The Victorian Contractors’ and Builders’ Price-Book, the first Australian price-book, published in 1859 in Melbourne, Victoria, by Charles Mayes C.E. (1827-1899)

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Abstract

Charles Mayes (1827-1899) practised as a civil engineer, architect and surveyor from 1850 to 1884 in the Australian colonies, where he made a significant contribution to the development of quantity surveying. His *Victorian Contractors’ and Builders’ Price-Book*, published in Melbourne in July 1859, a notable first in the Australian colonies, would become a building industry standard in 1862 as Mayes’s *Australian Builders’ Price-Book*, the last edition, published in 1951 in Sydney, a lasting testimony to his hard work and foresight. Reprinted every few years, such price-books are potentially a source of information for architectural historians and conservation architects alike.

Introduction

Today, civil engineering, architecture, surveying and quantity surveying are, for the most-part, separate disciplines. Not so in the 18th and 19th centuries, with surveying, surveying and measuring (quantity surveying), civil engineering and architecture overlapping professionally. Nevertheless, by the mid-1800s, quantity surveying had become more formalised, a quantities surveyor (i.e. quantity surveyor, a term not used until the 1870s) or chartered surveyor measuring or taking-out the quantities (the bill of quantities) for a building or engineering project from design and working drawings. The bill of quantities, in conjunction with the specifications and the costs of labour and materials, would then enable a tender price to be estimated by builders and contractors. Price-books were an invaluable part of the process, showing how to calculate costs based on the prices of materials and labour, either separately or as a composite sum.

Price-books first appeared in the late 1700s, with *The Builders’ Price-Book* (Taylor 1774, 1776) becoming a model for subsequent price-books, in the inclusion of an abstract of the London Building Act, following its introduction in 1774. After the Napoleonic Wars (1793-1815) a relative flood of new price-books appeared in Britain. This was in response to the growth of industrialisation, to increases in urban populations and to the introduction of the railways in the 1830s and 1840s.

According to Hobbs (2011: 57-58) these developments engendered new kinds of engineering and construction, with estimating increasingly based in mathematics. The principles of estimating were set-out in books such as Elsam’s *The Practical Builder’s perpetual price-book* (1825) and Nicholson’s *The Carpenter and Builder’s Complete Measurer* (1823), Skyring’s *Builders’ Prices* (25th edition 1845) and Laxton’s *The Improved Price-Book* (13th edition published by Weale in 1839), with Nicholson’s, Skyring’s and Weale’s price-books becoming industry standards. The Architectural Library, a well-known bookshop in Holborn, London, owned by I. and J. Taylor, published and sold books on architecture and related subjects, including building and...
estimating, until 1834, when the business was taken-over by John Weale following the death of John Taylor. Like the Taylors, Weale would publish and sell price-books for architects, builders, contractors and civil engineers (Topham 2004; *The London Gazette*, 13 February 1798).

Civil engineers, architects and surveyors in the Australian colonies, as microcosms of British society, were well versed in measuring and estimating employing the established, published standards as were many colonial contractors and builders. It is therefore not surprising that an Australian, colonial standard was not seen as a pressing need and it was not until the introduction of self-government in the 1850s that an Australian price-book was published. In his biography of Charles Mayes C. E. (civil engineer) Hobbs (2011) has explored the events leading to the publication of Mayes’ *Victorian Contractors’ and Builders’ Price-Book*, the first colonial price-book, in Melbourne in 1859.

Born in Watford, England, on 1 March 1827, Charles Mayes C.E., the son of a contractor and builder, served at least part of his architectural apprenticeship (c. 1840 - c. 1844) in Bristol (Public Record Office, 1841 Census of England, Wales & Scotland, Bristol Ref. HO 107/371/6/5/5). The apprenticeship (principal unknown), according to Hobbs (2011), was at a time when the almost
legendary engineers George and Robert Stephenson and Isambard Kingdom Brunel dominated transport and infrastructure developments in Britain, Brunel doing so in the south-western region of England, including Bristol. Watford was on the London to Birmingham line completed in 1838 by the Stephenson family, which dominated design and construction in the northern and eastern regions of Britain.

