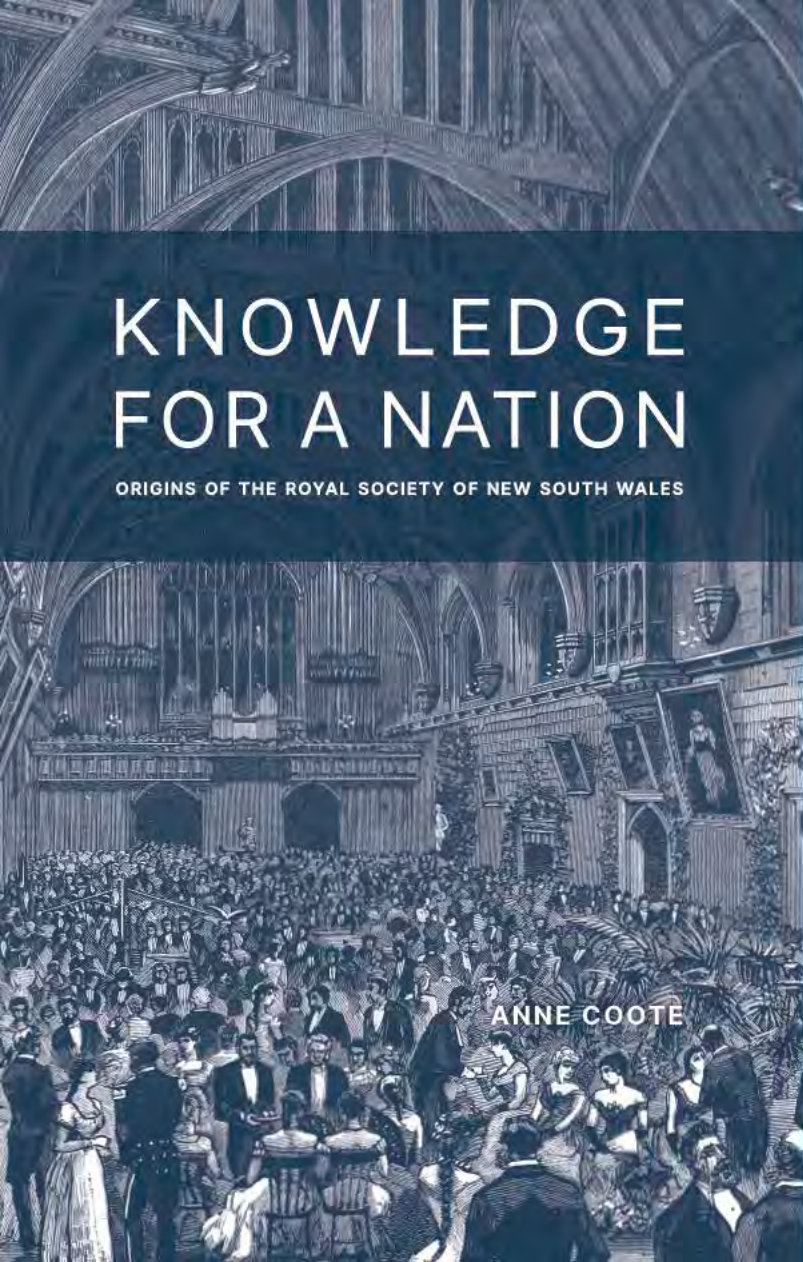




KNOWLEDGE FOR A NATION

ORIGINS OF THE ROYAL SOCIETY OF NEW SOUTH WALES

ANNE COOTE

ABOUT THE BOOK

Knowledge for a Nation: Origins of the Royal Society of New South Wales tells the early history of a learned society still active in the intellectual culture of twenty-first century Australia. The book begins with an account of Australia's first learned society, the Philosophical Society of Australasia (1821–1822), which is the Royal Society's enduring inspiration, if not its earliest incarnation. The Royal Society evolved from the Australian Society (1850–1), through the Philosophical Society of New South Wales, which was re-badged Royal in 1866. Successfully re-organised a decade later, the Royal Society reached the zenith of its influence on the development of a colonial science community in New South Wales. Hopes and disappointments, conflict and camaraderie, challenges and achievements are all part of this story which highlights the society's initiatives in the cause of science, its all-male membership, the women who nevertheless contributed, and the society's glittering conversaciones. The book concludes in 1914, when a visit to Australia by the British Association for the Advancement of Science demonstrated international recognition for the colonial scientific community which the Royal Society had worked so long to help create.

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This book was written on the lands of the Dharug and Gundungurra people of the Blue Mountains, NSW. The author and publisher acknowledge the traditional owners of Country throughout Australia and pay respect to Elders past and present.



ROYAL
SOCIETY
NEW SOUTH WALES

For Bob



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FOREWORD

The Royal Society of New South Wales is a vibrant organisation active in the intellectual life of twenty-first century Australia. In this book, Dr Anne Coote provides the very first comprehensive account of the early history of the RSNSW and its antecedents – from the mid-nineteenth century to the beginning of World War I. It is mandatory reading for any current or future member of the society. Even though this time span and the society itself embody a sliver of the record of human intellectual achievement, it is important to understand how and why it was conceived and developed, what it achieved for Australia, and how it is viewed now through the eyes of a cultural historian living in the third decade of the twenty-first century.

Dr Coote has created a very readable account that is hard to put down. By using the characters involved in the society to tell its story, she has produced a rollicking recital of their lives and times, of the society's fortunes and misfortunes, ebbs and flows, highs and lows. The storytelling is compelling not only because of her expertise as an historian and author but also her expansive and deep research during the past 10 years. To

paraphrase Anne's own words, her research rapidly became all-consuming, involving close study of the society's extensive archives, and other primary and secondary sources, and taking more than six years of her working life. She dedicates the book to her late husband Robert Coote, a science graduate with a keen interest in mathematics and its history who, she says, 'unselfishly accepted my day-long absences either in Sydney at the Mitchell Library or spent closeted in my study writing and rewriting'.

As President of today's society, I was gripped by a time-travelling sensation as I read the book. So many echoes of the society's past still reverberate in the society's Act and Rules and through the recurring issues on our Council agenda. These include clarifying and communicating the purpose and value of the society in our ever-changing world; delivering unique value to members and the broader public; understanding the motivations of members to join and contribute; overcoming the challenges of small financial reserves; having no fixed premises; preserving and making our extensive library and archives accessible; and maintaining the energy and enthusiasm of our volunteer workforce. We still hold general meetings on the first Wednesday of each month in Sydney; we continue to publish and exchange the society's *Journal and Proceedings* with libraries across the world. We are the first colonial society to honour scientific achievement with a bronze medallion and we still award the Clarke Medal and strike it using the original 1876 design that bears a portrait of Clarke with his flowing beard. We also still use the Seal of the society that was first designed by our late-nineteenth century reformist Archibald Liversidge, albeit modified to remove the words 'Founded in 1821. Incorp. 1881'.

The society's claim of a foundation date of 1821 is a tension that Dr Coote confronts in Chapter 1. Centennial celebrations were held by the society in 1921–22, followed by a spirited series of Bicentennial celebrations in 2021–22. The short-lived Philosophical Society of Australasia, founded in 1821, has long been the Royal Society's initial inspiration,

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but as Anne argues, nothing of substance supports the society's claim for lineal descent from that body. Rather, she identifies as the Royal Society's earliest antecedent, the equally short-lived Australian Society for the Encouragement of Arts, Science, Commerce and Agriculture, formed in 1850. This body's remaining funds and a fair proportion of its membership were absorbed into a new society formed in 1856: The Philosophical Society of New South Wales. This organisation changed its name to the Royal Society of New South Wales when it gained Royal Assent in 1866.

Dr Coote recounts how and why the society reformed and prospered during the later decades of the nineteenth century under the leadership of its Honorary Secretaries, Archibald Liversidge and Carl Adolph Leibius, and with the support of other leading members such as William Branwhite Clarke (until his death in 1878) and Government Astronomer, Henry Chamberlain Russell. It continued its dominant focus on science applicable to local colonial issues; led increasingly by scientifically trained professionals instead of expert amateurs. Papers at meetings or published in the *Journal* covered topical branches of science, such as development of a flying machine, weather and water supply, geology, mineralogy and astronomy, along with the language and customs of Aboriginal people, who were erroneously thought to be doomed to extinction.

The society's website today has links to all issues of the *Journal* and will soon publish its digital *Bicentennial Bibliography* that traces the timeline of society's publications to 2021 and author-alphabetically lists most of our historical papers, including links to online facsimiles. As a companion research guide, the society has also compiled brief profiles of the professional careers and major achievements of most of the 118 men, and all three women, who have held the gavel at meetings of the society and its antecedents since 1821.

Dr Coote highlights a small number of talented women whose research papers were presented before the society and thereby contributed to the published history of science, despite being excluded from society membership because of their gender. Florence Martin, for example, contributed papers on magnetic circuits and the study of oxygen, and Mary Everitt successfully submitted her research on the language and customs of Aboriginal people in south-east New South Wales. Helena and Harriet Scott, artists and expert entomologists, provided illustrations for the published work of society members Edward Pierson Ramsay and Gerard Krefft. Nothing in the rules explicitly excluded women from membership. It was simply assumed that women had no place in such an organisation. Papers by these women were presented for them, in their absence, by a society member. As Dr Coote remarks: ‘However scientific its goals, the Royal Society of New South Wales remained a gentlemen’s club. Women would not be allowed to join it until 1935’.

However, women were encouraged to attend the splendid *conversazione* events which from 1879 were usually held in the Great Hall of the University of Sydney. Each Ordinary member of the society was allowed to bring two female relatives. In November 1879, the *Australian Town and Country Journal* depicted on its cover the lively crowd attending the first RSNSW *conversazione* in the Great Hall, with a large number of women present. *Conversaciones*, special meetings ‘at which self-improvement merged with entertainment and pleasant social interaction’, were fashionable, well-attended events that displayed innovations in science and technology to a wide audience, and enhanced the society’s ‘public image as a leading learned body that was up to date’.

More than 50 interesting images illuminate the text of this book. We thank the State Library of New South Wales and its recently retired Director, Dr John Vallance AM, for its welcome support in scanning and donating many of them. The University of Sydney Archives was similarly

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generous with images from its collection. I acknowledge and thank John Hardie AM who as a former President and long-serving Council member commissioned Dr Coote to write this book. But it would not exist in published form without the expertise and dedication of a current councillor, Dr Davina Jackson, who has guided this book through the editorial and publication processes. Finally, the society acknowledges financial support for this project from Create NSW's Cultural Grants Program, a devolved funding program administered by the Royal Australian Historical Society on behalf of the New South Wales government.

Dr Susan Pond AM FRSN

President of the Royal Society of New South Wales, 2021–2025



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In March 1821, just a few months after his arrival in the young colony of New South Wales, Captain Francis Irvine, late of the 11th Bengal Native Infantry, wrote home to his father in Scotland with some reassuring news: ‘The country contains already a few men of cultivated and upright minds’.¹ Irvine had spent the previous 15 years in the bustling mercantile and military milieu of the British East India Company’s Bengal Presidency where he had been a Corresponding member of the Literary Society of Bombay (Mumbai) and a contributor to its *Transactions*.² He had moved his young family from populous Calcutta (Kolkata) to this penal colony at the edge of empire with the object of acquiring land, a venture that was bound to entail some sacrifices, so he must have been relieved to find in this colonial outpost the company of at least a few like-minded men. Within months of the letter’s dispatch, Irvine and five of his new acquaintances had formed the colony’s first learned society, the Philosophical Society of Australasia, a body whose existence is central to the foundation story told by the Royal Society of New South Wales.³

Today, every Australian state has a Royal Society dedicated to the cause of science and said to be linked to an earlier learned society founded during the nineteenth century. The short-lived Van Diemen's Land Scientific Society had been active in what is now Tasmania from 1829 to 1832, but Tasmania's Royal Society claims a continuing existence only since 1843.⁴ The Royal Society of South Australia traces its beginning further back to the South Australian Literary and Scientific Organisation which held its first meeting in London in 1834, two years before the first settlers arrived in South Australia.⁵ But the Royal Society of New South Wales claims the longest lineage of all. According to its website, it is 'the oldest learned society in the Southern Hemisphere, tracing its origin to the Philosophical Society of Australasia founded in Sydney in 1821'.⁶

The first person publicly to make this claim was the Anglican clergyman and expert geologist, the Reverend William Branwhite Clarke, during his Vice-Presidential Address to the society's first annual meeting under the title 'Royal' in July 1867.⁷ It was repeated by other Royal Society office-holders during the nineteenth century and ultimately fixed in print by histories of this society published during the twentieth century and beyond.⁸ While not unchallenged, this version of the Royal Society's beginnings continues to hold considerable power.⁹ Any new history of the Royal Society of New South Wales needs to consider the veracity and meaning of its foundation story, so this one begins by tracing the fortunes of the body founded in 1821.

•

The Philosophical Society of Australasia

The founding members of the Philosophical Society of Australasia were all relatively young men, still in their thirties. Like Irvine, they had come

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to the colony with an eye to advancement and were already members of the colony's social elite. Among their number were two senior members of the colonial administration – Supreme Court Judge Barron Field and Colonial Secretary Frederick Goulburn. Two more were surgeons. James Bowman had been appointed as Principal Surgeon at Sydney Hospital, and Henry Grattan Douglass had charge of the hospital at Parramatta. The sixth man at this first meeting was the rising Sydney merchant, Edward Wollstonecraft, a cousin of Mary Shelley, the author of *Frankenstein*.

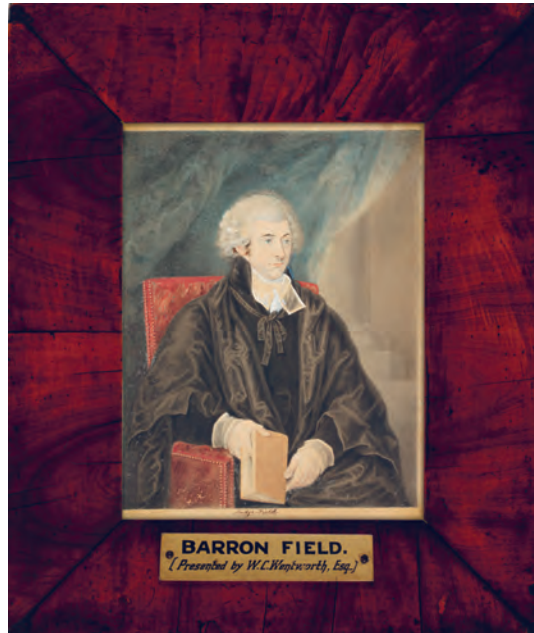
During 1821 and 1822 the society lost one member (James Bowman) but gained several new ones, not least the newly arrived Governor of New South Wales, Sir Thomas Makdougall Brisbane, who in November 1821 accepted the society's invitation to become its President.¹⁰ Other additions were: John Oxley, the colony's Surveyor-General, who joined the group at its second meeting; two more surgeons, Patrick Hill and Donald Macleod;



Surgeon Henry Grattan Douglass was Secretary of the Philosophical Society of Australasia 1821–22 and the Australian Society 1850–51. SLNSW.

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NSW Supreme Court Judge Barron Field was a founding member of the Philosophical Society of Australasia. Portrait by Richard Read, c.1820. SLNSW.



NSW Governor Thomas Makdougall Brisbane was an astronomer and first President of the Philosophical Society of Australasia. SLNSW.



Wollstonecraft's business partner, Alexander Berry; the Minto landholder William Howe; Christian Rümker, astronomer at Governor Brisbane's new Parramatta observatory; and naval hydrographer Captain Phillip Parker King. As the England-educated son of a former Governor of New South Wales, King was the Philosophical Society's only colonial-born member.¹¹ In August 1822, the scholar Robert Townson, aged 60, became the oldest person nominated to membership.¹² Another prominent colonist, the Reverend Samuel Marsden, had been nominated in September 1821, but had declined to join.¹³

In coming together to establish the Philosophical Society of Australasia, Irvine and his five colleagues were following a well-established European practice. Learned societies similar to this colonial body had long been the conventional means for organising activities dedicated to the pursuit and dissemination of knowledge.¹⁴ Their deepest roots lay with the fifteenth-century Renaissance academies, which were loosely organised bodies with royal or aristocratic sponsors.¹⁵

New kinds of learned society emerged from the second half of the seventeenth century. Learned academies, organs of state and reliant on government funding, were established in many parts of Europe. The first was l'Académie Royale des sciences in Paris, which was founded in 1666 by Louis XIV. More numerous were societies formed on private initiative. These were corporate bodies, financed primarily by member subscriptions, and their prototype was the Royal Society for Improving Natural Knowledge, founded in London in 1660 to promote 'experimental philosophy'.¹⁶ Both kinds of learned society were products of the scientific revolution of the sixteenth and seventeenth centuries, when advances in astronomy, physics, mathematics, chemistry and knowledge of human anatomy strengthened confidence in the potential for careful observation, experiment and reasoned analysis to explain the natural world.¹⁷ Curiosity and a commitment to rational enquiry inspired the Royal Society of

London's founders and those of numerous other learned societies that were formed during the eighteenth and nineteenth centuries.¹⁸

Natural Philosophy – precursor of natural science in its broadest sense – was the focus of the Royal Society of London. There were other learned bodies, such as the literary and philosophical societies founded in British provincial cities like Manchester (1781) and Newcastle-upon-Tyne (1793), which concerned themselves with a wider range of intellectual enquiry, not science alone.¹⁹ Both kinds of learned society met to listen to papers, debate questions of interest and examine exhibits. Some began their own publications, formed libraries and built collections of natural history specimens or antiquities.²⁰ Through their involvement in such activities, learned society members could regard themselves, and hoped to be perceived, as learned men or *savants*.

It is hardly surprising that transplanted European colonists, wishing to replicate the familiar culture of their native countries and seeking intellectual stimulation in congenial company, would attempt to establish learned societies whenever local conditions permitted. As early as 1743, Benjamin Franklin had founded the American Philosophical Society in Philadelphia, Pennsylvania, and colonists in the Dutch East Indies had established the Batavian Society of Arts and Sciences in 1778. Irvine's Literary Society of Bombay had met for the first time in 1804, and the first scientific bodies in Britain's Cape Colony (part of modern South Africa) appeared during the 1820s.²¹ By 1821, circumstances in New South Wales seemed favourable for establishing a learned society there.

Indeed, in 1821 New South Wales was on the cusp of change. More and more free men with capital – men like Irvine and his colleagues – now looked to the prison colony as a place to build their fortunes. All the Philosophical Society's founders were relatively recent arrivals. Field had been longest in the colony, having taken up his colonial post in 1817. As

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a naval surgeon on convict transports, Bowman had visited Port Jackson in 1816 and again in 1817, and had settled permanently as recently as 1819.²² Wollstonecraft had also come in 1819, while Goulburn, like Irvine, had arrived in Sydney during the second half of 1820.²³ Douglass was newest to the colony. He had come in May 1821, just weeks before the Philosophical Society of Australasia's inaugural meeting in June. Like Irvine, Douglass was already a learned society member, having been elected to the prestigious Royal Irish Academy in 1820, following his graduation as a Doctor of Medicine at Trinity College, Dublin.²⁴ But all of the Philosophical Society's founders would have been at least familiar with the associational culture they had left behind in Britain. Thanks to changing perceptions of the colony's potential, there were now enough like-minded men ready to reproduce that culture in their new colonial home.

Official opinion as to the colony's destiny and purpose was changing too. Lachlan Macquarie, its Governor since 1810, had viewed New South Wales as a place whose future lay with emancipated convicts and their descendants.²⁵ This was a vision of the colony which had inspired the original settlement. In the words of historian Alan Atkinson, New South Wales had been imagined as a place made for 'humble men turned rich and honest, freed from degradation and standing within a new territory as classic bearers of commonwealth'.²⁶ Just over three decades after 1788, this view of New South Wales was being superseded.

By the end of 1820, Macquarie's resignation had been accepted. Complaints against his administration, including his policies benefitting emancipated convicts, had spurred the colonial authorities to dispatch Commissioner John Thomas Bigge to New South Wales in 1819, partly to determine whether the punishment of transportation remained an effective deterrent against crime. Bigge, who returned to England in the year the Philosophical Society was formed, would recommend against a

continuation of Macquarie's practice of granting small parcels of land to emancipated convicts. What the colony needed were larger acreages, granted to free men with sufficient capital to engage successfully in pastoral pursuits using convict labour.²⁷ Accordingly, new laws governing Crown land alienation were passed, free immigration increased, and the colony moved towards becoming a free community in which learned organisations might thrive.

In the light of the colony's new direction, and the social position of its members, it seems appropriate that its first learned society should be dedicated to natural philosophy, or science. At the time, science was largely the pastime of unremunerated devotees. It was also a broad field of intellectual endeavour, as yet undifferentiated into specialist branches, and considered to embrace the careful, empirical study of all aspects of the natural world and human society. Scientific fact-collecting of this kind was an emblem of social status. It was also highly appropriate for ambitious free settlers, located on the edge of a vast continent whose land and resources had not yet been fully explored.

The Philosophical Society may have been the colony's first formal scientific institution, but it by no means marked the beginning of scientific activity in New South Wales.²⁸ From the earliest days of settlement, men and women of all classes and education had collected plants, animals and Indigenous artefacts, continuing the investigations begun with the visit of James Cook and Joseph Banks to Botany Bay in 1770. Some colonists painted or wrote about what they saw; others recorded the languages and customs of the country's original inhabitants, and efforts were made, officially and privately, to investigate and map the land.²⁹ By the beginning of the 1820s, inland exploration had reached south to the Murrumbidgee River, registered the course of several rivers flowing west beyond the Blue Mountains and made known country as far north

as the Liverpool Plains and the New England Tableland.³⁰ Whether all this work was undertaken in the name of science, driven simply by wonder, or done with an eye to personal social or pecuniary advantage, it contributed to local and metropolitan understanding of some of the territory claimed by Britain.

Yet European occupation had scarcely begun. Possession of Sydney's hinterland, the Cumberland Plain, had been secured scarcely five years earlier with the defeat of armed resistance by the Dharug and Gundungurra to the European invasion of their country.³¹ Most of the colony's non-Indigenous population (around 94 per cent), almost all the colony's cultivated land (97 per cent) and the greater proportion of its livestock (more than 70 per cent) were still to be found within 70 kilometres of Sydney.³² As New South Wales entered a new phase in its development during the 1820s, science promised to provide colonists with the tools for understanding and exploiting all the territory claimed by Britain. The formation of a scientific society was not only practicable in 1821, it also seemed timely and highly desirable.

Objectives and Rules

The Philosophical Society declared for itself a public-spirited objective which had future colonial development in view. Seemingly discounting earlier scientific investigation, the preamble to the society's regulations noted that 'upwards of thirty years has elapsed since the colony of New South Wales was established in one of the most interesting parts of the world, ... [y]et little ... has been done to awaken a spirit of research or excite a thirst for information among the Colonists'. More information about the colony would be required before European knowledge and experience could be applied to its development, and with 'the spirit of enterprize ...

increasing and the tide of emigration ... flowing rapidly ... some nucleus' was necessary to collect and process 'many valuable facts'. By gathering new 'information with respect to the natural state, capabilities, productions, and resources of Australasia and the adjacent region', and by publishing such information 'from time to time' to 'benefit the world at large', the Philosophical Society of Australasia intended to be this 'nucleus'.³³

There were never more than a handful of Philosophical Society members. In a colony where the majority of inhabitants were convicts or ex-convicts, the rules of a body founded by elite free settlers and meeting in their private homes, were designed to ensure its exclusivity. Candidates for membership had to be proposed and seconded by existing members and approved unanimously by ballot the following month. The hefty £5 annual subscription was an additional bulwark.



Government House, Parramatta, where some meetings of the Philosophical Society of Australasia were held during 1821–22. Landscape painting by George William Evans, 1805. SLNSW.

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Strict rules were also devised for organising the society's program. Meetings were to take place weekly on Wednesdays at seven o'clock sharp in a rotation of members' homes. To ensure that members had clear heads for discussion, tea was the only refreshment allowed. A five-shilling fine would be imposed for tardiness or absence, the only allowable excuse being 'sickness, public business or non-residence in Sydney'. On the first Wednesday of each month a rostered member was to present a paper, defaulters being fined £10. Additionally, each new member was required to present a research paper on the first Wednesday of the month after their admission. Copies of the papers read would be circulated for discussion at subsequent meetings, and members would decide by ballot which of the papers should be printed.³⁴ The members also agreed to collect specimens for a museum to be housed in a room at the Colonial Secretary's Office, and arrangements were made for cataloguing the collection and recording any donations.³⁵

Members' personal priorities were also reflected in the society's rules. While a thirst for stimulating discussion in congenial company had helped drive the society's foundation, the opportunities which it could offer members for accessing new reading matter was another powerful motivation. As yet the colony had no proper lending library, nor were there any dedicated booksellers. A portion of the several hundred volumes sent from Britain some years before, as the intended nucleus of a public library, could now be read at Parramatta, but only at the Reverend Marsden's private home. In any case, the reading matter on offer there consisted mostly of religious tracts.³⁶ Some colonial storekeepers carried a few books and George Howe, publisher of Sydney's only newspaper, the *Sydney Gazette*, occasionally had some to sell. Howe had also pioneered local publishing with John William Lewin's illustrated *Birds of New South Wales* (1813), Barron Field's *First Fruits of Australian Poetry* (1819), and the *New South Wales Pocket Almanack*, which had been issued annually since 1806,

but this business was very much in its infancy. Colonists wanting new reading material were usually forced to order their books and magazines from Britain, or else buy them second-hand when departing settlers put their personal libraries up for sale.³⁷

The only hint of developments to come was the appearance in May 1821 of the colony's first locally published magazine, the *Australian Magazine or Compendium of Religious, Literary and Miscellaneous Intelligence*, edited by Methodist minister the Reverend Ralph Mansfield. Although primarily a vehicle for religious teaching, his publication had some scientific content, but it was relatively short-lived, the final edition appearing in September 1822.³⁸ In any case, it had a minimal impact on the general drought of reading material in the colony, in response to which the founders of the Philosophical Society of Australasia formally agreed to pool their libraries. The rules of their new organisation made it obligatory upon 'Every Member ... [to] furnish the Secretary with an alphabetical catalogue of his library, to be digested into one Catalogue for the reference of all the members'.³⁹ A portion of the society's funds was to be dedicated to the purchase of additional books.

Activities

To disseminate information about the colony, and to relieve members' sense of isolation, the Philosophical Society attempted to set up a system of information exchange, a practice well established among European learned societies since the seventeenth century.⁴⁰ A circular was composed requesting the 'cooperation, communication and correspondence' of learned societies in Ceylon, Java and India, as well in British, European and North American cities.⁴¹ It also outlined the society's broad objective of 'enquiring into the various branches of the physical science of this vast

continent, and its adjacent regions', including 'the history and character of man together with the diversities of his language', and it expressed its members' readiness to conduct enquiries in the colony on the behalf of overseas societies.⁴² An exchange of specimens was proposed and the Philosophical Society undertook to transmit astronomical observations and 'quarterly meteorological tables' compiled in the colony. Presumably members would be relying for that information on the services of Dr Rümker, assisted by the 'self-registering weather clock' which, in December 1821, they resolved to have constructed by the clockmaker and former convict, James Oatley.⁴³

Some progress was made towards building a specimen collection for the Philosophical Society's museum, any chance for doing so being eagerly grasped. Captains Thomas Raine of the *Surry* and John Rodolphus Kent of HMS *Prince Regent* were each furnished with collecting instructions and a list of questions to be answered during their respective voyages to Macquarie Island and the Sandwich Islands.⁴⁴ Members also received a number of fossils and 'petrifications' collected by the Reverend John Youl, Assistant Chaplain at Port Dalrymple in Van Diemen's Land, as well as 'specimens of the different stratifications of coal' sent from the Port Hunter penal settlement by its Commandant, Major James Thomas Morisset.⁴⁵ Oxley donated mineralogical specimens he had brought back from Port Macquarie and it was resolved to ask the assistant surgeon at this new penal colony for specimens of timber and natural history, as well as other scientific information about the area.⁴⁶ Members themselves were asked to provide the museum with soil samples from their own districts, accompanied by some descriptive detail, such as the depth from which each one had been procured.⁴⁷

Delivery of members' obligatory research papers was postponed until January 1822.⁴⁸ Berry who was first on the roster, was absent in

January on an exploratory voyage south to Bateman's Bay, so Field took his place with a paper entitled 'The Aborigines of New Holland and Van Diemen's Land'. Over two meetings in February, Berry duly reported on his expedition, including his observations on the coastal geology between Newcastle and Bateman's Bay. In March Rümker presented his paper on the 'Importance of Astronomical Observations in the Southern Hemisphere'.⁴⁹ But thereafter momentum dissipated.⁵⁰

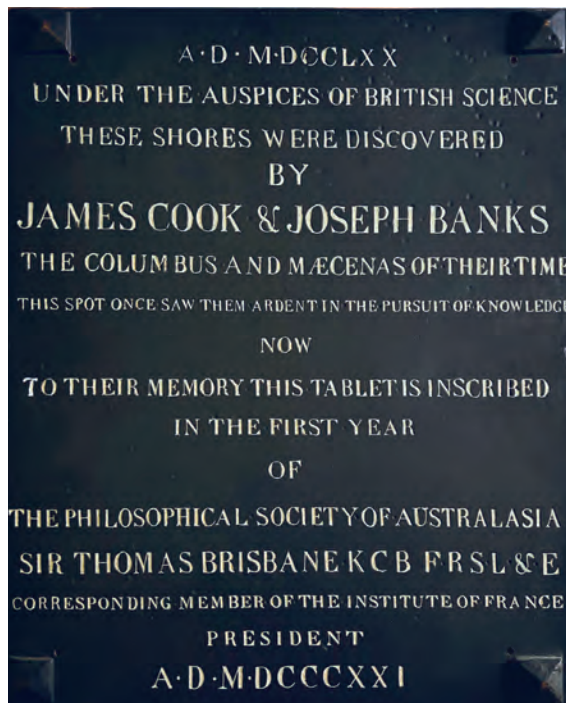
Macleod failed over several meetings to fulfill his obligation as a newly enrolled member and no one else volunteered a paper. Finally, it was agreed to suspend the rule about compulsory papers for six months, by which time the Philosophical Society of Australasia was defunct.⁵¹ Several years later, in England, Barron Field published all three of the delivered papers in his book, *Geographical Memoirs on New South Wales*. He also included a paper by Phillip Parker King on the 'Maritime Geography of Australia' which, according to Field, had been delivered in October 1822.⁵² However, entries in the Minute Book had ceased before the end of August.

Achievements

The Philosophical Society of Australasia had lasted little more than a year, but it was not without its legacies. The specimens accumulated for its museum would form the kernel of the government's museum which had its tentative beginnings in 1829.⁵³ The Philosophical Society would also be long remembered for the commemorative plaque its members placed at Botany Bay to honour James Cook and Joseph Banks for their 'discovery' in 1770 of what came to be the colony of New South Wales. The idea for such a memorial had been floated by Field at the fourth meeting. He had proposed a Latin inscription, but after deliberations lasting five more meetings, members settled on the following words, all in English, save for the date:

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Under the auspices of British Science,
These shores were discovered in the year of our Lord MDCCLXX,
by
James Cook and Joseph Banks,
The Columbus and Maecenas of their time.
This Spot then saw them land, ardent in the pursuit of Knowledge;
Now
To their Memory this Tablet is inscribed,
In the first Year
of
The Philosophical Society of Australasia.
President.
A.D. MDCCCXXI.⁵⁴



Replica of the
Philosophical Society
of Australasia's 1821
plaque, placed at
Inscription Point, Botany
Bay, to commemorate
the 1770 visit of James
Cook, Commander of
HMS *Endeavour*, with
botanist Joseph Banks.
RSNSW.

On Wednesday 20 March 1822, members of the Philosophical Society, with their President, Sir Thomas Brisbane, and officers of HMS *Dauntless* enjoyed a celebratory picnic lunch ‘in a natural harbour’ on the shore of Botany Bay. Afterwards the newly inscribed brass plate was fixed on the cliff-face some 25 feet above sea level, at a spot now known as Inscription Point on the South Head of Botany Bay.⁵⁵ Philosophical Society members later worried about the deleterious effect on their plaque of the spray from waves breaking on the rocks below, yet more than 70 years later, in 1895, some intrepid visitors to the site, descending by rope from the ledge above, found the inscription legible still.⁵⁶

In the year following this escapade, Joseph Maiden, then Honorary Secretary of the Royal Society of New South Wales, took steps to preserve for posterity the words from 1821. From a plaster cast of the original plaque, lodged in the Australian Museum, three reproductions were made: one for the society’s collection and one each for the public library in Sydney and the technical college.⁵⁷ In 1921, 99 years after the Philosophical Society’s Botany Bay ceremony, and 100 years since the formation of that earlier body, the memory of both occasions inspired a pilgrimage to Kurnell by members of the Royal Society of New South Wales where, according to the *Sydney Morning Herald*, they ‘spent the afternoon reviewing the work of the Society in its earlier days’.⁵⁸

Reporting on the Botany Bay ceremony in 1822, the *Sydney Gazette* had published two poems composed by Field for the occasion. Together with the plaque’s inscription, these comprised a public statement of the connection Philosophical Society members clearly felt to Cook and Banks and to the attributes they felt the pair embodied: ‘ardent in the pursuit of Knowledge’ and acting under ‘the auspices of British Science’. In Field’s verse, Cook appears as the harbinger of British science in a new continent, confronting ‘a simple race ... who presumed to face, with lance and spear, his musket’.⁵⁹ The gentlemen of the Philosophical Society of Australasia

clearly saw themselves following in the wake of these, their culture heroes, as energetic seekers after information in a part of the world not yet fully understood by Europeans, and thus far barely touched by what they understood to be the potential benefits of European science.

Demise

Clearly such idealism was insufficient to hold the Philosophical Society together. Perhaps the strict rules governing punctuality and paper preparation ultimately rankled. But there were also deeper reasons for the Philosophical Society's demise.

Although its rules forbade members bringing 'polemical divinity and party politics' into their deliberations, tensions in the penal colony's relatively small community of free settlers and officials nevertheless impinged to divide existing members and deter new ones. There had been increasing bad feeling between Brisbane and his Colonial Secretary, Goulburn, over their respective management styles. Brisbane's tendency to delegate daily administration to Goulburn and other colonial officials had also alienated many influential citizens, as did his 1822 decision to substitute Spanish dollars for sterling Treasury bills, an effective devaluation of the payments that settlers customarily received for supplying the Commissariat.⁶⁰ Brisbane's close friend and supporter, Henry Grattan Douglass, became a target for the hostility of the Governor's elite opponents at Parramatta, where Douglass was not only Surgeon-in-Charge of the hospital but also Superintendent of the Female Factory and a magistrate on the Parramatta Bench.⁶¹ Matters came to a head on 17 August 1822 when Marsden, a fellow magistrate, requested an official enquiry into an accusation recently brought against Douglass concerning his alleged sexual misconduct with a convict servant, Anne Rumsby. A few days later, magistrates on the Parramatta Bench refused to serve with Douglass,

and Supreme Court Judge Field sided with the magistrates.⁶² It seems no coincidence that the last meeting ever recorded in the Philosophical Society's Minute Book occurred on 14 August 1822 at Field's home and in the absence of the Secretary, Douglass.

The Philosophical Society of Australasia was probably far too small an organisation to survive such dissension in its ranks. Perhaps, as David Branagan suggested, it had also been founded 'too early', before New South Wales gained 'a stronger body of active scientists ready to keep things going'.⁶³ But the most persuasive explanation for its failure to survive its internecine strife was offered by the historian John Gascoigne. In seeking to catalogue colonial resources for *future* exploitation, he argued, the Philosophical Society did not offer members more immediate 'inducements ... to devote themselves to the cultivation of science'.⁶⁴

Indeed, as the Philosophical Society was imploding, some of its members were already working with Samuel Marsden to found a new association, better directed towards their own immediate economic interests as landholders. This was the Agricultural Society of New South Wales (from 1824 the Agricultural and Horticultural Society of New South Wales) which held its first meeting on 5 July 1822. Notwithstanding the 'baneful atmosphere of distracted politics' which Field would later blame for the Philosophical Society's demise, no less than nine of its members – including Douglass, Field, Goulburn and Brisbane – put aside their differences to join this new organisation.⁶⁵ Like the Philosophical Society, the Agricultural Society of New South Wales was committed to colonial development, but its scientific work was much more finely focused and it also promised outcomes more immediately practicable. Moreover, with its goal of raising standards of agriculture and grazing in the colony, the Agricultural Society offered members not just opportunities for intellectual stimulation, but also the chance to grow their private fortunes.⁶⁶

ANTECEDENTS

Despite the collapse of the Philosophical Society of Australasia, Clarke in his 1867 address insisted that it had not actually died. Rather, it had slept for nearly 30 years until 1850 when it was ‘resuscitated’ under a new name – the Australian Society – by its erstwhile Secretary, Douglass.⁶⁷ Clarke traced the Royal Society’s lineage back through the Philosophical Society of New South Wales, from which it had recently emerged, to the Australian Society and thus to that first scientific society founded in 1821. In other words, when the Royal Society of New South Wales held its first general meeting in 1867 it was, in Clarke’s view, already 46 years old.

The attraction of this foundation story is not difficult to fathom. The Royal Society acquired deep roots, and prestige as well, from an association with leading figures in the early history of New South Wales. How fitting too it would have seemed to the national pride of New South Welshmen in the 1860s that the eldest among the Australian colonies should be, if not the first colonial scientific society to hold a Royal Charter, at least the oldest scientific society on colonial soil.⁶⁸ More than that, a direct connection to the Philosophical Society of Australasia linked the Royal Society of New South Wales to the earlier body’s culture heroes, Cook and Banks, and to the scientific tradition which had helped drive their discoveries. It also connected the Royal Society to a sanitised version of the colonial past, one which bypassed the less palatable penal origins of New South Wales and had increasing appeal in the decades prior to 1914.⁶⁹

In a paper read to members in 1918, the Royal Society’s second historian, Joseph Maiden, dissented from Clarke’s version of the Royal Society’s origins. Since 1896, when he had organised the replication of the society’s commemorative plaque, Maiden’s investigations into the history of colonial scientific societies had changed his mind about the 1821 society’s significance. It was ‘not historically correct’, said Maiden, for the Royal Society to claim ‘lineal ... or even collateral descent’ from

the Philosophical Society of Australasia. That body was better understood as the Royal Society's 'forerunner' and its 'exemplar'.⁷⁰

Maiden's conclusion was sound. As the first scientific society formed on the Australian continent, the Philosophical Society of 1821–22 deserves recognition and it has certainly been the Royal Society's enduring inspiration. However, the society's claim, then and now, to a foundation date of 1821 cannot be justified.

The Australian Society

Clarke's 1867 assertion rested, as we have seen, on an assumption that the Australian Society, founded in 1850, was the 1821 society revived. There are certainly grounds for perceiving (as did Maiden) a lineal connection between the Australian Society and the Philosophical Society of NSW, later rebadged 'Royal', but nothing of substance links the Australian Society to the Philosophical Society of 1821.⁷¹

The Philosophical Society of Australasia could not have endured until 1850, even in a somnolent state. Ten of the 14 members in 1822 (including Townson) had either died or left the colony by the end of 1832. Among the absentees was Henry Grattan Douglass who had left New South Wales for France in 1828. He returned in 1848, so that in 1850, when the Australian Society was formed, there were only five former Philosophical Society members still living in New South Wales. Just three of these appear in the Australian Society's list of members – Douglass, Alexander Berry and Patrick Hill.⁷² All three men may well have perceived some continuity between the Australian Society and the old Philosophical Society, which perhaps they viewed with mixed nostalgia and regret. But the involvement of these gentlemen in both organisations is hardly proof of Clarke's claim that the two societies, separated by nearly 30 years, were one and the same.

ANTECEDENTS

Certainly, both bodies were committed to the scientific study of colonial resources, but the Australian Society also had much more in common with other learned societies that were active or merely planned during the gulf of years since 1822. Utilitarian science – the practical application of science for *immediate* communal and private good – was in the remit of all of these. Maiden drew attention to these societies in his 1918 address.⁷³

Committed to the improvement of agriculture and animal husbandry, the Agricultural Society of New South Wales had been the first such body and it continued as the Agricultural and Horticultural Society of New South Wales until 1836. Another agricultural society, with a narrower geographical focus, but a similarly practical purview, was founded in Maitland in 1842.⁷⁴ The Hunter River Literary, Scientific and Agricultural Society, later the Hunter River Agricultural Association, was still meeting in 1847. By that time, similar agricultural societies had sprung up in Singleton, along the Hawkesbury River and on the Cumberland Plain.⁷⁵ A new and more specialised body, the Hunter River Vineyard Association, had also been founded in Maitland to concentrate on developing fine wines for export.⁷⁶

Horticulture was the focus of the Australian Floral and Horticultural Association (also called the Sydney Horticultural Association) which was active in Sydney from 1836 to 1848. According to Maiden, this body was supported mainly by professional gardeners, but the Australasian Botanic and Horticultural Society, founded in 1848, counted among its founding members such leading scientific gentlemen as George and William Sharp Macleay, William Macarthur and the naturalist George Bennett, and it had as a formal objective, the ‘promotion of Botanical and Horticultural Science’.⁷⁷ Notwithstanding its professed commitment to pure science, the Australasian Botanic and Horticultural Society also had firmly in its sights ‘the encouragement of the manufactures and productions of the colony’.⁷⁸ In 1856, it would amalgamate with

the Horticultural Improvement Society, formed in 1855, to create the Australian Horticultural and Agricultural Society.

Despite all this activity, what the colony still lacked at mid-century was a learned society whose focus on colonial economic development extended beyond the study and improvement of horticulture and rural industries. Back in 1844, plans had been announced in the colonial press for a new learned organisation to be called the Australian Society for Promoting and Improving Agriculture and Indigenous Arts. ('Indigenous Arts' referred to the craft and trade skills of the colony's European inhabitants.) Envisaged as a solution to the prevailing economic depression, it was intended that this body would apply a range of scientific knowledge and expertise – in chemistry, mechanics, engineering, and natural history – to the development of manufacturing as well as agriculture.⁷⁹ Nothing seems to have come of this bold plan, but the breadth of the organisation's vision foreshadowed that of the Australian Society of 1850.

The Australian Society's focus on the application of science to wide-ranging economic development met a hitherto unfulfilled need, but it also distinguished this newly minted body from the Philosophical Society of 1821. Its longer, official title – the Australian Society for the Encouragement of Arts, Science, Commerce and Agriculture – made its primary goal quite clear.⁸⁰ Cataloguing the colony's natural resources was to be important, as it had been for the society founded in 1821, but greater emphasis was placed on using this knowledge for immediate economic advantage.

The Australian Society's geographic vision also differed from that of its putative 1821 incarnation. The collective gaze of the Philosophical Society of Australasia, as its name suggests, had extended imperially across 'this vast continent and its adjacent regions'.⁸¹ The focus of the 1850 society was more constricted. This word 'Australia' had been coined by Matthew Flinders to denote the continent whose coast he had charted, and was officially adopted with that meaning in Governor Macquarie's

time. Yet in New South Wales around mid-century, the term was still inclined to be slippery. In public rhetoric and private musings, ‘Australia’ could also be used to mean New South Wales alone.⁸² When in June 1851, a speaker at a Sydney election meeting announced to a receptive crowd that, thanks to the recent gold discoveries, ‘Australia ... [would] shortly take its place among the great nations of the earth’, he was not referring to some imagined continental nation. By ‘Australia’ he meant the colony in which his audience lived, as was obvious when he went on to assure them, amid enthusiastic cheers, that ‘they were now no longer the poor neglected colony of New South Wales’.⁸³ A vestige of this mindset would be evident three decades later in the abortive attempt by one old colonist, Sir Henry Parkes, to have the colonial legislature change the name of New South Wales to ‘Australia’.

