger's, *The Disenchantment of the Home : The Rationalization of Domestic Life in Victoria, 1880-1940* (Melbourne: Oxford University Press,1984).

15 R.D.C. Black (ed.), *Papers and Correspondence of W.S. Jevons*, Vol. II (London: Macmillan, 1973), 249.

16 Beilharz, *op.cit.* note 13, 101.

17 Louisa Ann Meredith, 'Notes and Sketches of New South Wales during a Residence in that colony from 1839 to 1844', cited in Bernard Smith, *European Vision and the South Pacific, 1768-1850* (London: Oxford University Press, 1960), 81.

18 Preface, *Sydney Magazine of Science and Art* (1858), 223.

19 *Ibid.*

20 Smith, *op.cit.* note 2, 180-181.

21 Report on a *conversazione* of the New South Wales Academy of Art, held in October 1875 and reported in the *Sydney Morning Herald* of that month. From a newspaper cutting, undated, in the Du Faur Notebooks, Mitchell Library.

22 William Woolls, *A Contribution to the Flora of Australia* (Sydney: F. White, 1867), 180.

23 H. and A. Gernsheim, *Louis Jacques Daguerre* (London: Thames and Hudson, 1968), 83-86.

24 Nikolai Miklouho-Maclay, letter, 28 October 1878, to the Secretary of the Russian Geographical Society, cited in *Newsletter of the Miklouho-Maclay Society of Australia, 4* (3) (August 1983), 14. I am grateful to Lydia Bushell of the Macleay Museum for drawing my attention to this comment.

25 Jevons, in Black, *op.cit.* note 15, 190-193.

26 *Ibid.*, 243-244.

27 *Ibid.*, 344.

28 *Ibid.*, 371.

29 *Ibid.*, 344.

30 *Ibid.*, 340.

31 *Votes and Proceedings, N.S.W. Legislative Assembly, 1859-1860, 3*, 401.

32 This date derives from the Macarthur Photograph Album (Mitchell Library Mss.), in which a second 'Grose Valley Exploration' image appears.

33 *Parkes Papers* (Mitchell Library Mss.), Jevons to Parkes, 18 June 1882. His comments here do not seem to refer to the trips recorded in either of the Black and Konecamp volumes.

34 Stereograph prints made from the same negatives appear in the Hunt and Hetzer Collections held by the Historic Photograph Collection of the Macleay Museum.

35 *Docker family Mss. letters.* Joseph Docker and Smith worked together making calotype images from stereograph plates, as a collection of photographs held by the Docker family shows; Docker experimented in 1864 with dry collodion plates prepared by William Hetzer; Robert Hunt's Collection shows salt paper prints made from wet plates.

36 Reports in the *Sydney Magazine of Science and Art*, of Monthly Meetings, 9 September 1857; 12 May 1858; 8 December 1858; 10 August 1858; 19 December 1859; 16 May 1860.

37 *Docker family Mss. letters,* in 1864 show that both Joseph Docker and William Hetzer were using dry plates, and that Hetzer was preparing and processing them commercially. Smith and Hunt, however, were using them for more obvious specialist and scientific purposes.

38 Josef Eder, *History of Photography* (New York: Dover Publications, 1972), 373-4, notes that the Taupenot process (collodio-albumen) was published in 1858 and exhibited successfully in London in 1862, the Richard Hill Norris gelatin experiment was patented in September 1856, and Russell's tannin-coating method was exhibited in London in 1862. The Norris plates were brought to Australia in 1857 or 1858, and in his 'Reminiscences', Ernest Brougham Docker claims (probably incorrectly) that the Taupenot process came in 1855, and the Russell process in 1861. (Typescript, Docker family).

39 *Sydney Magazine of Science and Art* (1858-9), 19-20.

40 Eder, *op.cit.* note 38, 374-5.

41 W.B. Clarke, 'On the Transmutation of Rocks in Australasia', *Sydney Magazine of Science and Art* (1866), 287.

42 J.H. Maiden, 'A Contribution to a History of the Royal Society of New South Wales', in *Journal and Proceedings of the Royal Society of New South Wales, 52* (1918), 301. These stereographs, some of which are dated July, 1865, appear to be part of a later series, perhaps prepared for the Paris Exhibition.

43 Moyal, *op.cit.* note 5, 131.

44 *Catalogue of the Natural and Industrial Products of N.S.W.*, forwarded to the Paris Universal Exhibition of 1867, N.S.W. Exhibition Commissioners (Sydney: Government Printer, 1867).

45 Moyal, *op.cit.* note 5, 276.

46 Clarke, *op.cit.* note 41, 287.

47 John Smith, 'On the Results of the Chemical Examination of Waters for the Sydney Water Commission', *Transactions of the Royal Society of New South Wales, 3*, (1869), 146-156.

48 Reported in the *Sydney Morning Herald*, 12 November 1863, 8.

49 Moyal, *op.cit.* note 5, 206.

CHAPTER THREE

'FULL OF INSTRUCTION'

JOHN SMITH AS TEACHER

H. GRAHAM HOLLAND

INTRODUCTION

IN COMMEMORATING Smith's contributions to Australian life, it is fitting that we should keep in sight the task for which he was brought to Sydney: to teach chemistry and physics to a handful of highly selected male students enrolled in an Arts course. This commitment persisted unchanged for three decades. It was only modified in his last three years to the extent that he was now exempted from teaching chemistry; that women students joined his classes; and that his students were enrolled not only in Arts but also in the new faculties of Science, Engineering, and Medicine. So much is known. Surprisingly, however, we know much less of Smith's actual teaching life — how much he did, what topics he covered, and what view he had of his subject. Inquiring into this domain we discover much about contemporary expectations of undergraduate education in physical science and much about the man himself.

In appointing him, the nascent University could regard itself as well placed to establish a tradition of science teaching. Smith had been both student and teacher in Marischal College, Aberdeen, a city whose two universities (soon to be amalgamated) were pioneers in the priority given to science as a component of the Arts curriculum. Chairs in natural history and in chemistry had been instituted in Marischal College in the previous century, and in Smith's time there 'the Senatus felt that the prosperity of the University depended, in no small degree, on the success of the teacher of Chemistry'.[1]

Smith's chemistry teacher and then colleague was Thomas Clark, a highly regarded though eccentric figure (see Figure 20).[2] Clark's lectures were 'illustrated by experiments on the same extensive scale as in the Universities of Edinburgh and of Glasgow', and twice weekly he held 'Conversational Examinations'. Smith followed Clark's example in holding frequent *viva voce* tests, and from the amount of money spent on equipment it is likely that he also followed Clark in the matter of lecture demonstrations. Clark's students could also attend 'a Course of Instruction in the Art of Chemical Testing, and in the operations of Chemical Pharmacy'. A surviving record of Clark's lecture course at the time when Smith was one of his students recalls that 'Clark . . . had essentially a practical turn of mind and was more interested in facts and in practical applications of facts than in scientific theory or the systemising of facts'.[3] On the evidence of Smith's examination questions in both chemistry and experimental physics, that description could equally apply to Smith's lectures in Sydney. But Smith's course could not have

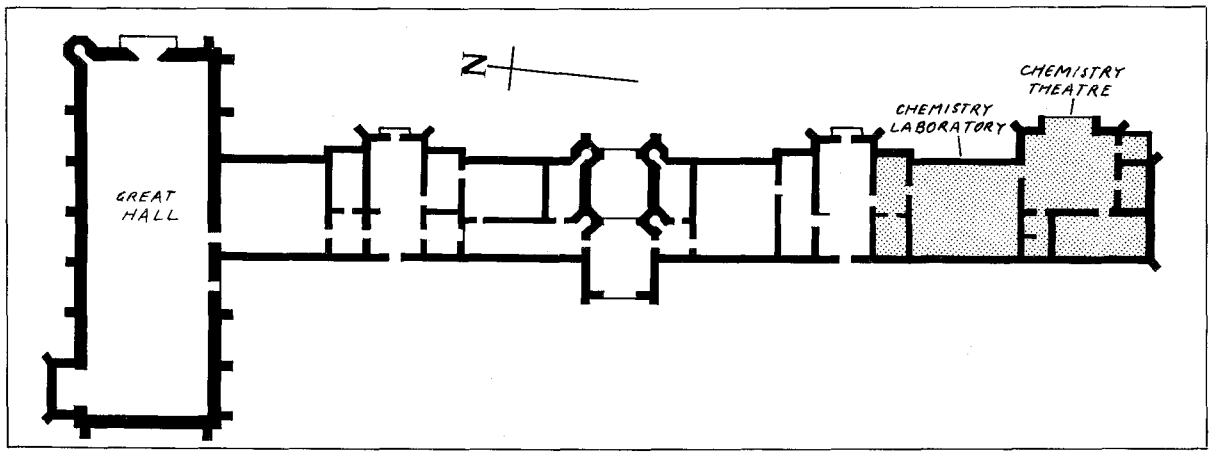

Figure 19 *Main Building, University of Sydney (1909 plan, after Edmund Blacket's original design.)*

been modelled entirely on Clark's, since a component of Clark's course, organic chemistry, does not appear as a (Sydney) Calendar subject entry until 1866.

Smith's first (and perhaps only) teacher of physics would have been the elderly William Knight, Professor of Natural Philosophy in Marischal College. Like Clark, Knight was given to 'sarcastic scurrility' in his lectures. Details of his physics course are not available, but a list of his apparatus survives, as well as a set of his lecture notes on chemistry.[4] In Sydney until the late 1850s, Smith's official teaching was performed in the University's temporary home in College Street, but with completion on the permanent site of the Main Building he was allocated a suite of rooms on the ground floor at the southern end, corresponding to those shaded in Figure 19.[5] This was the location of Smith's teaching throughout the rest of his life. The science area later expanded into the upper floor, though chemistry (and presumably physics) remained in the original quarters. Figures 21 and 22 show the lecture room as it was in about 1889 and the laboratory photographed in 1885 (a few days before Smith's death), when it was about to be dismantled.

LECTURING OBLIGATIONS

Throughout a large part of nearly every year, over nearly four decades, Smith's teaching duties formed the framework of his daily existence, yet little is known about them. In Sydney the duties of the new professors were defined in the by-laws, which required that 'Lectures of an hour each shall be given, daily, by the Professors in Classics, Mathematics, Chemistry, and Experimental Physics, at such times . . . as the Senate may . . . direct'. For a teaching year of about 30 weeks that meant a commitment of (some multiple of) about 150 lectures. In a printed report dated 17 March 1876 the following table (Table 1) appears.[6]

Table 1 Number of Lectures Given by Professors

	1st Year	2nd Year	3rd Year
Professor of Classics	145	145	145
Professor of Mathematics	145	145	145
Professor of Chemistry, etc.	145	110	—

The table includes additional entries to cover third-year courses in geology and mineralogy, as well as practical chemistry. But these activities belonged to Archibald Liversidge, who had arrived in 1872. The only entry relevant to Smith

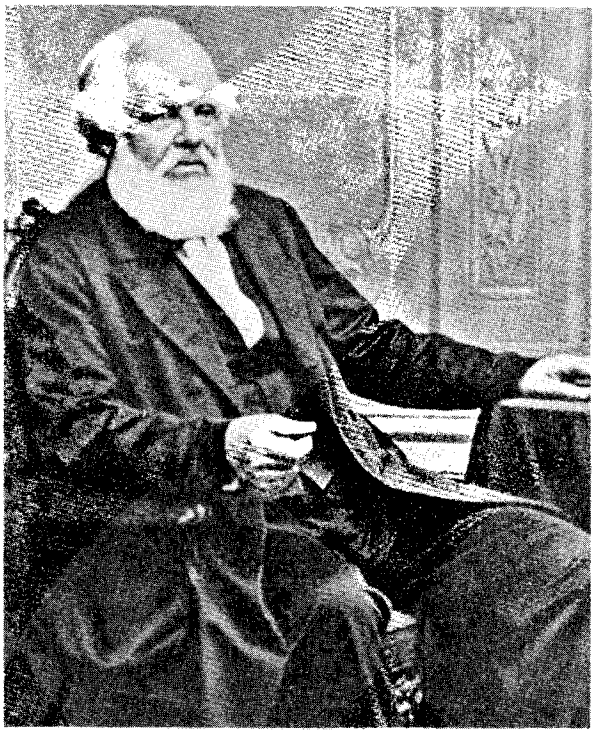

Figure 20 *Thomas Clark (1801-1867) (from Alexander Findlay,* The Teaching of Chemistry in the Universities of Aberdeen *(Aberdeen: Aberdeen University Press, 1935).*

is line 3. From this table, Smith's daily lecture load (in 1875) averaged 1.7, compared with 3.0 each for Badham (Classics) and Pell (Mathematics). Not included in the table is any reference (in line 3) to third-year lectures. Yet in nearly every issue of the University Calendar there are one or more question-papers for 'Third Year' or 'B.A.' level examinations on subject matter which must have been taught by Smith.

Table 1 would be more comprehensible if the entry '110' were inserted under third year rather than second year. Some light is thrown by 1876 letters from the Principal (Badham) to the Chancellor (Deas Thomson), in which Badham refers to Pell giving 'his three lectures today', and to Smith giving 'his one hour . . . at 12'.[7] At that time the University's Board of Studies was considering changes to the existing lecture timetable which among other things would require Smith to give two lectures a day 'instead of one as at present'. When the Senate adopted the Board's report, Smith wrote to the Chancellor (on 18 October 1876) stating that 'I cannot (for reasons adduced verbally) undertake to carry out the wishes of the Senate, and therefore, as the only alternative, I tender my resignation on terms similar to those recently granted to Professor Pell'.[8] Pell was entitled to a retiring allowance of half-salary for life, but Smith apparently did not qualify for the same treatment, and he continued in office until his death nine years later.[9]

SUBJECT AREAS

The selection committee which appointed Smith required that 'in Chemistry the course of the University of Edinburgh or of King's College, or University College, London, was to be copied'. Such a wide definition would cover any chemistry taught at the University, and so we may associate with Smith any evidence relating to chemistry before 1867. During 1861, when Smith was on overseas leave, the combined first and second-year chemistry course was given by a substitute, Charles Watt, a chemist. But since Smith personally selected him, Watt's lectures

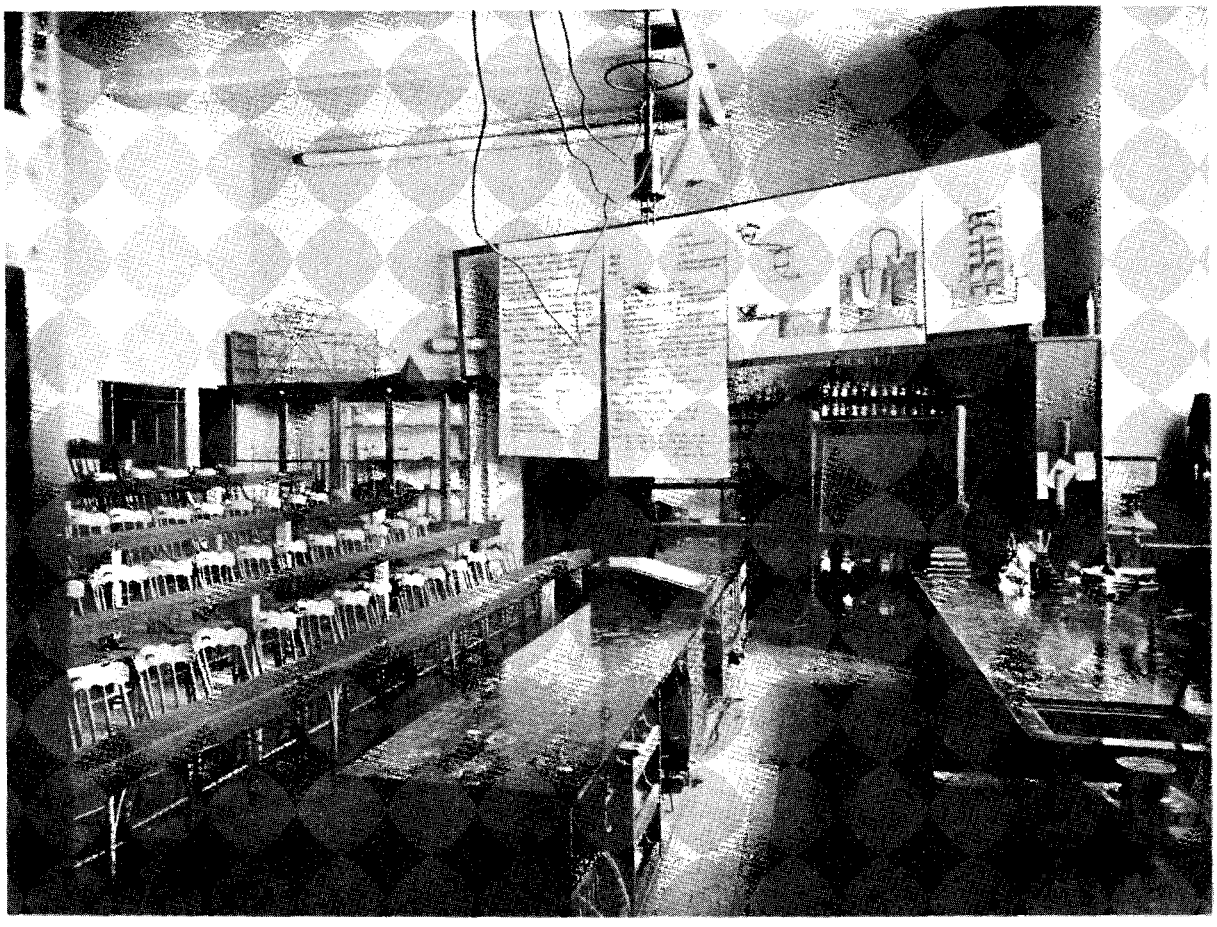

Figure 21 *Old Chemistry Theatre* (Liversidge Papers, *University of Sydney Archives*).

and examinations would have conformed to Smith's prescription. Evidence from later periods relating to chemistry cannot be unequivocally linked to Smith. From the beginning of 1867 he had an assistant or colleague — Alexander Thompson until 1871, and Archibald Liversidge from 1872 — who was primarily responsible for geology and mineralogy, but who also shared responsibility for practical chemistry. By 1882 Smith, then aged 61, was content to give up responsibility for all aspects of chemistry to his younger colleague.

But Smith was also to teach in Physics, so the relevant evidence relating to physics throughout his career may be attributed, with the following reservation, exclusively to Smith. 'Experimental philosophy', according to the terms of reference of the inaugural selection committee, was to be modelled on the course adopted by the Plumian Professor at Cambridge and also to include 'those subjects which belong exclusively to other Chairs, such as the Jacksonian at Cambridge'. Such a prescriptive definition of duties, based on contemporary Cambridge practice, shows awareness of potential areas of conflict arising from overlapping interests, which in Cambridge gave rise to demarcation disputes between mathematics and physics.[10] At Sydney, the apparent intention was to divide physics between Smith's Chair and the Chair of Mathematics (which would be occupied by Morris Pell).

At Cambridge, the Mathematics Tripos, with which Pell would have been familiar, incorporated Newtonian physics, optics, and astronomy. This division was to be followed at Sydney. In the first edition of the University Calendar

Figure 22 *Old Chemistry Laboratory* (Liversidge Papers, *University of Sydney Archives*).

(1852/53) an entry appears as follows: 'B.A. (Honors) 1. Classics, 2. Mathematics and Natural Philosophy, 3. Chemistry — Heat, Electricity, Galvanism, Magnetism'. It is perhaps coincidental that in the contemporary Natural Sciences Tripos at Cambridge one of the listed sciences was 'chemistry (with heat and electricity)'.[11]

Within a very short time the study of physics at Sydney would become identified in the University Calendar as including both 'experimental physics' and 'natural philosophy'. There was much inconsistency in contemporary usage: for example, a textbook on experimental physics listed its contents as 'Sound, Light, Heat, Electricity, and Magnetism', while another on natural philosophy gave its contents as 'Mechanics, Hydrostatics, Hydraulics, Pneumatics, Sound, and Optics'.[12] There was an overlap between the two areas, and definitions varied, but a rough division survived. The demarcation between 'natural philosophy' and 'experimental physics' in Smith's early years in Sydney is illustrated by a comparison of Figure 23a and Figure 23c and d. The scope of Smith's teaching in later years is indicated by Figure 24, and 'chemical physics' formed part of the title of a prescribed reference book.[13]

LABORATORY TEACHING

Writing in the University's jubilee history, in 1902, the Registrar, Henry Barff, commended Smith's lectures as 'singularly clear in style and full of instruction,

though there was no opportunity afforded for practical laboratory work in his subjects until long after his original appointment' — in practical physics not until the appointment of Professor Threlfall (in 1886).[14]

Nonetheless, it has been claimed that Smith initiated the teaching of practical chemistry in Australia. Occasional references appear in the Minutes of the University Senate to purchases of apparatus:[15] thus Deas Thomson refers to Smith's success 'in acquiring a knowledge of all the most important discoveries in his department of science which had been made during his sojourn here, and in procuring instruments and apparatus for their illustration',[16] but these may have been obtained simply to provide 'illustrations' to his lectures. That Smith recognised the necessity for practical work is evident in a memorandum he prepared in 1865 and used in the selection of Alexander Thomson as his assistant in practical chemistry. In prescribing the conditions for an assistant, it was specified that 'During one term he would probably have to superintend with me a class of Practical Chemistry, . . .' and '. . . the Senate have agreed to allow £300 a year as fixed salary, together with the fees of the students in Geology and Mineralogy, and such proportion of the fees in Practical Chemistry as may hereafter be settled'.[17] These statements imply an existing programme of laboratory classes, although they could also merely indicate Smith's future plans.

Calendar entries relating to practical chemistry first appear in 1867, and coincide with Alexander Thomson's first year in Sydney. 'Practical Chemistry' is listed as a component of the Physics entry under 'Subjects for the B.A. Examination of 1867', and there is a statement under the heading 'Third Year' that 'There will also be a class for Practical chemistry (Laboratory work)'. The final examination set for that year's class is reprinted in the Calendar of the following year. The time allowed is not stated, and of the eight questions, five required only a written statement on a laboratory problem, such as how to remove oxygen from a measured volume of air, how to prepare and identify various acids, which metals can be precipitated from acidic solution by hydrogen sulfide, and how to analyse a liquid, the contents of which are specified. The three remaining problems require use of the blowpipe to identify a metal in a specimen: to identify one (parent) acid and one (parent) base in a specimen of a salt; and to detect two metals in a specimen of an alloy, in each case describing the necessary experiments carried out.

The Calendar evidence for 1867 as the beginning of laboratory classes in chemistry is supported by the notices of forthcoming courses which appeared each February in the *Sydney Morning Herald*. In 1867 the subjects listed include for the first time both chemistry and practical chemistry, and a separate notice states that 'A course of practical instruction in *Chemistry*, embracing the leading operations in chemical manipulation, the preparation of chemical substances, and a systematic course of testing, together with the analysis of minerals and other substances, will be commenced on Tuesday, 26th February, and will be continued on Tuesdays, Wednesdays, and Thursdays, during Lent Term, from 2 to 4 p.m. This class is open to all persons, whether matriculated or not, on payment of a fee . . .'. A similar notice appears in subsequent years.

The next evidence of laboratory work again refers to chemistry, and appears as a syllabus of the practical course in the 1874/75 Calendar (after the arrival of Liversidge). No reference to practical physics appears until after the institution of the Bachelor of Science degree in 1882. In that year the Science by-laws prescribe theoretical and practical physics as compulsory in second year, and as an option in third year. In Edinburgh and London, the existence of medical schools had prompted the introduction of courses in practical chemistry,[18] but no such prompting existed while Smith was responsible for chemistry at Sydney. Practical chemistry here owed its origin to other factors.

LECTURE COURSES

Whether Smith indeed introduced laboratory teaching before 1867 remains an open question. The only evidence so far unearthed on the scope and content of Smith's lectures before or after that date comes from a few newspaper advertisements, and from successive issues of the University Calendar. The latter provide not only a collection of annual examination papers but also occasional lists of prescribed and recommended textbooks, and on rare occasions a detailed syllabus. However, explicit attribution of such material to the responsible professor occurs only in the later years (with no relevant references to Smith). Moreover, the sequence of published Calendars is incomplete, and within them the space devoted to reprinted examination papers is very variable, particularly in chemistry and physics.[19] One reason may be that on occasion the written paper may have been replaced by a *viva voce* examination unsuited to reprinting.

In present-day mathematics, physics, and chemistry it is possible to recognise a linear progression of increasing difficulty. In Smith's examination papers, however, such a progression is hard to detect. As indicated in Table 1, Smith lectured to a combined group of first and second-year students, with physics and chemistry being given in alternate years. Whatever the reason for this programme, it was not necessarily because of small class size: Badham observed that Smith's (combined) class consisted of 'about four fifths of the undergraduates'.[20] Yet even as late as 1881, the University's entire first-year enrolment was only 37.

There could thus be no progression in depth from first to second year. A reading of the examination questions labelled as 'Third Year' or 'B.A.' does not readily suggest a higher level than the questions set for the more junior students. A high proportion of the questions require descriptive rather than analytical answers, and when discussion of general laws is called for there is often little indication that answers are to be expressed in mathematical form, or that any mathematical derivation is to be carried out. (This comment also applies to a proportion of the 'natural philosophy' questions set by the Pell, as shown in Figure 23a). The examination papers in chemistry likewise fail to show a clear trend of increasing depth with seniority. It has been commented that Natural Sciences examinees in Cambridge during the 1850s 'did not have to demonstrate an ability to solve original problems or to perform chemical operations'.[21] This is equally applicable to Smith's students.

Smith himself may have felt that his courses were something of a Cinderella. Although required to attend lectures in chemistry and experimental physics, students were not required to pass a written examination. Moreover, from 1854 students were required to attend his lectures only during the first two years of their course.[22] In 1858 the programme for Trinity term listed for Third year 'A voluntary class in chemistry', later amended by deletion of 'voluntary'.[23] When the academic year was altered to begin in February, Smith found himself compelled to give up the second year students in Lent Term – the longest teaching term. The teaching of Chemistry or Experimental Physics to second year students, he feared, 'will become of little value'.[24] Smith also suffered in another way: 'respecting the loss of fees sustained by him in consequence of the new programme of studies, whereby the second year's students no longer go to him in Lent term'.[25]

Smith's position in relation to his fellow professors was invidious also in respect of his students' previous knowledge. However inadequate the colony's secondary schools may have been in preparing matriculants in classics and mathematics, of Smith's subjects they had been taught next to nothing. The 1876/77 Calendar gives details of the Senior (secondary) examination, with chemistry and geology appearing as options, but it was not until 1882 that elementary physics and elementary chemistry were included as options in the Matriculation examination.

EXAMINATION FOR HONORS.

FEBRUARY, 1857.

NATURAL PHILOSOPHY.

