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**Architectural Terra Cotta in Central Canada
and its Links with England and the United States**

by
Barbara J. McMullen, M.A.

A thesis submitted to the Faculty of
Graduate Studies and Research in partial fulfillment
of the requirements for the degree of
Master of Arts
in Canadian Studies

Carleton University,
Ottawa, Ontario
September, 2001

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**“Architectural Terra Cotta in Central Canada and its
Links with England and the United States”**

submitted by Barbara McMullen, B.A., M.A.

**in partial fulfillment of the requirements for
the degree of Master of Arts**


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Abstract

This thesis examines the use, manufacture, and supply of architectural terra cotta in central Canada in the late 19th and early 20th centuries. As a context, it also examines its use and manufacture in England and the United States. Exploring cultural, architectural, social, and technological movements that precipitated its use in England and North America, the historical perspective underlying this thesis is fundamentally social.

The thesis argues that terra cotta's use in central Canada was influenced by its revival in both England and the U.S. It also proposes that distinct differences were reflected in its use, appearance, and the degree of its acceptance in central Canada, reflecting Canadian values and culture. Terra cotta is viewed as an adaptable, transitional material with a wide range of appearances and uses, fascinating both the arts and crafts movement and architects interested in new forms of modern construction.

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Introduction

The clay, being ductile, lends itself to all softness of line; being easily frangible, it would be ridiculous to give it sharp edges, so that a blunt and massive rendering of graceful gesture will be its natural function: but as it can be pinched, or pulled, or thrust in a moment into projection which it would take hours of chiselling to get in stone, it will also properly be used for all fantastic and grotesque form, nor involving sharp edges. Therefore, what is true of chalk and charcoal, for painters, is equally true of clay, for sculptors; they are all most precious materials for true masters, but tempt the false ones into fatal license; and to judge rightly of terra-cotta work is a far higher reach of skill in sculpture-criticism than to distinguish the merits of a finished statue.¹

The words of influential critic and designer John Ruskin, expressed well over a century ago, have renewed meaning today in what appears to be a revival of interest in the arts and crafts in architecture, especially in the use of terra cotta as a building material. This renewal has been demonstrated in recent years through terra cotta's use in conservation and new-build projects in both the United States and England. There are also indications in Canada of a growing recognition of terra cotta's architectural role in the development of some of its major cities during the late 19th and early 20th centuries. This was reflected in part in the 1997 designation of Winnipeg's Exchange District as a National Historic Site, which contains a significant number of terra cotta buildings constructed during a period of rapid expansion in the early 20th century.²

The Toronto Region Architectural Conservancy's 1990 survey also identified numerous terra cotta buildings in Toronto, along with others elsewhere in Ontario mostly

¹E. Cook & A. Wedderburn, eds., The Works of John Ruskin, Lectures on Art & Aratra Pentelici, 1870 (London, 1905), 311.

²D. Johnson, "The Exchange District, Winnipeg, Manitoba", Historic Sites & Monuments Board of Canada Agenda Paper # 1996-26, 776, noted that Canadian architectural historian Robert Hill stated the district contains "a collection of terra cotta and cut stone buildings unrivalled in the world", cited from D. Lasker, "Winnipeg's Warehouse District," in Western Living, Vol. 1, No. 2 (April 1984), 19.

drawn from communities with active Architectural Conservancy of Ontario branches. As pointed out by the Toronto Conservancy in their report, there is likely no other building material that is so often overlooked and inaccurately identified. This lack of recognition or "cultural blind spot" is attributable to a number of factors, including terra cotta's almost infinite adaptability as a building material, its frequent lack of acknowledgement by those who used the material, possibly due to a lack of conviction of its advantages and qualities, and even the possible existence of a prejudice against the material.³ This thesis represents a first scholarly attempt to address terra cotta's virtual invisibility in central Canada, both as a building material and in architectural history literature, and to examine terra cotta's role in the growth of its cities, along with its historic context and cultural legacy, particularly movements and traditions associated with its use in England and the United States.

Terra cotta, generally meaning baked earth, is one of the world's oldest building materials, used for architectural purposes as early as 3200 B.C. in ancient civilizations. In the middle of the sixth century B.C. in Italy, it was used in the form of highly ornamental roof plaques, called antefixes, that were placed among the roof eaves to provide wind and weather protection for other building features or materials.⁴ Historically, terra cotta's use architecturally has occurred sporadically, enjoying popularity for relatively brief periods, then often interrupted by gaps of several centuries. Red terra cotta was used extensively together with red brick in northern Italy during the 14th and 15th centuries, at least in part due to regionally rich resources of suitable red-burning clay beds and an absence of nearby stone. The della Robbia family in Italy also mastered the art of enameled terra cotta in brilliant colours during the mid-15th century.

³The 1990 survey did not include the City of Ottawa since it does not have an A.C.O. branch. Toronto Region Architectural Conservancy, Terra Cotta Artful Deceivers, (Toronto, 1990), 2; A. Keefer, "Hidden in Plain Sight", *ibid.*, 5-7.

⁴R. Knoop, Antifixa Satricana: Sixth-Century Architectural Terracottas from the Sanctuary of Mater Matuta at Satricum, (Netherlands: Van Gorcum, 1987), 2, 11. Terra cotta's use at this time is believed to be the work of specialized artisans travelling in workshops, carrying moulds from distant places.

This thesis examines the use, manufacture, and supply of architectural terra cotta in central Canada in the late 19th and early 20th centuries. As a context for its use in Canada, this thesis also examines the terra cotta revival in England and its use and manufacture in the United States. Terra cotta is a key material in understanding the transition between pre-industrial and industrial production methods and building technology.⁵ It both fascinated the arts and crafts movement and appealed to architects interested in emerging forms of modern construction. Its manufacture was an extremely complex process involving highly skilled artisans and the careful processing of a select mix of clays over a lengthy period. Terra cotta had an almost infinite variety of uses, visual forms and appearances, often imitating other materials, in an effort to respond to evolving architectural and construction trends.

The term *architectural terra cotta*, as defined in this thesis, is a material used to decorate, shape and/or construct buildings, made

from a combination of ceramic materials skillfully selected and blended to produce a well-fired homogeneous material which if used correctly has a long-proven resistance to the worst excesses that weather and urban air pollution can offer.⁶

Architectural terra cotta is also typically hollow and hand pressed in a mould. Terra cotta's use as an exterior building material until the late 1880s in England, and the late 1890s in North America occurred mainly in an unglazed form as a decorative material. Thereafter and during the early 20th century terra cotta was used largely in a glazed form, referred to as glazed terra cotta in the U.S. and Canada, and as faience in England. Glazed terra cotta

⁵J. Smith, in Material Culture. Heritage Conservation Workshop, Winter Term 1998, Carleton University, Ottawa, Ontario.

⁶M. Weaver in Conserving Buildings. Guide to Techniques & Materials. (New York: John Wiley & Sons, 1993), 109. This definition is also consistent with J. & N. Ashurst, Practical Building Conservation, English Heritage Technical Handbook, Vol. 2, (England: Gower Press, 1988), 66; J. Fidler, "The Manufacture of Architectural Terra Cotta & Faience in the United Kingdom" in The Association for Preservation Technology Bulletin (hereinafter, APT Bulletin), Vol. XV, No. 2, 1983, 28; and R. Mack, "The Manufacture and Use of Architectural Terra Cotta in the United States" in H. Jandl, The Technology of Historic American Buildings (Foundation for Preservation Technology, 1983), 117.

was used with steel skeleton construction, first as a hollow exterior cladding material and later as a thin veneer unit. Terra cotta also served as a highly effective interior fireproofing material for protective and constructional purposes in England and North America. After about 1900, polychrome terra cotta, involving the use of multiple coloured glazes, achieved popularity in the U.S., and was used to a lesser extent in England. Polychrome terra cotta appeared much more frequently in the U.S. than in Ontario and Quebec, where its existence today could be considered as rare.

Terra cotta was first used in a significant manner in England in the mid-1860s and in the U.S. in the early 1870s, with both movements waning by the late 1930s. England's revival began much earlier with Coade Stone, a form of terra cotta made from the late 18th to early 19th centuries, exported to a limited extent to both the U.S. and Canada. In the early years of its revival, especially in England and the U.S., terra cotta imitated stone, as did a number of other materials. During the peak of its use in England, the U.S., and in Canada, terra cotta truly achieved an expression in its own right. Glazed terra cotta imitated marble, even granite. Carraraware, a glazed product imitating Carrara marble, made by the Doulton Co. in England, enjoyed popularity in central Canada during the early 20th century. Terra cotta was often the subject of great controversy and debate, at times causing strikes by stone masons. It often elicited praise of its aesthetic and artistic advantages by those who used or made it, and criticisms by others who viewed it as excessive ornament.

The terra cotta revival in England and its use in the United States were accompanied by similar, but distinct, interrelated cultural, architectural, and industrial patterns. From an architectural perspective, the British revival was strongly influenced by the 15th century use of terra cotta and brick in northern Italy, as well as its use in early 19th century Germany. The terra cotta revival in England stemmed from the interest in integrating architecture with the arts that characterized the Renaissance, and was closely associated with the British Arts and Crafts movement along with other fictile materials, including tiles,

mosaics, and cut or rubbed brick. John Ruskin, whose ideas and writings influenced the Arts and Crafts movement, valued terra cotta's plastic, sculptural qualities as well as its hand-craftsmanship by highly skilled modellers. Terra cotta's connections with the arts and crafts spanned virtually the full breadth of its revival, reaching from mid-19th century England through its flourishing in the U.S., having implications for its use in central Canada in the late 19th and early 20th centuries.

Purpose of this Thesis

The evolution of Canada's architectural styles, its culture and values, the use and development of building materials, and the growth of its towns and cities were all influenced significantly by both Britain and the United States. It could be expected that terra cotta's use as a building material in central Canada would reflect these general patterns. Architectural terra cotta emerged in central Canada not long after Confederation during a period when Canada faced the challenges of building a nation and its industrial base, and the rapid growth of its towns and cities. Its use also coincided with a time when Canadian architects were struggling not only with their own professionalism, but with an architectural identity that could be considered distinctly Canadian.

Terra cotta merits study since it played an important role in the architectural development of central Canada. From its small towns to its major urban centres, some of central Canada's finest architecture, built mainly during the 1880s to pre-World War I period, displayed terra cotta as a decorative or cladding material. Terra cotta also deserves study since its use in Canada during the late 19th and early 20th centuries has gone almost unrecognized due to a virtual lack of its identity and an understanding of its varied forms and characteristics. Finally, terra cotta merits examination since no extensive academic study has been undertaken of its use, manufacture and supply in central Canada and its

links with England and the United States.⁷ A 1991 dissertation by Wells made an important contribution to Canadian literature through its focus on conservation and the causes of deterioration and failure, discussing several Canadian terra cotta restoration and replacement case studies.⁸ A small number of articles have also been published in professional journals, including a brief discussion of terra cotta's use and manufacture in Canada⁹, and others mainly addressing the use of terra cotta in individual buildings.

This thesis argues that the use of architectural terra cotta in central Canada in the late 19th and early 20th centuries was influenced by the terra cotta revivals in both England and the United States. It also argues that distinct differences were reflected in terra cotta's use, appearance, and the degree of its acceptance in central Canada, reflecting Canadian values and culture. Exploring a convergence of cultural, architectural, social and technological movements that precipitated the use of terra cotta in England and North America, the historical perspective underlying this thesis is fundamentally social. It represents a broad attempt to identify architects and other designers who made frequent use of terra cotta and their clients, the manufacturers and skilled modellers who made it, and others who advanced its use in central Canada.¹⁰ It also attempts to identify links between Canada and England or the U.S. and other factors that may have prompted or detracted from its use in central Canada. It further aims to identify a broad sampling of specific architectural uses of

⁷K. Crossman, in Architecture in Transition: From Art to Practice, 1885-1906, (Kingston & Montreal, McGill-Queen's Press, 1987), 165, footnote 51, observed "The introduction and use of terra cotta in architecture at the end of the nineteenth century is a subject worthy of study on its own."

⁸L. Wells, "Terra Cotta in North America", unpublished master's thesis, Institute of Advanced Architectural Studies, Conservation Studies, University of York, England, 1991. Wells also provided a broad overview of the history of terra cotta in North America, and illustrated two terra cotta manufacturers' catalogues along with several Canadian buildings using Doulton Co. terra cotta.

⁹See T. Ritchie, "Terra-Cotta in Canada", in The Canadian Architect (August, 1970), 55-57.

¹⁰John M. Weiler described his unpublished dissertation, Army Architects: The Royal Engineers and the Development of Building Technology in the Nineteenth Century, 1987, University of York, xiii, as "a social history of technology". Richard F. Veit, Jr.'s unpublished dissertation, Skyscrapers and Sepulchers: A Historic Ethnography of New Jersey's Terra Cotta Industry, 1991, Univ. of Pennsylvania, 1, was an anthropological approach in examining New Jersey's terra cotta industry, focusing on understanding "the people who made terra cotta and deciphering what it meant to them."

terra cotta, reflecting its role in the evolving built form of a number of central Canada's major towns and cities.

Chapter one examines the history of the terra cotta revival in England, tracing early Italian influences and terra cotta's context in England's expanding industrialization and emerging arts and crafts movements. The first chapter highlights the role of terra cotta's use at South Kensington in London for its later flourishing in England. Terra cotta's use by a number of British architects in an evolution of styles is examined, evolving generally towards greater freedom and eclecticism. The development and use of faience is discussed, along with the use of glazed architectural ceramics in a specific set of building types. Chapter one also identifies terra cotta's perceived advantages from a British perspective, setting a base for comparison with the U.S. and central Canada. The first chapter finally identifies the influence of geological factors on the establishment of a number of major British terra cotta manufacturers.

The second chapter traces the evolution of terra cotta's use and manufacture in the United States, highlighting its links with England and first significant utilization in the Boston Museum of Fine Arts. Chapter two examines terra cotta's initial flourishing and manufacture, along with its use in several major eastern and mid-western cities by several prominent architects. It provides further insights into terra cotta's vernacular use, as well as the skills and ethnicities of terra cotta manufacturers, modellers and workers. Terra cotta's advantages from an American perspective are also identified, and the chapter concludes with a discussion of the U.S. manufacturing industry and the effects of its organization.

The third chapter examines the use of architectural terra cotta in central Canada, defined as Quebec, Ontario, and that part of Manitoba west to, and including Winnipeg.¹¹

¹¹The development Ontario and Quebec in the late 19th century were influenced by similar settlement, transportation, and industrial patterns. Winnipeg's rapid growth mainly resulted from the extension westward of the railway system, easily accommodating the transport of building materials from Ontario, Quebec and the U.S. Evidence in this research indicated little use of terra cotta in Nova Scotia.

Chapter three reveals that terra cotta's emergence as a building material in central Canada was virtually unrecognized in contrast with its much more celebrated entries in England and the U.S. This thesis pushes back terra cotta's point of entry in central Canada from 1884¹² as previously documented by historians, to 1876.¹³ Terra cotta's use in the development of several central Canadian towns and cities is discussed, highlighting its extensive use in the Perth County Court House in Stratford. Chapter three examines terra cotta's advantages from a Canadian perspective, along with the role of several architects who often used the material, the pro-active stance for Canadian-made terra cotta by a Toronto manufacturer, and the significance of a debate in central Canada about tall buildings. Chapter three identifies late 19th century Ontario brick and terra cotta manufacturers, as well as major U.S. and British terra cotta suppliers in central Canada in the early 20th century. It concludes with primary evidence documenting the difficulties of one major U.S. manufacturer in competing with other manufacturers for Canadian terra cotta contracts, discusses the estimating process, and identifies the manufacturers of more than sixty Canadian projects built between 1912-1919.

This thesis demonstrates the vital role of terra cotta in the development of central Canada's late 19th and early 20th century architecture, making an important contribution to its identity, distinctive from its use in both the U.S. and England. It indicates the potential for further research concerning the works, products and owners of late 19th century Ontario brick and terra cotta manufacturers, the links of Canadian architects and manufacturers with England and the U.S., and terra cotta's use both in central Canada after

¹²The William Lailey residence in Toronto, built in 1884, designed by Edward James Lennox, was previously reported as Ontario's earliest known use of terra cotta. TRAC, 1990, 19; L. Maitland, The Queen Anne Revival Style in Canadian Architecture, (Ottawa: Minister of Supply and Services, 1990).

¹³As discussed in Chapter III, T. M. Clark in Ottawa obtained a patent for white brick and terra cotta in 1876. Prior to, or in 1884, in addition to the Lailey residence, terra cotta was used in the residences of B. Cronyn Jr. (1880-82) and J. Labatt (1882-84) in London, Ont., the R. Simpson residence (1883) in Toronto, and J. Wiser's residence (c. 1884) in Prescott, Ontario.

1919¹⁴ and in western Canada. This thesis not only adds to a small body of existing literature on the use and manufacture of terra cotta in central Canada, but contributes a significant social dimension. It also places terra cotta's use, manufacture, and supply in central Canada in the context of its revival in England and its flourishing in the United States.