The differing emphasis of the 1821 and 1850 societies’ respective goals – the collection and distribution of scientific information for long-term imperial use, versus the immediate application of science to issues of local economic development in New South Wales – reflected the way in which the colony’s circumstances had changed during the decades since 1822. New South Wales was no longer a penal settlement with a pre-industrial economy. Convict transportation to this colony had effectively ceased well before 1850, despite an abortive attempt to revive it in altered form during 1849. Meanwhile, schemes for assisted immigration to New South Wales since the 1830s had helped produce a population which by 1850 was dominated by the free (84.3 per cent) and freed (14.2 per cent).⁸⁴

In contrast to the situation in 1821, New South Wales also now had an increasingly literate culture. This was manifest in improving popular literacy, particularly among the young, and in the greater availability of all kinds of printed material, especially books, newspapers and maps, thanks in part to a geographically expanding and well-used postal service. Participation in such a culture was helping to shape the popular imagination

in ways that allowed an increasing number of the inhabitants of New South Wales to feel themselves part of a distinct national community, rooted in an imaginable extent of territory and progressing towards a foreseeable future.⁸⁵ Public discourse around mid-century mirrored this emerging national consciousness – a sense of New South Wales as a colonial nation within the British Empire. The *Maitland Mercury* was appealing to such a perception among its subscribers when in 1849 it urged them to resist the renewal of convict transportation to New South Wales as a matter of ‘national pride’, asking, ‘Are we to be regarded as inferior to the South Australians and the British North Americans?’⁸⁶

Reflecting their colony’s changing character, the inhabitants of New South Wales since 1843 had also enjoyed a measure of representative government in the form of a partially elected or ‘blended’ Legislative Council. In 1850 this body was busy finalising arrangements for establishing the colony’s first university, a project for which Douglass was also a leading advocate.⁸⁷ Greater local legislative control – colonial self-government in some form – was already on the horizon. The Australian Colonies Government Act of 1850 would increase the proportion of elected representatives in the Council, extend the franchise and offer the inhabitants of several Australian colonies, including New South Wales, the opportunity to draw up their own constitutions. As the 1851 election approached, a Sydney newspaper, the *People’s Advocate*, declared that ‘the future of this country depends on the character of the new Legislative Council’ and it urged the colony’s expanded cohort of voters to take ‘an active share in building up the Nation’.

A new colonial nation was emerging and the gentlemen who met at Sydney’s Royal Hotel in January 1850 to plan a new scientific society were convinced that their national progress, as well as their individual fortunes, would rest on New South Wales having a diversified economy. Chastened by the previous decade’s economic depression, which had been caused by

falling wool prices, and confident, as the *Sydney Morning Herald* put it in November 1850, ‘in the undeveloped resources of the colony’, they did not believe that the colony’s ‘prosperity ... [was] always to be based on wool and tallow’. Accordingly, the *Herald* declared, they planned an organisation that would encourage ‘more careful and scientific attention to colonial woods and metal, and ... [induce] colonists to make experiments in the growth of cotton plants and sugar’. ‘[O]ne of the most important objects of the [Australian] Society’, the article continued, would be to consider ‘the means most likely to increase the exports from the colony’. A sub-committee of the organisation was to be formed for that very purpose.⁸⁸

John Fairfax, part-owner of the *Herald*, was a founding member of the Australian Society, and perhaps this article expressed his personal reservations when it went on to say that, ‘[i]n the eyes of many, objects of a more intellectual or purely scientific character’ would be of greater interest.⁸⁹ The surviving archives of the Australian Society are scant, but there is enough evidence in newspaper reports of its activities to show that, while interest in accumulating scientific facts about the colony’s natural resources was not entirely absent from its deliberations, the application of science to local development was central. Douglass may have been a founder and active member of both the 1821 and 1850 societies, but the activities and respective goals of the organisations to which he devoted so much energy, were not quite the same.

The economic development of New South Wales was the priority of most, if not all, the influential, civic-minded men who joined the Australian Society. Among its 40 financial members were senior colonial officials, merchants, public servants, doctors, lawyers, clergy and substantial land holders. Charles Moore, Director of the Botanic Garden, was the only member whose occupation entailed remunerated scientific research.⁹⁰ Charles FitzRoy, the Governor of New South Wales, was the Australian Society’s Patron, but effective executive power was

vested in the organisation's managing Council, which was headed by the Colonial Secretary Edward Deas Thomson, as President, and Charles Nicholson, Speaker of the Legislative Council, as Vice-President. Robert A. A. Morehead, a leading businessman, was Treasurer, and Douglass, the physician, was the new organisation's Honorary Secretary.⁹¹ At least in the social status of its leading members, the Australian Society resembled the Philosophical Society of 1821–22.

The Australian Society's economic focus was clear at the first meeting in June 1850. Fossil bones of the extinct New Zealand moa were the subject of discussion at one point, but the evening had begun with a paper prepared by the Surveyor-General, Thomas Livingstone Mitchell, on 'The Undeveloped Resources of the County of Cumberland'. Talk followed on the need to find local dyes for 'our manufactures', on a beetle whose larvae had proved to be a pest in vineyards, and on the current availability of cedar trees for timber, while a spokesman for the society's sub-committee on fish promised a report on their commercial importance.⁹² It was much the same at the July meeting. The gathering heard a zoological paper describing 'The Argonauts or Paper Nautilus of the Colony', but the bulk of the meeting was devoted to papers on such practical issues as the potential uses of indigenous fruit and grasses (by Mitchell) and the utility of alpacas for meat and wool (by the merchant Thomas Mort). The colony's cedar resources and insects of threat to colonial crops again provoked lively discussion.⁹³ The two meetings reported in 1851 were similarly themed. In January, Mitchell addressed members on his own invention, 'The Boomerang Propellor', and in May, Benjamin Capper, a new arrival in the colony with experience in engineering and invention, discussed 'The Application of Machinery as a Means of Saving Hard Labour'.⁹⁴

As well as encouraging the exchange of information at its meetings, leaders of the Australian Society also cherished an ambitious plan to hold an industrial exhibition in Sydney during October 1851, a colonial version

of the Great Exhibition of international culture and industry which was then being planned for London. Held from May to October 1851 in the Crystal Palace, a plate glass and iron pavilion especially constructed in Hyde Park, the London exhibition set the precedent for similar events elsewhere in Europe and in North America, as well as in the Australian colonies.

Although the exhibition planned for Sydney in 1851 was to be much more modest, Douglass recognised the need to protect any local inventions on display, so he arranged for a petition to the Crown, asking for colonial inventions to be secured by patent under colonial law.⁹⁵ Committees were set up in several municipal wards to gather signatures for this petition, as well as to collect subscriptions to fund the proposed Sydney exhibition.⁹⁶ One Sydney newspaper, the *Empire*, hailed the latter event as ‘an epoch in our history’, seeing it as a means of promoting the development of sorely needed colonial manufactures.⁹⁷ There was support for the exhibition as far away as the Moreton Bay District of New South Wales. By April 1851, a committee had already been formed in Brisbane, and another was being organised at Ipswich.⁹⁸

In November 1850 the Australian Society had announced yet another initiative for encouraging research and innovation.⁹⁹ Three gold medals were to be awarded in mid-1851 and in what seems to have been an attempt (perhaps by Douglass) to link the 1821 and 1850 societies, one medal was named for Governor Sir Thomas Brisbane and another for the current New South Wales Governor, Sir Charles FitzRoy. The Brisbane Medal was to go to the person cultivating the greatest quantity of cotton, and the FitzRoy Medal to the producer of one of several potential exports, including cotton, sugar or ‘metals from colonial ore’. The third medal, simply named the ‘Large Gold Medal’, was promised for the best essay submitted on the subject of native woods. Before and after this announcement, enthusiastic correspondence was received from individuals interested in the production of wine, sugar and paper.¹⁰⁰

A colonial patent law was promulgated in New South Wales during 1852.¹⁰¹ But the Australian Society's other ambitions came to nothing. Awarding the medals, scheduled initially for June and July 1851, was put off until October to coincide with Sydney's proposed industrial exhibition, but this too failed to materialise.¹⁰² Two years later, the unclaimed portion of the subscriptions raised by committees based in municipal wards, a sum of £95, 4 shillings and 6 pence, was donated to the Miller's Point Asylum for Destitute Children.¹⁰³ In 1852, the *Empire* dubbed the Australian Society a 'scientific abortion', maintaining that it had held meetings on just 'three short nights'.¹⁰⁴ This rather jaundiced assessment of the society's achievements may have been coloured by the exclusion of that paper's reporter from its May 1851 meeting, an insult exacerbated when a report on its proceedings appeared in the rival *Herald*.¹⁰⁵ In fact, the Australian Society had held five meetings, that of May 1851 being the last.¹⁰⁶

Significantly, this final meeting occurred in the same month that news reached Sydney of the gold discoveries near Bathurst. By mid-May, gold hysteria had taken hold in Sydney. The streets were filled with people and vehicles heading west to the Blue Mountains, with one observer, who watched their progress through Parramatta, likening the gold seekers to refugees fleeing a plague-infested city.¹⁰⁷ The social and economic disruption clearly proved too much of a distraction for Australian Society members, at least in the short term. A year later there was talk of rejigging the society, but it came to nothing.¹⁰⁸ Perhaps members' energies were exhausted in the ferment of colonial politics during the first half of the 1850s. Elections for the 'blended' Legislative Council began in September 1851, their significance being enhanced by recent extensions to the franchise. There was controversy too over the character of the colony's new constitution, whose design was in the hands of a Legislative Council select committee that included several members of the Australian Society, not least its Secretary and President.

A New Scientific Society

The necessary impetus for a resumption of organised scientific activity in Sydney finally came in 1855, with the arrival of the colony's new Governor, Sir William Denison. A skilled engineer and knowledgeable conchologist with an interest in other aspects of natural history, Denison was fresh from Tasmania where he had managed to reinvigorate the Royal Society of Van Diemen's Land. Once in Sydney he wasted little time in making known his desire to accomplish something similar in New South Wales.¹⁰⁹ In June, Denison summoned the remaining Australian Society members to a meeting at the Royal Hotel, where they agreed to the society's reorganisation under Denison's presidency and formed a sub-committee to make the necessary arrangements.¹¹⁰

Once again colonial politics intervened, but in May 1856, when elections for the colony's new Legislative Assembly were finally over, the Philosophical Society of New South Wales, as the new organisation was called, held its first general meeting.¹¹¹ Senior officers in the Australian Society continued their influence in the new body. The Philosophical Society had a new vice-regal President in William Denison, but Nicholson and Deas Thomson were appointed joint Vice-Presidents, with Douglass and Morehead continuing in their former posts as Secretary and Treasurer. The Australian Society's remaining funds – £88 – also became the property of its successor. Thus, despite the Australian Society's apparent torpor over the years since 1851, substantial administrative and financial continuities lend weight to part of Clarke's account of the Royal Society's history. The Australian Society was the body out of which the Philosophical Society of New South Wales was formed.



PRACTICAL PHILOSOPHERS

Governor Denison's enthusiasm for science and scientific societies was largely well received in Sydney, but some of the inhabitants had reservations. *Bell's Life in Sydney*, a popular sporting paper, probably spoke for many of its subscribers when it questioned whether, in the years to come, 'his scientific Excellency' would be remembered merely as 'the founder of an Antiquarian Association' or whether, as the paper hoped, he would prove to be a 'practical philosopher' and 'write his name on the Railways, the Electric Telegraph, and the Fortifications of New South Wales'.¹ The conservative *Sydney Morning Herald* was much more confident about the Governor's priorities and the learned society he was proposing to reorganise. 'We understand', its editor announced in February 1855, 'that His Excellency has signified his wish that the Australian Society ... should be at once revived', and that its original objective – developing the 'resources of the colony' and augmenting 'its wealth by increasing its Exports' – would now be 'practically and fully carried out'.²

In fact, science for Denison was much more than a private intellectual indulgence. It was also an instrument of public policy. By the 1850s the

notion that governments should make use of up-to-date scientific expertise, was the coming idea. This followed trends in Britain. The Public Health Act, passed there in 1848, had followed a government inquiry whose report employed statistical analysis to link the incidence of disease and death among the British working classes to their unsanitary living conditions.³ The author of that report, Edwin Chadwick, was subsequently appointed first Director of Britain's new Board of Health. In New South Wales and Victoria, revenue from gold mining provided governments with the means to pay for scientific expertise. This was especially true in the younger, southern colony where the gold fields were more lucrative. A comprehensive geological survey of Victoria was launched in 1852 and the following year, William Henry Archer was appointed that colony's Registrar-General, tasked with collecting and analysing the demographic and economic statistics necessary for informed government decision-making. Robert Ellery became Government Astronomer in 1853, and Ferdinand von Mueller was appointed Government Botanist the same year. In 1856 Frederick McCoy was made Government Palaeontologist and in 1858 Robert Brough Smyth was put in charge of meteorological observations at Melbourne's Flagstaff Observatory. From 1858 a Board of Science advised the Victorian government on scientific and technical matters, especially mining, and a Board of Agriculture oversaw the government's own experimental farm.⁴

Incorporation of science within the bureaucracy of government occurred more slowly in New South Wales. A salaried geologist, Samuel Stutchbury, had surveyed the colony's mineral resources between 1850 and 1855, but once Denison took office there were new initiatives. Within a year he appointed Christopher Rolleston as the colony's first Registrar-General and plans were soon in train for building a government observatory in Sydney. Both Rolleston and the newly appointed Government Astronomer, the Reverend William Scott, joined the Philosophical Society of New

NSW Governor Sir William Thomas Denison fostered formation of the PSNSW. Photograph by Freeman Brothers, 1859. SLNSW.



South Wales, an organisation which fitted nicely with Denison's belief in the value of scientific expertise to government. In Denison's view, the Philosophical Society's role was to encourage such research – to help generate and publicise useful information which the local colonial government and imperial authorities could use. The research in question should, however, be strictly empirical. As Denison advised members in his 1858 Presidential Address, the 'object of the Society was to collect facts, for other persons to reason from'.⁵ This sort of fact-gathering was then considered the proper role of scientific activity in Britain's colonies, because it 'fertilized overseas learning'.⁶

Utilitarian Science

Those who, like *Bell's Life in Sydney*, had doubts about the utilitarian value of Denison's scientific society would have been relieved to read, in

a report of the Philosophical Society's first meeting, that Denison had delivered a paper entitled, 'A Brief Outline of the Development of the Railway System in England, with suggestions as to its application to the colony of New South Wales'.⁷ Papers similarly focused on questions of colonial development were delivered at two following meetings. Vice-President Edward Deas Thomson spoke in June on 'Applications of Steam Power' to the Australian passenger trade.⁸ In July, attention returned to railways. William Pennington discussed the means of their construction and America-born Morris Birkbeck Pell, Sydney University's Professor of Mathematics and Natural Philosophy, gave his opinion on the way that railway construction in the colony should be funded, in a paper entitled, 'The Application of Certain Principles of Political Economy to the Question of Railways'.⁹

Indeed, the Philosophical Society of New South Wales proved to be nothing so impractical or backward-looking as an antiquarian association. Neither were its interests as eclectic as some of the provincial societies in Britain. Its formally stated purpose was to receive at meetings, 'original papers on subjects of science, art, literature and philosophy', but in practice science prevailed, with a strong focus on the application of science, including mathematics, to practical issues of colonial development.¹⁰ Such an emphasis favoured broader imperial interests, but was important too for an emerging colonial nation.

During the 11 years prior to the Philosophical Society's rebadging as a Royal Society, only one paper delivered before it, a discussion of Indian temples, lacked any real relevance to the national interests of the inhabitants of New South Wales.¹¹ Even an 1862 paper on the 'Climate and Capabilities of the Fiji Islands' had implications for the colony's trading interests. Philosophical Society members discussed questions of communal well-being, such as water quality, sanitary conditions, pavement construction and food supply, and matters of economic importance, including mineral

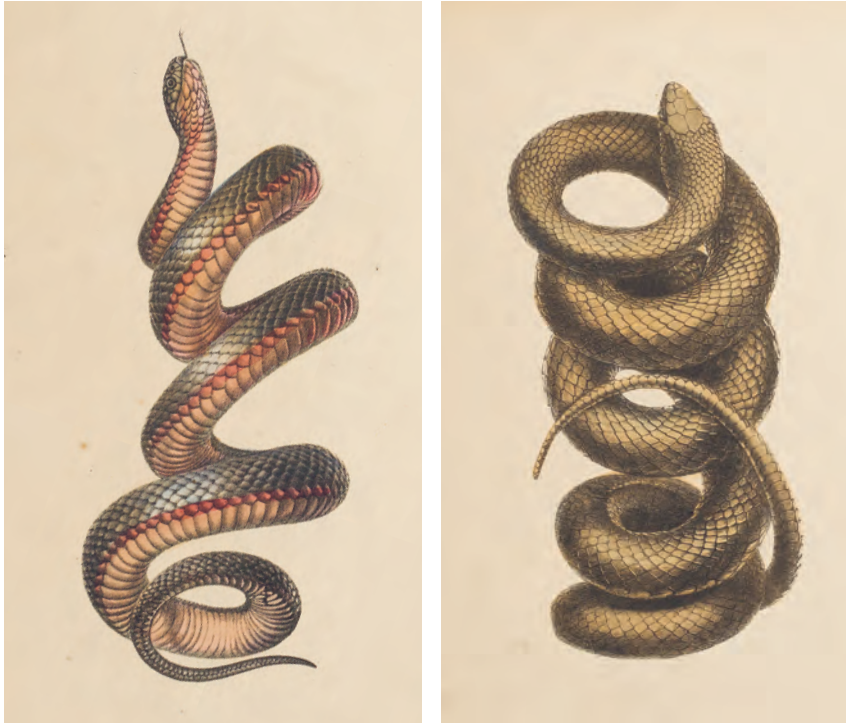
resources, currency, banking, superannuation and life insurance. On the agenda too was the application of new technology such as the electric telegraph and photography, which was the hobby of a number of members.

It may have required some higher learning to appreciate the local relevance of two papers read before the Philosophical Society by the engineer Martin Gardiner – ‘Improvements in Geometric Science’ (1862) and ‘Improved Analytical Geometry’ (1864) – but the practical colonial application of his exposition on ‘The Correct Scientific Method of Determining Railway Curves’ (1863) was quite clear. The Australian Museum Curator Gerard Krefft’s description of the habits and geographical range of ‘Frogs and Reptiles Found in the Neighbourhood of Sydney’ (1863) certainly spoke to colonial anxieties, as did expositions by medical members on the ‘Poison Apparatus of Venomous Snakes’ (Alfred Roberts, 1857 and 1858) and ‘Snake Bites and their Antidotes’ (Dr Julius Berncastle, 1863).¹² Several presentations on the subject of comets also had much more than esoteric interest among a colonial population made uneasy by the appearance of several of these ‘heavenly visitors’ during the 1850s and early 1860s.¹³

Membership

Of course, the subject matter of papers read before the Philosophical Society was also influenced by the skills and interests of their authors. These included expert amateurs, such as the solicitor William Pennington who gave an alternative opinion to Pell’s on the financing of railways, and the aforementioned Reverend William (W. B.) Clarke, Rector of St Thomas’s Church, North Sydney, who spoke on the geology of Australasia, including the occurrence of gold and other metals.¹⁴ But nearly half the men who addressed the Philosophical Society’s meetings spoke on subjects related to the area of science from which they earned their

PRACTICAL PHILOSOPHERS



Left, Black Snake by Helena Forde (née Scott). Right, Brown Snake by Harriet Scott. Both illustrations are from *Snakes of Australia* (1868) by Gerard Krefft, who had discussed his research at a Philosophical Society meeting in 1863. SLNSW.

living. Sydney photographers Frank Haes and James Freeman each gave a paper on the usefulness of their profession for medical practitioners, and medical men Isaac Aaron and William Williams expanded on such public health issues as sanitary reform and the adulteration of Sydney's milk supply. Other speakers shared their expertise in the science they practised as government employees. Christopher Rolleston, the colony's Registrar-General, discussed the latest statistics on mortality in Sydney (1858), agricultural production and food supply (1864) and the state of the colony's economic resources (1866).¹⁵ Martin Gardiner had designed bridges for

the Railways Department and was later Sydney's City Engineer, while Edward Orpen Moriarty, who discussed improvements in the navigation of the Hunter River (1861), was an engineer with the Harbours and Rivers Department.

George Smalley, Scott's successor at the observatory from 1864, was another science professional among the membership, as was Krefft, the Australian Museum's Curator, who joined in 1862.¹⁶ Krefft's predecessor, William Sheridan Wall, had become a member at the society's second general meeting.¹⁷ The long tradition of expert gentlemen amateurs in science had not yet passed and the generation of new knowledge via research was still largely unremunerated. Nevertheless, the occupations and often formal qualifications of the government employees named above reflected an emerging trend towards professionalisation in science, as more paid positions requiring scientific expertise became available in the public service and government-sponsored institutions.

Sydney University personnel were active in the society's work from the beginning. Professors Morris Pell and John Smith (inaugural Chair of Chemistry and Experimental Physics at Sydney University) were early Philosophical Society members, as was the Reverend John Woolley, Principal of the university and its Professor of Classics. Smith was appointed one of the society's first Honorary Secretaries, while Pell and Woolley were members of its initial managing Council. Smith and Pell had an extended involvement with the Philosophical Society and its successor, but Woolley's connection ended prematurely in January 1866 when he drowned during a shipwreck in the Bay of Biscay, while returning to the colony after a visit to England. As the century progressed, the contribution of Sydney University staff to scientific activity in New South Wales would grow significantly.

Philosophical Society membership was also swelled by the science professionals staffing a third institution established in Sydney during the

PRACTICAL PHILOSOPHERS



Morris Birbeck Pell was Sydney University's first Professor of Mathematics and Natural Philosophy. He served on the Councils of the PSNSW and the RSNSW. Sydney University.



John Smith was the first Professor of Chemistry and Experimental Physics at Sydney University. Smith joined the PSNSW and was twice President of the RSNSW. This photograph is believed to be a self-portrait. Sydney University.

John Woolley, first Principal and Professor of Classics at Sydney University, was a Council member of the PSNSW. He drowned in the Bay of Biscay after a visit to Britain. Sydney University.



1850s, the Sydney branch of the Royal Mint.¹⁸ Its Deputy-Master, Captain Edward Wolstenholme Ward of the Royal Engineers, had cooperated with his fellow Royal Engineer, Governor Denison, in founding the Philosophical Society and, with Ward's encouragement, a number of Mint employees applied to join. Among them were Joseph Trickett, another engineer, William Stanley Jevons, who was employed as an assayer, and the chemist Robert Hunt. All were elected at the second meeting. Assayers Francis Bowyer Miller and Henry Augustus Severn joined later, as did the Mint's German chemist, Dr Carl Adolph Leibius, who joined the Philosophical Society in 1859 and would play a crucial role in revamping its successor.

In keeping with his professional interests, Miller read a paper on 'The Detection of Spurious Gold' in 1860, but not all the Mint employees who provided papers for Philosophical Society meetings actually spoke on



Royal Mint building, Macquarie Street, Sydney. Captain Edward Wolstenholme Ward, Deputy-Master of the Mint, cooperated with Governor William Denison to found the PSNSW and several Mint employees joined the society. SLNSW.

subjects related directly to their employment. The scientific interests of Miller's fellow assayers, Jevons and Severn, were broader than the chemistry they practiced in their work.¹⁹ Severn, whose areas of expertise included electricity, mechanics, photography and astronomy, spoke in June 1859 on 'The Construction of Specula for Reflecting Telescopes', while Jevons offered the society information about a new sun gauge and his ideas on the formation of clouds.²⁰

Organisation

Philosophical Society members organised themselves much as learned societies had long done in Europe – with 'formal rules, public meetings and public accounts'.²¹ The society's rules were fairly straightforward.

General meetings were set down for eight o'clock on the second Friday evening of each month from May to December, a meeting of the Council of Management being convened during the week prior to each meeting. The Governor of New South Wales was to be President *ex-officio*. Other officers, elected annually at a general meeting in May, consisted of two Vice-Presidents, an Honorary Treasurer, at least two Honorary Secretaries and six other Council members.

Annual membership subscriptions were set at one guinea, payable by May, but £10 would secure Life membership. New members had to pay an additional one guinea entrance fee. Thirty days notice would be given to members in arrears with their subscriptions, after which their resignation would be assumed. Provision was also made for managing the society's funds and auditing its accounts.²²

Visitors could be admitted to Philosophical Society meetings only under specified conditions, and strict rules governed membership. Applicants (assumed to be male) had to be nominated and seconded by existing members at a general meeting and balloted for admission one month later. One negative vote in five was sufficient to exclude them. Successful candidates were to be formally introduced to the Chair at the first meeting they attended as members.

Expertise in science was by no means essential for acceptance by the Philosophical Society.²³ In addition to a number of expert amateur and professional scientists, its membership included parliamentarians, the Government Printer, lawyers, businessmen, journalists, artists, and clerks.²⁴ So what was the purpose of the Philosophical Society's scheme for vetting membership applications? No reason is given in its surviving records, but shared assumptions do not need to be explained, and it seems reasonable to conclude that the founders hoped to restrict the society's membership to gentlemen, much like themselves.

Local conditions favoured wealth creation and the presence in the colony of many self-made men heightened sensitivity to class.²⁵ With no clear distinction possible in the colony between income derived from landed assets and that which came from trade, the category ‘gentleman’ was rather slippery. Excluding from it those who earned a living by physical labour was another conventional standard not always easy to apply. Young men with capital, education and even aristocratic connections, who worked hands-on to establish themselves as pastoralists, might reasonably expect to be considered gentlemen too. According to historian Penny Russell, ‘the growing fluidities of the English class system were reproduced and intensified’ in the colonies and in the absence of any ‘reassuring order’, ‘manners *mattered*’.²⁶ In other words, what counted for determining a man’s gentlemanly status was his conformity to notions of middle-class character and behaviour.²⁷

Insisting that applicants for Philosophical Society membership were vouched for, and allowing time for objections to be raised, were ways to ensure that existing members would continue to enjoy congenial company. As a precaution against errors in such a subjective selection process, members who proved ‘obnoxious’ could be expelled by majority vote.²⁸ This sanction was never implemented by the Philosophical Society, nor by its successor during the decades up to 1914. Either the vetting system was efficient, or else informal ways were found for freezing out a member who proved unsuitable.

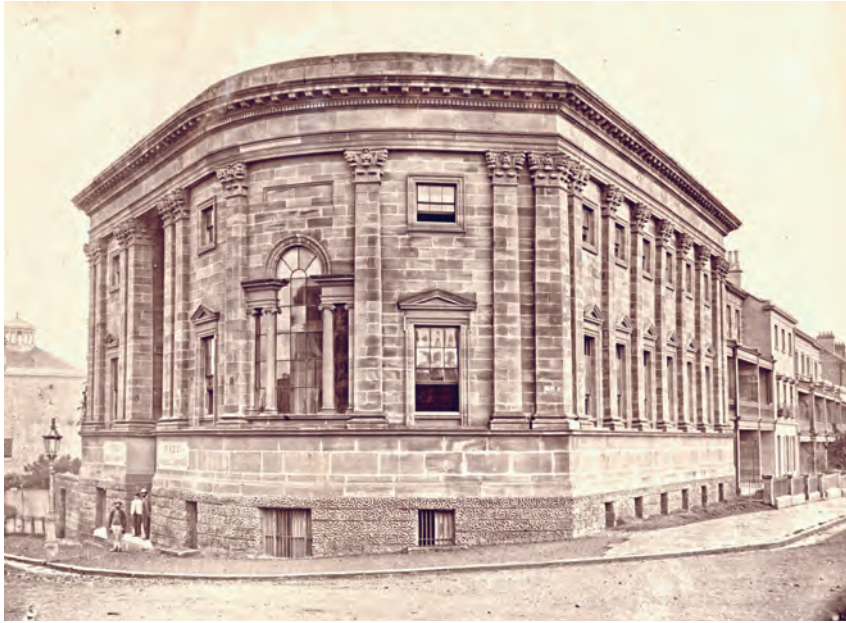
Over time the Philosophical Society evolved. The venue for its meetings was far from fixed since the society had no premises to call its own. Initially members met at the Sydney Mechanics’ School of Arts, but by the third general meeting the society was using the hall of the Australian Library and Literary Institution (originally the Australian Subscription Library) on the corner of Macquarie and Bent Streets, Sydney. The day originally set down for monthly meetings changed too. In August 1859 members



Sydney Mechanics' School of Arts in Pitt Street, where the first meeting of the PSNSW was held in 1856. SLNSW.

supported a proposal by the Vice-President, Edward Deas Thomson, to alter this from the second to the third Friday of the month, but two years later they voted unanimously to return to the old arrangement.

Arguably a more significant change in the Philosophical Society's organisation was the Council's decision in 1858 to recruit a remunerated Assistant Secretary. Twenty-seven-year-old English immigrant William Henry Catlett, a keen amateur botanist who had joined the Philosophical Society in 1856, took up this position in May at a salary of £60 per annum.²⁹ Then in May 1859, Denison suggested to members that they form specialist committees 'for the purpose of jointly carrying on investigations in particular branches of science'.³⁰ When he told them that he was currently

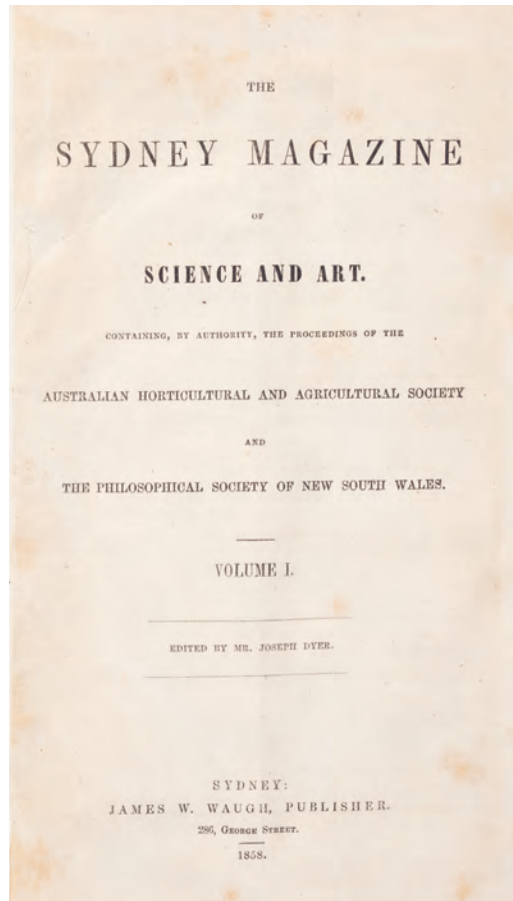


Australian Library and Literary Institution at Macquarie and Bent Streets, where the PSNSW and later the RSNSW met until 1869. Photo by Charles Pickering, 1871. SLNSW.

conducting ‘microscopical observations with a view to an investigation into the dental system of molusca [sic]’, members immediately authorised the formation of a Microscopical Committee.³¹ Its meetings (additional to the general meetings) would cater for the special interests of members who were fascinated by the possibilities that microscopes offered in several fields of scientific endeavour, including medicine.³² Initially eight men joined the Microscopical Committee. By the general meeting in June 1859, it had already met twice at Government House and had recruited six more members.³³ But interest waned the following year, when five of the scheduled meetings had no quorum, and in 1861 the Microscopical Committee ceased to meet altogether.

KNOWLEDGE FOR A NATION

The Sydney Magazine of Science and Art, edited by Joseph Dyer, published papers read before meetings of the PSNSW from 1857 to 1859. SLNSW.



Disseminating Scientific Information

Publication of the Philosophical Society's proceedings was important because it disseminated the scientific information assembled by the members. It also demonstrated publicly the worthiness of the organisation's activities and thus had potential to attract additional members. Initially the society relied entirely on the local press to make its proceedings known to a wider public. John Fairfax, proprietor of the *Herald*, was a member, as were the paper's editor, the Reverend John West, and Andrew

Garran, a *Herald* journalist. The *Herald* and its nearest competitor, the *Empire* – both dailies – reported the Philosophical Society's proceedings and published, verbatim or in summary, some of the papers read before it. Other newspapers were free to copy these reports, which could be read from time to time in country New South Wales and in other Australian colonies.

In May 1857, however, the Council decided to pass on abstracts of the society's proceedings, including papers considered suitable for publication, to James Waugh, the publisher of a proposed new monthly scientific journal, the *Sydney Magazine of Science and Art*.³⁴ Its editor, Joseph Dyer, was elected to the Philosophical Society at the next monthly meeting.³⁵ He was also a member of the Horticultural and Agricultural Society of New South Wales, which reached a similar arrangement with Waugh.³⁶ The transactions and papers of the two societies took up much of the magazine. The remaining space was filled with relevant extracts from other publications, editorial opinion, letters to the editor and the statistical tables supplied by two Philosophical Society members: monthly returns of colonial deaths and their causes, provided by Rolleston, and meteorological data, compiled by Jevons.

The impetus for publishing in this journal had not come from the Philosophical Society itself, which appears merely to have accepted Waugh's proposal. The idea for such a journal may well have originated with Dyer, who was perhaps inspired by the example of the Reverend Ralph Mansfield, half-brother of Dyer's father-in-law, Samuel Worthington Mansfield, and founder of the *Australian Magazine or Compendium of Religious, Literary and Miscellaneous Intelligence*, published in 1821–22.³⁷

Dyer already had experience in journalism and throughout his residence in the Australian colonies he exhibited seemingly boundless energy and enthusiasm for promoting Sydney's cultural and intellectual life. The son of a London clergyman and a colonist of just a few years standing, Dyer was soon to be appointed Secretary of the Sydney Fire Insurance

Office.³⁸ Earlier he had been a reporter for the *Empire* and in 1855 had succeeded Samuel Mansfield as Secretary of the Sydney Mechanics' School of Arts, where Dyer had already delivered lectures on aspects of literature and music.³⁹ The School of Arts and the Philosophical and Agricultural Societies were not the only cultural organisations in which Dyer was active during his time in Sydney. He later became Honorary Secretary of Sydney's Vocal Harmonic Society and from there, Secretary of the committee which organised the five-day music festival held in mid-1859 to celebrate the opening of the university's Great Hall.⁴⁰ Farewelling Sydney in 1858, the *Sydney Morning Herald's* columnist 'Peter Possum' (Richard Rowe) captured something of Dyer's restless energy (and alluded to his learned society membership) when he depicted 'secretary-savant Dyer' as a familiar figure on Pitt Street, 'dashing hither and thither in a superbly swinging Hansom'.⁴¹

Articles about Dyer, his own published pamphlet, and his frequent correspondence with the colonial press publicised his numerous, if not always practicable, inventions and improvement schemes. Among these were free public libraries, an aerial railway, an innovation for fighting shipboard fires, improvements to the electric telegraph and, in 1868, a 'Grand International Exhibition' to celebrate Captain Cook's 'discovery' of Australia.⁴² A year after joining the Philosophical Society, Dyer also proposed an improvement there, but his motion that the society award a medal for the best essay on a street plan for Sydney, was voted down.⁴³ The *Sydney Magazine* was one project Dyer did manage to have implemented, at least for a time.

The *Herald* welcomed the appearance of the *Sydney Magazine's* first issue and hoped it would be more successful 'than monthly publications in this city' had been 'hitherto'. But it added that since the magazine was unlikely 'to be extensively circulated among the general public', it was 'all the more necessary that the members [of its patron societies] ... render

it their utmost support'.⁴⁴ Mere 'acquiescence', in other words, was not sufficient, as time would prove. The *Sydney Magazine* was published in 24 monthly parts between July 1857 and June 1859, although on two occasions during 1859 two parts were combined in a single issue, a sure sign that the magazine was in difficulties.

Dyer argued that the Philosophical and Agricultural societies obtained significant advantage from publishing in his magazine. In the 'daily journals', he maintained, members' papers had previously been 'buried by the more exciting topics of the day', and also 'rendered useless for the purpose of reference by the ephemeral character of the medium'.⁴⁵ The *Sydney Magazine's* circulation also extended beyond the city boundaries where 'many residents', according to Dyer, had 'derived valuable information' and acknowledged this 'in local journals'.⁴⁶ In the October 1857 issue, Dyer directly addressed several country readers. Charles Grant Robinson of Duntroon on the Limestone Plains, southwest of Sydney, was thanked for the mineral specimens he had sent for expert examination, while an anonymous 'JB' of Bathurst was asked to send more information 'on silk cultivation'.⁴⁷

Nevertheless, as Dyer readily admitted, the circulation of the *Sydney Magazine* could not match the size and reach of some Sydney newspapers. It was also true that his monthly publication could not bring accounts of the two learned societies' proceedings as quickly before the reading public. This deficiency was exacerbated by Dyer's early practice of devoting space to papers that had already been published in newspapers before the *Sydney Magazine* commenced publication. Papers read before the society in 1856 – John Smith's on lead contamination in Sydney's water and Edward Moriarty's on the Parramatta Waterworks – were both duplicated this way.⁴⁸ Meanwhile, daily newspapers like the *Herald* and the *Empire* continued to report on Philosophical Society meetings

soon after their occurrence, publishing summaries of the discussions and sometimes entire papers.⁴⁹

The *Sydney Magazine*'s decline was mirrored in the gradual withdrawal of its advertisers. Eight pages of the first issue had been filled by notices from Sydney tradesmen and small businessmen – auctioneers, nurserymen, a bedstead-maker, an 'Artist in Hair', a saddler's ironmonger, and a firm of jewellers and opticians – all presumably hoping to attract business from the well-to-do gentlemen expected to read the magazine.⁵⁰ There were 10 pages of advertisements in the August issue, but advertisements and their accompanying revenue gradually contracted, so that by the end, most advertisements in the magazine were those promoting Waugh's own business.⁵¹

As early as May 1858, Waugh asked the Philosophical Society's Council for financial assistance in reproducing the illustrations accompanying its papers. He also informed them that the price of a yearly subscription had risen from 12 to 15 shillings. The Council agreed to contribute to the cost of illustrations, but it reduced the society's subscription from 25 to 15 copies.⁵² In doing so, it very likely hastened the *Sydney Magazine*'s collapse the following year.

Not long after the magazine's demise, John Fairfax seized the opportunity to ask the Philosophical Society's Council to grant his newspaper the exclusive right to publish the society's proceedings. The Council refused.⁵³ When Fairfax subsequently declined to pass on to the *Empire* details of the society's recent meeting, Catlett followed the Council's instructions to deny the *Herald* access to this information and pass it directly to the rival *Empire*.⁵⁴ Apparently responding further to Fairfax's obduracy, the Council also resolved that the society would buy three copies of any newspaper which published its papers.⁵⁵ In the following two months the *Herald* merely published brief notices about the society's meetings and one short paper on the adulteration of milk.

This had been presented before the Microscopical Committee back in July and was apparently in the *Herald*'s possession already.⁵⁶ By November 1859, however, Fairfax seems to have given up his push for exclusivity and his paper once again published detailed accounts of the Philosophical Society's proceedings.

By the 1860s, members were considering ways to establish a scholarly publication. Previously, the Philosophical Society had produced in pamphlet form an annual compilation of the titles of papers given at meetings, along with a list of the members and a copy of the rules. In 1864, however, the Council appointed a sub-committee to review all the society's proceedings since 1856, in order to select suitable papers for publication in a journal of its own.⁵⁷ The project was several years in the planning, and when at last this publication did appear, the Philosophical Society had already been reorganised and rebadged 'Royal'.

Decline

The Philosophical Society's metamorphosis to a Royal Society, completed by the end of 1866, was a response to the drastic decline in the membership of an organisation which had been inaugurated with such enthusiasm and hope, just a decade earlier. At the Philosophical Society's numerously attended initial meeting in May 1856, over 90 men had applied to become members and after 12 months, membership totalled 134.⁵⁸ By May 1858, there were 174 members and receipts during the previous 12 months from membership and entrance fees – the society's principal income source – had reached a little less than £205.⁵⁹ Flush with funds, the society purchased four government debentures worth £100 each.⁶⁰

However, membership growth and the Philosophical Society's annual income never again reached the levels attained during its first two years. Indeed from 1860 onwards, an average of less than eight new members were

added to the rolls per year. Even more worrying, established members were neglecting to pay their subscriptions on time. This problem had begun quite early. More than a third of members were in arrears by November 1858, when the Council decided to instruct a debt collector to exert more pressure on defaulters.⁶¹ The pressure on society finances resulting from slow membership growth and unpaid subscriptions increased during the 1860s. Income from subscriptions and entrance fees was a mere £114 in the 12 months prior to May 1863. In a similar period two years later, it was £59, forcing the society to reduce the Assistant Secretary's salary by £10 per year and to begin selling its debentures just to keep the organisation afloat.⁶² At the beginning of 1866, it was overdrawn at the bank by more than £33. Only one new member joined in the following 12 months, and the income from subscriptions and fees for the 12 months prior to 1 May 1867 was less than £44.⁶³ Clearly many members had lost interest and considered themselves to have resigned. This parlous situation drew a bitter joke from one unnamed member, who suggested that perhaps they should wind up the Philosophical Society, sell the rest of its debentures, and hold 'a grand picnic with the proceeds'.⁶⁴

An Entomological Society formed in Sydney during 1862 had potential to draw away some Philosophical Society members. But this new body also failed to thrive. Its meetings were suspended between May 1865 and December 1866, occurring just sporadically thereafter, until they ceased completely in 1874, when the Linnaean Society, which focused more broadly on natural history, took the Entomological Society's place.⁶⁵

Despite these difficulties, the Philosophical Society's falling membership was not necessarily due to a dearth of interest in organised scientific activity. The enthusiasm that drives the formation of any voluntary organisation can wane when the time and effort required to maintain it, become onerous. The Philosophical Society may also have contained the seeds of its own decline from its inception. As early as September 1856, one

of its earliest and youngest members, 21-year-old Jevons, wrote to his sister in England, declaring that, ‘on the whole’ the new Philosophical Society was ‘a decided failure’. It was, he said, ‘too much under the thumb of the RE’s [sic]’.⁶⁶ He meant Denison and his fellow Royal Engineer, Captain Ward. It was ‘as if the public were permitted to sit at a distance and hear them talk’, Jevons complained, ‘which is not the right thing in a Scientific Society where all should be on an equal footing’.⁶⁷ Jevons, who would later become an economist and logician at the universities of Manchester and London respectively, was highly intelligent, intellectually curious, and full of original ideas on a variety of subjects from meteorology to political economy. Not only did he collect and publish detailed data concerning Sydney’s weather, but he also conducted his own socio-economic survey of the poorer areas of Sydney.⁶⁸ Jevons’ resentment at the dominance of older men in the Philosophical Society is understandable, and might have been relieved later, at least to some degree, when he was invited to prepare papers of his own to be read at meetings.

But the Philosophical Society continued to be dominated by a relatively small group of influential members. Each year the Council presented a list of nominations to positions on the Council, and each year members at the society’s annual general meeting rubber-stamped their choices. From 1856 to 1866, the Philosophical Society’s two Vice-President positions were filled by just three men: Edward Deas Thomson (1856–1866), Sir Charles Nicholson (1856–1857) and the Reverend William Clarke (1858–1866). Six men held office as Honorary Secretary, which was initially three posts, and the Treasurer’s position changed hands just once. The scientific activities of the society were also dominated by a few. Thirteen of its Executive officers and other Council members provided nearly half the papers read before its meetings. Of these, Krefft provided seven papers, while Denison and Christopher Rolleston read six each.

Such a concentration of power and influence clearly had potential to alienate some Ordinary members, just as it had Jevons, and was a likely factor in membership decline. In August 1858, the voting down of Dyer's proposal for an essay prize had prompted the politically liberal *Empire* newspaper to comment on the power monopoly in the Philosophical Society in a manner which suggests that its editor was aware of some member discontent. While pronouncing Dyer's idea as 'nearly useless' and 'bordering on the absurd', the *Empire* nevertheless congratulated him for asserting 'his position and power as ... [an Ordinary] member', adding with rhetorical hyperbole, that '[t]he officers of the Society' were no more elective than 'the Emperor of the French, and his Senate'.⁶⁹ In the *Empire*'s view, the way the Royal Society was governed seemed out of step with liberal democratic ideas that were gathering strength in colonial politics at this time. A form of manhood suffrage for the election of members to the colony's Legislative Assembly was introduced in New South Wales in 1858. Then in 1861, a liberal-dominated Assembly asserted its power over conservative members of the colony's unelected Legislative Council in order to pass new legislation governing the alienation of Crown land, which was designed to disrupt its monopoly by the so-called 'squattocracy'.

The *Empire* acknowledged the scientific qualifications of members of the Council and admitted much was owed to them for rescuing the Australian Society 'from the depths of oblivion', but it was time to give the members more encouragement. A new rule should be instituted, the *Empire* suggested, requiring 'say one-half' of the Council to retire each year and remain ineligible for re-election for at least 12 months thereafter. Furthermore, when an Ordinary member moved a motion, Council members should 'abstain from expressing ... authoritative opinion'. In this way 'much of the hurtful exclusiveness would thus be removed', declared the *Empire*, and members would feel 'as they do not at present, that in reality they *are themselves the Society*'.⁷⁰

The power imbalance in the Philosophical Society contributed to the organisation's difficulties in another way. It meant that its ongoing viability depended entirely on the enthusiasm and energy of the same few men. Until 1860 when his governorship ended, Denison seems to have provided a good deal of the necessary impetus. Meetings of the Microscopical Committee, which he had initiated, ceased when Denison's term as Governor concluded in 1860. Yet Denison's departure from the colony was not sufficient in itself to explain the Philosophical Society's near collapse. It simply exacerbated an existing problem.