1. Explain what is meant by a Mathematical Axiom.

2. State and prove the parallelogram of forces, explaining the assumed physical principles upon which the proof depends.

3. A heavy uniform rod rests between two inclined planes. The planes are at right angles to one another; one of them is inclined at an angle α to the horizon, and the coefficient of friction between the rod and the planes is μ. Find the limiting positions of equilibrium.

4. State and explain the Second Law of Motion. Explain the process of reasoning by which we are convinced of the truth of the Laws of Motion.

5. A particle acted on by a uniform force, has an initial velocity u, and after describing a space s, has a velocity v. Show that

$$v^2 = v^2 + 2fs$$

6. Find the equation to the path of a projectile; the origin being the point of projection, and the axis of x horizontal. Also find the range and the time of flight, the initial circumstances of the motion being given.

7. Explain generally, without algebraical calculation, the method by which the motion after impact of two imperfectly elastic spheres impinging directly upon one another is determined. Apply this method to the case where the spheres are equal and perfectly elastic.

8. State the assumed laws of Optics.

9. Explain, as far as is known, how vision is produced by light proceeding from an illuminated object.

10. A pencil of rays falls directly upon a spherical reflecting surface. Determine the position of the focus after reflection.

11. Two convex lenses whose focal lengths are respectively 1 and 3 inches, are placed with their axes coinciding and their centres at a distance of 2 inches. A pencil of parallel rays is incident directly upon the first lens, find the position of the focus after refraction through the second.

12. Describe Galileo's Telescope.

13. State and explain the reasons which we have for supposing that the earth rotates about its axis.

14. Explain what is meant by the Precession of the Equinoxes, and the phenomena to which it gives rise.

15. Explain the phenomenon called Aberration.

16. Shew how the R. A. of the Sun may be determined.

17. Shew that there must be two Eclipses of the Sun in one year, and that there may be five.

CHEMISTRY.

1. From what substance is Oxygen best prepared? Give a diagram, with atomic weights, to illustrate the decomposition.

2. How was the composition of water first made out, and by whom?

3. Classify the solid matters that are usually found dissolved in natural waters.

4. State the four leading constituents of the Atmosphere, and their relative bulks.

5. What bulk of air, of average composition, and under standard temperature and pressure, contains 100 grs. of oxygen?

6. State the density, boiling point, freezing point, and atomic weight, of the sulphuric acid of composition HO, SO_3.

7. Name the usual constituents of coal-gas.

8. What is the cause of the illuminating power of a coal-gas flame?

9. What is gunpowder, and what purpose is served by each of its ingredients?

10. Write the formula of common alum in crystals.

11. Describe Marsh's process for the detection of arsenic.

12. State the density, melting point, and atomic weight of silver; also, its best solvent, and the mode of detecting silver in solution.

13. Give a diagram representing the preparation of corrosive sublimate.

14. How may gold be distinguished from golden coloured mica, and from iron pyrites?

15. What is the composition of British gold coins?

16. Write the general formulæ for sulphates, phosphates, and ferrocyanides.

17. Peroxide of iron is dissolved in sulphuric acid,—find by the general formula the composition of the resulting sulphate.

18. Represent by diagrams of the usual character the action of HCl upon PbO, and also of HO, SO_3 upon the same oxide. Give diagrams of the same reactions on the acid-radical theory, and show wherein the latter mode of explaining the reactions is preferable to the former.

Much of what Smith needed to teach was thus introductory. This is reflected in the number of essentially school texts in the published book lists – including Longmans' Text Books of Science ('adapted for the use of students in public and science schools') and Macmillan's Science Primers. The appendix lists the prescribed or recommended textbooks in chemistry and experimental physics during Smith's term of office, with the date of first listing. Almost without exception these were published in Britain, and many were also used at Melbourne University during that period.[26]

SECOND YEAR.

EXPERIMENTAL PHYSICS—HEAT.

1. Describe the three thermometric scales employed in Europe.

2. From what fixed points are thermometers graduated? and what precautions have to be taken in determining those points?

3. What is the import of the doctrine of Specific Heat?

4. When air is suddenly caused to expand, by having the pressure on it diminished, (as in the receiver of an air-pump,) how is the sensible heat affected, and what is the explanation of the change?

5. Describe Dr. Black's earliest recorded experiment on the heat absorbed by melting ice.

6. What is the latent heat of steam, and how may it be determined?

7. To what extent is the boiling point of water altered by a change of one inch of the barometer?

8. What is meant by Dew Point?

9. At noon of November 29th, a Mason's hygrometer showed 80° on the dry thermometer, and 66° on the wet; required the Dew Point.

10 A Montgolfier balloon, filled with 10 cubic feet of air at 150° Fah., is found to float free in the atmosphere without ascending or descending, the atmosphere being of standard temperature and density; required the weight of the solid materials of the balloon.

EXPERIMENTAL PHYSICS.

1. How is the magnitude of bodies affected by heat?

2. State the principle of Graham's compensation pendulum.

3. A bottle of flint glass is exactly filled by 100 cubic inches of mercury when the temperature is 32° F., how much mercury will be forced out, when the bottle and mercury together are heated to 212° F.?

4. What degree of the centigrade thermometer corresponds to—10° Fah.?

5. State the freezing and the boiling points of mercury.

6. At what temperature is water densest, and what is the weight of a cubic inch of water at the densest point?

7. If 100 cubic inches of air at 60° F. weigh 31 grains, what will be the weight of the same bulk at 90° F.—the barometer in both cases being 30 inches?

8. Describe the trade-winds, and their cause.

9. When water is mixed with oil of vitriol, how is the temperature affected and what is the explanation of the change.

10. The low specific heat of mercury recommends it as a liquid for the thermometer—Why?

11. Under what conditions does water boil at 212° F.?

12. What expansion does water undergo when converted into steam at 212° F.?

13. If 1 oz. of steam at 212° be condensed in 12 ozs. of water at 60°, what will be the temperature of the resulting 13 ozs. of water?

14. When steam is produced in close vessels, do the temperature and the pressure increase in the same ratio; and if not, which advances fastest?

15. How is mechanical effect usually expressed?

16. What is the mechanical equivalent of that amount of heat that suffices to raise 1 lb. of water 1° Fah.?

17. Distinguish between the terms Power and Duty as applied to steam engines.

18. In a double-acting steam-engine, suppose the piston to be 4 feet in diameter, and to make 20 double strokes of 5 feet each per minute; and suppose the effective pressure of the steam to be 8 lbs. on the square inch,—what is the horse-power of the engine?

19. Give Apjohn's formula for deducing the elasticity of atmospheric moisture from an observation of the psychrometer.

20. With a knowledge of the temperature of the air and the Dew-Point, how may the condition of the air, as to dryness or humidity, be correctly stated?

[All calculations to be given in full.]

Figure 23 a left *Earliest examination paper in Natural Philosophy. (Calendar of University of Sydney, 1857).*
b left *Earliest examination paper in Chemistry. (Calendar of University of Sydney, 1854. University of Sydney Archives).*
c and d above *Earliest examination papers in Experimental Physics. (Calendar of University of Sydney, 1854).*

EXAMINATION QUESTION PAPERS

When we turn from laboratories and lectures to examinations, we find a relationship difficult at best, obscure at worst. The question-papers are sometimes long, sometimes brief, but no indication of the duration of the examination (hence the scope of the questions) is given. (In later years the time allowed is usually specified as three hours). The link operating between lectures and examinations is illuminated only by the curious statement (in the 1882/83 Calendar) that 'Lectures are delivered on the subjects of Examination', and not, as one might expect, *vice versa*. Indeed, the emphasis upon examination was inconsistent with the University's stated policy of admitting non-matriculated students. In those contemporary British institutions which welcomed non-degree chemistry students, examinations were not considered the principal goal.[27] The primacy of the examination, at a time of increasing criticism of the 'examination utopias' elsewhere in the Empire[28] seems to have been taken for granted at Sydney.

M.A. DEGREE (HONOURS) IN THE SCHOOL OF NATURAL SCIENCE—SCHEDULE OF SUBJECTS.

I. CHEMICAL PHYSICS.

The physical states of matter. Weighing and measuring. The different kinds of attraction existing between matter. Specific gravity. Elasticity, Boyle's Law, and the correction for pressure in the measurement of gases.

Solution, saturated solution, diffusion of liquids, osmose, dialysis, diffusion and effusion of gases, adhesion of gases to solids. Crystallization, regularity of crystalline form, cleavage, symmetry of crystalline form, systems of crystallization, isomorphism, dimorphism. Separation of substances by crystallization.

Allotropy.

SOUND. Nature of sound, wave motion, vibration of solids, propagation of sound. Interference of sound, beats. Resolution of complex sounds into simple sounds. Harmonics. Musical scale.

LIGHT. Laws of reflexion and refraction of light, mirrors, lenses, microscopes, telescopes. Spectrum, achromatic combinations. Spectra of solids, and of elements in the gaseous state. Absorption spectra, solar spectrum. Luminous intensity, photometers. Phosporescence and fluorescence. Interference of light. General explanation of diffraction. Plane polarized light, double refraction in crystals.

HEAT. Sources of heat. Expansion by heat, measurement of temperature, correction of measurement of gases for temperature. Conduction, convection, radiation, reflexion and refraction of heat. Absorption of heat, connexion between absorption and radiation. Relative absorbability of heat of different kinds. Diathermancy. Polarization of heat.

Specific heat. Disappearance of heat accompanying change of the physical state of matter, and work done. Regelation. Mechanical equivalent of heat. Ebullition, causes affecting the boiling point. Difference in the quantity of heat latent in different vapours. Distillation. Dalton's law of the tension of vapours. The limit of evaporation. Rate of evaporation. Dew-point. Hygrometers. Liquefaction and solidification of gases. Spheroidal state.

Relation between specific and combining proportions of substances simple and compound. Quantities of heat developed by chemical action. Calorific equivalents.

ELECTRICITY. Sources of electricity. Positive and negative electric states, potential. Conductors and insulators. Attraction and repulsion of electrified bodies, electroscopes, static induction, condensers. Electric discharge, conduction, resistance. Ohm's law. Divided circuits. Development of heat by dynamic electricity in good and bad conductors. Chemical action of electricity. Relation of electric currents to magnetism, galvanometers. Mutual action of two currents, dynamic induction. Atmospheric electricity

MAGNETISM. Magnetic substances, magnets, magnetic field, diamagnetic phenomena. Magneto-electric induction. Terrestrial magnetism, dip, declination, total intensity, variation of elements of terrestrial magnetism, magnetic storms.

Figure 24 *Syllabus for M.A. (Hons.) in Natural Science. (Calendar of University of Sydney, 1879/80, University of Sydney Archives).*

To probe deeper into the context of examinations, it is necessary to look at and interpret the questions themselves. Some of Smith's 1854 chemistry examination papers have been reprinted (see Figure 23b), and Le Fèvre has made an analysis of their changing content,[29] but hitherto little attention has been given to Smith's examinations in experimental physics. We can examine the questions in 'experimental physics' during Smith's term of office using the table of contents of a present-day textbook of physics by Marshall, Pounder and Stewart (hereafter, MPS) as a basis for classification (see Table 2).[30] The general nature of each question can be indicated by the title of the selected chapter. In those scholarship

papers devoted jointly to 'Chemistry and Experimental Physics' there is a clear separation of the two components, and the chemistry questions in the first half have been ignored.

Altogether, 389 questions were considered. In the 1885 Calendar is a question paper with the unique title 'Physics II', and a set of eight questions which differ in style from most of the other papers. At the end of 1884 Smith's health was already in serious decline, and it is possible that this paper was set by another hand. In the absence of direct evidence, however, these eight questions have been included in the general analysis.

If we classify Smith's questions (Figure 23c and d) in relation to MPS chapter divisions, we can draw certain conclusions about the substance of Smith's interests in physics, and the extent to which his lectures (as assessed by examinations) kept abreast of international developments in physics in the period between 1854 and 1885.

For example, material discussed in the early chapters of MPS, Mechanics 1-9, is largely unrepresented in Smith's questions. This conforms with the allocation of mechanics away from Smith's area and towards natural philosophy, represented at Sydney by Pell's question-paper given as Figure 23a. Those few mechanics questions in Smith's papers are related to the mechanical equivalent of heat, and almost exhaust Smith's coverage of thermodynamics. The second law of thermodynamics is unrepresented in Smith's questions, although it is a topic in one of the listed books, a title which was particularly favoured by Smith as a student prize.[31] The word 'energy' was given its modern meaning by Maquorn Rankine in 1854, and replaced the ambiguous word 'force'. Three decades after Rankine, however, 'energy' had still not appeared in Smith's examination questions.

Second, Chapters 13, 14, and 19 of MPS, which deal with the behaviour of matter at the atomic/molecular level, are scarcely represented at Sydney, though the concept in modern form had been in circulation, in both chemistry and in physics, since the beginning of the century. Smith's mentor, Thomas Clark, had indicated a concern with molecules (from the point of view of their structure) in lectures given in Glasgow in the 1820s.[32] However, the subject matter of Chapter 21 in MPS, which covers the physical basis of meteorology, receives attention in Smith's questions, particularly in the early years. (Examples are the first-year questions 19 and 20 and the second-year questions 8 and 9 in Figure 23c). While this may seem an imbalance, the subject of weather seems appropriate in a general course for Australian Arts students, and may have influenced H.C. Russell, (later Government Astronomer, member of the University Senate, and the first Sydney graduate to become an FRS), who was an undergraduate between 1856 and 1859, and who later made meteorology his specialty.

A number of Smith's questions require a detailed knowledge of the design and construction of specific measuring instruments (for temperature, pressure, electric current, and so forth). Other questions require detailed description of equipment such as the electric telegraph, electric lighting, and the electric bell. The proportion of numerical problems set in 1885 (8 in 31) was much the same as in 1854 (7 in 30), but with much variation in between. In the early period there were also questions involving nothing more than recall of numerical data (for example, first-year question 5 in Figure 23d). For a present-day student accustomed to SI units the jumble of unsystematic units then in force would be distinctly alarming. From 1879/80 metric units appear and in 1885 there is a question on metric conversion.

Of the thirty questions asked in 1854, there are several which escape easy classification, and these may be considered as follows:

Chemistry In Figure 23c, question 9 refers to the heat evolved when water and 'oil of vitriol' are mixed, a topic which one would not expect to find covered in a

Table 2 *Classification of Smith's physics questions (subdivisions of physics are indicated by the chapter headings in Marshall, Pounder, Stewart,* Physics, *1968)*

		SYDNEY UNIVERSITY CALENDAR DATES																		
		1854	56	57	58	59	61	62	63	66	67	68	73 74	74 75	78 79	79 80	81 82	82 83	83 84	85	*row totals*
	MECHANICS																				
1.	**Introduction; Units of Time and Length**																			1	1
2.	**Kinematics**																				
3.	**Force**																				
4.	**Energy and Power**	2			1				1		1					1			1		7
5.	**Friction**																				
6.	**Angular Motion**																				
7.	**Statics and Machines**																				
8.	**Elasticity, Simple Harmonic Motion**	1																			1
9.	**Gravitation**															1					1
10.	**Fluid Mechanics**			2	2	6	5	2	1						1	2	2	1	1	3	28
	HEAT																				
11.	**Introductions to Heat**	5	2	1	4	3	7	1	2		1	1			3	1	1	3	3	1	39
12.	**Conduction and Expansion**	2	1			1		1			3				2	2				2	14
13.	**Molecular Theory of Gases**														1	1					2
14.	**Kinetic Theory of Gases**																				
15.	**The Expansion of Gases**	2	1	5	2	2	2	1				1	1		1		1	1			20
16.	**Heat Engines and the Laws of Thermodynamics**	2																			2
17.	**Irreversibility**																				
18.	**Radiation**								1		1					1		2			5
19.	**Sizable and Attractive Molecules**	1		1		1		1	1						1	1					7
20.	**Solids, Liquids, and Vapors**	1		2					2		2				2		1	1			11
21.	**Water Substance and the Atmosphere**	12	2	4	2	8	5	4	3	3	1				1	4	2	2	2		55
	SOUND																				
22.	**The Vibrations of Particles**				1										1			1	2	1	6
23.	**Wave Motion in One Dimension**			2			1														3
24.	**Waves in Two and Three Dimensions**																			3	3
25.	**Acoustics**			1	1												1			1	4
	LIGHT																				
26.	**Light and Color**								1	1	2	1		1	1	1	5	1	1	2	17
27.	**Reflection, Refraction, and Dispersion**																1			1	2
28.	**Lenses and Mirrors**																				
29.	**Simple Lens Systems**																	1			1
30.	**Illumination and Optical Instruments**								1		1							3	1		6
31.	**Diffraction, Interference, and Polarization**																				
	ELECTRICITY AND MAGNETISM																				
32.	**Electric Current**			1		2	1			1	1				2		1	1		2	12
33.	**Resistance**								1				1				1	1	1	4	9
34.	**Chemical Effects of Current**			4		2	3	1	2	1	3		1	1	2	3	3		2	3	31
35.	**Electrostatics**			2	1	1	2				3		1	2	1	2	3		1		20
36.	**Magnetic Effects of Current**					1	2	3	2		1				2		3	3		3	20
37.	**Electromagnetic Induction**			1					1		1	1	3	1	2	1	2			1	14
38.	**Magnetic Properties of Matter**			2		2	3		1		5			1	2	2	1	4		2	25
	OTHER																				
	Chemistry	1			1											1		1			4
	Meteorology, *etc*	1		5		1	4		4	1					1		1				18
	Philosophy																1				1
	column totals	30	6	33	15	30	35	14	24	7	26	4	7	6	26	24	30	26	15	31	389

modern textbook of physics. The question recurs in 1879/80, where 'oil of vitriol' appears as 'sulphuric acid'. The remaining chemical questions refer respectively to corrosion of lead alloys in Sydney water, and to the calorific value of coal. A question reprinted in 1863 was treated as pertaining to the conservation laws, and could be discussed in Chapter 4 of MPS ('Energy and Power'). It could equally

well have been classified as a chemical question. Thus: 'Explain the apparent destruction of matter in such a case as the burning of a candle'. A question in 1879/80 could likewise have been treated as a chemical question: 'Cite a simple experiment to shew (sic) that the melting point of ice is lowered by pressure. Under what general law does this lowering of the melting point of ice fall?' The topic is discussed at some length in the 1872 edition of Miller's chemistry book,[33] but an adequate general law was arrived at (by Henri Le Chatelier) only in 1884. A number of questions relate to electrochemistry, and these are discussed in Chapter 34 of MPS ('Chemical Effects of Current' in Electricity and Magnetism).

Physical Geography In Figure 23d, question 8 refers to trade-winds and two questions in later years refer to monsoons. Four questions refer to global temperatures, extreme and mean. One of these ends 'State the mean temperature of Sydney', at a date (1863) when the run of reliable records must have still been very short. Two questions related to thunder and lightning, and two to geysers. Another asked for a definition of 'isothermal, isochimenal, and isotheral' lines on maps. Questions on terrestrial magnetism can be allotted to Chapter 38 of MPS ('Magnetic Properties of Matter'), but certain questions today form part of physical geography. Thus, 'How may the magnetism of the earth be accounted for in connection with electricity?' (1867), 'Trace, in a general way, the secular variation of the compass at London during the last 300 years' (1863), 'At what period of the year has the atmosphere been observed in Europe to be most charged with electricity? Name the months in which it reaches its maximum and minimum' (1863).

In the 1881/82 Calendar, a single question asked: 'What do you understand by *substance* as distinct from *properties*? Why is it not possible to demonstrate such a distinction?'. In this respect, at least, Smith was aware of current chemical debates in Britain on the nature of matter. But that there were important gaps in the Sydney curriculum Smith was the first to concede. In applying to the Senate (in 1860) for leave of absence Smith stated that 'he feels himself getting behind'.[34] When he offered to resign in 1876, one reason given was 'that he was behind the age in point of Chemical Knowledge' (corrected in the Minutes to read 'that he felt himself no longer able to keep pace in his teaching with the advance of Natural Science').[35] With respect to Smith's chemistry courses, Le Fèvre has pointed to the fact that one of the outstanding developments in the study of molecular structure, published by August Kekulé in 1858, reached the University chemistry examinations only after Smith had ceased to have any connection with chemistry.[36] For such delays as there may have been, the 'tyranny of distance' had much to answer for.

Distance, however, proved relative to interest, and so far as the physics examinations were concerned, Smith was keen to introduce novelties. In his first published examination paper (1854) he asked two questions based on work done by James Joule within the previous decade. A question relating to the trans-Atlantic cable was set in December 1858, only four months after the cable was opened.[37] In 1863 appeared a question on the most efficient mode of generating light by the voltaic current, well before the invention of the incandescent lamp. In 1879/80, candidates were asked to describe the construction of Crookes's radiometer, invented in 1874. In 1867, there was a question on 'the art of electro-metallurgy', a recent innovation. In 1863, there were questions on solar radiation and its potential usefulness, topics of revived interest at the present time. John Tyndall's pioneering work on the absorption of infra-red radiation by gases and vapors (referred to under the now obsolete title 'diathermancy') clearly interested Smith, since the topic recurs in questions over a number of years. The topic summarised in the title of one of Faraday's books, *On The Various Forces of Nature*, prompted another recurring examination question.

Besides his formal lecturing commitments within the University, Smith also spoke to the wider community. As early as 1853 advertisements appeared for a 'short course of lectures . . . with a view to explain some of the leading principles of chemical science. The substances described will be chiefly those found in air and water'.[38] These lectures were given under the auspices of the University, but others were given independently of the University, including one on 'The chemistry of the heavenly bodies' at the Burwood Congregational Church.[39] There are allusions to 'a series of lectures in Electricity for Young Ladies', possibly given at the Sydney Mechanics' School of Arts.

CONCLUSION

Smith was chosen from a field of thirteen to be the first teacher of university-level chemistry and physics in Australia. His life as a teacher involved keeping abreast of a wide range of rapidly changing science and technology. Although he survived longest of the inaugural professoriate, his career and his life were over before the great expansion of the University began. His students were not numerous, and for nearly all of them his subjects were peripheral to their purposes. The success of two — Edward Rennie, the founding Professor of Chemistry at Adelaide,[40] and Henry Russell (for whom Pell must share credit) must have been among the few tangible compensations for thirty years of physical science teaching. But Smith's experience was characteristic of colonial science, and not far removed from that of his contemporaries in Britain. For his generation, and for the generation that succeeded him, science instruction was always carried out against high odds, and in a tradition which required a professor to be less a 'man of science', than a teacher, 'full of instruction'.

APPENDIX

Prescribed and Recommended Book Lists for Chemistry and Experimental Physics
(Univ. of Sydney Calendar, 1852/53-1885)

Bloxam, Charles Loudon, *Chemistry: Inorganic and Organic* (London: J. Churchill and Sons, 1867) 1879-80

——, *Laboratory Teaching: or, Progressive Exercises in Practical Chemistry* (London: J. Churchill and Sons, 1869) 1873-74

Chambers' *Practical Chemistry* (London: W. & R. Chambers, undated) 1873-74

Chambers' Educational Course, *Electricity* (London: 5th edition, W. & R. Chambers, 1874) 1885

Clarendon Press Series of Scientific (Physical) Manuals (Oxford: Clarendon Press, 1866) 1879-80

Fownes, George, *Manual of Chemistry* (London: 11th edition, J. Churchill, 1868) 1874-75

Fresenius, Carl Remigius, *Qualitative Analysis* (London: 8th edition, J. & A. Churchill, 1872) 1873-74

Ganot, Adolphe, *Physics* (London, 1877) 1879-80

Harcourt, A.G. Vernon, and Madan, Henry George, *Exercises in Practical Chemistry* (Oxford: Clarendon Press Series, 1869) 1873-74

Johnston, J.F.W., *Catechism of Agricultural Chemistry and Geology* (Edinburgh, 23rd edition, 1849) 1874-75

Jones, Francis, *The Owens College Junior Course of Practical Chemistry* (London: Macmillan and Co., 1872) 1874-75

Liversidge, Archibald, *Tables for Qualitative Chemical Analysis Arranged for the Use of Students* (London: Macmillan and Co., 2nd edition, 1904) 1882-83

Longmans' Textbooks of Science adapted for the use of Artisans, *Electricity* (London: Longmans Green and Co., 1870) 1874-75

———, *Heat* (London: Longmans Green and Co., 1870) 1874-75

Miller, William Allen, *Elements of Chemistry — Theoretical and Practical* (3 vols.) (London, 4th edition, 1867-69) 1879-80

Noad, Henry M., *Chemical Manipulation and Analysis Qualitative and Quantitative* (London, 1848) 1874-75

Privat-Deschanel, Augustin, *Physics* (Paris, 1868) 1879-80

Roscoe, Henry Enfield, and Schorlemmer, Carl, *A Treatise on Chemistry* (3 vols.) (London, 1877-84) 1880-81

Roscoe, Henry Enfield, *Lessons in Elementary Chemistry* (London: Macmillan and Co., 1866) 1880-81

Schorlemmer, Carl, *A Manual of the Chemistry of the Carbon Compounds of Organic Chemistry* (London, 1874) 1880-81

Stewart, Balfour, *Lessons in Elementary Physics* (London Macmillan and Co., 1870) 1880-81

Thompson, Silvanus Phillips, *Elementary Lessons in Electricity and Magnetism* (London: Macmillan and Co., 1881) 1885

Thorpe, T.E., *Qualitative Chemical Analysis* (London: Longman Green and Co., 1870) 1876-77

Thorpe, T.E. and Muir, M.M.P., *Qualitative Chemical Analysis and Laboratory Practice* (London: Longman Green and Co., 1870) 1880-81

Tyndall, John, *Heat a Mode of Motion* (London: Longmans Green and Co., 1863) 1879-80

———, *On Sound* (London: 3rd edition, Longmans Green and Co., 1875) 1879-80

Ure, Andrew, *Dictionary of Arts, Manufactures and Mines* (4 vols.) (London: 7th edition, Longmans and Co., 1875-78) 1879-80

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Acknowledgements

To Professor Roy MacLeod for the invitation to take part in the John Smith symposium, and for suggesting the topic; to Sydney University Archives for permission to reproduce Figures 21-24.

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1 Alexander Findlay, *The Teaching of Chemistry in the Universities of Aberdeen* (Aberdeen: Aberdeen University Press, 1935), 40.

2 *Ibid.*, 18-36; W.V. Farrer in D.S.L. Cardwell (ed.), *John Dalton and the Progress of Science* (Manchester: Manchester University Press, 1968), 290-299.

3 Findlay, *op.cit.* note 1, 31.

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5 H.E. Barff, *Short Historical Account of the University of Sydney* (Sydney: Angus and Robertson, 1902), 45.

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7 *Deas Thomson Papers* (Mitchell Library) Vol. 3, folios 756-759, 1028-1033.

8 *Liversidge Papers, op.cit.* note 6.

