



**Figure 1: Sydney Technological Museum (1892),
designed by William E. Kemp.**

Photograph by Kirsten Orr.

The Realisation of the Sydney Technical College and Technological Museum, 1878-92

Aspects of their Cultural Significance

Kirsten Orr

The surviving nineteenth-century buildings in Sydney's central business district are important tangible expressions of local identity and experience; culturally significant because they embody the aesthetic, scientific and social values of a particular period in Australian history.¹ Despite this, the heritage value of the Sydney Technical College (1891) and Technological Museum² (1892) has been narrowly defined in terms of the architectural style of their polychrome brick facades: the pair is notable for representing one of the most significant breaks with the classical sandstone traditions that then existed for public buildings. The cultural significance that derives from the social, political and economic circumstances of their conception and realisation has not been fully explored, particularly aspects relating to their siting and exterior architecture. This paper investigates the fourteen-year period from 1878, when the New South Wales Government voted £2,000 to establish a Technical or Workingman's College, to 1892, when the Sydney Technical College and Technological Museum were completed. In this reading of the social history of their creation, particular references are made to the role of the 1879 Sydney International Exhibition and the changing ethos to which it contributed.³ It was a time when the urban bourgeoisie were moving from a value system based upon British tradition and classicism in education and architecture, to a more utilitarian, technological and democratic outlook inspired by a belief in progress. The exhibition had stimulated debate on the subject of technical education, exposed the people of Sydney to some of the best artistic and technologically advanced products of their age and transmitted aesthetic ideas that encouraged more confident architectural and artistic practice.

This paper offers a new explanation of the sources that contributed to the architectural style of the Sydney Technical College and Technological Museum. It departs from previous accounts which have attributed the designs to the emerging influence of the American Romanesque and the architecture of Henry Hobson Richardson. It finds the designs were too early in the Australian context to be convincingly attributed to the influences of the American Romanesque and

proposes that the architecture of the new buildings drew heavily upon ideas that had originated at the Sydney International Exhibition via the display of Alfred Waterhouse's drawings of the Natural History Museum at South Kensington; and possibly also by other information conveyed by Professor Archibald Liversidge to the architect, William E. Kemp. The methodology is based on careful archival research and close observation of architectural style and detail, but there are also some speculations based on historical probability.

The Influence of the 1879 Sydney International Exhibition

Organisers of the Sydney International Exhibition held in 1879 sought to emulate the London Great Exhibition of 1851, and its numerous successors. These exhibitions had been regarded by their organisers as educational instruments and were structured on the pedagogical principle of "learning by looking", in which people learned first of all by observation, secondly by comparison and classification, and only in the final instance through abstract reasoning.⁴ By 1874 education was the professed rationale behind the fourth London International Exhibition.

The Official Guide made this clear by informing the visitor that 'It must always be remembered that the main object of this series of exhibitions is not the bringing together of great masses of works, and the attraction of holiday-making crowds, but the instruction of the public in art, science and manufacture, by collections of selected specimens.'⁵

The Australian international exhibitions were likewise conceived as a mixture of education and entertainment. Roy MacLeod observes that they 'were the most spectacular'⁶ messengers of science across intercolonial frontiers because they furnished exhibitors and visitors with new knowledge, information, ideas and values in an instructive, attractive and pleasurable way. Raw specimens, arranged by type, were presented in elaborate showcases or amassed in attractive geometrical patterns and imposing stacks. Manufactured items, classified by commercial sector, were lavishly decorated to make their individual qualities as conspicuous as possible. Visitors pressed two and three deep to view prototypes, scale models and exploded-view drawings and to watch novel machinery in motion. Extraordinary numbers visited the Sydney International Exhibition and the attendance figure of 1,117,536 was the largest in proportion to population that had 'ever been recorded at any great International Exhibition held in any part of the world.'⁷

Not only was the object of international exhibitions to educate the working classes, they were generally regarded as opportunities for existing institutions to exhibit collections, and for emerging institutions to acquire them. For example, the Royal Italian Industrial Museum at Turin grew out of the London International Exhibition of 1862 'at which the want of such an institution in Italy

had been most fully demonstrated.⁸ The Italian commissioners collected seven hundred cases of industrial items, models, machines and equipment to be used by arts and industries to form the basis of a new museum. By 1865 this museum had been expanded to encompass a technical institute that provided technical education. The Smithsonian Institute, already in existence at the time of the 1876 Philadelphia Centennial Exhibition, supported the exhibition by supplying exhibits and afterwards gained forty-two boxcars full of artefacts from the exhibition that provided a foundation for the United States National Museum (now known as the Arts and Industries Building), opened in 1881.

Given the custom for exhibits to be donated to local collections, it is no surprise that the official announcement of the Sydney International Exhibition in the *Government Gazette* in February 1878 had given fresh hope to the colony's intelligentsia who had been seeking for some time to establish appropriate cultural institutions such as a large public library, an art gallery, and a technological museum. The *New South Wales Parliamentary Papers* for the period 1879-1880 contain reports from the Trustees of the Australian Museum and the Sydney Free Public Library, both anticipating new opportunities arising from the forthcoming exhibition. On August 6, 1878 a special meeting of the Australian Museum Trustees was convened to consider a proposal by Dr Alfred Roberts. It resolved to establish a Technological Museum and to instruct Professor Archibald Liversidge and Edward Combes, at the time both travelling abroad, to collect the necessary information from the best institutions in Europe.⁹ A letter was immediately despatched by the outgoing mail to Liversidge to solicit his cooperation in collecting information and artefacts so that no time would be wasted in establishing the Museum.