Records of Council meetings reveal that the handful of men who had assumed responsibility for guiding the society had begun losing interest or losing heart much earlier than 1861. Of the 42 Council meetings scheduled between June 1856 and December 1860, 10 were attended by just three Council members (the minimum required for a quorum) and at three others there were insufficient present to hold a meeting at all, with only one councillor (and Catlett as Assistant Secretary) attending in each case. Thereafter the situation deteriorated. At 16 of the 61 meetings held from January 1861 to November 1866, just three councillors attended, and at 20 meetings, no quorum could be mustered at all. Occasionally when this happened, a replacement meeting would be reconvened, but more often the one or two members attending did their best to organise speakers for the coming general meeting, assisted by the society's paid Secretary.

Members' attendance at general meetings was also falling. On one occasion only the Governor (Sir John Young), John Smith, and the scheduled speaker bothered to come.⁷¹ Overt disenchantment among the members no doubt sapped the enthusiasm of the Council, but a passive Council would also have taken its toll on member numbers. It is notable that no elected officer managed to be present at all, or even most, Council meetings. The decisive role that even one or two visionary and dedicated

executive members could play in revitalising a learned society would be demonstrated during the 1870s and 1880s.

Reform

The Philosophical Society's leaders identified a very different reason for their organisation's decline when they finally took remedial action. In July 1865, a two-man sub-committee was formed to consider the problem and devise a solution.⁷² Its members – George Smalley of the observatory and Dr Edward Bedford, medical advisor to the colonial government – reported to the Council in September with a proposal for change which was enthusiastically adopted. They attributed the society's difficulties to its faulty public image. Shrinking membership could not be attributed to public 'indifference to Art and Science', it was argued, but rather to a mistaken belief in the community that discussions at the Philosophical Society's meetings were 'abstruse and abstract' and produced 'no general or useful results'.⁷³ It was necessary therefore to make 'some effort ... to restore ... [the society's] vitality and raise it to that importance and useful position which it ought to occupy'. Changing the society's title from 'Philosophical' to 'Royal' would achieve this goal.⁷⁴ In other words, the proposed rebadging of the Philosophical Society was, according to historian Roy MacLeod, 'an attempt to revive the society's image by promoting it, not as an amateur, frock-coated, mildly eccentric club of middle-aged gentlemen who liked to talk about rocks and stars, but as an "improvement" society'.⁷⁵ Left unsaid was the potential for the prestigious title 'Royal' and its implied comparison with the Royal Society of London, to attract new members.

Smalley and Bedford also proposed some other bold reforms. Like the British Association for the Advancement of Science (BAAS), the new Royal Society of New South Wales should be divided into specialist sections, each

having its own president and separate meeting time, but governed overall by the Royal Society's Council. Excess funds would be devoted partly to the monthly publication of the society's proceedings. Funds could also be used for assisting scientific expeditions and encouraging research with monetary rewards and medals. Members should work towards obtaining permanent premises which would accommodate a library and a resident secretary, thereby forming 'a sort of scientific club' in which other Sydney learned societies would probably wish to participate.⁷⁶

Yet another proposal was designed to concentrate greater power in the hands of leading members. This introduced two levels of membership: Fellows and Associates. Initially, the Governor would select the Fellows and then the Fellows themselves would choose replacements or additions from among the Associate members. Fees would remain the same for Associate members, but Fellows might be required to pay more.

At the October general meeting, members adopted the report in principle and appointed a further committee to devise a code of rules for the new Royal Society. These were presented for approval to a general meeting in November. Most of the old rules governing the Philosophical Society would remain, but there was a new statement of the society's objective – a declaration of its character as an 'improvement' society. Its purpose would be 'to receive at its stated meetings original papers on subjects of Science, Art, Literature and Philosophy, and especially on such subjects as tend to develop [sic] the physical character of the colony and illustrate its Natural History and Productions'.⁷⁷

Members attending the November meeting chose to alter this statement of the Royal Society's purpose. The focus of the papers presented at its meetings was now agreed to be the development of 'the resources of Australia'. More than a decade and a half on from the Australian Society's formation in 1850, this seemed a genuinely more expansive vision than the committee's original suggestion: the 'physical character of the colony'.⁷⁸

The rules approved at the November meeting also said nothing about specialist sections, scientific expeditions, medals or monetary rewards, but they did introduce an additional membership category – Honorary members – to be chosen from benefactors to New South Wales or ‘some other of the Australian colonies, or distinguished Patrons and promoters of the objects of the society’.⁷⁹ The proposal to divide the membership between Associates and Fellows, now somewhat reworked, was also put to members. The number of Fellows was to be limited to 30, but the cost of their annual subscription would be the same as that of Associate members. As before, the Governor of New South Wales was to be President *ex-officio*, and the Fellows would choose the other officers. Associates, however, would have some say in choosing six other Ordinary members of the Council, electing them in concert with the Fellows.

Apart from some minor adjustments, members agreed to most of the suggested rules. A sticking point, however, was the proposed two-tiered membership scheme, which would have further entrenched in the reorganised body the *de facto* power imbalance evident in its predecessor. A decision on the proposal was postponed to another meeting where it was dropped altogether. All members of the Royal Society, not just a select few, would continue to have the right to elect every member of the Council. As we have seen, ‘subscriber democracy’ like this (voting rights within an otherwise exclusive membership) was the standard for middle-class learned societies in Britain. Members at this adjourned meeting had voted to ensure that, theoretically at least, all the Royal Society members could participate on an equal footing.⁸⁰

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Arrangements for the Royal Society were finalised before the end of 1865, but the change of name would not be settled for another year. The Governor did not have the power, as members had hoped, to grant

permission for their adoption of the title 'Royal', so in mid-1866 the request was sent to Queen Victoria. Meanwhile, the society continued its financial decline. Nevertheless, meetings were held, papers were presented, and steps were taken towards publishing members' papers. Finally, at the monthly meeting in December 1866, members of the former Philosophical Society of New South Wales heard the good news that Queen Victoria's assent had been secured and their organisation was now officially the 'Royal Society of New South Wales'.



BIRTH OF THE ROYAL SOCIETY

Although the Philosophical Society had been reorganised and renamed by the end of 1866, its inaugural general meeting as a Royal Society was delayed until mid 1867. Neither its President, Sir John Young, the outgoing Governor of New South Wales, nor Edward Deas Thomson, soon to retire as Vice-President, had been prepared to give the opening address. The task fell to the other Vice-President, William Clarke, who requested additional time to prepare a suitable oration. In the meantime, Dr William H. Catlett, father of the society's Assistant Secretary, was engaged to scour back-issues of the colony's newspapers for information that Clarke could use in constructing the account he planned to give about the Royal Society's origins. Clarke's version of the society's history and august founders has reverberated ever since in the historical imaginations of members. But Clarke also spoke about the Royal Society's future, laying out for its members the important principles which he believed should guide all their scientific work. Both his service to the society and his reputation as a man of science ensured

BIRTH OF THE ROYAL SOCIETY



Expert geologist William Branwhite Clarke addressed the inaugural general meeting of the Royal Society in 1867. Portrait by Guilio Anvitti. SLNSW.

that what Clarke had to say about the Royal Society on this occasion would carry great weight.

William Branwhite Clarke's Vision for the Royal Society

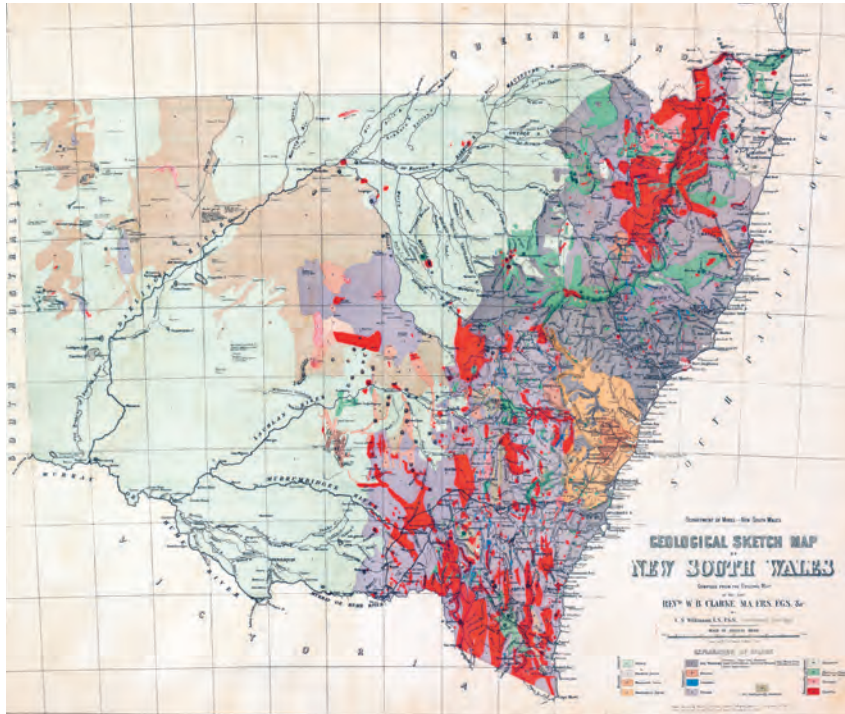
During the first seven years of the society's existence under the title 'Royal', some 10 per cent of its members were clergymen like Clarke. In the colonies, as in Britain, many clergy were amateur scientists. Studying the natural world was considered a way of revealing the power of a Creator God.¹ As well, clergy were usually well educated, and many were teachers or had oversight of the colony's denominational schools. Membership of a learned scientific society was thus compatible with their private intellectual interests, as well as with their responsibility for disseminating both spiritual

and secular truths. Some clergy had particular scientific expertise, among them the Reverend William Scott, the Royal Society's Honorary Secretary and Government Astronomer until 1862. Clarke combined parish duties with studying the geology and palaeontology of his adopted country, both independently and, from 1851 to 1853, as a geological surveyor for the government.²

Nearly 70 years old in 1867, Clarke had come to the colony in 1839 under the auspices of the Society for the Propagation of the Gospel. After serving briefly as Headmaster of the King's School, Parramatta, he had continued his pastoral work in the Dural, Castle Hill and Campbelltown parishes before being appointed Rector at St Thomas's Church, North Sydney, in 1846. A Fellow of the Royal Geological Society of London since 1826, Clarke had already published several papers on aspects of geology before coming to New South Wales where he was to make a significant contribution to the colony's intellectual life.³ Over his lifetime, more than 500 publications by Clarke, covering geology, palaeontology, meteorology, exploration, astronomy, theology and literature, appeared in local and overseas scientific journals, in books and government reports, and (more than half) in newspapers.⁴ He had also developed an extensive network of eminent scientific contacts and correspondents, including Adam Sedgwick, Roderick Murchison and Richard Owen in Britain, along with a number of professional and expert amateur scientists in the Australian colonies, New Zealand and India.⁵

Honours from the Royal Geological Society, the Royal Society of London and the Royal Society of New South Wales all lay in store for Clarke when he stood to speak in 1867, but he had already acquired kudos (and a New South Wales government reward of £3000) by being officially designated the first to discover gold in New South Wales.⁶ Indeed by 1867, Clarke was not only the Philosophical Society's second longest-serving Vice-President, he was also, according to historian Ann Moyal, 'a leading

BIRTH OF THE ROYAL SOCIETY



Geological Sketch Map of New South Wales, 1880, signed by Charles Smith Wilkinson of the NSW Department of Mines, and based on an earlier map recording geological research by William Branwhite Clarke. SLNSW.

savant, a prominent player in negotiating science, and a household name'.⁷ He may only have been the Council's third choice as speaker on this important occasion, but he was an eminently appropriate choice.

Clarke began his address by reiterating the reasons for discarding the organisation's former name, a decision which had not been universally popular with members, some seeing its new title, 'Royal', as an inappropriate affectation.⁸ In justifying the decision, Clarke made clear what he believed should be the Royal Society's main concerns. Its former title had been a misnomer, he argued. Neither those who had framed the Philosophical Society's rules, nor the organisation's subsequent supporters, had 'ever

really intended what, strictly speaking, the term “Philosophical Society” implied’. However interesting in their own right, ‘investigations’ conducted in the name of ‘Philosophy’, he said, ‘were often based on conjecture’.⁹ ‘[T]hat department of enquiry has never received any recognition from us’, Clarke insisted, ‘and perhaps, never will’.¹⁰ Up-to-date ‘intellectual enquiry’ focused empirically on ‘things visible’ and the business of the Royal Society, like that of its misnamed predecessor, should be ‘observation and experiment’, not ‘wild speculations’.¹¹ ‘[A]bstuse’ deliberation of the kind that characterised philosophical discourse, was also to be avoided. All discussion at meetings should be ‘capable of general comprehension’, as members worked toward what was, as Clarke reminded listeners, the Royal Society’s concrete and utilitarian ‘*especial* object’: ‘the development of the Physical character of the country we live in, and the development of its Natural History and Productions’.¹² While this goal was consistent with imperial interests, it was also fundamentally a colonial national objective.¹³

When Clarke went on to speak about the manner in which Royal Society members should pursue these goals, his advice was shaped by ideals of scientific objectivity. It was also influenced by the contemporary controversy over Charles Darwin’s theory of species evolution via natural selection.¹⁴ Darwin’s book, *On the Origin of Species* (1859), had been circulating in the colony since 1860 and while its revolutionary ideas had gained some colonial supporters, the climate of opinion was still largely averse to a theory which challenged conventional religious teaching about the origin of life on Earth.¹⁵ It presented a particular challenge for clergymen scientists like Clarke, who had either to reject Darwinism or find some way of reconciling it with their theology.

Many members of Clarke’s audience in 1867 must have leaned towards the first of these options. John Smith, for example, could apparently countenance the possibility of a succession of creations, but not the idea of species evolution, at least in the case of human beings. Endeavouring at

a Philosophical Society meeting in November 1863 to explain the origin of some unexpectedly ancient flint tools discovered in Abbeville, France, Smith had speculated ‘that a human race’, now extinct, might have ‘existed previous to the period of which we have the record’, and that after ‘a great gap ... in which there was no living human being ... a new human race was created’.¹⁶ As the press reported, a general discussion followed ‘respecting the proofs of the alleged antiquity of the human race’.¹⁷ Gerard Krefft, the Australian Museum’s Curator, had given a paper that evening on ‘Vertebrated Animals of the Lower Murray’ and had also exhibited some flint tools. He would later write to Darwin, expressing support for his ideas, but any comments Krefft might have made at that 1863 meeting regarding the ‘alleged antiquity’ of humans, unfortunately were not recorded.¹⁸ Darwin had another advocate in the wealthy merchant, Edward Smith Hill, a devoted amateur naturalist who had been a society member since 1859.¹⁹ Reporting in 1880 on his participation in a collecting expedition to Lord Howe Island, Hill would publicly assert that the changes he had observed in the plumage of domestic pigeons gone wild there, had ‘proved the correctness of Darwin’s theory’.²⁰

Evolutionary theory aroused strong feelings among Royal Society members on both sides of the controversy. When Krefft complained in 1873 about ‘the ignorance of even well-educated men’ who rejected Darwin’s theory, it seems likely that he had some of his fellow Royal Society members in mind.²¹ Although there is little suggestion, even in the record of that 1863 meeting, that controversy over Darwin’s ideas had weakened the former Philosophical Society, the potential for such division to damage the new Royal Society seems to have been on Clarke’s mind when he composed his 1867 address.

Persuaded by Charles Lyell’s *Principles of Geology*, Clarke had already abandoned his own earlier belief in the centrality of Noah’s Flood as an explanatory factor in geology and he had read *On the Origin of Species* with

great interest.²² He also maintained a friendly correspondence with the author, for whom he even conducted a small experiment involving bees.²³ But when Clarke told the Royal Society's inaugural meeting in 1867 that there should be '[n]o objection to the statement of arguments relating to the Origin of Species', he was not declaring his acceptance of Darwinian theory. Far from it. In 1863, during the discussion of Smith's comments on the antiquity of the Abbeville flint tools, Clarke had declared that he had no objection to adding 'a few thousand years to the commonly received chronology', but he could not countenance the idea 'that the present race of men was descended from a race that was not endowed with the same faculties as ourselves'.²⁴ Indeed, as Ann Moyal argued, to the end of his life Clarke 'remained a Creationist in the biological and theological worlds', convinced that present 'species were not the result of accidental conditions, but however related, ... [were] independent of their predecessors'.²⁵ Yet in Clarke's mind, there was nothing at all to fear from the empirical investigation of nature. 'Let research and inquiry be carried forward in every direction and in a fearless spirit', he told the 1867 meeting, 'and when their results are most completely established ... will it most undeniably be found, that Creation, Providence, and Revelation are the work of the same God'.²⁶ Clarke's open-minded engagement with Darwin's work paradoxically was underpinned by his unshakeable Creationist beliefs.

His determination to hold the Royal Society together and his commitment to empiricism and scientific objectivity combined with Clarke's religious beliefs to shape the principles which he believed should guide Royal Society members. Their investigations should be conducted thoroughly, and they must be honest in their reporting of them, loving 'truth', said Clarke, 'in things physical as well as moral'. '[H]asty theories and unsupported conjectures' should also be abjured and, above all, they should be open-minded and respectful of those who took an opposite view. We must, said Clarke, give 'our brother observer the same measure

of credit we take for ourselves' in the full knowledge that 'judgement will inevitably be given, whether for us or against us, by those who come after us'. Indeed, members should be satisfied if only 'to add but one grain to that enduring pyramid which is now in the course of erection as the testimony of Nature to the truth of Revelation'. In short, open-minded, thorough, scholarly investigation and discussion would together serve what Clarke considered to be the Royal Society's dual objectives – 'the development of the country we live in' and the revelation of Divine Creation.²⁷ Such a fair-minded approach to their deliberations would also help the newly reorganised society survive.

Developing the Country They Lived In

As Clarke conceived it, the Royal Society's scientific brief encompassed observation and experiment directed towards accumulating evidence concerning the natural world and its processes – empirical science of a fundamental kind – as well as the application of science to the solution of practical tasks. The proviso was that all the members' scientific activity should be directed towards their country's progress, including the welfare of its inhabitants. The 'country' to whose development the bulk of members' scientific work would be directed in following years, was New South Wales.

Four years after Clarke's 1867 address, another Vice-President, John Smith, reaffirmed the emphasis on locally useful scientific activity. '[I]n our circumstances', Smith told the 1871 annual general meeting, 'it is expedient to devote our energies more to applied science and matters of obvious practical utility'. But Smith was somewhat more open than Clarke to Royal Society members concerning themselves with theory, provided that such matters were brought to the society's notice by members 'competent' to do so.²⁸ 'Following the example of the Royal Society of England', said Smith, 'we can embrace the whole range of human knowledge and skill,

avoiding only such matters as usually end in angry controversy'.²⁹ Some Royal Society members might not have managed to maintain the scholarly respect that Clarke had stipulated, and Smith desired to preserve. (Witness Krefft's earlier-mentioned complaint to Darwin.) However, most issues brought before the Royal Society's meetings had a local and utilitarian focus.

Along with explanatory papers on more fundamental questions – the 'Value of Earth Temperatures' (George Smalley), the 'Source of the Sun's Heat and Light' (Edward Peppercorne), and the "Constitution of Matter' (Morris Pell) – members heard expositions on the application of scientific principles to practical matters of local concern, such as railway construction, communication via electric telegraph, and trigonometrical surveying. Mathematicians Pell and Christopher Rolleston provided statistics on mortality in Sydney and colonial wheat growing respectively, while Henry Chamberlain Russell, Smalley's successor at the Sydney Observatory, explained how his tables on magnetic variation around Sydney could be used to advantage for compass readings. A range of papers reported on original research in local zoology, botany and geology. Dr James Cox, an expert amateur conchologist, explained the distribution of a genus of marine snails, Botanical Gardens Director Charles Moore described the botany of Lord Howe Island, and George Milner Stephen discussed gemstones. Knowledge of a country's natural resources was a prerequisite for its development.

At a Royal Society meeting in December 1869, the Sydney Mint assayer Francis Miller expounded on an innovation that had international implications, as well as being relevant for colonial development. Two years previously, he had secured by patent in London and government registration in New South Wales, a new method he had developed for toughening and refining gold using chlorine gas. By 1869 this was already being used successfully in Sydney and Auckland. Later on, mints as far

afield as Norway and the United States took up the process, which has continued to be used worldwide into the twenty-first century.³⁰

A Board of Reference for Government

In his 1868 Vice-President's Address, George Smalley used a contemporary cliché to emphasise the Royal Society's immediate objective – to 'Advance Australia'. In line with Denison's vision for the former Philosophical Society, Smalley also expressed his confidence that their organisation could 'render good service to any government of the day by being a kind of board of reference to discuss and report upon questions of practical importance'.³¹ Like Denison, Smalley seems to have had the government of New South Wales in mind.

Back in 1856, members of the Philosophical Society, inspired perhaps by Edwin Chadwick's efforts in Britain, had taken a tentative step in this direction with an eye to improving sanitary conditions in Sydney and the health of its inhabitants. A seven-member sub-committee had been formed to collect information on 'the social economies and statistics of Sydney', but six months later Rolleston, who was one of its members, had reported that the '[p]ress of business and other causes' had prevented the committee from carrying out its task.³² Rather than being a helpful 'board of reference', the committee now deferred to municipal authority. Sydney's municipal council had appointed a health officer, Dr Isaac Aaron, who had been one of the committee members. Acting alone, Aaron could carry out the work 'with greater precision' than the Royal Society's committee, according to Rolleston, because he had 'the sanction of the municipal authority'.³³

Twelve years later, Sydney's sanitary problems had by no means disappeared, but Smalley in his 1868 Vice-Presidential Address placed a related matter – securing Sydney's water supply – topmost on a list of issues

about which he felt the Royal Society might usefully advise authorities.³⁴ Sydney's first water source, the Tank Stream, had been replaced in 1830 by the Lachlan Swamps, situated in what is now Centennial Park. Water from this location, transported to an outlet at Hyde Park via a sandstone tunnel known as Busby's Bore, was still being used in 1868, but it was now supplemented by water piped from some more extensive swamps at Botany to a reservoir in Crown Street, Surry Hills. Questions had been raised about the purity of the water from both sources. The Lachlan Swamps were subject to pollution from a cemetery and encroaching housing, while those at Botany had an abattoir and a wool-washing facility in their vicinity. There were also serious doubts about the capacity of current water sources to adequately serve Sydney and its suburbs, where the population was rapidly approaching the 138,000 inhabitants counted in the 1871 census – an increase of 43,000 over the total 10 years earlier.³⁵

This expanding urban population and Sydney's vulnerability to periodic droughts underlined the need to ensure an adequate and reliable supply of water which, as developing germ theory then indicated, needed to be pure enough to minimise the occurrence of dangerous water-borne disease.³⁶ Plentiful water was also required to run a more extensive sewerage system, settle dust on roads and otherwise improve the living standards of Sydney's inner-city and suburban residents. Apart from its social and sanitary benefits, a reliable water supply would bring economic benefits by encouraging the growth of manufacturing in Sydney, yet the substantial municipal expenditure entailed in any major engineering work was anathema to many ratepayers. It also challenged those favouring a *laissez-faire* approach by government authorities. Thus, despite the potential benefits of an improved supply of water, schemes put forward for achieving this were hotly contested.

Water supply – its source and purity in Sydney and the wider colony – would occupy the Royal Society's attention over several decades.

Initially, the focus was on Sydney. Smith had addressed the question of contamination from lead pipes before the Philosophical Society in 1856, while Denison in 1858, had discussed the effects of filtering water through sand. Between October 1868 and October 1870, no less than 10 Royal Society meetings were devoted to the question of Sydney's water supply, with eight of these occurring between July and October 1870.

Such a concentrated focus on the issue was prompted by the deliberations between 1867 and 1869 of a five-member Commission into the Water Supply of Sydney which was chaired by Royal Society Council member John Smith.³⁷ A second commissioner, Deputy Surveyor-General Phillip Francis Adams, was also a Royal Society member, while a third, Edward Orpen Moriarty, had been an active member of the Philosophical Society of New South Wales and joined its successor in 1870 in the midst of the Royal Society's water supply debate. Despite these links with the commission, the Royal Society was by no means acting as an official reference body for government in addressing the water supply issue. Nevertheless, its discussions did allow the pros and cons of the several schemes proposed to the commission, and the commission's recommendation, to be thrashed out publicly for the benefit of Parliament and the responsible municipal authorities, as well as for the wider public. As a *Sydney Morning Herald* editorial pointed out in August 1870, Parliament was 'not a scientific body' and could benefit from the Royal Society's 'scientific light', especially 'at this juncture when all is indecision'.³⁸ Unfortunately, the society's lending of assistance to government in this way would prove disruptive of the kind of respectful, scholarly discussion that Clarke had urged on Royal Society members.

The commission itself had been divided on the best water source for Sydney. A minority (and prescient) proposal put forward by one of the commissioners, Thomas Woore, had suggested construction of a dam on the Warragamba River. But public attention focused on the commission's

majority recommendation, a scheme designed by Moriarty to harvest water from the Illawarra Plateau south of Sydney. Water from the Upper Nepean, Avon, Cordeaux and Cataract rivers was to be piped from a dam constructed at Pheasant's Nest (just below the confluence of the Nepean and Avon rivers) to a second one at Broughton's Pass on the Cataract River. From there it would be carried to a reservoir at Prospect and then on to reservoirs in Sydney.³⁹ While this plan could supply ample water via a gravitational system that was capable of servicing the more elevated areas of Sydney, the distance of over 60 miles (96.6 kilometres) from source to city, and the cost involved, made Moriarty's visionary scheme highly controversial.⁴⁰ 'It may be that we are shut up to the scheme propounded after much careful consideration in the voluminous report ... but we do not like to think so', said the *Herald*, whose editor, like many other people, clearly hoped for a cheaper solution.⁴¹

In November 1869, not long after the water commission's report was released, the civil engineer Charles Mayes had argued in a paper given before the Royal Society that additional water required for Sydney would be best obtained initially from a dam constructed on the Cook's River and subsequently from a much larger one situated on the lower reaches of the George's River between Kangaroo Point and the promontory known as Baldface Stag (located in the present-day southern Sydney suburb of Blakehurst). The George's River solution was promoted by several speakers during the debates in 1870, including by the Honorable Andrew Garran MLC in a paper he presented to the July meeting.⁴² Particularly ardent in his support for a dam on the George's River was the Honorable Thomas Holt MLC, a Royal Society member only since 1868, who owned an extensive tract of land stretching from Botany Bay (into which the George's River empties) as far as Port Hacking.⁴³ A dam in this vicinity had potential to advance his private economic interests.⁴⁴ Standing obdurately against both the Nepean and the George's River solutions was Edward Bell,

the Sydney Municipal Council's engineer, who had been responsible for completing Busby's Bore. He told a Royal Society meeting that the Botany swamps were already supplying 'the present population with unquestionably good water' and simply by spending on improvements there an equivalent amount to that already spent by the commission in making its 'impractical [Nepean scheme] drawings', Sydney's current water source would soon be more than adequate for a population twice or three times its present number.⁴⁵

Feelings ran high during these debates. There were angry interjections, indignant points of order and non-members were allowed to speak. Member Edward Smith Hill wrote to the *Herald* scorning some of the arguments presented as 'bosh'.⁴⁶ Similarly inconsistent with the respectful conduct expected of Royal Society members were the personal attacks endured by Moriarty. Holt, perhaps accustomed to more brutal parliamentary debate, accused the engineer of incompetence in dam design, citing leakage at the Parramatta waterworks.⁴⁷ When Moriarty explained that he had completed the construction of the Parramatta dam and not designed it, Holt disparaged him as a copyist, whose 'forte was not in damming water'.⁴⁸ To Moriarty's warning that industries and the Benevolent Society's asylum upstream at Liverpool were likely to contaminate the water in any George's River dam, Holt exclaimed, 'was there ever greater rubbish written than his memorandum'.⁴⁹

Illness had prevented Clarke from attending Royal Society meetings during July. When he took the Chair in early August, he voiced his objection to the form and substance of the current debate. In Clarke's view, the Royal Society had gone too far in shining a 'scientific light' for government on the question of water supply. The debate should have been confined to a consideration of the first paper presented in July by Dr Garran, said Clarke. The 'Nepean Scheme was a matter between the commission and the Government, which they had no business with'.⁵⁰

The risk entailed in a learned society being overzealous as the government's 'scientific light' had been demonstrated a few years earlier by the outcome of the 1860–61 Victorian Exploring Expedition, organised by the Royal Society of Victoria. Seven members of that expedition had perished, including the leaders, John O'Hara Burke and William John Wills. The report of a subsequent royal commission of inquiry into the expedition's tragic outcome publicly criticised the Exploration Committee of the Royal Society of Victoria for having 'committed errors of a serious nature'.⁵¹

Ungentlemanly behaviour and violations of the society's rules were the only adverse outcomes of the debates surrounding Sydney's water supply, but they were nevertheless issues for regret. Clarke was very critical of non-members being allowed to participate in the discussions. 'The very small subscription required [for membership] was no bar to anyone who desired to take part in these debates', he said.⁵² Similarly decrying the course which the Royal Society's meetings had taken, Hill complained to the *Herald* saying, 'in no learned body in the world would such very striking irregularities have been permitted as have been countenanced by the Royal Society'. With 'strangers permitted to take part in deliberations ... [and] the reputations of distinguished engineers attacked', Hill concluded, 'altogether it was not a very edifying picture presented to the public who associate with such an institution, some idea of learning, gravity and justice'.⁵³ Perhaps all this was the inevitable outcome of the Royal Society's engagement with such a highly controversial political issue, as Smith seemed ruefully to admit when he advised the members in his 1871 address, that they should avoid 'such matters as usually end in angry controversy'.⁵⁴

Nothing was settled by the Royal Society debates. A second royal commission on the issue would be held in 1875 and it too recommended the Nepean scheme, but it was not until 1888 that the project was completed.⁵⁵

Nevertheless, despite the tenor of some of the debate, the series of well-publicised meetings, devoted to the question of water supply, improved perceptions of the Royal Society's contemporary relevance. Meetings were well attended by both members and guests and the society attracted 21 new members during that year, along with some former members of the Philosophical Society who, as Smith put it in his Vice-Presidential Address, 'now recognise us'.⁵⁶ Such a tally of new members, however, would prove to be an aberration.

Financial Difficulties Again

In his 1867 address, Clarke had not been especially optimistic that a name-change would cause the former Philosophical Society to thrive. Members could not, he had said, expect support from the many colonists intent on pleasure, 'whose mental occupation is only exercised by sensational novels or railway literature'.⁵⁷ But even university-educated men and the members of 'contemporaneous Associations', lamented Clarke, had failed thus far even to give encouragement to the Royal Society and its predecessor.⁵⁸ If the Royal Society was 'doomed to experience no great patronage and no universal sympathy', if intelligent and educated men 'prefer to withdraw from our fellowship, we must be content to remain a small, but we may still hope, a zealous body'.⁵⁹

Clarke was quite right to be pessimistic about the Royal Society's prospects of increasing its membership. Although 13 new candidates had been proposed for membership at the inaugural meeting in 1867, no more than 18 joined during the whole year. Just 102 names were on the membership list published in the Royal Society's *Transactions* for 1867.⁶⁰ Ten years before, the Philosophical Society had boasted 174 members. During 1868, the number of listed members climbed to 118, but remained static during the following year, and despite the 21 new members attracted

during 1870, the net gain was apparently no more than nine. In 1872 the Royal Society had 134 members on its books, still 40 short of the Philosophical Society's official membership in 1857.⁶¹

The society's published membership lists cannot be relied on as strictly accurate. Despite rules governing the fate of members who were too long in arrears, it could take time for unfinancial members' names to be expunged. Martin Gardiner, for example, who had given 10 papers on pure and applied mathematics before the Philosophical and Royal societies between 1862 and 1873, was found in 1874 to have paid no annual subscriptions for 11 years. Only then was he struck off.⁶²

Revenue from subscription and entrance fees offer a better guide to the progress or otherwise in the number of financial members. During 1867, for example, the 18 new members approved by ballot ought to have paid two guineas each, or nearly £38. The 84 existing members should have paid just over £88. Since the total received that year from subscription and entrance fees was less than £80, it appears that a good number of members, existing or newly elected, had failed to pay their dues.⁶³ Perhaps some of these, like Gardiner, were continuing to participate, but most had probably lost interest and considered themselves to have resigned. The situation was similar during 1868. Forty-three new members were approved by ballot during that year and, if all had paid the necessary fees, they would have contributed just over £88. Yet from the 118 officially listed members, little more than £93 was received. The society had only three Life members at this time (not liable for any further fees), so it is clear that many other members were still in arrears.⁶⁴ During 1869, 127 members contributed a mere £94. The discrepancy continued even when revenue increased, so that during 1870 the revenue raised from 129 listed members, including the 21 elected during the year, was just over £112; much less than could have been expected.⁶⁵ As Smith revealed in his address to the society in May 1871, the organisation was 'barely able to

make ends meet'. Unless there was 'material improvement' he warned, it would not be able to publish its *Transactions*. Once more, members were urged to pay promptly.⁶⁶ Nevertheless, income from subscriptions again fell substantially during 1871, forcing the Council to authorise the sale of the society's last government debenture to pay its debts.⁶⁷

In these circumstances, printing of the *Transactions* could not have gone ahead had the Council not responded to a suggestion made in May 1872 by one of the Ordinary members, William Tunks MLA, that it ask the government to do the printing free of charge.⁶⁸ A three-member deputation, which included Tunks and the Reverend John Dunmore Lang, was appointed to approach the Colonial Secretary (and Premier), Henry Parkes. In July members heard that the government had agreed to the society's application, provided that the cost and the number of copies printed were consistent with that of the previous year.⁶⁹

Perhaps members had been emboldened in this application by their success in 1871 when a deputation from the Royal Society had 'used its influence with the government', as Lang had put it at the time, to obtain a contribution of £300 towards assisting some of its members to join the 1871 expedition to Cape York, organised by the Royal Society of Victoria to observe a total eclipse of the sun.⁷⁰ Having obtained the grant for printing, members in September 1872 authorised a third deputation to approach the government, seeking the provision of a new telescope for the observatory, in preparation for another astronomical event, the Transit of Venus, due in December 1874.⁷¹ Careful recording of this phenomenon was important, according to the Government Astronomer, not only for 'the advancement of science', but for 'the honor of the colony'.⁷²

It is clear from these initiatives that despite the failure of many members to pay their dues, the Royal Society during the early 1870s was not entirely inert. Council meetings continued to draw at least a quorum, but a worrying sign was the forced cancellation of general meetings scheduled

for June, August and December 1871 because no member was prepared to give a paper. This failure was repeated in June 1872, a situation that was both a cause and an effect of low morale.

Just a few months later, in November 1872, the Royal Society gained a new member, 26-year-old Archibald Liversidge, through whose vision and energy the society's fortunes would soon be revived. 'What some saw as bleak despair', wrote historian Roy MacLeod, 'Liversidge saw as fresh opportunity'.⁷³ According to Joseph Maiden, the society's historian and its President in 1906 and 1911, the reforms which Liversidge would put in place 'practically' refounded the Royal Society of New South Wales.⁷⁴



REBIRTH

When Archibald Liversidge joined the Royal Society of New South Wales, its salaried Assistant Secretary, William Henry Catlett, had been employed there for more than 14 years. During that time, he had attended more Council meetings than any elected councillor, past or present. Indeed, the Council's September 1872 meeting, which illness kept Catlett from attending, seems to have been the first he had ever missed, and only the sudden death of his younger brother in 1876 prevented Catlett's presence at the annual general meeting that year.¹ More than conscientious, he must also have been well organised. During the term of his employment by the Philosophical and Royal societies, Catlett also managed, for varying periods, the minutes and correspondence of no less than five other voluntary bodies: the Cumberland Agricultural Society (later the Agricultural Society of New South Wales); the Sydney Poultry Association; the Committee of the Victoria Club; the Hyde Park Improvement Committee; and the Sydney Grammar School Trustees.² Granted, Catlett's work for the Philosophical and Royal societies thus far had not been especially

onerous, even during the Philosophical Society's decline, when Council members seem temporarily to have abrogated their responsibilities, missing Council meetings and apparently leaving Catlett on occasions to liaise with the ensuing meeting's speaker. But Catlett's workload increased dramatically when the Royal Society's rejuvenation got under way with Professor Archibald Liversidge and Dr Carl Leibius as Honorary Secretaries.

Fresh Leadership

Liversidge and Leibius made an excellent team. While Liversidge was a relative newcomer to the colony, as well as to the Royal Society, Leibius had been a member of both the Philosophical and Royal societies since his arrival in New South Wales in 1859. He was 13 years older than Liversidge but their mutual scientific interests in analytical chemistry and metallurgy drew them together. This friendship and shared commitment to the Royal Society made them natural allies in the reform project, while Leibius' experience, the respect he had built up within the society, and his own lack of personal ambition complemented Liversidge's vision and reforming drive.³

The field was open at this time for men of energy and purpose who wished to overhaul the Royal Society. Although still personally influential, Senior Vice-President William Clarke was aging and ailing by the mid-1870s; he would die in mid-1878. John Smith, the other long-serving Vice-President, was also no longer young and had many demanding responsibilities outside the society.⁴ He did become its first elected President in 1880, an office he held again in 1883, and he gave Anniversary addresses in 1871, 1879, 1881 and 1884. But a scientific paper read before the Royal Society in 1877 was Smith's first since the controversial water supply debates of 1869, and the last before his death in 1885.

REBIRTH



Archibald Liversidge, Professor of Geology and Mineralogy at Sydney University. As the RSNSW's Honorary Secretary from 1875, he 'practically' refounded the society. Sydney University Archives.



Carl Adolph Leibus was a joint Secretary of the RSNSW, who collaborated with Archibald Liversidge in the society's rejuvenation. SLNSW.

By contrast, Liversidge was a young man on the rise. Born in London in 1846, the son of a carriage builder, he had been educated at the Royal School of Mines, the Royal College of Chemistry, and Christ's College, Cambridge. He had taught at the Royal School of Naval Architecture and the University of Cambridge before his appointment in 1872 as Reader in Geology and assistant in the laboratory at the University of Sydney. This followed the premature death of William Morrison Thomson, the university's first Professor of Geology and Mineralogy, who had also been a member of the Royal Society of New South Wales.⁵ Two years later, at the age of only 28, Liversidge was promoted to Thomson's vacant Chair. In the meantime, he had begun to build a network of local scientific contacts, among whom were fellow geologist Clarke and Henry Russell, an early graduate of Sydney University and since 1870, the Government Astronomer.⁶ More than a decade Liversidge's senior, Russell, who was also

Henry Chamberlain Russell, the third NSW Government Astronomer and four times President of the RSNSW. He supported Liversidge's reorganisation of the RSNSW. Sydney University.



intent on fostering his professional reputation in the colony and beyond, clearly saw the value of belonging to an active scientific organisation of excellent repute.

Liversidge's progress in the Royal Society was swift. Russell, who was Treasurer in 1872 and a key supporter of the reforms that Liversidge would go on to introduce, nominated him for membership that year. Elected in November 1872, Liversidge immediately signalled his intention of playing an active role in the Royal Society by presenting a paper at the next general meeting. Its subject was the Deniliquin meteorite, part of which had been discovered by Clarke.⁷ In May 1873 Liversidge was elected to the Council for the first time, again with Russell's support.⁸ Council personnel changed from time to time, although this was fairly rare among the senior officers. But in 1875 Russell was planning to deliver his observations of the Transit of Venus personally to the Astronomer Royal in England and did not seek re-election as Treasurer, so Reverend William Scott, a Secretary of the Royal Society since its inception, was elected Treasurer in Russell's place. This made way for Liversidge's election as Honorary Secretary, while Leibius succeeded Scott's co-Secretary, Charles Moore.⁹ The influence of Liversidge and Leibius over the society was consolidated the following year by a new set of by-laws which they presented for approval to a general meeting of members in June 1876.¹⁰ One of these spelt out in detail the extensive responsibilities of the Honorary Secretaries, including their right to be ex-officio members of any committee which the Council appointed. These reforms gave the Honorary Secretaries sufficient power to oversee a fundamental reorganisation of the Royal Society.

Central to Liversidge's ambition for the Royal Society was a revised system for managing its affairs. As a scientist, Liversidge probably had a better understanding than most people of the character and relevance of systems. Human beings, their environment, indeed the universe itself, were conventionally conceived as systems, all being part of one 'great vital

system of Immensity'.¹¹ It was the scientist's task to collect and classify data, to experiment, and to draw conclusions about the workings of this vast interconnected system, and then apply such knowledge for the greater good. Social institutions were conceived as systems too, their optimal efficiency being the prerequisite for progress. Parliamentary governance, the management of Crown lands, economic relations, the railways, even housework, were all thought of as systems which could be reorganised for reform. As Alan Atkinson observed, 'The power to invent and to manage systems was now the high road to intellectual respectability, at least among men'.¹² Catlett must have had an efficient system for managing his disparate secretarial commitments, but Liversidge would demonstrate particularly high-level organising skills. Indeed, as his biographer, Roy MacLeod, noted, 'The principle of "organisation" was to be his *vis anima*. Give Liversidge a lever and he would move the world'.¹³ Coupled with vision, ambition, and a life unencumbered by the distractions of a wife and children, such a talent amply equipped Liversidge to revolutionise the fortunes of the faltering scientific society.

The task ahead had several connected strands. To begin with, appropriate procedural change was necessary to place the Royal Society's activities on a more systematic footing. But steps were also needed to obtain government financial assistance. With such a boost to funds, the Royal Society might put an end to its peripatetic existence, build and house an up-to-date scientific library, and otherwise fulfill its potential for leadership in the local scientific community, while developing a network of significant connections overseas.

Organisational Reform

Liversidge's influence on the Royal Society was evident even before he was elected Honorary Secretary. In 1874 he was a member of the three-man

sub-committee responsible for organising a gala evening of science and socialising, a *conversazione*, which was held to coincide with the May meeting. A similar event, though on a smaller scale, had been held at Sydney's Royal Exchange following the annual meeting in 1873, but here Liversidge, who was elected to the Council on the same evening, had been a participant rather than a planner.¹⁴ Liversidge's stamp was certainly evident on the highly successful 1874 event. Held at the more commodious Masonic Hall in York Street, this one had, as an additional attraction, members of the HMS *Challenger* scientific expedition, whom Liversidge had helped to entertain during their two-month stay in Sydney.¹⁵

By April 1875, Liversidge and Leibius were the Council's nominees as Honorary Secretaries and very likely behind a new rule devised that month to ensure that general meetings would be held monthly without fail.¹⁶ The old problem of meetings having to be cancelled for want of a paper had continued into 1874. Monthly meetings in June and August lapsed that year, with Liversidge and Catlett the only people bothering to attend on the latter occasion. As a remedy, the Council resolved that printed cards carrying the dates of all meetings for the year would be sent to members, and meetings would be held, whether or not a speaker had been arranged.¹⁷

Liversidge and Leibius had been confirmed in office before a general meeting in July 1875 was officially informed about this ruling. On that occasion, members were also reminded of one of the Royal Society's original by-laws, yet to be properly observed, which required each new member to be introduced to the Chair by their proposer and seconder at the first meeting they attended.¹⁸ Another of the Royal Society's original by-laws, similarly ignored thus far – the provision for Honorary members – was brought to members' attention at the same meeting. Honorary members were not required to pay any subscription, could attend monthly meetings, and received copies of the society's *Transactions*, but they had no right to

vote or hold office. The Council's 1875 list of candidates for Honorary membership was approved by a general meeting in August.¹⁹

More extensive organisational refinements came with the passage in 1876 of the new by-laws. The original 13 regulations were now increased to 33, and were sufficiently detailed even to prescribe the order of business at general meetings. As well as consolidating the power of the Secretaries, they clarified the authority of the Council by explicitly affirming its control over the society's property, including the distribution of its funds. But with power came responsibility. Attendance at Council meetings remained low. At one meeting in September 1874, only Liversidge and Catlett had attended. To encourage conscientiousness, the by-laws now required a written explanation for every absence from Council meetings. Three consecutive unexplained absences rendered a Council member liable for replacement.

To ensure uniformity, and to streamline the Secretaries' work, the new by-laws also made provision for printing a series of official forms. These included a certificate to be completed by candidates for election, a letter informing new members of their obligations to the Royal Society, and a form setting out the undertaking they were required to sign. For existing members, there was a printed notice indicating that subscriptions were due, and another to be used for the election of Council members.

Further measures to protect membership standards were also introduced in 1876. In future the suitability of candidates had to be vouchsafed by three existing members, two of whom had personal knowledge of the candidate. Once elected, and having paid all the necessary fees, new members were also now required to express their commitment to the Royal Society by signing an Obligation Book.²⁰

Significantly, the 1876 by-laws made provision for future projects – establishing a museum, opening branch societies and building a substantial scientific library. They also allowed for an initiative which was already

in train – the division of the society into sections catering for specialist scientific interests. The Philosophical Society had had some success with its specialist Microscopical Committee, but this development was much more ambitious. Initially, provision was made for nine sections, each with its own chairman, secretary and management committee, and catering respectively for: [A] the physical sciences, including astronomy; [B] chemistry and mineralogy; [C] geology and palaeontology; [D] biology; [E] medical and sanitary science; [F] microscopical science; [G] geography and ethnology; [H] literature and fine arts; and [I] social science and statistics. Almost immediately it was decided to make chemistry, mineralogy, geology and palaeontology a single section, and to remove sanitary science from the medical section, combining it instead with social science and statistics.