9 *Chancellor's Report*, University of Sydney, 1877.

10 Janet Howarth, 'Science Education in late-Victorian Oxford: a Curious Case of Failure?', *The English Historical Review, 102* (403) (1987), 352.

11 Gerrylynn K. Roberts, 'The Liberally-Educated Chemist: Chemistry in the Cambridge Natural Sciences Tripos, 1851-1914', *Historical Studies in the Physical Sciences*, 11 (1) (1980), 158.

12 B. Loewy, *Questions . . . on Elementary Experimental Physics (Sound, Light, Heat, Electricity and Magnetism)* (London, 1888); D. Lardner, *Handbook of Natural Philosophy and Astronomy* (London, 1851).

13 W.A. Miller, *Elements of Chemistry: Theoretical and Practical. Part 1. Chemical Physics* (London: Longmans Green and Co., 1872).

14 Barff, *op.cit.* note 5, 83, 104.

15 *Senate Minutes*, University of Sydney, 5 September 1860.

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17 *Senate Minutes*, University of Sydney, 11 April 1866; R.J.W. Le Fèvre, 'The Establishment of Chemistry within Australian Science -- Contributions from New South Wales' in A.P. Elkin *et al.*, *A Century of Scientific Progress: The Centenary Volume of the Royal Society of New South Wales* (Sydney: Royal Society of New South Wales, 1968), 332-378.

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19 The set of Calendars listed in Appendix 2 contains the following omissions: no Calendar was issued in 1855, 1864, 1869, 1871, 1872/73, 1875/76, or 1877/78; Calendars were issued, but contained no reprints of examination papers in either physics or chemistry, in 1860, 1865, 1870, 1876/77, and 1880/81. (Some of these dates cover periods when Smith was on oversea leave of absence).

20 *Deas Thomson Papers, op.cit.* note 7, folio 756.

21 Roberts, *op.cit.* note 11, 161.

22 *Professorial Board Minutes*, University of Sydney, 1 July 1854.

23 *Professorial Board Minutes*, University of Sydney, 7 June 1858.

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28 Roy MacLeod (ed.), *Days of Judgement: Science, Examinations and the Organization of Knowledge in Late-Victorian England*, (Driffield, UK: Nafferton Books, 1982).

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32 Farrer, *op.cit.* note 2, 294.

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34 *Senate Minutes*, University of Sydney, 5 September 1860.

35 *Senate Minutes*, University of Sydney, 18 October 1876.

36 Le Fèvre, *op.cit.* note 17, 351.

37 *Ibid.*, 357. Trans-oceanic cables were very topical. On 10 September 1856, the Philosophical Society heard an address by John Thompson, Deputy Surveyor General, entitled 'Electric Telegraphs and Railways between Sydney and London not Impossible'.

38 *Sydney Morning Herald,* 17 May 1853.

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CHAPTER FOUR

'A VALUABLE AND SELF-DENYING CITIZEN'

THE PUBLIC LIFE OF JOHN SMITH

DEBORAH CAMPBELL

JOHN SMITH was demonstrably no ivory tower academic. From his earliest days in New South Wales, Smith was fully involved in the social and cultural life of the colony beyond the walls of the University. Apart from his work with the Board of Education and later, the Council of Education, Smith was active in the Philosophical Society of New South Wales and its heir, the Royal Society; an elective Trustee of the Australian Museum; a director and chairman of the Australian Mutual Provident (AMP) Society; a Member of Parliament; a Commissioner for the 1879 International Exhibition; and a member of two of the city's exclusive social clubs. These activities, some of which he pursued for over thirty years, rendered Smith a member of the city's cultural elite – a group of prominent citizens who believed in the efficacy of culture and scholarship in improving the moral tone of their society.

In the second half of the nineteenth century, visitors like R.E.N. Twopeny, Francis Adams and J.A. Froude were unfavourably impressed with the state of cultural and intellectual life in the colony. Froude, after a brief visit in 1885, opined that:

The deficiency of the Sydney colonists is that they have no severe intellectual interests. They aim at little except what money will buy; and to make money and buy enjoyment with it is the be-all and end-all of their existence.[1]

Part of the problem was that the cultural life of the colony was measured against that of the 'Old World', and expected to derive from an ideal model of aristocratic patronage. In colonial society, so obviously young, brash, materialistic and isolated, 'cultivation' would take a long time to develop. When a 'leisure class' evolved to promote art, literature and science then, in due course, these cultural flowers would bloom. Observers did not expect to find a rich and varied cultural life in an ostensibly egalitarian society of ex-convict descendants and recent immigrants, and they were not surprised not to find it.

The picture, of course, was somewhat more complex than the impressions of

visitors would have us believe. By 1885, the year of Smith's death, Sydney had – apart from its University – a natural history museum, a museum of technology, a free public library, an art gallery, an astronomical observatory, a technical college, and botanical gardens. Moreover, it was home to a group of voluntary cultural organisations devoted to the promotion of the sciences, art, music and literature. While the public institutions and voluntary organisations often showed signs of poor patronage and benign neglect, they nonetheless existed. As Smith reminded members of the Royal Society in 1881, although the Society was 'occasionally twitted with indolence', it was the means of giving publicity and expression to a large amount of intellectual effort and scientific research.[2]

In short, a group of the city's citizens had assumed the management and direction of its cultural institutions and societies, and were indeed its 'custodians of culture'. There was much overlap in the activities of these men (very few were women, who quite often were simply disbarred from participating). Smith was not unusual in his range of interests. Others were even more eclectic. William Windeyer, for example, who became a well known judge, was at various times a member of the University Senate (1866-1867), Trustee of the Free Public Library (1884-6; 1888-97), a member of the Board of Technical Education (1883-6) and President of the Sydney Mechanics' School of Arts.[3] There was little specialisation of interest, and to the cultural activities of the 'custodians' must be added their involvement in charity work and parliament, as well as in social and sporting organisations. Moreover, the cultural elite was often bonded, apart from a convergence of cultural interests, by marriage and blood ties, by social intercourse and by a high degree of residential segregation in the 'better' suburbs.[4]

Undeniably, 'culture' in its various guises bestowed social status and distinction. More importantly for 'improvers' of the Victorian era, however, the arts and sciences were inherently moral and useful, a necessary counterweight to the rampant materialism of a colonial society and the vicious amusements of the masses.

Smith joined the Australian Philosophical Society soon after his arrival in the colony in 1852. Founded in 1821, the Society had soon lapsed, and was not revived until 1850. In 1856, Smith was instrumental in its transformation into the New South Wales Philosophical Society, and for nine of its eleven years was a member of its Council.[5] Under vice-regal patronage (even direction), the Society's objectives included receiving 'original papers on subjects of Science, Arts, Literature and Philosophy', and in 1857 boasted 178 members.[6] The rot soon set in, as Smith observed, when the Philosophical Society's early prosperity 'yielded after a few years to the usual reaction we are only too familiar with in all organisations attempted in Sydney'.[7] The Society limped along with declining membership and income until 1866 when its 'languishing condition' was blamed on a name which to many conveyed the wrong impression.

Announcing the need for a formal divorce between 'philosophy' and 'science' at the inauguration of the Royal Society in 1867, the Rev. William Branwhite Clarke observed:

It is one thing to respect the method by which a logical argument is to be maintained, and another to defend the introduction of investigations which are often based on conjecture and are altogther speculative.[8]

By arguing that speculation and theorising often lead to opinions which were 'more commonly sceptical than...theistic', Clarke, while open-minded on Darwinism, advocated above all the primacy of empirical observation.[9] Clarke pitched the Society's emphasis at the practical and utilitarian level, partly, no doubt, in a quest for relevance and broader social acceptance. In 1871, Smith endorsed Clarke's position:

A strictly 'philosophical' society might be expected to confine its attention to matters of speculation and pure science, while in our circumstances it is expedient to devote our energies more to applied science, and to matters of obvious utility . . . '.[10]

Although he was a University Professor of Chemistry and Experimental Physics, Smith seemed to suggest a public retreat from fundamental research — a position advocated by some contemporary American scientists in the Jacksonian era.[11] His own papers delivered to the Society, as well as his vice-presidential and presidential addresses, reveal a concern with such utilitarian matters as water supply, mineralogy and electricity. Speculation and theory were cast aside in favour of 'matters of obvious practical utility'.

Despite these attempts to justify its work in terms of the colony's prevailing social values, the Royal Society failed to thrive. It continued to lean heavily on a handful of its members. For them, publishing the Society's transactions was a burden which threatened to become overwhelming. More disturbingly, the Society wandered rootlessly about the city in search of a permanent 'home'. To add insult to injury, a rival organisation, the Linnean Society of New South Wales, was formed in 1874, 'solely for the cultivation of natural history'.[12] The *Sydney Morning Herald* expressed its doubts about the need for a second scientific institution. The Royal Society, it said

was still far less efficiently supported than it ought to be. Science is still a weakling in the colony, and it was somewhat of a risk for the few who were devoted to it, or who from a sense of its value gave it their support, to divide their forces.[13]

Indeed, the Royal Society did not enjoy the public recognition which Clarke and Smith felt that it deserved. As Michael Hoare has suggested, in the 1860s and 1870s the Royal Society had to struggle to assert itself as an acceptable leader of science in a society which was becoming increasingly informed and critical.[14] The Royal Society had fixed its sights on the factual and practical — a sign which indicated that research was still dictated from abroad. As Ann Moyal has pointed out, the 'proper' role for colonial scientists — amateurs, dilettantes and professionals alike — was to act as fact gatherers and specimen collectors for the 'Great' scientists in Britain.[15] Clarke, for one, was happy in this subordinate role, stating in 1875: 'We have done well to reflect a borrowed light rather than aim at shining with an effulgence of our own'.[16]

The Royal Society's fortunes took a turn for the better in 1875 when Smith's colleague, Archibald Liversidge, and Carl Leibius became its Hon. Secretaries. Liversidge was a man of great vision, energy and most important, organising ability; Leibius offered the skills of a publicist and public servant.[17] In 1876, Liversidge took up the suggestion of a new format for the Society, dividing it into nine working sections designed to bring a higher degree of specialisation to its activities. The annual task of publishing its transactions had already been taken off the Society's hands in 1872, when the Government consented to print them free of charge. A decision, however, to petition the Government for contributions to the building fund in 1876 caused dissension in the ranks. Objectors thought 'it was not right to place this Society on the same footing as a mere School of Arts . . .'.[18] The responsible Minister of the day was apparently convinced by the respectful request for assistance, in order that the Society 'may make their past labours and present capabilities of more use to the public'.[19] The Government agreed not only to contribute two pounds for every one pound collected by subscription, but supplemented the Society's membership subscriptions as well.

Under Liversidge's vigorous leadership, the Society burgeoned, its membership increasing from 126 in 1870 to over 400 by 1880. Important, too, the Society divested itself of its vice-regal presidency and Smith became its first 'active' President in 1881. During the 1880s, the Society grew in wealth and support, providing

the basis for Liversidge to organise the first meeting of the Australasian Association for the Advancement of Science (AAAS) in Sydney in 1888. That forum, scientific historians have agreed, marked the 'coming of age' of Australian science from tentative subordination to the beginnings of a more confident professionalism.[20] Nonetheless, the Society suffered from the malaise of habitual public indifference, which no colonial society could easily escape. Thus the *Echo*, in 1881, stated:

Science . . . represents to the popular ideal all that is inchoate, nebulous and unascertained. So soon as a matter assumes sufficient definiteness of configuration for the common eye to see it, the ordinary mind to comprehend it, it ceases to be regarded as having scientific interest. The Royal Society has, therefore, little status among the people in general, albeit there have been efforts . . . to give a practical object to its aims.[21]

After Smith's death in 1885, Liversidge spoke eloquently about the contribution his former colleague had made to the Royal Society. A member of the Council of the Society for nine of eleven years, vice president for ten years and president for two; the author of twelve papers and presidential addresses; if not a 'mover' like Liversidge, Smith provided the Society with invaluable support.[22] The Society came, in his time, to offer leadership in colonial science, of a kind which the University itself was unable to give. As he served the Philosophical Society (and later Royal Society), so Smith also served the Australian Museum. Smith became a member of the Museum's Committee of Management in 1852, not long after the Committee had rejected a proposal from the University seeking to assume control of the Museum and its grounds.[23] Smith was an elective member of the first Board of Trustees when incorporated under its own legislation in 1853, and remained a Trustee until 1860, and again between 1865 and 1872.

The Australian Museum, established as the 'Colonial Museum' in 1827, remains the oldest public funded cultural institution in Australia. The fact that it preceded its fellow cultural institutions by thirty to forty years is a tribute to the colonists' early interest in natural history reconnaissance, and their desire to keep a record of the 'rare and curious specimens' in which the continent abounded. In its earliest days, the 'Colonial Museum' was little more than a small, motley collection confined to one room. By 1837, when it became the 'Australian Museum', it had 800 exhibits, was chronically short of funds and had to solicit publicly for donations.[24] By the mid 1840s, the Museum had had in its brief existence so many changes of address that the task of acquiring a permanent home had become urgent. By the time Smith became a Trustee in 1853, a hall and gallery had been designed by the Colonial Architect and built, at its present site on the corner of College and William Streets, with great tardiness and at considerable expense.

The building which the new Trustees acquired was superficially grand but, as they complained in 1854, utterly unfit for the display of objects of natural history![25] An architectural hybrid of museum and art gallery, the building displayed casts and statuary, as well as natural history exhibits. If the hall and gallery were badly designed and fitted out, the west wing, designed and built in the 1860s by James Barnet, was a total disaster. A combination of 'Corinthian Classic' and Italian Renaissance styles, it was described by a visiting naturalist as a 'noble building'.[26] But its nobility was superficial. A Parliamentary Select Committee on the Museum in 1874 found that it was 'extremely defective':

The edifice is too high and too narrow, the approaches from the street are incommodious; the windows are wrongly placed and faulty in design; the interior is crowded with heavy pillars, which waste the space and obstruct the light; the internal walls are broken by angles and recesses; there is a useless gallery . . . and there is in every part of the building abundant evidence of the architect's desire to subordinate utility to ornament.[27]

Figure 25 *At Drummoyne House, c. 1857. (John Smith Collection, University of Sydney Archives).*

Figure 26 *On the verandah of Drummoyne House, the mansion of merchant William Wright. The photographer used a camera which exposed each image successively, and a wet collodion stereographic negative. (John Smith Collection, University of Sydney Archives).*

Figure 27 *The Tyranny of the Photograph Session, c. 1850s. Rev. G. Richardson, family and friends try to keep a straight face for the photographer. Taken from a wet collodion stereograph, this image hints at the stress experienced when a determined photographer tried to cope with a large group of people and a slow negative emulsion. It was common for exposures to last at least 30 seconds. (John Smith Collection, University of Sydney Archives).*

The subordination of utility to ornament was the fate of nineteenth century cultural institutions in Australia. Established as symbols of civilization, intended to provide for the intellectual and moral advancement of 'the people', the Museum, Art Gallery and Public Library in Sydney projected noble edifices, masking deprivation and squalor.[28] Scarcity of funds, and poor physical conditions became a constant refrain in the annual reports and minutes of the Museum's Trustees'. In order to make ends meet, valuable specimens were sold off, hours of staff increased and wages reduced. Continuing complaints were made to the Colonial Architect's Office for essential repairs to make the building safe for exhibits.[29]

Despite this inappropriate accommodation and their woefully inadequate funding, the Trustees were fortunate to have promoted the German born zoologist Gerard Krefft from Assistant Curator to Curator in 1864. An advocate of Darwinian theory and a student of palaeontology, Krefft managed, despite prodigiously adverse conditions, to produce an impressive list of publications based on evidence and specimens he had amassed. In doing so, he placed the Australian Museum 'firmly in the international world of science'.[30]

Krefft's obstacles were not only physical and financial, but also managerial. The Board of Trustees of which Smith became a member in 1853, was an example of a peculiarly Victorian institution. As a corporate board they were all-powerful. The Trustees had absolute authority to hire and fire staff as well as to determine rates of pay, hours of work and so on. A Board of twenty-four Trustees was established by the Australian Museum Trust Act of 1853 – twelve appointed and twelve elected – all unpaid. The twelve appointed Trustees included the Chief Justice, Colonial Secretary, and Attorney General – 'administrators of rank and political influence'.[31] Of the appointed Trustees on the first Board, only Edward Deas Thomson (Colonial Secretary), Alfred Stephen (Chief Justice) and Charles Nicholson (Speaker of the Legislative Council) had any real interest in the institution. The elective Trustees, of which Smith was one, became, to a large extent, a self-perpetuating club, comprising elite members of the community, such as the Macarthurs, the Macleays, the Mitchells and the Kings, to which individuals like Smith became attached as honorary members. As a management tool, the trusteeship system was sadly lacking. Smith was unusual in that he at least was a professional scientist; most Trustees were at best amateur scientists, at worst, 'bug and beetle killers', public servants, political hacks and time servers.[32] Because only five constituted a quorum and because official Trustees customarily did not attend, the elective Trustees assumed responsibility for the Museum's affairs. Even a quorum of five was often difficult to obtain, and meetings lapsed time and again for want of that number.

It was during Smith's time as a Trustee that the Board became a private club for the edification and convenience of its members. Smith was on the fringes of the Macleay circle – an ally but not a close friend or relative, unlike such other Trustees as Captain Arthur Onslow and William Macarthur (who were relatives), James Cox and James Mitchell. Smith appeared to acquiesce in the dominance of the institution by the Macleay circle. That the Museum was viewed as a private collection, rather than as a public institution dependent on public funds, was demonstrated by the fact that valuable specimens were often given away at the whim of Trustees. Macleay frequently 'borrowed' the services of George Masters, the Assistant Curator, for collecting expeditions and the like.[33] Differences between the Trustees and their Curator came to a head in 1874, when Krefft charged that the Trustees had used their positions directly for their own benefit and to enhance private collections. Meanwhile, the Trustees, for their part, accused Krefft of theft and insubordination. Krefft's charges were never satisfactorily refuted. In 1874, a Select Committee was appointed, and a draft report of that committee recommended the abolition of the system of management by Trustees, and the vesting of control of the Museum in a curator responsible

directly to a Minister of the Crown.[34] The final report, however, was 'doctored' by Macleay and Onslow, who were members of the Select Committee (as well as Trustees) and these recommendations, favourable to Krefft, were suppressed.[35] The Trustees vendetta against Krefft culminated in his forcible eviction in August 1874; Krefft was never re-instated and died embittered and impoverished.

The notion of Trusteeship as an honoured position of public trust took some time to develop. More public spirited and professional men like Smith were evidently needed. As Britain's premier scientific journal *Nature* commented at the time of the Krefft affair:

> *Those who can afford, from their pecuniary advantages, to spend their time and energies on unremunerative committees, are not the class who dirty their hands with the preliminary training necessary for a zoological or a botanical education.*[36]

The age of the 'professional' trustee was not at hand; in the 1870s, however, it was becoming apparent that the age of the professional curator was, and that the management of public scientific institutions was not, perhaps, best vested in unpaid, part-time amateurs.

During Smith's term as Trustee, the Museum grew in popularity and prominence. When first 'thrown open for public inspection' in 1857, it was visited by around 10,000 people. In 1864, the *Sydney Morning Herald* commented that 'It is gratifying to notice that the Museum is daily well attended by persons belonging to all classes . . .'.[37] By 1873, annual attendances had swelled to 60,000. Not only that, thanks to Gerard Krefft's endeavours, the Museum had become an authoritative centre of world reference for the study of Australian natural science.[38]

What was Smith's contribution to the Museum? Smith was a Trustee during this period of growth and consolidation, contributing in his usual conscientious way to the Museum's affairs. Not a leader among the Trustees, Smith was not formally a part of the Macleay circle partly because his interests were not in natural history. Neither a 'bug nor beetle collector', Smith was also not party to conflicts of interest, as were some of his fellow Trustees. However, in the absence of a technological museum, it is not surprising that Smith attached himself to the colony's premier scientific institution, the Australian Museum, even if his interest in it waned after 1870.

Another institution of an entirely different character in which Smith was influential was the Australian Mutual Provident (AMP) Society. Provident and friendly societies developed in the nineteenth century in anticipation of government-funded social security and superannuation, to prevent the exposure of middle class widows and children to poverty or to degrading dependence on charity. As its legislation stated, the State encouraged friendly societies to provide 'funds for the mutual relief and maintenance of the members thereof, their wives, children . . . in sickness, infancy . . . or any other natural state or contingency'. The Society was formed in Sydney in 1845, and Smith became a director in 1864; the other directors 'looking to the advantage of having, as a member of the Board a medical man . . . thought it very desirable to secure Dr Smith's services to the Society'.[39]

Smith served continuously with the Society, dying in the office of chairman, and holding no office with the AMP only in those years in which he was absent from the colony. It is not surprising that the idea of the Society appealed to Smith's shrewd and careful Scottish nature. As chairman of the AMP Society for eleven years, and deputy chairman and director for the rest of his life, Smith saw AMP's business grow most healthily, from an accumulated fund of £270,000 in 1864 to a fund of £5,371,466 in 1885.[40] In the 1870s, the Directors also decided to liberalise the terms under which policies were issued. On his death, the Directors recorded that the Society was deprived of a 'conscientious and painstaking Director, the

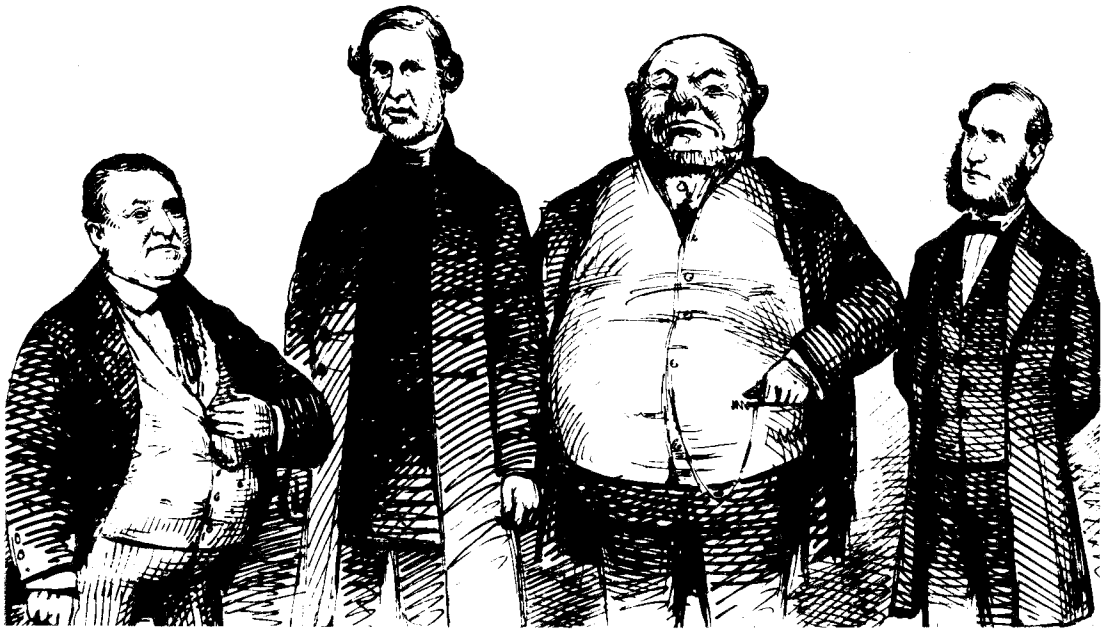


Figure 28 *'Vested interests,'* Sydney Punch, *8 October 1875, 336. From left to right, William Bede (1831-1888); Frederic Barker (1808-1882), the Anglican Bishop of Sydney; unknown commercial gentleman; and John Smith.*

Board of a courteous and able Chairman and the community of a valuable and self-denying citizen'.[41]

Perhaps the most elite 'club', of which Smith became a member in July 1874, was the Legislative Council of New South Wales. One of the few surviving Smith letters throws an interesting light on his nomination to that body. In August 1873, Smith wrote to Henry Parkes, then Premier, setting out his case for a seat:

I think the Government will scarcely be doing me justice if they overlook my claims. Twenty years of service in the cause of public education, not to speak of the numerous other ways I have sought to be useful to the Government and the public should I think be considered deserving of some honourable acknowledgement and a seat in the Upper House appears to be the readiest, if not the only way (consistently with my position in the University) by which the Government could match their appreciation of my services.[42]

Obviously calling upon a long established friendship with Parkes, Smith added that he had never before asked for anything from the Government 'and it is distasteful to do it now'. Duly nominated, Smith served as a member until his death speaking frequently, and occasionally at great length, on topics of personal interest, for example public education, Sydney's water supply and the medical profession. After his death, Alexander Campbell, a colleague of Smith's on the board of the AMP Society ('the greatest and surely the most beneficial institution in this country'), spoke of 'his great industry, his quick perception, his painstaking care in mastering details and his genial disposition (which) rendered him at once a most able man of business and a most agreeable colleague'.[43] Not arcane or academic in his debate on bills before the House, Smith was pre-eminently practical. Commenting on the Civil Service Bill in 1884, Smith was concerned more about provision of superanuation payments for public servants than about standards of entry into the service, which might have been expected to concern a university don.[44] Not abstruse or lofty in his commentary, the House nevertheless benefited, with W.B. Dalley attesting to Smith's 'extensive information on all subjects'.[45]

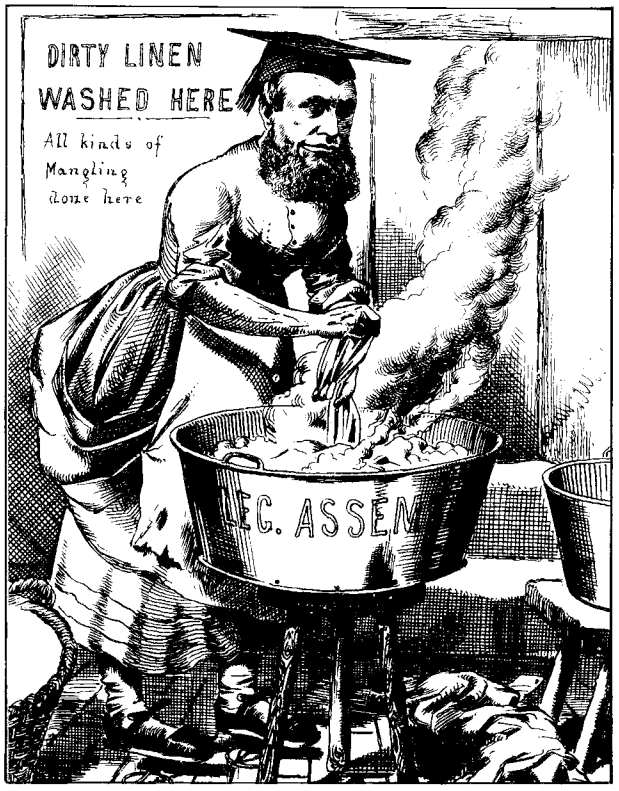
Smith's elevation to the Legislative Council is illustrative of the degree to which he had become entrenched in the colonial bourgeoisie. The starting point of Smith's extra-mural public career and springboard for other activities was undoubtedly his appointment to the Board of National Education soon after his arrival in the colony. Smith's contribution to the Board and its successor, the Council of Education, was indeed enormous. Claiming, as President of the Council in the 1870s to have been 'really performing so much of the work of a Minister, athough without either the title or the pay', Smith attended the office three or four days a week as well as having work sent home.[46] In 1877, he received the CMG, one of the few given in the colony, for his work as President of the Council.[47] In 1879, the Public Instruction Act, which introduced 'free', compulsory secular schooling in New South Wales, and put an end to State aid for church schools, was introduced. In the Legislative Council debates on the Bill, Smith mused publicly on his 'deeper interest in public instruction':

Of late years I have often doubted if I had done right in making such a hobby of the school system and giving up so much time to it. Perhaps that time should have been devoted to the University.[48]

Smith realised that his 'amateur' dabbling in educational administration had had its day: 'It becomes more and more difficult to get an unpaid board to attend sufficiently to duties'.[49] Moreover, as Smith conceded, 'we have a great deal of work to do, indeed some of us thought a little too much'. But even after his official retirement from educational administration, Smith wrote to Henry Parkes in May 1880, 'I am looking after some school affairs here — the old habit being strong'.[50]

Undeniably, Smith's 'hobby' or 'habit' of educational administration, particularly his years on the Council of Education, formed his most sustained and important contribution to what he called 'public usefulness'. It appealed to his sense of civic duty. Smith's natural philanthropic bent, as well as his qualifications as medical practitioner and man of science, made him much in demand. It was his 'philanthropic sentiment', according to the *Sydney Morning Herald*, that induced him to seek a seat on the board of the AMP, an institution which attracted him 'because of the good it was doing'.[51] Social distinctions aside, Smith found public work congenial. It could have been the welfare character of the Highland Society (or merely an attachment to his Scottish heritage) which caused Smith to seek office in that body in 1877. It is likely that he was sought out for his public prominence, joining Scottish-born fellow notables like Sir John Hay, Sir Alexander Campbell and the Hon. Alexander Stuart in a Society, the objects of which were, to advance the social and intellectual improvement of its members, and 'to assist (Scottish) persons newly arrived in the colony . . . in obtaining . . . employment'.[52] In a similar way, perhaps, the reforming and improving character of the Young Men's Christian Association attracted him in the mid-1870s. As the YMCA's President in 1874, he delivered a popular lecture on the 'Chemistry of Heavenly Bodies'.[53] His involvement with that organisation was brief, despite its objective of improving the 'spiritual, moral and intellectual condition of young men'. And when it found itself in the doldrums in the second half of the 1870s, Smith lost interest and departed.