Alfred (later Sir Alfred) Roberts (1823-98) was a prominent Sydney surgeon active in promoting the construction of infrastructure to improve the practice of colonial medicine and science. He became Chairman of the first Committee of Management of the Technological Museum and retained the position until the end of 1889, when the Committee ceased to exist. Archibald Liversidge (1846-1927) was a younger man who shared Roberts' interests. He had arrived in Sydney as 'Reader in Geology and Assistant in the Laboratory' at the University of Sydney in 1872 and became Professor of Geology and Mineralogy in 1874. Liversidge was to become a great organiser and federator of science in Australia, founding the Australasian Association for the Advancement of Science (AAAS later ANZAAS). Edward Combes (1830-95) was an engineer, politician and one of the finest painters in Sydney. He was the New South Wales Executive Commissioner for the Paris Exposition Universelle of 1878. In addition to his official exhibition duties, he had been requested to furnish a report to the New South Wales Government on educational developments in Europe and England including kindergarten and technical training.¹⁰ Combes was to become

instrumental in the fight to establish a system of technical education, and was President of the New South Wales Board of Technical Education from 1883-89.

When the letter from the Australian Museum reached him in 1878, Liversidge was overseas representing New South Wales as a commissioner at the Paris Exposition Universelle, purchasing books and specimens for the Australian Museum, and investigating the state of British and European technical education for the Chancellor of the University of Sydney. Now he had the additional charge of collecting information and drawings from the best European institutions to inform the establishment of the new Technological Museum in Sydney. An assiduous networker in the international scientific community, he acquired items for the new Museum and no doubt exploited every opportunity, as requested by the Australian Museum Trustees, to influence the types of exhibits that were to be sent on to the Sydney International Exhibition after Paris.

Liversidge's observations on technological museums and technical education were exhaustively detailed in a two hundred and seventy-two page *Report upon Certain Museums for Technology, Science and Art* that he presented to the government upon his return.¹¹ The report gathered together information on the collections, organisational principles and programmes of study of the principal museums, universities, scientific institutions and technical schools of Great Britain and Europe. It recommended that the proposed Technological Museum should be based upon certain features of institutions in South Kensington, Bethnal Green, Edinburgh, Dublin, Kew, Westminster, Berlin, Vienna, Munich, Paris and Turin.¹² The collections should comprise fifteen comprehensive categories ranging from animal products, geological specimens, sanitary and hygienic appliances, mining and engineering machinery, models, and artistic metalwork, to trade journals.¹³ Repeated references to South Kensington, above all, and the extensiveness of the proposed collections, make it clear that Liversidge had in mind the grand and long-term project of establishing a colonial complex of scientific and cultural institutions, of which the Technological Museum, complementing the collections of the existing Australian Museum, was to be the first.¹⁴

Liversidge envisaged the forthcoming Sydney International Exhibition as a rich source of items to form the basis of the new technological collection, and his report urges that 'full advantage be taken ... to secure as many suitable examples as possible for the Museum; later on similar advantage might also be taken of the Melbourne Exhibition.'¹⁵ Both exhibitions did provide a substantial foundation to the collections of the Museum. In addition, a Technological Education Conference (October 1879) was held in conjunction with the Sydney International Exhibition to gain advice from visiting foreign experts on the cultivation of industrial expertise through technical education. There was concern that the growing demand for skilled labour required an independent

system of technical education that was more practical in orientation than what was currently on offer through the Working Men's College and the University. A year later another Technological Conference was convened jointly by the Trades and Labor Council and the Committee of the Technical or Working Men's College, one session of which was chaired by the Premier, Henry Parkes. In 1883 the Government appointed a Board of Technical Education (the President was Combes and Liversidge was a member). A site in Ultimo was already under consideration for the eventual construction of the Sydney Technical College.

Seeking a Site

Liversidge's urban vision was more ambitious. He hoped to establish a scientific and cultural precinct like that of South Kensington in London. The precinct would be on the eastern edge of the city, extending northwards along the ridge that ran from Hyde Park to the Domain: it would stretch from the existing Australian Museum and Sydney Grammar School to the rising Garden Palace, built for the Sydney International Exhibition.¹⁶ Sadly the vision was never realised and ten years of indecision followed before a permanent home was found for the Technological Museum collection. As a temporary measure, over 30,000 square feet were set aside in the south-western portion of the Garden Palace – a decision that proved disastrous when, in 1882, most of the collection was lost in the fire that destroyed the Garden Palace. After the fire, Combes responded to a letter of commiseration from Parkes:¹⁷

Your very kind and sympathising letter was very welcome, and we all thank you heartily. The fire has been a national calamity, (so to speak) and will give us lots more work to do, not only in art, but in making further collections for technological purposes in mining, manufactures, etc. ... There is however no use in quarrelling with the inevitable – 'crying over spilt milk'. I have therefore bought a new pair of spectacles and mean to go to work.¹⁸

From 1883 six potential sites were considered around Hyde Park and in the Domain by the Committee for the Technological Museum.¹⁹ But, in the end, no site could be settled upon. Perhaps the major stumbling block was a lack of a suitable piece of land already owned by the government. Moreover, the Museum was one of many political priorities competing for limited public funds. The attainment of purpose-built premises for the National Art Gallery and the Free Public Library were equally, if not more, appealing: they had also been contemplated since the 1879 Exhibition but were not completed until 1909 and 1910 respectively. Sectional interests undoubtedly also stood in the way, particularly those arising from the tension in colonial society between classical values and the new spirit of technology and progress. Rising men in the community still sought a classical education for their sons to foster moral character, leadership, intellectual ability and civilising values. However,

manufacturers, merchants and urban workers generally did not consider the classics relevant to industrialisation and material progress. This tension in society between classicism and utilitarianism had been evident at the University of Sydney, which was able to overcome divisions and radically expand the predominantly classical curriculum to the medical and natural sciences through the unexpected Challis Bequest of the early 1880s. The tension even existed between those committed to a system of technical education. There were those who favoured the liberal arts tradition; others like James Inglis, Minister of Public Instruction, who thought that technical education should be part of a ladder of opportunity, a rung between primary school and university; and others who supported the view of Norman Selfe, acting President of the Board of Technical Education from 1887-89, that technical education should be a practical discipline in its own right and should be quite different from the theoretical approach of university education. The differences between Inglis and Selfe were public and irreconcilable and became a major obstacle to the advancement of technical education.