The *Australian Town and Country Journal* dubbed the 1876 reforms, ‘The March of Intellect in New South Wales’. The Royal Society, it proclaimed, was ‘giving evidence of new intellectual life’. The establishment of sections was especially praised:

[N]ow that they have thus begun to marshal their forces, and to distribute their members among the several fields of science in the sections ... it may confidently be expected that they will achieve results such as will render important service to the world, and reflect honour upon the country where this intellectual work is carried on.²¹

Clearly such optimism was shared more widely. Seventeen new members were elected at the June meeting and 13 more were nominated. By the beginning of 1877, the Royal Society had 298 members, a spectacular increase on the 176 members it had just a year before.²² A year later the total was 393.²³

The regulations were altered further in 1879. The ‘Objects of the Society’ were combined with the by-laws, making a total of 41 ‘Rules’, and

a necessary index was provided in the society's annual publication to assist members' navigation through them.²⁴ The list included a significant new rule which altered the role of the colony's Governor in the Royal Society. No longer President by virtue of his vice-regal office, the Governor was now 'Honorary President'.²⁵ In future, the President would be elected. The position was to be relinquished after one year, although a retiring president would be eligible for re-election after a lapse of 12 months.²⁶

As membership applications multiplied, the Council in 1879 seized the opportunity to double the entrance fee and the cost of an annual subscription, but only for new members joining from that year. Rules governing the admission of new members were also tightened. Aspiring members (who had to be at least 21 years old) were required have their application certificate read out, not twice as previously, but at three successive meetings. As before, four-fifths of the membership, voting by ballot, had to agree to their admission. Characteristic of Liversidge's attention to detail, the new rules specified the exact words the chairman was to use when introducing new members. Fearing that the Royal Society's accelerating popularity might cause it to grow unmanageably large, members voted in 1880 that membership be capped at 500.

On Liversidge's initiative, another new category of membership had been introduced in 1879. As well as Honorary members, the society would now have Corresponding members. Limited to 25, this category was reserved for individuals of 'eminent scientific attainments who had provided papers or otherwise promoted the Society's objects', and who lived outside New South Wales. They had to be elected in the same manner as Ordinary members, but (like Honorary members) they could neither vote nor hold office, and no more than three could be admitted in any one year.²⁷

A better organised Royal Society, more reliable in its scheduling of meetings and catering for specialist scientific interests, had attracted new

members, but not necessarily more revenue. Failure of some members to pay their subscriptions on time, if at all, remained a serious problem. At the end of 1873 total membership was a net 118, but income from subscriptions and entrance fees amounted to little more than £113. Much more was expected, especially as 70 guineas would have been due from the 27 new members admitted during the year.²⁸ Income rose slightly in 1874 to nearly £140, but again this was not commensurate with the fees owed by the 155 listed members, of whom only three were Life members.²⁹

It is tempting to think that Liversidge, whose position on the Council had just been confirmed a second time, was behind a Council decision in June 1874 to terminate the membership of the serial fee defaulter Martin Gardiner. Clarke admonished all defaulters in his 1876 Vice-Presidential Address, which in the fashion of the vice-regal speech on behalf of the government customarily given at the opening of a parliamentary session, spelt out the issues on which the Council was intending to take action. '[T]o ignore not only the [financial] obligation itself, but continued reminders of it', said Clarke, 'is suicidal to the respect due to those who regard a "debt of honor" as imperative as any ordinary obligation in life'.³⁰

Being questions of honour (or dishonour), unpaid debts were delicate matters among gentlemen, and as Gardiner's example suggests, the tendency thus far had been to tread quite softly. The 1876 by-laws increased the pressure somewhat. Previously, members in arrears had been named at a general meeting. Under the new regulation the names of fee defaulters were to be posted up in the meeting hall for all to see. Just over 10 years later Archibald Park, of Hay in country New South Wales, wrote indignantly to the Council protesting against this practice of shaming defaulting members, but he also included his subscription and an explanation for its delay.³¹

Liversidge added a financial penalty for defaulters who failed to formally resign. They would continue to be liable for unpaid subscriptions until their departures were made official, thereby leaving themselves open to

a substantial debt. An 1879 modification immediately disenfranchised members who failed to pay their dues by 31 May each year. However, by cancelling defaulters' memberships after two years, it also limited their accumulated debts. If a debt was subsequently paid, membership could be re-established.³² Withdrawal of the *Journal* and exclusion from the library were added in 1884 to the sanctions against overdue payment.³³

Government Funding

Even if all subscriptions had been paid promptly, income would still have been insufficient to meet the extra expense of establishing sections, building a library, establishing branches, or creating a museum. Nor would income from this source alone allow the Royal Society to purchase its own premises. The answer was to go cap in hand to the government. The society had already succeeded in obtaining assistance in kind, via the agreement reached in 1872 to have the *Transactions* printed free of charge by the Government Printer.³⁴ The next step was to obtain a cash subsidy.

Clarke brought up the matter in his 1876 Vice-Presidential Address. 'Nearly two years ago' he told members, he and 'a member of the present Council' had privately approached the relevant Minister on this subject, and although they had received a favourable response, the matter had not gone ahead because some members feared that government assistance would place the Royal Society on the same level as 'a mere School of Arts'.³⁵ Membership of the Sydney Mechanics' School of Arts was much more broadly based than that of the Royal Society. Those objecting to an application for government assistance may have feared that if the society accepted a government subsidy, it might have been forced to compromise its character as a gentlemen's club.

Clarke now argued that with a government subsidy, a good scientific library could be compiled much more quickly than by relying on private

donations, and with government money helping to meet the usual running costs, the society could more easily accumulate sufficient funds to secure permanent premises.³⁶ Following Clarke's address, Russell moved that a deputation consisting of five Council members (including, of course, Liversidge and Leibius), and two Ordinary members (strategically chosen parliamentarians Francis Lord MLC and John Squire Farnell MLA), should approach the relevant Minister.

The advisability of applying to the government for a large one-off grant, rather than a smaller annual subsidy, came up for discussion at the general meeting after Clarke's address. Five days later the Council resolved to ask the government for both: a grant of £2500 towards the purchase of a building for the Royal Society, to be placed on the Estimates for 1877, and a sum to be placed on the Supplementary Estimates for the current year, from which the society might draw an endowment equivalent to its annual subscriptions.³⁷ A written submission handed to Joseph Docker, Minister for Justice and Public Instruction, put the case for the Royal Society's past and future public usefulness. 'Since the commencement of the Society', it pointed out, members had 'subscribed upwards of £5000 for the promotion of Science and higher education in the colony'.³⁸ They had also furnished the government with scientific information and in the future, they hoped to do so again, but much more could be done if they were given government assistance. This would be used to conduct a series of 'Five Popular Scientific Lectures' and to underwrite the establishment of sections designed to promote 'the special branches of science'. Moreover, with money from the government, the society would be better able to fulfill its goal of building a significant scientific library, 'a central institution in New South Wales for the collection of scientific works from all parts of the world'.

The submission cited examples of the government aid presently given to similar scientific societies in Victoria, Tasmania and England. 'In

England', it pointed out, 'similar Societies are encouraged and assisted with large grants of public money and provided with Hall and offices in Burlington House' (home of the Royal Society of London).³⁹ The Royal Society of Victoria (previously the Philosophical Institute of Victoria) already had its own purpose-built premises situated on a site granted by the government and constructed with the assistance of a generous government subsidy of £2000, provided as early as 1859. Intercolonial rivalries probably made the example of the Victorian government the most persuasive. Since its separation from New South Wales at mid-century, the younger colony had established itself as a centre for scientific activity and other forms of intellectual life in the Australian colonies, aided substantially by the expenditure of its gold-boosted public revenue. During the first two decades of self-government, total revenue set aside in Victoria for scientific institutions and research – museums, observatories, botanic gardens, learned societies, geological surveys and agricultural improvement – was more than triple the amount provided for such purposes in New South Wales.⁴⁰ The quality of Victoria's cultural and scientific institutions had been publicly highlighted a few years earlier by the visiting British author, Anthony Trollope, who had written favourably about Melbourne's Public Library and National Museum and judged that colony's botanical collection comparable in its variety and rarity with any established in Europe.⁴¹ As Roy MacLeod commented, the New South Wales government was already being criticised for its neglect of the university and the Australian Museum, so providing assistance to science via a grant to the Royal Society offered the government 'a chance to gain quick publicity'.⁴²

Docker, who was the father of a Royal Society member and a former Philosophical Society member, responded positively to the Royal Society's deputation, promising to put its request before his government. Unfortunately, this government lost power before financial assistance could

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be secured. Further approaches to successive governments eventually bore some fruit, as a circular sent to members in September 1877 explained. The Royal Society was to receive an annual grant of £200, and £500 towards the purchase of a building, both payments being dependent on it raising double the promised amount by private subscription.⁴³

Premises at Last

Lacking dedicated premises, the Royal Society, like the Philosophical Society before it, had long held its meetings in rooms rented each month from other organisations. The hall of the Australian Library and Literary Institution had been the venue until 1869 when the library was purchased by the government and reopened as the Free Public Library. Thereafter the society met regularly in the rooms of the Sydney Chamber of Commerce



An 1874 photograph of the Exchange Building on Bridge Street, where the RSNSW held meetings from 1869 to 1875. SLNSW.

at the Exchange, an impressive sandstone structure bounded by Pitt, Bridge and Gresham streets.

Larger premises were very much needed and in April 1875 Liversidge, then Secretary-elect, was able to secure them. His brief had been to enquire whether the society might sub-let rooms in a building known as Clark's Assembly Rooms, then leased by the Society of Arts. This building was situated near the junction of Elizabeth and Hunter streets, a site now designated 5 Elizabeth Street.⁴⁴ Liversidge duly reached a satisfactory agreement with the Society of Arts, a task probably facilitated by the fact that the Honorary Secretary of that body, the surveyor Frederick Eccleston du Faur, was also a member of the Royal Society.

This building at 5 Elizabeth Street was the RSNW's headquarters for half-a-century from 1878. The top two storeys were added during renovations in 1895 and 1906. Nine-NLA.



Under its lease the Royal Society had the use of an upstairs room for a boardroom and office, with permission to use the hall downstairs, along with its furnishings, linen and table utensils, for meetings on ‘about’ eight nights a year. It was also permitted to furnish the boardroom, and to install wire blinds bearing the title ‘Royal Society’. The Society of Arts, and if necessary a ‘kindred society’, could still use the boardroom about once a month, provided that these meetings did not clash with those of the Royal Society. By the same token, the Royal Society’s use of the downstairs hall was not to interfere with the Society of Arts’ annual exhibition, held over about five weeks in March and April. A dedicated noticeboard for the Royal Society could be installed on the outside wall of the building, albeit only at the side door.⁴⁵ This was the closest the Royal Society had yet come to having a permanent footprint on the streets of Sydney. Without waiting for the Council’s formal approval (which was duly given), Liversidge purchased the necessary furniture and gas-fittings for the boardroom in time for Council’s May 1875 meeting.⁴⁶ On the same evening, downstairs in the sub-leased hall, the Royal Society held the first of many years of meetings in Elizabeth Street. As Clarke observed with satisfaction, ‘The rooms are an advance on our respectability’.⁴⁷

Nearly three decades earlier, artist Joseph Fowles had described the streetscape for his publication, *Sydney in 1848*.⁴⁸ According to Fowles, the building stood in the ‘most respectable portion’ of Elizabeth Street, the stretch from King Street to its intersection with Hunter Street. Thanks to its proximity to the Supreme Court, this section of Elizabeth Street was already dominated in 1848 by legal chambers, and in 1875 those of one distinguished Royal Society member, the Honorable Sir George Wigram Allen MP, Speaker of the Legislative Assembly, were conveniently located just across the road from the new meeting place. The latter’s layout, and the name by which it had been known – Clark’s Assembly Rooms – reflected the building’s history. Back in 1848, it had housed a

... for the lofty, well-ventilated, brilliantly lit hall, containing a handsome collection of oil and water-colour paintings and objects of vertu.⁴⁹

In mildly satirical vein, the paper, which was an offshoot of Fairfax's *Herald*, went on to suggest that the change of venue might improve the Royal Society's usually 'terrible meetings, in which the air fairly reeks of fossils'. 'Even a *savan* [sic] must have his comfort', opined the paper. Liversidge preserved this article among a collection of newspaper cuttings mentioning the Royal Society, which are now in his personal archive at Sydney University. Together they hint at his sensitivity to the public image of the organisation whose fortunes he was endeavouring to improve.

Sub-leasing arrangements with the Society of Arts continued into 1877, as the Royal Society persevered with efforts to obtain a promise of monetary assistance from the government. Once this had been achieved, efforts intensified to raise the £1000 in private subscriptions necessary to qualify for the government's promised £500 towards purchase of a permanent home. By December 1877, 67 members had offered over £399, and by May 1878 the total raised was just over £475. At this point the Concord philanthropist Thomas Walker came to the society's rescue with an extraordinarily generous donation of £500. A Scotsman and free settler, resident in New South Wales since 1822, Walker had built a large fortune as a pastoralist, merchant and banker, and he was well known for his generosity and commitment to the welfare of his adopted country. Although he had never been a Royal Society member, Walker responded without hesitation when approached for help.⁵⁰ In gratitude, the society unanimously elected its benefactor an Honorary member, the only one so far based in New South Wales. Walker's generosity and some additional member donations secured the government subsidy, allowing the Council to purchase the Elizabeth Street building for £3525 in 1878.⁵¹

Liversidge had already initiated the long process of incorporating the Royal Society as an entity capable of bearing the responsibilities of property ownership; the legal protection that incorporation could provide was finally achieved by an Act of Parliament passed in December 1881.⁵² A seal, designed by Liversidge, depicted this newly incorporated body as a vital scientific society with royal patronage (and enduring ties to ‘the old country’), hard at work in a resource-rich colony.⁵³ In place of a motto, the words ‘Founded in 1821. Incorp. 1881’ perpetuated Clarke’s faulty version of the Royal Society’s origins.

Repayments on a mortgage of £2000 at six per cent interest were now added to the society’s expenditure, along with the cost of insurance, building alterations and repairs, and remuneration for a resident ‘housekeeper’ who acted variously as caretaker, cloakroom attendant and caterer.⁵⁴ But property ownership also produced income. The Society of Arts continued to lease the building for a time and new tenants were recruited, among them the Women’s Literary Society and the Senate of the University of Sydney.⁵⁵ A less reliable tenant was the Geographical Society of Australasia. In May 1887 its rent was £27 in arrears. The Council decided to allow this fellow learned society to have use of the hall for one more evening, after which the privilege would be withdrawn until the debt was cleared.⁵⁶

The building fund was ongoing and now directed mainly towards clearing the mortgage, but members’ donations were still slow in coming.⁵⁷ To set an example, nine Council members (including Liversidge, Leibius and Russell) pledged to donate one guinea each per year.⁵⁸ Despite another formal appeal, £1500 was still owed to the bank at the end of 1881.⁵⁹ The debt stood at £800 in November 1886 when one member, Edward Fairfax, offered to donate £200 to the fund, on condition that by the end of the year, the balance necessary to clear the mortgage had been subscribed by other members.⁶⁰ The total required took into account the government subsidy, set at £400 since 1882 and provided on the basis of one government

pound for every two pounds raised privately.⁶¹ Subscriptions by December were far from adequate, but Liversidge managed to save the situation with a successful application for a change in the terms of the government endowment which would now be given on a pound-for-pound basis.⁶² Early in 1887 the Royal Society finally took possession of the building's title deeds and Fairfax was rewarded with Life membership.⁶³

Thereafter money from the building fund, boosted by new members' entrance fees, could be used for alterations and maintenance.⁶⁴ Some money had already been expended on this before the mortgage was discharged. Polishing the marble slab in front of the building and regilding external signage contributed to the image that the Royal Society wished to project, while the installation of a separating door at the top of stairs leading to the basement quarters of the housekeeper and his wife helped to maintain a proper distance between gentlemen members and their paid servants.⁶⁵

But Liversidge had already begun to doubt the long-term viability of the Elizabeth Street building. At a Council meeting in April 1889, he broached the possibility of seeking more suitable premises. It was resolved to make enquiries, but there the matter largely rested until 1890 when Liversidge took the subject up again in his Anniversary Address.⁶⁶ Until the mortgage had been paid off, he told the members, it had been considered 'inadvisable to speak of acquiring further obligations' through the purchase of another building, but now it could be brought before the members as a whole because the society was 'in the fortunate position of having some money in hand' for purchasing a new building or enlarging what they had.⁶⁷ Their society could not progress, he said, 'if we fold our hands'. What they required was a hall large enough for lecture audiences and accommodating the more popular monthly meetings. They also needed a separate reading room and accommodation for the sections. Ideally, said Liversidge, they required a purpose-designed building – 'a modest version of Burlington House' – which could be let out to other learned

societies and be a profitable investment. Liversidge had officially given the building fund a further goal.

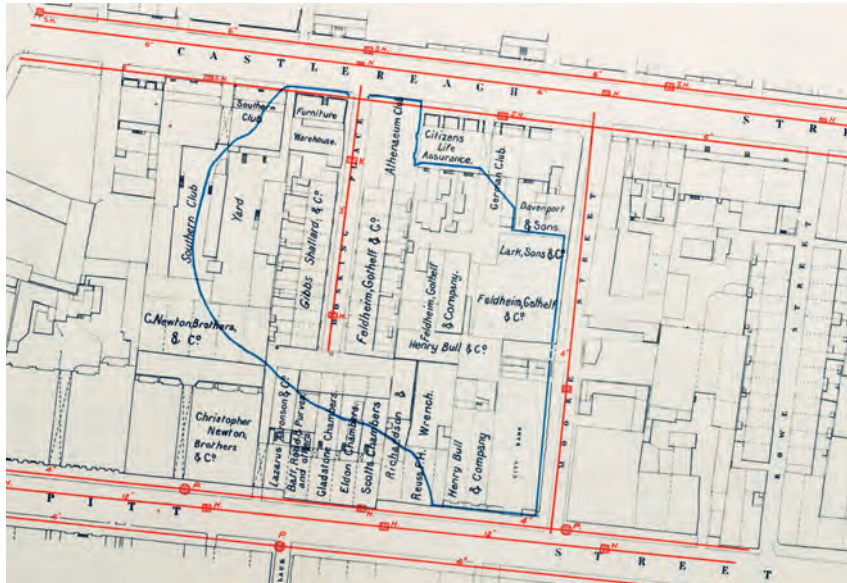
Fire!

Damp in the housekeeper's basement bedroom, caused apparently by a neighbour's abutting shed, was another worrying problem with the Elizabeth Street building.⁶⁸ When in 1890 the shed's owner refused to remove it, the possibility of purchasing the adjoining land was considered and then shelved.⁶⁹ Covering the external southern wall of the housekeeper's bedroom with a sheet of iron was chosen as a temporary measure. But rising damp and inadequacies of accommodation were the least of the Royal Society's problems later when, in the early hours of Friday morning 3 October 1890, a fire broke out in the building occupied by the printer-publishers Gibbs, Shallard and Co., located in Hosking Place between Pitt and Castlereagh streets.

Members of the Metropolitan Fire Brigade arrived within 15 minutes of the alarm being raised, but poor water pressure proved a serious hindrance, making it difficult to get water onto the building's upper storey where the fire raged.⁷⁰ Despite the efforts of city and suburban brigades, the conflagration spread rapidly, seriously injuring a number of firemen. Described by one newspaper as the 'most disastrous ... ever known in the Australasian colonies', the Gibbs Shallard fire ultimately destroyed or badly damaged numerous city buildings across an estimated two acres, including some properties in Castlereagh Street behind the Royal Society's premises.

Happily, the society's building survived unscathed, thanks in no small measure (as the minutes of a Council meeting recorded) to the 'inmates' of Bowden's Hotel in Castlereagh Street who 'helped save the building ... during the great conflagration'.⁷¹ Curiously, at the same meeting that the

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Plan showing the properties destroyed or damaged by a fire which began in Hosking Place between Pitt and Castlereagh streets on 3 October 1890. The RSNWS's Elizabeth Street building was saved thanks to customers of Bowden's Hotel in Castlereagh Street. SLNSW.

Council registered its gratitude, it also decided that if the losses due to the fire should cause premiums to rise, it would reduce the amount for which the building was insured.⁷² But the devastation of the neighbouring buildings had left an impression. In July the following year, the Council wisely decided to extend piped water to the upper storey of the building as a precaution against fire.⁷³

Establishing a Scientific Library

The Royal Society had much more to lose than bricks and mortar in 1890. It was already well on the way to establishing an up-to-date scientific library. Money had been expended in purchasing books and subscribing to

specific periodicals, but a large proportion of the library's acquisitions was being obtained via the time-honoured custom of publication exchange.⁷⁴

The Philosophical Society had received a copy of the *Transactions of the Entomological Society of New South Wales* back in 1864 and its first international donation had been received from the Smithsonian Institution in Washington DC the following year. International exchanges tentatively commenced when the Royal Society of New South Wales began publishing its own *Transactions* in 1867; the British Museum and Cambridge University Library were among the earliest recipients. Before the society secured rooms in Elizabeth Street, any publications received had to be stored at the Australian Museum, so it was not until 1875 that the exchange system could get properly underway.⁷⁵

Under the editorship of Liversidge from 1875, the Royal Society's annual publication was substantially improved. An index was added to the 1875 volume, along with summaries of the monthly general meetings, and the title was changed accordingly to *Transactions and Proceedings*. Reports and papers from the sections were added to its contents the following year. With a further name change in 1876, the society's *Transactions and Proceedings* became the *Journal and Proceedings*.

Liversidge had already arranged for the wider distribution of this revamped *Journal* with his 1875 appointment of the London firm of Trubner and Co. as the society's London agents. Letters had been written that year to the French, Imperial German, Portuguese, Norwegian, Russian and United States consuls in Sydney, asking them to forward to the governments of the countries they represented, a copy of the society's publication and a circular, inviting exchanges from kindred societies.⁷⁶ In 1879, Liversidge also wrote an appropriately obsequious letter to the Royal Society of London. Copies of that august body's *Transactions* would be 'extremely useful too, and ... highly prized by the members of the Sydney Society', he assured the London body, and the recognition which such

donations represented ‘would greatly stimulate and encourage the members in their efforts to promote the cultivation of science in the colony’.⁷⁷ His request bore fruit. By 1882 the Sydney society had accumulated all volumes of the *Philosophical Transactions of the Royal Society of London* published since 1801.⁷⁸ It also continued to receive donations from public and private sources in the Australasian colonies: *Transactions of the Royal Society of Tasmania*, for example; various statistical reports from the Victorian Government; and meteorological data prepared at the Sydney Observatory by Russell.⁷⁹

Involvement in an extensive system of international exchange meant that many more copies of the society’s publication needed to be printed. The Colonial Secretary, John Robertson, had been asked in 1875 to authorise the Government Printer to provide 200 additional copies of the current *Transactions* and 400 copies annually in future. When 300 copies were offered, the Assistant Secretary was directed to press Robertson to accede to the original request.⁸⁰ Reading and Wellbank, which had previously printed the Royal Society’s *Transactions*, had already been asked to return any copies of earlier volumes of the *Transactions* remaining in its stock.⁸¹

Before long there were substantial lists of ‘Donations’ being tabled at most monthly meetings, along with correspondence from various organisations (mostly overseas) asking to enter exchange agreements with the society, or requesting back copies of its publication to complete their own sets.⁸² Exchange agreements entailed shipping and printing costs, so the Royal Society was forced to be selective.⁸³ From time to time the decision to agree to an exchange was put off until the status of the requesting body and the suitability of its publication could be determined.⁸⁴ In July 1890, for example, the decision to exchange publications with the Philosophical Society of North Queensland in Rockhampton had to wait until a Council member, Robert Etheridge Jr, who was visiting Queensland at the time, could report upon that society’s status.⁸⁵ Acceptance of another

application for exchange, received in August that year from the Director-General Estadística in La Plata, Argentina, was similarly postponed until his promised donation had been received in Sydney.⁸⁶ The Royal Society occasionally refused exchange requests, but its own requests could be rejected too.⁸⁷ At the end of 1890, the Royal Asiatic Society declined to continue its exchange arrangement on the grounds that the Royal Society of New South Wales was not an 'oriental society'.⁸⁸ This was a minor setback. As Liversidge told members that year, the Royal Society already had exchange relationships with 'the principal scientific institutions in nearly every part of the world'.⁸⁹

Initially, the Council's room in the Elizabeth Street premises doubled as the library. Alterations were undertaken during 1881, but accommodation for the growing quantity of books, periodicals, maps and pictures was an ongoing problem and another pressing reason for Liversidge to argue in 1890 for the need to replace or substantially enlarge the Royal Society's premises.⁹⁰

The Royal Society's general rejuvenation, not least the development of a system of publication exchange and the provision of a library, entailed extra duties for the Honorary Secretaries, a fair proportion of which was delegated to their salaried assistant. By the end of 1876 Catlett was overwhelmed by what he judged to have been a quadrupling of his duties in the previous 18 months, and he requested a salary rise.⁹¹ He was given a £20 bonus and promised a salary of £100 per annum beginning in 1877. This would be conditional on his accepting *all* clerical work, as well as attending the library from four to six o'clock on Wednesday afternoons, and seven to 10 o'clock on Monday, Wednesday and Friday evenings.⁹² Given his secretarial positions with several other Sydney organisations, and possibly extra family responsibilities following his brother's recent premature death, Catlett rejected the offer with regret, and resigned.⁹³ He was quickly replaced by William Henry Webb, another English immigrant

who had come to the colony around the time that the Royal Society got underway. He held the position until 1911.⁹⁴

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Not every reform introduced under Liversidge's leadership was successful. Despite the sanctions designed to discourage fee defaulting, this continued to be a problem, and the rules on this issue were not consistently applied. As late as 1890, for example, 12 members came to notice for having failed to pay subscriptions for two years, but there were also four members who had not paid for three years, and another who was in arrears for four. Regional branches of the society, provided for in the 1876 by-laws, also failed to eventuate, while Liversidge's rule requiring new members to sign the Obligation Book was honoured mainly in the breach.⁹⁵ When it was introduced in 1876, Liversidge, Leibius and Russell had all signed the book, but only 59 existing and new members followed their example. In following years, many new members also failed to sign. During 1879, for example, 51 were elected but only 16 signatures were recorded; in 1888 only two of the 21 new members signed. Indeed, in seven of the 11 years from 1880 to 1890 the annual number of signatures in Liversidge's Obligation Book was less than 10, and only two signed forms (an alternative for those unable to attend meetings) had been pasted in the book. Perhaps this was a sign of some passive resistance among the membership to Liversidge's tendency for micro-managing the society's affairs.

Nevertheless, there could be no denying that the fortunes of the Royal Society of New South Wales had been thoroughly revived by the changes Liversidge had instituted with the support of Leibius and Russell. Membership numbers signalled the society's success. From a mere 176 men on the books in 1876, numbers reached 494 for two years running in 1884 and 1885. This was just six short of the 500-member limit that the Royal Society had set in 1880.⁹⁶ Clarke had acknowledged Liversidge's role in the

Royal Society's rejuvenation as early as 1877. Isolated by illness at home on the North Shore, Clarke wrote to Liversidge saying, 'I too highly value the great amount of labour you have bestowed on the society, without which it would not have reached much of its present importance'.⁹⁷ The emphasis is Clarke's. Little more than six months later Clarke passed away. Sadly, he did not see how far the Royal Society's 'importance' and its contribution to science in the colony would grow in the wake of the reforms introduced on Liversidge's watch.



ADVANCING COLONIAL SCIENCE

Now reinvigorated, the Royal Society used a variety of means to encourage local scientific endeavour. Honours were bestowed for individual achievement and encouragement was provided for original scientific research. Much energy and a sizeable proportion of the society's income were also invested in publishing the research communicated by the members at monthly meetings, disseminating these papers internationally via an organised system of publication exchange, and building an up-to-date scientific library. In keeping with the society's original statement of objectives, the liberal arts were not entirely neglected in its encouragement of intellectual life, but its focus was largely on science.

New Categories of Membership

By conferring honours for scientific achievement, the Royal Society of New South Wales not only made itself known abroad, it could also encourage local scientists and research conducive to local colonial development. Of all the honours in the society's gift, Corresponding membership, introduced

in 1879, seems to have been the least successful. It was formally abolished in 1900. Although the maximum number of Corresponding members allowed in any one year had been set at 25, only six had ever been elected and only one of these was resident in the colonies. This was the assayer Francis Miller, a former Ordinary member who had discussed his patented method of refining gold before the Royal Society in 1869 and was now employed by the Royal Mint in Melbourne.

Honorary membership was more enduring. Men judged to have promoted the objects of the Royal Society were eligible, as were '[e]minent benefactors' to one or other of the Australian colonies'. A contribution to colonial science was certainly implied in these criteria, although the 1878 election of Thomas Walker, the Royal Society's generous benefactor, was one case in which the contribution to science was rather indirect. Usually, as the Council made clear in 1900, candidates for Honorary membership had to be 'persons of scientific attainment'.¹

In selecting the first Honorary members, the Royal Society set out to recognise and encourage the work of scientists in the Antipodes. Twelve recipients were approved by a general meeting in August 1875, and all were resident in an Australasian colony.² They included, from Victoria: Government Astronomer Robert Ellery; Government Botanist, Baron Ferdinand von Mueller; and Frederick McCoy, then Professor of Natural Science at Melbourne University. South Australia was represented by Frederick Waterhouse, Curator of the South Australian Museum, and Dr Richard Moritz Schomburgk, Director of the Adelaide Botanic Garden. From Queensland, the Royal Society honoured the Surveyor-General Augustus Gregory, and Lewis Adolphus Bernays, Vice-President of that colony's Acclimatisation Society. Two Honorary members were connected with Tasmania. These were Dr James Agnew, Honorary Secretary of Tasmania's Royal Society, and the Reverend Julian Tenison-Woods,

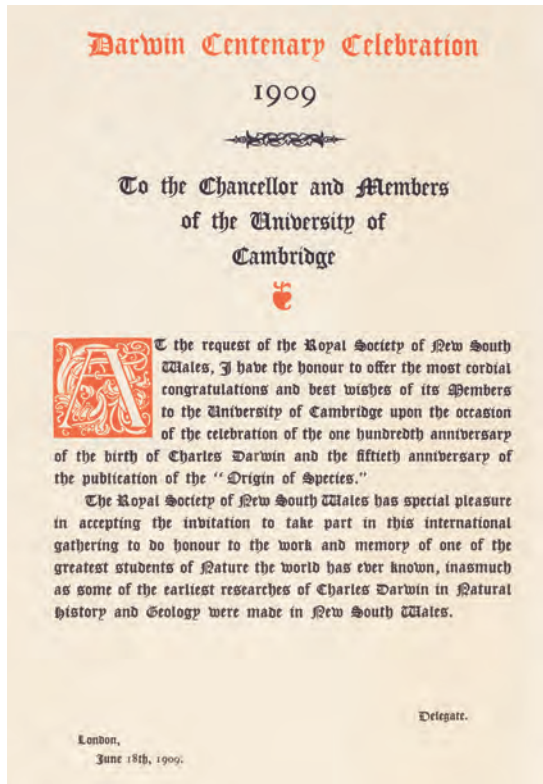
geologist, palaeontologist, zoologist and Catholic priest, originally based in South Australia, but an Honorary member of the Tasmanian society. Honorary membership was also bestowed on two prominent men of science across the Tasman: Dr James Hector, Director of New Zealand's Geological Survey and the Colonial Museum, and Dr Julius von Haast, Government Geologist and Director of the Canterbury Museum.³

Western Australia's sole representative among the Royal Society's first Honorary members was Frederick Palgrave Barlee, a politician rather than a scientist, who was then completing a 20-year term as that colony's Colonial Secretary. Although Western Australia had a number of small agricultural and horticultural societies, there was at that time no colonial museum, no geological survey, no university and no scientific organisation equivalent to the Royal Society of New South Wales and similar bodies in other colonies, in which an individual could make a name for scientific work. Nobody was nominated from New South Wales, but as the Council explained, electing Honorary members from their own colony would inevitably reduce the number of the society's 'working members'.⁴ It would also reduce the income from membership subscriptions.

The first European to be elected an Honorary member was Professor Laurent-Guillaume de Koninck of Liège, Belgium, in 1876. A palaeontologist and chemist, de Koninck had described the fossils which Clarke had collected from the Taemas-Cavan-Wee Jasper area of New South Wales in 1844.⁵ By 1880, Honorary membership had been extended to such eminent British scientists as Sir Joseph Dalton Hooker, Director of the Royal Botanic Gardens at Kew; Thomas Huxley, Professor of Natural History at the Royal School of Mines, Kensington; and Professor Richard Owen of the British Museum in London. This influential British triumvirate were recognised for their respective contributions to the botany, zoology and palaeontology of the Australian colonies.

Charles Darwin was unanimously elected to Honorary membership at a general meeting in August 1879.⁶ The Council's choice of nominees that year was judicious. Also nominated were Thomas Huxley, a defender of Darwin's theory of evolution via natural selection, and Richard Owen, Darwin's outspoken critic. Whatever their opinions of Darwinian evolution, Council members and all present at that August meeting had acted in accordance with Clarke's 1867 exhortation that members of the Royal Society be open-minded and respectful of those who held opposing views. This same spirit was in evidence following Darwin's death in 1882, when a general meeting unanimously passed a motion acknowledging the loss that 'they, with the whole scientific world, had sustained' by Darwin's passing.⁷ There would be an even stronger message of support some 27 years later, in an illuminated message of congratulations sent by the Royal Society of New South Wales to the University of Cambridge to mark the centenary of Darwin's birth and the 50th anniversary of the publication of his *Origin of Species*. The society had 'special pleasure', it declared, in honoring 'the work and memory of one of the greatest students of Nature the world has ever known'.⁸ By then, Darwinism was more widely accepted and on the curriculum of Australian universities.⁹

Acquiescence by the society's executive in the hegemony of metropolitan science was reflected in a Council resolution of September 1884. It was 'highly desirable, councillors declared, 'that Honorary members should be men of well-established reputation, and ... already recognized as such by one or more of the old scientific societies in Europe'.¹⁰ This was still the guiding principle three decades later. It did not exclude colonial scientists, but it set the standard by which they should be judged. Fourteen of the 17 Honorary members elected in the years 1900 to 1914 were Fellows of the Royal Society of London and resident in Britain. They included Liversidge, who had returned to Britain by the time of his election in 1908. Two other Honorary members elected in this period were prominent



Copy of the illuminated address sent by the RSNW to the University of Cambridge in 1909, to honour the anniversary of Charles Darwin's birth. SLNSW.

at European universities: Emil Fischer, Professor of Chemistry at the University of Berlin, and Stanislao Cannizzaro, Professor of Chemistry at Reale Università, Rome. A third, Rear-Admiral Simon Newcomb, Director of the American Nautical Almanac Office and Professor of Mathematics and Astronomy at Johns Hopkins University, was a Foreign member of the Royal Society of London.¹¹ Concerns for the international profile of the Royal Society of New South Wales seemed largely to have eclipsed the goal of encouraging colonial scientists with Honorary memberships.

The by-laws set at 20 the maximum number of Honorary members allowed at any one time, with no more than two to be elected per year. There were 20 by 1880, but the incumbents passed away more quickly

than the society replaced them, leaving just 14 in 1900. Perhaps to allow for future losses, it was decided to reset the quota to 30, but there was no commensurate increase in the number of Honorary members. None were elected in the years 1902, 1904, 1906, 1907, 1909 and 1910. Just 11 remained in 1913 and, bowing to the difficulties apparently encountered in choosing suitable candidates, the society reinstated the earlier quota.

The RSNSW's Clarke Medal for 'meritorious contributions to the Geology, Mineralogy and Natural History of Australasia'. It was first awarded in 1878 to Professor Richard Owen of the British Museum. SLNSW.



The Clarke Medal and Clarke Memorial Lectures

The Royal Society's most prestigious award for scientific endeavour was inaugurated following the death of its longest-serving Vice-President, William Clarke. An appeal for subscriptions to his memorial fund went out to all the Australian colonies in July 1878, but the response was very disappointing.¹² By May 1879, only £334 had been subscribed, much

less than the Council had expected.¹³ As Charles Moore complained in October that year, although Clarke had done as much for Victoria as for New South Wales, ‘the former colony had done nothing’ for Clarke. Even Melbourne’s *Argus* newspaper had not bothered to contribute, said Moore, despite its publisher having received 16 guineas for advertising the fund. Neither was the response of Royal Society members especially generous. By October 1879, only 74 out of the 400 had subscribed.¹⁴

It had been planned to use the Clarke Memorial Fund in two ways. A medal would be awarded annually for ‘meritorious contributions to the Geology, Mineralogy and Natural History of Australasia’, the recipient being chosen from among ‘men of science, resident in Australasia or elsewhere’.¹⁵ In addition, stipends would be paid to speakers, mostly members, to give special lectures in Clarke’s name. Chosen for their relevant expertise, these speakers would thus be honoured and encouraged in their scientific work. Their lectures would also disseminate scientific knowledge and potentially encourage interest in its pursuit. Unfortunately, inadequate subscriptions and the suspension of the bank in which the memorial fund had been lodged, meant that the Clarke lectures had to be postponed.¹⁶ The Council decided to start with the medal, making the Royal Society of New South Wales the first colonial scientific society to award scientific achievement this way.¹⁷

Dies for the Clarke Medal were commissioned from a London firm, but the medals themselves were cast in bronze at the Royal Mint in Sydney.¹⁸ John Smith, Vice-President in 1879, had hoped to have them struck in gold, but ‘some of the other members’, he conceded, believed ‘bronze [to be] more common at home’.¹⁹ The new medal bore a portrait of Clarke in bas-relief, bordered by his full name and academic qualifications. On the reverse side, a wreath composed of Australian native plants encircled the words, ‘FOR RESEARCHES IN NATURAL HISTORY’, and around the medal’s edge was the donor’s name: ‘THE ROYAL SOCIETY OF NEW SOUTH

WALES SYDNEY'. As well as being a statement of esteem for Clarke, the care expended on the medal's design reflected what the Royal Society naturally hoped would be the value placed on its award among the international scientific community. In 1893, the medal's international profile was both confirmed and enhanced when thousands of visitors to the World Columbian Exposition in Chicago had the opportunity to see two display specimens, exhibited there at the request of the exhibition's organisers.²⁰

Before the first medals were ready, four recipients had already been announced. One of these was Frederick McCoy of Melbourne University. McCoy had long disagreed with Clarke's conclusions concerning the age of the coal deposits in eastern Australia, but Clarke would probably have approved of the Council's choice. In fact, McCoy was doubly honoured by the Royal Society, having been elected to Honorary membership six years earlier. This was also true of several other Clarke medallists, among them Hooker, Huxley, Owen and de Koninck.

Choosing suitable medal recipients could involve a good deal of deliberation. Award of the 1893 medal was delayed until 1894 so that a six-man committee could draw up 'lists of the published papers and other original work of investigators into the Natural History (taken in its widest sense) of Australasia'.²¹ In all, 27 Clarke Medals were awarded between 1878 and 1914, the majority up to and including 1896. No medals were awarded during the years 1897 to 1899, 1904 to 1906, nor in 1908, 1910, 1911, and 1913.

This was partly because another use had been found for the Clarke Memorial Fund, one that was likely to have a greater practical impact on the promotion of colonial science than individual awards. In 1896, the entire fund (£376, 7 shillings and 9 pence) was borrowed by the society as a second mortgage to meet the cost of improving facilities at its Elizabeth Street premises.²² Regular repayments with interest were made to the

Clarke Memorial Fund, but in September 1902, the Council withdrew a further £200 to tide the society over until it received the usual government subsidy. Similar advances, some quite substantial, were extracted during following years.²³ For example, accounts for the year ending March 1914 show that the Building and Investment Fund had borrowed £300 from the Clarke Memorial Fund during the year. The General Fund took a further £155.²⁴

The Clarke Memorial Lectures took a long time to arrange, not only because the society had decided to wait for the fund to grow. Finding available speakers also proved a challenge. The first lectures were planned for three consecutive Wednesday afternoons in November 1889. Members were to receive free tickets upon application, while non-members could purchase those left over at 2 shillings and 6 pence each. Charles Smith Wilkinson, Government Geologist and Royal Society member, was the commissioned speaker but his unexpected departure for England necessitated the postponement, and ultimately the cancellation, of this first lecture series. There were no further developments until 1892 when the Council decided to approach Sydney University's new Professor of Geology, Tannatt William Edgeworth David, as a potential lecturer, but nothing could be arranged. Another two lectures, tentatively planned for 1896, also did not eventuate. David was to give one of these and Edward Fisher Pittman, Government Geologist and Under-Secretary in the Department of Mines, was engaged to give the other.²⁵ The failure of that year's lecture program is entirely explained by the Council's use of all the money in the Clarke Memorial Fund to finance the society's building renovations.

Finally, in September 1903, David delivered the first Clarke Memorial Lecture, its subject being Clarke's 'Life and Work'.²⁶ Three more lectures were given in October 1906 by Ernest Willington Skeats, Professor of Geology and Mineralogy at the University of Melbourne and a Council

member of the Royal Society of Victoria. His topics were ‘Volcanoes in Victoria’ and ‘The Origin of Dolomite’ (delivered in two parts). A further five Clarke lectures were delivered in 1907. David and Pittman both spoke in this series, along with 30-year-old Dr Walter George Woolnough, a former student of David’s at Sydney University, who had recently gained a doctorate from Adelaide University, and William Sutherland Dun, a palaeontologist with the Department of Mines. Three of these lectures focused on Australia’s geological past, another placed Australian geology in a wider oceanic context, and the third used geology to illuminate a subject of particular contemporary interest: ‘Problems of the Artesian Water Supply of Australia’. These were the last Clarke Memorial Lectures delivered before the outbreak of the First World War.



Geologist T. W. Edgeworth David delivered the first Clarke Memorial Lecture in 1903. Portrait by Rose Carter. SLNSW.

Monetary Support for Scientific Research

Using some of its resources to encourage specific research projects was another means by which the Royal Society could fulfill its central purpose. A provision for grants of this kind had been in the by-laws since 1875, and in November 1881 the society finally committed £25 towards establishing a biological laboratory in Sydney. Members also donated nearly £24 from their own pockets.²⁷ For a small fee, this new laboratory was to be available for use by local and visiting scientists, but the Royal Society's substantial contribution to the project gave it the right to nominate a worker who could use the facilities free of charge.²⁸

Similar facilities were already operating overseas in Naples (Italy), Newport (USA), Trieste (Austria) and Terschelling (the Netherlands). An argument for establishing one in Sydney had first been made at a Linnaean Society meeting in 1878 by the visiting Russian marine biologist, ethnologist and explorer, Baron Nikolai Nicholaievich de Mikluho-Maklai.²⁹ In the past, he told the members, travelling scientists had devoted their time merely to amassing specimens for later study, but the time for that was now passed. '[The] *great aim of travel*', Mikluho-Maklai declared, '*should be observation and investigation*, exercised immediately upon the spot'.³⁰ Financed by a New South Wales government grant, private donations, and financial contributions from scientific societies in Melbourne and Sydney, a building was erected during 1881 on land provided by the government at Watson's Bay on Sydney Harbour. It contained five workrooms or laboratories, two bedrooms, a storeroom and a bathroom.³¹

In his 1881 Anniversary Address, John Smith had expressed his hope that the Council would follow the Victorian Royal Society's example, and that of several other scientific societies, by making an ongoing annual contribution towards the upkeep of the Watson's Bay station.³² This did

not eventuate. In fact, the facility was not a great success, Mikluho-Maklai being the only person ever to use it. In early 1886, he embarked with his family on an extended visit to Russia and he died abroad in 1888. By this time the Watson's Bay laboratory had closed. Resumed by the government with a compensation payment of £500, the property was turned over to the military as a residence for married officers.³³ In 1890, William Aitcheson Haswell, the University of Sydney's Professor of Biology and a Royal Society member, led an attempt to revive the research station 'at a more convenient location', but this was unsuccessful.³⁴

Unlike its counterpart in Victoria, the Royal Society of New South Wales never attempted to organise any major research enterprise of its own. There was sufficient evidence of the pitfalls of such projects in the Victorian society's involvement with the disastrous Exploration Expedition of 1860–61. But the New South Wales society's willingness to finance and participate in large-scale scientific exploration – initiated by others – was tested in the final decades of the nineteenth century, when the great Antarctic continent beckoned powerfully as a promising field for scientific investigation and economic exploitation. As early as 1885, the British Association for the Advancement of Science (BAAS) had formed a committee on Antarctic exploration. The following year in Melbourne, the Royal Society of Victoria and the Victorian Branch of the Royal Geographical Society of Australasia also formed a joint Antarctic Exploration Committee.³⁵ 'I am at present subject to Antarctic fever', confessed the President of the Victorian Royal Society, William Kernot, in a friendly letter written in July 1886 to his 'brother President', Archibald Liversidge.³⁶

But 'Antarctic fever' was not so virulent as to weaken the characteristic caution of the New South Wales society's executive, whose support for any venture on the icy continent had its limits. In April 1887, the Council

received a letter from the Victorian committee, asking for cooperation in lobbying the New South Wales government to help finance Antarctic exploration.³⁷ The Victorian request was accepted. The Royal Society agreed to approach the New South Wales Premier jointly with the Linnaean Society and the New South Wales branch of the Royal Geographical Society of Australasia. Subsequently the Royal Society received a second letter from Victoria, requesting its cooperation in appealing to the BAAS for assistance. The Council was also willing to support this initiative but warned that it ‘would not guarantee any pecuniary responsibility’.³⁸ Neither appeal for funds was successful.