Smith's university appointment gave him three essentials for a 'public' career in colonial New South Wales — income, status and leisure. While his university salary and entitlements were such that his wife was to complain to the University's Chancellor in the 1870s, they were adequate:[54] sufficient, indeed, for him to afford membership of the Union Club in the 1870s, the entrance fee alone being £21, and the annual subscription about three times the weekly wage of a skilled worker.[55] He was able, also, to maintain a residence in Macquarie Street for most of his career. Status was also important. Despite the evident philistinism which English observers noted in the colony, academics and men of learning were held in high



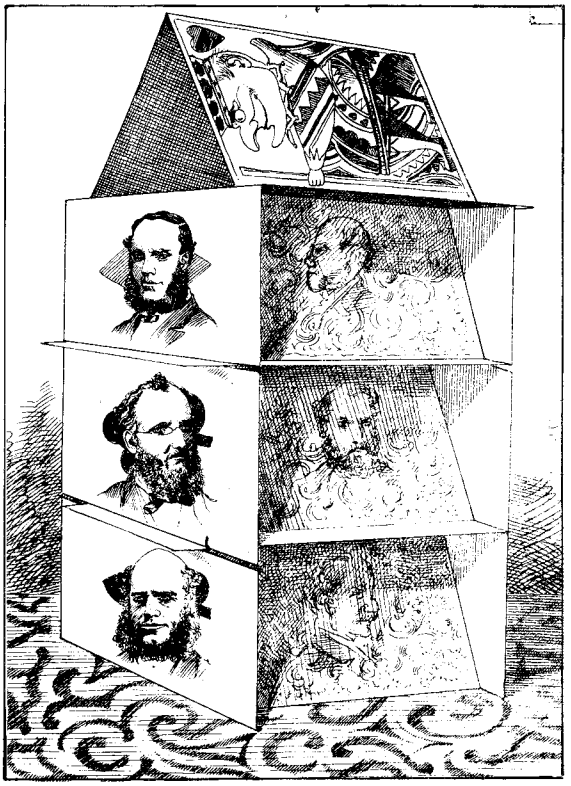


Figure 29 left *'Our Legislative Washerwoman,'* Sydney Punch, *2 February 1878, 283.*
right *' "Waste Not Want Not!" Mr. Punch's Advice to* The Members *of the Mutual Provident Society,'* Sydney Punch, *28 April 1876, 163.*

regard in Sydney and were widely known. University Commemoration days in the 1870s and 1880s were a highlight of the city's social calender; days of elegant ritual, high fashion and social exclusiveness.[56] In his public life, on boards and committees, Smith rubbed shoulders with the wealthy and famous. Most important, abundant leisure enabled him to throw his energies into education, science and 'causes', such as the solution to Sydney's water supply problems — not to mention his 'wayfaring' adventures.[57] The 'poor sister' of the humanities, the science that Smith taught, was not in demand until the 1880s. Indeed, in his speech on the University Extension Bill in 1884, Smith labelled the University an expensive failure, and expressed his perplexity at the fact that so few students chose to attend lectures.[58]

What, then, was the character of Smith's contribution? A reformer but not a radical, Smith admitted that by 1880 he was probably out of step with modern educational thought — just as four years before, he 'considered he was behind the age in point of chemical knowledge', when he tendered his resignation to the University Senate.[59] He remained vehemently opposed to the teaching of history in schools to the 'poorer classes', as 'about the least important thing those children could have'.[60] Motivated by altruism and humanitarianism, Smith nevertheless believed implicitly in self-help (and deplored free schooling). He supported the minor adjustments which charity could bring to an urban society in which the

conditions of the bulk of the people had been deteriorating under the impact of unfettered growth and urban development. During the 1879 education debate, Smith admitted that he perhaps could have done more University research.[61] It is important not to underestimate the extent to which the availability of leisure enabled Smith's involvement in the cultural and public life of the colony. If not part of a traditionally titled 'leisure class', Smith was from that important group of urban professionals with the time, money and education necessary to further the cultural pursuits of the colony. Smith believed implicitly in the importance of cultural institutions and organisations in contributing to the moral and intellectual improvement of the people, giving not only time and labour, but money from his own pocket to art unions, the Royal Society's building fund, and the University's Geological Museum.[62] His activities ranged over a number of fields, partly because his interests were broad, and also because — in the early days of self-government in particular — men of culture and leisure were few. Although his mental and physical powers declined dramatically in his last years, Smith made a contribution to the scientific and cultural life of the colony which was equalled by few.

Notes

1 J.A. Froude, *Oceana: Or England and Her Colonies* (London: Longmans, 1886), 165.

2 John Smith, 'Anniversary Address', *Journal and Proceedings of the Royal Society of NSW, 15* (1881), 2.

3 *Australian Dictionary of Biography, 6* (Melbourne: Melbourne University Press, 1976), 421. For a further examination of the workings of the cultural elite, see Deborah Campbell, 'Culture and the Colonial City: A Study in Ideas, Attitudes and Institutions; Sydney 1870-1890' (Unpublished Ph.D thesis, University of New South Wales, 1982), ch. 1.

4 S. Fitzgerald, *Rising Damp: Sydney 1870-90* (Melbourne: Oxford University Press, 1987).

5 'Obituary Tribute', *Journal and Proceedings of the Royal Society of NSW, 19* (1885), 151.

6 'Philosophical Society of New South Wales', *Sydney Magazine of Science and Art*, June 1857, 8. The magazine published the early transactions of the society.

7 Anniversary Address, *Journal and Proceedings of the Royal Society of NSW, 15* (1881), 4.

8 Anniversary Address, *Transactions of the Royal Society of NSW, 1* (1867), 4.

9 *Ibid.*, 6.

10 Anniversary Address, *Transactions of the Royal Society of NSW, 5* (1871), 2.

11 See George H. Daniels, *American Science, in the Age of Jackson* (New York: Columbia University Press, 1968), 13-21. Both Daniels and Nathan Reingold, 'American Indifference to Basic Research: A Reappraisal', in George H. Daniels (ed.), *Nineteenth Century American Science* (Evanston: Northwestern University Press, 1972), 38-62, argue that the loudly proclaimed retreat from basic research in American science was predominantly a tactic to gain social acceptance.

12 Annual Address by the President, *Proceedings of the Linnean Society of NSW, 1* (1876), 84.

13 *Sydney Morning Herald*, 3 February 1876.

14 Michael Hoare, 'Science and Scientific Association in Eastern Australia, 1820-1890' (Unpublished Ph.D thesis, Australian National University, 1974), 283.

15 Ann Mozley Moyal, *Scientists in Nineteenth Century Australia: A Documentary History* (Sydney: Cassell, 1976), 3.

16 Anniversary Address, *Journal and Proceedings of the Royal Society of NSW, 9* (1875), 4.

17 Hoare, *op.cit.* note 14, 286.

18 Anniversary Address, *Journal and Proceedings of the Royal Society of NSW, 10* (1876), 9.

19 J.H. Maiden, 'A Contribution to a History of the Royal Society of NSW', *Journal and Proceedings of the Royal Society of NSW, 52* (1918), 343.

20 See Hoare, *op.cit.* note 14, ch.8; and Moyal, *op.cit.* note 15, 110.

21 *Echo*, 14 May 1881.

22 'Obituary Tribute', *Journal and Proceedings of the Royal Society of NSW, 19* (1885), 151-2.

23 R. Etheridge, 'Australian Museum: Fragments of its Early History, II', *Records of the Australian Museum, XII* (1916-17), 361.

24 *Ibid.*, 355-6.

25 Australian Museum, *Annual Report* (1854), 374.

26 J.E. Taylor, *Our Island Continent: A Naturalists' Holiday in Australia* (London: Society for Promoting Christian Knowledge, 1886), 216.

27 *Report from the Select Committee on the Sydney Museum* (Sydney, 1874), 1.

28 See Campbell, *op.cit.* note 3, ch.2.

29 The wages of the Curator, Gerard Krefft, for example, were cut from £700 to £500 in 1871. The following year, staff working hours were increased. Australian Museum, *Minutes of Trustees*, 4 May 1871, 4 January 1872.

30 Ann Piggott and Ronald Strahan, 'Trustee Ridden, 1860-1874', in Ronald Strahan (ed.), *Rare and Curious Specimens. An Illustrated History of the Australian Museum, 1827-1979* (Sydney: Australian Museum, 1979), 30. See also Ann Mozley Moyal, 'Sir Richard Owen and his Influence on Australian Zoological and Palaeontological Science', *Records of the Australian Academy of Science, 3* (1978), 41-56.

31 Etheridge, *op.cit.* note 23, 368.

32 For Gerard Krefft's description of gentlemen amateurs like William Macleay 'who thought that true science consisted in keeping a lot of those insects in a cabinet in apple-pie order', See *Krefft Papers* (Mitchell Library, Ms.), A261, Journal, 169.

33 G.P Whitley, 'The History of the Australian Museum' (Unpublished manuscript, Australian Museum), 18; Australian Museum, *Minutes of Trustees*, 6 January 1870, 5 September 1872.

34 *Nature, 10* (4 June 1874), 81.

35 *Australian Museum Archives, Draft Report of the Select Committee Report on the Sydney (sic) Museum* (Sydney).

36 As Ann Piggott and Ronald Strahan have commented, 'it was intrinsically ridiculous and contrary to British parliamentary practice to have two members of a committee inquiring into their own integrity and competence'. See Piggott and Strahan, *op.cit.* note 30, 31.

37 *Sydney Morning Herald*, 13 May 1864.

38 Moyal, *op.cit.* note 15, 22.

39 AMP Society, *Annual Report of the Directors, 1864* (Mitchell Library).

40 *Ibid.*, (1864); (1885).

41 *Ibid.*, (1886).

42 *Parkes Papers* (Mitchell Library, Ms.) A 908, John Smith to Henry Parkes, 25 August 1873

43 *New South Wales Parliamentary Debates, Legislative Council* (afterwards, NSWPD, LC) (1885-6), 21.

44 *NSWPD, LC* (1884), 5776.

45 *NSWPD, LC* (1885-6), 21.

46 *NSWPD, LC* (1879-80), 1464.

47 *Public Record Office* (London), PRO 30/6 and CO 447. Communication from G.T. Powell, Australian Joint Copying Project Officer, 4 February 1987.

48 *NSWPD, LC, op. cit.* note 46, 1463.

49 *Ibid.*, 1464. Smith was adamant that his services were honorary, refusing to take travelling expenses 'because he wished to be in a position to say he took no money for his work'.

50 *Parkes Papers, op.cit.* note 42, Smith to Henry Parkes, 26 May 1880.

51 *Sydney Morning Herald*, 13 October 1885.

52 *Report of the Highland Society of NSW* (Mitchell Library) (1880).

53 YMCA, *Annual Report* (Mitchell Library) (1874).

54 Smith's permanent salary was £675 p.a., with a £120 p.a. housing allowance. The other two Professors salaries were, interestingly, £975 for Professor Pell and £925 for Professor Woolley. University of Sydney *Senate Minutes, 1851-1855* (University of Sydney Archives), 2 July 1853, 148.

55 *Deas Thomson Papers* (Mitchell Library, Ms.) A 1531/3, Mrs J. Smith to Edward Deas Thomson, 14 January 1875; Australian Club, *Rules and Regulations* (Sydney, 1870).

56 The *Daily Telegraph*, 4 May 1885, described the Sydney University Commemoration as 'one of the social events of the year in Sydney'.

57 See chapters 2 and 6 in this volume.

58 *NSWPD, LC* (1883-4), 3049.

59 University of Sydney, *Senate Minutes*, 18 October 1876.

60 *NSWPD, LC* (1879-80), 1568.

61 *NSWPD, LC* (1879-80), 1463.

62 The Art Union of NSW in connection with the NSW Academy of Art, which was crucial in founding the National Art Gallery, lists Smith as a subscriber in 1875. For reference to Smith's £350 contribution to the Geological Museum which was 'not mentioned among the benefactors', see *Deas Thomson Papers, op.cit.* note 55, Mrs John Smith to E. Deas Thomson, 14 January 1875.

CHAPTER FIVE

THE MEDICAL PROFESSION AND PROFESSOR SMITH

MILTON LEWIS

JOHN SMITH was first Dean of the Faculty of Medicine at the University of Sydney. Yet on two occasions he found himself publicly at odds with the medical profession of Sydney. The first and less serious confict arose from his opposition to the establishment of a Medical School in the late 1850s. The second arose in the mid-1870s from his opposition to legislation which would protect doctors from the competition of unqualified practitioners. Smith's first clash is partly explained by his declared preference for the development of the Faculty of Arts over the establishment of a Medical School. But the larger conflict between Smith and the profession is fully intelligible only in terms of two more general processes at work in colonial Sydney: the development of medical knowledge and practice, and the professionalisation of medicine. In his opposition, Smith found himself influential at a critical juncture in the colonial profession's march towards greater status and power in the Australian community.

I

Smith graduated Doctor of Medicine from Marischal College, Aberdeen in 1844, having graduated Master of Arts the year before. As a student he had distinguished himself in natural history, mathematics and natural philosophy, and, according to the Senatus Academicus of Marischal College, had been 'much devoted to the science of Chemistry'.[1] He did not practise medicine for very long after graduation. Following a voyage to Australia as ship's surgeon — a journey taken for the sake of his health — Smith was appointed Assistant to Thomas Clark, Professor of Chemistry at Aberdeen, in 1847. Chemistry was to be his chosen vocation. Indeed, he did not bother to register with the Medical Board after his arrival in New South Wales.

When he arrived, professional medicine scarcely existed. The Act of Incorporation of the University of Sydney, which received the Governor's assent in October 1850, gave the Senate power to confer the degrees of Bachelor of Medicine and Doctor of Medicine and to 'examine for Medical Degrees in the four branches of Medicine, Surgery, Midwifery and Pharmacy . . .'.[2] In addition, the Senate was required to advise the Government concerning institutions in Sydney suitable for training medical students. Medically qualified Fellows of the Senate and the leaders of the profession like Henry Grattan Douglass and John Macfarlane favoured establishment of a Medical School within the University, but priority

was instead given to the development of a Faculty of Arts to educate a class of cultivated and conservative gentlemen able to govern the colony according to proper principles. To this end, the three Professors of Classics, of Mathematics and of Chemistry and Experimental Philosophy were the first appointed. Eventually the University decided to create a Faculty of Medicine, but this was to be a purely examining body.[3] John Smith, as the only medically qualified member of the professoriate, was duly appointed Dean in 1856. As Dean, he was assisted by a Board of Examiners who came from the ranks of eminent Sydney medical practitioners. And as such, he became part of the colonial profession's increasing sense of identity and self-assertiveness. In England, ten professions formed national associations in the period from 1825 to 1880.[4] In medicine, practitioners sought, through their new professional association, to regulate the behaviour of fellow practitioners, and to standardise and control the training of recruits. In London, Oxbridge and the provinces, closer links arose between medicine and the universities. Moreover, the profession sought from Parliament licensing laws which would suppress and exclude unqualified practitioners. In New South Wales, before the 1850s, attempts to create a professional medical association, and to secure protective legislation were only partly successful. This had much to do with the smallness of the private practice sector in a colony where state provision of medical services was for many years predominant. From the late 1850s, however, the profession more confidently pursued its twin goals. With the formation of the New South Wales branch of the British Medical Association in 1880, the profession went from strength to strength, and finally won protective legislation on the eve of Federation in 1900.

If medicine in New South Wales was shaped by these pressures for professionalisation, it was also affected by changes in knowledge and practice that originated in Europe. European medicine changed fundamentally during the nineteenth century, as France pioneered the 'clinic', and Germany introduced laboratory research. Eighteenth-century medicine had its roots in the doctrines of the classical world. The human body was seen as a microcosm with its own laws of growth and decay.[5] Disease was identified by external symptoms and interpreted according to the subjective experience of the patient. Diagnosis rested on projection from the patient's history of the illness, and pathology involved identification of morbid forces acting in the total body system, not in diseased organs or tissue. The doctor was expected to use heroic therapies such as regular bleeding, purging or emetics to combat the morbid forces debilitating the patient.

A major conceptual shift took place in France in the first four decades of the nineteenth century. 'Hospital medicine'[6] arose in Paris in the wake of the Revolution's destruction of the central medical institutions of the *ancien regime*. The new medicine involved four significant changes. Pathology was localised (local lesions); patients were physically examined; statistical methods created new degrees of certainty, and diseases were classified in terms of pathological anatomy. Symptoms were now seen as secondary signposts to the causes of disease, which were located no longer in general constitutional disturbances but in specific lesions in the body's tissues. Meanwhile, in Germany, the cell became the seat of disease. As attention shifted from the anatomical to the cellular level, detection of disease moved beyond the reach of the patient, and even beyond the competence of the medical practitioner. Progress in medicine began to emanate from the laboratory rather than from medical practice.

While by 1870 this new laboratory-oriented medicine had progressed far towards a rational view of disease, it was lacking in two important respects. First, it had not elucidated the role of bacteria, viruses and protozoans in communicable disease. Infections remained the source of a vast amount of mortality and morbidity. Secondly, scientific medicine, whilst discrediting traditional therapies,

offered little to replace them. There was thus a considerable gap between laboratory medicine's capacity to explain and the practitioner's capacity to cure.

The total number of practitioners in New South Wales was so small that the traditional British division into distinctive medical orders — physician, surgeon, and apothecary — never really developed in the colony. A small population and an expanding frontier of settlement also worked against the development of a system, which in any case was breaking down in England itself. Bush conditions demanded that isolated practitioners be competent in a wide range of medical skills. The general practitioner emerged at an early date. As the free and emancipist numbers grew, private practice became more feasible.[7] The earliest private practitioners were the emancipist doctors, William Redfern (1778-1833) and William Bland (1789-1868). Until his retirement in the mid-1820s, Redfern combined an extensive private practice with government work at the General Hospital in Sydney. Bland, who became the first full-time private practitioner in 1815, played an important role in colonial politics, in medical practice, and in professionalisation.

By the 1830s, competition within the ranks of the medical profession in Sydney was intensifying. The *Sydney Herald* observed in 1834, 'the success of Apothecaries and non-licentiates in this town has been owing to a deficiency of qualified practitioners of whom we now have a superabundance'.[8] James Bowman, Principal Surgeon, 1819-27 and Inspector-General of Colonial Hospitals, 1827-36, told the Legislative Council's Committee on the Medical Practice Bill that some young doctors who had emigrated from Britain had been forced to go home for lack of opportunities to practise.[9] At the same time as competition increased, the profession began to seek legislation to put down its rivals — unqualified practitioners and chemists and druggists. The Medical Witnesses Qualifications Act of 1838 empowered the Medical Board to record on a single register doctors and bachelors of medicine, physicians or surgeons 'licensed . . . by some College of Physicians or Surgeons in Great Britain or Ireland',[10] London Apothecaries, and medical officers of the armed services. In 1845, a supplementary Act extended recognition to members and licentiates of Apothecaries Hall, Dublin. Nevertheless, it was unrealistic to prohibit unqualified practice. The profession saw no conflict between self interest and the public interest. However, neither the community nor the legislature would accept the claim of orthodox medicine to absolute control. Repeated attempts to get exclusive legislation through Parliament failed. The problem was that the community in New South Wales saw no great difference in effectiveness between qualified and unqualified practitioners. The demonstrable ability of the qualified to explain and cure illness was not substantial enough to sustain their claim to a privileged status in law.

It was therefore not accidental that the same leading figures in the profession who created the first professional associations, and who at an early stage sought protective legislation — Henry Grattan Douglass, Bartholomew O'Brien and John Macfarlane — also supported efforts to have a Medical School established within the University of Sydney. Doctors appearing before the Legislative Council's Committee on the Medical Practice Bill in 1838, asked whether they believed a Medical School should be created in Sydney replied that this would be premature when neither students nor teachers of quality were available in sufficient numbers.[11] Proposals in 1846 and 1847 to create a Medical School at the Sydney Infirmary (later Sydney Hospital) proved unsuccessful.

A decade was to elapse before July 1859, when the Senate of the University of Sydney appointed a committee 'to consider the practicability of establishing a School of Medicine'.[12] The committee included the Provost, Sir Charles Nicholson, a wealthy landowner and physician with a high reputation in obstetrics; the Vice-Provost, the Hon. Francis Merewether M.L.C.; Drs. Henry Grattan

Douglass and Bartholomew O'Brien; and Professor John Smith. Receiving a favourable report, the Senate resolved to open a Medical School by Lent Term, 1860.[13] Instructions were given to the University's architect to prepare plans for an Anatomy School and negotiations were opened with the Sydney Infirmary for the provision of clinical lectures.[14] But the plans of Nicholson and others keen to establish a school were thwarted when the Legislative Assembly set up a Select Committee on the University in late 1859. Chaired by T.A. Murray, this committee was the creation of the political enemies of W.C. Wentworth and Nicholson. In 1846-56, Nicholson had been Speaker of the Legislative Council and a political ally of Wentworth. The two had worked hard to persuade the University Senate to proceed with creation of a Medical School.[15] Although the committee made no mention of the proposed Medical School, two of its witnesses — Dr. John Macfarlane M.L.C. and Professor John Smith — discussed the matter at some length.

According to Macfarlane the profession supported the idea.[16] Costs would be kept low by employing local practitioners to teach part-time until chairs were created. The current practice of sending young men to Europe for training could be ended, since young men were already being well educated in law and theology without leaving Sydney. A Medical School would also improve the quality of colonial pharmacy, and become a valuable aid in the fight against diseases of cattle and other livestock. Students educated locally would gain experience of peculiarly Australian forms of various diseases.

Smith was diametrically opposed. A Medical School would take funds from the Arts Faculty when the 'first duty' of the University was 'to provide a good general education', not a professional one; and when chairs of Natural History and of Mental Science were yet to be established.[17] In any case, teachers of intellectual stature and experience were not to be found in the colony, and the semi-tropical climate discouraged the use of bodies in anatomy classes. The argument concerning Australian types of disease was not telling when weighed against the advantages of observing diseases in vastly more populous European cities. Finally, as no more than three to four students per year could be expected to enrol, such small numbers could hardly justify the cost.

As well as publicly condemning the proposal, Smith joined with the other two Professors in an intramural protest to the Senate.[18] The Professors stated that the measure would seriously retard development of the Arts Faculty, and complained that while by-laws required that questions relating to studies be considered by the Professorial Board, the Senate had not referred to the Board nor to the Professors, nor to its own Dean of Medicine. The Senate brushed aside the Professors' protest, and re-stated that a Medical School would provide 'a new and honourable field of employment to the youth of the Colony', while the University itself would be 'assimilated, in all its most essential objects and aims, to the great Academic Institutions of Europe, upon the model of which it is founded'.[19]

But despite the Senate's stand, the proposal collapsed. Smith's opposition was an important factor, although the University's lack of funds was more significant still.[20] Over twenty years were to pass before a Medical School was finally created. In 1866, the University and Sydney Hospital renewed discussion about a medical course. A scheme was devised under which the first two years of a medical curriculum were to be provided; a professor of anatomy was to be appointed and an Anatomical Museum built. But the Colonial Government refused to provide the necessary funds. When an attempt was made to assassinate Prince Alfred, Queen Victoria's second son, during his visit to Sydney in 1868, loyal subjects donated funds for a memorial to commemorate his recovery. This took the form of a new hospital. Under an Act of 1873, land was set aside on the University domain, for this new hospital, which was to be used as a teaching hospital of the University as

and when a Medical School was established. Lack of finance delayed the opening of Prince Alfred Hospital, but in 1880, the announcement of the Challis bequest led the Senate to approve a scheme under which teaching at the University would be much expanded. Chairs or lectureships in natural history, modern languages and engineering, and a medical school, were to be created. Parliament provided an increased endowment which the University was able to use to make new appointments. Thomas Anderson Stuart, of Edinburgh University's Medical School, was appointed foundation Professor of Anatomy and Physiology. Within a decade, the Medical School began to supply well-trained doctors, with five years of training when four years was still common in Britain. The school saw the beginning of medical research: Anderson Stuart, on the structure of the eye and the functions of the epiglottis and larynx; Alexander MacCormick, first Demonstrator in Anatomy and Physiology, on the myology of the limbs of *Dasyurus viverrinus*. The specialties began to appear in metropolitan hospitals like Prince Alfred, St Vincent's, and the long-established Sydney Hospital. A class of consultants emerged as the new elite of the profession, although specialist societies were not to appear until the early twentieth century. Stuart replaced Smith as Dean of the Faculty of Medicine, but Smith remained an Examiner in Medicine until 1885, the year of his death.