¹⁴As evidenced by the TRAC survey, the NYATCC Archive and other sources, the use of terra cotta in central Canada after 1919 was limited although some evidence indicates the 1920s-30s deserve investigation. H. Kalman, A History of Canadian Architecture, Vol. 2, (Toronto: Oxford Univ. Press, 1994), 761-7, reported terra cotta's use on the Toronto Star Building (1927-9, demolished) in Toronto. R. Lemire & D. Pigeon, "Le Terra Cotta: Un Matériau de Construction Oublié", in Bulletin of the Society for the Study of Architecture in Canada (SSAC), Vol. 76, no. 2 (August, 1981), 5, reported the 1937 Woolworth Co. Building in Montreal made use of glazed terra cotta. Later use of terra cotta particularly occurred in the development of western Canada, such as in the 1929-30 Marine Building in Vancouver.

I. The Terra Cotta Revival in England

Although produced in London as early as 1769 in the name of Coade Stone, terra cotta's revival in England was first marked in a significant manner by its extensive decorative use with brick in the 1860s at the South Kensington Museum in London in a distinctive style based on northern Italian Renaissance architecture. Terra cotta reached the peak of its revival in England in the late 1880s during an extended period of rapid growth in some of Britain's largest cities. The success of this revival was associated to a significant extent with the Victorians' attraction to decoration, which was fostered by the Arts and Crafts Movement, along with their interest in eclecticism. A desire for greater architectural freedom also brought an increasing variety of "free" styles which often made frequent use of terra cotta. By the late 19th century the eventual abundance of these styles and a growing distaste for heavily decorated buildings coalesced with a growing preference for classical architecture. Modern construction forms encouraged the development and use of faience products in a specific set of building types, often used as an expression of identity, beginning in the late 19th and continuing into the early 20th centuries.

The history of the British revival of terra cotta and faience is best prefaced by an understanding of the influence of Italian craftsmen and architecture in England in the early 1500s, of the production of terra cotta by the Coade Manufactory, and by terra cotta's limited use in the early 19th century in neo-classical forms and the Gothic Revival style.

Early Italian and Neoclassical Influences

Early 16th century England was characterized by a new movement that brought about marked changes in British architecture, art, science, literature, and religion. The

influence for much of this change in both architecture and in art was the Italian Renaissance and the presence and work of Italian craftsmen in England in the early 1500s. The reign of Henry VIII, a patron of the arts, directly encouraged the employment of Italian craftsmen in England and the use of Italian skills to model terra cotta for British-designed domestic Tudor architecture.¹⁵ Italian Renaissance influence on English architecture at this time was confined mostly to the south of England and largely limited to terra cotta ornamentation of exterior surfaces, including tracery, plaques, or busts.¹⁶ Much of this work is believed to have been designed by highly skilled Italian artists and sculptors.¹⁷ The reintroduction of brickwork during the Tudor period in England, particularly in domestic architecture, also brought with it the decorative use of cut brick in diaper patterns, sculpted chimneys, and in other features.¹⁸

The use of terra cotta at Hampton Court Palace in Middlesex (1515-1520), in the form of busts of emperors in roundels over the entrance, is a well-known example of its use in Tudor architecture. The terra cotta modelling was executed by Italian sculptor Giovanni de Majano, commissioned by Henry VIII to carry out this work.¹⁹ (Figure 1.1) Terra cotta was used extensively at Sutton Place in Surrey (1523-25) in the form of pointed windows, Gothic tracery, and winged cherub ornament.²⁰ Along with the influence of Henry VIII, the owners and builders of such houses, who were knowledgeable of foreign

¹⁵J. A. Gotch, The History of The English House (London, 1985), 126-7.

¹⁶R. Blomfield, A History of Renaissance Architecture in England 1500-1800 (Lon, 1897), 21. Richard Glazier, A Manual of Historic Ornament (London, 1906), 73, stated the first important terra cotta work occurred in the tomb of John Young in the Rolls' Chapel, completed in 1516.

¹⁷Although several sources noted the high quality of the terra cotta in this period, G. Hollis and D. Moffatt, "Architectural Terracotta in Britain", British Ceramic Transactions, Vol. 91 (5), 1995, 167, viewed it as being crudely manufactured and susceptible to frost damage, facilitating its demise.

¹⁸American Face Brick Association, English Precedent for Modern Brickwork (New York, 1924), 87-88, recorded that a fine example of 17th century brickwork was preserved in the Victoria & Albert Museum at South Kensington, consisting of a cut (or carved) brick pedimented capital.

¹⁹Blomfield, 2-3.

²⁰American Face Brick Association, 21. Most sources suggest the terra cotta at Sutton Place is of Italian influence and likely executed by Italian craftsmen; however, R. Brunskill, Brick Building in Britain (London, 1990), 69, stated recent research suggests this may have been the work of local craftsmen.

architecture through travel abroad, facilitated the transport of skilled Italian workmen and materials to England.²¹

The use of fine terra cotta work with brick was prevalent in northern Italy in the 14th and 15th centuries, especially in the Lombardy region. This tradition later played a significant role in the revival of terra cotta in England, particularly through the style adopted by the Royal Engineers at South Kensington in London. The development of architectural ceramics was also advanced significantly in 15th century Italy by the della Robbias, who had begun to produce superb glazed polychrome terra cotta panels and roundels for use as architectural decorations in Florence in 1442.²² (Figure 1.2)

The Italians left England after the death of Henry VIII, and after c. 1540 the use of terra cotta for architectural purposes virtually disappeared until the latter part of the 18th century when Coade Stone, a stone substitute and type of terra cotta, was introduced and used during the Georgian period. The Coade Stone Manufactory, operated by Eleanor Coade from 1769 until 1839 at Lambeth in London, produced a high quality, durable, smooth, stone-coloured product, used abundantly in London and exported abroad, manufactured and sold in a broad range of sculptural work and architectural detailing, and fired in small muffle kilns.²³ The Coade Manufactory employed highly skilled sculptors, including John Bacon and John De Vaere, both of whom had worked at the Wedgwood pottery, who modelled neoclassical designs that were often later used for mass production.²⁴ The British demand for neo-classical designs in Coade Stone reflected changes in attitudes which influenced the use and direction taken by architectural

²¹Blomfield, 350. Terra cotta was also used together with brick at the Layer Marney Tower at Essex (1500-1525), the Great Snoring Rectory, and the East Barsham Manor House (1500-1515).

²²J. Pope-Hennessy, Luca della Robbia (New York, 1980), 33. Luca della Robbia converted his sculptural work, formerly carried out solely in marble, exclusively to terra cotta in favour of its aesthetic possibilities, its durability, and its use as a relatively inexpensive sculptural material.

²³M. Stratton, The Manufacture and Utilization of Architectural Terracotta and Faience, Ph.d. dissertation (Birmingham, England, Univ. of Aston, 1983) Vol. I, 28-30.

²⁴Stratton, *ibid*, Vol. I, 30-31 noted that Bacon's choice of designs was astute, and that some of his moulds were apparently used for many years.

decoration, including an acceptance of the idea that current art was best inspired by ancient cultures, an appreciation for eclecticism, and the desire for a contemporary style based on the present. In Stratton's view, it was especially the latter

which became something of an obsession to the Victorians and which came to form a justification for the use of essentially new materials such as terracotta.²⁵

The St. Pancras' Church in London (1818-22) by H. W. and W. Inwood exemplifies the neo-classic architectural use of terra cotta during this period. Complete casts of the caryatids at the Acropolis were taken by the architects, then copied by modeller John Rossi in high quality terra cotta columns covering cast iron supports for the roof.²⁶ Terra cotta's main, although limited use in the early 19th century occurred in the Gothic Revival style in several churches near the Welsh border by both Thomas Penson and Edmund Sharpe, amidst considerable controversy. Sharpe's St. Stephen's Church at Lever Bridge in Lancashire (1842-45), a so-called 'pot' church, was constructed almost entirely of terra cotta, in exterior constructional blocks, elaborate repetitive moulds and window tracery, and in several interior elements, including pew-ends, a pulpit and organ case.²⁷ (Figure 1.3) The Ecclesiologist was highly critical of this "pretence and affected decoration", calling its use "subversive", implicitly reflecting a strong preference for stone.

Seriously we must protest against adopting such a material as cast-clay for a church. Whatever objection has been raised to cast-iron or to stamped wood applies also to this... We should almost prefer the honest ugliness of

²⁵Ibid., 18-19. Stratton discussed these value changes and concepts as identified by J. Summerson in his Architecture in Britain 1530 to 1830 (Middlesex, 1977), 407.

²⁶M. Stratton, The Terracotta Revival: Building Innovation and the Image of the Industrial City in Britain and North America, (London, 1993), 48. Stratton, *ibid.*, called the St. Pancras' Church the "most completely architectural use of terracotta within neoclassicism....". Rossi had also worked in the Coade factory but by this time had entered into partnership with James Bubb, who had also worked at Coade's.

²⁷Ibid., 50-52. Other churches in the Gothic style included Thomas Penson's Christ Church at Welshpool (1839-44), Penson's St. Agatha's Church, Llanymynech in Shropshire (1845), and Sharpe's Holy Trinity Church at Platt near Manchester (1846).

a red-brick building to the yards and scores of cast mouldings and crockets which compose... the church of Lever Bridge.²⁸

The cumulative effect of terra cotta's use for ecclesiastical purposes at this time led to its rejection by Gothic Revival advocates, and to terra cotta's status as a second-rate material, at least for the interim.²⁹ Yet it was through the adoption of the Gothic as a national style by the Arts and Crafts Movement, and the attraction of the latter for ornament that led to a pronounced revival of architectural ceramics in England some two decades later.

The closure of the Coade Manufactory in 1839 was closely followed by the founding of several other terra cotta firms, notably those of Mark Blanchard in 1839, and of John Blashfield in 1859, both of whom had worked at the Coade factory and purchased some moulds upon its closure. Blanchard's terra cotta products won medals at both the 1851 and 1862 Exhibitions. Blashfield has been described as likely the most influential early British individual in applying terra cotta as a structural building material.³⁰

Industrialization and the Arts and Crafts Movement

The founding of Blanchard's and Blashfield's works reflects England's increasing industrial base during this period. By about 1840 the country was undergoing the effects of expanding industrialization, along with growing pains associated with accelerating population growth, especially in its cities.³¹ Concerns were growing that lower artistic standards would preclude England's ability to compete with Europe economically, while

²⁸Quotations are from Ecclesiologist, Vol. 3 (February, 1844), 86-7, in R. Holley, "Edmund Sharpe and the 'Pot' Churches", in Architectural Review, No. 146, 1969, 427-31. The Ecclesiologist was published between 1841-68 by the Ecclesiological Society, a strong force in the Gothic Revival. J. Curl, A Dictionary of Architecture, (Oxford, 1999), 219.

²⁹Stratton, 1993, *ibid*.

³⁰Stratton, 1983, Vol. II, Appendix, 350-353. The Victoria and Albert Museum was one of Blanchard's early contracts; he also developed an extensive export trade. Blashfield eventually had the capacity to employ 500 workers; his works produced terra cotta for Dulwich College, and along with Blanchard, for the Wedgwood Institute.

³¹Greater London's population in 1801 barely exceeded one million, but by 1851 it had grown to nearly three million. A. Service, London 1900 (New York, 1979), 4.

many buildings in Britain's growing cities were beginning to show the effects of soot. Growing criticism of the impacts of new industrial techniques for the workman, along with a desire for a national design in architecture and the decorative arts to provide a British identity, coalesced in a social, economic and moral inclination characterized as the British Arts and Crafts Movement. The roots of this movement have been traced to the mediaevalism of Pugin, Ruskin and Morris, the 1851 Great Exhibition, and the 1836 Government Reports on industry and design. Among other potential remedies, the latter recommended establishment of Schools of Design.³²

Architect A. W. N. Pugin was the chief advocate of Gothic Revival architecture and in 1841 discussed the use of ornament and truth in materials in his influential The True Principles of Pointed or Christian Architecture. Pugin had a first-hand understanding of craftsmanship, but unlike Ruskin, believed in the use of "modern" mechanical devices.³³ Pugin's affinity for mediaeval design and objects encouraged the revival of encaustic tiles and ceramics. In partnership with Herbert Minton of Minton & Co. in the 1840s-50s, Pugin produced numerous designs for floor tiling. The 1851 London Great Exhibition included a display of Pugin's stove tiles in his "Mediaeval Court", along with exhibits of terra cotta made by Blanchard, Doulton, and sixteen other exhibitors.³⁴

John Ruskin, a British critic and academic, was influenced by Pugin's thoughts on ornament and by Gothic Revival architecture, and was also impressed by northern Italian decorative carvings and architecture. Ruskin's 1840s-50s writings on architecture and decoration were especially significant for the Arts and Crafts movement.³⁵ Ruskin was

³²I. Anscombe and C. Gere, Arts and Crafts in Britain and America (London, 1978), 7-8.

³³C. Wainwright, Pugin: A Gothic Passion (New Haven, Connecticut, 1994), 163-5. Pugin worked in a London cabinetry workshop in the 1820s, and in 1829 established his own furniture workshop.

³⁴P. Atterbury, "Catalogue of the Exhibition", in Wainwright, 314, 381-3; C. Barry (Jr.), "Some Descriptive Memoranda on the Works Executed at New Alleen's College, Dulwich....", Transactions of the Royal Institute of British Architects (RIBA), 22 June, 1868, 263, 272.

³⁵M. Swenarton, Artisans & Architects: The Ruskinian Tradition in Architectural Thought (New York, 1989), 2-16.

concerned about the effects of industrialization on workers' creative powers, and viewed decorative art as a form of communication with its own rules of composition.³⁶ The writings of both Pugin and Ruskin advocated the use of ornamental themes in the Gothic Revival style to create a clear identity, and to symbolize the authority of the British state.³⁷

Ruskin viewed clay as having specific advantages over the use of other materials, easily lending itself to sculptor's ideas, especially in soft curved lines and "fantastic and grotesque form", at times using terra cotta sketches in his lectures.³⁸ He cautioned, however, that although a valuable material in the hands of skilled modellers, in unskilled hands, the result could be fatal.³⁹ Ruskin would have viewed mass production of terra cotta as degrading to the craftsman, believing the use of machine-made or cast ornaments should be avoided wherever possible.

For it is not the material, but the absence of human labour, which makes the thing worthless; and a piece of terra cotta, or of plaster of Paris, which has been wrought by the human hand, is worth all the stone in Carrara, cut by machinery. . . . But for ductile and fusible materials, as clay, iron, and bronze . . . they become precious, or otherwise, just in proportion to the hand-work upon them, or to the clearness of their reception of the hand-work of their mould.⁴⁰

Ruskin's The Seven Lamps of Architecture, which devoted one chapter to principles essentially defining ornament and describing how it should be used, had considerable influence on the design of ornament and terra cotta in Victorian England.⁴¹

³⁶John Ruskin, The Stones of Venice, Vol. II (London, third edition, 1898), 150.

³⁷Anscombe and Gere, 7, 12.

³⁸E. Cook & A. Wedderburn, The Complete Works of John Ruskin, Vol. XXII, Lectures on Landscape, (London, 1906), 50. Ruskin used terra cotta to demonstrate clay's suitability to express realism, motion, and mystery.

³⁹Ruskin, 307-311. Ruskin expressed his like for uncoloured terra cotta, as well as his general dislike of then-contemporary terra cotta, as being "of very small art value".

⁴⁰John Ruskin, The Seven Lamps of Architecture, (London, 1907), 34-35, 56.

⁴¹Ibid., 103-49. For Ruskin, the most noble decoration depicted human form, followed in decreasing importance by imitated animals, flowers or vegetation, and stone. He argued fully represented, small forms should be placed closest to the eye, while more abstract forms should be viewed from a distance. He also argued that decoration should only appear in places where it could be calmly appreciated. Colour was acceptable when presented in natural form, holding to the principle of honesty in architecture.

William Morris, who was central to the British Arts and Crafts movement, frequently referred to Ruskin's ideas and writings. In 1861 Morris abandoned his architectural practice and launched the decorative design business known after 1874 as Morris & Co., along with a number of other associates, such as architect Philip Webb, whom he had met while working in the office of architect G. E. Street. Morris & Co. made fine handcrafted furniture, wallpaper, textiles, stained glass and decorated tiles, using designs by Webb, Morris, and such artists as William De Morgan, Daniel Gabriel Rossetti, and Sir Edward Burne-Jones.⁴² Morris's vernacular Red House (1856-60), designed by Webb in red brick with a tiled roof, was influential in the move for greater freedom in architecture. William Morris also established the Society for the Protection of Ancient Buildings in 1877 and inspired the founding of the Art-Workers' Guild in 1884, as well as the first Arts and Crafts Exhibition Society in 1888.⁴³

South Kensington and the Rundbogenstil

Weiler's dissertation on the role and impact of the Royal Engineers in the development of new materials and building technology argued that it was largely due to the design skills and pioneering work of Captain Francis Fowke that terra cotta played a significant role at South Kensington in London, strongly influencing and precipitating the revival of architectural ceramics in mid-19th century England. Fowke was a Royal Engineer who led a team of decorative artists and draughtsmen in the architectural atelier from 1856 to 1865 in the Science and Art Department, providing leadership in the creation of a distinctive style that was strongly associated with terra cotta as "the hallmark of the 'South Kensington' style". The fifteenth century northern Italian architecture that inspired Fowke and the Royal Engineers at South Kensington made extensive use of red brick

⁴²Swenarton, 68-69.