Then in 1890, the Swedish explorer and geologist, Count Nils Otto Gustaf Nordenskjöld, offered to lead a joint Swedish-Australian expedition and, with the assistance of a Swedish magnate and philanthropist, Baron Oscar Dickson, to take responsibility for most of its cost. This offer was contingent on £5000 being raised within the colonies. Correspondence from both the Victorian Exploration Committee and the New South Wales branch of the Royal Geographical Society of Australasia relayed this news to the Royal Society of New South Wales, once again requesting its cooperation in fundraising.³⁹

The Council took the matter seriously. A special committee, formed jointly with the Geographical Society, met in mid-September 1890. After listening to opinions concerning the commercial and scientific advantages of Antarctic exploration and the practical difficulties involved in bringing such a project to fruition, the committee reported that ‘it was not deemed desirable to place any programme before the public until the project was more matured than it is at present’.⁴⁰ Later, when the Royal Society received a circular with a subscription list from Victoria’s Antarctic Exploration Committee, it resolved that it would need more detailed information about ‘the general arrangement of the intended expedition, especially as the sum

of £10,000' (the expected Swedish and colonial contributions combined) seemed 'inadequate for the purpose'.⁴¹ By the time that Carl Leibius gave his Anniversary Address in 1891 as one of the society's Vice-Presidents, more information about the expedition and the Swedish contribution was available, but less than £1000 had yet been subscribed in the colonies. Leibius hoped (in vain as it turned out) for a better result eventually.⁴² Nordenskjöld did eventually mount an Antarctic expedition from 1901 to 1903, but he did this without direct involvement of the Victorian Antarctic Exploration Committee, nor of the Royal Society of New South Wales.

The only recorded request for financial assistance for an individual researcher was received in 1892. At a Council meeting in August, Dr Thomas Peter Anderson Stuart, Professor of Physiology and Anatomy at Sydney University and one of the society's Honorary Secretaries, moved that a grant be given to Dr Charles James Martin, who was a demonstrator in his department.⁴³ Martin, an Englishman, was a rising star. He had been appointed to Sydney University in 1891 but was not yet a Royal Society member.⁴⁴ He would become one in September 1893, and three decades later, as Director of the Lister Institute of Preventative Medicine in Britain, Martin would join the list of Honorary members.

Martin had already begun research into the venom of the black snake in cooperation with society member John McGarvie Smith, who had his own private laboratory. Their joint paper on this subject was delivered a few weeks prior to Anderson Stuart's motion.⁴⁵ Martin was asked to state in writing the amount of money he required and how he planned to use it.⁴⁶ He asked for £25 to assist with his investigation into the physiological effects of the venom of Australian snakes. At its December meeting, the Council regretfully rejected Martin's request, explaining that the society's current financial condition prevented it from allocating grants for scientific research.⁴⁷

Essay Competitions

Coincidentally, news was received at that same December Council meeting that Ralph Abercromby, a visiting British meteorologist, had offered to provide the society with £100 to support ‘an exhaustive study of certain features of Australian weather’.⁴⁸ The offer was immediately accepted and the following year Abercromby joined a committee appointed to manage the grant. The first Australian weather feature selected for study was the wind then known as the ‘Southerly Burster’ (now called the ‘Southerly Buster’). A prize of £25 was offered for the winning essay on the subject.⁴⁹

Due by March 1894, the essay had to be no more than 50 foolscap pages long, contain mainly original information and preferably be illustrated with photographs showing ‘a characteristic ... cloud-roll’ of each ‘burster’. The committee also set out very specific instructions concerning features of this weather phenomenon which entrants were required to address, including the conditions that influenced the formation of a ‘burster’, any accompanying changes in air pressure, and the relationship between the ‘burster’ and rainfall.⁵⁰ The competition was advertised extensively in Melbourne and Sydney, letters were sent to learned societies in Europe and America, and it was mentioned briefly in the British journal *Nature*. The number of entrants is unrecorded, but the winner was Henry Ambrose Hunt, Second Meteorological Assistant at the Sydney Observatory. He was elected to membership later in 1894 and his essay was published in the *Journal*. At the beginning of the 1895 session, there was £68 left in the Abercromby Fund, some of which rewarded a second essay by Hunt, entitled, ‘Types of Australian Weather’.⁵¹ Both of Hunt’s essays, along with another by Henry Russell on Southern Hemisphere anticyclones, appeared in a book published by Abercromby in 1896 titled *Three Essays on Australian Weather*.⁵²

A more enduring method of encouraging original scientific research was the Royal Society's own essay competition, introduced in 1881. Initially, a £25 prize was promised to the author of each winning essay and from 1883, a bronze medal was offered as well. This bore the Royal Society's Seal on one face and on the other, a wreath surrounding the space where the winner's name was inscribed. Most prizewinning essays were also published in the *Journal* as a further reward for original research. All essays were required to contain substantial original material and, to ensure impartiality, each author's identity was protected by a nom de plume. The competition was divided into 19 numbered series with a choice of several essay topics in each series, all with a scientific focus.⁵³ A prize was promised for the winning essay on each topic in a given series.

Entries in the first series were submitted in September 1881 and those in the last were due in 1900, but 1896 was the final year in which any prize was awarded. Two authors received prizes in the 1889 series, but this was unique. Indeed, only 14 prizes were ever awarded. Sometimes the essay topics attracted no entries at all, and too often all the essays on a given topic were judged to be of insufficient merit.

Winner of the final essay prize in 1896 was the Reverend John Milne (Michael) Curran, a geologist, Roman Catholic priest and Royal Society member, whose chosen subject was 'The Occurrence of Precious Stones in New South Wales, with a description of the deposits in which they are found'.⁵⁴ This was his second award. He had also won the medal and money prize in 1891 for an essay: 'A Contribution to the Microscopic Study of Some Australian Rocks'.

The competition was designed to encourage research on subjects relevant to colonial interests. Three winning essays, written respectively by amateurs John Fraser (1882), John Mathew (1889) and Robert Hamilton Mathews (1899), focused on Indigenous Australians, while two others, by Julian Tenison-Woods (1888) and Thomas Whitelegge (1889), surveyed



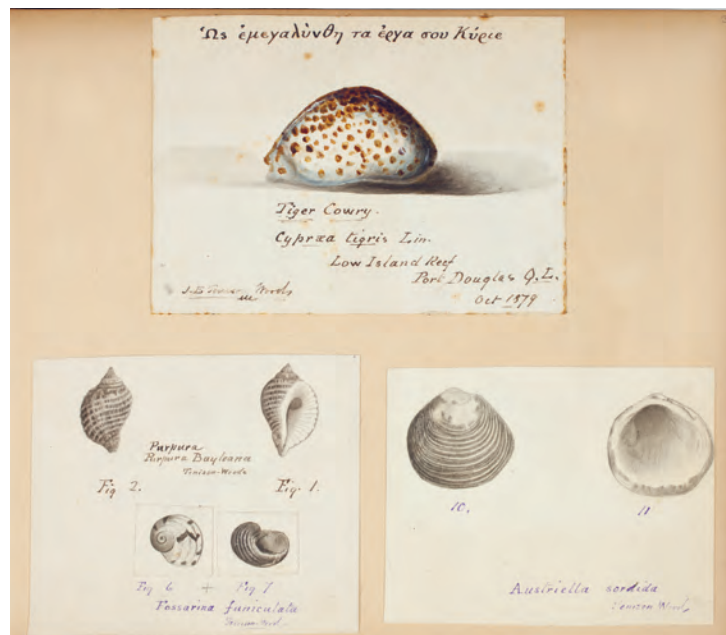
Catholic priest and natural scientist Julian Tenison-Woods was an Honorary member of the RSNSW from 1875 and was awarded the Clarke Medal in 1888. Photograph by Henry Hall Bailly in Hobart, 1880. SLNSW.

native fauna. Tenison-Woods' essay on indigenous mollusca ranged over the whole continent, while Whitelegge catalogued the 'Marine and Freshwater Fauna of Port Jackson and Neighbourhood'. Four other prize-winners surveyed colonial economic resources: tin (1886), gold (1887), timber (1894) and precious stones (1896). Colonial economic development was also the underlying concern of two other winning essays: 'Water Supply in the Interior of New South Wales' by William Abbott (1884), and 'On the Influence of the Australian Climates and Pastures upon the Growth of Wool' by Andrew Hendry Ross (1882).

Another winning essay, judged in 1892, approached economic development from the opposite direction, by discussing the effect of

KNOWLEDGE FOR A NATION

Sketchbook pages of sea shells drawn by Julian Tenison-Woods. His paper on indigenous mollusca won the RSNSW's essay prize in 1888. SLNSW.



settlement on native vegetation. Its author, Alexander Greenlaw Hamilton, was Headmaster of Mount Kembla Public School. He was also an amateur naturalist and a member of the Linnaean Society. Hamilton's understanding of the interconnectedness of living things was clear as he laid out convincing evidence of the damage that had been done to native vegetation, not only from clearing, but also from the introduction of foreign flora and fauna, and the destruction of native species, especially birds. His argument, and the society's choice of essay topic, reflected growing concern in some quarters for the protection and preservation of native flora and fauna. Hamilton became a leading advocate for the teaching of nature study in schools, a subject introduced to the New South Wales primary school curriculum in 1904. Its main objective was to foster in young children an aesthetic appreciation of the natural world and 'a living sympathy with everything that is'.⁵⁵

Essay topics which failed to attract a winning entry similarly dealt with aspects of local significance. Some had a particularly utilitarian focus and others merely sought contributions to the body of human knowledge. An essay set in Series I, for example, required original work on 'Forage Plants Indigenous to New South Wales', another in Series II asked for research on the 'Chemistry of Australian Gums and Resins', while essay topics set in Series X attempted to encourage studies of Australian, New Zealand and Tasmanian meteorology, and research into the anatomy and life history of the echidna and platypus.⁵⁶ In 1895, Charles Martin won the Royal Society's bronze medal, and the £25 he had earlier requested as a special grant, for his essay on a subject important to most colonists: the 'Physiological Action of the Venom of the Australian Black Snake (*Pseudechis porphyriacus*)'.⁵⁷ As observed by historian Peter Hobbins, 'in the Australian colonies there was no question of ... [the snake's] pre-eminence in the continent's ecology of dread'.⁵⁸

Neither Martin's research, nor that which Curran reported in his 1891 essay, had depended on extensive fieldwork. Both had also required access to the kind of scientific facilities not always available to amateurs. Curran had studied the 'structure of Australian rocks' through the lens of a microscope.⁵⁹ Martin had experimented on living animals under laboratory conditions.⁶⁰ Using a series of instruments to measure and record his subjects' response to black snake venom, he had identified its impact 'on the three most vulnerable points in a higher organism; the blood, the heart and the respiratory centre in the medulla'.⁶¹ Further reflecting the professionalisation of science in the colony, both men also produced original research in branches of science from which they already, or would very soon, earn a living. His reported research having earned him a Doctor of Science from the University of London, Martin moved to Melbourne University as a lecturer and later Professor of Physiology, and 12 years later he was appointed Director of the Lister Institute of Preventative Medicine in London. Curran took up a travelling lectureship with the Department of Public Instruction following his win in 1891 and in 1897 was appointed a lecturer in geology and mineralogy at Sydney Technical College.⁶²

Connecting Local Scholars with International Scientists

Particularly effective in facilitating local scientific endeavour was the Royal Society's system of publication exchange. The scientific reputations of the Royal Society's most productive members were likely to be enhanced when their papers were distributed internationally via the Royal Society's *Journal*.⁶³ By September 1877, for example, an article on new processes of copper extraction by the metallurgist Samuel Levy Bensusan; another by Henry Russell on 'Meteorological Periodicity'; and George Denton Hirst's 'Some Notes on Jupiter during his Opposition of 1876', all

published in the Royal Society's 1876 *Journal*, were available to patrons of the library of the Academy of Natural Sciences in Philadelphia.⁶⁴ Of course some Royal Society members, especially those whose work was less concerned with local issues and at the forefront of international research at the time, chose to publish overseas. Richard Threlfall, the University of Sydney's Professor of Physics from 1886 to 1898, who was active in studying fundamental questions of physics during his time in Sydney, published only five papers in the Royal Society's *Journal*.⁶⁵ One of these was his 1895 Anniversary Address as the society's retiring President.⁶⁶ Reflecting Threlfall's opinion of the reach and reputation of the Royal Society's *Journal*, more than half his papers (58 per cent) were published overseas, and apart from reports he prepared for the colonial government, most of his local publications appeared as reports to the Australasian Association for the Advancement of Science.⁶⁷ By contrast, Joseph Maiden, who published prolifically on Australian flora from 1887 to 1921, rarely published outside the Australian colonies.⁶⁸ Liversidge also published overseas but demonstrated his commitment to the Royal Society and the reputation of its *Journal* by publishing 45 of his pre-1901 papers there. The Royal Society's *Journal* continued to be the preferred outlet for Sydney's chemists until the 1930s.⁶⁹

As well as raising the profile of colonial scientists, publication exchange allowed scientists, in Sydney at least, to keep up with international developments in their chosen field. By 1900, the list of organisations and institutions to which the society sent publications had grown to 421 and that year the library received in return some 224 volumes, 1669 parts of volumes, 85 reports, 263 pamphlets and five maps.⁷⁰ These came not only from Great Britain and its colonies in Australasia, North America, India, Ceylon and South Africa, but also from centres of learning in western, eastern and northern Europe, the United States, Central and South America, and Japan.⁷¹ In addition, the society subscribed to 48 local

and overseas journals and purchased 22 books for the library. Continually being updated through international exchange, book purchases and journal subscriptions, the Royal Society's ever-growing library was a valuable resource for serious scholars and particularly important for those who lacked access to Sydney University's resources.

Even those with access to the university's resources could appreciate the value of the Royal Society's library with its wide range of regularly augmented serial publications. Threlfall relied particularly on the society library. When he arrived in Sydney in 1886, he had found that the university had 'absolutely no physical library at all – neither standard works nor serials'.⁷² Over time there was limited improvement in the university's subscriptions to serials relevant to physics and in its acquisition of the standard texts required by Threlfall's physics students. Then in 1893, financial constraints arising from the prevailing economic depression forced the university to reduce its serial subscriptions and too many of those cut related to Threlfall's area of interest, electrotechnology.⁷³ Without the Royal Society's library, as he reflected later, 'it would have been impossible at one time for me to have done any work at all'.⁷⁴

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The Royal Society's honours, grants and essay competitions were uneven in their impact on the development of scientific endeavour in New South Wales. Much more effective were its well organised system of publication exchange and its growing scientific library. But the great bulk of the society's work for colonial science occurred month by month and year by year at section and general meetings. The progress of the sections and the nature of the scientific work that occupied the Royal Society's active members is explored in the following chapter.



A PRODUCTIVE HIVE

William Branwhite Clarke surely would have been pleased with the industry displayed by the Royal Society's 'working bees', as he called the most active members.¹ Well over 700 papers and numerous exhibits were presented at its general meetings during the years 1876 to 1914. In the same period, leading members also worked to establish and maintain the specialist sections, provision for which had been made prior to Clarke's death.

Specialist Sections

Management of the sections was patterned on the organisation of the parent body. Each section had an elected chairman and a management committee, and some printed their own extensive sets of rules. Sections were expected to meet monthly on a designated day during the Royal Society's session and provide an annual report of their proceedings for publication in the *Journal*. These reports, the surviving minute books and

some intermittent press coverage of their meetings, together shed light on the history of the sections and what they were able to achieve.

Sections B (Chemistry and Mineralogy) and C (Geology and Palaeontology) having merged almost immediately after their formation, the original nine sections were reduced to eight, and in the first blush of sectional enthusiasm seven were active during 1876. Two preliminary meetings called in 1876 to elect office bearers for Section D (Biology) lapsed owing to insufficient interest but, following a transfer of the Sydney Botanical Society's membership and assets to the Royal Society, Section D was reimagined as 'Botanical' and began meeting in 1877. By 1882, however, only two of the original eight sections were still active. Longest lasting were Section E (Microscopical), which continued until 1891, and Section H (Medical), which was active into 1899. Two other lapsed sections were resuscitated before 1900, but only for a year or two. The combined Section B and C met for the last time during 1879, but it was revived briefly during 1892 with a focus on geology. Section I (Sanitary Science and Statistics) ceased meeting after 1879 but met again during 1886 and 1887. Proposals during the 1890s and early 1900s to open additional sections for ethnology, pathology and dentistry failed to attract sufficient support.² Whether attenuated or more enduring, the activities of those sections which did get off the ground, certainly merit a closer look.

With Henry Russell as Chairman, William John Macdonnell as its first Secretary and 16 founding members, Section A (Physical Science) was particularly productive. Apart from a one-year hiatus during 1880, it met regularly from 1876 to 1881. During the five years it operated, a total of 21 research papers accompanied this section's annual reports. Most of these papers focused on astronomy. They addressed such subjects as: the characteristics of certain planets; the use of equatorial telescopes; and Russell's exposition of his own invention, a measuring device, the

‘Triangle Micrometer’. Russell produced nine of these papers, all between 1876 and 1879. John Tebbutt, an expert amateur astronomer, had eight papers published over the entire life of this section and Macdonnell two, while two other amateurs, George Hirst and William Jacomb Conder, produced one each. Dominated by amateur astronomers, the section gave much less attention to the other passion of its Chairman – meteorology. During 1876, public servant Frederick Eccleston du Faur, who was a founding member of this section, discussed a recent local windstorm, while pastoralist Leopold Fane de Salis raised the possibility of periodicity in colonial weather patterns.³ But the only paper with any meteorological connection published in Section A’s annual reports was Russell’s ‘The River Darling – The Water Which Should Pass Through It’. Here Russell employed his extensive knowledge of rainfall in the river’s catchment to estimate how much precipitation was finding its way into the Darling.

Archibald Liversidge was the first Chairman of the combined Sections B and C. The sum of £20, allocated by the Council in July 1877, allowed this section to purchase reference books and a mineral cabinet, and Charles Smith Wilkinson, a geological surveyor with the Department of Mines, was approached for help to enlarge the specimen collection.⁴ Most meetings were devoted to exhibiting and discussing specimens. During the first two years, there were field trips too. In October 1877 members examined the Devonian measures near Mount Lambie on the Bathurst road, west of the Blue Mountains, and in July the following year, they surveyed the geological features at Mount Prospect near Fairfield.⁵ During a meeting in November 1877, Liversidge spoke informally and at length about mineral deposits obtained from hot springs in New Zealand, and in 1878, William Adam Dixon discussed the silver mined at Boorook near Tenterfield in northern New South Wales. Dixon’s was the only formal paper published in the section’s proceedings. Attendance at meetings was never numerous,

dropping to four people at meetings from September 1878 through June 1879. By September 1879, meetings had ceased altogether.

When this section was briefly re-established during 1892, four meetings were held from April to September. Six papers were delivered, and various exhibits were discussed, including a variety of mineral specimens, photographs of geological phenomena and a petrological microscope.⁶ Despite, or perhaps because of what this section had managed to accomplish, there were murmurings of disaffection in the ranks. In August, some members complained about the excessive formality of meetings. They wanted ‘social meetings’ and a more ‘convivial atmosphere’.⁷ Suggestions from the floor were taken and a list made of the topics that members would like to discuss informally in future. After one more meeting, however, the section folded once again.

The Botanical Section (D) was never very large; attendance at its meetings varied from three to seven. At the suggestion of its Chairman, the surveyor and naturalist Robert David FitzGerald, members agreed to research in detail one plant genus each. Meanwhile, they examined volumes of George Bentham and Ferdinand Mueller’s *Flora Australiensis* and listened to a paper written by Thomas Cheeseman, Curator of the Auckland Museum.⁸ Overall, however, little seems to have been accomplished. Apart from registering attendance, the minutes of many meetings were simply left blank. In November 1878 the Botanical Section trialled weekly meetings, but the following year it met only three times and meetings ceased altogether after July 1880. No reports were submitted to the Council in 1878 and 1879, nor for the single meeting reportedly held in 1880, when the *Journal and Proceedings* for that year stated incorrectly that Section D had not met at all. The Linnaean Society of New South Wales, founded in 1874, already catered for individuals with expertise or interest in botany, which might help explain the Botanical Section’s collapse.

For the best part of 15 years, an active Microscopical Section (E), attracted doctors and others who constructed optical lenses or made use of them in their scientific work. Among the latter was the geologist Michael Curran, whose work on the microscopic structure of Australian rocks has already been mentioned, along with amateur astronomers, Hirst and Macdonnell, and Macdonnell's father, a scientific instrument maker.⁹ Methods of slide preparation, and the merits of various microscopes and optical lenses, were discussed, and members viewed with interest the detailed information about micro-organisms and human anatomy revealed in the slides exhibited at meetings. The extent to which this section satisfied the needs and interests of its members was reflected in its extended life.

Geographical exploration, the principal focus of Section F, was an enthusiasm of its Chairman, du Faur, who was a Fellow of the Royal Geographical Society of London. He had already helped to finance an 1874 expedition in search of the missing explorer Ludwig Leichhardt and another to New Britain in 1875.¹⁰ Du Faur was excited by new information about distant parts of New South Wales, which he received from surveyors in the field in the course of his work as Chief Draftsman in the Crown Lands Office. Under his leadership, the section took the first small steps towards cataloguing available accounts of Australian exploration. A librarian in Hobart answered a request for a list of relevant works; an obliging British Navy captain supplied Admiralty charts of the Antarctic Ocean; and section members were urged to collect any information on geographical subjects that appeared in the press.¹¹ Attention turned to ethnology in June 1879, when members responded to a Melbourne correspondent's request for information about Aboriginal people in New South Wales. But this was the section's penultimate meeting; du Faur's passion for geography had proved insufficient to sustain it. As early as 1876, three meetings had lacked a quorum and only four people attended the other two. Section F

met only once in 1877 and a mere three times in 1879.¹² When the New South Wales branch of the Geographical Society of Australasia opened in 1883, it removed any possibility of this section's revival.

Eliezer Levi Montefiore, Sydney manager of the Pacific Fire and Marine Insurance Company, was an accomplished black-and-white artist and a driving force in Section G (Literature and Fine Arts). A nod to the broader cultural objectives originally stated for the Royal and Philosophical Societies, this was the only section established at this time which was not focused on science. Section founders Montefiore and du Faur were both members of the Academy of Art. Several other section members – Carl Leibius, Russell, and his deputy at the observatory, Henry Lenehan – were better known for their scientific expertise. Art, photography and music education were among the subjects discussed at this section's meetings, and seven papers were included with its annual reports. There were no meetings during the 1877 session, but they occurred fairly frequently during 1876, 1878 and 1879. The final meeting took place in July 1880. A note appended to its minutes explained that leading members were absent from the colony afterwards, attending the Melbourne International Exhibition.¹³ This opened in October and by then Montefiore and du Faur had acquired an additional distraction as trustees of Sydney's new public art gallery, which was inaugurated in September 1880 in a temporary building located in the Domain.¹⁴

Doctors in Sydney must have welcomed the formation of the Medical Science Section (H). There had been earlier, unsuccessful attempts to establish a medical association in New South Wales. In 1844, Dr William Bland had established the Medical-Chirurgical Association in Sydney, but internal dissension had hastened its demise. An Australian Medical Association, formed in 1860, was undermined the same way. By 1868 it had only six financial members and it collapsed the following year.¹⁵ The

Royal Society's new Medical Section promised regular opportunities for professional development that were long overdue.

At meetings, doctors exhibited specimens of diseased body parts and deformities. They also drew on their clinical experience to discuss and compare treatments for various ailments and injuries, sometimes with a hapless patient on hand as a living exhibit.¹⁶ Members were also concerned about deficiencies in the registration of deaths in New South Wales and in 1877 they asked the Registrar-General to alert the government that, in too many instances, the cause of death was not being certified by qualified medical practitioners.¹⁷

In 1880, four years after the Medical Section began meeting, a branch of the British Medical Association (BMA) was formed in Sydney. Problems of communication with its London headquarters took time to be ironed out and for a while the two medical bodies co-existed, the BMA meeting in the Royal Society's premises. In August 1889, however, Anderson Stuart warned the Council that the Medical Section was becoming 'moribund'. This was less a matter of dwindling membership, than the quality of its discussions. There was, he said, 'not sufficient material to supply two societies' and either the Medical Section or the BMA branch 'would have to give way'. Adding to the problem, according to Stuart, were the Royal Society's own rules, which prevented the section from discussing issues of 'professional etiquette'.¹⁸ Concessions were required if the Medical Section was to survive. Immediately the Council authorised Stuart to consult the section regarding an appropriate revision of the rules, and the following year, in response to a further suggestion from Stuart, it also agreed to emulate the BMA by supplying refreshments gratis at the Medical Section's meetings.¹⁹ The section did survive, but only for a few more years.

Section I (Sanitary Science and Statistics) was led by the respected surgeon, Alfred Roberts, once dubbed by a colleague 'the true creator of

the Prince Alfred Hospital'.²⁰ If not necessarily 'fussy and officious ... in the cause of sanitary reform', as Henry Parkes had once described him, Roberts was certainly committed to the cause.²¹ Doctors and engineers were attracted to this section and papers read at meetings reflected their leading preoccupation: the need for effective public health legislation. They discussed such subjects as: the connection between sanitation and disease; the importance of high pressure in water supply; and 'the ventilation, fitting and management of emigrant ships'. A paper on this last subject, read by the section's Secretary, was the work of Miss Jane Chase, not a section member of course, but a woman with many years' experience as a matron on emigrant ships.²² In October 1876, the Royal Society's Council responded positively to Section I's request that a deputation of members be appointed to press the government about improving public health. Subsequently, the deputation reported that the Minister was willing to support a public health bill drawn up by the society and to this end, he had offered assistance from a parliamentary draftsman.

At a general meeting in November, this news sparked debate about the Royal Society's proper relationship with government. Archibald Liversidge was opposed to the society's involvement in such a project, insisting that it should not 'interfere in any legislation'. Long-term members Russell, Charles Moore and William Scott all advised caution. A few months earlier, the society's application for a parliamentary grant had stressed its usefulness to the government as a source of scientific information. But drawing up legislation for government seemed a step too far, because it had potential to involve the society in political controversy and draw members into ungentlemanly debate like that during 1870 over Sydney's water supply.

Roberts argued that this was an 'exceptional case' and 'hardly political in character'. His arguments carried the day with members, so a

sub-committee was appointed to prepare the bill.²³ Liversidge and Leibius were ex-officio members. Sometime later, however, the Council learned from the Colonial Secretary that the deputation had been mistaken in thinking that the society had been asked to draw up the bill, nor had it been offered a parliamentary draftsman, although the government would be willing to provide one.²⁴ This news provided a welcome excuse for disbanding the Health Bill Committee.²⁵

Improving the collection of statistics associated with public health was Section I's other aim. From the beginning, members applied themselves to the question of improving the accuracy of information collected by the Registrar-General about deaths in the colony and their causes, a concern shared with Section H. But it was not until September 1879, at the section's first meeting for that year, that members agreed on the recommendations for reform to be passed on to the Colonial Secretary.²⁶ By this time, the reforming zeal which had powered this section seemed temporarily exhausted and after one more meeting, the Sanitary Section folded.

But Sydney's still parlous sanitary condition and the lack of effective public health legislation spurred a revival of the Sanitary Section in 1886. When it met again in June 1886, all present agreed that the section's focus should be an investigation of the merits of the health bill then proposed by Dr Charles Kinnaird Mackellar, the Health Board's President.²⁷ To inform their deliberations, members requested and received from the governments of other Australian colonies various official documents on sanitation and public health. During 1886 and 1887, members presented papers on subjects including the 'Ventilation of Sewers', 'Sanitation in the Suburbs', and the 'Disposal of Sewage'. But after June 1888, Section I folded for the second and final time. A comprehensive Public Health Act was not passed in New South Wales until 1896.

Problems with the Sections

The short-lived character of most sections set up in 1876 requires some explanation. Competition from other learned societies, spent reforming zeal, or divergent views on the way a section should be run, variously contributed to the fate of some. But in the case of Section A, a disgruntled William John Macdonnell cited a deeper problem. During Section A's 1880 hiatus, he blamed the Council for 'the suppression' of section meetings, 'especially Liversidge', he insisted, 'who I know thinks they interfere with the main meetings'.²⁸ In a detailed history of the Astronomical Section, Wayne Orchiston and Ragbir Bhathal offered evidence to support Macdonnell's take on the Council's attitude.²⁹ They noted, for example, Russell's failure in his duty as Chairman to re-convene the section in 1880, arguing that its reactivation in 1881 was at Macdonnell's instigation, and that Russell, who was still officially the Chairman, failed to attend some meetings that year and provided no papers. Perhaps, as these writers speculated, Russell was responding to pressure from the Council to encourage the 'demise of his very own creation'.³⁰

Russell had spelt out what the Council expected of the sections during his 1882 Anniversary Address. In the British Association for the Advancement of Science, he said, sections had been formed with the object of accomplishing 'certain work', but the sections in their own society were designed simply to allow members with specialist scientific interests to meet with less formality than at a general meeting. '[W]hen any member has prepared a paper', Russell continued, 'it is understood ... that he is not to hide his light by reading it to a small section, but bring it to a general monthly meeting of the Society'.³¹ From this point of view, the numerous research papers read before Section A could well have been perceived as problematic.

Saturday 13 June 1885

<i>a</i>	<i>Scorpius</i>	<i>R.A. 15-58-58.7</i>	<i>Dec. + 6-47-25"</i>	<i>β</i>	<i>Scorpi</i>	<i>R.A. 15-58-48</i>	<i>Dec - 19-29-22"</i>
1		46		1		51	
2		18.5		2		24	
3		38-49.5		3		58.58	
4		20		4		30	
5		<u>51</u>		5		<u>23</u>	
		15-58-49	<i>Chrono 10.3</i>			15-58-57.2	<i>Chrono 9.2</i>

Result

<i>Star Scorpi</i>	<i>by Almanac</i>	15-58-48
<i>Star a Scorpi</i>		15-58-38.7
		<u>20-9.3</u>
<i>Star by clock</i>		15-58-57.2
<i>Difference</i>		<u>20-9.3</u>
<i>Assumed Transit-Star</i>		15-58-47.9
<i>by clock</i>		15-58-49.
<i>Difference</i>	<i>3.1</i>	<i>Star or Telescope used</i>

Astronomical observations recorded at Port Macquarie in June 1885 by bank manager-astronomer William John Macdonnell, who blamed Liversidge for the demise of the RSNW's Section A (Physical Science). SLNSW.

But more mundane reasons can be advanced for the demise of this and other short-lived sections. Not least was a shortage of willing sectional ‘working bees’. No other member had been prepared to take the lead by convening Section A in 1880 when Russell failed to do so and Macdonnell’s work took him out of town, nor in 1882 when Macdonnell was transferred permanently to Port Macquarie as a bank manager.³² Leadership of Section B and C from 1876 to 1879 had depended on just three men – Liversidge,

William Dixon and Leibius – while Montefiore and du Faur were each the mainstays of their respective sections.

However keen were the men who tried for several years to keep the sections going, they were also very likely overstretched by other commitments. Leibius, Liversidge and Russell are obvious examples. As well as being section leaders, they had onerous responsibilities within the Royal Society as a whole. Over-commitment across the sections was a factor too. Initially it was not unusual for members to join multiple interest groups. Montefiore, for example, joined the Geography Section, du Faur was active in both Fine Arts and Astronomy, while Leopold de Salis pursued his varied interests in Sections A, G and F.

A civic-minded gentleman's voluntary activities outside the Royal Society could also prejudice his involvement in a section. As Council member Joseph Maiden informed Section B and C in 1892: 'I am in difficulty about attending the meetings ... as the ... date clashes with the fixed engagements I have for that evening every month'.³³ At the time, Maiden was Curator of the Technological, Industrial and Sanitary Museum, Vice-President of the Field Naturalists' Society and a leading member of the horticultural society, whose meetings he was frequently called upon to chair. In fact, many, if not most, of those attending section meetings would have had multiple responsibilities – professional, private and cultural – so that the closure of a section could well have come as some relief.

New Sections from the 1890s

Despite the obstacles, the Royal Society was never without a functioning section for more than a few months. In 1891, before the Microscopical and Medical sections lapsed, the first of two entirely new sections had been established. At its peak, Section K, an interest group for civil, mechanical and later electrical engineers, was particularly active and well attended. As

many as 13 papers accompanied the Engineering Section's proceedings for 1903, the result of a conference on water conservation and irrigation which the section had conducted over three nights during July. In 1906, it hosted a 'smoke' *conversazione* (men only) in cooperation with three kindred professional organisations: the Engineering Association, the Institute of Architects and the Electrical Association. This had been designed to allow members of all four bodies to become better acquainted and it may have succeeded all too well, at least from Section K's perspective. While the other three societies flourished, Section K lost members and it lapsed after 1908.

A second new section, dedicated to Economic Science, was formed in 1901 when the Royal Society absorbed the failing Australian Economic Association.³⁴ Energised by the issues of political economy raised by the inauguration of a new federal government, members presented papers on such subjects as 'Old Age Pensions', 'Commonwealth Borrowings', and 'Imperial Defence'.³⁵ With the Immigration Restriction Act before Parliament in 1901, one member, Joseph Palmer, also argued forcefully against 'the theory of White Australia', denouncing it as 'unjust', 'undesirable' and 'impossible'.³⁶ Perhaps because it had formerly been an independent body, the Economic Section seems to have been less than conscientious in its adherence to Royal Society rules. Reports to Council were rather sketchy and no formal minute book for this section has survived, only some rough notes. The section also defied Royal Society convention by continuing the Economic Association's practice of permitting women to participate. Rose Scott, who had given a paper in support of female suffrage before the Economic Association back in 1895, attended a section meeting in November 1902 and with a fellow member of the Womanhood Suffrage League, Ellen (Nellie) Martel, joined in that evening's discussion of 'overproduction'.³⁷ The Economic Section lasted for little more than two years.

Women's suffrage campaigner Rose Scott broke a RSNSW ban against women members by speaking at one of its Economics Section meetings in 1902. Photograph by May Moore, 1913. SLNSW.



Much more enduring was the third incarnation of Section B and C which began meeting in August 1908. Led initially by Joseph Carne, the Assistant Government Geologist, this section was devoted entirely to geology. An order of business for its meetings, established early, provided not only for the presentation of exhibits, but also for free discussion of a range of geological problems that were chosen by agreement among members. Original papers were to be presented at general meetings and discussed at section meetings. In addition, individual members undertook to survey current literature on a given area of geology and prepare abstracts of the most significant papers to share at section meetings.³⁸

An annual section dinner was proposed and from time to time members adjourned to the library at the conclusion of a meeting to honour special guests and departing or returning members. In November 1910, they gathered to bid goodbye to Raymond Edward Priestley, who was about

to join Scott's Antarctic Expedition.³⁹ A year later they welcomed the Australian Museum's Charles Anderson home from Europe and wished 'bon voyage' to Carl Adolph von de Heyde Süssmilch, the section's Secretary, who was embarking on a trip to the United States to study methods of technical education.⁴⁰

Also farewelled in November 1911 were two members of Douglas Mawson's Australasian Antarctic Expedition, Messrs Andrew Watson and John Hunter.⁴¹ In June 1912, Edgeworth David reported on the geological information gathered by Ernest Shackleton's 1907–1909 Antarctic expedition, as a member of which David had reached the South Magnetic Pole and climbed Mount Erebus.⁴² Such connections with Antarctic exploration no doubt helped sustain interest in this section, but its judicious combination of formality with conviviality and broad member participation also suggests that lessons had been taken from the complaints of 1892. This section would continue for decades, much longer than any other thus far.

Importance of the Sections

By attracting new members with specialised scientific interests, and helping to maintain the loyalty of older ones, the more successful sections clearly benefited the Royal Society. Judging by the relative longevity of some of sections, and the initial enthusiasm evinced for most, the society's 1875 initiative had also answered a need. Section A, for example, was the earliest astronomy interest group in the Australian colonies and the void filled by the Medical Section has already been discussed.⁴³ If the Council had once been wary of Section A's independent energy, there were no such qualms in 1914 when a Queensland correspondent was reassured by the society's Honorary Secretary as to the wisdom of introducing specialist sections in his own scientific organisation. 'From time to time some of the Sections

have dropped off and formed independent societies', he was told, 'but I do not think [that was] because they were sections. The tendency of the age is to specialise, and buds will drop from the parent tree'.⁴⁴

It would be a step too far to assert that the Royal Society was necessarily the progenitor of the specialist scientific and professional societies that emerged during the years before 1914. The Medical and Engineering sections operated for some years in parallel with rival specialist societies to which they ultimately gave way. Yet, as the author of a 1914 newspaper article observed, the Royal Society did exercise 'a kind of parenthood' over independent 'specialised bodies', by providing them with rooms to meet 'at its house in Elizabeth Street'.⁴⁵

This was not true of the Linnaean Society of New South Wales. Its offices and museum had found a home on the ground floor of the Garden Palace, which had been constructed on part of the Domain (now part of the Botanic Garden) for Sydney's 1879 International Exhibition.⁴⁶ Following that building's destruction by fire in September 1882, a general meeting of the Royal Society unanimously endorsed the Council's offer for the Linnaean Society to use the Royal Society's rooms for 'meetings ... pending the acquisition of suitable accommodation'.⁴⁷ But thanks to the Linnaean Society's founding President and benefactor, Sir William John Macleay, alternate accommodation had already been secured at what became Linnaean House, Elizabeth Bay.

The Linnaean Society's local influence and prestige grew in parallel with the Royal Society's rejuvenation under Liversidge, both societies contributing significantly to the encouragement of science in New South Wales. The Linnaean Society was dedicated to natural history in its broadest sense (including, at this time, ethnography), subjects also discussed at Royal Society meetings. Its existence may have contributed to the failure of the Royal Society's Botany Section, but a significant number of Royal Society members, who had the financial means and

time, joined both societies. In 1876, for example, when the Linnaean Society's *Proceedings* was published for the first time, well over 30 current members of the Royal Society were listed among the Linnaean Society's membership, including Archibald Liversidge who was a member of the governing councils for both bodies.⁴⁸

Science Month by Month

While the sections flourished or faltered, the Royal Society's general monthly meetings continued to offer colonial scientists, as the aforementioned 1914 article explained, 'a common meeting ground' where their 'investigations and discoveries ... [could] be set out and discussed in ... [an] orderly manner'. An audience of Royal Society members also created a stimulating 'atmosphere', maintained the writer, that would be impossible to achieve with just 'the fellowship and criticism and rivalry of ... two or three [colleagues]'.⁴⁹ A further advantage for most presenters was having their polished papers distributed widely via the Society's *Journal and Proceedings*.

All the papers presented and published were approved by the Council, which was tasked with ensuring that the work was both scientifically respectable and sufficiently original. Papers offered by leading members, such as Liversidge and Russell, seem to have been accepted on face value, and between them these two had just over 100 papers published in the *Journal*. Other submissions, especially those by non-members of unknown reputation, were likely to be scrutinised more closely and sometimes courteously declined.

One of these rejected papers was submitted in 1884 by the Victorian government's Statistician, Henry Heylyn Hayter.⁵⁰ He argued that the crime rate in New South Wales was statistically higher than in Victoria, and he linked the discrepancy to the older colony's convict origins.

The Council declined Hayter's paper on the grounds that its contents had already been substantially published in the *Victorian Government Yearbook 1882–1883*. Perhaps Council members also shared something of the patriotic indignation which the Sydney press expressed at Hayter's perceived slur on the character of New South Welshmen.⁵¹

The papers accepted for reading at meetings and published in the *Journal* expounded on research in many branches of science, but also in disciplines that would not now be considered strictly scientific. Ethnology, for example, was well represented. The many papers recording Aboriginal culture and language may well have reflected not only their authors' intellectual curiosity, but also what was then a widely shared, though erroneous, belief in the inevitable disappearance of the country's Indigenous inhabitants.⁵² There were also a few historical offerings, among them Joseph Maiden's discussion of a club believed to have been the weapon used to kill Captain James Cook in Hawaii, and two papers by Lawrence Hargrave on the likelihood of a Spanish sea-captain, Lope de Vega, having entered Port Jackson in the sixteenth century.⁵³ A vessel commanded by Lope de Vega, which had sailed from Peru in 1595 with three other Spanish ships, subsequently disappeared without trace. Hargrave was convinced that iron mooring rings on rocks at Woollahra Point and rock carvings of animals, men and shields near his Woollahra home were signs that de Vega's ship had been moored in Sydney Harbour.⁵⁴ Three other articles with a focus on the past were provided by Maiden, who was also a member and twice President of the Royal Australian Historical Society. But these papers dealt with the scientific contributions of early colonial botanists and explorers.⁵⁵

As had long been the case, the subjects discussed necessarily reflected the interests and expertise of those members who were willing to provide papers. Robert Hamilton Mathews' fascination with Aboriginal culture

was reflected in some 27 papers he published in the *Journal* from 1893 to 1911, and Lawrence Hargrave's principal enthusiasm – the development of a flying machine – was chronicled in 20 of his published papers. The greater weight given to some areas of science also signalled the influence of their authors and the relative length of their membership. More than one-fifth of the papers published from 1876 to 1914 dealt with geology or mineralogy, the areas of expertise of Liversidge, who contributed one third of these. His recognised expertise and his influence in the Royal Society over several decades may also explain the society's attraction for others with similar interests who also presented papers. Similarly, it seems no coincidence that astronomy and meteorology, the leading interests of Henry Russell, were subjects of a further 14 per cent of published papers. Russell contributed well over half of these.

Weather and Water Supply

Russell's influence in the Royal Society was not the only reason that many papers in the period focused on meteorology. Weather had economic implications for the colony, as well as for the safety and comfort of its inhabitants. Many of Russell's meteorological papers discussed local meteorological events – for example, 'Rainfall Map for the Year 1882'; 'The Storm of 21st September 1888'; and 'Note on the Recent Rainstorm'.⁵⁶ Meteorological papers by other members had similar colonial relevance. Henry Hunt's Abercromby Prize essays, Henry Ling Roth's 'The Climate of Mackay', and Frederick du Faur's 'A Notable Hailstorm ... in the Parish of Gordon' are obvious examples.

Russell's interest in meteorology was by no means parochial. On the contrary, as Ragbir Bhathal noted, Russell pioneered a global perspective on meteorology, making the 'radical suggestion', for example, 'that the

movement of anticyclones was a hemispherical phenomenon'.⁵⁷ He was also, as historian Alan Atkinson observed, 'a pioneer in asking questions with a vertical perspective'. Russell was convinced that events in the Earth's atmosphere were influenced by what happened far beyond it and that, in turn, atmospheric events had their effect below the Earth's surface.⁵⁸ Having built a network of some 290 amateur meteorological informants, Russell moved beyond the strict empiricism that Clarke had advocated, by using the accumulated meteorological data to develop his own theory that weather patterns recurred on a 19-year cycle, linked to phases of the Moon.⁵⁹ Foreshadowed in the discussion which de Salis had initiated at a Section A meeting in 1876, Russell's theory was presented formally at a general meeting later the same year, as 'Meteorological Periodicity'. Twenty years later Russell set out his theory in a more developed form, in a paper entitled 'Periodicity of Good and Bad Seasons', and in a further article on the 'Recurrence of Rain' in 1901, he linked 'the motion, northwards or southwards of the moon in declination, to the incidence of rainfall in NSW'.⁶⁰

Russell's readership would have recognised the local significance of any attempt to make sense of the vagaries of climate. During the last decades of the nineteenth century, various parts of the continent at different times had experienced a dearth of rain, culminating in the so-called 'Federation Drought' of the 1890s, which went unrelieved until 1903.⁶¹ Understanding the causes of drought and being able to predict it seemed very important; equally so was finding ways to manage the dangers of dry periods.