Inglis, a graduate of the Scottish university system, denied Selfe's assertions that universities were exclusive and ineffective institutions and he looked with suspicion at the men of the Board of Technical Education 'who had no loving sympathy with the higher culture and wider range of theoretical learning.'²⁰

Finally, after all the sites proposed for the Technological Museum had been discounted, the Board of Technical Education had been abolished, and the Museum committee of Roberts, Liversidge and Robert Hunt had tendered their resignations, emergency talks with the government in 1889 led to the decision to locate the Museum with the Sydney Technical College on a corner site in Ultimo, away from the city centre. The site had originally been recommended by Combes for an industrial college, school of design and technological museum because he believed that its accessibility for working men – whether arriving by train at nearby Central Station, or coming from work in the industrial areas on the western edge of the city – was more important than the concentration of the city's institutions in one central precinct like South Kensington in London.

Sources for the Romanesque Exterior

The Sydney Technical College (Figs 2-5) and the Technological Museum (Figs 1&6) are modest, three-storey buildings sitting side-by-side, facing Mary Ann Street and Harris Street respectively. The main axis of both is broken by a centrally placed, projecting pedimented section. Polychrome brickwork in red, brown and cream rises from a rusticated sandstone base, and is accented by full-height arcades featuring Romanesque arches enclosing the windows. Facades are enriched with panels of terracotta relief, dressed sandstone sills and frieze-like bands of stonework detailed with carvings of Australian flora and



Figure 2: Sydney Technical College (1891),
designed by William E. Kemp.
Photograph by Kirsten Orr.

fauna. Inside, the Museum's three floors were organised in "kingdoms", with the mineral kingdom occupying the ground floor, the vegetable kingdom the first floor, and the animal kingdom the second floor.²¹ After completing the elaborate exterior ornamentation the building contractor ran out of money, leaving the interior brick walls and the hardwood floors in their original rough state.²²

The architecture reflects a rather eclectic approach to design, and stylistic elements are drawn from a variety of sources. The structural polychrome brickwork and smooth-finished stone are typical of the English Romanesque, the rusticated sandstone base and clusters of colonnettes are typical of the American Romanesque, while the vertical straps are typical of North German Romanesque. Other details are drawn from different styles altogether, such as the window frames, which demonstrate the influence of the Italian Renaissance.²³

In a significant departure from the classical style favoured for public buildings, William E. Kemp, Architect to the Department of Public Instruction, chose the Romanesque style for the Sydney Technical College and Technological Museum; designs were commenced in November 1889 and plans completed by 1891. The style of these buildings was directly influenced by ideas displayed at the Sydney International Exhibition. Kemp's individual architectural expression can be regarded as a precursor to the Federation style, with its preponderance



of face brickwork (in place of the falsity of plaster and stucco), decorative wall surfaces, colour, and incorporation of new materials, such as terracotta and pressed metal. His designs attempt a resolution of the conflict between classicism and utilitarianism that characterised the exhibition movement as a whole, and they are an important step in the development of an Australian school of architecture. In particular, Alfred Waterhouse's drawings of the London Natural History Museum, exhibited at the exhibition in Sydney, influenced the design of the new buildings,²⁴ while the ideas of newly arrived artisans such as Lucien Henry inspired new directions in the colonial fine arts that were embodied in the buildings' decorative motifs.

The Romanesque was Kemp's style of choice because it was free of the constraints normally associated with traditional architectural styles. The Greek Doric or French Gothic, for example, were thought to have already attained

Figures 3–5 (opp.): Details of Sydney Technical College (1891), designed by William E. Kemp.

Photograph by Kirsten Orr.



Figure 6 (right): Detail of Sydney Technological Museum (1892), designed by William E. Kemp.

Photograph by Kirsten Orr.

their ultimate perfection and architects working in these styles were forced to engage with a set of prescriptive canons and rules. In contrast, the Romanesque was considered to not yet have reached its zenith and the style offered modern architects scope for development and refinement, liberating them from the exigencies of academic purity. It was to be taken as a point of departure, not as an end in itself. Moreover, the Romanesque was not so deeply associated with ecclesiology as the Gothic was, thus lending it more easily to appropriation for secular uses. This conception of the style made it ideally suited to new architectural typologies being developed around the world for museums and technical education. Internal spaces could be manipulated to suit the functional requirements of exhibiting items ranging in scale from the massive to the miniscule, and to suit the modern educational requirements of lecture rooms. The Romanesque style also lent itself to variation in response to local climate, with the positions and proportions of architectural elements such as windows able to be adjusted to suit internal requirements for light and ventilation. Similar freedoms extended to the exterior where the façade could be, and was, used in new ways as a surface for applied ornament.

Thus the opportunities for variation afforded by the Romanesque revival led to regional differences that provided the basis for emerging national styles in America and Australia. Kemp, who had been working for a decade on the design of schools throughout New South Wales, recognised the appropriateness of the Romanesque for educational institutions. He had found the Gothic less than satisfactory for school buildings and had turned to a more eclectic style to satisfy functional and climatic requirements. In his address to the Sydney Architectural Association in 1893 he reflected that

It will be within the memory of most of you that the schools built before 1880 were mostly of a Gothic character – some of them no doubt very fair representatives of the style, others rather poor attempts to give a Gothic character to buildings having no other claim to the title than a steep roof and an occasional pointed arch. Finding that I must build, in almost all cases, brick buildings, and that certain proportions of height of wall and position of windows were essential to realising the conditions of light and ventilation I deemed necessary for school buildings, I was led to consider whether these could not be more satisfactorily attained by the use of low-pitched roofs and square-headed window openings than by the style then in use ... A pointed arch of ordinary brick is to my eye not at any time satisfactory, and there are few other Gothic details which can be produced except by purposely made bricks.²⁵

An editorial the following week supported his approach, saying that while most hold an 'enthusiastic admiration for Gothic architecture as architecture, we nevertheless are of the opinion that, unless under exceptional conditions, the Gothic style is not entirely suitable for secular edifices in this country.'²⁶