⁴³Curl, 436. Morris advanced the concept of conservation, as well as the appreciation of vernacular buildings.

along with red and fawn-coloured terra cotta ornament.⁴⁴ This architecture is exemplified by the church of the Certosa of Pavia, Lombardy (1396-1478), which had also inspired Ruskin. (Figure 1.4) The round-arched cloisters of this immense red brick church, now a national monument, are decorated with elaborate terra cotta detailing.⁴⁵ This round-arched style of Italian architecture was also related to the Rundbogenstil, a German term referring to all round-arched styles of architecture, essentially eclectic, based on Byzantine, Italian Romanesque and other styles.⁴⁶

The Rundbogenstil style, admired by German architects, such as Friedrich von Gärtner, Heinrich Hübsch, and Karl Schinkel, was being revived in Germany in the first part of the 19th century.⁴⁷ Schinkel became highly committed to the use of terra cotta and brick in round-arched architecture, frequently collaborating with Berlin terra cotta manufacturer Tobias Feilner to incorporate terra cotta into many of his projects. His Berlin Bauakademie (1831-36), for example, which housed an architectural school and reflected the round-arched style in an Italianate manner, demonstrated Schinkel's complete commitment to terra cotta through its allegorical panels representing the role in history and future civilization of painting, sculpture and architecture.⁴⁸ (Figure 1.5)

Lewis Gruner's timely 1867 publication, The Terra-cotta Architecture of Northern Italy strongly promoted the use of Lombardian round-arched 15th century architecture in

⁴⁴J. Weiler, "Army Architects: The Royal Engineers & the Development of Building Technology in the 19th Century", unpublished dissertation (Univ. of York, England, 1987), 279-81, 288.

⁴⁵American Face Brick Association, Brickwork in Italy A Brief Review from Ancient to Modern Times. (Chicago, 1925), 178, 201, 205. This source suggested an abundant supply of clay and a deficiency of stone in the Valley of the Po led to the extensive use of brick together with terra cotta in Lombardy, and that the manufacture of architectural terra cotta in this period was a flourishing industry in northern Italy, resulting in the extensive use of terra cotta, even on ordinary houses.

⁴⁶J. Curl, Victorian Architecture (London, 1990), 97-8; Curl, 1999, 574.

⁴⁷Stratton, 1993, 55-6.

⁴⁸Schinkel's Gothic Werdersche Church in Berlin (1824-30) featured a large terra cotta figure of St. Michael over the main entrance. B. Bergdoll, Karl Friedrich Schinkel: An Architecture for Prussia. (New York, 1994), 94, 186-193, 201-5. Stratton, The Terracotta Revival, 55, credited Schinkel as likely the first architect in the 19th century to admire terra cotta in his 1803 tour of Italy to study the use of brick.

England through its rich illustrations of 12th to 15th century northern Italian red brick and terra cotta buildings, highly praising the use of terra cotta in Italy.

In Italy the art of terra-cotta attained its crowning development during the prevalence of the Renaissance style, as noble monuments, both sacred and profane, attest. Then were produced very fine and beautiful ornaments in terra-cotta From the most celebrated architects who flourished along with Luca della Robbia, that pre-eminent modeller in terra-cotta, down to the period of the Renaissance, ceramic ornament invariably entered into the designs for buildings.⁴⁹

Professor Gruner was the artistic advisor to Queen Victoria's consort, Prince Albert, who was knowledgeable about Germany's use of brick and terra cotta since the 1830s.⁵⁰

The Museum of Construction and Building Materials at South Kensington, opened in 1857, was the product of England's Science and Art Department. Its primary functions were to carry out building research and serve as an education centre for construction technology. Both Captain Fowke and Sir Henry Cole, who was Secretary of the Department from 1858-73, had visited northern Italy and studied its buildings from an architectural style and building technology perspective.⁵¹ The Royal Engineers' use of terra cotta for decorative, structural and constructional purposes assisted considerably in establishing the material's credibility--not only in terms of its durability and cost advantages, but its position bridging technology with art and craftsmanship. Fowke made his initial use of terra cotta in the interior of the Sheepshanks Gallery (1856-57), in the form of a terra cotta shield. The latter served simultaneously to fireproof the gallery's cast iron girders, serve as a critical element in its ventilation, and to decorate its lower rooms.⁵² Weiler stressed that the 1855 Paris Exhibition figured critically in Fowke's experimentation

⁴⁹L. Gruner, ed., descriptive text by V. Ottolini and F. Lose, The Terra-cotta Architecture of Northern Italy (XIIth-XVth Centuries) portrayed as examples for imitation in other countries (London, 1867), 4. Gruner dedicated this book to Queen Victoria.

⁵⁰Stratton, *ibid.*, 55.

⁵¹Weiler, 279-288, 295.

⁵²*Ibid.*, 321, 324.

with terra cotta at South Kensington, quoting from his 1856 Report on Civil Construction to demonstrate his early interest in terra cotta.

This material has been used with success in France for external decorations and would seem to offer peculiar advantages for the same purpose in this country, more especially in localities such as London, where stone dressings are so expensive . . . Altogether there is enough to convince any one who may look into the subject that terra-cotta and earthenware may be brought with advantage to play an important part, both in the construction and decoration of our edifices of all classes and for all purposes.⁵³

Fowke worked closely with designer and modeller Godfrey Sykes to produce a variety of decorative designs in terra cotta for a number of buildings at South Kensington. Sykes, who became a close friend of Fowke's, had also been inspired by Italian architecture, was skilled in three dimensional design, and was master of the Sheffield School of Art. Together, they strongly influenced the expression of the distinctive style associated with the Department of Science and Art.⁵⁴

Fowke's and Syke's collaboration on the Victoria and Albert Museum (1864-6), also known as the South Kensington Museum, could be said to represent the most highly decorated and flamboyant use of terra cotta in Victorian architecture. The six Ages of Man columns supporting the deeply arcaded second storey of the Lecture Theatre Block were deeply modelled in alternating drums portraying animated figures, representing childhood, manhood and old age.⁵⁵ (Figure 1.6) The Victoria and Albert Museum also commemorated the 1851 Exhibition through a mosaic of terra cotta tesserae in the central pediment, displaying images of Queen Victoria and the Crystal Palace,⁵⁶ listing nations that participated in the exhibition, including Canada. (Figure 1.7)

⁵³BSP/1856/XXXVI/Part 3/673, *ibid.*, 280, 285, 297. Fowke attended the 1855 Paris Exhibition, becoming secretary of the British delegation, residing in Paris during that year. Cole attended the same Exhibition. Stratton, *ibid.*, 52-8 seemed inclined to give greater credit for terra cotta's use at South Kensington to Henry Cole, although emphasizing Cole's 1858 study of Italian Renaissance architecture.

⁵⁴Fowke and Sykes died within three months of each other. *Ibid.*, 283.

⁵⁵Stratton, *ibid.*, 59-60. Weiler, 326-7, also discussed Fowke's use of terra cotta in 1861 in the arcading of the Royal Horticultural Society gardens.

⁵⁶J. Barnard, The Decorative Tradition (London, 1973), 63.

The use of plain red brick and buff-coloured terra cotta on the upper part of the amphitheatre of the Royal Albert Hall (1867-71) at South Kensington reflected a departure from the tradition to date at the South Kensington complex in the use of Lombardic architectural ceramics to one more related to buildings constructed in stone.⁵⁷ At first it had been intended that the use of terra cotta in the Albert Hall amphitheatre would be sculptured; instead, terra cotta tesserae was again used, in buff figures set against a contrasting chocolate background.⁵⁸

The exhibition of ceramic products, including terra cotta made by Blanchard, Blashfield, and Gibbs and Canning, was a significant component of the Museum at South Kensington as early as 1860, promoting its durability and its superiority in cost as a substitute for stone. Fowke often acted as a prime spokesman for terra cotta's resistance to pollution, promoting it as the "best material for architectural decoration in large and smoky towns".⁵⁹ More than thirty-six exhibitors also displayed their terra cotta work at the 1862 International Exhibition in London.⁶⁰

Terra cotta's advantages in resisting the effects of pollution, its washable properties, and its rich colour potential were some of its major attractions for architect Alfred Waterhouse, whose Natural History Museum (1873-81) at South Kensington was one of his many buildings to utilize terra cotta.⁶¹ Terra cotta also appealed to Waterhouse as a modern economical material through its repetition of standard shapes, even though his experience with it at the Natural History Museum led him to recognize, and use terra cotta

⁵⁷Stratton, *ibid.*, 62.

⁵⁸Weiler, 325-6, described the involvement of a group of ladies in a mosaic class in assembling the tesserae decoration and the use by the Royal Engineers of photography in designing the frieze.

⁵⁹Weiler, 301-2, 322.

⁶⁰Barry, 272.

⁶¹In a lecture to Birmingham art students, Waterhouse commented on the irony that terra cotta was "made from clay found in the same pit as the coal which did the mischief. It seems the only building material which can successfully withstand its corroding influence." From *Building News* (1882), 245, in C. Cunningham & P. Waterhouse, *Alfred Waterhouse 1830-1905 Biography of a Practice*. (Oxford, 1992), 160, 162. Waterhouse had previously used terra cotta with brick on several occasions, such as at Easneye Park in 1866; on his own house at Foxhill (1866), and on the inside of the Town Hall at Manchester (1867-1868).

within its limits as a new material.⁶² The Natural History Museum was England's, and possibly the world's first building to utilize terra cotta as a facing material for the complete façade. Waterhouse chose a buff and blue-grey terra cotta colour scheme that had its precedent on the interior of Waterhouse's 1868 Manchester Town Hall, complemented by large, richly modelled terra cotta zoological figures peering down from the front of the building, reflecting the contents of the Museum. (Figures 1.8 and 1.9) Waterhouse's series of round-arched windows reflected more of a Romanesque than a Renaissance variation of the Rundbogenstil, although the ground and first floor units bore a resemblance to Fowke's earlier Renaissance design for the building.⁶³

The Natural History Museum revealed one of terra cotta's potential drawbacks—the potential for construction delays, especially with very large commissions. Although previous buildings at South Kensington had been supplied by more than one terra cotta manufacturer, only Gibbs and Canning was chosen for the Natural History Museum. Serious construction delays occurred, mainly due to terra cotta block defects in burning, creating inconsistent colour in the blue blocks. In addition to numerous design revisions, other problems were experienced since each unit was designed for only one location on the building, a common characteristic of terra cotta construction, although creating particular organizational challenges for a building of this size. The Museum opened in 1881, five years later than scheduled, although well received by the public despite these problems.⁶⁴

Like the Royal Albert Museum, the Natural History Museum also represented a shift from the earlier use of terra cotta with a form with which it was historically associated;

⁶²Ibid., 61.

⁶³M. Girouard, *Alfred Waterhouse and The Natural History Museum*, (London: 1981), 32, 42-45, 53. From another perspective, the advantage of the Romanesque for Waterhouse may have been that it was the style from which the Gothic had developed; thus permitting him to demonstrate his commitment to the Gothic Revival through simple traceried windows. Fowke had prepared designs for both the Royal Albert Hall and the Natural History Museum prior to his death.

⁶⁴Cunningham & Waterhouse, 160-61; Stratton, *ibid.*, 152-6. Girouard, *ibid.*, 36, indicated the Natural History Museum frontage measured 680 feet (207 metres). Gibbs & Canning had to add more staff and expand their facilities during the execution of the contract.

however, this time the shift was dictated mainly by Waterhouse's practice of focusing first on the purpose of the building, followed by a clear exploitation of terra cotta's expressive potential through colour, naturalistic sculpture, and repetitive decoration. Waterhouse in this way pointed toward a more free and liberal use of the material,⁶⁵ consistent with a larger transformation in the late 19th century which placed greater emphasis on a greater freedom in style and more imaginative forms of decoration.

Outside the complex of buildings at South Kensington, the use of terra cotta during the 1860s and 1870s was neither extensive nor consistent. Two buildings stand out from this period and demonstrate these differences. Robert Edgar and John Kipling's quattrocento design for the Wedgwood Institute (1863-73) combined the use of decorative brick, tiles, mosaic, della Robbia ware, and terra cotta panels and mouldings. The design and modelling of the story-telling terra cotta panels, supplied by manufacturers Mark Blanchard and John Blashfield, were the work of two national scholars from the Potteries School of Art: one set of panels, entitled *Process*, illustrated the pottery industry, while the other depicted the *Months of the Year*. The Wedgwood Institute's dramatic display of terra cotta became the object of criticism, however, again due to numerous construction delays, caused by the complexity of multiple manufacturing processes.⁶⁶ (Figure 1.10) The New Alleyn Dulwich College (1866-70) in London involved the collaboration of architect Charles Barry, Jr. and John Blashfield in a use of terra cotta more reminiscent of stone than architectural ceramics, reflecting Blashfield's like for highly detailed forms.⁶⁷ Barry was an enthusiastic supporter of terra cotta, having studied brick and terra cotta architecture in northern Italy. Barry presented a highly informative paper on terra cotta's history as well as its advantages at the 1868 meeting of the Royal Institute of British Architects, describing his use of terra cotta at Dulwich College as "a maiden essay", "full

⁶⁵Stratton, 1993, 77.

⁶⁶R. J. Morris and W. Wright designed and modelled the terra cotta panels for the Wedgwood Institute. Ibid., 63-65.

⁶⁷Stratton, *ibid.*, 67-69 commented that Dulwich College received few positive comments.

of defects and shortcomings", intended to lead others to "carry on the employment of terra cotta in England."⁶⁸

Free Gothic Liberalism and Queen Anne Eclecticism

Terra cotta reached its highest point in England in the mid-1880s. In addition to Fowke's leading role in the revival of terra cotta, its increasing use was influenced by Waterhouse's frequent use of the material, augmented by his professionalism and leadership within the British architectural community. Waterhouse, along with other architects such as Martin and Chamberlain, often used terra cotta in a "free Gothic" style for commercial and public buildings, combining Gothic with Renaissance, Romanesque or Rundbogenstil forms or details, clearly in an effort to integrate terra cotta's attributes in this approach.⁶⁹ During roughly the same period, a broad cultural, social and even moral reaction, that originated in the Arts and Crafts movement, rejected strongly Gothic forms in a search for a vernacular, more delicate architecture. The latter culminated in the emergence of the Queen Anne Revival style, which often combined terra cotta ornament with brick. The 'Queen Anne' literally thrived in a number of London's new suburbs, mainly with domestic and public buildings. Both architectural movements embodied greater freedom and eclecticism, largely embracing the use of terra cotta and architectural ceramics until around 1900, by which time Gothic idioms had become less acceptable and Classic forms were becoming increasingly desirable.

Seventeen of Waterhouse's numerous office building commissions for the Prudential Assurance Company characteristically combined red brick with a hard, bright red or pink terra cotta. Constructed between 1877 and 1901, this material and stylistic combination established Prudential's distinctive identity across England, associating terra

⁶⁸Hollis & Moffatt, 167-8; Barry, 259-279.

⁶⁹Stratton, 1983, Vol. II, 1, 33-36.

cotta with commercial success.⁷⁰ The four storey brick and terra cotta London corporate headquarters for Prudential Assurance on Holborn Street (1876-9) (Figure 1.11) exemplifies Waterhouse's design approach for these commissions, revealing Waterhouse's integration of traditional Gothic details in a strongly vertical, angular form. Waterhouse influenced the colour choice for terra cotta in the 1880s, with red coming into favour particularly for commercial buildings, schools, libraries and churches, frequently matched with pressed bricks. Although appearing to have a range of possible design solutions for commercial and public buildings, Waterhouse's use of terra cotta in a variety of sizes and decorative details seems to have served as his consummate choice to express strongly vertical forms and rich detail.⁷¹ Although apparently unrelated to the use of terra cotta, Waterhouse also provided "advice on terrace walls" to sculptor Marshall Wood in 1873 in relation to work Wood was undertaking in Ottawa, Canada.⁷²

Waterhouse's influence was also felt through his role as President of the Royal Institute of British Architects (1888-91) and his adjudication of public architecture,⁷³ such as the Birmingham Assize Courts competition. Also known as the Victoria Law Courts (1887-91), won by architects Aston Webb and Ingress Bell, the "Terracotta" entry was the first major public building to be faced entirely with deep red terra cotta, combining curved terra cotta ornament that contrasted with its otherwise strongly vertical, angular frame. Webb and Bell's design reflected their collaboration with several prominent artists and

⁷⁰Ibid., Vol. II, 35-58, 50.

⁷¹Stratton, *ibid.*, 23, 40-3. Waterhouse also utilized red brick and red terra cotta on the Central Institute of the City and Guilds of London Institute (1881-4), and dark plum-coloured brick and deep pink terra cotta on his St. Paul's School in Hammersmith.

⁷²Cunningham's list of Waterhouse commissions, 245, included: "Advice on terrace walls. Client: Marshall Wood, sculptor Ottawa, Canada, 1873". Wood was a prominent British sculptor and designer, first commissioned in 1873 to prepare proposals for the grounds of Ottawa's first Parliament Buildings, along with several fountains and statues. A change in government resulted in the commissioning of eminent landscape architect Calvert Vaux the same year to prepare plans for the same grounds, with considerable confusion and conflict ensuing. See J. Stewart, "Notes on Calvert Vaux's 1873 Design for the Public Grounds of the Parliament Buildings in Ottawa" in Association for Preservation Technology (APT), Vol. VIII, No. 1, 1976.