Self-employed by 1845, Charles Mayes was fortunate in that 1845 was the start of a railway boom in Britain, a boom which would last until 1849 (Lewin 1936). In 1871 Mayes noted that on 7 January 1850 John and Solomon Tredwell, railway contractors, had provided him with a reference, stating that he had been in their employ for 2 years as an ‘Engineer’ and that he was competent in every aspect of ‘Surveying and Engineering in general’ (City of Sydney Archives [CSA], NCSA, Item 26-108-439). The reference was written in response to the collapse of the stock-market bubble created by ‘railway mania’ and failed investment in the many speculative, railway companies.

The end of the railway boom of 1845-1849 led many civil engineers to find employment overseas and brought Mayes to Australia, where he would be exposed to the boom-to-bust cycles associated with the gold rushes, railway construction and the associated urban development. In his biography of Charles Mayes, Hobbs (2011) established that Charles Mayes C.E. came to South Australia in mid-to-late 1850, having married Eliza Hannah Smith on 24 December 1849 at Watford, Hertfordshire. Most of the Mayes family would follow, with the exception of William M. Mayes (also a civil engineer and architect), settling in the future colony of Victoria between 1849 and 1856. Charles Mayes would work as civil engineer, architect, surveyor and quantity surveyor in South Australia (SA) (1850-1851), Victoria (1851-1863) and New South Wales (NSW) (1863-1893).

South Australia

The colony of South Australia was the third largest copper producer in the world, producing some 10% of world output by 1850. Silver and lead had been found at Glen Osmond near Adelaide in 1841 followed by copper at Kapunda in 1842 and at Burra [Burra] in 1845. Ships came to Port Wakefield for ore concentrates and brought new trade; land sales boomed and Adelaide enjoyed a brief heyday as the most prosperous of Australia’s capital cities (Department of Primary Industries and Resources South Australia, 2003, n.d.; Roe, 1974). Charles Mayes may have chosen South Australia because of the copper mining boom described in the South Australian News, published in London, or through contact with companies in London, such as the South Australian Company. However, of equal importance, would have been the passing of the Sydney Railway Act in 1849 and the formation of a railway company in South Australia in the same year (Hobbs 2011).

There does not appear to be any record of Mayes’ arrival in South Australia or of his employment during the short time that he was there, however, a hand-drawn, detailed map of the mining districts bearing his name has survived in the State Library (RGS Australiana Collection [J],

Figure 2: C. Mayes, surveyor, outside his office, Tambaroora Street, Hill End, in 1872, American & Australasian Photographic Company (after Hobbs 2011, courtesy of Mitchell Library, State Library of NSW).
Call No. 912.9423 M468). The discovery of gold in New South Wales, and then Victoria, in 1851 would cause the copper mines in South Australia, and development generally, to suffer setbacks caused by the lack of labour, with some mines closing until the mid-1850s due to the movement of people to the gold rushes. The result was that the economy would not be strong enough to fund major public works, such as railways, until the 1860s (Department of Primary Industries and Resources South Australia, 2003; Lee 2003).

Charles Mayes and his wife sailed for Melbourne, Victoria, in all likelihood leaving Adelaide on board the brig *Esperance*, on 28 May 1851 (*Adelaide Times*, 29 May 1851: 2). This departure coincided with the discovery of gold in New South Wales at Ophir in April 1851 and was after the initial discovery of gold near Bathurst, in February 1851 (Hughes 2003), suggesting that Mayes’ move was connected with these discoveries as much as with the presence of members of his family in Victoria.

**Victoria**

Gold was first discovered in Victoria at Clunes, in the Dividing Range, an event reported in the Geelong press on 7 July 1851 (*Geelong Advertiser*, 7 July 1851: 2). Two days later, on 9 July 1851, a gold find at Warrandyte, some 30 kilometres east of Melbourne, was reported by the Melbourne press (*The Melbourne Daily News*, 9 July 1851: 3). On 20 July 1851 gold had also been found at Mount Alexander, the find reported by the *Argus* on 8 September 1851. These gold discoveries were the first major mining prospects in the colony of Victoria, which, coupled with the discovery of gold at Ballarat in September 1851 (*Geelong Advertiser*, 9 September 1851: 2), would result in the Victorian gold rushes. Gold was also found at Sandhurst (renamed Bendigo in 1891) in November 1851 (*The Argus*, 22 October 1851: 3; 13 December 1851: 2), Ballarat and Sandhurst developing as the urban centres in what would become the major goldfields.