II

Smith's opposition to a Medical School, in deference to general education, paralleled his opposition to restructuring of medical legislation. In the 1870s, the profession was divided against itself. Its standing in the community was such that many believed 'quacks' could achieve therapeutic results at least as satisfactory as those achieved by orthodox practitioners. The profession had been seeking legal recognition of the rights of the qualified medical practitioner since the 1830s. It sought to have the law prohibit medical practice by the unqualified and the chemists. In the event, it accepted something short of that — prohibition of the illegitimate assumption of medical titles — which nevertheless would help to reduce competition from those outside orthodox ranks.

The 1880s saw a turning point in the development of medical professionalisation in the colony. A professional union and a journal were established on a sound basis; there were to be no more false starts.[21] In 1880, a branch of the British Medical Association, the successful corporate advocate of the demands of the general practitioner in Britain, was formed in New South Wales. A new journal, the *Australasian Medical Gazette*, was launched in this period.

The *Australasian Medical Gazette* and the B.M.A. campaigned against such unacceptable activities as advertising and fraternal legal battles. A Medical Defence Union was formed in the 1890s to provide legal aid for members who became involved in court cases. Significantly, no aid was given in cases where a member proceeded against a legally qualified medical practitioner.[22] Perhaps most important of all, the 1880s saw the beginning of medicine's capacity to explain and to act effectively against major areas of illness and disease. It was the beginning of the great age of bacteriology, and surgery, revolutionised by anaesthetics and antisepsis, was starting to win the confidence of the public.

The medical profession continued to seek a Medical Act which would reduce, if not actually eradicate, competition from 'quacks'. Bills had been introduced without success in the 1860s. The newly established *New South Wales Medical Gazette* stated unhappily in 1870, 'Repeated attempts have been made to get a Medical Act passed such as, while it shall recognise the just claims . . . of the profession, shall also . . . protect the public from . . . not only known charlatans but . . . those unfaithful among ourselves who have deserted the paths of legitimate practice . . .'.[23]

In the 1870s, the profession pursued a concerted campaign to have protective legislation enacted. Acts in force in Victoria and Queensland, in other British colonies and in the United Kingdom, and European and American legislation, were studied before a local bill was drafted by the eminent lawyer Sir Alfred Stephen, with the aid of leading doctors, such as Frederick Milford, Charles Nathan, J.M. Creed and John Macfarlane.[24] The Colonial Secretary, Henry Parkes received deputations, urging him to enact legislation, and petitions were signed by leading clergy, lawyers, well-known merchants and by most of the University Senate.[25] But Parkes was cautious, arguing that his Government did not want to be seen to support a sectional interest whatever its learning and respectability.[26]

Not surprisingly, the profession reacted angrily to John Smith's public opposition to protective legislation, and his implied questioning of the ability of qualified practitioners. In March 1875, Sir Alfred Stephen obtained leave to bring in a bill which, he told the Legislative Council, would save citizens from the ministrations of 'ignorant, unqualified and presumptuous men'. This would be achieved essentially by making illegal claims to medical titles not legitimately obtained.[27] Professor Smith, by now a member of the Legislative Council, spoke at length in the debate. The profession might be deserving of the utmost respect, he said, but it should not seek legislation which would 'encroach upon the rights of those who might be outside the privileged circle'.[28] He observed that 'there was ignorance and unskilfulness in the profession as well as out of it' and many doctors were 'hopelessly given over to intemperance'. He had found on several occasions qualified practitioners presenting for medical degrees, who failed to pass examinations in subjects practitioners should have known. Moreover, he suggested, medicine was 'at the present day more of an art than a science' and competence in an art could only be obtained by experience. The capacity to observe well was essentially God-given, and 'the power of detecting disease was not to be acquired by study, and was often possessed by those who had not gone through regular training'.[29] The public had not requested legislation and no Act by itself could fully protect the community from incompetence or malpractice. The medical profession was seeking privileges that no other profession enjoyed, and the proposed legislation could inflict injustices on innocent citizens. John Smith's critical view was widely shared.

Sir Alfred Stephen told Parliament that he was surprised by the amount of opposition to the bill which, he pointed out, would not prevent anyone from practising medicine. In reply, one opponent of the bill said that he could not agree to a measure which created a monopoly for a class of practitioners in whom he had no confidence. Earlier, the same member had objected to the bill on the ground that it infringed the liberty of the subject.[30] So eminent a political figure as Sir Edward Deas Thomson (who was also Chancellor of the University) commented that he would just as soon trust a council of doctors to regulate all doctors as he would trust the heads of one religious sect to regulate the religious practice of the whole community.[31]

Smith's first parliamentary statement had angered the profession, and a meeting of forty-five Sydney doctors, chaired by the well-known Dr. George Bennett, Examiner in Medicine at the University, 1856-93, carried a number of resolutions critical of Smith. The first said his remarks about ignorance and intemperance within the profession were 'unbecoming and unjustifiable'; the second censured him for his claims about the unscientific nature of medicine; the third claimed his views would adversely affect students preparing to become doctors; the fourth stated that he could not in the circumstances remain Dean of the Medical Faculty; and the fifth decided to report the views of the meeting to Smith himself and to the General Medical Council of Great Britain.[32] The profession's journal, the *New South Wales Medical Gazette*, joined the battle, criticising the many

members of Parliament who during the debate on the bill had shown a 'rooted aversion' to doctors and had 'insolently and wantonly' accused them of ignorance and unreliability. Smith's own attack on the profession had been 'indecent and unjust', and well served the interests of the fraternity of 'quacks'. The *Sydney Morning Herald* was also criticised, for failing to publish letters which supported the bill. The journal's fiery editorial concluded with some morale-boosting reflections on the local profession which was encouraged to see itself as part of a 'mighty body spread over the four quarters of the globe — the inheritors of a rational and progressive philosophy which has endured for thousands of years and the humble followers of self-sacrificing sages and philanthropists'.[33]

Using Parliament as a forum, Smith replied at some length to his critics in the profession. He was unrepentant in his opposition to what he saw as class or special interest legislation, which the public had not demanded and the profession did not need. He outlined the contents of a letter he had sent to Dr. Bennett, who had communicated another series of resolutions, condemning Smith's position, passed by a meeting of the University's Examiners in Medicine.[34] Smith said in reply that when he had mentioned 'ignorance' within the profession, he had not meant that there was as much ignorance within as without its ranks, but rather that ignorance did exist among orthodox doctors. As to medicine as an art, he challenged Bennett to analyse the list of drugs he prescribed on a randomly chosen day. He would find many were prescribed as a result of experience rather than because of their scientifically proven efficacy. Moreover, skill as a practitioner depended not only on a scientific medical education, but on experience and a gift for observation.

Smith pointed out that English medical authorities — including Dr. William Withey Gull, physician to Guy's Hospital and Sir John Forbes F.R.S. — supported his view that medicine was more of an art than a science. Smith had always encouraged students to pursue lofty aims, and was hurt by the fact that some of his former students had supported the resolutions passed by the profession. He hoped that when his critics in the local profession reported the whole 'wretched business' to the General Medical Council, they would be 'manly enough' to include his interpretation of the affair. He had little faith in a local Medical Council staffed by people so vindictive as to want to refer the present matter to the Medical Council of Great Britain. He remained ready to be proven wrong by temperate argument and would never shut his ears to 'right reason'.[35]

Some in the Legislative Council felt that the profession's attack on Smith for his statements in the Council constituted a breach of the privileges of the House.[36] In the event, no action was taken. However, the *New South Wales Medical Gazette* apologised on behalf of the profession for any unwitting offence, although maintaining that in the face of Smith's criticism of doctors, the profession could not be expected to remain silent. With the lay press closed to the profession, doctors had no choice but to call a meeting and record their indignation about a speech which was 'a ruthless and cruel insult'.[37] Similarly attacked, members of other professions would have reacted at least as angrily. A little later, the journal made one last foray into the field. It contrasted the high-minded views of the leading Edinburgh medical chemist, Professor Alexander Crum-Brown on the value of a scientific medical education with those of Smith. The journal proclaimed, 'To the medical profession of New South Wales, who have been censured by members of the Legislative Council, lectured by the press, depreciated by the Dean of the Faculty of Medicine . . . and abused by a few foolish persons of homeopathic or spiritualistic proclivities, for upholding the rights of legally qualified medical practitioners, there is a *soupçon* of comfort in the rational views of Dr. Crum-Brown'.[38]

The quest for protective legislation was by no means over. Through the 1880s and 1890s, the profession tried repeatedly to obtain a Medical Act. In 1887, J.M. Creed, President of the New South Wales Branch of the British Medical Associ-

ation (B.M.A.) and Member of the Legislative Council, chaired a parliamentary enquiry into the practice of medicine in the colony. The enquiry showed that unqualified practice was widespread, and named eighty-four practitioners of various unorthodox schools in Sydney and ninety-nine in country towns. Although the enquiry would not endorse outright prohibition, it insisted on legislation recognising the rights of qualified practitioners.[39] Yet, despite considerable press coverage and support from a variety of prominent people — including the Lieutenant Governor, the Chief Justice, the leaders of the Anglican, Roman Catholic, Wesleyan and Congregational Churches, and the Rabbi of the Jewish Congregation — the legislation did not pass.

The delays in passing such an Act owed much to the instability of governments (there were twenty-nine ministries between 1856 and 1901) and the factional nature of New South Wales politics. Moreover, exclusive legislation was widely perceived as an attempt to gain monopoly control, and was as such ideologically suspect in the age of liberalism. Egalitarian sentiment, and mistrust of the gentlemanly pretensions of the medical profession, also played some part. But above all, there were serious doubts about the effectiveness of orthodox medicine, and many were ready to testify to the therapeutic capacity of unqualified practitioners. Orthodox medicine was not yet sufficiently superior to unorthodox schools of healing for it to lay claim incontestably to special legal status.

In the mid-1870s, John Smith's insistence upon the importance of the empirical and experiential aspects of medical practice was fundamentally sound. It was perhaps unwise to have been so publicly forthright about the limitations of orthodox medicine. He saw that it was the profession rather than the public which was calling for legislation. Smith's criticism was made much worse by the fact that it came from the Dean of Medicine. To doctors it seemed that Smith was saying that there was nothing to choose between the qualified and unqualified. Qualifications were made out to be much less important than the profession wished them to be.

Compared with medicine of the early nineteenth century, Australian medicine of the 1870s was quite 'scientific'. The *New South Wales Medical Gazette* in 1873 pointed out that progress had been achieved in almost every department. Technical aids to diagnosis abounded, including the ophthalmoscope, the laryngoscope, the microscope, the sphygmograph and the thermometer — and new drugs like chloral hydrate and potassium bromide had become available.[40] But the miasmatic theory of infectious disease still prevailed, major surgery was still a dangerous and doubtful undertaking, and apart from pain-killers, medicine had few effective drugs. In hindsight, Smith's views of the nature of medicine and medical education in the 1870s were quite reasonable. After all, as a modern historian of medicine could write, 'By the end of the century the progress was well started which would inevitably end in the objective of training in the *science and art of medicine* [my emphasis]., the science of pathology, diagnosis and therapeutics . . . the art of making a diagnosis, or deciding on a treatment, by processes of unconscious reasoning, and of making a provisional diagnosis and prescribing a provisional treatment . . . while the scientific process was put into action'.[41] Smith's difficulties with the medical profession of Sydney arose not only from the fact that on balance he spoke the truth about the limitations of the medicine of his time, but that unknowingly he set his face against the powerful historical process of professionalisation in which the search for truth was very often subordinated to the advancement of self-interest and the quest for corporate advantage.

Notes

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1 Marischal later combined with King's College to form the University of Aberdeen. Quoted in R.J.W. LeFèvre, 'The Establishment of Chemistry within Australian Science — Contributions from New South Wales', in A.P. Elkin *et al.*, *A Century of Scientific Progress: The Centenary Volume of the Royal Society of New South Wales* (Sydney: Royal Society of NSW, 1968), 341.

2 Quoted in J.A. Young, A.J. Sefton and N. Webb (eds.), *Centenary Book of the University of Sydney Faculty of Medicine* (Sydney: Sydney University Press, 1984), 3.

3 The original rules were so restrictive that no candidate presented for examination. In 1866, the M.B. by-laws were relaxed, and eleven M.B.s by examination were awarded before the opening of the Medical School in 1883. In the same period, thirteen M.D.s were gained by examination. Young, Sefton and Webb (eds.), *op.cit.* note 2, 22-23.

4 Law, Medicine, Architecture, Pharmacy, Veterinary Science, Engineering, Teaching, Librarianship, Accountancy and Dentistry. M.S. Larson, *The Rise of Professionalism: A Sociological Analysis* (Berkeley: University of California Press, 1977), 5 and 246.

5 N.D. Jewson, 'The Disappearance of the Sick-Man from Medical Cosmology, 1770-1870', *Sociology, 10* (1976), 227.

6 *Ibid.*, 229.

7 The Colonial Medical Service, a government organisation, had provided care to everyone for some years after the penal colony was established in 1788.

8 *Sydney Morning Herald*, 16 January 1834, 1.

9 Report from Committee on Medical Practice Bill, 1838, *Votes and Proceedings, Legislative Council*, 1838, Part 2, Minutes of Evidence, 8.

10 Quoted in E. Hilder, *One Hundred and Twenty Years of Medical Registration in New South Wales 1838-1958* (Sydney: duplicated typescript, 1959), 3.

11 Report from Committee on Medical Practice Bill, 1838, *op.cit.* note 9 above, 12 and 31.

12 *Senate Minutes, University of Sydney*, 6 July 1859, 200.

13 *Senate Minutes, University of Sydney*, 7 September 1859, 210. Neither Smith nor Merewether had been parties to the committee's report.

14 *Idem.* See also *Senate Minutes, University of Sydney*, 6 June 1860, 247.

15 Young, Sefton and Webb (eds.), *op.cit.* note 2 above, 19 and 32. For a brief biography of Nicholson, see *ibid.*, 31-33.

16 Report of Select Committee on Sydney University, 1860, *V. and P. (L.A.)* Vol. 4, 1859-60, Minutes of Evidence, 111-115.

17 *Ibid.*, 92-93.

18 *Ibid.*, 100.

19 *Idem.*

20 Nicholson's residence in England after 1862 and the withdrawal of Douglass and O'Brien from University affairs reduced the pressure for creation of a Medical School. The opening of Melbourne University Medical School in 1862 probably lessened the force of the argument in favour of a school in Sydney because the Australian colonies now had a Medical School. Young, Sefton, and Webb (eds.), *op.cit.* note 2, 12.

21 For the history of professionalisation in the colony, see M. Lewis and R. MacLeod, 'Medical Politics and the Professionalisation of Medicine in New South Wales, 1850-1901', *Journal of Australian Studies 22* (1988), 69-82.

22 *Australasian Medical Gazette* (April 1897), 193.

23 *New South Wales Medical Gazette* (October 1870), 15.

24 *Australian Practitioner* (January 1878), 130-131.

25 *New South Wales Medical Gazette* (December 1873), 66 and 94; (November 1874), 55-56; *V. and P. (L.A.)*, Vol. 5, 1873-74, 963.

26 *New South Wales Medical Gazette* (May 1874), 258-261.

27 *Sydney Morning Herald*, 26 March 1875, 2.

28 *Sydney Morning Herald*, 14 May 1875, 4.

29 *Idem.*

30 *Sydney Morning Herald*, 4 June 1875, 3; 3 June 1875, 4; 18 June 1875, 2.

31 *Sydney Morning Herald*, 14 May 1875, 4.

32 *New South Wales Medical Gazette* (June 1875), 280-281.

33 *Ibid.*, 271-273.

34 Before the opening of the Medical School in 1883, a total of nineteen examiners — nine initially and the rest as vacancies occurred — were appointed. An homogeneous group, virtually all held office in one of the various professional bodies established in Sydney between 1840 and 1880. Most had appointments at the city's public hospitals, while a number had part-time

government posts and some were members of the Medical Registration Board. Young, Sefton and Webb (eds.), *op.cit.* note 2, 30.

35 *Sydney Morning Herald*, 26 June 1875, 7.

36 *Sydney Morning Herald*, 25 June 1875, 2-3.

37 *New South Wales Medical Gazette* (July 1875), 300-301.

38 *New South Wales Medical Gazette* (November 1875), 60.

39 Report of Select Committee on Medical Practice, 1887, *J. (L.C.)*, Vol. 43, 4, 1887-88, 500-504.

40 *New South Wales Medical Gazette* (July 1873), 322-324.

41 C. Newman, *The Evolution of Medical Education in the Nineteenth Century* (London: Oxford University Press, 1957), 226-227.

Figure 30 *'Hydro(ec)statics; or, The Water Babies. Mr. Clarke, the Hydraulic Engineer, having arrived, receives many suggestions as to the Water Supply',* Sydney Punch, *9 December 1876, 111.*

CHAPTER SIX

JOHN SMITH AND THE 'WATER QUESTION'

PETER SHELDON

THE PROBLEM of an adequate water supply has troubled Sydney for most of its history. Sydney has a relatively dry climate, is plagued by periodic, long droughts and has no large rivers nearby. Administrative and financial factors meant that supply never anticipated need until the completion of the Warragamba scheme in the early 1960s. For much of this period, Sydney suffered intermittent water scarcity. This paper looks at the efforts of one man to alleviate that problem.

John Smith's involvement in the water question between 1854 and the early 1880s was part of his wider involvement in the fields of urban development and sanitation. They were the actions of a reforming, humanitarian, if at times elitist, professional in a period of growing public health crisis. This crisis was the result of the enormous, unplanned growth of population and private building during the 'Long Boom' from 1860 to 1890.

As in Britain in the 1830s, the rapid growth of Sydney in the second half of the nineteenth century created or aggravated a number of interlinked social and economic problems. Sydney, like the other Australian capitals, did not suffer the twin and causal scourge of British urban growth, rapid industrialisation. Rather, as a commercial and administrative centre, it served the growing links between its productive and profitable hinterland and the expanding industrial centres of Europe. Sydney had developed as a wool port before it became a city.[1]

The gold discoveries of the 1850s not only caused an immediate and very large immigration to eastern Australia, but through a series of subsequent economic linkages, sustained immigration from the 1860s.[2] Most of these immigrants settled in Sydney, Melbourne and Adelaide.[3] The population of Metropolitan Sydney (City and Suburbs) thus grew from approximately 54,000 in 1851 to 95,000 in 1861, 138,000 in 1871 and 245,000 in 1881. By 1891, it was some 390,000.[4]

This very rapidly growing population urgently required housing. The newly arriving immigrants and the ex-diggers coming to Sydney during the 1860s in search of work provided a quickly expanding workforce. This and the ready availability of capital for the construction industry in general made possible the first great period of city building in Australia from the early 1860s to 1890.[5] This exacerbated existing inadequacies in sanitation in metropolitan Sydney.

Recently, historians have corrected existing broad generalisations about rising living standards in Australia between 1860 and 1890 by referring to the appalling living conditions of the city working class in Sydney. Both Clark and Fisher go further to point out that these conditions were the result of the specific nature of

Australian economic development and Sydney's role within it.[6] This was true of water supply.

In the 1850s, Sydney's population lived mainly within the City Council boundaries. Class largely determined housing patterns with George Street forming an important divide. There were strong working class pockets on the east side of town and a great number lived around Goulburn Street. Nevertheless, the working class, and in particular the unskilled and semi-skilled, lived predominantly west of George Street in an area between the Rocks and the Haymarket and along both sides of Darling Harbour.[7] Some of these areas already had a reputation for overcrowding and generally unsanitary housing. These conditions were to worsen with development, and extend later to Surry Hills.

The division of Sydney along class lines continued, as the growth of the first ring of nearby townships merged into the metropolitan area as suburbs in the 1860s. Redfern, Glebe, Balmain, Paddington, Darlinghurst and Newtown had populations between three and four thousand in 1861, although some sixty percent of the metropolitan population still lived within the City boundaries.[8]

Over time, the growing commercial and administrative importance of Sydney prompted the destruction of City housing to make way for warehouses, houses, offices and shops. As the central business district spread, the wealthy moved out of town and away from the discomforts and nuisances associated with unplanned and unserviced urban growth. The need to live within walking distance of their work around the port, the railway yards and manufacturing restricted working class housing patterns.

The growth of the commercial and administrative centre therefore increased the overcrowding in the remaining working class housing in the City. Others moved to inner suburbs, some of which were fast losing their fashionable reputations. Redevelopment of land and housing as well as sub-letting added greatly to population densities as these suburbs became more identifiably working class. The problem was not only one of progressive deterioration of existing conditions; much of the housing built during the boom years was sub-standard and without even basic sanitary amenities.[9]

Population growth in the inner suburbs was particularly rapid during the 1870s. A further ring of less crowded suburbs grew strongly and gradually merged into the metropolis. There was tram or train to the City, but, more importantly for the working-class inhabitants of Botany, Waterloo, Alexandria, St. Peters and Marrickville, there was the chance of local work. In general though, the growth of Sydney's role as an international port shaped residential patterns so that there was a clear distinction between the better off outer suburbs and the inner areas of the poor. While the total suburban population more or less doubled each decade between 1861 and 1891, it only surpassed the City in the late 1870s. In 1891, there were still over 100,000 people crammed into the little residential area remaining in the City.[10]

The poor of these increasingly overcrowded areas lived in dark, cramped and poor quality houses which were usually badly ventilated and had no water or sewerage facilities. Their streets, lanes and alleyways were generally undrained. Those living in the nearby suburbs suffered a similar lack of basic amenities. Henry Parkes, as Chairman of the 1859-60 Select Committee on the Condition of the Working Classes of the Metropolis found "many of the older tenements are unfit for the occupation of human beings."[11] Reports of successive City Health Officers, intermittent investigations by the *Sydney Morning Herald* and the reports of the 1875-6 Sewage and Health Board corroborated this and brought the worsening situation to official and public attention. Yet, for most of this period, little occurred to remedy the situation notwithstanding campaigns by sanitary

reformers. A similar situation had been true of Britain until the late 1840s.[12] In both cases, the intolerably bad conditions of the working class only really became of wider public interest when those conditions threatened the health and lives of the metropolitan middle class, that is the 'public health'.

For the earlier part of the period, most Australian sanitary reformers, professional and lay, as well as the broader public believed in some form of miasmic generation or contagion of disease. That is, it was evil smells, fumes or stench that caused and spread disease.[13] This was to slowly change in Sydney from the 1860s but had an important influence on the choice of health strategies and a continuing one on questions of housing policy.[14]

In towns and cities, those odours came from human, animal and vegetable wastes which abounded in the more densely populated areas devoid of sewers and drains or of the water supply to make them function properly. For the inhabitants of these areas, lack of fresh air and sunlight increased the probability of contagion. The potential for the more infectious and virulent diseases to become epidemic was very real and it was fear of this that lay behind much middle-class concern or alarm about working-class sanitation. It was the extremely high infant mortality rates which especially provoked community dread of ill-health.[15]

Agitations in Britain for sanitary reform in the 1830s and 1840s[16] and that in Sydney especially in the 1870s,[17] derived their urgency from the experience and further fears of epidemic. Sydney, as an international port, was particularly prone to diseases brought by visiting ships and incubated in the teeming and dirty dwelling areas around the docks. News of overseas epidemics heightened fears that the dreaded smallpox and cholera would find fertile grounds in Sydney's 'rookeries'

Developments in scientific knowledge and the growing institutional monopoly of such expertise did much to promote debate and activity concerning public health problems and their solutions. The industrial revolution in Britain helped forge the emergence, from the 1830s, of closely knit and increasingly experienced professional groups of civil and mechanical engineers and medical practitioners. They had a growing background in research and experimentation and a belief in the ability of applied science to ultimately resolve all problems.[18] When transferred to Australia, these developments raised expectations that investigation by experts would lead to practical solutions to problems of public health. These expectations were to be long frustrated by the realities of politics, economic interest and personal and professional jealousies.

More than professional considerations motivated many sanitary reformers. A most important factor was the growth in humanitarian sentiment among the middle class. In Britain, public health, as other areas of Victorian social reform, took on the character of a moral crusade: As Wohl writes:

Whether this inspiration was religious or secular, whether it stemmed from a sense of shame or altruistic duty, from self-interest or fear of the ravages of epidemics, the most widely held view of Victorian social doctrines was that physical well-being and a pure environment were the essential foundations for all other areas of social progress.[19]

The social problems of rapid urbanisation in Sydney were similar to those of Britain and the Sydney reformers either came from Britain, like John Smith, or were much influenced by British developments. Nevertheless, it is not accurate to describe Australian reform as merely lagged transfers of changes in Britain.[20] For example, developments in water supply in Melbourne and Adelaide and to some extent in Sydney either preceded British moves or occurred at the same time. While drawing on British experience, reformers in Sydney did not do so exclusively as they also weighed up European evidence. Nor did they slavishly clone overseas examples into an antipodean environment.[21]

John Smith was a singular example of such professionals moved by humani-

tarian impulses. Like most of his fellow reformers in Britain and Australia, his response to the collectively suffered costs of untrammelled private capitalist accumulation was state intervention into urban problems. More aware, concerned and coherent than most of his Sydney contemporaries, his emphasis was on a planned and comprehensive involvement by the New South Wales Government in areas which Victorian *laissez faire* dogma held inviolate. This was true for his activities in favour of a better water supply as well as for systematic, improved and accessible public housing for the working class.

The early hegemony of miasmic theory favoured general environmental responses to movement of wastes and their stench and for the destruction or improvement of unhealthy housing. In Britain and Australia both approaches involved the removal or improvement of cesspits, the provision of water closets and underground sewers or other methods of dealing with human excrement, and finally the construction of adequate town drainage. Fundamental to much of this was the need for a constant supply of running water. This could only come from a system with abundant reserve supplies.

The terrible epidemics of cholera, typhoid and typhus in Britain between 1830 and 1860 gradually pointed scientists and reformers to an empirical connection between contaminated drinking water and disease. The developing idea of germ theory during the 1860s prompted the placement of sewer outfalls well away from river areas used for water supply, the zealous safeguarding of existing water supplies and the search for new sources distant from threats of urban pollution. Thus attention turned from water quantity to quality. The Sydney experience was not as linear, as quality was an important priority from the early 1850s, and quantity was only partially and sporadically a source of great official interest until the late 1860s. Nevertheless many of the practical priorities were similar.