As we have seen, problems and solutions associated with securing a water supply for the colony's capital had previously been the subject of heated Royal Society debates. Controversy on the subject was briefly raised again in 1880, when the civil engineer Frederick B. Gipps argued before a meeting that the water collected from the Illawarra plateau ought to be piped to Sydney from a reservoir at Kenny Hill on the Nepean range,

rather than from the proposed reservoir at Prospect.⁶² Perhaps wisely in the light of past experience, the Council discouraged further discussion of this issue. By that time members with expertise in several disciplines and occupations were focused on ensuring a reliable supply of water to support settlement in the colony's interior.

The idea that an inland sea existed in the heart of the Australian continent, had long ago proved illusory. But the possibility that large quantities of water flowed deep within the Earth – a notion as ancient as the biblical story of Noah and the Flood – could still inspire the imaginations of Europeans in Australia.⁶³ Artesian water, a subterranean supply under sufficient pressure to require little or no pumping, had already been tapped in England and France in the first part of the nineteenth century.⁶⁴ The hope of colonial scientists was to find something similar in Australia.

In his Section A paper on the Darling River and its catchment, Russell estimated that a relatively small percentage of the run-off from precipitation actually reached the river. A large part, he concluded, 'must sink into the ground to flow at some lower level', creating an 'inexhaustible supply from wells'.⁶⁵ He explored the subject further in another paper, delivered at a general meeting in 1889.⁶⁶ By the time that Russell presented the first of these papers, some concrete evidence for the existence of artesian water in New South Wales had already been found. In 1878 on Killara station, a remote pastoral property on the Darling flood plain 170 km west south-west of Bourke, men digging into an existing 33 metre-deep well near Wee Wattah, encountered gushing artesian water.⁶⁷

Hoping to learn more about this important natural resource, Russell urged his fellow Royal Society member, Thomas Kingsmill Abbott, Police Magistrate at Gunnedah on the Liverpool Plains, to conduct a survey among landholders in his district about wells and springs on their land. His results appeared in the *Journal* in 1880.⁶⁸ Four years later Abbott's brother William, a Hunter Valley pastoralist, won the Royal Society's essay



Plan of the runs on Killara station in western NSW. In 1878, water gushing from a well dug near Wee Wattah (lower right of this map) revealed part of Australia's Great Artesian Basin. Noel Butlin Archives Centre, ANU.

prize for his study of 'Water Supply in the Interior' and in 1893, another member, the pastoralist and politician William Henry Suttor, discussed artesian bores on Bunda station in Queensland.⁶⁹

Members with expertise in several branches of science were also turning their attention to artesian water. In a series of papers offered from 1891 to 1907, geologists Edgeworth David and Edward Pittman separately discussed the geological underpinning of this water source. Chemists William Dixon (1891) and John Charles Henry Mingaye (1893) reported

on the chemical content of artesian water and its suitability for crops, and Hugh Giffen McKinney applied his engineering expertise to the distribution of this resource with papers published in 1889, 1893 and 1901. Even more interdisciplinary expertise was applied to artesian water and its uses at the Engineering Section's 1903 conference on Water Supply and Irrigation.

Russell used meteorological data, collected by his network of informants, to venture into theorising about weather, but the scientific work presented and published by other Royal Society members largely involved empirical data collection or the application of existing knowledge. Much of this, and the work on water supply, was consistent with what Clarke in 1867 had declared to be the proper object of the Royal Society: to encourage research conducive to 'the development of the Physical character of the country ... and the development of its Natural History and Productions'. Engineering issues, for example, constituted nearly eight per cent of published papers from 1876 to 1914, and nearly 16 per cent when papers read before the Engineering Section are included. The utilitarian value of certain other reported research was less immediately obvious – Julian Tenison-Woods' 1876 paper 'On Some Tertiary Australian Polyzoa', for example, or Alfred Ewart's 'Contributions to the Flora of Australia' (1908). Such work certainly had general disciplinary interest, but it also contributed to a necessary understanding of the territory which European settlers now called their own.

Aeronautics

If the research aired at meetings and published in the *Journal* largely reflected members' interests and local priorities, it also signalled developments in the discipline of science itself. Lawrence Hargrave's experimentation with flying machines is an internationally significant example. Equipped with

engineering expertise gained as a young man during his employment by the Australian Steam Navigation Company, and with the spirit of adventure evident in his participation in no less than six expeditions to New Guinea during the 1870s, Hargrave worked for several decades to develop a successful flying machine. After acquainting himself with the physics of flapping flight, he constructed more than 50 kites, mostly of the box variety. His object was to discover the best weight-supporting surface for a flying machine, and he studied ways to curve these surfaces for maximum lift. Hargrave also designed 52 engines, some meant for powering flappers and others, such as the air-screw engine, made for fixed-wing flight. To power them, he experimented with a variety of fuels, from compressed air, steam and gunpowder to carbonic acid, kerosene and petrol.⁷⁰



Engineer-inventor Lawrence Hargrave preparing to fly a box kite at Point Piper, c1910. His early research on 'flying machines' influenced the Wright brothers before their first successful flight in 1903. SLNSW.

Ultimately it was Wilbur and Orville Wright at Kitty Hawk, North Carolina, USA who in 1903 achieved the first, sustained, powered flight using a heavier-than-air machine. But Hargrave's research, disseminated internationally in the Royal Society's *Journal*, and generously shared by the inventor himself, certainly influenced the development of aviation. Not only was his work on supporting surfaces used in France in the construction of the successful Voisin-Archdeacon float glider, but circumstantial evidence suggests that the Wright brothers were influenced by Hargrave's work on aerocurves in the construction of their own successful flying machines.⁷¹ As aviation historian William Hudson Shaw argued, Hargrave also deserves acknowledgement for 'originating an idea for the [radial rotary] engine which was to be a major factor in European aircraft design for nearly 20 years'.⁷²

The Royal Society and Developments in Colonial Science

Some colonial scientists were undertaking research in newer branches of older disciplines, including parasitology, phytochemistry and the chemistry of food. From 1909, Royal Society member Dr John Burton Cleland and biologist Thomas Harvey Johnston contributed a dozen papers on their investigations into parasitic organisms affecting humans and other animals.⁷³ Nearly as many papers focused on food chemistry. In 1896, for example, Frederick Bickell Guthrie compared the absorption of water by the gluten of different wheat varieties. William Michael Doherty discussed vanillin in 1913 and in 1914 Henry Wardlaw contributed two papers to the *Journal* on the chemistry of milk. Over 60 papers detailed recent research on the chemistry of plants. In five of these, published in 1887 and 1888, Joseph Maiden presented his findings on chemicals useful for tanning that were found in a number of native species. Particularly prolific, Richard Thomas Baker and Henry George Smith similarly focused

on the economic potential of indigenous vegetation. In as many as 60 papers, written separately or collaboratively, they reported their work on the isolation and analysis of essential oils in native species.

Other Royal Society members were exploring new developments in physics. Richard Threlfall experimented with electricity during the 1890s and his successor as the university's Professor of Physics, James Pollock, continued this work in the early years of the new century.⁷⁴ In 1896 Threlfall also began experimenting with a recently discovered wonder, x-rays, and he explained to Royal Society members the method of producing them.⁷⁵ A paper published in 1904 by Douglas Mawson and Thomas Laby (both Sydney University demonstrators at the time) discussed the occurrence of radioactive minerals in Australia and in 1913 Sidney Ernest Pierce, a Deas Thomson research scholar in Pollock's department, prepared a paper for the society explaining the ionising effect of 'Penetrating γ Rays in a Closed Thick-Walled Vessel'.⁷⁶

The most up-to-date work in many fields of science required a level of specialised knowledge which usually came from formal scientific training. Access to the necessary apparatus was also required, and in the absence of the kind of private financial resources that made Hargrave's work possible, institutional support was vital as well. As a result, work in science was ceasing to be the province of well-informed citizens like Suttor and the Abbott brothers, nor of most expert amateurs. Increasingly, professional scientists dominated their fields and the papers read at monthly meetings of the Royal Society increasingly reflected this.

Many papers published in the *Journal* during the decade before World War I, reported on research by scientifically trained professionals who were employed in government departments. John Burton Cleland and Thomas Johnston pursued their work in parasitology at the Health Department's new Bureau of Microbiology, established in 1909. William Doherty studied vanillin as an analyst in the Department of Health, and Frederick Guthrie

examined the properties of different wheat grains while an employee of the Department of Agriculture.⁷⁷ Geologist Edward Pittman, who reported on new minerals, subterranean rock temperatures and artesian water, and palaeontologist William Dun, who discussed fossil finds in the Sydney Basin's coal deposits, both worked in the Department of Mines. John Ashburton Thompson discussed sewerage, sanitation and quarantine measures in his capacity as Chief Medical Officer and President of the Board of Health.

Papers had long been contributed by professionals who staffed older colonial scientific institutions – the Botanic Garden, the Australian Museum, the Sydney Observatory, the Royal Mint and Sydney University. The university, in particular, had maintained a long and fruitful relationship with the Royal Society of New South Wales. The Act providing for the university's foundation had been passed in the same year that the Australian Society was formed and the university's first staff members – Professors Woolley, Smith and Pell – had joined the Philosophical Society of New South Wales from its inception. More university staff joined the Royal Society as the university evolved. In 1882, the university gained a Faculty of Science and provided for a doctorate in science to be awarded for original scientific research.⁷⁸ Its School of Medicine and a Chair in Anatomy and Physiology were also established in 1882, and the School of Engineering in 1884. New chairs were also established in physics (1886), geology (1891), agriculture (1909) and veterinary science (1909), and lectureships were introduced in surveying (1887) and architecture (1890). The university's primary role as a site for transferring knowledge had not changed, but as its curriculum expanded to include more science-based subjects, there were more university personnel able and willing to engage knowledge creation.

William Warren, the university's first Professor of Engineering and a Royal Society member, was one of these. At a general meeting in 1887, he demonstrated his department's 'Autographic Stress-Strain Apparatus'

for testing construction materials. The following year he described the equipment in greater detail and later published in the *Journal and Proceedings* a series of papers describing tests being carried out in his department on timber and reinforced concrete.⁷⁹ The list of university personnel publishing in the Royal Society's *Journal* was extensive. As well as Warren, Liversidge, Threlfall, Pollock, Laby and Mawson, they included Oscar Vonwiller (physics); Charles Martin and John Thompson (physiology); William Haswell (anatomy and physiology); David Welsh (pathology); and Edgeworth David, Herbert Stanley Jevons, William Smeeth and William Woolnough (geology). A further sign of Sydney University's evolution as a centre for knowledge creation was the publication of three papers produced by its research scholars, in the Royal Society's 1913 *Journal*.⁸⁰

Another centre for scientific research had also emerged. Smith and Baker's experiments in phytochemistry were conducted at Sydney's Technological, Industrial and Sanitary Museum, where Maiden was the Curator. Established in 1880, the museum was originally located in the ill-fated Garden Palace, destroyed by fire in 1882. By 1893 the museum was housed in purpose-built premises in Harris Street, adjacent to the technical college. Several college lecturers – Michael Curran, Carl Süssmilch and William Clunies Ross – also contributed research papers to the *Journal*.

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Structural reform initiated during the late 1870s enhanced the Royal Society's capacity to provide expert amateurs and a growing number of professional scientists, including a first generation of postgraduate students, with section meetings to cater for their specialties and general meetings held monthly without fail for the presentation and distribution of their scientific work. The reforms had been timely, given the emergence of new centres

of research in New South Wales: Sydney University, the Technological Museum and government departments. Local priorities, the expertise and personal influence of active members, and developments in the discipline of science, all influenced the subject matter of the papers read at meetings and published in the *Journal*. Together these showcased, in the Australian colonies and overseas, the work of more than 200 of the Royal Society's most active members.



‘DRONES’ AND ‘WORKING BEES’

It would be well if our little hive contained all working bees’, William Clarke told the Royal Society in 1867. But as Clarke conceded, the society’s ‘philosophical drones’ were essential too, because they contributed ‘as much in material support in one way as do those ... foraging in the fields of research’.¹ However unintentionally insulting his image of less active members may now seem, Clarke’s metaphor expressed a truth. Leading individuals in the Royal Society, energetic officeholders and the expert amateurs and professionals who provided papers and exhibits or participated in the discussion at meetings – men like Liversidge, Leibius, Russell and Clarke himself – were certainly essential to the society’s viability. Yet so were those who did no more than attend meetings and, even more important, who paid their annual subscriptions on time. As Clarke and his 1867 audience were well aware, the Philosophical Society, so recently revamped, had come to grief when too many of its members fell away and subscription receipts declined.

What were the backgrounds of the men who joined the Royal Society – both leading lights and less productive members – and how did the

character of the membership change over time? Of interest too is what men gained (or hoped to gain) by joining. One potential benefit was the assistance and support that could be expected from brother members. But fraternalism could fracture under stress. Friction among members sometimes went beyond differences of opinion on scientific matters, reflecting the changing culture of colonial science or problems within the structure of the Royal Society itself.

Backgrounds of the Members

Henry Chamberlain Russell, four times President and without doubt one of the Royal Society’s principal ‘working bees’, was a ‘son of the soil’, born in West Maitland in 1836.² His father, Bourn Russell, was a ship owner, storekeeper and, from 1858, a member of the New South Wales Legislative Council. After graduating from the University of Sydney in 1859, Henry had worked at Sydney Observatory under two Government Astronomers before being appointed to that position himself.³

Russell was not alone among the membership in being colonial born, but many of his fellow members had been born and educated overseas. Most of them, like Liversidge and Clarke, had emigrated from the United Kingdom, but some originated elsewhere. One long-term member, the Reverend Robert Allwood, for example, was born in Jamaica, where his father was a Supreme Court judge, while Barbados was the birthplace of Dr Haynes Gibbes Alleyne, the son of a planter and slaveholder, John Gay Alleyne.⁴ Other Royal Society members had come from continental Europe. Civil servant and geographer Edmond Marie Marin la Meslée (a member from 1879 to 1886) and Australian Museum mineralogist Felix Ratte (1876–1890) were born in France, as was the biologist Adrien Loir (1890–1898), Louis Pasteur’s nephew, who conducted research on animal diseases at his Rodd Island laboratory. Pastoralist Leopold de

Salis (1875–1898), son of Count Jerome Fane de Salis, had entered the world in Florence.⁵ A number of other members were natives of one or other of the pre- or post-unification German states. They included the Australian Museum Director, Gerard Krefft; the Sydney optician and scientific instrument maker, Theodore Frederick Wiesener (1884–1897); Sydney's German Consul, Carl Ludwig Sahl (1875–1897); jeweller Frederick Allerding (1867–1895); and accountant Wulf Christopher Bartels (1875–1894). Their presence in the society reflected a more general trend towards the involvement of German immigrants in science in the Australian colonies.⁶

Similarly various were the religious affiliations of Royal Society members. For example, W. Clarendon Stuart, a surveyor, artist and founding member of the Anglo-Catholic English Church Union in Sydney, was dubbed 'scourge of the dissenters' by one Sydney newspaper, but he managed to coexist, at least for a limited time, with fellow members who were Presbyterians, Methodists, Congregationalists, and even Evangelical members of his own denomination, like the Reverend Clarke.⁷ Julian Tenison-Woods, an Honorary member of the society and recipient of the Clarke Medal in 1888, was a Roman Catholic priest, while Jewish members included Eliezer Levi Montefiore, Samuel Bensusan and musician Sydney Moss.⁸

Qualifying for Membership

The certificates designed by Liversidge for completion by prospective members did not require them to furnish any information about their birthplace or religious denomination. However, they were expected to provide details of their 'Qualifications and Occupation'. A science-based profession, acknowledged expertise in some branch of science and perhaps an affiliation with another learned society – qualifications as a scientific

savant – must all have been advantageous, but the Royal Society continued to admit members who lacked such credentials. The one essential for admission continued to be something more nebulous – the candidate’s qualification as a gentleman. His occupation might hint at this, but it was not an infallible guide and so, just as with the Philosophical Society, the opinion of existing members about a candidate’s suitability was also important.⁹ Liversidge’s 1879 by-law, requiring a candidate’s certificate to be read at three successive meetings rather than twice as previously, suggests that members’ judgement about the character and behaviour of candidates remained paramount.¹⁰

In a fluid colonial community where ‘manners mattered’ as a signifier of social class, gentlemanly character and behaviour could blur a man’s social origins.¹¹ While many members, like Liversidge and Russell, had been born to families of established middle-class respectability and material means, others had much more humble beginnings. Take Thomas Whitelegge, senior scientific officer in charge of the Australian Museum’s Lower Invertebrate collection, who was admitted to the Royal Society in 1883. The son of an illiterate English brick maker, Whitelegge was a hatter by trade, but through self-education and assiduous fieldwork, he had developed the necessary knowledge and skills, not only to be appointed to this significant colonial post, but also to mix socially with gentlemen.¹² Another Royal Society member who had risen above the station into which he had been born, was the Sydney auctioneer, Frederick Resolute Strange, who joined the Royal Society in 1886. His late father, a poorly educated former sailor, had earned a modest living as a commercial field collector of birds, quadrupeds, insects, shells and plants. Following his father’s untimely death in 1854 at the hands of the Indigenous custodians of Middle Percy Island on the Great Barrier Reef, Frederick and his siblings had to be saved from destitution by a generous public subscription. Viewed by his contemporaries merely as an ‘upright tradesman’, Strange senior had

not only lacked the income, but also the social graces, to be accepted by a learned body like the Royal Society, had such an organisation existed in his lifetime.¹³ Also lowly, but less reputable, were the origins of the wealthy shipowner and merchant James Merriman, a member of the Royal Society from 1877 to 1881. Born to a convict mother and orphaned from an early age, he had grown up in the home of an emancipated convict and served his apprenticeship as a cooper. In the year he joined the Royal Society, however, Merriman's middle-class respectability was well established. Already an alderman on the Sydney Municipal Council, he became Mayor for the second time in 1877 and was elected to represent West Sydney in the Legislative Assembly.¹⁴ Nor was Merriman the only member with convict connections. Edward Pierson Ramsay, Krefft's successor as the Australian Museum's Curator and a society member since 1865, was the grandson of the emancipated convict, Simeon Lord.¹⁵ His uncle, Francis Lord, a Member of the Legislative Council, was also welcomed by the Royal Society (1876–1892).¹⁶

Unsurprisingly, given the careful filtering accomplished by its membership rules and fees, the Royal Society, like its predecessor, drew its members largely from the class of colonists which supplied the colony's social and political leaders. A study by Peter Tyler of the Royal Society's membership between 1866 and 1872 found lawyers, clergymen, public servants, pastoralists and successful men of business, as well as individuals who used their formal scientific qualifications professionally (especially doctors, engineers, Royal Mint assayers and university personnel).¹⁷ A smaller number of journalists and artists (including photographers) were also included in the mix and, as might be expected, the Royal Society attracted men who were, or who later would become, members of the colonial Parliament.

While the range of members' occupations remained fairly constant, significant change did occur in the extent to which the several occupational

categories were represented. The percentage of Royal Society members whom Tyler categorised as ‘Businessmen’ (merchants, manufacturers, bankers and insurance personnel), was one-fifth lower than it had been in the Philosophical Society’s membership. That of engineers in the Royal Society was also lower by more than half, but that of doctors was greater. Most important for a scientific body, the proportion of members during the Royal Society’s first five years whom Tyler categorised as ‘Scientists and Teachers’, approached twice that category in the Philosophical Society.¹⁸

The character of the Royal Society’s membership changed further as the years progressed. My own study compared the occupations of members listed in the *Transactions and Proceedings* for 1875 (just before the first major reforms instituted by Liversidge) with those of members similarly listed in 1895. Over 94 per cent of members’ occupations were ascertained for both years. Engineers, surveyors and architects were grouped together, while dentists and pharmacists were counted with medical practitioners in the ‘Medical’ group. Included in the category ‘Scientists’ were chemists, assayers, geologists, botanists, zoologists, palaeontologists, astronomers, meteorologists and mathematicians, most of whom were employed at Sydney University, the technical and agricultural colleges and in various government departments.

Between 1875 and 1895, the proportion of members in the Scientist category grew from just under 12 per cent to 15 per cent. Individuals engaged in ‘Medical’ occupations had already been a substantial group in 1875, making up more than one quarter of the membership. This had barely changed by 1895, but the proportion of engineers, surveyors and architects had nearly quadrupled in the same period. Taken together, all three groups of members with scientific expertise made up 41 per cent of the membership in 1875. Twenty years later they constituted nearly 65 per cent, the overwhelming majority in both years being formally trained,

remunerated professionals. The society now attracted fewer clergymen and politicians, while members engaged in commerce, manufacturing and finance were reduced from more than 19 per cent in 1875 to around 13.5 per cent in 1895.

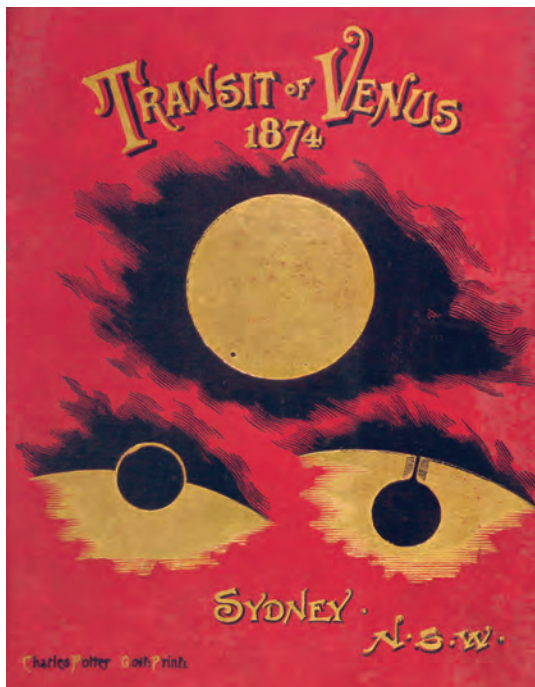
As the new century approached, the Royal Society was dominated by professionals in a range of science-based fields. It could still attract expert, scientific amateurs. One of these was the landowner, John Tebbutt, a member of the Philosophical and Royal societies from 1862 to 1904, who earned international recognition for his discoveries in astronomy made from his private observatory at Windsor.¹⁹ Two other long term members – the banker William Macdonnell and the Sydney wine merchant George Hirst, both elected in 1868 – were also knowledgeable amateur



A Sydney Observatory camp at Woodford, NSW, where RSNSW members Philip Francis Adams, Leonard Vessey, Frederick Eccleston du Faur and George Hirst recorded the 1874 Transit of Venus. SLNSW.

astronomers and, like Tebbutt, Fellows of the British Astronomical Association.²⁰ Macdonnell published papers in journals overseas. Both men participated in the Sydney Observatory's observations of the Transit of Venus during 1874 and were also active members of the Royal Society's Microscopical Section from the 1870s to the 1890s.²¹

Clearly the age of amateur science was yet to pass completely, but the dominance of science professionals in the Royal Society reflected broader change in the character of colonial science. This was partly a function of the New South Wales government's growing reliance on scientific expertise. Many of these government employees were engineers and surveyors, with skills much in demand in a developing colony. Their increased presence in the Royal Society also owed much to developments within the society itself, in particular the formation in 1891 of the highly successful Engineering



Cover of the Sydney Observatory book *Transit of Venus 1874*, authored by NSW Government Astronomer Henry Chamberlain Russell. SLNSW.

Section.²² In his Presidential Address to the 1895 annual general meeting, Richard Threlfall expressed his satisfaction with this section, calling it ‘certainly the most important meeting ground of engineers in the colony’. Three years later, another President, Henry Deane, who was Engineer-in-Chief for Railway Construction in the colony, also remarked on the large number of engineers among the members, adding that their ‘very active’ Engineering Section was still ‘a rallying ground for the members of the engineering and surveying professions’.²³

Attractions of Royal Society Membership

It is not difficult to understand why professionals and expert amateurs alike would have been attracted to the rejuvenated Royal Society, especially those who, like the engineers and surveyors during the 1890s, could interact with like-minded fellow members in a specialist section devoted to their particular field. But even where no such section existed, there was much to recommend a well-organised society with established premises of its own, which offered an extensive scientific library and regular opportunities for the discussion, publication and international distribution of its members’ scientific work.

Yet only a minority of members had papers published in the *Journal* from 1876 to 1914, more than half of these (57 per cent) being the work of just 24 authors. Participation was also proportionately small in other areas. It is clear, for example, that members did not borrow from the library in large numbers. All the loans registered from 1875 to 1952 are contained in a single volume. More members certainly attended the library to read, and library attendance was not insubstantial, at least in later years. During 1909, for example, when the society had 315 members, 384 members signed in, but a fair proportion of these signed in multiple times, suggesting that

library use was a long way from universal, and probably well-patronised only by a minority of dedicated scholars.²⁴

Attendances at meetings could be very uneven too. During 1880, for example, these ranged from 100 members in May down to 20 in December.²⁵ An audience of 80 at a special meeting held in December 1884 heard the visiting British scientist, William Hay Caldwell, discuss the development of marsupials, monotremes and lung fish, but average attendance at ordinary meetings that year was only 33.²⁶ Similarly in 1885, when membership of the Royal Society was 494, average attendance for the year was little more than 14 per cent of all enrolled.²⁷

Of course, not every member had the ability to prepare and publish scientific papers and some members lived too far away to attend meetings or use the library. Located in a colony with a widespread population, the Royal Society attracted members living remotely from the capital. Nearly 14 per cent of them lived outside Sydney in 1875, and by 1895 the figure was more than 16 per cent, with members spread as far as Grafton, Walgett, and Queanbeyan in New South Wales, and a handful subscribing from adjacent colonies. So apart from the chance to present, publish and listen to papers read at meetings and have access to a scientific library, what was it that motivated the hundreds of individuals who applied for membership?

Certainly, the *Journal* offered intellectual stimulation to every member with an up-to-date subscription, a consideration especially important to scientifically trained professionals living far away from Sydney. Lands Department surveyors and Public Works Department engineers who were based in distant country towns – men like Joseph Witter Allworth, District Surveyor in East Maitland on the Hunter River, and Charles Blomfield, a Public Works Department engineer in Hillston over 400 miles (nearly 644 km) west of Sydney – still had the chance to keep in touch with developments in their professions by reading the *Proceedings of*

the Engineering Section. The *Journal* could be anxiously awaited. 'I am not yet in receipt of a copy of the *Proceedings* of the last session of the Royal Society', wrote Robert Jones in 1894 from his Public Works Department office at Muswellbrook in the Hunter Valley, 'Kindly send and oblige'.²⁸

Royal Society membership also promised opportunities for career advancement. Evidence of an individual's involvement with the science community must have been advantageous in occupations requiring scientific credentials. Contacts made through the society could also lead to useful introductions and recommendations. Public servants would have seen the advantage of belonging to a body in which their superior officers – Edward Charles Cracknell, Superintendent of Telegraphs; Harrie Wood, Under-Secretary for Mines; and the Chief Railway Engineer, Henry Deane – were also Royal Society members.²⁹ During the 1860s, public service positions had been largely in the gift of ministers, but power gradually devolved to departmental heads in the period before the Public Service Board was established in 1893.³⁰ Thomas Whitelegge seems to have owed his Australian Museum position at least partly to his Royal Society membership. He had arrived in Sydney in February 1883 with a letter of introduction addressed to Liversidge, and was admitted to the Royal Society (and the Linnaean Society) the same year.³¹ Membership put him in a position to impress another Royal Society member, the Australian Museum's Curator, Edward Ramsay, who gave Whitelegge a temporary position at the Museum in 1884 and his permanent appointment three years later.³²

Much prestige also attached to a scientific society titled 'Royal' that had the Governor as President (later Honorary President) and in its ranks, parliamentarians, senior public servants, professors and other leading men of science, as well as members of elite professions. Perhaps this aspect of Royal Society membership was what attracted Strange, the auctioneer whose ill-educated 'tradesman' father had unsuccessfully

aspired to recognition as a man of science.³³ Involvement in science was still an emblem of social position and for Strange, admission to the Royal Society could well have constituted both confirmation of his scientific heritage and public proof of his acceptance as a gentleman.³⁴ He had stopped subscribing by 1887 and was among a number of fee defaulters whose names were removed from the roll of members in 1889.³⁵ Perhaps for Strange, simply being admitted to the Royal Society was all he required.

Many Royal Society members had workplace and professional connections which very likely underpinned their decisions to join. It should not surprise that new members were prone to have their candidatures seconded by professionals in the same field. Adrien Loir, Director of the Pasteur Institute of Australia, for example, was supported in his 1891 candidature by William Hamlet, Government Analyst with the Health Department, and by medical practitioner Francis Boughton Kyngdon. Chemists Liversidge and Frederick Guthrie supported the application of the analytical chemist Elliott Gurney in 1897, and Russell Sinclair, a consulting engineer who applied for membership in 1893, had among his seconders, another engineer, Thomas Harry Houghton.³⁶

Another of Sinclair's seconders was his brother Eric, a medical practitioner who joined the Royal Society in 1882. Their eldest brother, Sutherland, who was Secretary to the Trustees of the Australian Museum, also joined in 1883. Family connection across and down the generations was yet another factor influencing men to join the Royal Society of New South Wales. Three sons and one grandson followed in John Fairfax's footsteps as Royal Society members, while members Ernest and Wilfred Docker were sons of the politician and former Philosophical Society member, Joseph Docker. Herbert, son of William Jevons, became a member after he came to Sydney in 1902 to take up his appointment as a lecturer and demonstrator in mineralogy and petrology at Sydney University.³⁷ Another

circle had been completed in 1873, when Dr Francis Wemyss Irvine, born in Sydney in 1821 to the Philosophical Society of Australasia's founding member, Captain Francis Irvine and his wife Sophia, returned to the Antipodes and was elected to the Royal Society of New South Wales.³⁸

Professional and family networks reinforced the communal feeling which membership of an elite organisation like the Royal Society could generate, and membership solidarity could be another advantage of belonging. Joseph Maiden, Curator of the Technological Museum and Honorary Secretary of the Royal Society in 1892, experienced the benefit of his fellow Council members' support when his integrity was attacked by a non-member, Frederick Turner, an economic botanist with the Department of Agriculture. The crisis was precipitated when the Royal Society awarded a bronze medal and a £25 prize to the Port Kembla schoolmaster, Alexander Greenlaw Hamilton, who had won the society's essay prize that year with his discussion of the effects of settlement on indigenous vegetation.³⁹ Turner, who considered himself an expert on native grasses, had also entered the competition and he wrote to question why he had not received the prize. Hamilton's entry, Turner insisted, was not original, as required by the competition's rules, because Hamilton had named Turner's 'large collection of grasses'. Hamilton, he asserted, had merely 'copied out my list of introduced plants'.⁴⁰ Turner was convinced that his paper had been unfairly judged and that Maiden was to blame. 'It is a well-known fact', he insisted, 'that one of the judges is a bitter enemy of mine'. According to Turner, Maiden's enmity arose from a wish to hide the extent to which his own research had relied on Turner's expertise: 'I have given him a great amount of information', he asserted, '... which he does not care for anyone to know'.⁴¹ In other words, Turner not only accused Maiden of corruption in judging the competition, but seemed also to be charging him with plagiarism.

Turner's accusations had been made in letters to Kyngdon, the other Honorary Secretary, and to another Council member, Anderson Stuart. In October the Council voted to make Turner's complaints official.⁴² Maiden was then permitted to read out an indignant 12-page letter to the Council in which he defended his actions in relation to the judging of the essays and gave an account of Turner's previous hostility towards him. He had not even read Turner's essay, Maiden insisted. Having recognised Turner's handwriting on the envelope, he had duly passed the essay on, taking no further part in any of the judging. The final choice of winning essay had been made jointly by Charles Moore and the amateur botanist, William Woolls, who was not a Royal Society member and had been paid six guineas for his work.⁴³ As for Turner's previous hostility and his allegations against Maiden's professional integrity, Maiden could only explain them by attributing to Turner 'an unworthy jealousy of me and my honorable reputation'.⁴⁴

The Council did not hesitate in siding with Maiden. On Russell's motion, it resolved to form a sub-committee 'to frame a resolution to ... place on record the confidence felt by the Council in Mr Maiden and their sympathy with him under the attacks embodied in the letters by Mr Turner'. At a special Council meeting held on 22 October, this was tabled. Turner's accusations were declared 'wholly unfounded and unjustifiable', and the Council put on record 'its high opinion of Mr Maiden's honour and scientific attainment'.⁴⁵

Tension Among Members

Of course, communal loyalties did not prevent professional jealousy and other tensions from occasionally disrupting relations among Royal Society members. The bitter debates between proponents of the competing solutions to Sydney's water supply problem had been an extreme example.

Royal Society member and expert amateur astronomer John Tebbutt earned international recognition for his observations at his home observatory in Windsor, NSW. SLNSW.



More limited interpersonal disagreements probably occurred as they might in any large organisation, but these are rarely evident in the Royal Society's surviving records.

One exception was the tension that developed between the Government Astronomer, Henry Chamberlain Russell, and expert amateur John Tebbutt, which was symptomatic of the growing professionalisation of colonial science. Traces of the Tebbutt-Russell conflict found in the society's records are backed up by evidence derived elsewhere. Early relations between Tebbutt and Russell had apparently been quite friendly, but a rift developed as Tebbutt's status in the international astronomical community ascended.⁴⁶ At a meeting in December 1878, Russell (in the author's absence) had read a paper by Tebbutt entitled, 'A New and Remarkable Variable Star in the Constellation of Aria'. Afterwards, Russell took the opportunity to comment critically on Tebbutt's findings, telling the

meeting that ‘he had examined the spot indicated by Mr Tebbutt and examined it carefully ... [and] found no star ... of the magnitude stated’. The observatory’s ‘larger telescope’ might account for the discrepancy in their respective measurements, Russell offered, and he concluded with a jibe: ‘Mr Tebbutt had discovered a remarkable star for it was remarkable for a star, to vary from the 5th to the 10 and half magnitude’.⁴⁷ In the context of the developing feud, this comment makes Russell’s discussion of Tebbutt’s paper seem something less than scholarly.

Tebbutt had become aggrieved by what he believed was Russell’s tendency, as a professional astronomer, to undervalue the contributions of amateurs in the field, and Tebbutt’s own work in particular. Russell’s



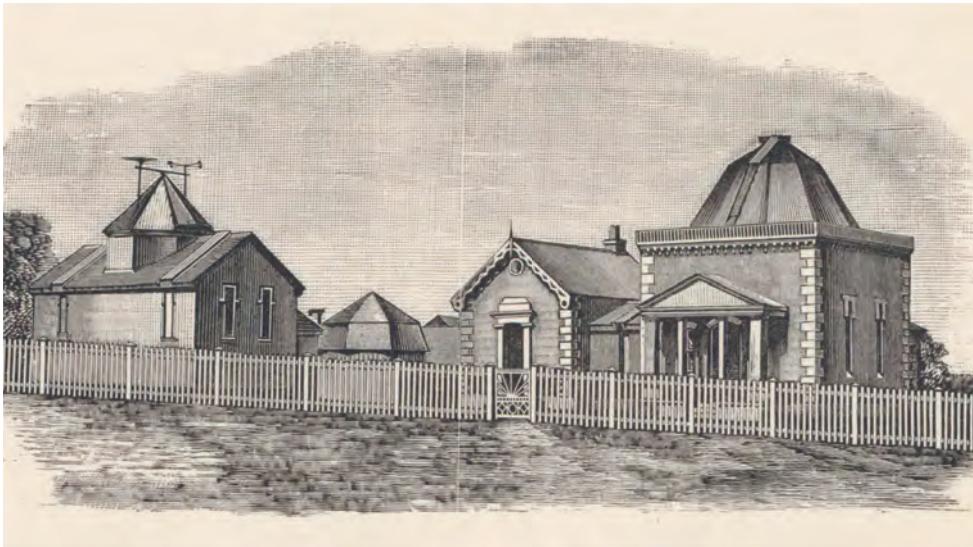
Sydney Observatory c1878. Successive Government Astronomers joined the RSNSW. Photograph attributed to Charles Bayliss. SLNSW.

response to Tebbutt's 1878 paper, including his claim regarding the observatory's superior equipment, provides some evidence of this. In May 1880, Tebbutt complained to a fellow expert amateur, William Macdonnell, that 'amateur astronomers' received 'so little encouragement in this colony. Nothing', he said, 'appears to have any authority unless it come from an official source'.⁴⁸ From his Windsor observatory 12 years later, Tebbutt fumed over an article by Russell which he had just had the opportunity to read. Entitled 'Astronomical and Meteorological Workers in New South Wales 1778–1860', it failed to mention anything about Tebbutt's considerable contribution.⁴⁹ The next day Tebbutt penned a letter to the *Windsor and Richmond Gazette*, alluding to the omission of his name from the article, which he attributed to 'the antagonism ... private observers have to encounter at the hands of officials in a colony separated so widely from the great centres of scientific activity'. 'There are two ways by which official antagonism can be carried out', said Tebbutt, '– one is by direct criticism and the other is by quietly ignoring'.

As to his own expertise in astronomy, Tebbutt pointed out that his private observatory at Windsor was recognised internationally as 'one of the principal working observatories in the world'. He also reminded readers that years ago when the Reverend Scott had resigned from his position at the Sydney Observatory, he had wanted Tebbutt to succeed him as Government Astronomer, but Tebbutt had declined. At the time, Russell who was Scott's 'computer', had been passed over for the position.⁵⁰ Tebbutt seemed to be implying that Scott's recognition of Tebbutt's superior fitness for the observatory position was a sensitive point for Russell, and another reason for the erasure of Tebbutt's work in Russell's article.

Russell may also have been influenced by the public criticism he had received during the 1880s from amateur astronomers, including Tebbutt, for his perceived neglect of astronomical research in favour of meteorology.⁵¹ Conflict between Russell and Tebbutt on this score

‘DRONES’ AND ‘WORKING BEES’



Past (front) and present (rear) views of the private observatory of astronomer John Tebbutt, located on his estate at Windsor, NSW. Above, Old engraving, artist unknown. SLNSW. Below, Recent photograph by Winston M. Yang Wyp. Wikimedia.

peaked in 1891, when the latter put out a pamphlet highly critical of the observatory's priorities. Other amateur astronomers wrote to newspapers and complained to politicians, while Tebbutt's local newspaper kept up a chorus of derision. The criticism, as Ragbir Bhathal pointed out, was unjust and revealed a poor understanding of the many responsibilities of the observatory's Director.⁵² While it did lead Russell to give greater emphasis to astronomy in the 1890s, the criticism did little to dent his scientific reputation in the colony. As a leading figure in both the Royal Society and the Australasian Association for the Advancement of Science (AAAS), Russell's position was assured.⁵³

Conflict of a fundamental kind within the Royal Society – misgivings and resentments about the power balance between the Council and the wider membership – had been evident at the time of the Royal Society's formation and even earlier in the Philosophical Society. It re-emerged in 1879, just as Liversidge and Russell were continuing their reforms. In May that year, William Macdonnell attempted to initiate a change, by adding to the reforms that Russell and Liversidge wished to introduce, an amendment of his own which was intended to open up the Council to new blood. Until then, Ordinary members had been able to replace the Council's nominees for Royal Society offices with their own candidates, but only at the time of voting, which was their first chance to see the Council's nominations. Macdonnell now proposed that the list of Council nominees be provided to members well beforehand, giving Ordinary members time to galvanise support for their own nominees. As Macdonnell later observed to his friend and fellow amateur, Tebbutt: 'I am afraid there is too much cliqueism in the Society just now, and a little fresh blood on the Council would do a great deal of good – Russell, Liversidge and their party have had it all their own way for years and cannot brook the slightest opposition'.⁵⁴

The amendment was considered first by the Council, and then by a committee consisting of both Council and Ordinary members (including

Macdonnell) and a version of it was finally passed at the September meeting.⁵⁵ In future members would personally receive a list of nominees 14 days before voting, the list also being placed on display in the society’s hall during that time.

A good deal of frustration with the perceived power imbalance had apparently been vented during the 1879 debate on Macdonnell’s amendment. In response, Russell in high dudgeon tendered his resignation as Honorary Treasurer, even before the amendment was passed. Rejecting Liversidge’s plea to reconsider, Russell went further and withdrew from the Council altogether. He ‘could not’, he explained indignantly, ‘consent to occupy a seat on the Council subject to such criticism as that which has recently been applied to that body by certain younger members of the Society’.⁵⁶ By May the following year, however, Russell had sufficiently recovered from his outraged feelings to allow himself to be elected Vice-President.⁵⁷ Meanwhile, with their grievances aired and to some degree assuaged by the concession they had managed to wrest from the Council, discontents like Macdonnell and Tebbutt seemed grudgingly quiescent.

Further changes to the rules surrounding Council membership, made in 1884 and 1890, catered to any leadership ambition among the numerous new members who had joined the society following its rejuvenation. From August 1884, three of the annually elected Council members were chosen from individuals who had not been Council members the previous year, and in 1890 a new rule increased the number of Council members from six to 10 (in addition to the Honorary Treasurer and at least one Honorary Secretary).⁵⁸ At the same time, the number of Vice-Presidents was increased from two to four. As Liversidge explained, the society now had many more members qualified for leadership. Increasing the size of the Council of Management would allow the various branches of science to be better represented.⁵⁹ By ‘qualified’, Liversidge clearly meant *scientifically* qualified.

It would be wrong to over-emphasise any disunity in an organisation whose members clearly had so much in common, not only their status in the colonial society and shared intellectual interests, but also, in many cases, their family and occupational ties. Despite any differences that may have arisen, there was fairly broad consensus on one issue which was fundamental to the Royal Society's organisation. Highlighting a biological inconsistency in Clarke's 1867 apicultural metaphor, within the Royal Society 'hive', 'working bees' and 'philosophical drones' were all required to be male.



WOMEN AND THE ROYAL SOCIETY

Among the many buildings devastated by the 1890 Gibbs Shallard fire were the premises of two private gentlemen's clubs, both situated in the vicinity of the Royal Society's premises. The Southern Club in Castlereagh Street was extensively damaged and the Athenaeum Club on the corner of Hosking Place, where the fire had started, was completely gutted.¹ More fortunate was the German Club in Phillip Street, which narrowly escaped incineration when fire destroyed the building directly behind it.² Sir James Reading Fairfax, a Royal Society member since 1868, had been the Athenaeum Club's founding President, and over the years numerous other members belonged to this and similar organisations elsewhere in the city, among them the Victoria, Union and Australian clubs.³ For example, Thomas Holt, passionate advocate in 1870 for a dam on the George's River, belonged to the Australian Club on nearby Bent Street, as did the Hunter Street physician and conchologist, James Cox. Carl Leibius and Archibald Liversidge were both members of the Union Club on Bligh Street and Liversidge resided there until 1889.⁴ Clearly there

was much in the elite culture of nineteenth-century Sydney to normalise the Royal Society's own gendered membership arrangements.

Indeed, at the time of the Royal Society's formation and earlier, when the by-laws of all the bodies in its putative lineage were formulated, the idea that their respective memberships should be exclusively male was simply taken as read. This assumption was consistent with the well-established fraternalism of so many British voluntary associations in the nineteenth century and earlier, including the scientific societies on which the Royal Society of New South Wales and similar bodies in other Australian colonies modelled themselves.⁵

A notable exception was the British Association for the Advancement of Science (BAAS) founded in 1831. Women were admitted to its meetings from the beginning, although the question of allowing women to attend the business and section meetings of this organisation, even as visitors, was initially controversial. By the 1850s, a few women were able to become members of the BAAS and their numbers increased over the decades, although they remained a small minority.⁶ The BAAS example would be followed by the Australasian Association for the Advancement of Science (AAAS), but it was the dominant fraternalism of metropolitan club culture which took root most successfully in nineteenth-century Sydney.

Women and Science

The Royal Society's exclusively male membership also reflected conventional wisdom at this time about the divergent intellectual capacities of men and women, a perception embedded in a notional division between the public and private social spheres. According to this view, the public sphere which embraced government, commerce and scholarship, was strictly a masculine domain and the intellectual processes thought best suited to this public sphere – reason, objectivity and a capacity for dealing with

abstractions – were attributes exclusive to men. These were also the abilities considered necessary for most scientific pursuits. By contrast, women properly inhabited the private sphere, a domestic space where, as wives, mothers and daughters, they dealt with the concrete practicalities of daily life. These roles demanded empathy and emotion, attributes perceived as norms of femininity and antithetical to serious scholarship in most scientific fields.⁷ Of course, numerous women in Sydney and elsewhere were successfully engaged in the public sphere of colonial commerce, whether in their own right or in partnership with male relatives.⁸ Seclusion in the private sphere was a luxury reserved only for those women whose families could afford it.