By the end of September 1851, Mayes had established his own office at 11 Russell Street in the city (*The Argus*, 29 September 1851: 4). Charles Mayes’ arrival in Melbourne, at a time of drastic shortages of skilled professionals and tradesmen caused by the rush to the goldfields, would be unprofitable in the short term, the next few years being somewhat tumultuous, with little economic activity in Melbourne. Mayes was, however, fortunate that the Australian colonies were slowly moving towards self-government, in which infrastructure projects, including railway systems, the telegraph and municipal gas and water supplies, would be developed.

In his biography of Mayes, Hobbs (2011) discussed the issues confronting Mayes as a new arrival in Melbourne, finding that it was not until 1853 that he was noted as a member of the Victorian Architects’ Association, formed in May 1851 in Melbourne. Although Mayes’ design for the City of Melbourne Gas and Coke Company works was noted in the press as having won second prize (£10) in the open competition in September 1851, it was considered by Melbourne’s first gas engineer, George South, to be superior to the poorly thought-out, winning design by Charles Laing, an architect of long-standing in Melbourne society. Following this rejection, Mayes appears to have gone to the goldfields at Mount Alexander and Ballarat, returning to Melbourne by January 1853. Mayes had returned at an opportune time; the business recession of the early 1850s would begin to decline by 1855, the suburbs expanding with urban services and railways becoming important fields of employment for civil engineers, architects and surveyors.

In contrast to his early professional difficulties in Victoria, Hobbs (2011) has identified Charles Mayes as the contractor’s engineer and quantities surveyor for the successful tenderer on the Yan Yean reservoir, including the dam wall and associated structures, built between November 1853 and mid-1855 at a cost of £94,575. Similar dams had failed in Britain, Mayes’ attention to detail, in what was considered of national importance by the Commissioners of the Yan Yean Waterworks, a testament to his skills in helping to complete what was Melbourne’s and Australia’s first major water-supply system, one with a dam that did not fail.

During the time that Mayes worked on the Yan Yean reservoir, he was also involved in suburban subdivision in Melbourne and had acquired land at Northcote late in 1853. According to
Hobbs (2011), Charles Mayes had, by 1854, begun to succeed in private practice. Among his commissions were houses and shops in Collingwood, a brick inn at Yan Yean and the Junction Hotel, St Kilda, by 1854. Shortages of bricks in Melbourne prompted him to use the land at Northcote for brick production, although this was unsuccessful due to the distances involved. Mayes’ move into the manufacture of building materials was clearly evident in his attempt to create a cheap building method using pise. In September 1854, Mayes had received the second patent granted in the colony of Victoria, at a cost of £50, for an ‘improved pise’ construction technique, employing moulds of galvanised iron to create walls with internal cavities.

In 1854, under the **Australian Colonies Government Act of 1850**, Victoria separated from New South Wales with Sir Charles Hotham as Governor. By 1856, under the Haines’ administration (1855-1856), the beginnings of responsible government had begun to emerge, with the first Parliament elected in 1856. The construction of roads had begun in 1853 with the first railway construction taking place from 1853 to 1854 at Hobson’s Bay, although major railway construction would not take place until 1859, to service Ballarat and Bendigo in the goldfields (Serle 1997).

A major problem for the emerging Australian colonies would be the issue of inter-colonial trade. By the end of the 1850s, the expansion of the wool-trade in the Riverina in southern New South Wales had greatly increased the quantity of imports entering from Victoria, with a free-trade agreement formed in 1857 between the Australian colonies. However, the completion of a railway line to Echuca in 1864, from Melbourne, to capture the Riverina Trade for Victoria, ended the agreement. The colony of Victoria had been able to complete a main-line railway through the goldfields to Echuca funded by the wealth brought by gold (O’Keefe & Pearson 1998; Gunn 1989).

The development of railways in Victoria and Mayes’ initial role have been summarised by Hobbs (2011). Three railway companies had been formed in Victoria by 1854; two would merge with the Hobson’s Bay Company in 1865 to provide an urban service, while the Melbourne, Mount Alexander and Murray River Railway Company (MMA & MRR Co.) line to Bendigo in the goldfields was taken over by the Victorian government in 1856, with the formation of a Railways Department in Melbourne. Mayes was successful in obtaining a position as an Assistant Railway Surveyor in June 1855, at a salary of £300 per annum, laying out trial surveys for sections of line to Echuca, where he was stationed in April 1857.