In Britain, nineteenth-century water supply was largely in the hands of privately owned and controlled water companies. Conflicts between profits and public utility caused major obstacles until the early 1880s when large numbers of town waterworks were again coming under municipal control.[22] The Australian experience was one of Colonial Government and then municipal control and should not have provoked similar obstacles. This was true for Melbourne and Adelaide which both benefitted from the removal of water supply from municipal to semi-government control. Melbourne had a good supply from Yan Yean after 1857[23] and Adelaide from the Torrens River from the 1860s.[24]

This was not at all true for Sydney, which languished without an effective supply or supply authority until 1888, at the earliest.[25] Where her rivals' systems largely coped with their growing populations, Sydney's proved increasingly embarrassing. Water supply, together with other aspects of sanitation in Sydney, suffered from grossly inadequate institutional structures and action. These failings arose out of the climate of *laissez faire* fiscal authority and governmental aversion to social planning.

Reinforcing legislative inactivity in New South Wales was the belief, strongly held in some political circles, that it was wrong to encourage the growth of Sydney. Their ideas derived from the view that as rural industries provided the colony's export earnings and stimulus to growth, Sydney 'lived off the fat of the land'. The City was both economically unimportant and a drain on the colony's wealth. Sydney's growth was at the expense of rural interests . Any expenditure which improved living conditions in the metropolis was therefore resisted. These views retarded attempts at constructive and orderly development of Sydney.[26]

When John Smith arrived in Sydney in 1852, Sydney already had a well developed tradition of grossly inadequate water supply. Little attempt had been made to draw on the lessons of long droughts and the expansion of population and industry. Nor did those in control seem to have learnt from experiences of encroachment by housing and industry upon water catchment areas.

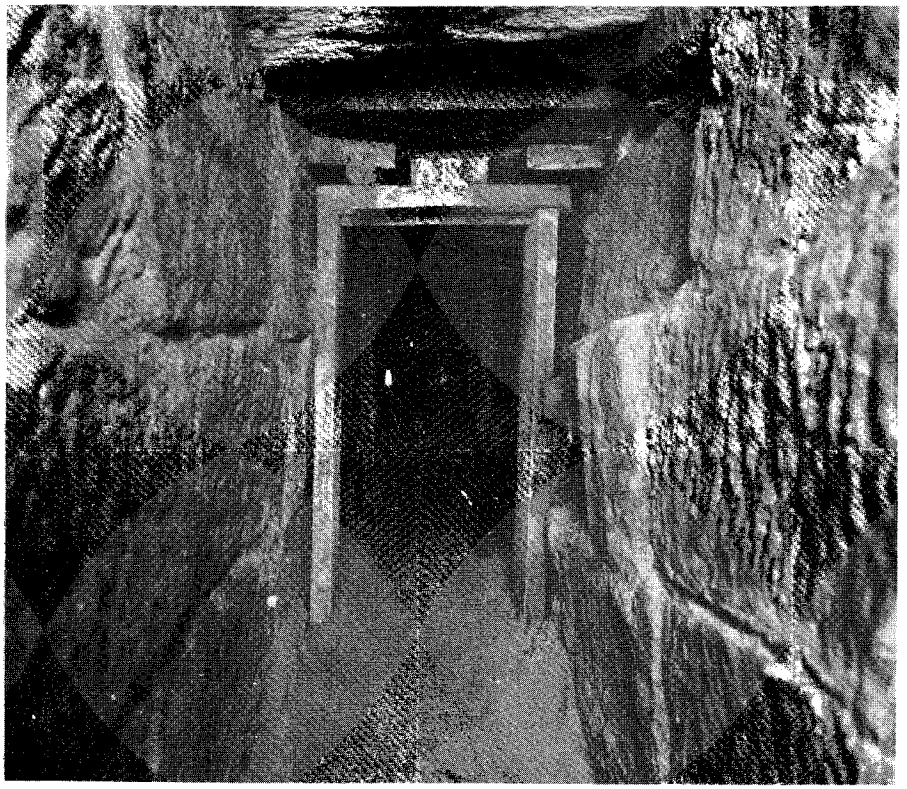

Figure 31 *Busby's Bore — Open Cut Section under Oxford Street, between Liverpool Street and Riley Street. (Courtesy of Sydney Water Board).*

The Tank Stream, the settlement's original water source, had been badly polluted and its supply was unsure during dry periods. As a very belated replacement, a tunnel, Busby's Bore, supplied water from the Lachlan Swamps (now Centennial Park) to Hyde Park from 1830. It was a reaction to existing population and demand patterns and soon proved most inadequate.

The incorporation of Sydney in 1842 and the transfer to the City Council of responsibilities for water and sewerage did nothing to improve the position. For the next forty years the Council provided a highly inadequate service. It followed and entrenched the same timorous attitudes to gaining an adequate supply and a disconcerting lethargy in promoting the use of water through reticulation to the growing suburban population.

This was partly a product of the weak institutional position of the Council. The New South Wales Government abdicated any sustained, substantive role in the provision of water and sewerage and yet would not grant Council the necessary administrative or financial powers to provide an adequate service.[27] It was only during times of extreme crisis that the legislature would provide the necessary bridging finance. Thus the Council entered into large debts for *ad hoc* schemes with little potential for future supply. Council also controlled water and sewerage outside its boundaries. The growth of suburban municipalities during the 1860s and 1870s added to the complaints about the lack of adequate supply and other tensions over control and revenue sharing.[28]

The poor functioning of the Council worsened its institutional difficulties. There was a very restrictive property franchise which gave landlords — the enemies of expensive sanitary connections — a major voice. The calibre of aldermen was considered low and mismanagement and allegations of corruption were not unknown. The constant turnover of Mayors during the 1860s meant that most effective power concerning water supply resided with the City Engineer. The

stubbornness of one, Edward Bell, delayed any long-term alternative for many years.

Smith arrived in Sydney in the same year that one of the many inquiries into the problem of finding an adequate supply source advocated a scheme based on using the reserves of the Botany Swamps to augment those of the adjoining Lachlan Swamps. This was to prove an unhappy irony of history as this proposal was the only one of the nineteenth-century proposals which led to reasonably prompt action. One of Smith's major contributions was his late chairing of the 1867-9 Royal Commission which recommended the abandonment of the Botany scheme. In this later case, however, Smith's own proposals had to wait another ten years before being put into practice. The different fate of the two proposals was undoubtedly due to the Botany scheme's being the cheapest one investigated by the 1852 inquiry.

The repercussions of the 1852 choice were profound and dictated policy for many years against the best efforts of concerned sanitary reformers such as Smith. As Clarke puts it:

In this outcome were sown the seeds of Sydney's water supply problem for the next three decades. Once capital had been invested in the Botany project, once engineering reputations had been built, and then rested upon the long-term viability of the project, the likelihood of work on other necessary but more far-sighted sources of supply was reduced. In times of crisis, trust would be placed in yet a little more expenditure on the Botany system.[29]

Smith was, in time, to come to the same conclusion.

However, the Council's abysmal public standing further deteriorated due to more procrastination and scandal during 1853. Water from Busby's Bore was increasingly inadequate in quantity and there was alarm at potential repercussions for public health.[30] Pressure for the dismissal of the Council yielded fruit in October 1853 when the government replaced it with three City Commissioners. The Commissioners attempted an early start on the Botany scheme once government backing for their borrowing was obtained.

Professor John Smith, with his reputation as a water analyst, was a logical choice to investigate and report to the Commissioners on the quality of Sydney water. He found samples badly polluted with lead and urged against the use of lead pipes and cisterns. He also reported contamination of the Botany swamps from a nearby abattoir and woolwashing establishment and proposed the works' removal and the wholesale resumption and preservation of the Botany catchment area.[31] His proposals concerning lead went largely unheeded but the Commission took some steps on the second matter. Smith's concerns about pollution of the reserve were clearly vindicated over time as the spread of population and the growth of manufacturing increasingly impinged on the purity of the Botany water. By 1857, the Commissioners too were highly unpopular and the government reconstituted the City Council. Botany water finally reached Sydney in 1859 to add greatly to the supply from the Bore.

Smith again gave expert evidence in 1862, this time before a Select Committee of the Legislative Assembly. The Committee examined Government proposals to sell off part of the water reserve for housing in the light of fears of existing contamination of the Lachlan Swamps.[32] Evidence pointed to pollution caused by drainage from recent housing in Randwick and from Randwick Cemetery.

While Smith foresaw future problems from growing settlement around the water reserve there was no immediate danger. He reassured the Committee that the action of a running stream over sand purified the drainage of organic faecal matter. The Lachlan Swamps water was pure although the cemetery posed a problem. Smith noted that the London experience had indicated a connection between seepage and cemeteries, water supply and cholera. Here sand and a

running stream were not enough. Thus Smith was already haltingly moving towards an awareness of an alternative to miasmic theory.[33]

Others too were moving in this direction. With the rapid growth of the colony, a number of other medical and scientific professionals were emerging alongside the professor and sometimes in contrast to him. In 1862, for example, Dr. Isaac Aaron, a former City Health Officer, gave clearer and more emphatic evidence before the Committee in distinguishing between the appearence of pure water and its chemical purity. He noted that sand might filter suspended impurities but not those held in solution, and the latter could be the most dangerous. The cholera epidemics in England had taught Aaron of a connection between water contaminated with sewage and disease. The Lachlan Swamps were evidently endangered.[34]

This divergence between the reassuring, optimistic Smith and some of his more alarmed and alarmist colleagues was to grow wider over the years. Nevertheless, Smith remained deeply concerned about the preservation of the water supply catchment area:

Although I have great confidence in the self-purifying power of running streams, especially where sand is concerned, yet I think that water for the supply of great towns ought to be most religiously preserved — that no risks ought to be run.[35]

He had a high opinion of the Nepean River water which he had unofficially examined. The Select Committee restricted their questioning of Smith to problems of water quality and there is no glimpse of his attitude to the Nepean as

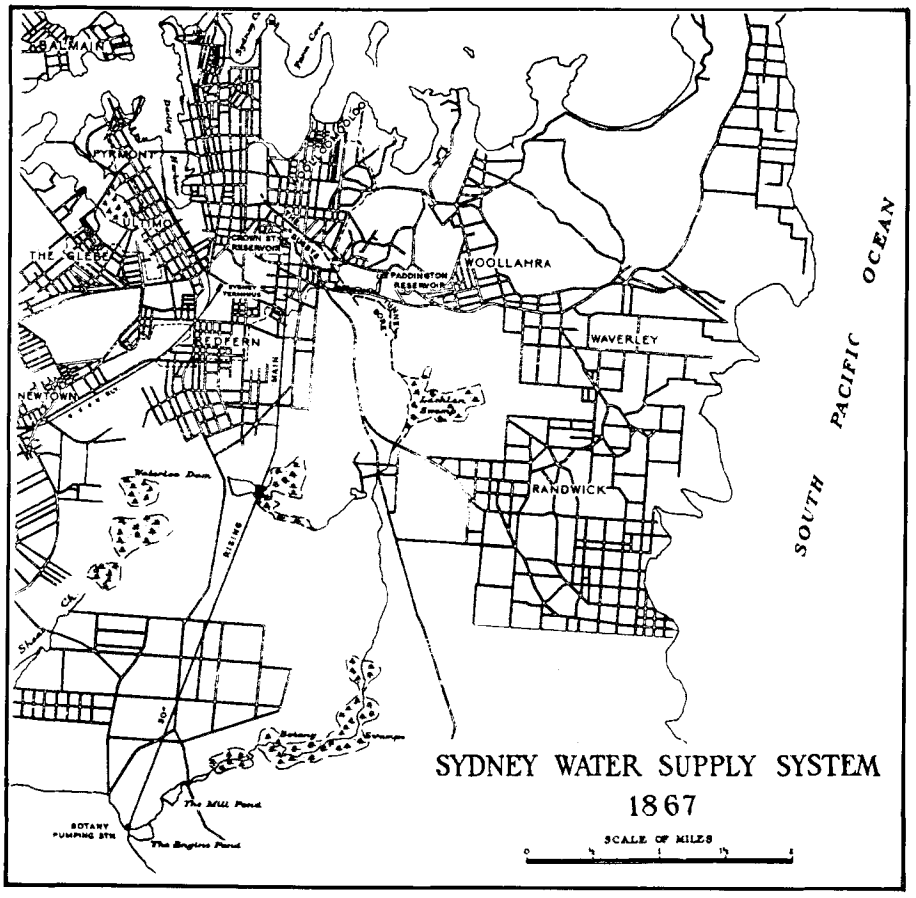

Figure 32 *Sydney Water Supply System, 1887. (W.V. Aird (comp.),* The Water Supply, Sewerage and Drainage of Sydney *(Sydney: M.W.S. & D.B. Printer, 1961)).*

an alternative for reasons of quantity of supply. This question, which was to engage him so earnestly five years later, arose in the questioning of other witnesses and set the patterns for subsequent debate.

For Edward Bell, the short-sighted and intractable City Engineer, the existing supply was clearly abundant and the Botany Scheme would suffice three times the existing population.[36] As Clark points out, Bell's estimates became less optimistic each time he appeared before one of the subsequent water supply inquiries.[37] Bell rejected any suggestion of the Nepean as an alternative supply source, believing it impractical, expensive and unnecessary. The Council would be better served sinking wells three or four hundred feet deep in the City when the time arrived for an enlarged supply.[38]

Others disagreed. City Aldermen Sutherland and Speers and past Mayors Hill and Thornton all favoured the Nepean as a permanent source. The question was, how soon was it needed? Some felt confident of Botany for a number of years. Others did not. All agreed the enormous problem of finance for a Nepean scheme was beyond the Council.[39]

During the 1860s, three groups were best served by the limited mains supply. They were the wealthy, inner city residents; the manufacturers and commercial enterprises, all beneficiaries of the Council's water rating system; and, to a much lesser extent, those working class people living in the few areas supplied by public fountains. For the rest of Sydney, wells dependent on rainfall and private water carts were the main sources. Irregular rainfall greatly reduced the benefits of the former, particularly for the inhabitants of the crowded inner working-class suburbs. It meant dependence on the latter and paying a high proportion of income for water.[40]

The lack of a sewerage system in these areas and the lack of space meant the placing of cesspits alongside wells with the resulting seepage causing appalling

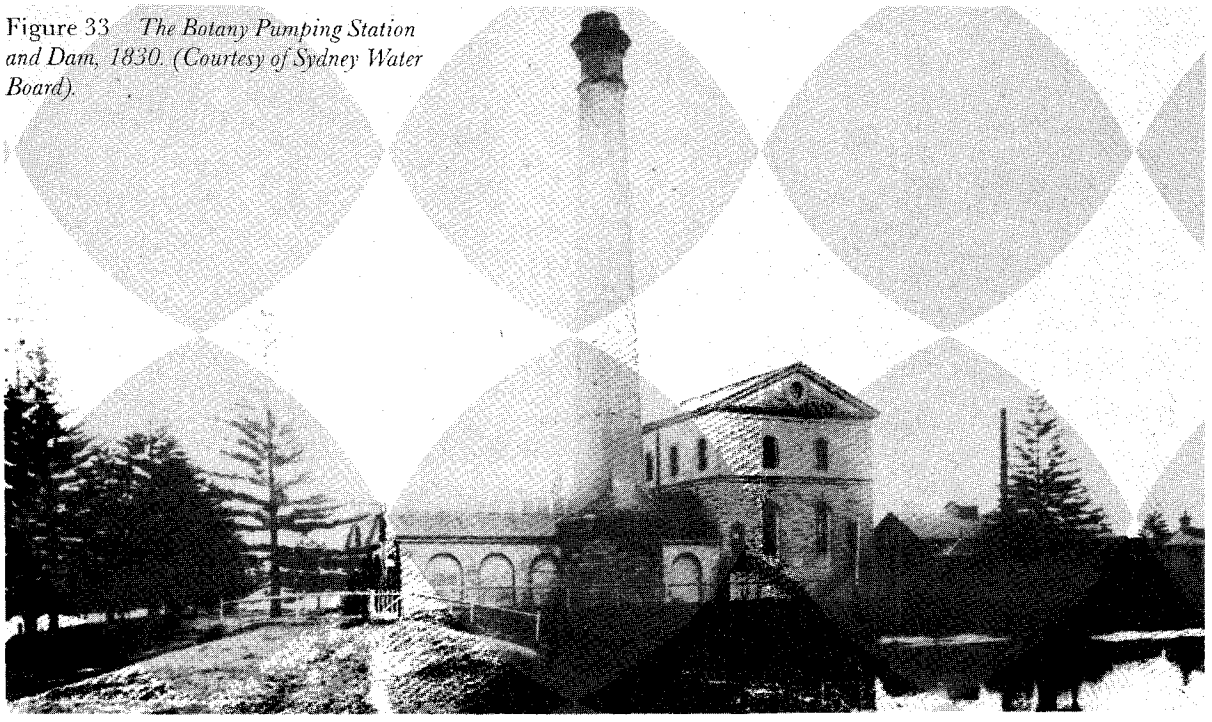

Figure 33 *The Botany Pumping Station and Dam, 1830. (Courtesy of Sydney Water Board).*

contamination of the water. The results were obvious. Despite the deteriorating quality of the Botany System water, the contamination of Busby's Bore and dirt in the mains, those areas not supplied with mains water suffered a higher incidence of water-borne infectious diseases.[41]

By the mid 1860s, drought again proved Botany insufficient in quality and quantity. As the water available for pumping to Sydney diminished, Council cut off overnight supply. Complaints of the water being salty and the continued closer settlement around the water reserve encouraged further doubts about the purity of supply.

Mounting public dissatisfaction gave Parkes occasion to appoint his eminent friend,[42] Professor Smith, to chair a Royal Commission in 1867. Smith and his fellow Commissioners — all engineers or surveyors — were to investigate the 'fears' concerning the adequacy of the Botany-Lachlan system and if they found those fears proven, to suggest an alternative supply which would be 'reliable and plentiful'.[43]

The Commissioners set about their task with great zeal yet their interpretation of their brief meant that the Report took nearly two years to complete. This was largely due to Smith's emphasis on providing supply ahead of future demand. In estimating this, they considered the rapidly growing population and *per capita* domestic and industrial usage. This approach represented a major change. Smith's was the philosophical underpinning of the Report, while to E. Moriarty, the Engineer-in-Chief for Harbours and River Navigation, must largely go the credit for the form of the scheme finally chosen, the Upper Nepean.

The Commissioners, and in particular, Smith and Moriarty, demolished the credibility of the Council's apologists for the Botany Scheme by making evident their lack of knowledge of population trends and patterns of usage, and by bringing into question Botany's ability to supply demand. Smith's concerns for the sanitary conditions of those in the suburbs using contaminated well water translated into his insistence that Council officials and aldermen face the demand implications of a much fuller extension of supply to the suburbs.[44] Similarly he and his fellow Commissioners undermined the more extravagant or ludicrous proposals advanced by influential witnesses.[45]

During the course of the Committee's labours, Smith delivered two papers before the Royal Society of New South Wales, each indicating that he had already arrived at some definite conclusions. Whether these papers were exercises in consciousness raising or attempts to defuse eventual criticism from partisans of unsuccessful proposals is unclear. Whatever his motives, Smith was remarkably candid. One paper clearly indicates his attitudes on quantity of supply and its relationship to public health:

In a hot climate like this, there ought to be a superabundance of water, as well for public health and safety, as for personal comfort and convenience. Sydney, however, is not favourably situated for abundant supply, and it cannot be procured without enormous outlay.[46]

This clearly raised the problem that the Commission had set itself and was an acknowledgement that existing sources were inadequate. By rebutting the traditional refusal to countenance public investment to guarantee reasonable sanitation for the residents of Sydney, he also alluded to the difficulties to be faced. In practical terms it meant the abandoning of Botany, and Smith had no hesitation in doing so because:

We have no sufficient provision for a long drought, and there is nothing to spare for thousands of people in the suburbs, or for the natural increase in our population.[47]

Smith's own missionary enthusiasm for the civilising function of water was clearly evident in his second paper dealing with water purity:

Irrespective of any possible injurious effects on health, it is of great consequence that a water intended for domestic use should be free from taste and smell, and pleasant to the eye . . . A water may be wholesome in the absence of those qualities but people will be deterred from using it as a beverage, and will be tempted to substitute fermented and distilled liquors, to the detriment of health and morals.[48]

Through the life of the Commission, Smith worked tirelessly, travelling over the countryside to examine remote sites of potential dams, taking altitude readings, collecting water samples for later analysis. In the hearings, he displayed a keen interest in questions of demography, public health and personal hygiene, hydraulics, water analysis and general engineering questions. He showed an unyielding mental toughness (cloaked in quiet courtesy) when dealing with protagonists of undesired schemes and an ability to gently prise sympathetic answers out of supporters of one of the number of acceptable alternatives.

The Final Report, which strongly bears his mark, was an excellent example of his having learnt from the unhappy history of water supply in Sydney. It rejected Botany Bay as anything but a stop-gap and discarded Thomas Holt's much publicised George's River scheme as prone, over time, to the dangers of contamination from a growing metropolis which had caused so much concern with the Botany-Lachlan Swamps. Drainage from settled areas was always to be avoided near a supply source.[49]

The Report's recommendation of the Upper Nepean won wide public and some official support but a number of factors contributed to delaying the hoped-for immediate start to the work. Good rains during 1869 and 1870 removed the emergency which was always necessary to pass from thought into action with these matters. Smith, with a keen and ironic appreciation of the dynamics of decision-making in Sydney, commented:

It is perhaps unfortunate for Sydney that ever since the publication of the Report of the Commission, rain has fallen so abundantly that the authorities have not felt the question of water supply to be so urgent. And yet it is just the time for calm and careful deliberation, for when the pressure of the drought comes, . . . the first thought will be not to find out and adopt the best plan, but to seize on the readiest.[50]

Secondly, the Report did not resolve debate but rather served to inflame it. The arguments carried over into the engineering and scientific communities and from there into the press and the public arena. A focal point for much of the argument was the Royal Society of New South Wales, of which Smith was the Vice-President.

During 1870, the Society held eight heated and at times vituperative meetings on the water question with Smith in the chair. Much of the venom was directed at Moriarty who was widely regarded as the real force behind the choice of the Upper Nepean. At all times, Smith dealt fairly and courteously with the Report's detractors. As a Society stalwart, he could see the positive value of well attended and spirited meetings as well as being favourably inclined towards rigorous scientific scrutiny of the Commissioners' work. Nevertheless, in hindsight, the year's energies seemed wasted to him. Nothing new had come of it all.[51] Some of the criticism was in fact in good faith, but much reflected various combinations of cynical self-interest, frustrated ambition and megalomania.[52]

The third reason for the delay was the unresolved question of administrative controls and financing of any new scheme. The Report had not suggested that the Government remove control from Council nor had it indicated who should build the Upper Nepean project. Some legislators moved to have the Report's proposal put into action through Government taking immediate control of the water

supply. Others tried to minimise the Government's direct involvement. The confused factional politics and lack of parliamentary interest in the Sydney water question meant that the initiative failed.

Nevertheless, the City Council reacted strongly to these threats and, in March 1870, petitioned Parliament for a Select Committee to review the Commission's findings in the light of Council grievances. Their ratepayers had a large stake in the water systems and Council did not wish to lose control.[54] The evidence before the Committee of the Mayor, Town Clerk and City Engineer offer ample evidence of the maladministration, lack of planning and conflict of interests for which the Council was infamous.

The Mayor, W. Renny, complained of water wasted at night flushing water closets and approvingly cited the London remedy of intermittent supply. His decided preference for Council as against Parliamentary control of water supply provides a useful background to the very partial, uncaring and inadequate nature of Council activity over the previous thirty years. Council:

as elected by bona fide householders, while members of Parliament are elected by people who have no stake in the country . . . most of . . . (Council) . . . have household property, and whatever they do is for the improvement of their own property, as well as for the benefit of their own citizens.[55]

Bell, too, fought to keep control and to preserve the Botany system. Smith recognised that the tenacity of Bell's resistance would again postpone any serious response to the problem of Sydney's water supply.[56] The Council kept control and Smith and his fellow reformers who had failed to clearly spell out the political implications of their proposals had to wait another decade before the Government moved. Smith thought that the appointment of an eminent overseas engineer to investigate the Royal Commission's findings would overcome division within the professional ranks and silence those self-interested critics who were cheerfully exploiting it. Henry Parkes agreed.[57]

Parkes made a further attempt to resolve what was now the major impediment — the administrative problem — in March 1874, by introducing a bill 'to make better provision for the supply of water to the City and suburbs of Sydney, and for the sewerage thereof'. Under the bill, the Government would constitute a mixed Municipal-Government appointed Metropolitan Board of Water Supply and Sewerage which would assume all the water and sewerage powers and obligations of the City Council.[58] Due to a busy parliamentary session, residual resistance, and finally the fall of Parkes, the bill lapsed after innumerable postponements. What parliamentary debate there was, indicated a continuing distaste for assuming such responsibilities, for creating a 'costly staff', for spending money on Sydney's water.[59]

If the administrative problem remained unsolved, Parkes had not forgotten the Nepean proposal. In April 1874, he again championed Smith's suggestion for the engaging of the eminent, foreign expert. Although there was some agreement in Parliament, this too had to wait.[60]

John Smith was appointed a Legislative Councillor in the same year and participated actively in debates on public health issues. A major arena for his public and parliamentary intervention was, however, close at hand. The City Health Officer, Dr. Dansey had, since 1870, regularly published the increasing mortality levels in Sydney due to the worsening living conditions of the City poor. However, it needed his January 1875 report of the presence of an 'epidemic' of smallpox in the City to create sufficient public panic and force the Government to act. In April 1875, it constituted the Sydney City and Suburban Sewage and Health Board to investigate ways of protecting public health and improving sewage disposal.

The Board, chaired by Smith's colleague, Professor Pell, included Smith and three of his fellow commissioners from the 1867-79 Royal Commission. Aware of the magnitude of the public health crisis, the Board divided its labours among a number of committees. These dealt comprehensively with the problems of housing, drainage, industrial pollution, night-soil disposal, systems of sewerage and the purity of Sydney's water.

The Board's twelve reports clearly show the growing professional acceptance of germ theory, at least for the communication of diseases through contaminated water. The Board's crisis-inspired *First Report* dealt with the grave threat to public health from the direct connection of water mains to water closets. The Board found enormous quantities of faecal matter in the mains carrying drinking water. Alarm over the epidemic ensured rapid legislative translation of the Board's key proposals into the Water Pollution Prevention Act, 1875. In the Legislative Council, Smith strongly supported the legislation to enforce the installation of cisterns between mains and water closets.[61]

The *Second Progress Report* further investigated threats to health from contaminated water supplies in its examination of cesspits. It clearly showed how the question of water supply had moved onto centre stage:

So long as the inhabitants are daily drinking . . . water in many cases contaminated with what should be confined to water closets and sewers, it would be merest affectation to adopt any such measure for improving their sanitary condition. . . .[62]

Again, parliamentary action was prompt and the Nuisances Prevention Act to regulate privies and cesspits also passed onto the books in 1875.