Within the private sphere, the scientific pursuits conventionally acceptable for women were botany and horticulture. These overlapped with other appropriately genteel, female activities such as art and landscape appreciation, and could be seen as extensions of interior decoration.⁹ Plants were also accessible subjects for study by women at home. Their dissection and preservation required no specialised scientific instruments and their cultivation and collection encouraged healthy outdoor activity. In Britain, women had been admitted early on to the Botanical Society of London, and in New South Wales from the 1850s, they joined such organisations as the Horticultural Society of New South Wales and the Balmain Horticultural Society.¹⁰

In other areas, however, the presence of women continued to be seen by many as an obstacle to the serious intellectual work of men.¹¹ In May 1869, for example, when a *Sydney Morning Herald* editorial suggested that the Royal Society of New South Wales should give more encouragement to women, it stopped short of advocating that they be admitted to full membership. Rather, it suggested that dedicated ‘ladies nights’ be introduced at which ‘suitable subjects’ could be dealt with ‘without sacrificing the distinguishing severity of a Philosophical Society’.¹² Clearly

the writer had not entirely discarded contemporary cultural assumptions about the place and attributes of women.

A year before this editorial appeared, the Government Astronomer, George Smalley, had challenged conventional arguments against female engagement with science during his 1868 Anniversary Address. Stressing that he was not just offering ‘fulsome compliments’, Smalley argued that ‘[i]n general ladies ... [were] neither uninterested nor inappreciative of science – and they ... [were] certainly not incapable of understanding it’.¹³ He cited the astronomer Caroline Herschel, self-taught mathematician and science writer Mary Somerville, and Elizabeth Juliana Sabine, translator of Alexander von Humboldt’s *Compass*. They were all proof, according to Smalley, that ‘a knowledge of science in ladies’ was neither ‘inconsistent with their natural refinement nor incompatible with their usefulness in domestic and social life’.¹⁴ Like the *Herald*, however, Smalley stopped short of advocating that women be admitted as full members, but he did hope that they would ‘sometimes attend the ordinary meetings’.¹⁵ Sadly, Smalley died the following year and his arguments in favour of greater female involvement in the ordinary business of the Royal Society were not taken further.

Yet, as people in Smalley’s audience in 1868 would have been well aware, some women in their own social circles already engaged with science outside the private sphere.¹⁶ Conventional wisdom did not necessarily match lived experience. Many such women were interested readers of a variety of scientific information. They visited the Australian Museum and some donated specimens to its collection. Donations to the museum by the wives of certain Royal Society members suggest something of their scientific interests. Mary Cox, wife of the conchologist James Cox, seems to have shared her husband’s interest in marine zoology; she donated a large specimen of coral in 1868.¹⁷ Among the specimens donated over

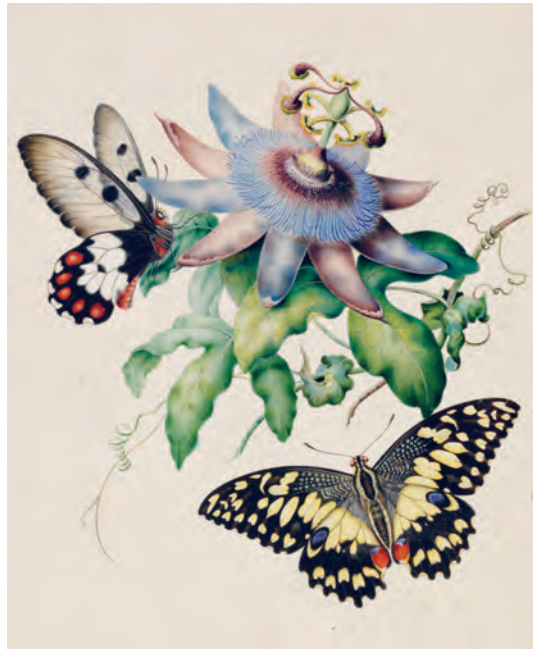
three decades by Mary (Mrs John and later Lady) Hay were ‘a night-lizard’, two snakes, an albino kangaroo and 15 pied crow shrikes.¹⁸

Some women also reached beyond the private sphere by post to pursue their scientific interests. Ferdinand von Mueller, Victoria’s Government Botanist, publicly encouraged women to contribute to his scientific survey of Australian plants and many women responded.¹⁹ Isolated at ‘Mountain View’, her family’s dairy farm at Tilba Tilba on the New South Wales South Coast, Mary Bate, for example, sent flowering plants, algae and fungi to Mueller. These included two previously undescribed species which Mueller named for their collector – a new shrub (*Myoporum bateae*) and a moss (*Byrum bateae*).²⁰ A new species (*Erechtites atkinsoniae*) and a new genus (*Atkinsonia ligustrina*) were named in honour of another of Mueller’s New South Wales correspondents, the journalist, botanical artist and novelist, Caroline Louisa Calvert (née Atkinson).²¹ Georgina King, a sister of Royal Society member Kelso King and a friend of Mueller, also sent him botanical specimens, but her scientific interests were not confined to botany.²² Her correspondents also included Royal Society member and Government Geologist, Edward Fisher Pittman; Melbourne palaeontologist Frederick McCoy; and the Queensland geologist, Robert Logan Jack.²³

Entomology was the particular interest and area of expertise of Harriet Morgan and Helena Forde, who were the daughters of the expert amateur entomologist Alexander Walker Scott and cousins of the Australian Museum Curator Edward Ramsay and feminist Rose Scott. Instructed in entomology by their father, both sisters were also talented botanical artists who provided well-researched illustrations for his publications and for those of other colonial men of science, including Ramsay and Gerard Krefft. Although barred by their gender from full membership of the Entomological Society of which their father and cousin were founding

KNOWLEDGE FOR A NATION

Butterflies with a
passionfruit flower,
illustrated by Helena Scott.
SLNSW.



Chelepteryx collesi (White-
Stemmed Gum Moths),
drawn from life by Harriet
Scott, from *Australian
Lepidoptera and Their
Transformations*, by
Alexander Walker Scott,
illustrated by Helena and
Harriet Scott, published
1864. SLNSW.





Illustrations by sister botanical artists Helena and Harriet Scott for a proposed book on oology by their cousin, Edward Pierson Ramsay. Left, Egg (species unidentified) by Harriet Scott. Right, Egg of *Granulcalis melanops* by Helena Scott. While excluded from RSNSW membership, the sisters were made Honorary members of the Entomological Society. SLNSW.

members, the sisters were made Honorary members in recognition of their contributions to Australian entomology.²⁴ Alexander Scott and Ramsay were both members of the Royal Society, but this body was closed to the sisters despite their scientific expertise.

During the last two decades of the nineteenth century, opportunities began to open for women to gain formal scientific qualifications at university. Sydney University admitted women on the same terms as men for the first time in 1881. In 1888 the Faculty of Science produced its first female science graduate, Fanny Hunt, and by 1895 two women had also graduated in medicine. Responding to change, some colonial scientific societies slowly began to accept women as members. The Royal Society of Queensland admitted its first female member in 1883, the Royal Society of Victoria followed suit in 1889, and by the end of the century equivalent bodies in Tasmania and South Australia were also open to women. In Sydney, the Linnaean Society admitted the botanist Sarah (Sally) Hynes to membership following her graduation from Sydney University in 1891.

There was no equivalent development within the Royal Society of New South Wales, although some leading members demonstrated their openness to female participation in the kind of intellectual activity traditionally restricted to men.²⁵ Sir William Montague Manning, during whose term as Chancellor of Sydney University women were first allowed to study for degrees, was a Royal Society member from 1881 until his death in 1895.²⁶ Archibald Liversidge had been among university personnel who supported Manning's initiative, while Henry Russell's position on the subject of higher education for women was clear in his funding of the university education of his daughter, Jane. She studied physics and chemistry as an undergraduate and gained honours in mathematics when she graduated with a BA in 1886. Other Royal Society members in this period were willing to encourage women's employment in science. In 1897, William Aitcheson Haswell, Sydney University's Professor of Biology, proposed the



Botanist Sarah (Sally) Hynes was admitted as an Associate Member of the Linnaean Society of NSW in 1892. Sydney University.

appointment of a female demonstrator to his department, albeit without success, and in 1908, Edgeworth David appointed the first of a series of female demonstrators in geology.²⁷

However, among the Royal Society's general membership there was evidently no desire to upset the status quo. Women rarely attended monthly meetings, and only as visitors. Between 1880 and 1914, women signed the visitors' book on just four occasions – just seven female visitors in all.²⁸ The Council's curt reply to an 1880 query from a member of the public, made perfectly clear the society's fallback position on the question of female participation: 'The rules only provide for the admission of ... gentlemen as members; it is not customary for ladies to attend the ordinary meetings; non-members are only admitted on special invitation'.²⁹ Perhaps as an organisation claiming such longevity, the Royal Society was reluctant to disrupt tradition by admitting female members. Or did the comfortable



Jane Foss Russell, daughter of Henry Russell. She studied physics and chemistry at Sydney University and gained honours in mathematics. Sydney University.

fraternalism that members had long enjoyed at monthly meetings seem far too valuable to sacrifice?

Female Scientists and the Royal Society

Against the odds, a handful of women did manage to make scholarly contributions to the Royal Society's work, although none attended the meetings where their research was presented. Even before the society was rebadged 'Royal', Helena Forde had provided the illustrations for a paper, 'On the Oology of Australia', presented by her cousin Edward Ramsay in 1865, and she was acknowledged in the minutes.³⁰ During the years from 1893 to 1914, the names of five more women appeared alongside papers published in the Royal Society's *Journal*.

Four of these women were university-educated. The first was Florence Martin, daughter of the late Sir James Martin, former Premier and Chief Justice of New South Wales. In 1893, she contributed a paper entitled, 'An Approximate Method of Finding the Forces Acting on Magnetic Circuits', which was delivered at a meeting in July that year by her co-author, Richard Threlfall. Initially, Martin's name had been omitted from the minutes, but these were subsequently corrected, and she received due credit for her assistance when the paper was published.³¹ Martin, who had given up her arts degree to become Threlfall's unpaid assistant, afterwards travelled to Cambridge, where for 18 months she attended advanced practical classes and, on Threlfall's recommendation, was accepted for work on a project in physics under the supervision of Cavendish Professor Joseph John (J. J.) Thomson. After her return to Sydney, she was listed as co-author with Threlfall of a second paper entitled, 'A Contribution to the Study of Oxygen at Low Pressures', read as before by Threlfall, at a meeting in 1897. But following Threlfall's departure from the colony in 1898, Martin's scientific career stalled. She spent six months tutoring female students at

the university during 1899, but then retired from science altogether to care for her mother.³²

In 1908, Jean White was co-author of a paper titled ‘Contributions to the Flora of Australia’, written with the Melbourne University Professor Alfred Ewart, who was also Mueller’s successor as Victorian Government Botanist.³³ The daughter of an assistant astronomer at Melbourne’s Observatory, White had graduated from the University of Melbourne in 1904 with a Bachelor of Science. She gained an MSc in 1906, and in 1909 was only the second woman in Australia to be awarded a Doctor of Science. Despite her marriage in 1915 to American agricultural chemist Victor Haney, White was able to pursue a science career in Australia before she moved to the United States in 1930. From 1912 to 1918 she was Officer-in-Charge of the Queensland Board of Advice on Prickly



Florence Martin, who collaborated with Professor Richard Threlfall on two papers which Threlfall read to the RSNSW in 1893 and 1895. SLNSW.

Pear Destruction. In 1926 she attended the Pan-Pacific Science Congress in Tokyo and in 1928 was employed by the Council for Scientific and Industrial Research (CSIR) to investigate two significant pasture weeds.³⁴

Fanny Cohen was the sole author of a paper entitled 'Notes on Azurite Crystals from Broken Hill', which was presented before the Royal Society on her behalf in 1910.³⁵ At the time, Cohen was a junior demonstrator in geology at Sydney University and one of Edgeworth David's nominees. She had graduated BA in 1908 and gained a Bachelor of Science the following year with first class honours in mathematics and the University Medal for geology. Cohen would later turn to school teaching, concluding her career as Headmistress successively of two leading girls' public schools: St George Girls' High School in the southern suburb of Kogarah and Fort Street Girls High School in the city.³⁶

Royal Society member Leo Arthur Cotton was a lecturer in Sydney University's Department of Geology in 1912 when he collaborated with junior demonstrator Catherine Drummond-Smith on a paper entitled 'Some Crystal Measurements of Chillagite'. As was customary, it was Cotton who delivered the paper. Smith had graduated from Sydney University in 1911 with first class honours and the University Medal for geology, but her career in science was curtailed following her marriage to Leo Cotton's younger brother Frank, a lecturer and demonstrator in physiology. Both Leo and Frank Cotton became Sydney University professors in their respective fields. Catherine, who remained sympathetic to women who desired to work outside the home, directed her intellectual energy into historical research. Having translated the private correspondence of the scientist and explorer Dr Ludwig Leichhardt, she published his biography, *Ludwig Leichhardt and the Great South Land*, in 1938.³⁷

The fifth woman in this short list of female contributors to the Royal Society's deliberations had not attended university. Mary Martha Everitt, the daughter of a carpenter, was Mistress-in-Charge-of-Girls at the Superior

Public School, South Parramatta, when her paper was read for her in December 1900.³⁸ Titled ‘The Organisation, Language and Initiation Ceremonies of the Aborigines of the South-East Coast of N. S. Wales’, it was researched and written in collaboration with retired surveyor-turned-ethnologist Robert Hamilton Mathews.³⁹

The extent of Mathews’ contribution to the paper was questioned by Christopher Illert in an article published in the Royal Society’s *Journal* in 2011.⁴⁰ According to Illert, Everitt was actually sole author of this paper and Mathews merely its ‘referee’. Illert provided strong evidence of Everitt’s visits, both to the settlement at La Perouse, and to Gundungurra speakers in the Burratorang Valley. Mathews, he asserted, would have been too old to have undertaken much field research of this kind, dismissing him out of hand as just ‘an armchair expert’ who paid little attention to Aboriginal language.⁴¹ Yet, as Mathews’ biographer Martin Thomas showed, Mathews actually travelled widely ‘[f]rom the 1890s until the First World War’, visiting ‘Aboriginal communities in Victoria, New South Wales and southern Queensland’, and ‘[l]anguage elicitation’ can be found in 36 of his anthropological publications.⁴² Illert also repeated allegations that Mathews ‘routinely falsified his field notes’. Historian Terry Kass found evidence of Mathews acting illegally and unethically for pecuniary gain as a surveyor, but it cannot be simply assumed that the same was true of his unremunerated research into Aboriginal culture.⁴³ According to Thomas, the ‘contested’ value of Mathews’ ethnographic work, reflects the lingering effect of the campaign waged against him by the Victorian anthropologists Walter Baldwin Spencer and Alfred William Howitt, in what Thomas called the ‘competitive and highly fractious’ ‘anthropological scene in turn-of-the-century Australia’.⁴⁴ None of this should detract from Everitt’s considerable achievement in recording the Gundungurra language for posterity, and in managing to have some input in the scientific deliberations of the Royal Society of New South Wales.

In April 1901, Mathews informed the Council about a paper that Everitt had written in her own right, entitled ‘Aboriginal Rock-Carvings and Marked Trees in Upper Burragorang’.⁴⁵ The Council thought her paper was too brief, and resolved to wait for ‘further information’, so Everitt added to her paper and again entrusted it to Mathews for submission to the Council. Later, however, Everitt fell out with Mathews and withdrew the paper. Mathews, as Thomas explained, was ‘essentially a one-man operation’.⁴⁶ Everitt had no argument with the Royal Society. On the contrary, in a letter to Alfred George (A. G.) Stephens, literary editor of the *Bulletin* where she hoped to have the paper published, Everitt commended the society for its ‘courtesy and fair play. My objection’, she said, ‘is not the least to them’.⁴⁷

Quite different was Georgina King’s opinion of the Royal Society and its leading members. Like Everitt, King lacked a university education, but as the daughter of the Reverend George King, one-time incumbent of the central Sydney Parish of St Andrews and Fellow of Sydney University’s St Paul’s College, she had the opportunity from an early age to mix socially with many of the colony’s scientific intelligentsia. King claimed to have been encouraged to pursue her study of geology by none other than William Clarke, who had been a family friend. However, Frederick McCoy was her significant long-term mentor and a supporter of some of the theories she subsequently expounded.⁴⁸

King’s particular interest was the origin of mineral wealth in New South Wales, including that of coal. By 1870, disagreement between Clarke and Frederick McCoy, concerning the age of Australian deposits of black coal, was resolved in Clarke’s favour to the satisfaction of most geologists. Thanks to the work of Richard Daintree and Charles Gould, it was clear that the major deposits of coal in eastern Australia dated from the Permian (or Permian-Carboniferous) period of the Palaeozoic Era, and not the more recent Mesozoic Era, as McCoy continued to maintain. Encouraged by

WOMEN AND THE ROYAL SOCIETY



Amateur geologist and anthropologist Georgina King, whose research papers were rejected for presentation before the RSNSW. Royal Botanic Gardens Victoria.

McCoy, however, King argued for rock successions much younger than most colonial geologists considered true at the time. By King's reckoning, Australia was a young continent, having no land surfaces prior to the Carboniferous period, around 299 million years ago.⁴⁹ The colony's alluvial wealth, according to King, was the result of an even more recent period of geological turbulence during the Tertiary period when, she maintained, the cooling of the Earth's crust had caused it to crack open, allowing the eruption of the hot material underneath.⁵⁰ King later linked this idea of 'Tertiary Catastrophism' to the transformation of living organisms into the country's mineral wealth, including its gold, and also to an explanation of human development much more rapid than was possible via Darwin's theory of natural selection. Women, according to King, had evolved ahead of men, because their particular anatomy had allowed women to respond instantly to the danger posed by the Tertiary eruptions. They had jumped up in fright, acquiring bi-pedal motion and a capacity for speech, both of which were then passed on to men.⁵¹

King set out her ideas in a series of papers which she submitted to the Royal Society: ‘Had Australia a True Devonian Period’; ‘The Earth’s Throes with regard to Mineral Alluvial Wealth and the Glacial Periods’; and ‘The Discovery of the Missing Link’.⁵² After examination by Council members, all three papers were rejected. Unbowed, King published her ideas in pamphlets, as articles in colonial newspapers and, in the case of her ‘Missing Link’ article, in *The Science of Man*, the journal of the Royal Anthropological Society of Australasia, of which she became a member.⁵³

Mistakenly, King accused Royal Society members such as David, Liversidge and Pittman of plagiarising her work. In David’s case, King went further. In her memoir, begun in 1914, King maintained – but without credible evidence – that years before, when David had been acting Chief Surveyor in the Department of Mines, he had acted corruptly in order to secure his professorship at Sydney University.⁵⁴ In a period of growing professionalism in the sciences, King seemed to assume that remunerated science was likely to breed corruption. Being an amateur and an outsider, she considered herself to hold the high ground of scientific integrity, from which she felt well placed to challenge the conclusions of a professional scientific elite.⁵⁵

King’s publications apparently found some resonance in her own time, at least among the wider public. A century or so later, a modern biography of King attributed the Royal Society’s rejection of her work to ‘a dominant clique’, intent on putting down anybody who did not ‘know their place’.⁵⁶ Certainly, as David Branagan wrote, the ‘scientific men of Sydney closed ranks against ... [King]. It seems to have been their only possible defence ... as her persecution complex grew and her ideas became increasingly eccentric’.⁵⁷

The exclusivity maintained by its membership rules and the restriction of membership to men, made the Royal Society vulnerable to the sort of accusations hurled by King, however unfounded or unfair they might

have been. The gendered character of the Royal Society's membership, once explicable in terms of prevailing cultural norms, persisted in the face of changing perceptions of the capacity of women to achieve professional qualifications in science, and long after similar organisations in Sydney and other Australian colonies had begun to move with the times. However scientific its goals, the Royal Society of New South Wales remained a gentlemen's club.⁵⁸ Women would not be allowed to join it until 1935.



CONVERSAZIONI

Although women were not permitted to become members of the Royal Society, a select group were invited to attend its *conversazioni*, those special meetings at which self-improvement merged with entertainment and pleasant social interaction. The expense and effort which the Council devoted to staging these sporadic departures from the serious formality of ordinary business, testifies to the value of *conversazioni* in the culture of the Royal Society of New South Wales.

Conversazioni had their origins in the salons and soirées which had been held in the homes of the wealthy in Britain since the eighteenth century. By the mid-nineteenth century, they were pervasive in the associational culture of the British urban middle classes.¹ Their great popularity reflected wide contemporary enthusiasm for exhibitions of material culture, coupled with a growing faith in the effectiveness of ‘learning by looking’.² Museums – opened to the people with a view to public education – multiplied in Britain, especially during the second half of the nineteenth century.³ At the same time, and on a grander

scale, London's 1851 Crystal Palace Exhibition inspired a succession of international and intercolonial exhibitions of industrial, agricultural and technological achievement. Conducted locally by private clubs and civic institutions, conversazioni represented these broader trends in microcosm.

Transplanted Britons embraced the conversazione with enthusiasm.⁴ In Sydney and the country towns of New South Wales, numerous organisations conducted conversazioni – from temperance groups and churches, lodges and yacht clubs, to schools of arts, mechanics' institutes and a variety of learned societies.⁵ In its simplest form, such an event could merely entail informal discussion among club members on an issue of mutual interest.⁶ During the mid-1850s, for example, the Sydney Yacht Club held a monthly conversazione of this kind in its rooms at the Perrier's Club in Pitt Street.⁷ Occasionally, conversazioni took the form of concerts, perhaps organised as a fund-raising event, but these events could also offer much more in the way of mental stimulation and social interaction – not only music, but lectures, demonstrations and a range of exhibits, along with ample opportunity for informal discussion and socialising.⁸ This was the format that developed for the Royal Society's conversazioni which, at their peak, ranked among the most fashionable and well-attended events in the social calendars of Sydney's elite.⁹

Hosting a conversazione could be seen as a natural step for the Royal Society because, ideally at least, its regular meetings embodied some of the features of such an event. Formal business was usually followed by one or more talks. There would be some discussion of the presentation thereafter, and where time permitted, several exhibits or demonstrations were also provided for the interest and enlightenment of the members. Of course, conversazioni offered many more exhibits than were shown at regular meetings and were also made exceptional by the presence, on most occasions, of numerous female guests.

Philosophical Society *Conversazioni*

A precedent for the Royal Society's *conversazioni* had been set by its immediate predecessor. The Philosophical Society of New South Wales had held its first such event in December 1858, when members were given the privilege of introducing 'the ladies of their families'. Designated a 'Photographic *Conversazione*', the evening commenced with a talk on the 'Progress of Photography and its Application to the Arts and Sciences', given by James Freeman, a society member and partner in Freeman Brothers, professional photographers in George Street. Afterwards members and their guests browsed the numerous photographs on show. Two more photographic *conversazioni* followed in December 1859 and December 1860, which was a reflection of contemporary interest in this new technology, and the number of keen photographers among the membership.¹⁰

Several professional photographers accepted the society's invitation to exhibit examples of their work at the photographic *conversazione* in 1859. Among their contributions was a composite portrait, measuring some six square feet (6.83 square metres) and depicting the heads of every member of the New South Wales Legislative Assembly.¹¹ This had been supplied by the Royal Photographic Portrait Establishment in George Street, whose proprietor, the artist, photographer and society member, Edwin Dalton, described himself as 'late instructor and painter to the Queen'.¹² Dalton and his wife had both enjoyed royal patronage as copyists of paintings in the Royal Collection and Dalton had instructed Victoria and Albert in the art of lithographic print-making.¹³

Freeman Brothers matched the ambition of Dalton's entry with a panorama of Sydney Harbour, photographed from a platform erected near the statue of Governor Bourke in the outer Domain. Bourke's statue, which now stands in front of the Mitchell Library in Sydney, was then located near the old Bent Street entrance to the Botanic Garden. Also

on show were around 100 stereographs produced by the Hunter Street photographer William Hetzer. Viewed using the stereoscopes that had been set up around the room, these afforded considerable entertainment for members and their guests.¹⁴ Several amateur photographers, John Smith, Robert Hunt and Joseph Docker, also exhibited examples of their work. Such was the enthusiasm for this exhibition of professional and amateur expertise that the Council decided to keep the exhibition open for an extra day.¹⁵

Although officially designated 'photographic', the *conversazione* held in December 1860 offered members and their guests much more. Also on show were 'numerous ... mineralogical, chemical and optical specimens'.¹⁶ Items of wider scientific interest had also been provided at several earlier *conversazioni*, held after the formal business of the annual meetings in 1858, 1859 and 1860. In May 1860, for example, members and their guests were offered, among other things, a model of revolving batteries, a sample of black lead, a pseudoscope (used for studying stereoscopic vision), and an apparatus for measuring altitude by using the boiling point of water.¹⁷

There were similar kinds of displays at the four *conversazioni* conducted by the Philosophical Society in 1861 and 1862, and at two more held in December 1863 and July 1864. At the latter two events, members were also entertained and informed by practical demonstrations. Smith's 'electrical experiments' were the biggest attraction of the evening in 1863, and the following year, Major Thomas Wingate, Commander of the New South Wales Volunteer Rifles, intrigued audiences with his demonstration of what was described as the 'rotary motion of cut-rock crystal on inclined planes'.¹⁸

By this time, the range of exhibits had also expanded to include a variety of works of art. In 1863 the Sydney merchant John Alger contributed some from his private collection. Among them was a sketch by the marine artist Oswald Brierley, depicting Princess Alexandra's arrival at Gravesend,

and purported to be preparation for a larger painting destined for the Royal Collection.¹⁹ Joshua Josephson, a relatively new member, provided a selection of ‘articles of vertu’, including valuable Florentine brooches, various cameos, and a golden Maltese Cross.²⁰ The presence of all these items among the scientific apparatus, geological objects and specimens of natural history was not only typical of the eclectic array of exhibits to be found in many contemporary conversazioni, it was also consistent with formal statements about the areas of knowledge within the Philosophical Society’s broad remit: ‘science, art, literature and philosophy’.²¹

Women attended at least eight of the Philosophical Society’s conversazioni. Newspapers reported that a ‘large proportion’ of ‘ladies’ were present in December 1860, and that in December 1863 ‘the greater proportion’ of those present were ‘ladies’.²² In 1862 Mary Hay gave further evidence of her eclectic scientific interests by exhibiting a specimen of asbestos. While women would continue to participate in large numbers as guests, very few would be credited with supplying exhibits.

Attendance by ladies at the 1864 conversazione was also said to be ‘considerable’, but the number of items on show was judged disappointingly ‘small’.²³ This would be the last such evening that the Philosophical Society ever hosted. The Council had persisted in organising these events despite, or perhaps because of, the difficulties being experienced by the society during the early 1860s, a conversazione being a potential a drawcard for otherwise inactive members. From 1865 to 1867, however, the Council eschewed such entertaining to focus on effecting the Philosophical Society’s resurrection as the Royal Society.

Conversazioni and the Royal Society

It was not until 1868, therefore, that the next conversazione was held, the first for the newly constituted Royal Society of New South Wales. The

Council had scheduled this event for June, expecting it to coincide with the visit to the colony by Prince Alfred, Duke of Edinburgh, but any hope of having royalty grace this *conversazione* was thwarted.²⁴ At a picnic at Clontarf on Sydney Harbour in March, the prince was shot and wounded in an assassination attempt by a deranged Irishman and having recovered from his injury, he departed for England in early April.

Despite Prince Alfred's absence, the Royal Society's 1868 *conversazione* was judged by the press as 'a very great success'.²⁵ It had been preceded by Smalley's address advocating greater female involvement with science, and afterwards, the female guests, perhaps buoyed by the Vice-President's opening remarks, joined members in viewing the 'numerous objects of scientific and artistic interest' on display. Smalley's contribution from the Sydney Observatory included a wind dial constructed by Henry Russell. This was one of a number of instruments, many of his own making, which Russell would exhibit before the Royal Society in the ensuing years. Ambience was provided by potted plants supplied by the Director of the Botanic Garden, Charles Moore, while Gerard Krefft of the Australian Museum brought photographs of Australian snakes. A range of technical equipment was provided by Edward Cracknell, Superintendent of the Electric Telegraph Office, and Thomas Richards, the Government Printer, exhibited several objects illustrating the history of printing, including a letter written by William Caxton, the first English printer and seller of printed books. On show too was a selection of works by local artist-photographers Victor Prout and Eugene Montague Scott, including a partially finished crayon portrait of the Duke of Edinburgh, for which Scott had recently received a handsome commission.²⁶

All of these contributors were society members, but a few items were provided by individuals who were otherwise ineligible to participate in Royal Society activities. These exhibits included a collection of stuffed Australian birds which were the work of James Samuel Palmer, a Hunter

Street taxidermist and a dealer in specimens of natural history. Palmer was a conditionally pardoned felon. His own criminal history, and the recent involvement of his stepdaughter in a highly publicised murder case in Sydney, would no doubt have prevented Palmer from satisfying the society's stringent membership standards.²⁷ Gender alone would have disqualified the Sydney artist Myra Felton, who nevertheless was welcome to provide several crayon portraits for the evening.

There were no more Royal Society conversaziones until 1873 and that event, like the society itself at this time, met with indifferent success. John Smith made some preliminary remarks explaining the significance of some of the exhibits, and a few experiments were conducted using some of the electrical and other machines on show. Unfortunately, however, not all the exhibits were in working order because, as Smith apologised, many items had been brought in too late to be made ready.²⁸

Conversaziones held in 1874 and following years greatly benefited (as did the Royal Society) from the vision and organisational skills of a new councillor, Archibald Liversidge. Formerly all such gatherings had been held in the society's meeting rooms. From 1874, the Royal Society customarily hired a larger venue for the evening. Initially, this was the Masonic Hall in York Street. Patronised by 'most of the leading families' and 'highly successful', according to the *Sydney Morning Herald*, the 1874 conversazione proved to be an expensive undertaking. The £60 it cost the Royal Society included the unforeseen expense of reimbursing its honoured guests, the officers of the HMS *Challenger* expedition, for 40 yards (36.58 metres) of canvas, which had mysteriously disappeared from among the exhibits.²⁹

During 1875, the society was too busy establishing itself in Elizabeth Street to contemplate repeating the triumph of the previous year. In any case, economy was necessary. Furnishing the newly leased rooms in Elizabeth Street had required a substantial outlay of funds, with much

more expense expected for printing and postage as additional organisations responded to the Royal Society's requests for an exchange of publications.³⁰ However, a conversazione was held the following year and from 1876 through 1879 these gala evenings occurred annually.

Optical instruments, minerals, natural history specimens, photographs, paintings and 'beautiful sculptures' were all on show at the conversazione in 1876, but it was electricity and its application to communication which apparently occupied centre stage. It certainly captured the imagination of a journalist from the *Australian Town and Country Journal*. He recorded in detail his own understanding of John Smith's explanation of Ruhmkorff's coil, and made particular note that, among Edward Cracknell's exhibits of undersea electric cables, batteries and other instruments, there had been an invention by Sir William Thomson which could record transmitted messages. If anyone was inclined to doze when there was 'so much to attract and gratify the eye', declared this enthusiastic chronicler, 'the intense electric lights that were occasionally made to glare upon them and the loud detonation of the electric shock' would certainly have aroused the sleeper. Refreshments were provided for the crowd and there was musical entertainment in the form of piano recitals by an unnamed 'lady' and a 'gentleman'. All in all, concluded the reporter, Messrs Russell, Moore, Liversidge and Leibius, who comprised the organising committee, deserved 'credit for the happy combination of pleasure and instruction which they set before the visitors'.³¹

Conversazioni held in 1877 and 1878 were similarly successful. No longer an addendum to ordinary meetings, these were now stand-alone events. In May 1877, as the *Sydney Mail* reported, the Band of the New South Wales Artillery entertained some 400 to 500 'ladies and gentlemen of the elite of Sydney' as they examined the 'large collection of objects of scientific interest'.³² Attendance was equally 'fashionable', if somewhat smaller, at the 1878 conversazione, although the Masonic Hall

was described as ‘crowded’ by the *Herald*. Its report focused on what it considered ‘the centre of attraction’, the scientific instruments, ‘all of the latest and most improved manufacture’. A highlight for those attending were ‘the telephones’ which, as the *Herald*’s report remarked dryly, ‘were experimented ... [upon] in not altogether dulcet tones’.³³

A Grand New Venue

A turning point in the Royal Society’s *conversazioni* came in 1879 when, for the first time, the Council managed to secure what was arguably the city’s ‘grandest public room’ – the Great Hall of the University of Sydney.³⁴ The opportunity to socialise surrounded by the Victorian Gothic splendour of Edmund Blacket’s architectural creation may well have added to the event’s attraction. At the same time, the building’s ornamented masonry, pointed arches, and steep-pitched roof – deliberate references to Oxford and Cambridge universities – tended to enhance the Royal Society’s image by locating this colonial organisation within an intellectual tradition that was centuries old.

This new *conversazione* venue also further strengthened the Royal Society’s long-standing links with Sydney’s university. ‘University authorities’, as the *Sydney Mail* informed readers, now joined senior public servants, private companies and Ordinary members in providing exhibits. The university’s contribution included spectroscopes and apparatus for liquefying gas, ‘glass wool’ for filtering chemicals, photographic slides, specimens for illustrating crystallography and several models of large diamonds.³⁵ Spread out along eight tables in the hall was an eclectic mix of items in which the university’s scientific apparatus and teaching aids competed for attention with ethnographic items, telegraphy technology, medical equipment, gem collections, natural history specimens, and 150 books on Australian history, contributed by Liversidge. At the close of



North-east corner of Sydney University's Main Building. From 1879, most of the RSNW's conversazioni were held in its Great Hall, at right. SLNSW.

the evening, according to the *Sydney Mail*, 'everybody departed, evidently much pleased with the intellectual treat the Council had provided'.³⁶

During the 34 years from 1880 to 1914, the Royal Society managed to host a dozen similar events, all but one in the Great Hall. Three of these, in 1888, 1898 and 1911, coincided with meetings in Sydney of the Australasian Association for the Advancement of Science. On these occasions, AAAS delegates were the society's guests of honour. As many as 2000 people attended in 1888, constituting according to one press report, a 'brilliant and fashionable assemblage'. Professors Threlfall, Liversidge, Stuart and Warren gave explanatory talks on the various exhibits and guests were entertained by Frederick Morley on the pipe organ which

had been installed in the Great Hall six years before. Gaslight illuminated the hall and numerous Chinese lanterns lit up the lawn outside. Guests could retire there to enjoy the cooler air when they were not examining the exhibits or inspecting the university's classrooms, laboratories, library and museums. The Royal Society's *conversazioni* were beginning to resemble a showcase for the university as well.

Distinguished guests at the *conversazione* in 1890 included the Governor and his wife, Lord and Lady Carrington, the Premier Sir Henry Parkes with Lady Parkes, and the officers of several British naval vessels in port at the time. Even without visiting AAAS delegates, attendance was between 700 and 800 people and no expense was spared on the decorations and entertainment. A miniature fountain played in the centre of the hall, its 'crystal waters', as a press report enthused, playing 'with refreshing constancy to the melody of the organ'.³⁷ Guests were entertained and informed by various demonstrations and experiments, as well as by the numerous exhibits set out in the hall and in the university's chemical, physical, engineering and biological laboratories. A 12-page catalogue included a detailed description by Liversidge of the university's new chemical laboratory, which had been 'thrown open for the first time for the inspection of the friends of the Royal Society'.³⁸

The cost of the 1890 festivities was well over £134.³⁹ Afterwards the Council agreed with Liversidge that because the six guineas paid for tuning the university's instrument had been excessive, organ recitals should in future be abandoned, a stricture which endured until 1901.⁴⁰ As the society's *conversazioni* became more and more elaborate, the pressure they placed on its funds increased. Much more was also now demanded of the organising committee, as well as of the society's paid secretarial assistant, William Webb. Decorations – flowers, greenery, bunting, Chinese lanterns and fountains – all had to be chosen, ordered and (except in the case of the Botanic Garden's contribution) also paid for. As well, personnel had

to be hired to manage the carriage traffic, announce the guests, attend the cloakroom, provide refreshments and transport exhibits. There were guest lists to be decided and invitations, tickets and catalogues to be prepared, printed and sent. The costs of postage, insurance and lighting the hall with kerosene, gas and later, electricity, all came out of the society's funds. In 1890, the Council even had to meet the cost of hiring a wheelchair for an aging Sir Henry Parkes.

Occasionally the society substituted what were called 'receptions'. Conducted on a much smaller scale and less expensive than the conversazioni, these were held in the society's own meeting room, with attendance restricted to members. When the first of these occurred in 1880, the Council explained that the room was not large enough for ladies to be invited, nor would it be possible to provide them with appropriate entertainment. Receptions given in 1884 and 1889 were similarly limited. In 1896, however, the Royal Society hosted a full-scale conversazione in the society's own premises. Pride rather than parsimony motivated the choice of venue on this occasion; the purpose was to show off the lately completed renovations. Some 800 invitations were sent out to members and their female relatives.

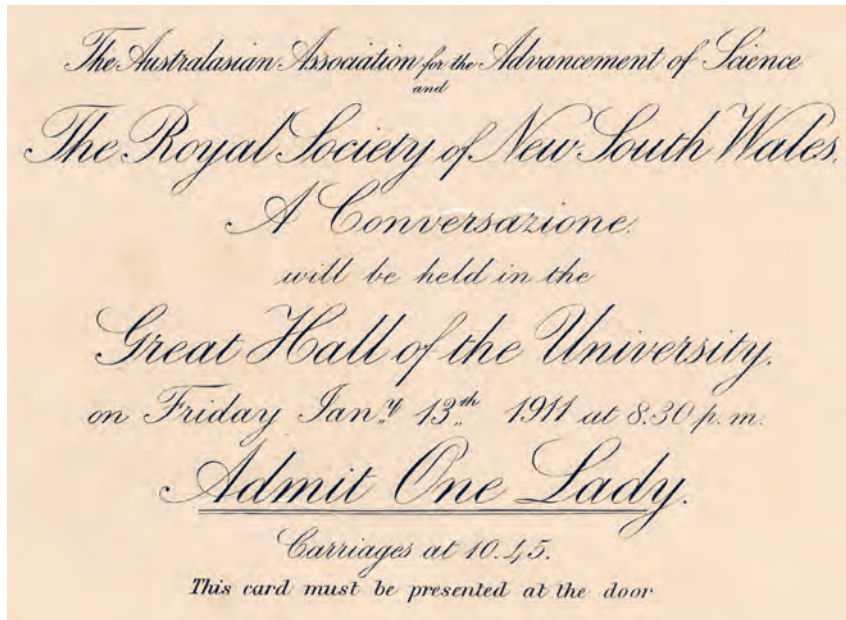
The Value of Conversazioni

The effort and expense of staging the Royal Society's sparkling gatherings for socialising and self-improvement arguably were balanced by the benefits. Scientists – professional and amateur – had a valuable chance to demonstrate their expertise and the utility of science. But everybody present stood to gain. As historian Samuel J. M. M. Alberti pointed out in his discussion of conversazioni in Britain, much more than material exhibits were on display at such events: 'Conversazioni were also stages on which civic grandees could strut'.⁴¹ Merely being present at a conversazione of the

Royal Society of New South Wales was a public assertion of one's identity as a member of the colony's middle-class elite. It was also an opportunity for exhibitors and their audience to demonstrate their 'cultural sophistication', including their capacity for 'rational communication'.⁴² As they admired and commented on the many objets d'art and instruments of scientific innovation, their senses stimulated by music and tasteful decoration, men and women could parade the sophistication of their taste and their capacity to engage with concepts on the frontier of scientific knowledge.

Engage they did in a multi-sensory experience, as the most vivid of the press reports reveal.⁴³ Milling round the tables or transfixed by spectacular experiments, members and their guests handled the scientific instruments, shouted into telephones, heard the 'crack' and 'ping' of telegraphic communication, reacted to 'intense electric lights', recoiled at the 'loud detonation' of an 'electric shock', and sniffed the wafting ozone.⁴⁴ They asked exhibitors all sorts of eager questions and had ample opportunity to discuss the scientific novelties among themselves. Exhibits were expected to be conversation pieces, conversation being central to a conversazione. This was active, not passive learning. For many members, conversazioni served up science in a much more digestible form than did the lengthy and often highly technical papers read at general meetings. By attending conversazioni, both members and their guests could keep up with innovations in science and technology.

The women attending had even more to gain from Royal Society conversazioni. Each Ordinary member was allowed to bring two female relatives, so women often comprised as much as two thirds of the attendance. Rarely were these women named in early press reports and when the press did more than note a female presence at the society's conversazioni, the reports reflected old ideas about women's limited interests and capabilities. The *Australian Town and Country Journal's* report on the 1890 conversazione, for example, merely praised the 'ladies'



A Lady's Ticket for the RSNSW conversazione held in 1911. This event coincided with a Sydney meeting of the Australasian Association for the Advancement of Science. Sydney University.

dresses', judging the 'limp artistic clinging skirts, with full bodices ... short waists and high puffed sleeves', 'cool and appropriate'. The same article drew a clear distinction between 'women' and 'scientists'. Women, the report maintained, were drawn to the wood carvings and model steam engines, but 'scientists [presumably society members] preferred inspecting ... cultures of bacilli and microbes'.⁴⁵ Later press reports resembled social jottings, with the names of female guests recorded for the interest of social-conscious readers. But Royal Society conversazioni could do more than reinforce the status of elite female guests. They also offered women the opportunity, rarely given, to publicly engage, hands on, with areas of science beyond the botany and horticulture conventionally considered appropriate to their sex.



The RSNSW's conversazione held in Sydney University's Great Hall in October 1879, depicted in the *Australian Town and Country Journal*, 1 November 1879. Possibly by staff artist Arthur Collingridge. NLA.

Such an opportunity arguably had particular significance for certain female guests, who were already active in subverting old ideas about the roles, rights and capabilities of women. Their presence at Royal Society conversaciones can be determined when their names were mentioned in post-1900 press reports, or inferred from the presence of their close male relatives among the membership. Others attended as members of the Australasian Association for the Advancement of Science.

From the late 1880s, a handful of young women attending the society's conversaciones were university graduates, having achieved a level of formal education equal to, or better than, that of some members, and in areas of science previously considered unsuitable for women. These pioneers included Kate Hogg, Agnes Bennett and Mary Booth, all qualified medical

practitioners, and Jane Foss Russell MA, a classics graduate with studies in science and academic achievement in mathematics.⁴⁶

Russell founded the Sydney University Women's Association and was appointed as a tutor to the university's women students in 1892. But she was only one of many *conversazione* guests who were active in advancing women's education. Augustine Soubeiran, Louisa Gurney, Maybanke Wolstenholme (later Anderson) and Isola Thompson were all teachers. Lady Mary Windeyer, her daughter Margaret, Mrs Emily Jane Russell (née Foss), and Mrs Mary Garran (wife of member Andrew Garran) were all members of the ladies committee that was formed to raise money to establish and support a residential college for women at Sydney University.

Quite a few women in attendance had joined the Women's Literary Association, formed in 1889. As well as literary works, its members discussed contemporary issues, including women's suffrage, and several of them, including *conversazione* guests Wolstenholme, the Windeyers and Matilda Curnow, formed the Womanhood Suffrage League. In 1895, Margaret Windeyer, who networked with women's rights groups overseas, also convened the founding meeting of the National Council of Women of New South Wales, whose committee on immigration and emigration Jane Foss Barff (née Russell) would later chair.⁴⁷

Attending a Royal Society *conversazione* did not advance these feminist causes, nor did it bring these women any closer to Royal Society membership. But it did provide them with a stage where they could enact their own convictions concerning the capacity of women to engage with areas of science once seen as limited to men, their ability, in other words, for equal participation in the public sphere.

For the Royal Society itself, *conversazioni* were much more than a diversion from its regular activities. With science and scientists centre stage, *conversazioni* helped to realise the Royal Society's object of encouraging

scientific work in New South Wales. Often reported in glowing terms by the press, conversaziones also enhanced the organisation's public image as a leading learned body that was up to date with the latest in science and technology.⁴⁸ This was important for an organisation which needed to attract government financial support.

Conversaziones were also very popular with members. As Archibald Liversidge commented in his 1901 Presidential Address, 'the majority of our members much appreciate such evenings, and largely because they can bring the ladies of their families'. Indeed, he added, conversaziones were the only meetings that some members ever bothered to attend.⁴⁹ In other words, conversaziones helped the Royal Society to hold onto existing members. They also had potential to attract new blood. This was an important consideration in 1901 because by then, membership numbers had dwindled.



FIN DE SIÈCLE

With the benefit of hindsight, the Royal Society's decision in 1880 to limit itself to 500 members could look like hubris. It had more than 430 members by the beginning of 1880 and four years later could boast 494.¹ But then membership plateaued before starting to fall. In 1901 the Royal Society had only 368 members and by 1914, membership had shrunk even further. But there was no equivalent diminution in the society's commitment to science, of whose benefits the general public were now increasingly aware. The hive may have been reduced in size, but the Royal Society's 'working bees' remained industrious and productive. They were also creative in their responses to problems whose origins were well beyond the organisation's control.