The question that has occupied historians' minds is how Kemp came to be influenced by the Romanesque. He had not designed buildings like these before and in 1889 there were no other major buildings in the Romanesque style in either Sydney or Melbourne. Other historians have attributed the design of the Sydney Technical College and the Technological Museum to the emerging influence of the American Romanesque and the architecture of Henry Hobson Richardson, which for some years had been discussed in British and American periodicals. Robyn Lee argues that Kemp's sources are to be found as a ready-made style in North American architecture as illustrated in the *American Architect and Building News* in 1889.²⁷ Myra Dickman Orth finds the central gable of the Sydney Technical College reminiscent of Richardson's Sever Hall;²⁸ and Peter McKenzie is confident that Kemp's Romanesque, characterised by its florid combination of red brick, terracotta and finely carved stone, was very much derived from the Richardsonian Romanesque.²⁹

However, Kemp's designs appear too early in the Australian context to be convincingly attributed to the influence of the American Romanesque. Examples of the style were not shown in the Australian architectural press until April 1890 – little more than a month before Kemp completed his plans for the Technical College building. The article featured Adler and Sullivan's Chicago Auditorium Building, thought by the Sydney-based *Australasian Builder and Contractor's News* to be 'probably the ugliest looking building of its kind in the whole country.'³⁰ Presented in these terms, it is unlikely that Kemp would have been inspired to adopt the American Romanesque style immediately. The one building which was indisputably in the American Romanesque was the Sydney Equitable Life Assurance Building, designed in July 1891 by a visiting American architect. July 1891 was only one month before the building of the

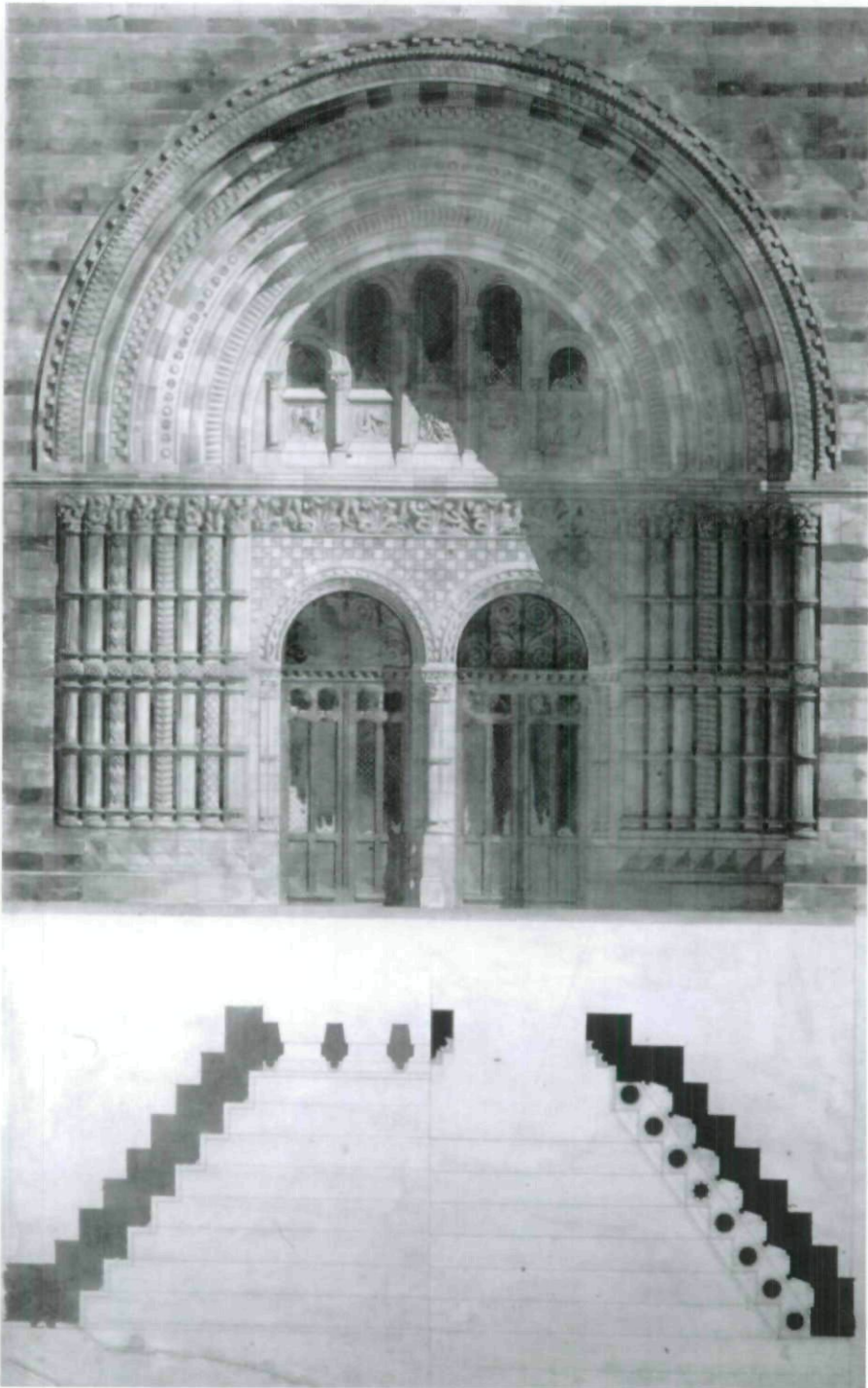


Figure 7: Alfred Waterhouse, "Natural History Museum, London, Elevation of Main Entrance," c.1876, watercolour.
Source: RIBA Library Drawings Collection.

Sydney Technical College was completed and was also after the plans for the Technological Museum had been submitted (May 1891). Therefore the Sydney Equitable Building could not have been a precedent for Kemp's style.