⁷³Stratton, *ibid.*, Vol. II, 59; Cunningham and Waterhouse, 148. Waterhouse was also influenced by Pugin and Ruskin, and had travelled in Italy, Switzerland, and France.

craftsmen in the modelling of figurative decoration, including William Aumonier, W. S. Frith, Walter Crane, and Harry Bates, who designed and modelled the large figure of Queen Victoria, situated prominently over the entrance.⁷⁴ (Figures 1.12(a) and 1.12(b))

Martin and Chamberlain used terra cotta to ornament forty-one schools for the Birmingham School Board between 1873 and 1898 in an Italian interpretation of the free Gothic style. After 1875 they also used terra cotta in their designs for most of Birmingham's libraries, hospitals and public baths, often in complex tracery, lattice panels, and mouldings.⁷⁵ Despite its earlier rejection for ecclesiastical purposes, a number of churches in the Midlands utilized terra cotta mainly in small blocks for decorative purposes in the free Gothic style in the 1870s-80s, exemplified by the individual designs of architects John Douglas and E. G. Paley. Terra cotta was also displayed on a number of church gables in the terra cotta manufacturing towns of Ruabon and Tamworth as an expression of pride and as a mark of local industry.⁷⁶

The Queen Anne movement had its birth with several architects who were trained in, and at first enthusiastic about the Gothic Revival, but eventually abandoned its heavier forms in favour of an approach that borrowed from many traditions and was more suitable for everyday use. The movement also represented a search by younger members of the British middle class for "sweetness and light", or beauty and intellectual fulfillment, rendering it as much a cultural and social movement as it was an architectural one.⁷⁷ The Queen Anne movement was rooted in the work of architect Richard Norman Shaw, who had worked in the office of George Edmund Street, a leader in the High Victorian Gothic style. By the late 1860s, Shaw, J. J. Stevenson and a few other architects had begun

⁷⁴Stratton, *ibid.*, 61-64.

⁷⁵*Ibid.*, 67-70; Stratton, 1993, 86. John Chamberlain's College of Art (1881-5) in Birmingham used terra cotta in the cornice, along with a 12' diameter terra cotta rose window in the gable executed in an abstract lily motif.

⁷⁶Stratton, 1983, Vol. II, 80-85.

⁷⁷The expression "sweetness and light" was first used by Matthew Arnold in his Culture and Anarchy (1869) as a means to describe the Queen Anne movement. Girouard, Sweetness and Light, 4-12.

mixing straight or Flemish gables, prominent hipped roofs, ribbed chimney-stacks, brick pilasters, and pediments and aprons, along with embellishments in rubbed brick and cut brick, or decorative terra cotta. Queen Anne architects often incorporated particular decorative motifs in the latter, such as sunflowers, lilies, and other motifs characteristic of the British Arts and Crafts movement.⁷⁸

Shaw's New Zealand Chambers (1871-73), a commercial building in central London built for a New Zealand shipping firm quite literally "put 'Queen Anne' on the map", combining brick with extensive glass in prominent bay and oriel windows, an ornate moulded plasterwork cornice, and elaborate stringcourses and pediments.⁷⁹ Both Stevenson and Shaw favoured the use of cut or rubbed brick,⁸⁰ defined by Stevenson as "bricks intended to be cut or rubbed to some shape different from that in which they were originally moulded". Although Stevenson recognized terra cotta's success at South Kensington, he preferred the effect of cut brick for aesthetic as well as technical reasons.⁸¹

Certain other architects, including Ernest George and Harold Peto, T. E. Colcutt, E. W. Godwin, and W. H. Powell, made frequent use of terra cotta as a decorative and sometimes constructional material with the Queen Anne style. Terra cotta and the Queen Anne style were strongly associated with some of London's first suburbs, including Bedford Park, the Cadogan Estate and Tite Street in Chelsea, and Mount Street in Mayfair.⁸² Bedford Park, first developed in the mid-1870s, was associated with a

⁷⁸Ibid., 25-38.

⁷⁹L. Maitland, The Queen Anne Revival Style in Canadian Architecture, (Ottawa, 1990), 112. identified the New Zealand Chamber's stringcourses and pediments as terra cotta. Girouard, Sweetness and Light, 42-5, described the same features as "parquetting of splendidly lush quality", based on the prototype of Sparrowe's House in Ipswich, Suffolk from the early seventeenth century.

⁸⁰Girouard, *ibid.*, 42, 100.

⁸¹J. Stevenson, House Architecture, (London, 1880), Vol. I, 337; Vol. III, 104. Stevenson stated "cut brick produces a different, and I think, more charming effect. Large pieces of terra-cotta, and even moulded bricks, are apt to twist in burning, [sic] it is difficult to get their lines true, and the colour is often unsatisfactory.... In cut brick work the lines are true and clean and the colour a charming orange red."

⁸²J. M. Richards, The National Trust Book of English Architecture (New York, 1981), 225, 227-8, connected the popularity of the Queen Anne style in these suburbs with commuting, the economics of rail transportation of brick and terra cotta, and terra cotta's resistance to pollution.

progressive and aesthetic movement, made up of a number of writers, artists, designers, and architects, such as Maurice B. Adams. Adams was the editor of Building News, a Queen Anne enthusiast, and one of Bedford Park's principal architects, along with Shaw. Adams also created terra cotta and faience designs during the 1880s for Wilcock & Company, a British architectural ceramics manufacturer.⁸³

Significant parts of the Cadogan Estate in Chelsea were frequently decorated with lavish terra cotta ornaments integrated in tall red brick houses with a distinct Dutch derivation, many of which were the work of Sir Ernest George and Frank Peto.⁸⁴ George and Peto's strongly Flemish design for 52 Cadogan Square (1886), for example, combined red brick with extensive rich buff and contrasting red terra cotta decoration, prominently displayed in a three storey bay, with deeply modelled grotesques and caryatid jesters protruding from the corners of the bay and guarding the entranceway.⁸⁵ (Figure 1.13) Ernest George's Queen Anne Flemish houses in Collingham and Harrington Gardens, Kensington, as well as others at Cadogan Square, were detailed mostly in fashionable yellow terra cotta, a style and material combination that was imitated all over the rest of England.⁸⁶

George and Peto's, as well as Powell's Queen Anne designs on Mount Street in Mayfair, built largely in the late 1880s, presented a virtual display of terra cotta architecture. George and Peto's developments at 104-8 and 109-11 Mount Street (1885-90) were faced entirely in buff terra cotta and characterized by wide-arched ground floor shops with protruding upper storey bay windows. (Figure 1.14) Powell's design for 128 Mount Street (1886-88) integrated a large terra cotta panel containing a cherub, shield, two storks, and curving floral motifs within a set of asymmetrical arches.⁸⁷ (Figure 1.15) The

⁸³Girouard, *ibid.*, 130, 160-172. See next section and Figure 1.18.

⁸⁴Richards, 227-8.

⁸⁵Stratton, 1983, Vol. II, 118-9; Stratton, 1993, 114, 94-6.

⁸⁶Girouard, *ibid.*, 224.

⁸⁷Stratton, 1983, Vol. II, 106, 110.

small community of Tite Street in Chelsea was characterized by a distinctive architecture and life-style, the milieu of several artists, including Frank Miles, a flower enthusiast and artist who commissioned E. W. Godwin to design a house for him at 44 Tite Street with rich terra cotta ornament. Godwin also created designs for a number of other Tite Street houses, including one for painter James Whistler, the artistic leader of Chelsea.⁸⁸

Thomas E. Colcutt, who had also worked in G. E. Street's office along with Webb, Shaw, and Morris, was a main supporter of the Queen Anne style. Colcutt made his first use of terra cotta with glazed bricks in a row of Queen Anne houses in Nightingale Lane, Clapham c. 1879, designed for George Jennings, a sanitary engineer who made the terra cotta panels at his pottery.⁸⁹ Colcutt's enthusiasm for terra cotta was also reflected in his design for the City Bank, Ludgate Hill (1890), decorated with terra cotta grotesque ornaments. Colcutt made use of architectural ceramics into the twentieth century, also designing furniture, as did Shaw, Webb, and several other Arts and Crafts architects.⁹⁰

The Queen Anne also proved a popular style for London Board Schools, often incorporating Flemish gables and decorated at minimum cost, usually in the form of a rectangular moulded terra cotta panel bearing the name of the school, the date and initials of the Board, or a sunflower.⁹¹

Terra Cotta Sculpture and Catalogue Terra Cotta

The revival of terra cotta in late 19th century England was characterized by two additional distinctly different design movements. The first of these reflected close

⁸⁸Girouard, *ibid.*, 177-82 described Whistler as having replaced Dante Rossetti as the artistic leader of Chelsea. The Irish playwright Oscar Wilde also lived at 16 Tite Street and visited Ottawa during his 1882 North American lecture tour, an acquaintance of Marquis of Lorne, Canada's fourth governor general. J. Bonellie, "A Portrait of Robert Ross", in *The Beaver*, October/November, 2000, 16-21.

⁸⁹Girouard, *ibid.*, 84, 126; Stratton, 1993, 96.

⁹⁰Stratton, *ibid.*; Stratton, 1983, Vol. II, 124-6; Girouard, *ibid.*, 130

⁹¹Girouard, *ibid.*, 5, 69; Barnard, 66; Stratton, Dissertation, Vol. II, 127. An elaborate terra cotta panel depicting "Knowledge Strangling Ignorance" was used with the first schools built in the 1870s, symbolizing "enlightenment"; later it was repeated in a coffee tavern panel, symbolizing temperance.

collaboration between architects and artists in an effort to exploit the sculptural potential of terra cotta, especially in the form of narrative sculptural panels and figures. The second involved the production and use of catalogue terra cotta and faience designs. Both movements apparently had a relatively limited following due to the reluctance of many architects to entrust design details to artists, or to use stock designs in a period that highly valued the expression of architectural identity through custom-designed decoration.

The "New Sculpture" movement was limited mainly to London and has been attributed largely to the efforts of John Sparkes and Henry Doulton. Sparkes, who was headmaster of the Lambeth School of Art in the 1860s, convinced Henry Doulton to execute his students' designs at the nearby Doulton terra cotta works. Doulton sponsored the work of several decorative artists in this manner in the 1860s-'70s. George Tinworth, whom Ruskin had called an "indubitable genius" upon viewing his work at a private Lambeth showing, was the first student to be sponsored in this manner. Tinworth collaborated with architect G. E. Street in 1876 on a large terra cotta triptych involving high-relief modelled figures. Tinworth later modelled a number of reredoses and other, mostly religious panels, such as the "Sons of Cydippe" (c. 1884) (Figure 1.16) that were later criticized for an absence of idealism and intellectualism. Tinworth worked extensively in terra cotta in the 1870s-80s, mainly in the Gothic style.⁹²

Sparkes later persuaded Jules Dalou, a French sculptor who taught at South Kensington and was known for his strong modelling skills, to teach clay modelling at the South London School of Art.. W. S. Frith, who studied under Dalou at South Kensington and modelled several sculptural figures for the Birmingham Assize Courts, sculpted the figure of Queen Victoria along with "the group symbolizing Canada" for a memorial fountain created for the 1888 Glasgow International Exhibition, successfully "combining

⁹²The triptych, for York Minster, was Tinworth's first large terra cotta panel and was designed by Street. Stratton, 1993, 92; Stratton, 1983, Vol. II, 93-4, 97, Appendix: 375. Tinworth said in 1894 he had sculptured at least 500 panels in terra cotta "of important size", plus countless other smaller ones. D. Eyles, The Doulton Lambeth Wares (Hutchison of London, 1975), 110.

intricate detail and a strong sense of individual and national character." Harry Bates, who studied under Rodin and modelled Queen Victoria for the Assize Courts, was another of Jules Dalou's students. Amongst other works, Bates created a spontaneous relief frieze of four panels representing plowing, sowing, reaping and milling corn for Messrs. Hill and Sons' bakery.⁹³

In 1897, W. J. Neatby also modelled a commemorative terra cotta panel depicting angels and shields for the Manchester School of Art. Neatby was head of the architectural decoration department at Doulton between 1889 and 1907, and also worked as a ceramics designer and painter for the Burmantofts works at the Leeds Fireclay Co. Neatby was mainly known for his exquisite work as a designer and painter in glazed ceramics or faience.⁹⁴ The relatively limited scope of this movement is likely attributable to the preference of most architects to develop the details of decorative design themselves rather than collaborating with artists, or to pass on some of this work to modellers or draughtsmen employed at terra cotta manufacturing firms.⁹⁵

Despite a common public perception that much architectural terra cotta was the result of catalogued designs stocked in mass by manufacturers, Stratton argued the actual reliance on stock terra cotta decoration in England was avoided by most architects, except in limited situations. This apparent lack of response to company catalogues, an important means of advertising for many terra cotta manufacturers, reflects the incongruence of this approach with then-contemporary values.

...such a practice ran completely against the ethics of Victorian architectural design which was seen as a continuum from the development of the ground-plan through to the composition of the façade and of the minutest decorative

⁹³Stratton, 1983, Vol. II, 96, 98-9. Sculptors John Broad, H. Ellis and F. W. Pomeroy were also involved in the fountain for the 1888 Glasgow International Exhibition. The fountain, which told the history of the Empire, was 46' high and 70' across the basin. It has been described as "the most highly elaborated structure in pure terracotta which had, up to that time, been executed in England." E. Gosse, Sir Henry Doulton: The Man of Business as a Man of Imagination (Hutchinson of London, 1970), 153.

⁹⁴Stratton, *ibid.*, Vol. II, 102-3, 100; Appendix, 376; Stratton, 1993, 108.

⁹⁵Stratton, 1983, Vol. II, 103.

detail. Speculative building was building rather than architecture largely because ornament was lacking...; in contrast all the major architects gave obsessive attention to the details of their designs.

Three other related factors worked against the common use of stock designs. Their repeated use threatened the reputation of architects known for their ability to create unique decorative designs. Further, manufacturers were both unable to make and stock enough blocks to produce relatively simple designs, let alone complex features, ordered on short notice. The lack of standardization of brick in England during this period also made it difficult to match and course in the scale of terra cotta with the height of widely varying brick.⁹⁶

A number of manufacturers' catalogues advertising a wide range of other clay items presented only limited architectural terra cotta products, such as the 1900 catalogue of Gibbs and Canning, the largest manufacturer at the turn of the century. Doulton's 1883 catalogue advertised a number of stock designs for terra cotta consoles or volutes (referred to by Doulton as trusses) in various sizes (Figure 1.17); however, they failed to imitate the elaborate nature of most architects' custom-created designs. The use of catalogues by many manufacturers apparently instead served to advertise the range and variety of their manufactured items, or to promote their terra cotta products generally. Stratton found that a number of designs illustrated in George Jennings' 1874 catalogue were re-used but argued the large size of the blocks would have rendered them not usable for builders' wider-spread utilization. Although Jennings' terra cotta products were priced and identified by number, moulds, rather than finished clay products were actually kept in stock.⁹⁷

⁹⁶Ibid., Vol. II, 137.

⁹⁷Ibid., 138. A manufacturer would often make it known that a particular catalogue-advertised architectural feature, such as a stringcourse, could be made available without extra cost in wide variation of design provided that a certain minimum length or number was requested.

A limited number of architect- created designs appeared in certain manufacturer's catalogues, such as J. E. Colcutt's designs for George Jennings.⁹⁸ Maurice Adams' highly elaborate illustrations of windows, porches and fireplace mantels (Figure 1.18) also appeared in Burmantofts' 1880s catalogues, appearing to suggest they need be only ordered,⁹⁹ although these designs were unpriced and apparently unexecuted. Ruabon Brick and Terracotta Co.'s 1890s catalogue also illustrated a variety of decorative effects, demonstrating suggested building treatments, portraying how various terra cotta details could be integrated into one domestic façade.¹⁰⁰

The actual use of catalogued terra cotta appears to have been restricted mainly to minor pieces, such as keystones, decorative chimney pots, and small panels, and to towns situated near major factories where brick size could be predicted and terra cotta was a source of local industry and pride.¹⁰¹ Stratton indicated distinct differences in the use and manufacture of terra cotta versus decorative bricks, with terra cotta the preference for architect-designed buildings, and decorative bricks commonly used in builders' designs, manufactured in a limited number of designs and repetitively supplied on demand.¹⁰²

Advantages of Terra Cotta

British terra cotta advocates often promoted its durability, washability, resistance to pollution and fire, and its cost-saving advantages over other materials during the late 19th century. Charles Barry, Jr., also cited terra cotta's lighter weight advantage, especially when made hollow, but still lighter than Portland and other building stones when made

⁹⁸Stratton, 1993, 97.

⁹⁹Barnard, 28-9. Adams also designed furniture and created a number of "prototype" house designs for Bedford Park. Girouard, *ibid.*, 59, 132-3.

¹⁰⁰Stratton, 1983, Vol. II, 144-5; 1983, 98, suggested Ruabon's statement "'all patterns are obtainable to suit various heights of brick courses'" indicated that no moulds had been previously prepared.

¹⁰¹*Ibid.*, 1993, 144, 147.