Mayes’ contracting background and lack of professional qualifications, such as associate membership of the Institution of Civil Engineers (I.C.E.), may well have placed him at a disadvantage when applying for public positions. Nevertheless, his position as a trial-railway surveyor, from June 1855 to July 1856, and then as a ‘Quantities Surveyor and Engineering Draftsman’ in the Drafting Branch of the Victorian Railways Department, from 1857 to September 1862 (as per his testimonial in 1862 from the Department, but describing himself as a ‘Railway Engineer and Architect’ in his price-book of 1862), would give him exposure to all aspects of railway construction in the colony (CSA, NCSA, Item number 26-108-439; Mayes 1862: xv). Mayes was employed for 7 years on the survey, design and construction of the goldfields’ railways linking Melbourne with Ballarat, Bendigo and Echuca, the relatively stable employment enabling him to develop his ideas on quantity surveying and estimating in the Australian colonies.

The contract for the first 13 sections of the railway line from Melbourne to Bendigo had been won by contractors John Bruce and William Cornish for the sum of £3,357,000. Construction had started on 1 June 1858, with the contract to be completed by the end of 1861 (Lee 2007). However, strikes by stonemasons, in particular following the introduction of the 8-hour day, delayed works, amid allegations of poor materials and proven bribery of officials, resulting in supervision by the Victorian Railways Department being greatly increased (Maxwell 1969). As early as 1859, Engineer-in-Chief George Darbyshire had been held accountable for mismanagement, i.e. for squandering public money, on the basis that he did not have adequate engineering experience. This led Darbyshire to resign in 1860, despite the fact that the increased cost of construction was a result of the use of wide-gauge, double tracks, employed throughout the
railway system, a decision taken in August 1857 by the government of the day, and a less than accurate estimating and contracting process (Lee 2007; The Argus, 23 May 1860).

Critically, whilst working in the Melbourne office of the Railways Department, Mayes found time to consider the inconsistencies he found in colonial quantities surveying, for the purpose of estimating construction costs in Victoria, at a time of fluctuating wages and difficulties caused by both contractors and workforce following the gold rushes. In these respects, Mayes appears to have held strong views on industrial relations and labour costs in the building and contracting world. Mayes would refer, in 1862, on his return to the private sector, to his disagreement with the Victorian Railways and Public Works department’s use of the term ‘nett measurement’ in specifications, which could only lead to some degree of guesswork in estimating costs (Mayes 1862: xxii). Such inaccuracy was unacceptable to Mayes, whose professional origins lay in the world of contracting, with all its attendant risks.

Architects, civil engineers and surveyors, such as Mayes, were necessarily involved in the estimation of building costs for clients, something contractors and builders often found difficult to achieve with any degree of accuracy. These difficulties had been highlighted in September 1856, when the Australian Builder and Practical Mechanic published a letter from architect and contractor John Young of Geelong to the editor:

Sir – The system of tendering, pursued in the colony, is open to so many objections, that endeavouring to ventilate the whole question cannot but result in benefit to the employer, architect, builder and operative.

Everyone tendering for work in Melbourne must be disgusted with the whole proceedings in the majority of cases. Probably, first, by the crowding to get at the drawings, and the time wasted in waiting for an opportunity to get just a peep at plans and specifications; further disgusted on reading the specifications to find them at least so general in description, while nothing in particular is mentioned. (Young 1856: 246)

The letter also referred to the slow decision making, stating that the British system was perhaps the best currently in use and that the chosen contractor generally paid a commission to the surveyor or estimator who took out the quantities.

Appointed in March 1859, William Wardell F.R.I.B.A., a British architect, became Inspecting Clerk of Works and Chief Architect in the Department of Works and Buildings in Victoria (The Argus, 12 March 1859: 4). However, it would appear that the Victorian Institute of Architects was already looking into the question of bills of quantities, as would William Wardell. To this end the Victorian Builders and Contractors Association lobbied Wardell as to what might be proposed (The Australian Builder and Practical Mechanic, 25 September 1856: 246; The Australian Builder and Railway Contractor, 2 April 1859: 106, and 16 April 1859: 122). The Institute of Architects had voted on 15 November 1858 (State Library of Victoria MS 9454, Council Minute Books 1856-1861) on the motion ‘that professional charges for the furnishing of Working Drawings and Specifications to Contractors shall be 1 per cent under £1000, ¾ per cent under £5,000 and ½ per cent above £5,000’.