It would be useful to know what journals Kemp subscribed to or what architects he may have been in contact with. Unfortunately no archives of his personal papers survive. We will never know exactly the sources that inspired Kemp's design. We do know something of his character, however, because on his death Cyril Blacket described him as a careful and thoughtful man:

His was not the impetuous fiery nature which carries everything before it in a first impulsive rush; on the contrary, his manner, thought, and action were deliberate, almost to excess ...³¹

The idea of a technical college and technological museum had been on the agenda since the time of the Sydney International Exhibition and Kemp might well have expected to be the architect. This gave him ten years to ponder the most appropriate architectural approach and to discuss it with other interested people in the colony. For a significant project like this, it is highly unlikely that Kemp would have seized upon a suddenly fashionable American style. While Australians looked to America as an elder sister and a wonderful example of progress in the new world, they remained essentially British in outlook. When it came to the design of important public institutions, they sought to emulate the best of old-world practice and the natural tendency was to look towards Britain. Indeed, all the plans of suitable buildings obtained by Liversidge and Colonial Architect James Barnet, were from England and Europe.

That the Sydney International Exhibition was a significant influence on Kemp's design has never been considered. Not only did it establish a climate that was ripe for this sort of eclecticism, but it introduced new ideas through items on display, and new materials that could be used in construction. In particular, two recent drawings of the Natural History Museum at South Kensington by Alfred Waterhouse excited the attention of architects, artists and scientists at the exhibition. These were part of an extensive display of British architectural drawings and models.³² The Waterhouse drawings depicted an interior view of the Index Museum and an exterior view of the principal front façade (Fig 7). They had just been awarded Rappel of Medal of Honour at the 1878 Paris Exposition Universelle, and were received with interest and acclaim in Australia.³³ Judges at both Sydney and Melbourne awarded the 'splendidly executed' work the highest honour of First Degree of Merit.³⁴ The Waterhouse design featured eight recessed columns on either side of a double doorway. Each was carved with a geometric design and topped with a capital of traditional foliage such as acanthus. At the level of the capitals, the foliage continued across the doorway in a frieze. The eight recessed arches above were enriched with geometric decoration. The great tympanum was filled with a five-lighted



Figure 8: Lucien Henry, "Door for Australian Technical College, Art [Australian Door. Granite – Bronze and Majolica]," c.1889-91, watercolour and gouache over pencil.

Source: Powerhouse Museum, Sydney.

window, divided by shafts. Set below the window were five panels each with a carving of a bird or animal. No surface had been spared as a canvas for ornament – even the wall plane under the frieze was detailed with a chequerboard pattern of relief terracotta tiles. One of the six judges of the category comprising engraving, lithography, photography and architectural designs at the Sydney International Exhibition, in which the Waterhouse drawings were displayed, was Lucien Henry.³⁵

Henry, a French artist recently arrived in the colony, and searching for a distinctly Australian school of art, is sure to have admired Waterhouse's abandonment of classical conventions in favour of a heavily ornamented approach, thoroughly integrating art and architecture. A decade later, Henry designed a doorway for a decorative arts college, apparently intended to be part of Kemp's vision for the Sydney Technical College; a brick structure embellished with massive sculpted archways and Australian imagery (Fig 8).³⁶ His design clearly recalled the Waterhouse drawings, so similar was the architectural formula. His painting in watercolour and gouache is even similar in composition. Henry's scheme was a more colourful interpretation, if substantially scaled-down version, of the Waterhouse design. The single doorway, whose leaves were to be carved with native flora, was flanked on either side by two recessed columns clad in brightly glazed tiles – one pair featuring a geometric design, the other a floral motif. The columns were topped with capitals of proteas and kangaroo paw. Above, the recessed arches were also clad in brightly glazed ceramic tiles featuring red waratahs and stenocarpuses and golden stars against a rich blue ground. The outer granite arches were to be decorated with a pattern of fern fronds and gold stars. The tympanum featured a rising sun and a band with the words 'Decorative Arts'.

A less direct influence of the exhibition movement on the design of the Sydney Technical College and Technological Museum was Liversidge's trip overseas in 1878 as a commissioner at the Paris Exposition Universelle, which gave him the opportunity to visit Waterhouse's nearly-complete Natural History Museum. His trip coincided with the final construction phase, and he would almost certainly have been taken on a guided tour by Waterhouse himself.³⁷ In a letter to the Agent-General of New South Wales, outlining his proposed activities while overseas, the 'new natural History Museum at South Kensington' was top of the list of leading British institutions that he proposed to visit to collect 'copies of the designs of places together with working drawings of the showcases and other fittings.'³⁸

In the final report that he furnished to the New South Wales Government he briefly mentions that a 'very large and fine new building for the reception of the Natural History Collection has recently been erected at South Kensington, and the whole of such specimens will shortly be removed into it.'³⁹ This is the

only specific mention in his report of the architecture of *any* museum, university or school he visited. Although he 'refrained' from reproducing plans or drawings in his report, Liversidge no doubt returned to Australia with a suitcase bulging with illustrative material because of his interest in architectural matters.⁴⁰ It is reasonable to speculate that a large number of the drawings that came into the Colonial Architect's possession were actually pressed upon him by Liversidge.⁴¹

In character, Liversidge was a practical man interested in the design of buildings with a scientific purpose.⁴² In 1880 he was actively involved in the design of his new chemistry building at the University of Sydney, paying particular attention to ventilation to make sure it worked.