¹⁰²Stratton, 1983, Vol. II, 146, cited *Builder*, 34, 1876, 517 as stating that terra cotta had "'but little favour with the ordinary housebuilder'" since this involved extra cost and introduced potential construction delays.

solid.¹⁰³ Its practical attributes were nevertheless the subject of considerable debate and discussion within the architectural profession, serving as the basis for strong prejudices both for and against the material. Its decorative and aesthetic advantages appear to have far exceeded its practical merits, contributing to the peak of its revival in England in the late 1880s.¹⁰⁴

Although terra cotta's popularity in the architectural profession has at times been assumed to have been nearly universal,¹⁰⁵ Stratton argued that most leading architects in late Victorian England were not inclined toward its use. Their reasons for skepticism, among others, included a reluctance to entrust their designs to "ordinary brickmakers". The spalling of some terra cotta blocks caused by the inferior quality of a limited number of early manufacturers' products had also become evident by the 1880s. The combined effect of such concerns led architects who made frequent use of terra cotta to rely strictly on manufacturers with the best reputations. Most architects who used terra cotta also insisted on working on design details with preferred manufacturers in advance of contracts being let. This approach created certainty in product quality and reduced construction time lags, but effectively destroyed the practice of competitive tendering.¹⁰⁶

Although strongly associated with cleanliness and health and a belief that terra cotta would banish London's accumulated effects of pollution, these benefits were frustrated by the failure of many architects to require quality materials, or especially to establish necessary conditions for terra cotta's maintenance. The latter included designing the building to permit regular rainwater, along with good maintenance practices, to wash down

¹⁰³C. Barry, "Some Descriptive Memoranda on the Works Executed in Terra Cotta at New Alleyn's College, Dulwich. ..." in Transactions of the RIBA, (June, 1868), 266.

¹⁰⁴Stratton, 1983, Vol. II, 1, 25. Stratton judged that terra cotta's popularity peaked in 1886 when the designs for the Assize Courts and numerous terra cotta buildings in Chelsea and Mayfair were being exhibited at the Royal Academy and published in various journals.

¹⁰⁵Barnard, 80, stated "The Victorians loved terracotta and there were few architects who did not use it."

¹⁰⁶Stratton, *ibid.*, Vol. II, 3-4, 20-1. Stratton reported that most architects relied on the firms of Gibbs and Canning, Doulton, Burmantofts, or J. C. Edwards.

everyday dirt and soot build-up. Without these precautions, most buildings became discoloured, with the result that terra cotta was criticized for its otherwise excellent durability and weathering characteristics.¹⁰⁷

The potential for construction delays with terra cotta, particularly as evidenced by the Natural History Museum, contributed to other arguments against its use. The massive size of the Natural History Museum, along with successive design changes, Waterhouse's constructional technique, and his introduction of polychromy, however, contributed to excessive delays in this instance.¹⁰⁸

Savings attributable to the use of terra cotta was largely dependent on "the design of the building involving both decorative work and a reasonable amount of repetition". Under such conditions the use of terra cotta could result in savings as much as one-third compared with stone. Stratton's examination of a number of relevant factors, including comparisons of tenders for terra cotta versus stone on specific projects, led him to generally conclude that

The factor that was widely presented as being most categorically to the advantage of terracotta, cost, appears on evidence to have been variable and even marginal in its influence.¹⁰⁹

Doulton & Co. acknowledged in the 1880s that in areas where local stone was plentiful, there would be fewer advantages in marketing terra cotta. By the 1890s, artificial stone or concrete was the cheapest, "if not a particularly desirable material". Architects making frequent use of terra cotta commonly viewed it as an alternative to stone dressings or ashlar, especially during the last quarter of the 19th century when stylistic preferences in England generally encouraged the use of terra cotta with stone, rather than brick. James

¹⁰⁷Stratton, *ibid.*, 4-5.

¹⁰⁸Stratton, 1993, 73.

¹⁰⁹Stratton, 1983, Vol. II, 14. Cost savings of approximately one-third were borne out in prices quoted in W. Young's *Spon's Architects' & Builders' Pocket-Book* (London, 1877), 258, 268 when comparing the cost of a terra cotta string per lineal foot with "moulded" Portland stone in a "Gothic" pattern, priced per foot cube.

Doulton nevertheless argued that terra cotta was most appropriately used with brick. Stratton noted terra cotta's potential practicality and economy where rectangular blocks were coursed in with three or four layers of brickwork when incorporating stringcourses, cornices, or window surrounds for brick wall exteriors.¹¹⁰

Terra cotta's potential and its advantages as a decorative material clearly led all arguments over its use. The strong interest of Victorian architects and contemporary progressive figures in ornamentation and eclecticism appears to best explain the attraction for terra cotta in late nineteenth century England.¹¹¹ Terra cotta's malleable characteristics, permitting it to be shaped into an almost infinite variety of shapes, sizes, and colours, met the Victorian's desire and preference for a highly varied decorative vocabulary. Compared with stone and brick, terra cotta was considered to offer decorative design freedom, facilitating new types of patterns that could be used repetitively to create richly ornamented architecture. Terra cotta was valued as a decorative material for its labour and time-saving advantages, as well as its sculptural possibilities when worked directly by hand. In an apparent confirmation of Ruskin's argument concerning the advantages of terra cotta for soft curved lines, Stratton suggested the near emergence of a distinctive style in the latter part of the nineteenth century that took advantage of terra cotta's flexible qualities.

While it was difficult to achieve high relief decoration in terracotta, it could be formed into complex curved profiles or sections far more easily than was possible with stone. By the end of the 1880s, the exploitation of the plastic nature of terracotta in its unburnt state had almost created a discernable 'terracotta style', characterised by the use of smooth curving forms.¹¹²

Barry highly valued terra cotta's artistic value as "sole originals", advocating avoidance of the use of repetitive moulds. He also emphasized terra cotta's advantage in being easily modified after modelling but before burning. He especially stressed its

¹¹⁰Stratton, *ibid.*, 9-10, 17, 14.

¹¹¹*Ibid.*, 25.

¹¹²*Ibid.*, 27-28.

potential for "brilliant effects of light and shade", resulting from the superimposition of separately modelled pieces over recessed parts "while all are in a plastic state", then burnt in "one homogenous mass".¹¹³

The Victorian's demand for ornamentation ultimately led to a growing concern and perception in the late 19th century that buildings were becoming overloaded with cheaply mass-produced ornament. Terra cotta's critics also charged that architects with little originality would take advantage of, and utilize the material simply as a means to advance their own work. Terra cotta became judged more in the 20th century for its value in architectural design and its potential use in new forms of architecture.¹¹⁴

Faience and Colour

The use of unglazed terra cotta was increasingly considered offensive in the late 19th century, resulting from a growing dislike for eclecticism and heavily ornamented Victorian architecture. Further, an abundance of "free" architectural styles eventually culminated in the re-emergence of the idea that classical architecture should rely on its own rules rather than serve as the basis for free personal expression. At the same time, a small number of architects and decorative artists pursued another kind of free, more creative type of architecture in the use of narrative panels in terra cotta, faience, tiled mosaics, and colour. The more widespread pursuit of classical architecture was dominated by the Baroque style, especially for public and commercial architecture.¹¹⁵

As a result, architectural ceramics took on a reduced and altered significance around the turn of the century. Many architects viewed its use with more skepticism and began to criticize the work of Colcutt and Waterhouse, as well as the use of ceramics in the

¹¹³Barry, 265.

¹¹⁴Stratton, *ibid.*, 31.

¹¹⁵Stratton, 1993, 99. Architect Charles Doll's extensions to the Imperial Hotel (1905-11) in London, however, were heavily ornamented in unglazed terra cotta. Girouard, *ibid.*, 225, identified as many as five "free" styles by the 1890s, the waning of the Queen Anne and its virtual disappearance by 1900, and a search at this time for an "absence of style", in addition to an increasing preference for classicism.

façades of theatres, public houses, chain-stores and cinemas, a trend that had begun in the 1890s. Others, concerned mainly with commercial architecture, were attracted to faience as a means to express colour--a largely unexplored vocabulary, except for red terra cotta, now associated with opulence.¹¹⁶ Faience also represented a practical, if not prerequisite means to move to more modern forms of construction.

The development of faience products was strongly linked with the manufacture of tiles, which were mass-produced in England from the 1870s. Two firms, Doulton & Co., as well as Wilcock and Co. (later known as the Leeds Fireclay Co., who used the brand name of Burmantofts), began producing large faience forms in the early 1880s, mainly for interior use.¹¹⁷ Doulton had first produced a stoneware product resistant to frost and soot in 1876, and by 1888 had begun manufacturing Carraraware, a matt-glazed stoneware that imitated Carrara marble. Carraraware marked a significant advance in technology, making possible the production of large complex faience forms that soon became popular for use as a non-load bearing exterior cladding material. The Birkbeck Bank (1895) in London, designed by T. E. Knightly in a heavy Renaissance style, was both the first extensive project to make use of Carraraware and the first lavish use of polychromy in England. Brown, pink, and peacock-green faience were displayed in vertical stages on the exterior, along with large decorative panels and embossed tiles, set between Carraraware ribs that lined the interior of its spacious dome.¹¹⁸ (Figure 1.19)

Several members of the Art Workers' Guild, especially Charles H. Townsend, Halsey Ricardo, Edward Prior and Gilbert Bayes promoted the use of terra cotta and faience in new, creative ways during the 1890s. The Art Workers Guild grew out of the

¹¹⁶Stratton, 1983, Vol. II, 151-4. The south block completion of the Victoria and Albert Museum at So. Kensington exemplifies the shift toward more classical forms and materials. Webb and Bell's 1891 competition design planned the use of terra cotta, but by the time the building was begun in 1899, Portland stone dressings were used instead. Stratton, 1993, 132-5 referred to the use of faience by retail chains, co-operatives and other retailers as a form of "advertising".

¹¹⁷Stratton, 1983, Vol. II, 157, 160.

¹¹⁸Ibid., 174-6, 182; Stratton, 1993, 102-5. Other manufacturers, including Burmantofts, Gibbs & Canning, and Carter waited until c. 1909 to bring their own forms of matt-glazed faience.

Arts and Crafts movement, first formed in 1884 as an assembly for architects, craftsmen, artists, and designers to discuss their work and ideas.¹¹⁹ Townsend, who was inspired by symbolism and natural forms, displayed swirling art nouveau tree branch motifs in buff terra cotta in the façade of the Bishopsgate Institute (1892-4) in London. (Figure 1.20) The frieze was modelled in low relief by William Aumonier, reminiscent of some of the lush terra cotta patterns that later characterized Louis Sullivan's buildings in the U.S. English interpretations of art nouveau gained only limited acceptance in England, however. Several European architects, such as Otto Wagner in Vienna, and Antoni Gaudí in Barcelona utilized polychromatic architectural ceramics about the same time in rich art nouveau designs.¹²⁰

Architect Halsey Ricardo actively promoted and lectured on the use of polychromy in glazed and washable architectural ceramics in England as a solution to urban society's "universal hunger for colour".¹²¹ Ricardo had studied Italian architecture and ceramics and was the friend and partner of William De Morgan in the production of hand-decorated tiles in the 1890s. De Morgan's lustrous tiles were displayed throughout the Debenham House¹²² (1905-07) in London, designed by Ricardo as a residence for millionaire Sir Ernest Debenham, who appreciated faience and glazed polychromy. (Figure 1.21) The Renaissance exterior of the Debenham House combined round-arched pink Carraraware with Classical detailing, green glazed brick on the ground floor, and blue glazed brick in the cornice and chimneys. Debenham & Freebody's department store (1906-08) in

¹¹⁹A. Service, London 1900 (New York, 1979), 13. The Art Workers' Guild was originally founded by such architects as William Lethaby and Edward Prior, joined later by other influential architects whose works were displayed by the Arts and Crafts Exhibition Society, founded in 1888 as a means to "revive" the arts in architecture.

¹²⁰The Bishopsgate Institute embodied a library and entertainment halls. Service, 179; Stratton, 1993, 104.

¹²¹H. Ricardo, "Of Colour in the Architectural Cities", in Art and Life, and the Building and Decoration of Cities (London, 1897), 221-2, 248. in Stratton, *ibid.*, 108.

¹²²H. Van Lemmen, Tiles: 1,000 Years of Architectural Decoration (New York, 1993), 145, 153. De Morgan was a friend of Morris, and produced designs for Morris & Co. By 1869 in London he had established his own tile operation, utilizing brilliant colours in animal, bird and floral themes.

London, designed by Gibson and Wallace, was built in only a few weeks and utilized white Carraraware cladding over a steel frame, along with green marble columns.¹²³

W. J. Neatby's faience design for the Everard Printing Works in Bristol (1901-02) is perhaps his best known use of architectural ceramics, particularly for the way that it made use of arts and crafts symbolism. Working in collaboration with Birmingham architects Essex, Nicol and Goodman, Neatby utilized virtually the entire front of the building to create a narrative illustration of the history of printing, clearly portraying the function of the building. The ivory Carraraware façade depicted Gutenberg and William Morris with their hand-presses and stylized alphabets, along with Pre-Raphaelite figures symbolizing Light and Truth.¹²⁴ The name of the firm appeared in art nouveau typeface, specifically designed by Everard for this purpose. The illustrations were painted directly on the tiles in ceramic colours and later sealed with a clear glaze.¹²⁵ (Figure 1.22)

Neatby had earlier demonstrated his skillful use of art nouveau faience detailing in the Royal Arcade (1899), a shopping arcade in Norwich, and the Orchard House (c. 1900) in London.¹²⁶

Faience became acceptable in England after 1900 for its imitation of marble or Portland stone, far more than its use in glazed polychromy. Doulton's Carraraware glazed stoneware body had insufficient plastic qualities to permit highly sculptural work, although it easily lent itself to classical detailing and its use in a Parisian Beaux-Arts style that was becoming popular. T. E. Collcutt's designs for a series of additions to the Savoy Hotel in London beginning in 1903-04 drew considerable attention, and set a precedent for subsequent London hotels and commercial buildings, through the use of ivory Carraraware

¹²³Ricardo used glazed bricks with a number of his houses and offices. Stratton, *ibid.*, 108, 182: Service, 68, 27.

¹²⁴Stratton, *ibid.*, 110; Stratton, 1983, Vol. II, 180.

¹²⁵Barnard, 112, 114. When the Everard Printing Works was completed and revealed from its formal drapery it attracted so much attention that police had to control traffic for several days.

¹²⁶Stratton, *ibid.*, 109; Stratton, 1983, Vol. II, 185. The Orchard House featured peacocks and a stylized tree in low relief panels; the Royal Arcade also displayed peacock and floral patterns, along with the four elements of water, fire, air and earth.

in conservative styling and detailing, constructed rapidly with steel frame construction. Decorative work was confined mainly to simple panels below the windows and egg and dart mouldings, along with green-banded chimney stacks. Some large figures also appeared beneath the cornice of the main block. (Figure 1.23) The Strand Palace hotel, also in Carraraware, situated opposite the Savoy followed suit in 1907, along with the nearby Regent Palace hotel in white Burmantofts' faience five years later. Colcutt used simple detailing in Carraraware for Gloucester House (c. 1908), again using green and white in the gable.¹²⁷ Central London experienced a boom in luxurious hotel construction around the turn of the century, responding to increased travel by prosperous foreign visitors, and to wealthy Londoners enjoying a meal in suave hotel restaurants.¹²⁸

More so than previously, the use of terra cotta and faience in England beginning after about the late 1890s was associated with the inner suburbs, with emerging forms of modern construction, the use of faience as a form of corporate identity, and with a particular set of building types. The latter included public houses, underground railway stations, theatres, cinemas, retail chain stores and co-operative society shopfronts, and seaside resorts,¹²⁹ summarized and exemplified below.

England experienced a concentrated period of public house construction from the 1890s, mostly represented by a commercial form of pub, in contrast with numerous Queen Anne style coffee taverns built during the 1870s-'80s. Architects James and Lister Lea utilized terra cotta on twenty-six Birmingham public houses between 1899 and 1914. Their designs represent an apparent standard architectural prescription, although each particular public house was adapted to its own site and given individuality through

¹²⁷Stratton, 1983, 181-2; Stratton, 1993, 112. Work began in 1896, but Carraraware was first used on the Savoy Hotel in 1903-04 on the Strand and Savoy Court. Stratton noted a review in the British Clayworker indicated egg and dart mouldings were used because they broke easily from the moulds, and that a "free and flowing" type of decoration was most suitable to the work.

¹²⁸Service, 146, 150.

¹²⁹Stratton, 1983, Vol. II, 238-310. Note: The discussion concerning specific building types between the late 1890s to about World War II relies primarily on Stratton's dissertation, which was based on an analysis of the Hathern Station Brick & Terra Coğa Co. contract records for this period.

distinctive architectural details, such as the festoons and moulded dolphins decorating the Salutation Inn (1902) in Birmingham. (Figure 1.24) James and Lea frequently complemented the terra cotta exterior of their pubs with interior coloured majolica tiles made by Minton.¹³⁰ Other pubs of this period displayed more elegant polychrome façades using faience, tiling, and mosaics, such as the Birmingham Dog & Duck (1900) and the Crown Liquor Saloon in Belfast, Ireland (c. 1890).¹³¹

Architectural ceramics was also the basis for getting around London, displayed in nearly uniform street architecture of London's underground railway stations. In 1903 Leslie W. Green was appointed architect for London's Underground Electric Railway, designing some fifty stations within a five year period. Green's standardized design relied on a faience façade over a steel structure in a deep reddish brown, using the same faience moulds and models, exemplified by the Piccadilly Circus station (c. 1906). (Figure 1.25) The designs were repeated all over London, purposely creating a recognizable identity closely associated with cleanliness and firesafe construction. Stratton viewed these as an "acceptable face of architectural repetition", representing

... the only instance, in the British revival of architectural ceramics, of complete building forms such as window-surrounds and cornices being systematically repeated to achieve a visual consistency and a degree of economy.¹³²

Faience and terra cotta also served as an integral element in the identity of a large number of theatres built in London beginning about 1900, especially those designed by architect Frank Matcham. Many were built in London's West End, responding both to the city's rapidly growing number of residents, and to many Londoners' desire for a lively

¹³⁰Stratton, *ibid.*, 238-244; Stratton, 1993, 113. Stratton generally criticized the architectural value of Birmingham's pubs, viewing them as the "ultimate debasement of Victorian eclecticism", representing more the pursuit of commercial profit than of "any aesthetic ideal".