Challenges from the 1890s

Complex external factors affected the Royal Society's ability to attract new members and retain existing ones. Not least was the severe economic depression experienced in the Australian colonies during the 1890s.²

Declining wool prices since the 1870s reduced the value of colonial exports which, by the late 1880s, amounted to a mere 15 per cent of domestic production.³ This increased the colonies' already great reliance on British capital. By 1890, interest on foreign debt accounted for 40 per cent of the export earnings of the colonies as a whole.⁴ A crisis came in 1890 when defaulting borrowers in Argentina threatened the viability of a leading British merchant bank. Shaken by this, British investors restricted lending to the Australian colonies with a resultant rise in interest rates that had dire consequences for colonial commerce. Businesses collapsed and, as loan defaults increased, numerous banks and other lending institutions were forced to close, leaving depositors without access to their savings.⁵ Unemployment among skilled workers reached 30 per cent in 1893 and was even higher among the unskilled.⁶ Then, in the middle of the decade, just as the economic climate was starting to improve, eastern Australia was hit by an extended drought.⁷

In these conditions, recruitment of new Royal Society members slowed to a trickle and many existing members were forced out by financial hardship. There were 29 resignations during 1893 and 20 more men were deregistered for non-payment of their subscriptions. Fewer members were struck off in ensuing years, but resignations continued. In 1894, 34 members resigned, a further 52 left the society between 1895 and 1897, and as late as 1898, there were 48 resignations.⁸

A shrinking membership was not the only impact of the economic climate. The straightened financial circumstances of other voluntary bodies flowed on to the Royal Society in the form of decreased rental income, which fell from £103 received during the year prior to March 1891, down to £15 in the same period 1899–1900. Fortunately, the society was sustained throughout the 1890s by the annual government grant, increased to a maximum of £500 in 1890, but still allocated in proportion to its income from subscriptions.⁹ Membership fell to 336 by March 1905,

but subscription fees and money clawed back from members in arrears were still sufficient to keep the grant at around £500 annually during the 1890s.¹⁰ The lavish *conversazione* held in the society's premises in 1896 temporarily upset the budget, leaving the society with just over £14 in hand at the beginning of 1897, with a bill for nearly £65 unpaid. But in most years between 1893 and 1900, the society began each year with a positive opening balance, albeit reduced from over £63 in 1894 to just under £36 in 1900.¹¹

Economies were necessary: Charles Martin's request for a research grant was denied on financial grounds in 1893; the essay prize was reduced in value in 1895; and a deadline was set the following year for the competition to close altogether. One area where the Royal Society was unwilling to compromise, however, was in publishing the *Journal and Proceedings*. Between 1872 and 1886, this had been produced free of charge by the Government Printer, but with a limit on quantity. In September 1886, the Council resolved to ask the government for a grant of £250 so that it could make its own printing arrangements, but in May the following year it was informed that the government had decided against subsidising the *Journal* altogether.¹² Printing costs had reached almost £293 by 1892, a significant burden given the society's shrinking income. Nevertheless, the Council firmly rejected a motion to limit the number of copies printed.¹³

The Royal Society's exchange system was also maintained, with a modicum of government assistance. When in March 1893 the government's Board of International Exchange offered to transmit the *Journal* free of charge, the Council decided to accept, but only for a trial period while it monitored the time taken for the latest volume to arrive at various destinations.¹⁴ Standards needed to be maintained. Apparently dissatisfied by the results of this trial, the society fell back on its own resources, at least until 1897, when it finally decided to cooperate with the Linnaean Society and the Australasian Association for the Advancement of Science

in applying for the International Exchange Board's assistance.¹⁵ Like the *Journal*, the exchange program was considered essential to the Royal Society's work.

As well as depression and drought, other factors inhibited the Royal Society's growth from the 1890s, and the influence of these continued into the new century. In the first place, Sydney had changed. As Archibald Liversidge noted during his President's Address in May 1901, there were now 'miles of new suburbs' and the residential areas once located 'conveniently close to the Society's House' were largely taken up by 'professional offices or business premises'. Having to remain in town for a meeting at the end of a 'fatiguing day' and afterwards to make one's way home to the suburbs was a significant deterrent against joining any city-based society.

In addition, those men who were prepared to sacrifice convenience for intellectual stimulation, by remaining in town for a meeting, now had a variety of scientific and professional societies from which to choose. To colonial scientific bodies established since the 1870s, such as the Linnaean Society (1874), the Zoological Society (1879), and the Natural History Association of New South Wales (1887), were added local branches of the Royal Geographical Society of Australasia, the British Astronomical Association and the British Medical Association, along with specialist professional bodies like the Engineering Association and the Institute of Architects. Some Royal Society members had previously been active in one or more these bodies, but the existence of so many of them, according to Liversidge, 'tended to withdraw members [from the Royal Society] or prevent new members from joining'.¹⁶

Efforts to Boost Membership

Recognising the changed environment at the beginning of the new century, the Royal Society became proactive in finding ways to attract and keep

members. A dedicated recruitment plan was hatched in 1901. Its object was to attract younger men still making their way in their respective professions and perhaps deterred from joining the Royal Society by the expense involved. By encouraging a younger cohort, the society could not only enlarge its membership, but also minimise the losses regularly incurred as older men passed away. Accordingly, the entrance fee normally charged to new members was suspended for the rest of the year and this concession was renewed annually until the levy was dispensed with altogether.¹⁷

Despite the fee concession and occasional attempts to persuade particular individuals to withdraw their resignations, membership numbers continued to fall.¹⁸ The total of new members rose slightly during 1901, but most additions to the roll were offset by deaths, resignations and deregistration of members in arrears. After gaining 16 members in 1904 but losing 30 more, the Council resolved that from time to time councillors would write letters of invitation to ‘gentlemen’ who it considered would be ‘suitable members’.¹⁹ There is nothing in the Royal Society’s records to suggest that boosting membership by opening the society to women was ever contemplated.

The society’s dwindling numbers were also connected to developments in the practice of science. There were now many members who were professional scientists (over 68 per cent of the membership by 1914).²⁰ They were formally qualified specialists, many of whom had access through their paid employment to the kind of facilities and apparatus required for advanced scientific work.²¹ These things and the increasing complexity of scientific knowledge set them apart from other members who, however well-read, merely had a layman’s understanding.²² The highly technical papers read at monthly meetings – for example, William Warren’s ‘Strength and Elasticity of Reinforced Concrete’ (1904), replete with mathematical equations, and Richard Westman Challinor’s discussion of the ‘Approximate Colorimetric Estimation of Nickel and

Cobalt' (1904) – could easily have deterred many less qualified men from attending meetings or even continuing their membership. To maintain the Royal Society's relevance for a broad spectrum of existing and potential members, the Council took steps to rebuild a sense of community among the members.

One strategy was to make some of the science presented much more accessible. Popular science lectures, open only to Royal Society members and their guests, were organised for the first time in 1900.²³ Monthly, from mid-June until mid-October that year, a number of leading members – acknowledged experts in their respective fields – presented explanatory talks on subjects of general interest, sometimes illustrating them with lantern slides. 'Liquid Air' was Archibald Liversidge's subject, and Henry Russell lectured on 'Photography in Astronomy'. Anderson Stuart discussed 'The Mechanics of the Human Framework', Professor of Anatomy James Thomas Wilson explained 'Mammalian Development', and Edgeworth David chose a topic highly relevant for a community on the brink of Federation, 'The Building of the Australian Continent'. These inaugural lectures attracted audiences large enough 'to tax the capacity of the Society's hall'.²⁴ Later lectures covered a variety of subjects from 'Health Resorts' and 'Food Fishes' (1907), to 'Radioactivity' (1909), 'Recording Earthquakes' (1910) and 'The Milk Supply of a Great City' (1914).²⁵ Less technical than the papers at monthly meetings and comprehensible with only 'elementary scientific training', these lectures, it was hoped, would go some way towards ensuring the loyalty of lay members.²⁶

Cohesion might also be enhanced by more conviviality. Addressing the Royal Society in 1901, Liversidge not only drew attention to the popularity of conversaciones, he also recommended that the society's annual program should always include one, along with two other opportunities for social interaction: a reception and 'an annual dinner of the members'.²⁷ He had raised the subject of a dinner at a Council meeting in July the previous

year and the first of these was scheduled for April 1901.²⁸ An informal ‘smoke’ *conversazione* (for men only) followed the monthly meeting in July 1901, and a full-scale *conversazione* was held in Sydney University’s Great Hall in September that year. *Conversazioni* were also arranged in 1902 and 1903, but then the plan to make them annual occasions languished.

The dinner remained an annual event. Arranged as a prelude to the opening of the session, these evenings seem to have been reasonably popular. Unlike *conversazioni* or receptions, dinners also placed no particular burden on the society’s limited finances because members wishing to attend were required to purchase tickets. A surviving invitation and program for the dinner held on 24 April 1913 offers a glimpse of these occasions, which were generally held in the private rooms of public restaurants. The venue in 1913 was ‘a charming room’ in Farmers’ Luncheon Hall, an establishment of generous proportions located in Market Street between George and Pitt streets (now the site of Myer department store). The guests that year included the Chief Justice of New South Wales, Sir William Cullen, and the presidents of several scientific and professional organisations in the city. As a special attraction, members also had the company of ‘some recently returned Antarctic explorers’. Perhaps these included Frank Wild and New Zealand engineer Eric Webb, veterans of Douglas Mawson’s Australasian Antarctic Expedition, whom the Council had honoured with a reception earlier that month. For the price of 7 shillings and 6 pence, members were promised ‘a good dinner’. The menu, fashionably in French, was certainly extensive, offering among other delights: ‘Filet de Mouton’; ‘Chateaubriand’; ‘Sorbet au Grand Marnier’; and ‘Salade de Salmon’, with ‘Bombe Royale’ and ‘Café’ to follow. Toasts were kept to a minimum and the members, seated at small tables for ease of conversation, were entertained with a dozen musical items provided by the venue’s orchestra and soloists. The Council, as the invitation informed members,

‘desired to make these Annual Dinners special events, alike pleasurable and interesting to a company of intellectual men’. They certainly had potential to strengthen fraternal bonds, and in this way to encourage members’ commitment to the Royal Society. About 100 members and guests were present in April 1901. Total attendance in 1913 was 87.²⁹

Unfortunately, none of the several efforts made to build the Royal Society’s numbers proved sufficient to counter the factors which were drawing members away. There were 350 members in April 1907 and just 325 in April 1909. Additions outnumbered losses during the next year, bringing the April 1910 total to 333. But at the beginning of 1914, the society comprised a mere 309 members, which was 148 fewer than at the end of 1880, when the 500-member cap had been set. The Council nevertheless remained positive. ‘[C]onsidering the number of scientific and cognate societies in New South Wales ... the number is a creditable one’, its April 1914 report concluded.³⁰

Change

As well as a shrinking membership, the Royal Society experienced a changing of the guard during the two decades before 1914. Several prominent members left the stage. Carl Leibius passed away in 1893, memorialised in the minutes as ‘a sterling man of knowledge’ and ‘a genial sympathetic friend’.³¹ Charles Moore, a member since 1856 and faithful supplier of botanical decoration at the society’s conversaziones, died in 1905 and Henry Russell, Liversidge’s ally in the society’s reformation, passed away in 1907. Liversidge retired from Sydney University in 1907 and returned permanently to England, although he remained an Honorary member until his death in 1927. While his connection to the society was not entirely severed, Liversidge’s influence on its day-to-day operation, so powerful since the 1870s, was over.

These losses were significant, but the Royal Society was not short of well-qualified individuals who were prepared to accept the responsibilities of leadership. Those who stepped up to serve as President included chemist William Mogford Hamlet (1908); engineer Henry Deane Walsh (1909); geologist Edgeworth David (1910); surveyor and botanist Richard Cabbage (1912); and phytochemist Henry George Smith (1913). Administrative continuity was provided by the Government Botanist Joseph Maiden, who was an Honorary Secretary every year from 1893 up to and including 1913, except in 1911 when he took his second turn as President.

There were changes as well in the salaried administrative staff. William Webb had loyally served the Royal Society since 1877, assisted since 1890 by a series of office boys. At a general meeting in 1911, Webb was presented with a testimonial acknowledging his 34 years of loyal service.³² In deference to his age and failing health, he had recently been given the less onerous and lower-paid position of assistant to the Honorary Librarian, a job he held until his death in 1916.³³ A much younger man, Henry Albert Morrow, took Webb's place as Assistant Secretary.³⁴

Morrow proved to be a most unfortunate choice. He had already left the society's employ by May 1912, when its auditor, W. Percival Minell, informed the Council about an unexplained deficit of £308, 8 shillings and 7 pence in the annual accounts.³⁵ It seemed clear that Morrow had embezzled the money. Legal action against him was considered at length, but none was taken.³⁶ The reason for this decision is unrecorded, although the Council may have been swayed by a letter (no longer extant) which it had received from Morrow's wife.³⁷ About a year later there was a further revelation of Morrow's dishonesty when the Council heard from a Mr Crouch, who had recently purchased a second-hand microscope from a Sydney dealer. Having found the society's name on the instrument, Crouch now asked if it could supply some of the instrument's missing parts. One of the society's microscopes had been missed for a while and Morrow was

soon identified as the person who had purloined and sold it. This time his theft was referred to the police. Morrow was found guilty of larceny, receiving a sentence of three months with hard labour. As far as the court was concerned, however, this was Morrow's first offence, so the sentence was suspended, and Morrow was placed on a good behaviour bond.³⁸

Miss Alice Dunn, a qualified shorthand typist, replaced Morrow at the Royal Society, albeit in the lower-paid position of clerk.³⁹ Her employment, and the election of Sydney University lecturer in physiology Henry George Chapman, initially as Acting Treasurer in 1912 and then as Honorary Treasurer from 1913, would also have unfortunate consequences. Twenty-two years after Minell's exposure of Morrow's dishonesty, the auditor once again discerned irregularities in the society's accounts. Chapman, by now Professor of Physiology, committed suicide in his room at the University Club. Subsequent investigation revealed that he had stolen £3360 from the Royal Society and more than £15,000 from the Australian National Research Council, of which he was also Treasurer. A proportion of this stolen money had been spent on his long-term mistress, Alice Dunn.⁴⁰

In 1914, nobody could have anticipated this future scandal. But the revelation of Morrow's dishonesty, in stark contrast to the integrity and loyalty of his predecessors, Webb and Catlett, together with falling numbers and the loss of several long-serving and stalwart leaders, provided much to unsettle members during the decades before 1914.

Science and National Efficiency

Although the Royal Society's membership was dwindling, science was now at the forefront of public consciousness. Author Philipp Blom dubbed the period 1900 to 1914 as *The Vertigo Years*, identifying it as a time of dizzying developments 'in technology, globalization, [and] communication

technologies', and of profound 'changes in the social fabric'.⁴¹ '[T]hen as now', according to Blom, 'the feeling of living in an accelerating world, speeding into the unknown, was overwhelming'.⁴² Not only rapid, much of the change that science had wrought was counterintuitive, confounding ways people previously conceived the world.⁴³ Something similar had occurred in the seventeenth century, when the microscope had magnified for human eyes a previously invisible and scarcely imagined dimension of living things.⁴⁴ During the last years of the nineteenth century and the early years of the twentieth, science and technology produced numerous new marvels.

At least as remarkable as microscopic vision was a development that was heralded in over 2000 newspaper articles across the Australian continent during 1896: the discovery of x-rays in 1895 by Munich University's Professor of Physics, Wilhelm Röntgen.⁴⁵ Now human eyes were promised new power to penetrate what had previously been opaque.⁴⁶ 'Photographing the Invisible' was the headline for the *Sydney Mail's* 1896 report on German experiments with a related development: x-ray photography.⁴⁷

Electric street lighting seemingly had turned night into day in several country towns of New South Wales since 1888, when Tamworth in the colony's north-west became the first to astound its citizens this way. From 1904, this wonder came to Sydney, replacing gas-powered street lamps on which the city had relied for decades. In the first stage, electricity generated by a powerhouse in Pyrmont lit the streets between Circular Quay and Redfern and from Hyde Park to Darling Harbour with more than 200 electric lamps.⁴⁸

Public entertainment was also enhanced. Past events could now be brought to life and replayed multiple times in 'Living Pictures', as one newspaper dubbed the product of a new technology for capturing motion on film.⁴⁹ From November 1896, short factual films – *The Arrival of the Paris Train*, for example, or *The Waves of Dieppe* – could be viewed via an Edison Kinetoscope at the Salon Cinematograph in Pitt Street.⁵⁰ The

world's first feature-length, filmed drama, *The Story of the Kelly Gang*, was made in Australia in 1906 and the first purpose-built cinema opened the same year. By 1914, large audiences were being regularly entertained and informed by 'Living Pictures' in cinemas across the country.⁵¹

Thanks to science too, distance was being conquered in new ways. By 1901, the voices of around 7500 subscribers in inner Sydney were linked by telephone, and from 1907, a trunk line carried voices between Sydney and Melbourne. More astonishing innovations seemed to be on the horizon. As Charles Burge told the Royal Society's Engineering Section in 1903, in the most recent trial of a high-speed electric railway conducted on Germany's Berlin-Zosse line, 128 miles (206 kilometres) had been traversed in a single hour. If this system were applied in Australia, Burge predicted, 'it would bring Melbourne and Sydney within four and a half hours journey of each other'.⁵² New ways of conquering distance by air were presaged by the Wright brothers' achievement of sustained powered flight in 1903. But developments in aeronautics also seemed to promise that a god's-eye view of Earth – once only imaginable with maps or glimpsed by daredevils hanging precariously under balloons – might one day become commonplace for a previously Earth-bound populace.

Contemporary scientific and technological advances, the outcome of deliberate and disciplined human thought processes – 'brainwork' as it was called – encouraged public confidence in the power of the human mind to discover the secrets of the universe. It also set people wondering about the changes that brainwork, applied to science, might produce in the future.⁵³ Remarking on the discovery of Röntgen rays in 1896, a *Newcastle Herald* editorial put into words what many people must have been beginning to think. '[N]othing', it declared, 'has more clearly shown the folly of imagining that we have attained to all that can be known in the realm of Nature'.⁵⁴

Untethered from conscience, scientific brainwork could be a cause for trepidation in some quarters. This was the pessimistic scenario of contemporary science fiction like H. G. Wells' *The Island of Dr Moreau*. Yet it was also recognised that, if applied wisely and in good faith, brainwork by scientists could yield immense benefits. The advantages to medicine offered by Röntgen's discovery and its application, x-ray photography, soon became obvious.⁵⁵ One thing seemed certain. Science and scientists seemed likely to shape the future in remarkable and as yet unimaginable ways. 'Humankind en masse', according to Alan Atkinson, 'was to follow the great experts, the great brains, into worlds beyond common instinct and intuition, beyond shared custom and the everyday'.⁵⁶

Positive public expressions of the importance of science and its expert practitioners were validating for the Royal Society, which for many years had fostered the deliberate, disciplined brainwork of leading men of science. In the Australian colonies, as in Britain, science and technology were now often linked in public discourse to national and imperial efficiency. 'More and more the complex industries of modern life come to depend on the application of scientific knowledge and on the application of scientific methods', observed the *Sydney Morning Herald* in 1906, adding a fortnight later, '[S]afety, efficiency and progress all alike find their only hope in science'.⁵⁷ 'National progress postulates national efficiency, and that in turn is only possible when brains are linked with science', declared the *Ballarat Star* in 1909.⁵⁸ The trend was part of what Roy MacLeod identified as the 'adaptive, pragmatic Progressivism which both gave shape to Federation Australia, and tailored policies in which science had a special role to play'.⁵⁹

Of course, the idea that scientific expertise should be put to use in the interests of efficient government and national progress was by no means new. Governor Denison had encouraged the Philosophical Society's formation in the belief that science should be an instrument of public

policy in New South Wales. Later, William Clarke reminded members of the newly formed Royal Society of New South Wales that the ‘essential object’ of the science they pursued was to promote the development of ‘the country ... [they] lived in’. Initially, the government of New South Wales had lagged behind its Victorian counterpart in the use it made of scientific expertise, but at the beginning of the twentieth century, appropriately qualified individuals were being employed in government departments and in a range of old and new government-funded scientific institutions, from the Australian Museum and the observatory to the Sydney Technological Museum and the Bureau of Microbiology.

However, the circumstances in which science for national progress was pursued, had changed by the early twentieth century. Not only was there greater public recognition of the contribution that science could make, there was also a new layer of national efficiency to be promoted – that of the Australian Commonwealth formed in January 1901. A sense of continental nationhood now supplemented, rather than replaced, older notions of national community focused on the separate former colonies, with both levels of loyalty remaining more or less in harmony with an overarching imperial attachment.⁶⁰ The scope of the Royal Society’s work for science now encompassed all three layers of communal consciousness.

Fostering Science in New South Wales

Despite the difficulties that it faced from the 1890s, the Royal Society pushed on with its regular work for science in New South Wales. To facilitate the efficiency of that work, the society’s Elizabeth Street premises were renovated and expanded. Damp on the southern wall and in the basement had yet to be resolved and the building had serious structural defects. Its south-western corner was found to rest on little more than

loose earth.⁶¹ Just as important, it lacked the space to meet the society's increasing needs. A series of repairs and small improvements had been made, but in 1895 the Council decided to commence major renovations.

Boosted over time by the entrance fees charged new members, the building fund stood at £1246 at the beginning of 1895. In his President's Address in May, Richard Threlfall prepared members for the possibility of using this money to improve the premises. He reminded them that more space was needed for the library, whose contents already overflowed into the Assistant Secretary's office, impeding his work. While the storage of books behind the dais in the meeting room had given some 'temporary relief', said Threlfall, 'the time is not far distant when the building fund will have to be employed in providing us with the actual space we require'.⁶² The Council purchased a small strip of land measuring 14 feet by 80 feet 8 inches (4.27 by 24.6 metres) adjacent to the building and in December 1895, it accepted a builder's tender of £1570 for the planned additions and alterations. To cover the costs of land, construction, and fixtures and fittings, the Council bypassed the banks by securing a loan of £1490 from the Australasian Association for the Advancement of Science. A further sum of just over £376 was borrowed from the ever-useful Clarke Memorial Fund.⁶³

The Royal Society gained a great deal from these renovations. In the basement there was now a new meeting room, measuring 940 square feet (87.33 square metres), as well as a vestibule and a room each for books and pamphlets. There was also a lavatory on this floor, with additional latrines located in the adjoining yard. The original galleried hall on the ground floor remained, along with the library and reading room, a cloak room and the society's office. The Council's meeting room and another book room were located on the first floor, while a new second floor now accommodated the housekeeper.⁶⁴ In designing and carrying out the

new work, as Edgeworth David assured members in his 1896 President's Address, the 'comfort and convenience' of members had been the Council's priority.⁶⁵

Additional building work was undertaken a decade later, providing a quieter, better-ventilated meeting hall, illuminated by electricity. There was also better provision for the library and extra meeting rooms that would be available for letting.⁶⁶ With these improvements, as the Royal Society's outgoing President, Anderson Stuart, told the annual general meeting in 1907, 'we "stand on velvet" and also bring around us some of the scientific societies of the metropolis'.⁶⁷ By no means had the society's premises been transformed, as Liversidge had hoped in 1890, into a 'modest edition of Burlington House'.⁶⁸ But by enhancing the society's capacity to serve as a hub for a range of scientific and other societies in Sydney, the improvements to its building were consistent with its goal of advancing science in New South Wales. They also helped to increase the society's rental income. Rent received during 1900 had been a mere £17 and 10 shillings, but thanks to the improved facilities, a stronger colonial economy and the introduction of higher rental charges during 1912, the amount received per year from tenants climbed to over £1103 during 1914.⁶⁹

A few years after this second round of renovations, the planned construction of a building within 10 inches of the back wall of the society's building threatened to block out all the natural light on that side.⁷⁰ In September 1911, a Council sub-committee was formed to investigate the possibility of selling in Elizabeth Street and purchasing land for a new, purpose-designed building.⁷¹ With a potential site found in Phillip Street, architects Mansfield and Son were engaged to design a new building and real estate agents Richardson and Wrench were requested to estimate how much rental income these premises were likely to yield.⁷² A potential

purchaser offered the society £11,000 for the Elizabeth Street building in February 1912.⁷³ Unfortunately, no record of the Council's discussion of this offer survives to explain why the sale did not go ahead.

The challenge to find superior accommodation had not been abandoned. As the Council reported in 1914, lack of shelf space was 'seriously impairing the Library's work and retarding its development'. Structural problems also persisted: damp was still an issue in the basement; there was cracking in the ceiling of one of the library rooms; and the floor of another was actually giving way.⁷⁴ Further renovations no longer seemed like a practical



Elevation sketch by architects Mansfield and Son for a Phillip Street building intended to replace the RSNSW's Elizabeth Street premises, 1911. SLNSW.

solution, so at a meeting on 29 July 1914, the Council decided to seek valuations of the society's building, with an eye to purchasing another property then for sale in Pitt Street.⁷⁵ However, by the time the Council met again a month later, war had been declared in Europe and this may well have influenced its decision to postpone 'for the present' any move from Elizabeth Street.⁷⁶

Connecting Scientific Minds

At the annual members' dinner in 1912, Joseph Maiden spoke of the Royal Society's role in connecting scientific minds. 'Every handshake and every greeting is made for the advancement of science', he argued, 'because it made scientific men better known to each other'.⁷⁷ Members of learned societies elsewhere in the Australian Commonwealth, and indeed in Sydney, may well have demurred at the extravagant compliment paid to the Royal Society by another dinner guest that evening. 'It was a great thing', he declared, 'that there should be a Society that could be taken as representing the collective scientific thought of the country'.⁷⁸ To this honour, another scientific organisation could make a superior claim – the Australasian Association for the Advancement of Science (AAAS). Its inaugural meeting in 1888 had brought together representatives from a wide range of learned societies devoted to science in the Australian colonies and New Zealand. Membership was also open to individuals who were unaffiliated with any learned society, including women.

Formation of the AAAS was necessarily underpinned by a shared desire for intercolonial collaboration among scientists across the colonies. It had been founded at a time when support was building in some quarters for greater cooperation among colonial governments. An intercolonial convention had been held in Sydney at the end of 1883, as a result of which an 1885 Act of Parliament in Britain established the Federal Council of

Australasia, which had limited powers to pursue the interests of its member colonies in relation to the South Pacific. New South Wales did not join the federal council and South Australia joined only briefly. It would be a decade and a half before the colonies united at Federation to form the Commonwealth of Australia, but an Australasian community of scientists had been created long before.

The Royal Society had played a leading role in the creation of the AAAS, and it continued to contribute to its organisation in the decades prior to 1914. In his inaugural address as President of the AAAS in 1911, Professor David Orme Masson of Melbourne University dubbed Liversidge the association's 'actual founder', because 'it was he who conceived the idea, worked it up, and made it an accomplished fact'.⁷⁹ As far back as 1875, the Royal Society, under Liversidge's leadership, had demonstrated a willingness to support colonial science beyond the boundaries of New South Wales by appointing as the first Honorary members, individuals from every Australasian colony. In a timely letter to the *Sydney Morning Herald*, published in September 1884, Liversidge had publicly advocated for the formation of 'a federation or union of the various scientific societies in Australia, Tasmania and New Zealand into an Australasian Association for the Advancement of Science'.⁸⁰ Ideally, he had suggested, its first meeting should coincide with the centenary of European settlement in Australia in 1888, when there was also likely to be an international exhibition, 'with ... [whose] combined attractions we might hope to gather together a very fair number of scientific visitors to take part in the proceedings'.⁸¹

In May 1886, Liversidge repeated his proposal, this time in an address before the Royal Society. '[W]ith certain modifications to suit our local circumstances', he argued, this new body should be organised along the lines of the British Association for the Advancement of Science (BAAS).⁸² Sufficient Royal Society members later answered Liversidge's request to register 'as intending members, so that the necessary preliminary steps

... [could] be taken'. At a meeting in June, the Council formally agreed to initiate the formation of the AAAS, organised in accordance with Liversidge's suggestion. The Royal Society's representatives on the planning committee were elected by the Council in July.⁸³

Having been integral to the inception of the AAAS, the Royal Society of New South Wales also played a central role in its operation. From the beginning, its Elizabeth Street premises housed the headquarters of the AAAS, whose first President was Henry Russell. Liversidge was Honorary Secretary from its formation until his return to England, except during



Councillors and officials of the Australasian Association for the Advancement of Science, depicted on a certificate of appreciation honouring its President, Archibald Liversidge, at centre. Photographed by J. H. (Hubert) Newman, 1898. SLNSW.

1898 when he took his turn as AAAS President. Following Liversidge's departure, Joseph Maiden took over the Secretary's role. The AAAS met 14 times in the capital cities of participating colonies in the period 1888 to 1913. Its first meeting occurred in Sydney as Liversidge had planned. Two other meetings prior to 1914 were also held there and, in each year – 1888, 1898 and 1911 – the Royal Society of New South Wales hosted a gala conversazione in honour of visiting AAAS members.

Involvement with the International Scientific Community

While continuing to encourage scientific endeavour at home, the Royal Society was also cooperating with scientists abroad. It supported two imperial projects, the first of which was the British Science Guild. Founded in London in 1905 and active until 1924, the guild aimed to 'bring together ... those throughout the Empire interested in science and scientific method' to work towards ensuring that 'the methods of science' were applied to 'all branches of human endeavour' and, in this way, 'to further the progress and increase the welfare of the Empire'.⁸⁴ Liversidge spoke in favour of the guild at a general meeting of the Royal Society in July 1907 and Dr Walter Spencer, a society Vice-President, did the same in June the following year. Having extolled the benefits of joining the guild's New South Wales branch, Spencer encouraged his audience to enrol as members at the end of the meeting.⁸⁵ Spencer was the driving force behind the local branch and when he died in 1910, Edgeworth David, as the Royal Society's President, urged members to continue supporting it.

The Royal Society of New South Wales was an active participant in the second project: the compilation of the International Catalogue of Scientific Literature. An initiative of the Royal Society of London, this was planned as a comprehensive bibliography of all scientific publications, arranged by subject and year of publication and indexed by authors' names. Annual

issues would ultimately consist of 17 volumes, each devoted to a different scientific branch.⁸⁶ Circulars announcing the proposed catalogue were received by the New South Wales society in 1895. In response, the Council agreed that Liversidge should attend a conference on the subject to be held in London in July 1896. By May 1897, the Council had confirmed the society's participation in the cataloguing project, promising a contribution of £10 per year in financial support, and in 1898 it undertook to subscribe to the entire catalogue as each part became available. The International Council for the Catalogue of Scientific Literature appointed the Council of the Royal Society of New South Wales as its official New South Wales bureau in 1904. Following his return to Britain in 1907, Liversidge became the society's representative on the International Council.⁸⁷

The 1896 International Catalogue conference in London, which Liversidge attended, had been truly international, having delegates not only from within the British Empire but also from nine European countries, the United States, Mexico and Japan. The Royal Society of New South Wales had long engaged with scientists and scientific bodies both inside and outside the British Empire and not only via its extensive publication exchanges. Information about the society's essay prize was circulated in Europe and America, and Royal Society members were notified of prizes offered by bodies such as the Smithsonian Institute in Washington DC and the Physico-Economical Society of Königsberg, Germany.⁸⁸ Members also received invitations to a variety of international conferences, among them a geographical congress at Berne, Switzerland, in 1890, an ornithological congress in Budapest in 1891, and a geophysical conference in Berlin in 1899.⁸⁹ Distance could be a problem, but Carl Süssmilch, George Knibbs, Charles Hedley, Edgeworth David and Liversidge were among the Royal Society members who at various times each travelled, on their own account, to Britain, Europe or the Americas for conferences, on

fact-finding tours, or to attend meetings of the overseas scientific societies to which they belonged.⁹⁰

The BAAS Comes to Australia

At its periodic gatherings, the AAAS endeavoured to bring together the collective scientific expertise of Australasia. Several meetings of its British counterpart, held in colonial locations – Montreal (1884), Toronto (1897), South Africa (1905) and Winnipeg (1909) – tried to do the same for science on an imperial scale. Liversidge's 1884 *Herald* letter proposing the formation of the AAAS had been prompted by hope in some quarters that the BAAS would soon visit Australia. At the 1884 BAAS meeting in Montreal, delegates' interest in Antipodean natural history had been piqued by William Hay Caldwell's announcement, telegraphed to them from Australia, of his conclusions concerning platypus and echidna reproduction: 'monotremes oviparous, ovum meroblastic'.⁹¹ Soon calls were heard from BAAS members for a meeting in Australia, to which the Premier of Victoria, James Service, immediately responded by inviting the BAAS to meet in Melbourne the following year.

No such meeting took place. Liversidge had advised caution. Distance and economics, he had pointed out, would mean that only a few BAAS members – his estimate, 50 at most – were likely to attend a meeting held in 1885. 'Instead of looking for a near visit', he had advised, 'we should be preparing the way for issuing an invitation later on'. A federation of Australian scientific societies – the formation of an AAAS – was, in Liversidge's view, a necessary first step towards a visit from the BAAS.⁹² Federation of the Australian colonies under a central Commonwealth government in 1901 proved to be the second condition, because it allowed the separate former colonies to approach the BAAS with a single voice, and more easily finance such a major venture using federal funds.⁹³

The desired BAAS visit eventually took place in 1914, but planning had begun as early as 1909 during a meeting of the Council of Melbourne University.⁹⁴ Subsequently, the federal government agreed to issue an invitation to the British association and in 1910 it voted £10,000 to support the venture, an amount it later increased to £15,000. In turn, state governments promised delegates free travel by rail. Planning for the BAAS visit was placed in the hands of a federal council, formed in 1912 and consisting of representatives of the Commonwealth, the Australian States, and New Zealand.

Royal Society members were active in these preparations. Five of the six New South Wales members of the federal council were drawn from the society, including its 1912 President, Richard Cambage. Edgeworth David chaired the local organising committee; Maiden was its Secretary; and Chapman was Treasurer. A room in the Royal Society's building was allocated for use by the BAAS during its visit to Sydney.⁹⁵

Royal Society members were also conspicuous among the contributors to the *Federal Handbook* which the Commonwealth government published for distribution among BAAS delegates.⁹⁶ Illustrated with diagrams, graphs and numerous maps, it provided the visitors with a comprehensive introduction to Australia. There were chapters on the country's Aboriginal people, its history and geography, and its political and educational systems. Other chapters dealt with pastoral and agricultural development and local progress in commerce, industry, manufacturing and mining. The handbook also contained expositions of current scientific knowledge about Australia, contributed by Royal Society members: Maiden supplied the chapter on 'Australian Vegetation'; William Haswell wrote on 'Animal Life'; Edgeworth David discussed 'The Geology of the Commonwealth'; Edward Pittman assessed the 'Mining Fields of Australia'; and George Handley Knibbs the Commonwealth Statistician, contributed 'Numerous Notes on Australia, Its People and Activities'.

During a visit which lasted from 28 July to 31 August 1914, the BAAS met in a series of Australian State capitals.⁹⁷ Nearly 5000 individuals attended its meetings, the bulk of whom were colonists who had joined the organisation for the occasion. There were more than 300 overseas visitors, drawn not only from Britain, but also from Europe, the United States, South Africa, Canada, India and Egypt.⁹⁸ Colonial scientists rubbed shoulders with such respected figures as the Nobel Prize winner Ernest Rutherford; Edward Poulton, an Oxford professor and President of the Linnaean Society in Britain; Charles Greeley Abbott, Director of the Smithsonian Astronomical Observatory in Washington DC; and Germany's Albert Pencke, Professor of Geography at Berlin University and Director of the university's *Museum für Meereskunde* (Museum of Marine Science).⁹⁹ Less well known then, but soon to be so, was Bronislaw Malinowski, who was about to embark on his important ethnographic studies in the Trobriand Islands.¹⁰⁰ Although a Life member of the BAAS, Liversidge was not among the visitors, but he had worked hard in England to make the Australian visit a success by encouraging BAAS members to make the journey.¹⁰¹

In July, an advance party of the visitors arrived in Perth, where they gave lectures and enjoyed some excursions. The pattern of lectures and excursions was repeated in Adelaide, Melbourne, Sydney and eventually Brisbane, but the planned BAAS visit to New Zealand had to be cancelled, owing to the outbreak of war in Europe. War had been declared on 3 August, one day before the main party reached Adelaide, and as a result, the seven German scientists among the visitors suddenly found themselves classified officially, not as honoured scientific guests of the Australian Commonwealth, but as enemy aliens. Nevertheless, they were allowed to participate in the BAAS meetings and most were permitted to leave Australia afterwards. By the time the visitors departed, however, anti-German feeling was building in Australia and following some inflammatory words from Dr Fritz Graebner,

he and his travelling companion, Dr Peter Pringsheim, were arrested and interned for the duration of the war.

Frederick Trouton, President of the British Association's Physics and Mathematics Section, hailed the BAAS visit as the 'coming of age' of Australian science.¹⁰² The meaning of that phrase and the criteria for measuring such a milestone are open to debate, but some observations can be made about the visit's significance for colonial science and also for the Royal Society of New South Wales. MacLeod argued persuasively that the publicity which the BAAS meetings received in the colonies 'conveyed a sense of national urgency to the business of science, and projected its scientists, now made known to the public, into the political arena'.¹⁰³ The BAAS visit also presented ample opportunities for overseas scientists to perceive the calibre of their Australasian counterparts, while the presence in Australia of many current and future luminaries of science from overseas gave local scientists an unprecedented opportunity for networking. Visitors and locals were able to discuss key questions in their respective fields and plan future research.¹⁰⁴

There was certainly much about the visit of the BAAS to gratify the Royal Society's Council and its Ordinary members. Making colonial scientists and their work known among the wider scientific community had long been a leading object of the society's *Journal* and exchange system. However, the BAAS visit also underlined the Royal Society's altered status in the colonial science community by highlighting the importance of Sydney University as a centre of scientific expertise. Society members who contributed to the *Federal Handbook* did so primarily as Sydney University personnel or government employees, rather than as representatives of the Royal Society of New South Wales, and BAAS meetings in Sydney were hosted largely by the university, which also took responsibility for organising a *conversazione* in honour of the BAAS members.¹⁰⁵

As noted earlier, the university and the Royal Society had a long-standing connection. Legislation providing for the establishment of the University of Sydney was passed in the same year that the Australian Society began meeting. Since the Philosophical Society's formation in 1856, staff and graduates of Sydney University had gravitated towards the Royal Society: supplying papers, filling the ranks of its Ordinary members and taking leadership roles in the Council. The establishment in 1882 of the university's Faculty of Science had increased the trend. Since 1879, the university's Great Hall had also been the venue for most of the society's conversaciones. While these attracted favourable publicity for the society, they also highlighted the work of the university's scientists and its research facilities. By 1914, Sydney University – a leading public institution whose impressive infrastructure stood prominently on a rise along Parramatta Road – was publicly much better known than the Royal Society. Having done much to encourage the scientific work of university personnel, the Royal Society could be viewed as the originator of its own eclipse.

'[F]ew people who are not members of the Royal Society, have more than the vaguest idea about it', declared a defensive newspaper article in 1914.¹⁰⁶ Its anonymous author then proceeded to argue for the Royal Society's importance and to explain its origin, activities and the facilities that it offered members. The article concluded with an invitation: 'Anyone may join who is enough interested in scientific matters to pay the annual subscription'.¹⁰⁷ An explanatory piece of this kind and such a public invitation to prospective members had been unnecessary during the late 1870s and 1880s when the Royal Society was at the height of its communal importance, with a growing membership and extensive publicity for its meetings.

None of this should detract from the substantial contribution that the Royal Society had made to the practice of science in New South Wales,

especially since its reorganisation in the 1870s. The Royal Society's regular monthly meetings, where members' research was presented and discussed, the *Journal and Proceedings*, an efficient system of publication exchange, and a regularly updated scientific library had done much to facilitate and encourage local research and make members' work internationally known. In fact, the Royal Society, together with more recently established learned societies and professional organisations – the Linnaean Society, for example, and the Engineers Association – had contributed significantly to the growth of the active community of local scientists which welcomed the BAAS to New South Wales in 1914.

Much of the work undertaken by Royal Society members in the decades up to 1914 had been consistent with the goal that William Clarke had set for them in 1867 – developing 'the country we live in'. Via members' research into the colony's physical character and natural resources, infrastructure construction, water supply, public health, food production and much more, the Royal Society had made good its 1876 claim of utility as a government resource. It had also contributed significantly to the development of New South Wales for the benefit of its non-Indigenous inhabitants. While the society continued to encourage and support the pursuit of science in New South Wales, the members' efforts in this cause now extended to the whole Australian Commonwealth, the Empire and the wider world. Despite the existence of many other competing societies by 1914, the Royal Society of New South Wales maintained its relevance as a scientific body, because it was the only one, meeting regularly in Sydney, which catered for such a broad range of specialties.

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In 1914 the Royal Society of New South Wales was 64 years old. Much had been achieved, but it was not a story of uninterrupted progress. As Charles Moore had told members in 1880, 'The Society since its establishment has

had its seasons of success and times of depression'.¹⁰⁸ The Australian Society had ceased to meet well before some of its remaining members answered Denison's call to form the Philosophical Society of New South Wales in 1856. Soon this new society also struggled, and the attempt to revive it under the title 'Royal' had limited success. Reforms to the Royal Society's organisation from the 1870s had reinvigorated it, but during the 1890s and beyond, external factors outside the society's control – depression, drought, competition from new scientific societies, and the increasing complexity and specialisation of science itself – caused membership to dwindle once again. Undaunted, the Royal Society persevered and expanded its work during the final years of the long nineteenth century.

The colonial science community had changed considerably since the 1850s. Its increasing professionalisation was reflected in the character of the Royal Society's membership. This was not true of the incipient trend for women to gain formal qualifications in fields of science previously considered male domains. Unlike some scientific societies in New South Wales and elsewhere in Australia, the Royal Society continued to eschew any direct participation by female scientific *savants*. Yet in other areas, the society had demonstrated a healthy capacity to embrace change. The 1866 rebadging to improve its public image was an early example. Members had also readily accepted Liversidge's organisational reforms, and the innovations introduced from 1900 to retain and recruit members. This proven ability to adapt and innovate would serve the Royal Society well, as its story continued into the twentieth century and beyond.



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More than twenty years ago, Dr Peter Tyler began his research for a book-length history of the Royal Society of New South Wales. He published his preliminary assessment of the Royal Society's development and significance in the society's *Journal and Proceedings* in 2006. In a second article, published in 2010, he discussed the society's early history in greater detail. An entry by Tyler on the Royal Society's history appeared in the online *Dictionary of Sydney* the same year. Sadly, Dr Tyler's sudden death prevented him from completing the planned monograph, so in 2013 the Royal Society's representative, Mr John Hardie AM, asked me to undertake this task.

I am very grateful to the Royal Society of New South Wales and to Peter Tyler's family for allowing me access to his research papers, the influence of which I have acknowledged in the text. However, I have also made my own journey through the society's extensive archives and drawn on other primary and secondary sources to reach an interpretation of the Royal Society's history which is inevitably my own. Peter Tyler's expertise and experience lay in administrative and medical history. I am primarily

a cultural historian, and my interpretation of the Royal Society's history reflects this.

The Royal Society's extensive archives are lodged mostly with the Mitchell Library in Sydney. I thank the society for allowing me unfettered access to these records and to others then lodged at the society's premises in Darlington. Much of my research and writing was undertaken during successive terms as an adjunct associate lecturer at the University of New England, Armidale, an attachment which gave me access to the resources of its Dixon Library. Throughout the project, I have relied on the expertise and assistance of librarians and archivists at other institutions: the Mitchell Library, Sydney; the National Library of Australia, Canberra; the New South Wales' State Records Authority; Sydney University Archives; and the Noel Butlin Archives Centre at the Australian National University, Canberra. The last two bodies also generously supplied images for this publication free of charge.

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ABBREVIATIONS

AAAS	Australasian Association for the Advancement of Science
BAAS	British Association for the Advancement of Science
HRAS	Historical Records of Australian Science
JRAHS	Journal of the Royal Australian Historical Society
JPRSNSW	Journal and Proceedings of the Royal Society of New South Wales
JRSNSW	Journal of the Royal Society of New South Wales
ML	Mitchell Library
NLA	National Library of Australia
NSW	New South Wales
NSWSRA	New South Wales State Records Authority
PSNSW	Philosophical Society of New South Wales
RSNSW	Royal Society of New South Wales
SLNSW	State Library of New South Wales
SMH	Sydney Morning Herald, The
TRSNSW	Transactions of the Royal Society of New South Wales
TPRSNSW	Transactions and Proceedings of the Royal Society of New South Wales



NOTES

Chapter 1—Antecedents

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Chapter 7—'Drones' and 'Working Bees'

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This is a very readable account of the scientific origins of the Royal Society of New South Wales. Using the characters involved in the society to tell its story, Dr Anne Coote has produced a rollicking recital of their lives and times, and of the society's fortunes and misfortunes, ebbs and flows, highs and lows. The storytelling is compelling.



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