According to the Australian Institute of Quantity Surveyors (Leach 2008), Wardell adopted the British system of using two quantities surveyors, representing the client and contractor, to jointly estimate the quantities, in May 1859. Quantities surveyors would be paid 1 per cent for large works and 1.5 per cent for smaller works. The system did not start well, with claim and counter claim as to the real figures, and there was obviously a need for a common standard and approach to estimating. Hobbs concluded in his biography (2011) that Mayes, as an experienced architect and civil engineer based in contracting and quantities surveying, and as a member of the Victorian Institute of Architects, was well placed to produce such a standard.

Working on his own account, Mayes published his Victorian Contractors’ and Builders’ Price-Book in Melbourne in July 1859. The price-book, the first published in Australia, was available in Melbourne, Geelong, Sandhurst, Ballarat and Castlemaine in Victoria as well as Sydney, Adelaide and Hobart. The Victorian Contractors’ and Builders’ Price-Book was advertised in Victoria and Tasmania in September 1859, in South Australia in December 1859 and in Sydney...
by October 1859. The reviews and comments, with the exception of some colonial rivalry, were more than favourable, the book an important addition to the stock-in-trade of builders and contractors (The Argus, 15 September 1859: 5; Launceston Examiner, 29 September 1859: 1; The Maitland Mercury & Hunter River General Advertiser, 6 October 1859: 3; The South Australian Advertiser, 6 December 1859: 3).

The Victorian Contractors’ and Builders’ Price-Book of 1859 had its origins as much in the great social and economic changes brought by the gold rushes in 1851, as in the difficulties faced by builders and contractors attempting to tender. In the preface to his new book, Mayes (1859) stated that the contractors and builders of Melbourne and Geelong had little occasion for a price-book before the gold rushes began. According to Mayes there had been a ‘comparative scarcity of good buildings’ until 1851, a situation which was changing rapidly with the erection of ‘well-built, lofty, brick and stone houses, many equal to the best buildings of provincial towns in Britain’ (Mayes 1859: 3) This change in the ‘architectural features of the colony necessitated a corresponding change in the general rise in the wages of artificers’ (tradesmen) wages’, the opening up of roads and railways in the colony generally resulting in an increase in the wages of all classes of labourers, a situation which would peak in 1854, with excessive labour costs and a business recession. In arriving at an estimate of the cost of work, contractors and builders were unable to arrive at an approximate valuation or estimate, their ‘general resort’, according to Mayes, ‘being the London Price-Books for London work, or work common to London, with the colony, and for colonial work, or work peculiar to the colony, either to some colonial precedent or to more dearly bought colonial experience’.

Mayes’ publication was intended to resolve these difficulties based on the use of Constants, i.e. the time required to perform a certain quantity of work, which would enable changes in wages and the length of the working day (8-10 hours) to be taken into account separately to the cost of materials. A review of the book in September 1859 noted that it gave ‘a universal and permanent price-list for labour only; [and] the Melbourne price of materials for 1859 in all branches of the building trade’ as well as an abstract of the Melbourne Building Act of 1849 (The Argus, 15 September 1859: 5). In setting out the price-lists, Mayes gave the ‘Cost of Labour only [as] equal to wages of [e.g.] carpenter, per hour, multiplied by [the] Constant or time given’. The Constants given in the last column were headed Hrs. & 12ths (i.e. 5 minutes) or s. & d. (shillings & pence) at 1s per hour, so enabling anyone to calculate the cost of labour by multiplying the Constant given by the rate of wages per hour. If a price including ‘all materials’ was required the cost of the materials to be used was simply added to the cost of the labour. According to Mayes, his Constants were calculated from Skyring’s Builders’ Prices, although his own prices could sometimes be higher, reflecting colonial conditions. In addition, according to Mayes (1859: 4-5), although the price-books of Skyring, Weale and Laxton generally agreed on prices, price-books by Taylor and Skyring required revising almost every year, a consequence of the pricing system, one which combined materials and labour costs into a single sum, as opposed to Mayes’ price-book, with its use of Constants.