Some of the pillars in external walls were in effect narrow chimneys, with a gas flame near the base to create an updraught. Hydrogen sulfide gas was piped to each work-bench from a gas-holder out of doors and after use in a shared glass chamber was exhausted to the exterior. Miniature fume-hoods exhausted vertically downwards. Metallurgy furnaces exhausted through underfloor ducts leading to a large external stack.⁴³

Knowing the thoroughness and single-mindedness with which Liversidge approached his work, and his very deep interest in establishing the Technological Museum, there is no doubt that he would have talked both to the Colonial Architect and later to Kemp about what was to be built. Liversidge had been prominent in the arrangement and planning of the Australian Museum and played a similar role in the Technological Museum.⁴⁴ It is easy to imagine Kemp and Liversidge in long and earnest discussion about ventilation – their shared passion.⁴⁵ Liversidge was most particularly taken by the new Natural History Museum at South Kensington because it was a building developed from a close consultation between the architect, Waterhouse, and the scientist, Richard Owen, Superintendent of Natural History of the British Museum. Owen later recorded that

I took the liberty to suggest ... that many objects of natural history might afford subjects for architectural ornament; and at Mr Waterhouse's request I transmitted such as seemed suitable for that purpose.⁴⁶

Owen admired Waterhouse's artistry, especially his choice of a Romanesque style, which lent itself to 'endless beautiful varieties of form and surface-sculpture exemplified by the animal and vegetable kingdoms.'⁴⁷

Liversidge was an ambassador for colonial science. He was on the committees of all the major scientific institutions in the colony and had the ear of many people sharing similar interests. He was on the committee that fought until the bitter end for the building of the Technological Museum. Like Owen, he would have exerted an enormous influence on Kemp and he would have been pushing for a building like the Natural History Museum in South Kensington. Kemp did not need to look to the American Romanesque because a fine example of British Romanesque was most likely already on the table.⁴⁸

The exemplar was substantiated by architectural commentary emanating from England in the late 80s in favour of the Romanesque revival. The highly influential *RIBA Journal* promoted the Romanesque as appropriate to the new circumstances and wants of progressive and aspiring nations – a message that dovetailed neatly with the progressive, utilitarian ideology driving the development of technical education in New South Wales.⁴⁹ Keen to develop an architectural language better suited to contemporary needs and aspirations, Waterhouse's inaugural address in 1888 as President of the Royal Institute of British Architects exhorted architects to shake themselves free from tradition, to become more self-reliant, and to take an eclectic approach to architectural design.

If we are for ever dwelling on the past, we shall not be self-reliant; and if not self-reliant, we shall never be bold originating architects ... We see that in America they are shaking themselves free from tradition. No doubt it is comparatively easy for them to do so; but are we to allow them to monopolise the guidance of common sense in architecture? May we not also make greater efforts than we have hitherto done to express the purpose of our works in a language of our own; to clothe our buildings, not in the cast-off garments of bygone ages, but in materials cut out and fashioned to suit ourselves and our own needs? ... If our art is ever again to evoke popular enthusiasm, it must do so by embodying the thoughts, the aspirations, and the genius of the living people for whom we build.⁵⁰

Like many, Waterhouse was more concerned with the ethos of the new style – which was original, liberal and utilitarian – than with its aesthetic characteristics. The Australian Romanesque revival took its early inspiration from English architects and was imbued with a similar progressive ethos suited to the colonial context. When the American Romanesque hit Australia in the 1890s, favourable conditions for its reception had already been laid by the Royal Institute of British Architects.

It is unlikely that the Sydney Technical College and Technological Museum were influenced by the American Romanesque style. Indeed, the *Australasian Builder and Contractors' News* noted how skilfully Kemp 'utilised and adapted the form of the Romanesque to the requirements of his edifice, without adopting the coarseness and almost barbaric massiveness that characterise a good deal of the American Romanesque.'⁵¹ Kemp's design reflected the ethos of the new Romanesque, as conveyed by the British architectural journals and the specific example of the Natural History Museum. Like the Natural History Museum, whose forms and naturalistic ornament expressed the concept of a natural history museum,⁵² the architecture of the Sydney Technical College and Technological Museum expressed their role by incorporating Australian craftsmanship and design of the highest order. As institutions for the promotion of culture their architecture and ornamentation exemplify good design, while materials and construction illustrate modern technical processes. They are

permanent monuments intended to guide and inspire colonial craftsmen, and to foster improvement and progress. Because the building of a technical college and museum was a unique undertaking it provided Kemp with the opportunity to strike out in a new direction. It encapsulates the new post-exhibition urban ethos of cultural and material progress being adopted by the architectural profession. In fact John Horbury Hunt, the President of the Institute of Architects of New South Wales and a friend of Kemp, proclaimed that architecture had a role to play in nation building and should 'be the means of influencing the habits of modern nations.'⁵³

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The Sydney Technical College and Technological Museum designed by William E. Kemp are significant early examples of the Romanesque style in Australia; a departure from the traditional Gothic or Classical styles usually employed in public buildings. Although the buildings are modest in size, their external detailing is extremely fine, with fancy polychrome brickwork, terracotta relief and decorative sandstone featuring carvings of Australian flora and fauna. The architecture can be read as a document and also as a story of personal endeavour, competing ideologies and economic realities. The buildings' importance is revealed through an understanding of the part events and people played in shaping Sydney's cultural life.

A major part of the Sydney Technical College and Technological Museum's cultural significance derives from their connection to the 1879 Sydney International Exhibition: they are important architectural legacies. Unlike Melbourne's 1880 Royal Exhibition Building, which is now World Heritage listed and survives as a reminder of 'Marvellous Melbourne' of the 1880s, Sydney's magnificent timber Garden Palace was destroyed by fire in 1882.⁵⁴ Thus the Sydney Technical College and Technological Museum, together with the Garden Palace Gates at the Macquarie Street entrance to the Sydney Botanic Gardens, are the only architectural reminders of this largely forgotten event in Sydney's history; an event which contributed to an evolving urban ethos and prepared the way for nation building and Federation.⁵⁵

They are also fine examples of the contribution made by mega-events such as exhibitions and Olympic Games to city development. Such events are about the particularity of place and a city's image, which is projected to the world and used to re-position the city in the global economy. They are usually intended to physically transform some strategically important urban area. In particular, by placing Sydney suddenly in the international spotlight, the Sydney International Exhibition encouraged local pride in the city and imbued the population with a new optimism for the future of their colony and its material and cultural advancement.⁵⁶ It stimulated debate on the need to establish new institutions

and the merits of locating them in a centralised scientific, cultural and educational precinct along similar lines to that at South Kensington in London.