¹³¹Stratton, 1983, Vol. II, Appendix; Stratton, 1993, 115. Van Lemmen, 108-9, noted the Crown Liquor Saloon was still in operation as an active pub and was owned by the National Trust.

¹³²Stratton, 1993, 119-20; Stratton, 1983, Vol. II, 256. Normally the only differences between individual station designs was in the length of frontage, as well as exit and entrance locations.

evening out in a fashionable setting.¹³³ Matcham's practice soon came to specialize in theatres and music halls, often designed in a traditional but highly decorated Baroque style using brick with terra cotta. Typically, Matcham situated twin domes on either side of a central gabled entrance, along with decorative detailing, such as in the Hackney Empire (1901). (Figure 1.26) Matcham's use of terra cotta in the Coliseum Theatre (1903-04) near Trafalgar Square, described by Stratton as his best high Baroque design, imitated stone in colour and featured a prominent tower. Several provincial architects followed Matcham's lead, using terra cotta in the design of theatres in other major cities throughout England.¹³⁴

Faience was still strongly associated with entertainment two decades later when a number of large cinemas were built beginning in the late 1920s in response to so-called "talking movies". Cinema design before that time shifted away from traditional architecture to the use of faience in eastern styles, exemplified by the use of dramatic minarets and middle-eastern motifs by Hickton and Farmer in their design for the Cinema House (1912) in Rotherham. Beginning in the 1920s George Coles was also a strong advocate of the use of white faience in cinema design, valued for its appearance, durability, cleanliness, fire resistance, and its pleasant appearance.¹³⁵ Coles' Carleton Cinema (1928) in London featured large moulded faience pilons creating a gateway on either side of the entrance, and a coved cornice with polychrome Egyptian symbolism, generally inspired by the discovery of Tutankhamen's tomb. (Figure 1.27) His later sleek Horsham Odeon Cinema, Sussex (1936) emphasized a lighted cylindrical beacon resembling a lighthouse or space rocket. Cole designed fourteen Odeon cinemas, ranging in expression from restrained classicism to

¹³³Service, 119.

¹³⁴Stratton, 1983, Vol. II, 245-9; Service, 122-3. Matcham was involved in the design of 107 theatres, with much of this work in rebuilding or alteration. The Coliseum seated over 3000.

¹³⁵Stratton, *ibid.*, 291.

more futuristic idioms, using a variety of Renaissance, Egyptian, Chinese and art deco designs.¹³⁶

Retail chain store façades and co-operative shop fronts comprised a significant portion of the 1920s market for architectural ceramics, mainly in faience. Stratton linked the importance of this movement, which generally progressed from classical to modernistic styles, with a specific intent to express a corporate identity. The Co-operative Society movement started just before World War I, marking a revolution in the design of store fronts that was generally followed by private sector retailers in the late 1920s. Many Co-op societies hired one architect who generally used a one-story faience "house style", characterized by classical details with subtle variations in the design of different stores. The Derby Co-operative Society shop (1930), Balacava Road exemplified the approach of architect L. G. Ekins, who supervised the design of ten Derby Co-operative shops, incorporating wide expanses of glass with simple faience pilasters and columns, along with a plain store front faience "sign" bearing the Society's name and function, i.e., butchery and grocery store. The Derby Co-op façade designs varied only slightly, although enough to exclude the possibility that moulds were reused between individual stores.¹³⁷

Private sector chain store retailers generally incorporated architectural ceramics in more lavish, modernistic store fronts, with faience often applied as a veneer over existing façades. The Times Furnishing Store, Ilford, Essex (1926) typified architect C. J. Eprile's designs, using white faience above black pedestals, with expansive areas of glass and two large faience panels carrying the firm's name. (Figure 1.28) Eprile had studied at the Central School of Arts and Crafts. A much stronger art deco house style was developed by Harry Wilson for the Montague Burton Company stores in the 1920s, incorporating tall

¹³⁶Stratton, *ibid.*: Stratton, 1993, 138-141. Stratton referred to Coles as England's "most creative designer of cinemas".

¹³⁷*Ibid.*, 132-3; Stratton, 1983, Vol. II, 228, 278-280. The Co-op Wholesale Society commissioned Hathern's terra cotta and faience in 140 contracts between 1913 and 1938 in England. Distinctive high-relief modelled ornament occasionally appeared on some co-op stores, such as a panel incorporating a sheaf of grain and a shovel, and a striking art deco floral motif in salt-glazed stoneware.

narrow windows with projecting elephant heads above extensive glass and bronze window frames on the ground floor.¹³⁸

Faience was strongly linked with resort seaside architecture in the 20th century due to its resistance to salt-laden air and its facility in creating "light-headed" moulded and polychrome ornament. The use of architectural ceramics was heavily concentrated in Blackpool, north of Liverpool on England's northwest coast, where architect Halstead Best created designs for seaside shelters, information kiosks, a lifeboat station, and over twenty other architectural ceramics contracts involving hotels, churches, cinemas and guest houses. Best's commitment to faience was also exemplified by his 1928 design for the First Church of Christ the Scientist at Blackpool, distinguished by its pronounced circular arcade entrance of Corinthian columns in moulded cream faience.¹³⁹

Faience was used for industrial purposes only selectively between World Wars I and II. The food processing industry often utilized white or ivory faience to convey a hygienic image, such as for a butter and cheese works, or an ice cream factory. Dairies typically preferred the use of white and blue faience. Faience was also used in massive five foot depth slabs at the base of the Ferrybridge Power Station, and in large grey faience slabs along with black and blue accents in the Battersea Power Station of the London Power Company (1930). Smaller factories situated along arterial roads, such as the Great West Road in West London, at times chose fashionable and brightly coloured faience to portray a strongly Egyptian influence, such as in the design of the Firestone Tyre Company (1929) and the Hoover Factory (1932).¹⁴⁰

Faience had relatively little application for commercial offices, public buildings and service uses in the inter-war period in comparison with either the Victorian and Edwardian periods. Slower growth in office construction during this time partially explains this

¹³⁸Ibid., 285, 287; Stratton, 1993, 134-5. Wilson often alternated faience with stone or artificial stone in the upper stores of the Burton stores.

¹³⁹Stratton, 1983. Vol. II, 267-71.

¹⁴⁰Ibid., 272-5.

factor, along with the frequent preference for stone or brick for financial or government offices to project an image of respect or dignity. During the early part of the 20th century faience was used with some smaller Prudential Assurance office buildings designed by J. H. Pitt, who had taken on Waterhouse's earlier role, such as a Renaissance design at Holborn, built c. 1913 carried out in green and egg-shell coloured faience. A few other office buildings were built in London about the same time using Carraraware with simplified classical decoration.¹⁴¹

Major Manufacturers

England's architectural terra cotta industry was strongly influenced by geological and geographic factors, relying largely on coal-measure clays to support the scale of the terra cotta and faience revival. Following the closure of the Coade Manufactory in London in 1839, London's terra cotta industry was mainly dominated by Blanchard and Blashfield's works, who relocated nearer suitable clays generally in the southeast of England around 1870. After about 1875, much of the industry was located northwest of London in the Midlands near large deposits of coal-measure clays that served as the basis for the bulk of terra cotta and faience production into the 20th century.¹⁴² (Figure 1.29)

Mark Henry Blanchard's role in the revival of terra cotta was significant, especially through his early contracts at South Kensington as well as his production of terra cotta columns for the arcades in the gardens of the Royal Horticultural Society (1861).¹⁴³ Likewise, the singular contributions of John Marriott Blashfield's works should not be underestimated. Blashfield was involved with many major projects in England, including terra cotta's extensive use in the grounds at Castle Ashby in 1867, designed by Matthew

¹⁴¹Ibid., 275-7.

¹⁴²Ibid., Vol. I, 161, 168-171, 181. A geological survey in South Wales in 1828 first indicated the significance of underclays lying beneath coal seams, and publication of detailed surveys of the coal fields in the 1860s-70s precipitated the establishment of terra works in particular locations.

¹⁴³Weiler, 326 reported that "Blanchard may have supplied as much as 95% of the terracotta for the South Kensington Museum"; he also won medals for his exhibits at the 1851 Exhibition.

Digby Wyatt. Prior to his first production of terra cotta at his own works in 1851, he had worked for Coade and represented Minton in London during the 1840s at the time of the development of encaustic tile flooring. Blashfield reportedly had the largest terra cotta exhibit at the 1862 Exhibition. (Figure 1.30) He also collaborated with artists and the Dept. of Practical Art in the development of the Process Panels for the 1866 Wedgwood Institute, and manufactured the terra cotta for the 1867 Dulwich College, the largest installation at that time in England.¹⁴⁴

Despite the existence of a large number of firms spanning the period 1769 to around the beginning of World War II, when demand largely disintegrated, less than about a half-dozen firms delivered the majority of contracts at any given time. During the peak of the revival in the 1880s, most companies advertising the material produced only simple architectural details, many having begun with the production of brick, tile and clay pipes. The major British manufacturers operating between the 1870s to late 1930s period included: Accrington Brick & Tile Co., Henry Dennis, Doulton and Co. Ltd., J. C. Edwards, Gibbs and Canning, Hathern Station Brick and Terra Cotta Co., Minton and Co., the Ruabon Brick and Terracotta Company, Shaw's of Darwen, Messrs. Wilcock & Co. (taken over by Leeds Fireclay Co., which had a Burmantofts Works section), and George Woolliscroft and Son, Ltd.¹⁴⁵

Ruabon, Clwyd, a small town situated south of Liverpool near the Welsh border, was the centre of the industry during the late 19th century, becoming known for its deep red, virtually indestructible terra cotta blocks utilized in numerous public and commercial

¹⁴⁴Stratton, 1993, 48, 66-7, reported that Blashfield was influenced by Blanchard's display at the 1851 Exhibition. M. Floyd, "A Terra-Cotta Cornerstone for Copley Square: Museum of Fine Arts, Boston, 1870-1876, by Sturgis & Brigham", in Journal of the Society of Architectural Historians (JSAH), Vol. XXXII, No. 2, May, 1973, 96-8 described Blashfield as being involved in "nearly all the major terracotta installations in England, beginning about 1837" and as the "central supplier" in England from his earlier association with Minton to 1862.

¹⁴⁵Ibid., Vol. II, Appendix, 161-4. Stratton's Dissertation Appendix contains a listed all British firms over a period of 250 years that were involved in architectural ceramics, i.e., "for which there is evidence of terracotta actually being produced". Fidler, 27-28 reported the existence of some 420 manufacturers in England and Wales between 1720 and 1983 (based on information supplied by Stratton).

buildings, especially by Alfred Waterhouse. J. C. Edwards, established around 1870 in Ruabon, supplied red terra cotta and bricks for at least eight of Waterhouse's Prudential commissions. The characteristically purplish, mottled Ruabon clay marls were not well suited to handling glazes for faience, however, and after World War I many firms situated in this area returned to the production of bricks and roofing tiles.¹⁴⁶

Gibbs and Canning was situated in Staffordshire in the Midlands just outside Tamworth, first producing architectural terra cotta in 1867. The firm had access to both white and red clays ideal for the production of terra cotta, although mainly known for their buff terra cotta products. Gibbs and Canning supplied the largest contracts at South Kensington, including the Natural History Museum.¹⁴⁷ As discussed in Chapter III, Gibbs and Canning made consistent attempts to develop an export market to Canada in the early 20th century, even planning the construction of works in Canada although abandoning this effort at the beginning of World War I.

The Hathern Station Brick and Terracotta Company was founded in 1874, first published architectural terra cotta designs in 1883, and developed rapidly as a major terracotta and faience manufacturer from 1896. Situated in Hathern, Leicestershire, the firm was the largest British manufacturer of architectural ceramics from 1921-5, turning out products that were utilized throughout the country, with all building types, and in most architectural styles.¹⁴⁸ Ibstock Hathernware Ltd., as the firm is known today, is the only British firm to have remained in continuous production since the early 1880s, producing a complete range of architectural terra cotta and faience products. Used in both restoration and new projects, the contemporary re-introduction of terra cotta and faience was inspired

¹⁴⁶Stratton, 1983, Vol. I, 184-9; Vol. II, 51; Stratton, 1993, Appendix I.

¹⁴⁷Ibid. Gibbs & Canning was first established in 1847 as a glazed pipe manufacturer.

¹⁴⁸Stratton, 1983, Vol. II, 210, 226. Stratton utilized Hathern's records as a case study to investigate the use of architectural ceramics in England and Wales between 1896 and 1939, considering the firm's output during this period to be ideal for analysis since "The management never restricted their work to particular markets, geographical areas or styles, or even tried to establish a particular identity."

by the post-modern return to classic ideals that are well-suited to the use of faience and terra cotta.¹⁴⁹

The firm of Messrs Wilcock and Co. was established in 1858 in Burmantofts, Leeds, West Yorkshire, becoming re-established as Leeds Fireclay Co. in 1889. Leeds Fireclay Co. became the largest business in the north of England, with works in four different locations in the vicinity of Leeds. The firm's initial production of stock architectural details was expanded to large slabs and blocks of faience under the name of Burmantofts in the late 1880s. Burmantofts faience was first used in the interior of large London restaurants along with tiles in the 1870s, followed its extensive use by Alfred Waterhouse and his contemporaries during the 1870s-90s. The firm's glazed faience cladding became popular for use with steel frame construction after the turn of the century in Manchester, followed shortly thereafter by the additional successful application of their faience products with concrete construction.¹⁵⁰

A number of major British manufacturers joined the Terra Cotta Association shortly after 1900 to regulate prices, as well as the terms of sales. The Association effectively limited competition during a period of domination of the industry by Gibbs & Canning and J.C. Edwards in the early 1880s, establishing a fund that compensated firms not meeting their quotas. The overall effect of the Association reinforced personal contacts with architects as the basis for contracts and emphasized acceptable levels of production.¹⁵¹

The terra cotta industry in Britain was highly vulnerable to the peaks and valleys of the building cycle, with some firms experiencing up to three-fold differences in contracts from one year to the next. The manufacture of terra cotta and faience was labour intensive

¹⁴⁹G. Hollis & D. Moffatt, "Architectural Terracotta in Britain", *British Ceramic Transactions & Journal*, Vol. 91, 5, 1992, 167-71. Fidler, *ibid.*, and Stratton, 1993, 231 also identified Shaw's of Darwen, as today being capable of producing faience and glazed bricks. Shaw's works were first established in 1897 as part of the firebrick industry; they began making glazed bricks in 1909.

¹⁵⁰Stratton, 1993, 102, 117-18, 231. The design of the YMCA was based on the use of concrete for both the walls and the frame. The YMCA was designed by Woodhouse, Corbett and Dean; Lancaster House was designed by H.S. Fairhurst & Son, described also by Stratton as having been built in 1909.

¹⁵¹Stratton, 1983, Vol. 1, 342-349.

and required a highly skilled work force; together with rising costs and severe competition, production became increasingly non-viable in the 20th century. The most significant weakness of the British architectural ceramics industry as whole was likely its delayed response in bringing out a less complicated material, such as faience, then not advertising it as a stock item once it came into significant production. The beginning of World War II brought a sharp decline in the sale of terra cotta and faience products from which the industry never recovered, although a number of firms had discontinued production before that time.¹⁵²

Conclusion

It has been seen that England's terra cotta revival was precipitated by its use reflecting 15th century northern Italian Renaissance architecture in the 1860s at the Victoria & Albert Museum at South Kensington, mainly to the credit of Captain Francis Fowke and his team of artists and draughtsmen in the Department of Science and Art. The South Kensington Museum of Construction and Building Materials also strongly promoted terra cotta's decorative and practical benefits through its display of ceramic products while visually demonstrating its versatile architectural uses in the complex of buildings at South Kensington. The establishment of art and design schools, along with the collaboration of artists and architects, fostered by the terra cotta industry, also exploited the sculptural potential of the material. Together with the promotion of northern Italian brick and terra cotta architecture by the artistic adviser to the Prince of Consort, the use of terra cotta was by all appearances virtually sanctioned by the British government.