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**Figure 3:** Example of the tabular use of constants by Mayes in The Victorian Contractors’ and Builders’ Price-Book, published in Melbourne in 1862 (courtesy National Library of Australia).
In expanding the method, and its origins, Mayes (1859) stated that his book was compiled chiefly from: Skyring’s Builders’ Prices, a London price-book, corrected to 1851, with several pages from Weale’s The Builders’ and Contractors’ Price-Book for 1857; The Student’s Guide to Measuring Artificer’s Works by E. Dobson, 1852-53 edition; and various editions of Laxton’s Price-Book. Mayes also made reference to other texts of the period, namely the work of Peter Nicholson on Constants, cited by Joseph Gwilt under the heading of ‘Measuring and Estimating’ in his Encyclopaedia of Architecture (2nd edn, 1851), in identifying Constants as an important part of estimating. Although these imported price-books and treatises were available in the Australian colonies in the 1850s, Mayes’ price-book featured advertisements by Australian firms, for Australian and imported materials, and an abstract of the Melbourne Building Act of 1849, making it commercially and professionally more relevant. Nevertheless, Mayes’ price-book owed much to the standards and prices set out as early as 1845 in Skyring’s Builders’ Prices (25th edn, 1845), a fact made clear by Mayes in his price-book.

In October 1862 Mayes revised The Victorian Contractors’ and Builders’ Price-Book as The Australian Builders’ Price-Book. The new and expanded price-book, published in Melbourne, was available in Brisbane, as well as the previously listed towns and cities in the Australian colonies. In addition, the 1862 edition was entered at Stationer’s Hall, London, for sale in Great Britain and the colonies. In particular, Mayes noted in the revised edition that a great many misunderstandings arose in measuring and estimating due to the fact that architects and builders came from many different backgrounds and countries, including America, Germany, Italy and Great Britain, something that Mayes (1862) saw his price-book as accommodating with a clear set of rules for measurement.

In the front of his price-books of 1859 and 1862, Mayes described himself as a Civil Engineer and Architect. However, the 1862 edition included a one-page circular before the preface to the effect that ‘Mr Mayes is prepared to take out quantities, and to compile Estimates of every description of engineering or architectural works, in any part of Australia, on commission or otherwise’. A copy of a letter, dated 9 November 1859, from the Victorian Builders and Contractors Association, in his revised book of 1862, confirmed the value of his first publication. The letter stated that the Association ‘believe it to be well adapted to the requirements of this colony, where labour varies so much, they will endeavour to make it a standard work for the guidance of the Association’. Similarly, the South Australian Association of Architects, Engineers and Surveyors considered, in its letter of 22 June 1860 to Mayes that the system upon which the price-book was based was ‘exceedingly good, and such as fits it for adoption in this or any other Colony’ (Mayes 1862, pp. xv, xvi).

On 30 September 1862, when his position was no longer required due to the ‘Railway works being so far advanced’ Charles Mayes duly received compensation for the ‘loss of Office’
with the Victorian Railways Department (CSA, NCSA, Item number 26-108-439). Mayes subsequently moved to Sydney due to the decline in railway construction in Victoria after 1862, with employment opportunities in the private sector limited by increasing competition from the growing ranks of civil engineers, architects and surveyors.

**New South Wales**

Although railway construction had started in NSW in 1850, in Sydney, under the Sydney Railway Company, it was not until 1863 that the line reached the Nepean River. However, it would not be for another 6 years that the first main line crossed the Blue Mountains to Lithgow, the line reaching Bathurst in 1873 (Lee 2003).

By April 1863 Mayes had moved his practice to Sydney, where, by the end of 1864, he would establish himself as someone able to deliver reliable bills of quantities and estimates and had put himself forward as one of Sydney’s first dedicated quantities surveyor (*The Sydney Morning Herald*, 6 April 1863: 69, 20 May 1864: 8). The Australian edition of his price-book would be revised many times; in 1877, 1883 (fourth edition), 1886, 1891 (sixth edition), 1907, 1908, 1914, 1927 (10th edition), 1938 and 1951 (11th edition). The 10th edition was registered in Canberra in 1927 by his son, Charles Ernest Mayes, a contractor, under Commonwealth statutes, to protect the Mayes’ family’s intellectual copyright. According to Hobbs (2011) the price-book would became a building industry standard in the nineteenth and early twentieth centuries, the last edition, *The Australian architects and builders and contractors price-book and guide*, being printed in 1951 in Sydney by Charles Ernest Mayes’ eldest son, Phillip Mayes, a builder and contractor.