Moreover the Sydney Technical College and Technological Museum are important because they represent the real beginnings of technical education in New South Wales and stand as a tribute to the men who fought to place a practical system of technical education on the political agenda.

The Romanesque style, which had been found to be suited to new architectural typologies being developed around the world for museum and educational institutions, was adapted to the local circumstances of climate, available building materials and imagery. The façades of the Sydney Technical College and Technological Museum are inspired by the London Natural History Museum but are uniquely Australian in many features. They are representative of a time when architects – and the general public – were seeking a distinct national identity and an appropriate Australian style of art. It is the complexity of cultural context which gives these buildings their meaning and importance.

NOTES

1. Australia ICOMOS, *The Burra Charter: The Australia ICOMOS Charter on Caring for Places of Cultural Significance* (Kingston, ACT: Australia ICOMOS, 1997), Art. 1.2.

2. The museum has had five different names: Technological Industrial and Sanitary Museum (1880-89), Technological Museum (1890-1944), Museum of Technology and Applied Science (1945-49), Museum of Applied Arts and Sciences (1950-87) and Powerhouse Museum (since 1988). In 1988 the Museum moved further along Harris Street to a new location in the old Ultimo Power Station.

3. Kirsten Orr, "A Force for Federation: International Exhibitions and the Formation of Australian Ethos (1851-1901)," PhD thesis, University of New South Wales, 2006.

4. Graeme Davison, "Exhibitions," *Australian Cultural History* 2 (1982): 6.

5. Paul Greenhalgh, *Ephemeral Vistas: The Expositions Universelles, Great Exhibitions and World's Fairs, 1851-1939* (New York: St Martin's Press, 1988), 19.

6. Roy MacLeod, "Organising Science Under the Southern Cross," in Roy MacLeod (ed.), *The Commonwealth of Science: ANZAAS and the Scientific Enterprise in Australasia 1888-1988* (Melbourne: Oxford University Press, 1988), 21.

7. Patrick Jennings' closing speech reported in *The Sydney Morning Herald*, cited in *Official Record of the Sydney International Exhibition, 1879* (Sydney: Thomas Richards Government Printer, 1881), ci.

8. Archibald Liversidge, "Report Upon Certain Museums for Technology, Science, and Art, Also Upon Scientific, Professional and Technical Instruction, and Systems of Evening Classes in Great Britain and on the Continent of Europe," *New South Wales Legislative Assembly Votes & Proceedings Legislative Assembly of New South Wales (1879-80)*, 3: 845.

9. J. L. Willis, "From Palace to Power House: The First One Hundred Years of the Sydney Museum of Applied Arts and Sciences," unpublished research report, Museum of Applied Arts & Sciences Library, 1982, 8.

10. Edward Combes, "Report on the Lighting, Heating, and Ventilation of School Buildings in Great Britain, the Continent of Europe and America, with Remarks on School Discipline, Normal Colleges and the 'Kindergarten' System; Also on the Technical Educational Institutions of the above Countries," *New South Wales Legislative Assembly Votes & Proceedings (1879-80)*.

11. Liversidge, "Report upon Certain Museums," 787-1059.
12. Liversidge, "Report upon Certain Museums," 801.
13. Liversidge, "Report upon Certain Museums," 802.
14. Liversidge, "Report upon Certain Museums," 802-3.
15. Liversidge, "Report upon Certain Museums," 804.
16. Orr, "A Force for Federation," 270-81.
17. Henry Parkes to Edward Combes, September 26, 1882, Parkes Correspondence, vol. 50, 537-540, Mitchell Library, State Library of NSW.
18. Edward Combes to Henry Parkes, 26 September 1882, Parkes Correspondence, CY Reel 72, vol. 50, A920, 534-537, Mitchell Library, State Library of NSW.
19. Some of the sites considered for the Technological Museum were to be temporary, others permanent. – Orr, "A Force for Federation," 279.
20. S Murray-Smith, "A History of Technical Education in Australia, with Special Reference to the Period before 1914," PhD thesis, University of Melbourne, 1966, 427.
21. F. R. Morrison, Director of the Technological Museum from 1955-1960, recorded his impression of the Museum in 1906, when the basic arrangement was probably similar to the original. – Willis, *From Palace to Power House*, 69-70.
22. Willis, *From Palace to Power House*, 67. Internal descriptions and plans can also be found in Graeme Davison & Kimberley Webber (eds), *Yesterday's Tomorrows: The Powerhouse Museum and its Precursors 1880-2005* (Sydney: Powerhouse Publishing, 2005).
23. My thanks to Dr John Phillips from the Faculty of Design Architecture & Building at the University of Technology, Sydney, who spent an afternoon walking around the Sydney Technical College and Technological Museum with me and discussing their stylistic features.
24. The connection between Waterhouse's Natural History Museum and Kemp's designs for the Sydney Technical College and Technological Museum was made accidentally when the author was testing the theory that the South Kensington model had influenced the planning of Sydney's institutions. Investigating all of the institutions that had sprung up in South Kensington since the Great Exhibition of 1851, I was struck by the remarkable similarities between the terracotta and polychrome brickwork designs of the London Natural History Museum and the Sydney Technical College and Technological Museum.
25. William E. Kemp, "School buildings (Paper read before the Sydney Architectural Association, 3 July 1893)," *Australasian Builder & Contractors' News* (July 8, 1893): 15-17.
26. "Schools and School Buildings" (editorial), *Australasian Builder and Contractors' News* (July 15, 1893): 30-32.
27. Robyn Lee, "W. E. Kemp's Sydney Technical College and the School and College Architecture of the New South Wales Department of Public Instruction 1890-1910," honours thesis, University of Sydney, 1972.
28. Myra Dickman Orth, "The Influence of the 'American Romanesque' in Australia," *Journal of the Society of Architectural Historians* 34, no. 1 (1975): 3-18. Many aspects of Orth's paper do not inspire confidence in her conclusions: Kemp was not one of 'the new generation of Australian architects,' as she claims (3). He was 59 when he designed the Sydney Technical College and Technological Museum and retired in 1896, just three years after their completion. Orth's stylistic description of the two buildings as 'Sydney-warehouse-Richardsonian' (11) reveals a lack of understanding of the Australian context. All of the parties involved – architects, scientists and politicians – would have been offended by the label, for it is inconceivable that this important nineteenth-century institution could have been confused for a warehouse. Later the Romanesque became popular for warehouse construction in Sydney, but these warehouses bear little resemblance to the Sydney Technical College or Technological Museum.
29. Peter McKenzie, "William Edmund Kemp: His Contribution to Australian Architecture," undergraduate thesis, University of Technology, Sydney, 1977, 98.
30. *Australasian Builder and Contractor's News* (April 5, 1890) & (December 20, 1890).
31. Cyril Blacket, "The Late Mr W. E. Kemp," *Australian Technical Journal of Science, Art and Technology* (June 30, 1898): 170.
32. *Sydney International Exhibition 1879: Official Catalogue of the British Section Fine Art & Industrial* (London: J M Johnson & Sons Ltd, 1879), 29-36; *Official Record Melbourne International Exhibition 1880-81* (Melbourne: Mason, Firth & McCutcheon, Melbourne, 1882), 302.