The British love for decoration and mediaeval design, influenced by Pugin, Ruskin, Morris and the Arts and Crafts Movement, largely explain the Victorians' late 19th century attraction for terra cotta. The British middle class search for beauty and truth, a desire for a

¹⁵²The terra cotta industry did not respond to the price advantage of artificial stone by introducing slab faience for more than a decade. Stratton, *ibid.*, Vol. I, 271, 290, 293, 328, 355, 358-9.

vernacular and eclectic architecture, and London's rapid population growth influenced the extensive use of terra cotta during the 1870s-80s in the 'Queen Anne' style. The desire for greater freedom in architecture, led by Waterhouse's liberal use of terra cotta in numerous commercial and public buildings further encouraged its use, contributing to its peak in popularity in 1886. The preference of most architects to develop the details of their decorative designs, the Victorians' high regard for originality and identity, and a lack of evidence of significant repetition of decorative blocks strongly contradicts the perception that terra cotta was supplied through catalogued and stock items during the Victorian period.

Architectural ceramics had a reduced and altered significance after 1900 resulting from an abundance of "free" styles in the late 19th century and an increasing disenchantment with heavy ornament, accompanied by a growing preference for classical architecture, especially Baroque forms. The advent of modern steel-framed construction encouraged the development and use of faience products and the imitation of marble or Portland stone. An interest in polychromy, as well as art nouveau motifs, rooted in the Art Workers Guild resulted in a brief, but highly original use of terra cotta and faience around the turn of the century to express colour and arts and crafts themes. The use of terra cotta and faience in the 20th century in England was strongly associated with an expression of corporate identity as well as a specific set of building types, especially public houses, underground railway stations, theatres and cinemas, retail chain stores and Co-operative shop fronts, and seaside resorts.

Britain's terra cotta industry was strongly influenced by geologic and geographic factors. The terra cotta and faience revival relied heavily on coal-measure clays in an area northwest of London after 1875, with the establishment of terra cotta works in the 1860s-70s often precipitated by the publication of detailed geological surveys. Despite the existence of hundreds of terra cotta firms during the span of the revival, less than about a

half-dozen firms delivered the majority of contracts at any given time during the revival.

The formation of a Terra Cotta Association around 1900 did little to promote the terra cotta industry, with its effects essentially reinforcing personal contacts with architects as the basis for contracts. Severe competition and the production of highly labour intensive architectural ceramics became increasingly unviable in the 20th century. The British terra cotta industry was subject to highly variable contract levels from one year to the next, and the emergence of World War II brought the industry to basic closure.

II. Terra Cotta in the United States

As occurred in England, terra cotta also experienced a "false start" in the United States through the limited import of Coade Stone around 1800, and its early manufacture and use in a restricted manner in the eastern U.S. during the 1840s to 1860s. The liberal use of terra cotta in the Boston Museum of Fine Arts (1870-76), modelled in ideology and structure after the South Kensington Museum, influenced its on-going use and manufacture in the U.S. in much the same manner as its precedent-setting use at South Kensington had influenced its on-going utilization and production in England.

Pre-1870s Use and Manufacture

Kelly recorded several instances between 1787 and 1820 of the use of Coade Stone, directly imported from London to the eastern U.S., exemplified by the interior Coade Stone chimney pieces (Figure 2.1), as well as capitals and bases in the entrance porch of the Octagon House (1799) in Washington D.C.¹⁵³ In 1850, Andrew Jackson Downing was also encouraging the use of elaborate chimney-tops made of Garnkirk fireclay with his Gothic rural villa design in his book, The Architecture of Country Houses, available in both New York and Boston through James Lee & Co.¹⁵⁴

Terra cotta was produced in a limited fashion as architectural ornament from the late 1840s-60s in the eastern and southeastern U.S., made by several small drainpipe

¹⁵³A. Kelly, Mrs. Coade's Stone (Great Britain, 1990), 443-444; N. Neblett, "A Search for Coade Stone in America" in Association for Preservation Technology, hereinafter APT, Vol. III, No. 4, 1971, 68.

¹⁵⁴A. Downing, The Architecture of Country Houses (New York, 1968 reprint of 1850 edition), 329. Stratton, 1983, Vol. 2, Appendix, listed the Garnkirk Coal Co., located near Glasgow in Scotland, operating from 1833, as probably the first terra cotta manufacturer in Scotland, known by 1883 as the Garnkirk Fireclay Co.

manufacturing firms and used mainly for trimming. Terra cotta offered a less costly and durable substitute for wood ornament or carved brownstone, then a preferred material in much of the eastern U.S. Architect Elbridge Boyden of Worcester, Massachusetts encouraged potter Henry Tolman to make terra cotta ornament, likely first using Tolman's window caps, consoles, and a cornice in his design for the Harrington Corner Block (1848-49), then selling a variety of Tolman's architectural products to builders in the central Massachusetts area. Boyden later said he had never heard of terra cotta before that time, but was interested in using burned clay as architectural ornament. After 1851 terra cotta products made by Tolman, Luther & Co. were used to decorate several buildings in Boston, Maine, and New Hampshire in the early 1850s. Tolman's terra cotta window caps were used repeatedly on the five story Italianate style 1853 Mills House Hotel in Charleston, So. Carolina, designed by architect John E. Earle and described by Ceccacci as "possibly the earliest example of the extensive use of terracotta architectural ornament in the United States."¹⁵⁵

Architect Richard Upjohn introduced terra cotta in New York City when he ornamented the 1851-53 Trinity Building, a five storey office building, with lion's head keystones and a terra cotta cornice (Figure 2.2) made by Edward Roche, who also manufactured drainpipes at his New York Hudson River Pottery and Terra Cotta Works. Upjohn's subsequent use of terra cotta in the cornice of the Corn Exchange Bank Building (1853), was far less successful, made by a fledgling New Jersey drainpipe manufacturer and destroyed by frost the first year, likely due to unreliable firing methods.¹⁵⁶ Architect James Renwick also pioneered the use of terra cotta ornament in New York in 1853, incorporating terra cotta cornices and beltcourses on five New York buildings, including

¹⁵⁵S. Ceccacci, unpublished Master of Arts thesis, "Architectural Terracotta in the U.S. Before 1870", Boston University Graduate School, 1991, 23-29.

¹⁵⁶S. Tunick, Terra-Cotta Skyline: New York's Architectural Ornament, (New York, 1997), 4; also Ceccacci, 31. Tunick noted that Winter & Co., the firm that made the Corn Exchange building cornice, was operated by several highly educated Europeans possibly more interested in discussing the Renaissance than becoming successful terra cotta makers.

the six storey St. Denis Hotel, the Tontine Building, and three houses, produced by New York City drainpipe manufacturer Alexander Young. This met with strong opposition from apparently threatened New York stonecutters and masons, who argued the material was not durable. Renwick was unsuccessful in promoting its further use in New York at this time, commenting during the 1880s, "The fact is, we were ahead of the times, and could find no one who understood or would venture to use it."¹⁵⁷ Despite the failure of the Corn Exchange Building cornice, most terra cotta produced by several early U.S. firms demonstrated not only its durability, but the important role of several architects in its early introduction, design and promotion. The founding of a number of other small terra cotta manufacturers shortly after 1855 also ultimately led to the establishment of such major firms as the Chicago Terra Cotta Co., as well as the North Western Terra Cotta Co. in Chicago.¹⁵⁸

Terra cotta was not used with any frequency again in New York City until the late 1870s. In the interim, the construction of the Museum of Fine Arts in Boston beginning in 1870 marked both the import of British-made terra cotta to the U.S. and the transfer of British manufacturing technology to Chicago, making the Boston Museum a significant link or transatlantic bridge relative to the on-going ornamental use and manufacture of terra cotta in the United States.¹⁵⁹

¹⁵⁷Tunick, *ibid.*, 4-5.

¹⁵⁸Ceccacci, 41-45. Early terra cotta manufacturers Patrick Bannon of Louisville, Kentucky, and Joseph Glover, also of Louisville and later of Indianapolis, both began their careers as plasterers. See Ceccacci, Appendix I or Tunick, *ibid.*, Appendix B for a complete list of U.S. terra cotta manufacturers between the 1840s and 1870.

¹⁵⁹M. Floyd, "A Terra-Cotta Cornerstone for Copley Square: Museum of Fine Arts, Boston, 1870-1876, by Sturgis & Brigham", in *Journal of the Society of Architectural Historians* (hereinafter JSAH), Vol. XXXII, No. 2 (May, 1973), 102; M. Floyd, "A Terra Cotta Cornerstone for Copley Square: An Assessment of the Museum of Fine Arts, Boston", unpublished dissertation, Boston University Graduate School, 1974, 100.

Boston: The Museum of Fine Arts as a Trans-Atlantic Link

Representing the earliest major use of terra cotta in a public building in the U.S., the Boston Museum of Fine Arts (1870-76) was situated in Boston's Back Bay, on what later became known as Copley Square. The museum was designed by John Hubbard Sturgis, an American architect with British training. Embodying lecture and art training facilities and modeled after the Museum at South Kensington, the Boston Fine Arts Museum was liberally ornamented with terra cotta made by John Marriott Blashfield at his works in Stamford, England.¹⁶⁰ (Figure 2.3) The art training classes at the Museum were organized by Walter Smith, an Englishman who studied at the South Kensington Museum who was brought to Boston in 1870 as the new Director of the newly created office of State Art Education. Smith, highly admired, also established a Normal Art School in Boston in 1874 and organized evening art classes in all American cities with a population of 10,000 or more.¹⁶¹ He also produced several art education publications in the 1870s, nearly paraphrasing Henry Cole, in his 1872 Art Education: Scholastic and Industrial, praising terra cotta for its durability and fireproofing merits, as well as its artistic qualities.¹⁶² A movement also occurred during the 1870s to establish the "South Kensington-Massachusetts model" in several U.S. midwest industrial cities.¹⁶³

John Sturgis was born in China, the son of Russell Sturgis, a partner in the London Baring Bros. Bank, which shipped a variety of English buildings materials to the U.S. including the terra cotta ornament for the Boston Museum. John Sturgis first went to England in 1850, was strongly influenced by Pugin's and Ruskin's theories and studied as an artist under architect James K. Colling at the Architectural Association in London.

¹⁶⁰Ibid., 83-4, 98-9. The Boston Fine Arts Museum was demolished in 1906.

¹⁶¹D. Van Zanten, "Sullivan to 1890", in W. De Wit, Louis Sullivan: The Function of Ornament, (New York, 1986), 30.

¹⁶²Stratton, 1993, 144, f. 144.23 on 238, and f. 144.27 on 239. Cole had recommended Stratton's appointment in Massachusetts in light of his previous art education role in Leeds in England. Smith returned to England in 1883.

¹⁶³Van Zanten, *ibid.*

Colling was strongly interested in foliate ornamentation and later prepared the terra cotta detailed drawings for the Boston Museum of Fine Arts. Sturgis took up partnership in the U.S. in 1861 with Charles Brigham, but returned to England in 1866 and continuously corresponded with Brigham, until his return to Boston in 1870.¹⁶⁴ As demonstrated in his paper on terra cotta, presented in Boston in 1871 at the Fifth Annual Meeting of the American Institute of Architects, Sturgis was knowledgeable about its use in 15th century Italy and at So. Kensington, as well as then-contemporary examples of its use, its manufacture, and its numerous advantages.¹⁶⁵

Stylistically, terra cotta "entered Boston on a Gothic horse" at a time when the Gothic style was still being debated in England, occurring despite Sturgis's earlier designs for the Boston Museum. Although Floyd concluded the final design was likely the decision of the Boston Museum Committee,¹⁶⁶ Stratton suggested Sturgis was influenced in this design shift by Colling.¹⁶⁷ Floyd also viewed the Boston Museum as having played a significant role in the subsequent increasing use of fictile materials, mainly terra cotta, molded brick, tile, and mosaic in the U.S. in new surface treatments in other styles, including the Queen Anne revival. The Boston Museum was characterized in its north elevation by a series of grouped pointed arches in the first storey, with naturalistic terra cotta foliage in the spandrels above the windows, along with a strongly contrasting treatment of the second storey, including two large terra cotta panels,¹⁶⁸ using red brick with both red and buff terra cotta ornament. The large allegorical relief panels in the gable ends depicted "The Genius of Art" and "Art and Industry".¹⁶⁹ (Figure 2.4)

¹⁶⁴Floyd, 1973, 85-87.

¹⁶⁵J. Sturgis, "Terra-Cotta and Its Uses", in American Institute of Architects Proceedings, 1871, 39-43.

¹⁶⁶Floyd, 1973, 101-2; Floyd, 1974, 106. None of Sturgis's previous designs were Gothic; two were round-arched, and one was trabeated.

¹⁶⁷Stratton, *ibid.*, 144.

¹⁶⁸Floyd, 1973, 100-103. Floyd noted the combination of red brick and terra cotta was common to the earlier Dulwich College, the Wedgwood Institute, and the South Kensington Museum.

¹⁶⁹N. Jones, "American Terra Cotta and the Boston Terra Cotta Company, 1880-1893", unpublished Master's thesis in Art History, Tufts University, Boston, 2000, 34.

Technologically, the Boston Museum of Fine Arts represented a link between London and Chicago, both through the import of Blashfield's terra cotta, and the nearly simultaneous move to Chicago by James Taylor, who was employed for several years at Blashfield's Stamford works and later became known as the "father of terra cotta" in America. Floyd also placed the Boston Museum in the context of the advancement of U.S. terra cotta manufacturing technology, even its later use in the designs of Louis Sullivan as a sheathing material with iron and steel construction:

They would hardly have reached reality. . .without the prior development of a terra cotta industry in America for the production of the material, or continuous experiment to perfect the relatively sophisticated technology of its application.¹⁷⁰

The Chicago Terra Cotta Works, first established in 1868, contacted Blashfield at his Stamford works for manufacturing advice in 1870 and became aware of Taylor's planned move to the U.S.¹⁷¹ Taylor first went to New York in 1870, intending to start his own terra cotta business, but experienced opposition from an "influential architect" to further use of the material there at that time, as well as difficulties in obtaining financing. Soon becoming Superintendent of the Chicago Terra Cotta Works later the same year, Taylor imported British terra cotta manufacturing improvements, including clay preparation, moulds and production methods, and muffle kilns designed to protect terra cotta products from direct fire exposure, designed after those used by Blashfield. By 1876, when Taylor left Chicago, the firm was manufacturing architectural terra cotta, porous tiles, and terra cotta fireproofing protection for columns, employing seventy-five men.¹⁷²

John Blashfield had supplied several major British terra cotta installations during the 1830s-70s. Although not producing terra cotta for the South Kensington Museum,

¹⁷⁰Floyd, 1974, 100.

¹⁷¹W. Geer, The Story of Terra Cotta, (New York, 1920), 156.

¹⁷²Tunick, 1997, 6-8.

most recently these included the Wedgwood Institute (1866) and the terra cotta for the New Alleyn's College at Dulwich (1867).¹⁷³ About the same time Blashfield also supplied decorative terra cotta for Pinebank, the 1868-69 Boston residence of Edward N. Perkins, a prominent Bostonian who wanted an "English" brick house. Also designed by Sturgis & Brigham, Pinebank combined red brick with Blashfield's yellow terra cotta panels below the windows, a moulded brick cornice, and gray carved stone elements, also imported from England. Perkins, who was part of the mid-1860s planning committee for the Boston museum, was influential in Sturgis and Brigham's being awarded the Museum of Fine Arts design contract.¹⁷⁴ Blashfield's contract for the Boston Museum of Fine Arts was followed by a burgeoning of the U.S. terra cotta industry. His own terra cotta works in England, however, ironically and almost sacrificially, failed in the mid-1870s as a result of major difficulties encountered in the execution of the Boston Museum contract, mostly involving shipping and payment delays, followed by Blashfield's bankruptcy and poor health.¹⁷⁵

In addition to the influence of its use in the Boston Museum of Fine Arts, terra cotta's increasing acceptability in the U.S. from the 1870s occurred in the context of a growing attraction for surface texture in Boston's Back Bay, owing much to the work of architect H. H. Richardson. Brownstone dominated Boston's Back Bay for most of the 1850s-60s, followed by greater experimentation in styles and an increasing variety of materials and textures beginning in the 1870s, including several types of brick and stone, slate, wrought and pressed iron, glazed tile, and terra cotta. The "Panel Brick" style came into frequent use at this time, characterized by brick masonry with a variety of projecting or receding decorative brick panels, used in corbelled chimney stacks and string courses.¹⁷⁶

¹⁷³Floyd, 1974, 63-65.

¹⁷⁴Floyd, 1973, 44, 88-90; Jones, 36.

¹⁷⁵Stratton, 1993, 145-7. After the failure of Blashfield's works, a number of other employees who previously worked for Blashfield emigrated to the U.S. to work in the terra cotta industry there.

¹⁷⁶B. Bunting, Houses of Boston's Back Bay, (Cambridge, 1967), 170.

Architect Henry Hobson Richardson's limited but significant use of crafted brick during the 1870s in the Back Bay symbolizes the influence of John Ruskin¹⁷⁷ in the U.S., along with the increasing acceptability of fictile materials. Educated at Harvard, and at the École des Beaux-Arts in Paris, Richardson also traveled in England and France and was impressed by round-arched church architecture. He was influenced as well by the British Arts and Crafts movement, and knew and had visited both William Morris and William De Morgan. As a parallel to Morris's role in England, Richardson led the U.S. Arts and Crafts movement in the late 19th century, influencing the work of architects Charles McKim and Stanford White, along with many others who trained with him, including Shepley, Rutan & Coolidge, who were Richardson's successors after his death. Richardson's atelier-teaching style and his excellent reference library, containing British Arts and Crafts furnishings and hundreds of photos from a European trip, easily facilitated this role.¹⁷⁸

Richardson's Trinity Church (1872-77), situated across from the Boston Museum of Fine Arts, was a study in structural polychromy, composed of random ashlar light and dark red sandstone, along with bright red large crockets, roof tiles and hip-rolls made by the Chicago Terra Cotta Co.¹⁷⁹ (Figure 2.5) Richardson's bright red roofs became characteristic of much of his work in the 1870s and 1880s, such as in the new State Capitol Building, and City Hall in Albany, New York.¹⁸⁰ Just one block away, Richardson's somewhat later brick masonry Trinity rectory (1879-83) displayed crafted brick panels and

¹⁷⁷M. Floyd, Henry Hobson Richardson A Genius for Architecture (New York, 1997), 206.