The appointment of James Barnet, of British background, as Colonial Architect in New South Wales would have similar benefits to those which had followed the appointment of William Wardell in 1859 in Victoria. In addition to the restructuring of his department, Barnet, according to Reynolds (1972) recognised the need for quantities surveyors on his staff in 1865. However, as a private practitioner, Mayes would be limited to the preparation of bills of quantities and estimates for contractors and builders, on government works in NSW, as well as his own architectural commissions. Government projects for which he prepared bills of quantities for contractors included: the Brewery Bridge, Goulburn; the Government Jetties at Mort’s Dock; Callen Park Lunatic Asylum; and Montague Island Lighthouse (*The Sydney Morning Herald*, C. Mayes advertises ‘quantities prepared’, 10 December 1877 to 14 October 1884).

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**Charles Mayes, Quantities Surveyor,**

Supplied Quantities to the leading Contractors of New South Wales, &c., from 1863 to 1888, and intends to resume practice, on the terms and conditions recognised by the Profession.

Temporary Office at his residence:

41 St. Mary St., Camperdown.

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*Figure 5:* Advert placed by Charles Mayes in the 1891 edition of *The Australian Builders’ (and Contractors’) Price-Book*, published in Sydney (courtesy National Library of Australia).
Although Hobbs (2011) concluded that Mayes did not achieve immediate acceptance in Sydney, his commissions over the period from 1863 to 1884 included speculative housing, schools and hotels as well as the small town hall in Hunters Hill and a rural villa as far south as Ulladulla. However, Mayes was not shy about becoming involved in projects which might lead to future work. Of particular note, according to Hobbs (2011), was his involvement in the survey and discussion of possible water sources for Sydney in 1869, which would eventually lead to the Nepean River water supply scheme for Sydney, commissioned in 1888.

In 1868, with his fellow architects, Mayes had objected to the manner in which the Mayor and Corporation of Sydney had established the competition for the new Sydney Town Hall. Three years later, in 1871, he was, not surprisingly, unsuccessful in applying for the City Engineers position as well as employment as a salaried Quantity-Surveyor with the City of Sydney. Seemingly rejected, according to Hobbs (2011), Mayes left Sydney and went to Hill End in late 1871, following the discovery of gold, where he worked as a mining engineer and mine manager. Returning to Sydney, he was appointed in June 1873 as a Trial Railway Surveyor by the NSW government, Mayes worked successfully in the New England and Riverina regions before returning to architectural practice in Sydney by June 1877. Ironically, his last trial survey, from Junee in the Riverina, ended at Narrandera only some 200 km from Echuca.

In his biography, Hobbs (2011) has shown that Mayes was clearly influenced by the Building Act of 1849 and the Health Act of 1854 in Victoria, taking every opportunity to influence urban planning and health and sanitation outcomes in NSW. Elected a Fellow of the Institute of Architects of New South Wales in 1883, Mayes had been a founding member in 1871 and was one of the first members of the New South Wales Institute of Surveyors, formed in Sydney in 1880. However, in 1884 he resigned from these professional bodies having taken a government contract, with his son Charles Ernest Mayes, to build Petersham Reservoir, completed in 1886. According to Hobbs (2011) father and son would work together on a number of contracts, Charles Mayes demonstrating his understanding of the roles of contractors, architects and quantities surveyors in moving successfully and profitably into contracting. In 1888 he retired from business to his home in Camperdown, where he would die in June 1899, his first wife Elizabeth having died in April 1890 (Hobbs 2011).

Conclusion

Charles Mayes’ professional life in the Australian colonies encompassed important phases of mining exploration and urban development, as well as the construction of municipal services and railways in both Victoria and New South Wales. However, his career, at the interface of the civil engineering, surveying and architectural professions, was dominated at times by his skill in preparing estimates and bills of quantities. In this respect, Mayes’ Victorian Contractors’ and Builders’ Price-Book had capitalised on his skills and on the need for a standard on which to estimate and tender and was the first colonial attempt to establish such a standard, one that was suitable to the colonial economic cycle.

However, although Mayes had used the term ‘Quantity-Surveyor’ as early as July 1871 (CSA, NCSA, Item number 26-110-808), the profession of quantity surveyor would not be formally recognised until 1908, when an Association was formed in New South Wales (The Sydney Morning Herald, 16 June 1908: 3). Nevertheless, it is concluded that, through his rigorous approach to bills of quantities and estimates and through his price-books, Mayes contributed significantly to the quality of estimating and tendering in the Australian colonies and hence to the formation of the Australian quantity surveying profession.
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