Smith, as a member of the Board, the chairman of two of its committees and an expert witness, was very active in this uncovering of the dangers to public health. Nevertheless, his tendency to minimise levels and dangers of contamination of the Lachlan Swamps again caused disagreement with his fellow professionals. This time, the divergence was sharper and it spread to the public arena. As chairman of the committee examining the Botany Watershed he reported isolated cases of pollution in the Lachlan Swamps but re-assured the Board that there was no serious general problem. Removal of the sources of contamination would suffice.[63]

The Board had also commissioned another of Smith's colleagues, Professor A. Liversidge, to report on complaints of pollution of the water from Busby's Bore and Paddington and Crown Street Reservoirs. He found the Reservoir water was very poor and his analysis of City water samples showed gross faecal contamination. There was a need for urgent action to install the cisterns to water closets and to ensure constant supply through the system from the Bore to avoid backflow of sewage into the water mains.[64]

Liversidge also found contamination in the Lachlan Swamps water but, unlike Smith, he was not re-assuring about the dangers. The disagreement became open and publicly notorious. Liversidge presented the Board with a written defence of his work in which he accused Smith (without mentioning names) of shutting his eyes 'to the known Sources of evil' by passing off faecal pollution as due to decaying vegetation. The Lachlan water, said Liversidge, was not noxious but relatively contaminated.[65]

In his evidence before one of the Committees, Smith took the increasingly untenable position that the water was not polluted but would be increasingly so, given encroachment on the water reserve. The water could only be kept pure with great difficulty and expense yet such expense was not warranted. He favoured some small expense to improve the flow into the Bore, to keep a running stream. Nonetheless, the Swamps were always at best a short-term solution. It would be better, said Smith, to use the land for building or manufacturing and bring supply from another source.[66]

This provides some clues to understanding Smith's strange position and his relentless examination of Liversidge before the Committee. Whereas Pell, Liversidge and most of the other reformers hoped the presentation of evidence of dangerous levels of contamination would create sufficient public alarm to induce a strong parliamentary response, Smith had little faith in this process.[67] He acknowledged the inadequacy of the existing system but at the same time realised the time lags involved in gaining supply from a new source such as the Upper Nepean. He was, he intimated, still seeking that goal, slowly, haltingly but by use of reason with those in authority rather than through popular agitation.

In the meantime, Smith was resigned to the Lachlan Swamps continuing as a source. It is probable that he was wary of public alarm again causing rash decisions and heavy expenditure on the cheapest stop-gap solution. That had been the story of the Sydney Water Supply. Alarm had only ever entrenched the increasingly inadequate Botany Supply ahead of necessary long-term alternatives. We can surmise that Smith was not willing to again succumb to this process even if it meant taking an uncomfortable position.

Pell, in the *Sixth Progress Report*, took a path between Liversidge and Smith but leaned towards the former. Nonetheless, his most important conclusion was dear to Smith's heart. While zealously protecting the qualities of the Swamp water:

> *the public attention should be kept continually directed to the fact that . . . the whole watershed must be regarded as a temporary source only, and that we must look elsewhere for a more abundant and purer supply.*[68]

The Board indicated the Upper Nepean and by advocating a system of ocean outfall sewers made the gaining of a more abundant water supply source imperative.

Smith took a more typically enlightened attitude as chairman of the committee which dealt with housing and sanitation. Here miasmic theory still influenced the committee's proposals for the destruction of offensive housing, the clearing of wider streets and the relocation of displaced working-class tenants in an improved system of low-cost public housing within the City limits.[69]

Fear of stench-induced disease also informed Pell's introduction to the *Eleventh Progress Report*. A copious and constant water supply to remove offending matter by closed drains and underground sewers was a priority. Pell also attempted to resolve the administrative problem by proposing a government-nominated Central Board of Health and Works to carry out the necessary works deriving from the Board's proposals and with powers to enforce sanitary regulation.[70] This was not acted on.

However, an awareness of the danger of water-borne germs had centred the discussion on questions of water purity. The growth of Sydney and proposals for improved sanitation were making Botany's future as Sydney's water supply untenable. For Smith, the great proponent of abundant, constant and sparkling-pure water for the moral and physical betterment of all, the day was approaching. Miasma and germs were combining to break down the obstacles — political and economic — to the provision of an adequate supply.

The engagement of the desired overseas expert at the end of 1876 and his favourable report (derived from narrow guidelines) on behalf of the Upper Nepean brought the moment even closer.[71] Parkes, who had supported the proposal for some years without success, finally had work started by the Department of Public Works in 1879. In the following year, with his re-introduction of the 1874 bill to deal with the lingering problems, administrative and financial, resolution of the water question seemed at hand. At last the body controlling water and sewerage would have a metropolitan rather than a merely City focus, planning and development could anticipate future needs and the government admitted financial responsibility for these services. The Department would build the major

works and transfer them to the control of the new Board upon completion.[72]

In 1875, within the Legislative Council. Smith had determinedly fought for legislation which incorported the Sewage and Health Board's recommendations on sanitary fittings and regulations. By 1880, he could confine himself to ensuring, with a certain pedantry, that the wording of the Metropolitan Water Board Act was to his liking.[73] A major part of his life's work had borne fruit, at least on paper. He was not to see the finished project and its extension as a system before he died in 1885.

Notes

1 E.L. Fry, 'Growth of an Australian Metropolis' in R.S. Parker and P.N. Troy (eds.), *The Politics of Urban Growth* (Canberra: Australian National University Press, 1972); J.W. McCarty, 'Australian Capital Cities in the Nineteenth Century', in J.W. McCarty and C.B. Schedvin (eds.), *Australian Capital Cities in the Nineteenth Century* (Sydney: Sydney University Press, 1978).

2 W.A. Sinclair, *The Process of Economic Development in Australia* (Melbourne: Longman Cheshire, 1976), 84-86.

3 *Ibid.*, 107-108

4 *Ibid.*, 108. A.J.C. Mayne, *Fever, Squalor and Vice* (St. Lucia: University of Queensland Press, 1982), Appendix 1, Table 1.1.

5 Fry, *op.cit.* note 1, 5.

6 David Clark, ' "Worse than Physic": Sydney's Water Supply, 1788-1888', in M. Kelly, (ed.), *Nineteenth Century Sydney* (Sydney: Sydney University Press, 1978), 65; S.H. Fisher, 'An Accumulation of Misery?', *Labour History*, No. 40 (May 1981), 27.

7 The information on housing patterns largely comes from Mayne, *op.cit.* note 4, Appendix 1, Table 1.1.

8 *Ibid.*, 7.

9 M. Kelly, 'Picturesque and Pestilential: The Sydney Slum Observed 1860-1890', in Kelly, *op.cit.* note 6, 72.

10 Mayne, *op.cit.* note 4, Appendix 1, Table 1.1

11 Kelly, *op.cit.* note 6, 74.

12 O. MacDonagh, *Early Victorian Government, 1830-1870* (London: Weidenfeld and Nicholson, 1977), Ch.8.

13 Mayne, *op.cit.* note 4, 25-27.

14 Mayne overestimates the continuing importance of miasmic theory in public health discussion and fails to notice the strong drift towards an intuitive grasp of germ theory. This is probably true of Davidson for Melbourne too: G. Davison, 'Public Utilities and the Expansion of Melbourne in the 1880s' in McCarty and Schedvin (eds.), *op.cit.* note 1, 85. A more accurate interpretation is that in S. Fisher, 'The Pastoral Interest and Sydney's Public Health', *Historical Studies*, 20 (78) (April 1982), 74.

15 Mayne, *op.cit.* note 4, 23-24.

16 MacDonagh, *op.cit.* note 12, 134; D.J. Olsen, 'Introduction: Victorian London', in D. Owen, (ed. R.MacLeod), *The Government of Victorian London, 1855-1899* (Cambridge Mass: Harvard University Press, 1982), 11.

17 Mayne, *op.cit.* note 4, 81, ch.8.

18 MacDonagh, *op.cit.* note 12, 3.

19 A. Wohl, *Endangered Lives* (Cambridge Mass: Harvard University Press, 1983), 6.

20 Clark, *op.cit.* note 6, 54.

21 For examples of their wider inspiration, N.S.W. Royal Commission, *Report into the Supply of Water to Sydney and Suburbs* (Metropolitan Water, Sewerage and Drainage Board Archives), 1869, 16-17, 31.

22 Wohl, *op.cit.* note 19, 111; W.M. Stern, 'Water Supply in Britain: The Development of a Public Service', *Royal Sanitary Institute Journal, 74* (10) (October 1954), 998-999, 1002.

23 D. Dunstan, 'The Life and Times of the Board of Works', *Australian Municipal Journal, 57* (905) (May 1978), 284.

24 M.Williams, 'The Making of Adelaide', in McCarty and Schedvin (eds), *op.cit.* note 1, 131-132, 134.

25 The question of control remained unclear until the 1920s and twentieth century wars and depression hampered attempts to fulfil development planning. See W.V. Aird, *The Water Supply, Sewerage and Drainage of Sydney* (Sydney: Metropolitan Water, Sewerage and Drainage Board, 1961).

26 S.H. Fisher, 'Life and Work in Sydney, 1870-1890' (Unpublished Ph.D. thesis, Macquarie University, 1976), 4,14.

27 F.A. Larcombe, *The Stabilisation of Local Government in New South Wales, 1858-1906* (Sydney: Sydney University Press, 1976), 95.

28 *Ibid.*, 97.

29 Clark, *op.cit.* note 6, 58. For details of the Botany system, see N.J. Thorpe, 'The History of the Botany Water Supply', *Sydney Water Board Journal, 3* (3) (October 1953).

30 *Ibid.*, 59.

31 David Clark, 'The Development of Sydney's Water Supply 1842-1887' (Unpublished B.Ec.(Hons) Thesis, University of Sydney, 1967), 116.

32 *Votes and Proceedings of the Legislative Assembly of N.S.W (V. and P. (L.A.)*), Vol.4, 704-706.

33 *Ibid.*, 707.

34 *Ibid.*, 706.

35 *Ibid.*, 706.

36 *Ibid.*, 685.

37 Clark, *op.cit.* note 31, 152f.

38 *V. and P. (L.A.), op.cit.* note 32, 685-686.

39 *Ibid.*, 699, 701, 715-716, 725.

40 Royal Commission, *op.cit.* note 21, 171-175; Clark, *op.cit.* note 6, 61.

41 *Ibid.*

42 Parkes was a major parliamentary protagonist of Smith's water supply proposals. Although historians of New South Wales politics in this period describe Parkes' close links with Smith, there is little or no examination of the water question. See A.W. Martin, *Henry Parkes* (Melbourne: Melbourne University Press, 1980), 93, 257.

43 *Royal Commission, op.cit.* note 21, 5.

44 *Ibid.*, Minutes of Evidence, 2, 14-15, 35.

45 *Ibid.*, 84, 167-170.

46 Included as an Appendix to *Ibid.*, 98.

47 *Ibid.*

48 *Ibid.*, 99.

49 *Ibid.*, Report, 24, 28.

50 *Transactions of the Royal Society of New South Wales, 5* (1871), 5.

51 *Ibid.*, 3-4.

52 See 'Had the learned Professor, on the occasion of making such a proposition, been drinking the river water, and found it so exhilarating, as to make him oblivious to the full meaning of the expression? If so, we fear such water would scarcely be acceptable to teetotallers'. Editorial, *New South Wales Medical Gazette, 1* (1870), 53. Or John Lucas, M.P., *A Paper and Letters upon the Sydney Water Board* (Sydney: NSW Government Printer, 1876), 2; or Holt in the Minutes of the Chamber of Commerce, 24 September 1970 (MacLeod files); Edward Bell, 'On the Botany Watershed', *Transactions of the Royal Society of NSW, 4* (1870), 79-87-88.

53 *V. and P. (L.A)*, 1870, Vol.1, 214-215. For details on the background politics, P. Loveday and A.W. Martin, *Parliament, Factions and Parties* (Melbourne: Melbourne University Press, 1966), 67-75.

54 *V. and P. (L.A.)*, 1870, Vol.2, 491.

55 *Ibid.*, 505.

56 Minutes of the Chamber of Commerce, *op.cit.* note 52.

57 Bell, *op.cit.* note 52; Clark, *op.cit.* note 31, 186.

58 *V. and P. (L.A.)*, 1873-74, Vol.1, 322; *Sydney Morning Herald*, 6 March 1874, 2; *Sydney Morning Herald*, 7 March 1874, 6.

59 *Sydney Morning Herald*, 6 March, 1874, 2.

60 *Sydney Morning Herald*, 9 April 1874, 4.

61 *V. and P. (L.A.)*, 1875, Vol.4, 331-367; *Sydney Morning Herald*, 16 July 1875, 2.

62 *V. and P. (L.A.), op.cit.* note 61, 371.

63 *V. and P. (L.A.)*, 1875-76, Vol.5, 433-434.

64 'Report to the Sewage and Health Board', *V. and P. (L.A.)*, 1875-76, Vol.5, 439-444.As to the disagreement between Smith and Liversidge, e.g. *The Echo*, 20 August 1875 in *Liversidge Papers*, (University of Sydney Archives), Box 1, 349.

65 'Sixth Progress Report'. *V. and P. (L.A.)*, 1875-76, Vol.5, 387-388.

66 *Ibid.*, 407.

67 *Ibid.*,422.

68 *Ibid.*, 373.

69 'Eleventh Progress Report', *V. and P. (L.A.)*, 1875-76, Vol.5, 548.

70 *Ibid.*, 537.

71 W. Clarke, 'Report . . . on Various Projects for Supplying Sydney with Water', *V. and P. (L.A.)*, 1876-77, Vol.3, 789-840.

72 43 Vic. c. 32. This division between construction and operations and its financial implications plagued the new Water Board from its commencement in 1888 until the reconstitution of the Board in 1925 and its takeover of construction responsibilities in 1928. Aird, *op.cit.* note 25. XVII, 217-18.

73 New South Wales, *Parliamentary Debates*, 1879-80, 2162-2164.

CHAPTER SEVEN

'VIATOR'

JOHN SMITH AND THEOSOPHY

JILL ROE

PROFESSOR JOHN SMITH died aged sixty-four of phthisis, at his residence, 137 Macquarie Street on 12 October 1885. Two days later, on the afternoon of Wednesday 14 October 1885, his remains were interred at Waverley cemetery. Funeral arrangements were reported unostentatious, as perhaps befitted a practising Presbyterian. However evidence of esteem abounded. There were two ceremonies, the first a short service conducted at the Smith residence in Macquarie Street by a Presbyterian divine the Reverend James Cameron, M.A., of Richmond, which Premier George Dibbs and Colonial Secretary Sir Patrick Jennings attended. A procession then formed, led by undergraduates, cap and gown, four abreast, in front of the hearse, which was flanked by professors and followed by the chief mourners, Mrs. Mary Smith and the Smiths' adopted daughter Nora, and then by a long train of private carriages and other vehicles, along Edgecliff Road to Waverley. There a second service was conducted at the graveside, again by prominent Presbyterian divines, the Principal of St. Andrew's College, the Reverend Dr. John Kinross and Dr. Campbell, in the presence of the Lieutenant Governor of New South Wales, Sir Alfred Stephen and the Anglican Primate of Australia, Bishop Alfred Barry. The *Sydney Mail* reported that the many influential gentlemen present represented 'leading departments of literature and science in the city', the *Sydney Morning Herald* that they occupied 'prominent positions in social and commercial life'.[1]

At Waverley cemetery there are three main sections for interring the dead: 'C. of E.', 'R.C.', and 'General'. Professor Smith's remains were interred in a vault in the C. of E. section. On the day, the slab of the vault was completely covered with flowers. Above it, Mary MacLeod Smith — Professor Smith's widow, called Minnie — erected a tall celtic cross of pink granite, soberly inscribed:

To the memory of John Smith CMG, LLD, MD,
Member of the Legislative Council and for thirty three years
Professor of Experimental Physics at the University of Sydney
Born at Peterculter Aberdeenshire December 12th 1885
Leal and true

Added to the plinth is notice that Mary MacLeod Smith entered into rest on 21 July 1930 (?). The now badly weathered inscription ends 'Re-united'.

Today Professor Smith's memorial may be discerned in silhouette from most

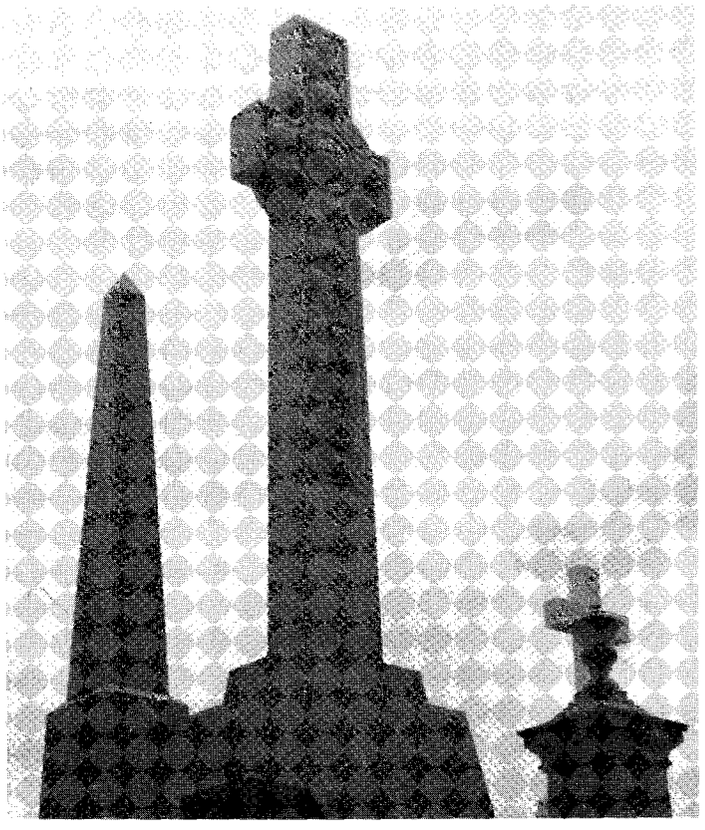

Figure 34 *Professor Smith's grave, Waverley Cemetery. (Photographed by Mark Matheson).*

parts of the cemetery. It stands on the bottom-most ridge of Waverley's splendid grounds, which then drop away to the ocean; and it stands out, as a celtic cross, of which there are few in C. of E. sections, and, it may be hazarded, none so striking, even in the R.C. section, where there are many. In the Roman Catholic section, Celtic crosses are generally white and variously embellished with shamrocks, roses, passion-flowers, bleeding hearts and sometimes a snake, a contrast to the Smith memorial in that Smith's pink cross and its decoration seems modest and abstract, or to put it another way, modernist. This is observable also by comparison with another noteworthy celtic cross at Waverley, that which adorns the grave of Sir Walter Davidson, Governor of New South Wales, who died in 1923.[2]

The cross which adorns Professor Smith's grave was constructed by Ross and Bowman, stonemasons at Waverley since the 1880s. Its most striking feature is its decoration. It is decorated with serpents and swastika. Two-headed serpents encircle a central motif of square-patterned circles (which resemble hot cross buns). As this motif recurs, it is encased by intertwining serpents. On the upright a pattern of raised rounds feature stylised swastika, also encircled by intertwined serpents.

As is well known, St. Patrick expelled snakes from Ireland; and the swastika was once nothing more than 'the fiery cross'. But this decorated cross hardly exudes celtic Christianity; nor does it conjure up other Christian conventions. By no stretch of the imagination could its imagery remind the viewer that as a Presbyterian Professor Smith was a follower of John Knox, one of the elect whose assurance of resurrection and the life hereafter rested solely on faith in the redeeming powers of Jesus Christ, as recorded in the *New Testament* and interpreted by John Calvin's *Institutes of the Christian Religion.* Indeed it is difficult to extract any statement of faith from the exotic stonemasonry at Waverley, except

from the final word of its inscription, 're-united', which indicates that Minnie Smith believed in life after death.

Minnie Smith was a spiritualist. No doubt she thought the austerely worded inscription sufficient. Possibly she meant to leave the symbolism obscure. More likely something has been lost. A fact more readily appreciated at any time between the 1880s and the 1930s than today is that a serpent and reverse swastika appear on the emblem of the Theosophical Society. From 1882 until his death, Professor Smith was a 'valued member' of the Theosophical Society, though this could not be guessed from the obsequies, and it is not mentioned in the many respectful obituaries which duly appeared (unless the *Sydney Morning Herald*'s mention of 'other indications' of failing powers be a snide reference). The curiously decorated cross serves as discreet reminder that the Presbyterian professor died a Fellow of the Theosophical Society. If, as some aver, his remains were actually interred in a Presbyterian part of the Anglican section at Waverley, reality is nicely encompassed.

John Smith Presbyterian is quickly portrayed. According to Malcolm Prentis's recent history of *The Scots in Australia*, Smith came from a United Presbyterian background. This means presumably that he came from among the first eighteenth-century seceders from the established Church of Scotland.[3] To an outsider the curious thing about divisions in the Scottish church is that they all remained Presbyterians; and whatever Smith's youthful religious experience, his entry as a young man into academic life shows that he too was a loyal Presbyterian. In fact, anything else was impossible in Scottish academia: ties between church and university were so close in Scotland in the eighteenth century that all university teachers had to accept the Westminster Confession of Faith, a severe document dating from the seventeenth century, and until well into the nineteenth century religious tests were applied, in Scotland and in England, though not at the new University of Sydney, Australia.[4] Perhaps because they were not fully aware of this last point, writers of testimonials supporting Smith's application for the Chair of Chemistry and Experimental Physics at Sydney University frequently referred to his soundness of religion. William MacGillivray, Professor of Natural History at Smith's own Marischal College, Aberdeen, considered the candidate held to 'what I esteem scriptural principles of religion'.[5] Smith soon justified his referees. Shortly after arriving in Sydney he wrote to Henry Parkes at the *Empire* to thank him for defending Sydney University against charges from the Bishop of Newcastle and others that it was a godless institution:

> *I desire, in my proper sphere, to act to the glory of God — but I believe I can do so in the humble capacity of a teacher of chemistry as much as another in the capacity of a teacher of dogmatic theology — and that the atmosphere of the classroom may be as conducive to the healthy development of sound moral principles and Christian tempers as the atmosphere of the other.*[6]

This statement made when Smith was thirty-one years old might have come from any one of the many natural scientists in early Victorian times who adhered to the Christian faith.

In Sydney, Smith's friends always included Presbyterian clergy. He seems to have taken some interest in Pacific missions.[7] Other evidence of participation in kirk life during his first decade in Sydney is meagre, to say the least; but then relevant records have not survived, and divisions in New South Wales Presbyterianism at the time — until 1864 there were four separate groups, or synods, of Presbyterians in New South Wales — further confuse the scene.[8] In 1862, Professor Smith while on leave in England was charged with finding a suitable incumbent for St. Stephen's church, the old Iron Church, on Macquarie Street, a charge successfully fulfilled by the appointment of the Reverend Dr. Robert Steel, who served St. Stephen's for thirty years and became a prominent figure in New

South Wales Presbyterianism.[9] This suggests that Smith was already a respected layman of the Free Church, and as he resided in Macquarie Street, St. Stephen's was probably his local church.

A Free Churchman in Scotland meant one who followed Dr. Thomas Chalmers out of the established Church of Scotland in protest against lay patronage at the great Disruption of 1843 — 'the most important event in the history of nineteenth century Scotland' as D.W.A. Baker has said in his impressive biography of John Dunmore Lang, *Days of Wrath*. In New South Wales a Free Churchman was one who belonged to the Synod of Eastern Australia, formed in 1846 in sympathy with the recently organised Free Church of Scotland. 'The new church', Baker writes, 'was marked from the beginning by amazing qualities of faith, energy and self-sacrifice'; and in New South Wales, where just under 10% of the population adhered to Presbyterianism in the second half of the nineteenth century, it grew quickly in size and influence. Something of its style and tone may be guessed from the title of the Free Church's newspaper, *The Voice in the Wilderness*. The Disruption invigorated without necessarily modernising Calvinism.[10]

From 1862 there can be no doubt where Smith stood in all this turbulence. His name appears on the communicants' roll at St. Stephen's from its beginning to the year of his death, and there is not a year apart from the ones spent abroad on leave from the University when he was not present at the table of the Lord, often on all four occasions marked on the roll annually.[11] When, in 1865, all four synods united to form the Presbyterian Church of New South Wales, more than fifty years before re-union in Scotland, it was lauded as evidence of the progressiveness which Professor Smith was so often said to exemplify. It is significant that the first private ceremony of Smith's funeral was conducted by the Reverend Cameron, a Free Church minister prior to reunion in 1865.

Professor Smith was in his pew to partake of the sacraments at St. Stephen's at the first quarterly communion in 1881. Perhaps because his health was now poor, perhaps because his mind was already racing ahead, he was not present at the three remaining communions in 1881. In late December 1881, Professor and Mrs. Smith left Sydney for Europe, Smith's third and last leave from Sydney University granted for health reasons and to observe closely 'the rapid advances which all branches of Science are making at the present day'.[12]

Arriving in Bombay on 13 January 1882, the Smiths stopped over in India for several weeks. Almost immediately they undertook 'A fortnight's run through India', the title of a three-part series forwarded by Smith from Naples on 1 March 1882 which appeared some six weeks later in the *Sydney Morning Herald*. They took a train trip through north India, from Bombay to old Delhi, down the Ganges valley through Cawnpore and Lucknow with their many melancholy reminders of the 1857 Mutiny, to Benares, returning to Bombay across the Deccan *via* Jubbulpore and Allahabad.