33. *Official Catalogue of the British Section Fine Art & Industrial*, 35: Exhibit 371, "Interior View of the Index Museum, Natural History Museum, South Kensington, London"; Exhibit 372, "Exterior View of the Principal Front of the Natural History Museum, South Kensington, London".
34. *Official Record Melbourne 1880-81*, xcvi.
35. Peter Proudfoot & Graham Pont, "The Technological Movement and the Garden Palace," in Peter Proudfoot, Roslyn Maguire & Robert Freestone (eds.), *Colonial City Global City: Sydney's International Exhibition 1879* (Sydney: Crossing Press, 2000), 244.
36. Charles Pickett, "Lucien Henry and Sydney Architecture '... Motives for the Decoration of any Construction,'" in Ann Stephen (ed.), *Visions of a Republic: The Work of Lucien Henry Paris, Noumea, Sydney* (Sydney: Powerhouse Publishing, 2001), 103.
37. The Natural History Museum attracted considerable attention during construction and Waterhouse frequently took interested visitors on a tour of the incomplete building. – John Olley & Caroline Wilson, "Pioneer of Modern Museum Design: The Natural History Museum," *Architects' Journal* 181, no. 13 (1985): 32-55.
38. Archibald Liversidge to Mr Forster, Agent-General of NSW, March 31, 1879 (written from Saville Row Westminster). – Liversidge Papers, series 11, no. 3, box 9, University of Sydney Archives.
39. Liversidge, "Report upon Certain Museums," 835. Kenneth Hudson highlights the Natural History Museum's significance as a 'Museum of Influence' because it broke new ground and had no serious rivals in Victorian Britain. – Kenneth Hudson, *Museums of Influence* (Bath: Bath Press, 1987), 11.
40. Liversidge, "Report upon Certain Museums," 794.
41. Lee claims in *W. E. Kemp's Sydney Technical College* (6) that Barnet, obtained the drawings himself. But it is more likely that Liversidge furnished the Colonial Architect with the plans he had obtained while travelling on behalf of the New South Wales Government.
42. Liversidge's interest in architecture is clear in two papers he presented at the Sixth Meeting of the Australasian Association for the Advancement of Science in 1895, one was titled "Experiments in the Waterproofing of Bricks and Sandstones", the other "Experiments in the Porosity of Plasters and Cements". – *Report of the Sixth Meeting of the Australasian Association for the Advancement of Science* (January 1895).
43. David Branagan & Graham Holland, *Ever Reaping Something New: A Science Centenary* (Sydney: University of Sydney Science Centenary Committee, 1985), 39.
44. Resolution of the Meeting of the Trustees of the Australian Museum, March 6, 1908, on the resignation of Professor Liversidge. – Liversidge Papers, series 10, no. 6, box 9, University of Sydney Archives.
45. Kemp, "School Buildings," 15-17.
46. Richard Owen cited in Carla Yanni, "Divine Display or Secular Science: Defining Nature at the Natural History Museum in London," *Journal of the Society of Architectural Historians* 55, no. 3 (1996): 276-99.
47. Yanni, "Divine Display or Secular Science," 295.
48. Lee identifies similarities between the Natural History Museum and the Sydney Technical College and Technological Museum but dismisses the possibility of any direct influence because the Natural History Museum is 'illustrated neither in Combes [*Report on Technical Education*] nor in Robins [*Technical School and College Building*].' Referring to Selfe, she argues that English models, though favoured by the Board of Technical Education, did not influence Kemp. I believe Selfe's comment that 'little or no use appears to have been made of the information gathered by the disbanded Board' cannot be taken at face value because it was made in 1898, five years after the museum had officially opened and at a time when it had already outgrown its premises. Lee's study does not mention the Sydney International Exhibition and she seems unaware of the impact of the Waterhouse drawings exhibited there. – Lee, *W. E. Kemp's Sydney Technical College*, 11-12.
49. Alexander Graham, "Architecture in the United States," *RIBA Journal* (March 8, 1888): 193-96.
50. Alfred Waterhouse, "The President's Address, Royal Institute of British Architects," *Builder* (November 10, 1888): 336-40.
51. "New Technological Museum, Ultimo, Sydney," *Australasian Builder and Contractors' News* (September 16, 1893).

52. Yanni, "Divine Display or Secular Science," 293.

53. John Horbury Hunt, "Address to the Institute of Architects of New South Wales," *The Building and Engineering Journal* (June 22, 1889): 479-81.

54. Graeme Davison, *The Rise and Fall of Marvellous Melbourne* (Melbourne: Melbourne University Press, 1978).

55. Orr, "A Force for Federation."

56. Orr, "A Force for Federation," 213-50.

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