As on previous excursions en route for leave in Europe in 1861 and in 1871-72, in Egypt and Palestine and across America, accounts of which he subsequently published in two series of *Wayfaring Notes* (1865 and 1876), in India the wayfaring professor visited as many tombs, temples, mosques and other sacred sites as possible. These included the Taj Mahal, 'a dream of beauty', Sanarth where 'the "Light of Asia" Prince Siddhartha first publicly taught his new doctrine of Buddhism', and the burning ghats of Benares, a city he found indescribable and appalling, a more likely source of cholera than illumination. Later he witnessed a Parsee wedding in Bombay, 'an animated and brilliant scene like something out of the Arabian Nights', seeking afterwards a translation of the ceremonies conducted in the name of the god 'Hormand'.[13]

By then Professor Smith was a wayfarer, or as in the Latin, *viator*, in more senses than one. His *Sydney Morning Herald* letters make no reference to it, but his short

Figure 35 *Madame Helena Petrovna Blavatsky (1831-1891). (Henry Deane Collection, National Library of Australia).*

time in India encompassed psychic as well as tourist adventure. Simultaneously with the *Herald* contributions he despatched from Naples a report of the former to the leading Australian spiritualist journal, the Melbourne *Harbinger of Light*, signing himself *'Viator'*. It emerges that, back in Bombay, Professor Smith accepted the hospitality of Russian-born Helena Petrovna Blavatsky and Colonel Henry Steel Olcott, two American citizens who in 1875 in New York founded the Theosophical Society, and who, at the invitation of a reforming Hindu sect the Arya Samaj, shifted their operations to Bombay in 1880. At their residence, the Crow's Nest, Smith first witnessed the powers of Madame Blavatsky's Himalayan Masters, perfected beings who lived in Tibet and communicated by various supernatural means with Madame Blavatsky. It was these Masters, the Master Koothoomi and the Master Morya, who caused her to found the Theosophical Society, Madame Blavatsky averred, to revive ancient powers and wisdom which the world now badly needed – and which were presently exploited by ignorant spiritualists.[14] At the Crow's Nest, Professor Smith heard many strange tales, and occult phenomena were much discussed. But he reported to the *Harbinger* only that incident which came 'under my own observation'.[15]

The incident was as follows. Smith expressed interest in receiving communication from the Masters such as seemed to arrive for other members of the household. Shortly after, the Master Morya precipitated a message into Smith's bedroom. Olcott and Blavatsky were also present. Olcott estimated that the message appeared in the air about six feet above the spot where he and Smith were seated by Madame Blavatsky, who stood by Professor Smith holding both his hands in hers. When he read the message, Smith found that it referred to his previously expressed wish for contact and that it was written with the same pencil and hand as those seen earlier. (It also asked him to 'work for us in Australia', a point omitted by *'Viator'* as 'personal').

Professor Smith thought the message could not have been precipitated without accomplices, a possibility he then dismissed as fraught with danger due to the likelihood of exposure. And he expressed his absolute conviction that neither Blavatsky or Olcott would lend themselves to deception – as it might be inferred

would vulgar magicians and conjurers. In a signed statement penned the next day, on 2 February 1882, Smith wrote '(a) fair review of the circumstances excludes, in my opinion, any theory of fraud'.[16] His article for the *Harbinger* appeared under the simple head 'Occult Phenomena'.

Occult phenomena continued to intrigue Professor Smith. Not only did he report his Bombay experience immediately to the *Harbinger*; he sent a letter forthwith to the amazing Madame, intending to test the Master's powers further. But his test was a hard one, and it was many months before he received a reply. What he did was enclose in the letter to Madame Blavatsky another letter to the 'Master M' which he hoped could be answered without being opened. To ensure that the letter, or sachet, could not be opened, Mrs. Smith double-sewed its opening with coloured silks, a specimen of which Smith retained.

At Nice, in January 1883, a reply finally came. It came from Madame Blavatsky, who rebuked Smith for setting tests. She also returned the sachet intact. But when Smith slit it open he found, thrice-folded, a sheet of fine china-paper with writing in the same ink and hand as before, and a sardonic message: 'Your ladies I see are unbelievers, and they are better needlewomen than our Hindu or Tibetan lasses'. Professor Smith expressed himself more than satisfied by the Master's powers. 'I scarcely hoped for anything so good'.[17]

An account of this protracted but ultimately satisfying experiment appeared in the *Harbinger* in July 1883. *Viator* was sure that which was originally sought, *viz.*, 'additional evidence of the command over the forces of nature as possessed by adepts or brothers who cooperate with Madame Blavatsky', had been obtained. It was unnecessary to amplify the plain facts. The incident might seem minor to those who had read A.P. Sinnett's *The Occult World*, which described the many wonders performed by masters in cooperation with Madame Blavatsky, but — and here is the authentic voice of empiricism for which Scottish intellectual life was renowned — 'the multiplication of such facts may be useful'. Readers could judge for themselves.

The efforts of *'Viator'* end there. But the evidence of Smith's interest continues, in the pages of *The Theosophist*, a monthly journal 'devoted to Oriental philosophy, art, literature and occultism; embracing mesmerism, spiritualism and other secret sciences' established and edited by Madame Blavatsky in December 1879, which was and still is the major journal of the Theosophical Society. In October 1883 *The Theosophist* carried an article entitled 'Some scientific questions answered'. It was written, according to a prefatory note from the editor, by a *chela* who had enough acquaintance with western science to offer, for the first time, an explanation of occult phenomena, specifically of the controls achieved by adepts over atomic relations. It was probably written by Blavatsky herself, whose first book, *Isis Unveiled* (1877), was an extensive polemic about the unhappy relations between religion and science.

It was Professor Smith, referred to as 'one of our most eminent Australian fellows', and elsewhere as 'a notable Australian convert', who posed the questions. He did so in a grateful letter from Nice earlier in the year which expressed the astonishment and gratification felt not only by himself but also the apparently more sceptical Mrs. Smith at the return of his sachet and its contents. But, he asked, 'How did the china-paper get inside my note?' Might he be granted some further proof of the 'Master M's' miraculous powers ('for with our present notions of matter this affair of the note may be so designated')? How, he wanted to know, did the Master M actually communicate with Madame Blavatsky — by mental impression perhaps, or by actual conversation with his double? And what was to be made of the claims of another correspondent of the Masters, Allan Hume, that his answers came direct: did the Master take these letters away from Hume's house, or answer them on the spot? Smith found the whole thing perplexing, and

regretted that he had not stayed longer in Bombay, where he might have seen the Master for himself, and even become personally acquainted.[18]

The Theosophist replied that the 'osmosing' of notes was proof of the superiority of Eastern Adepts to Western men of science. In Aryan Arhat Science, adepts stood at the crown of spiritual self-evolution with access to the Universal Divine Force, which controlled brute force and mere matter. Adepts were far above mere spooks on the scale of 'psychic gravity'. By what is called the 'attraction of cohesion' atoms could be re-arranged and matter pass through matter:

The profound art is to be able to interrupt at will and again restore the atomic relations in a given substance; to pull the atoms so far apart as to make them invisible, and to hold them in polaric suspense, or within the attractive radius, so as to make them rush back into their former cohesive affinities and recompose as substance.[19]

This put modern evolutionary theory on a truly noble basis, and enabled humanity to refresh its moral and spiritual nature in an age of degrading scientific materialism.

What Professor Smith thought of these answers is not known. It is known that he remained convinced by Madame Blavatsky's Masters. In London in 1882 a group of luminaries formed a Society for Psychical Research to investigate aspects of spiritualism; and in 1884, the society despatched Richard Hodgson, a severe young Melbourne-born lawyer and protégé of the Society's president, the eminent Cambridge philosopher Henry Sidgwick, to India to investigate Madame Blavatsky's phenomena. At Adyar, Madras — in 1882 the two founders had established a comfortable residence there which serves as headquarters of the Theosophical Society still — Hodgson set to work. One of his investigations was into 'Professor Smith's letter sewn in silk'. He wrote to Smith saying Madame Coulomb, an apostate house-keeper, testified that she had unpicked the stitches around his note and resewed them with a hair after the message had been inserted. But Professor Smith could not credit it: 'I could believe that Madam Coulomb unpicked the silk and restored it again, only if I saw her do it'.[20]

Hodgson's report was read to the Psychical Research Society in London on 24 June 1885. He said Madame Blavatsky wrote the so-called Mahatma letters herself; that she used mechanical aides such as trapdoors to effect phenomena; and that she had accomplices in Madame Coulomb and her husband. Madame Blavatsky was dubbed one of the most ingenious imposters in history. Theosophists were outraged at Hodgson's abuse of Adyar hospitality, his kangaroo court and what they call 'the Coulomb conspiracy'; though it became easier to discredit Hodgson and his 'inexperienced hypotheses' when later he became a convinced spiritualist himself.[21]

The Melbourne *Harbinger* reported that in May 1885 Madame Blavatsky had been compelled to resign her position in the Theosophical Society due to ill-health and to depart for Europe. By the time she had settled at Würzburg, Germany, to write her second book *The Secret Doctrine* (1888), Professor John Smith had departed this life. Probably he never saw a copy of the Hodgson report: it was not reported by the *Harbinger* until April 1886, though it may have arrived earlier and its content probably came through as a news item earlier still. But Professor Smith had already preferred his own observation to that of Hodgson.[22]

Another visitor to Adyar in 1884, the famous American preacher Moncure Conway, asked Madame Blavatsky what her manifestations meant. Disarmingly she replied, 'it is all glamour — people think they see what they do not see'.[23] So far the story of Professor Smith and theosophy has been 'all glamour'. It is time for strict chronology. A strict chronology discloses that *Viator*'s occult phenomena are largely irrelevant to Smith's commitment, and what he thought about the answers to his questions unimportant. Professor Smith was hooked long before.

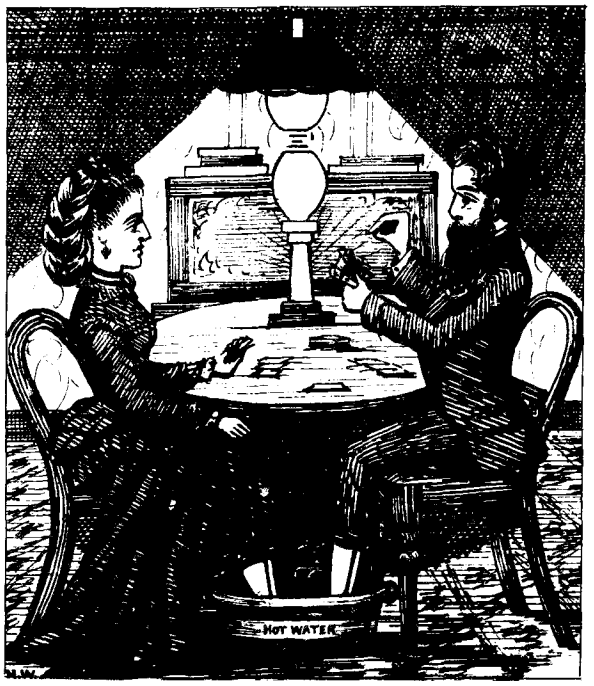

Figure 36 *'The Sybarites. Sardanapalus Smith and his Cara Sposa having Bezique on the brain and chilblains on the heel enjoyed their* tête à tête *evenings',* Sydney Punch, *1 August 1872, 329.*

The evidence is that Professor Smith stopped over in Bombay in January 1882 with the explicit purpose of joining the Theosophical Society. He arrived with a letter of introduction to Madame Blavatsky — some sources say he wrote ahead himself, but this seems to be the result of confusion — and on the first day he met with Colonel Olcott, president of the society. On the evening of his second day in Bombay he was received into membership, that is, even before his party set off to view the sights of India.[24] Since entry into the active fellowship of the Theosophical Society at that time involved referees, ritual initiation and an oath of secrecy, it can hardly have been a snap decision. Rather it bespoke agreement with the society's objects. In 1881 the objects were fourfold: to form the Nucleus of a Universal Brotherhood of Humanity; to study Aryan literature, religion and science; to vindicate the importance of this enquiry and correct misrepresentations with which it has been clouded; and to explore the hidden mysteries of Nature and the latent powers of Man, on which the Founders believe the oriental Philosophy is in a position to throw light.[25]

The situation may be put another way. Professor Smith knew all he needed to know about the Theosophical Society before he left Sydney. Communications improved dramatically in the 1870s. Numerous and weighty metropolitan journals brought news of religious developments. From the mid-1870s the colonists were producing substantial quarterlies of their own. And publications poured off small presses set up by socio-religious radicals in the larger colonial cities. By 1881 when Smith's interest in theosophy must have been quickening, interested persons in Australia had access to all the most important literature pertaining to the theosophic revival, and a few of them had already joined the Theosophical Society.[26]

The best source of information was the *Harbinger*, established by W.H. Terry in 1870. The *Harbinger* kept an eye on theosophy from the outset. It welcomed the first issue of *The Theosophist* not least because it explained that theosophy was 'a philosophical study of the laws of nature'.[27] Recognising theosophists as likely

allies in the struggle to reconstruct religion on the ruins of revelation, Terry joined the society himself in 1880. He accepted an agency for *The Theosophist* and advertised *Isis Unveiled* and other books in his mail order catalogue, which went far and wide.

News of theosophy also came by word-of-mouth. Emma Hardinge Britten, a touring American trance lecturer in Australia from February 1878 to April 1879 and author of many works on spiritualism including the valuable *Nineteenth Century Miracles* (1884), was actually present at the founding of the Theosophical Society in New York. Emma Britten befriended Mrs. Smith in Sydney. It was Emma Britten who provided Professor Smith with a letter of introduction to Madame Blavatsky.[28]

A history of spiritualism in late nineteenth-century Sydney has yet to be written. But it is obvious that interest rose across the 1870s in polite circles in Sydney as in London. It is surely significant that in Cheshire on 11 June 1872, aged fifty-one, Professor Smith married a spiritualist wife and brought her to Sydney during the very decade when spiritualism was gathering strength. Very little is known about Mrs. Smith; but the temptation to assume that she encouraged her husband to take an interest in spiritualism is hard to resist. It is correspondingly easy to imagine that the Smiths were among the 150 citizens, many of them notable, who assembled in early 1879 to help Emma Britten organise Sydney spiritualists into the Psychological Society of New South Wales. If so, Smith's views had changed because although he was interested enough to attend a spiritualist meeting in Boston on his way to England in 1871, he was not very impressed: he referred to the mediums as 'the chief actors' and judged the messages they brought through 'of no value or interest to a stranger'.[29]

Whatever the influence of Professor Smith's new wife, men of science everywhere found it increasingly difficult to ignore the claims of spiritualism. In the 1870s there were more and more mediums and they did stranger and stranger things, producing all sorts of physical effects up to and including manifestations of the spirits themselves. In Britain, some scientists, notably chemist William (later Sir William) Crookes, endorsed their achievements. Others, often 'gentlemen' scientists, hired mediums and began private investigation. Of course there was opposition too, as from T.H. Huxley, who said dismissively that he had never cared for gossip. But it was a sign of widespread interest that there was a move at the meeting of the British Association for the Advancement of Science in Glasgow in 1876 to set up a special investigatory committee.[30]

When it is recalled that a surprisingly high proportion of mid-Victorian scientists were orthodox Christians, no better equipped than anyone else to process the findings of geologists, biologists, archaeologists and historians which tested orthodoxy, it is hardly surprising that the urge to investigate, and the will to believe, became quite mixed up in the minds of many men of science. Charles Darwin felt it was difficult to draw the line between scepticism and credulity among the would-be investigators. As James R. Moore has shown in *The Post-Darwinian Controversies*, there were many ways of coming to terms with Darwinism, some of which bore little relation to the original propositions.[31]

Seen in this context Professor Smith was not so very odd. Had there been a Society for Psychical Research in Sydney, he might well have joined (after all, he advocated a chair of psychology at Sydney University in 1859, not a reality until 1920).[32] But as far as I know the first and only Society for Psychical Research in Australia was not formed until in the 1890s and then in Melbourne. Nor were the various local scientific societies a suitable venue. They were still diffusely utilitarian, and discussion of religious topics was especially frowned on, a protection, perhaps, against rancorous sectarianism in colonial culture. On the other hand, where professional men of science were so few, psychical research may have seemed self-indulgent. Given that spiritualism was mainly a plebeian interest and

entertainment, such an interest may even have seemed vulgar to a professor at a university whose social function was to improve the tone of a society stained by convictism.[33] Furthermore, it has been shown that Professor Smith was most interested in 'natural' science. He sought facts, and the multiplication thereof, which he tried to test for the sake of understanding 'the laws of nature'. By the 1880s this would have been somewhat old-fashioned. The psychical researchers did their most constructive work with mental rather than physical phenomena.

Smith differed from many of the psychical researchers in one other respect. As with all aspects of his beliefs, the evidence is fragmentary; but none of it suggests that he experienced a crisis of faith as was so common to his class and time, and rife among psychical researchers. The impression of a robust man holds even in the religious sphere. Like the even more robust John Dunmore Lang, he was not perturbed by geological evidence which challenged a literal reading of the first verse of the Book of Genesis. In the Holy Land, the pilgrim professor expressed deep satisfaction to find close accord between text and place and showed himself at ease with the idea of an historical Jesus. His travels elsewhere do not seem to have fostered a deep interest in non-Christian religions, even in India. A reference to Darwinism in a lecture to the Royal Society of New South Wales in 1871 hardly bespeaks a troubled mind. Presbyterians, Prentis tell us, take the sacraments very seriously; Smith remained a communicant to the end of his days. The only area of stress one can point to with confidence is the Disruption in 1843, and then only because as 'the most important event in the history of nineteenth century Scotland' it affected all Scotsmen. All of them feared a drastic diminution of the authority of organised religion in the aftermath of schism.[34]

In its own rather bizarre way, the Theosophical Society aimed to strengthen the authority, not of churches, but of religion. In *Isis Unveiled*, Madame Blavatsky assailed the Roman Catholic Church as the enemy of free thought and true religion. In the first issue of *The Theosophist*, she offered a haven to 'minds maddened by Protestantism'. Spiritualism was not the answer. The answer lay in recovering 'the ancient wisdom' and the training of spiritual powers now lost except among certain magi and masters of the occult and preserved in ruins of past civilisations, in the monumental and magisterial remains at Luxor for example. All that was needful could be achieved by rational means. Thus although the Theosophical Society was and is primarily mystical and occult, and when Smith joined a semi-secret society too, yet it promised membership, or fellowship, to earnest seekers after basic truths said to be common to all religions. Though early theosophy had an anti-Christian bias, and there were considerable divergences between commonly advanced theosophical views and Christian doctrine — did Professor Smith expect resurrection or reincarnation? — it claimed to be anti-dogmatic. The society's motto has always been 'There is no religion higher than truth'. To a faithful empiricist like Professor Smith, theosophy seemed entirely progressive.

It remains to be said, however, that John Smith's conjoint adherence to Presbyterianism and theosophy was not publicly acknowledged until the 1950s. His friends probably knew, and assiduous readers of European spiritualist journals might have picked up a statement there that '*Viator*' and the author of the signed statement of 2 February 1882 were one and the same. But W.H. Terry protected Smith's identity; and the first theosophical historian to notice him remarked rather brusquely that he did not after all work for the Masters in Australia. This was probably due in part to poor health, and to the absence of a branch of the Theosophical Society in Sydney until 1891. But the fact remains that Madame Blavatsky was far from reputable, especially in the mid-1880s, and the Masters were regarded by many as an outrageous spiritualist stunt. John Smith was not won to the cause by the Masters, but by the promise of religious progress. Even so

he did believe in them; and at Waverley cemetery his wife left a reminder that he did. Like many more to come, he was doing his best to maintain true religion.

Notes

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2 Lionel Gilbert, *A Grave Look at History. Glimpses of a Vanishing Form of Folk Art* (Sydney: John Ferguson, 1980), 52.

3 Malcolm D. Prentis, *The Scots in Australia: A Study of New South Wales, Victoria and Queensland, 1788-1900* (Sydney: Sydney University Press, 1983), 191 and J.H.S. Burleigh, *A Church History of Scotland* (London: Oxford University Press, 1960), Appendix.

4 *Ibid.*, 317, 354.

5 *G.B. Airy Papers* (University of Sydney Archives), M.137, Testimonials.

6 *Parkes Papers* (Mitchell Library) Vol. 58. Smith to Parkes, 12 November 1852.

7 *Smith Papers* (University of Sydney Archives), M47.

8 'Presbyterian Church', *Australian Encyclopaedia* (Melbourne: Grolier Society, 3rd edn, 1977).

9 James Cameron, *Centenary History of the Presbyterian Church in New South Wales* (Sydney: Angus and Robertson, 1905), 64; *St. Stephen's Church: A Centenary Memo* (Sydney, 1942) (Mitchell Library).

10 D.W.A. Baker, *Days of Wrath: A Life of John Dunmore Lang* (Melbourne: Melbourne University Press, 1985), 219-221, 454; R.B. Walker, 'Presbyterian Church and People in the Colony of New South Wales in the Late Nineteenth Century', *Journal of Religious History, 2* (1962), 62.

11 *Free Church/St. Stephen's Church: Communicants' Rolls, 1862-1941* (Archives of St. Stephen's Church, Sydney), Vols. 1-6. I should like to acknowledge assistance received from members of St. Stephen's Church Archives Committee, and from G. Anne Steel, *The Archives of St. Stephen's Church* (unpubl. typescript, 1981).

12 *Sydney University Calendar*, (1882-3), 153.

13 *Sydney Morning Herald*, 27 April 1882, 4 and 29 April 1882, 7; *Journal and Proceedings of the Royal Society of New South Wales, 18* (1884), 5-7.

14 Josephine Ransom (comp.), *A Short History of The Theosophical Society, 1875-1937* (Madras: Theosophical Publishing House, 1938) is the only general history.

15 *Harbinger of Light*, 1 June 1882, 2238.

16 Cited in J.L. Davidge, 'Professor John Smith and Theosophy', *Theosophy in Australia*, (December 1959), 6.

17 *Ibid.*

18 *Ibid.*, 6-7.

19 *Ibid.*, 7-8.

20 Mary K. Neff, *How Theosophy came to Australia and New Zealand* (Sydney: Australian Section, Theosophical Society, 1943), 32-33. On Hodgson, see *Australian Dictionary of Biography, 4.* (Melbourne: Melbourne University Press, 1972).

21 Ransom, *op.cit.* note 14, 213.

22 *Harbinger of Light*, 1 June 1885, 2991 and 1 April 1886, 3192.

23 Moncure Conway, *My Pilgrimage to the Wise Men of the East* (London: Archibald Constable, 1906), 200.

24 J.L. Davidge, ' "Work for us in Australia!" ', *Theosophy in Australia*, (August 1954), 10; Neff, *op.cit.* note 20, 13, 42.

25 Ransom, *op.cit.* note 14, 547-48.

26 See my *Beyond Belief: Theosophy in Australia, 1879-1939* (Kensington: University of New South Wales Press, 1986), ch.1.

27 *Harbinger of Light*, 1 December 1879, 1693; on William Henry Terry see *Australian Dictionary of Biography, 6* (Melbourne: Melbourne University Press, 1976).

28 Davidge, *op.cit.* note 24, 9; for Britten in Sydney see *Harbinger of Light*, 1 December 1878, and 1 February 1879.

29 *Wayfaring Notes (Second Series): A Holiday Tour round the World* (Aberdeen: Brown and Co., 1876), 368-69; *Harbinger of Light*, 1 March 1879, 1556.

30 Jon Palfreyman, 'The Seances and the Scientists', *New Society*, 21 June 1979, 709-711.

31 James R. Moore, *The Post-Darwinian Controversies: A Study of the Protestant Struggle to come to terms with Darwin in Great Britain and America, 1870-1900* (Cambridge: Cambridge University Press, 1979, 1981), ch. 3.

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33 Deborah Campbell, 'Culture and the Colonial City: A Study of Ideas, Attitudes and Institutions, Sydney, 1870-90' (Unpublished Ph.D. thesis, University of New South Wales, 1982), 345-350. On plebian spiritualism, see Janet Oppenheim, *The Other World: Spiritualism and Psychical Research in England, 1850-1914* (Cambridge: Cambridge University Press, 1985), Part 2.

34 *Sydney Morning Herald*, 12 November 1863; *Wayfaring Notes: Sydney to Southampton by way of Egypt and Palestine* (Sydney: Sheriff and Downing, 1865), 277; Campbell, *op.cit.* note 33, 350.

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For a scholar so well known and yet so neglected as John Smith, no adequate bibliography exists. When a definitive life is written, it must necessarily refer to the vast spectrum of public endeavour in nineteenth century metropolitan Sydney. For this reason, the following list of sources can be indicative, not exhaustive.

The published writings of Smith himself are not extensive. Outside his scientific papers and addresses, many were of an ephemeral nature, and prove difficult to locate. Additions may well appear as scholars turn the unindexed pages of those newspapers, notably the *Sydney Morning Herald*, that helped shape public opinion in colonial affairs. We record below the major published works written by, and attributed to him. Little of Smith's unpublished correspondence has yet been discovered. We can point to perhaps twenty items in the *Parkes Papers*, and among the *Macarthur Papers* and *Deas Thompson Papers* in the Mitchell Library. There are also his speeches in the Legislative Council, cited earlier in this volume, which appear in the *NSW Parliamentary Debates*; and several unpublished addresses and demonstrations before the Philosophical Society of NSW and its successor, the Royal Society of NSW.

In the secondary literature, there are several sources which mention Smith's work, and which must be taken into account in understanding his Australian career. The following bibliographical guide serves not so much to summarise, as merely to outline the contributions of a man who, obliged by his condition in colonial life, inevitably saw a harmony of interest between the advancement of knowledge and service to the public.

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CONTRIBUTORS

Kenneth J. Cable, Associate Professor and Head of the Department of History, University of Sydney, is the co-author (with Stephen Judd) of *Sydney Anglicans* (1988). He is currently engaged in the production of a series of studies on the history of the University.

Deborah Campbell wrote her doctorate in history at the University of New South Wales on attitudes to culture and scholarship in late colonial New South Wales. Since 1981, she has been employed as a policy adviser in the New South Wales Public Service; and for the last four years has served on the personal staff of the Deputy Premier.

H. Graham Holland studied chemistry at Sydney and Cambridge universities, and for many years taught at the University of Sydney. He was co-editor of the Science Faculty's centenary book, *Ever Reaping Something New* (1985).

Milton Lewis is a graduate of the University of New South Wales and the Australian National University. He has held teaching and research posts in Australia, the United Kingdom and New Guinea. He is currently Senior Research Fellow in the Department of Public Health, University of Sydney.

Roy MacLeod is a Professor of History at the the University of Sydney, where he teaches imperial and military history, Australian history, and the history of science and technology. He is the author and editor of many articles and several books in the social history of science. He is currently writing a biography of Smith's younger colleague, Professor Archibald Liversidge, FRS (1846-1927).

Jill Roe is an Associate Professor in Modern History at Macquarie University. She has published extensively in the field of Australian social and cultural history, and is author of *Beyond Belief: Theosophy in Australia 1879-1939* (Sydney: University of New South Wales Press, 1986).

Peter Sheldon has taught at a number of Australian universities. For three years, he lived in Italy, studying its economic and labour history. He is completing post-graduate studies in the Department of History and Politics at the University of Wollongong. His thesis, a history of Water Board unionism, has stimulated further research into urbanisation, public health and labour history.

Catherine Snowden was, between 1982 and 1986, Curator of the Macleay Museum's Historic Photograph Collection at the University of Sydney, where she researched and wrote a catalogue of the John Smith Collection of glass plate negatives and prints held by the Sydney University Archives. At present, she is a consultant historian, and is completing a Ph.D thesis on 'Australian Bird Collectors and Photographs'. In her spare time, she is writing a book on the twentieth century photographer and naturalist J.S.P. Ramsay.

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