¹⁷⁸J. Curl, A Dictionary of Architecture (Oxford, 1999), 550; J. O'Gorman, Living Architecture: A Biography of H. H. Richardson (New York, 1997), 14, 157-159; Floyd, 1997, 12, 86. O'Gorman reported that T. M. Clark, described as an "expert in technology who later published a manual on building superintendence" worked in the office of Gambrell & Richardson around 1870. It is unlikely this was the same T. M. Clark who obtained a patent for terra cotta in Ottawa in the 1870s, who was listed in the Ottawa 1870-71 Directory, having come to Ottawa in 1868.

¹⁷⁹O'Gorman, 1997, 106, 110, reported Trinity Church contained stained glass made by William Morris and Edward Burne-Jones. Stratton, 1993, 151, recorded Trinity Church as the first use in Boston of U.S. made terra cotta, in an unusual use of red compared with most of the Chicago firm's products.

¹⁸⁰Floyd, 1997; Jones' Appendix D. Both the new State Capitol Building, and the City Hall in Albany, New York, designed by Richardson, were listed in the 1884 Boston Terra Cotta Co. catalogue.

roll moldings, complemented by carved sandstone ornament. (Figure 2.6) Richardson's design for Sever Hall (1879), a red brick classroom building with art gallery, influenced by other Harvard college architecture and the Queen Anne Revival style, incorporated large carved brick panels reflecting recognizable botanical forms. Outside of Richardson's use of crafted brick, it was not used extensively in the U.S. partially due to the increasing availability of less costly terra cotta by the late 1870s, as well as the influence of the Museum of Fine Arts and its decorative-arts program.¹⁸¹

Terra cotta was produced in Boston from the late 1870s, preceded by several fire brick producers, such as the 1877 firm of Fiske & Coleman.¹⁸² A Boston branch of the Chicago Terra Cotta company was established in 1878 but closed in 1879 after a brief operation. James Taylor was associated with the Boston branch of the Chicago Terra Cotta Co., and became Superintendent of the Lewis & Wood terra cotta works in Boston in 1879. In yet another move, Taylor took the position of Superintendent of the newly founded Boston Terra Cotta Co. in 1880, staying there until 1886, when he helped organize the New York Architectural Terra Cotta Company.¹⁸³

In addition to supplying Boston orders, the Boston Terra Cotta Co. had a large market in New York, Philadelphia, and elsewhere in the eastern and midwest U.S., due in large part to its proximity to convenient shipping and rail facilities. The Boston Terra Cotta Co. built a new 4 storey plus basement addition to its existing operations in 1883, especially designed to accommodate two large kilns in James Taylor's ideal factory layout. While with the Boston Terra Cotta Co., Taylor closed most terra cotta contracts and prepared all estimates.¹⁸⁴ The 1884 Boston Terra Cotta Co. catalogue contained numerous

¹⁸¹Floyd, 1997, 211, 218.

¹⁸²Jones, 37, 48. George M. Fiske later managed the Boston Terra Cotta Co. for the entire span of its existence.

¹⁸³Tunick, 1997, 9-10.

¹⁸⁴Jones, 45. See Jones, 49-52 for a detailed description of the factory design, which also accommodated a show-room, and was later used in the design of the New York Architectural Terra Cotta Co. works.

examples of both standard items and original architectural terra cotta ornament. In the latter category, large high- and low-relief medallions were illustrated, along with details of large terra cotta spandrels, nearly square terra cotta panels, and a large triangular terra cotta panel displayed in the pediment of the Massachusetts Charitable Mechanic Association (1881-82) in Boston's Back Bay. The latter was the Boston Terra Cotta Co.'s first important project, designed by W. G. Preston, who was awarded a gold medal in 1881 by the Mechanics' Association for the building's brick stone, and terra cotta ornament.¹⁸⁵

The Boston Terra Cotta Co. also provided studio space for two sculptors, one of whom was prominent Boston sculptor Truman H. Bartlett, who modelled terra cotta ornament for the 1878 English High & Latin School in Boston. Bartlett also taught at the Massachusetts Institute of Technology, and established a school for sculpture and modelling in 1879. Jones argued that Bartlett's association with the Boston Terra Cotta Co. was significant, both in providing an implicit statement about the artistic quality of the firm's terra cotta, as well as in attracting future contracts.

The significance of a sculptor of Bartlett's stature on the premises of the Boston Terra Cotta Company cannot be underestimated. His very presence, and at times his direct hand, would have had an impact on the artistic quality of the terra cotta produced. In addition, his affiliation with the company likely was an endorsement to other sculptors that they could rely on the Boston company. With James Taylor, technical expertise was guaranteed. With Truman Bartlett, aesthetic sensibility could be nurtured.¹⁸⁶

Terra cotta made by the Boston Terra Cotta Co. was also used by John Putnam in the Queen Anne style residence at Commonwealth Ave. and Gloucester St. in Boston (1881-82), displaying its artistic and constructive use in large lintels, slender columns, and several panels. This clay modelling approach, characterized by swirling patterns, while

¹⁸⁵Ibid., 53-55, 59. The triangular panel in the Mass. Charitable Mechanics Assoc. building (demolished) measured 22' x 6.5' and displayed their symbol, an arm holding a hammer, contained within a roundel. The 1884-85 Boston Terra Cotta Co. catalogues also listed other buildings supplied with the firm's terra cotta, along with their architects, contained in Jones' Appendix D.

¹⁸⁶Ibid., 45-47, 52.

somewhat constrained and more repetitive than the more deeply undercut sculptural style in England, influenced a style that distinguished American from British terra cotta.¹⁸⁷ This more shallow style also bears resemblance to the carved brick work of H. H. Richardson, which also set a precedent that many would have wanted to emulate.¹⁸⁸ (Figure 2.7)

Two followers strongly influenced by H. H. Richardson, Henry Walker Hartwell and William Cummings Richardson, used terra cotta ornament with brick in both the Queen Anne Revival and the Romanesque Revival styles in the early 1880s in the Boston area. Their Richardsonian Romanesque Revival style Odd Fellows Hall in Cambridge (1884) combined red pressed brick with molded brick and red terra cotta ornament in two main arches framing a second storey meeting hall space, along with elaborately modelled terra cotta string courses separating the first and second stories.¹⁸⁹

Boston was also the locus of an early use of polychrome terra cotta in the U.S. as a result of collaboration between the tile and terra cotta industries. J. P. Putnam's design for The Charlesgate (1891), a residential hotel, incorporated glazed terra cotta in shades of greenish-blue, tawny yellow, and white together with glazed brick in the building's interior, manufactured by the Boston Terra Cotta Co., with the assistance of the firm of Atwood and Grueby in developing the greenish-blue glaze. Prior to this time the use of coloured glazed ceramics in the U.S. had largely been limited to tiled floors and walls.¹⁹⁰

The Boston Terra Cotta Co. opened offices in New York and Philadelphia after 1885 to compete with the newly founded New York Architectural Terra Cotta Co. Although shipping its products across much of the eastern and midwest U.S., the Boston

¹⁸⁷Stratton, 1993, 152-3.

¹⁸⁸Jones, 60-61.

¹⁸⁹Jones, 62-63. Hartwell & Richardson's Queen Revival style Belmont Town Hall (1881) also utilized brick, moulded brick, and terra cotta panels. S. Vogel, "Hartwell & Richardson: An Introduction to Their Work" in *JSAH*, Vol. XXXII (May, 1973), 142-3. The design of the Odd Fellows Hall, Cambridge, Mass., along with its use of terra cotta ornament appears to have influenced a red brick building located at 428 Bank Street in Ottawa, c. 1897-98, decorated with white terra cotta capitals, decorative voussoirs and roundels.

¹⁹⁰Tunick, 1997, 52.

Co. ceased to operate at the end of 1893. Purchased by the New York Architectural Terra Cotta and Perth Amboy companies, the dissolution was an agreed-to plan to eliminate the Boston Terra Cotta Co. by five major members of the First and Second Brown Associations, an organized group of terra cotta manufacturers.¹⁹¹

Chicago

The Great Chicago Fire of 1871 destroyed vast sections of the city, although not the Chicago Terra Cotta Co., founded in 1868. As mentioned previously, the Chicago Terra Cotta Co. had hired James Taylor as its Superintendent in 1870, at which time Taylor reorganized the firm into the Chicago Terra Cotta Works and began implementing British terra cotta technology and clay processing methods.¹⁹² Architect Peter B. Wight, who had moved to Chicago within a month after the fire, presented a paper on fireproof construction at the 1871 American Institute of Architects' meeting which recommended cement, artificial stone, or terra cotta as a protection for iron floor beams. Hollow tile floor arches, patented by Johnson & Kreisler in 1871, were first used in Chicago in the 1872-73 Kendall Building, followed by the Chicago Terra Cotta Co.'s patent for porous terra cotta in 1874, invented by Sanford Loring, used as fireproofing for cast iron columns.¹⁹³ Although these fireproofing developments were new in Chicago and the U.S., Francis Fowke's 1850s Report on Civil Construction had described a variety of hollow, lightweight bricks used for fireproof construction,¹⁹⁴ and Weaver reported that light weight hollow terra cotta fireproofing units were first used much earlier in Europe, being

¹⁹¹Jones, 57, 76-77. The fifth member was the A. Hall Terra Cotta Co., also eliminated at this time. Tunick, 1997, 104, 155, f. 191, reported the First Brown Assoc. was organized in 1886, and the Second Brown, in 1893.

¹⁹²Geer, 156; Tunick, 1997, 6-7.

¹⁹³S. Landau, P.B. Wight: Architect, Contractor, & Critic, 1838-1925, (Art Institute of Chicago, 1981), 45-48. Drake & Wight had patented a cladding for iron columns using red oak or other appropriate materials one month earlier than Loring's porous terra cotta patent. Wight later founded the Wight Fireproofing Co., c. 1881, and manufactured a variety of hollow tile products during the 1880s.

¹⁹⁴Weiler, 297.

closely related to hollow pot flooring developed by Monsieur Fart in eighteenth century France for use with wrought iron structural members and to similar eighteenth century English independent developments of terra cotta.¹⁹⁵

The Chicago Terra Cotta Works had begun producing a variety of architectural terra cotta products soon after the fire, using clays brought from Indiana, including stock terra cotta patterns for ornamental window and door caps, glazed brick, and crestings, although the greatest demand at that time was for cornices. Chicago also spawned several other terra cotta firms beginning in the late 1870s, such as the Northwestern Terra Cotta Works, founded in 1877, and the American Terra Cotta & Ceramic Co., which set up operation in 1888 on a major rail line near natural clay resources in Terra Cotta, Illinois, northwest of Chicago.¹⁹⁶

The effort to re-build Chicago, much of which occurred during 1872, prompted the construction of a number of buildings using decorative terra cotta made by the Chicago Terra Cotta Works, designed by such prominent U.S. architects as William LeBaron Jenney, P. B. Wight, Burnham and Root, and W.W. Boyington. Several of these buildings, along with the contributions made by these architects to the re-building of Chicago, were discussed years later by James Taylor in The Clay-Worker, including Burke's European Hotel, designed by Canadian architect Cyrus P. Thomas. (Figure 2.8) Taylor praised Thomas's use of dark or bluish gray terra cotta, noting a sample of it had been seen by Mr. Sturgis of Boston, who was reportedly surprised that such material was made in the U.S.

Cyrus P. Thomas, an architect from Canada, who came to Chicago to assist in her re-building gave some valuable assistance to the movement. He knew that Terra Cotta was capable of being made of various colors, and disregarding the ordinary buff color he used only a dark or bluish gray. The first building he designed and built in Chicago was Burke's European

¹⁹⁵Weaver, 111-112.

¹⁹⁶S. Darling, "Architectural Terra Cotta in Chicago" (New York, undated).

Hotel, on Madison street near Clark street. The walls were of Philadelphia brick of a dark red color, and the pier bases, collars and imposts as well as the Voussoir arches were of this dark gray colored Terra Cotta. The work was well done and of a very hard and close quality from the use of Manganese which acts as a flux. A sample of this work having been shown to Mr. Sturges [sic] of Boston, who was himself a patron of Terra Cotta; he expressed a doubt of its being any genuine American product, saying he had no idea of such material being produced in the United States.¹⁹⁷

Cyrus P. Thomas was born in Leamington, England, the son of William Thomas, also born in England. William Thomas was one of Canada's leading architects in the mid-19th century, whose work reflected his love for richly detailed ornamentation. Cyrus Thomas was also the nephew of noted sculptor John Thomas, best known for his work as carver in chief of the British Houses of Parliament in London, where he worked directly with architects A.W.N. Pugin and Charles Barry. Cyrus apprenticed with his father, and he and his brother William Tutin Thomas became partners in the firm of William Thomas & Sons in 1857. Cyrus operated the firm's office in Halifax, where he designed a whole streetscape of Italianate commercial buildings on Granville Street (1859-60), using decorative cast-iron store fronts made in New York City, making him one of Canada's first architects to also utilize this emerging technology. Although Taylor implied Thomas came to Chicago just after the October, 1871 fire, other evidence indicates he arrived there not long before the fire, practicing there until 1897 when he returned to Toronto.¹⁹⁸ Burke's European Hotel, built c. 1871-72, was situated in the Chicago Loop area in the heart of the fire's devastation, not far from the future sites of several buildings to make important use

¹⁹⁷J. Taylor, "Architectural Terra-Cotta No. 9", in The Clay Worker (September, 1887), 113-6. Taylor also noted, to his dislike, that the owner of the European Hotel later painted the terra cotta "so as to represent red work", looking "too much like slipping back to the old days of imitation...." I am grateful to Nancy Jones, who brought Taylor's discussion of Thomas's Chicago work to my attention.

¹⁹⁸G. McArthur & A. Szamosi, William Thomas Architect 1799-1860, (Ottawa, 1996), viii-xi, 95, 133-145. Cyrus Thomas's Union Bank in Halifax (1860-62) became the first home of the Nova Scotia School of Art & Design. McArthur & Szamosi reported C. P. Thomas took up practice in Montreal in 1862 and practiced with W. T. Thomas until moving his office to Chicago 1870-71. E. Arthur, revised by S. Otto, Toronto No Mean City (Toronto, 1986), 261, recorded Thomas's move to Chicago as 1869.

of terra cotta, such as Burnham & Root's the Rookery and the Reliance buildings, Holabird & Roche's Tacoma Building, and Sullivan's Carson Pirie Scott department store.¹⁹⁹

By the mid-1880s Chicago architect William LeBaron Jenney's Home Insurance building (1883-85) had demonstrated the use of a self-sustaining metal frame to carry the outer wall for the first time in the U.S., along with an elevator and fireproofing, an important milestone in the evolution of tall building construction.²⁰⁰ Jenney later promoted the use of terra cotta in his paper to the Chicago Fire Underwriters' Association, recommending the use of brick exterior walls with terra cotta decoration, along with floors and fireproofing of porous terra cotta, as the "best method of rendering a mercantile building fireproof".²⁰¹ Shortly after 1870, Jenney had set up architectural practice in Chicago with Sanford Loring, who left the practice shortly thereafter to become the first treasurer of the Chicago Terra Cotta Co. Jenney was also interested in craftsmanship, and together with Peter Wight organized a display of "Artistic Furnishings and House Fittings in 1875 at the Inter-State Industrial Exposition, exhibiting several of their own furniture designs along with wallpapers by such British Arts and Crafts designers as William Morris and Charles Eastlake. Jenney and Wight also collaborated with several craftsmen in Chicago whom they helped establish there, including English carver and modeller John Legge, clay modeller Giovanni Meli of the Chicago Terra Cotta Co., and Isaac E. Scott, who also worked as a terra cotta ornament and sculptural modeller at the Chicago Terra Cotta Co.²⁰²

¹⁹⁹Other evidence suggests C.P. Thomas built numerous other buildings in Chicago from 1872-74, such as the 1874 Delaware Building, reported in McArthur & Szamosi. See, e.g., Am. Inst. of Architects Chicago, AIA Guide to Chicago (New York, 1993), 132. Further research is needed to determine whether terra cotta ornamented these buildings as well, although given Taylor's comments, it is likely.

²⁰⁰S. Tunick, "Architectural Terra Cotta: Its Impact on New York", in Sites 18 (New York, 1986), 13; A. Carr, Toronto Architect Edmund Burke (Montreal, 1995), 122; and J. Curl, Dictionary of Architecture (Oxford, 1999), 347.

²⁰¹"Fireproof Construction for Mercantile Buildings", in Canadian Architect & Builder (December, 1897), 226.

²⁰²D. Van Zanten, "Sullivan to 1890", *ibid.*, 28-29.

Jenney and Wight's art furniture interests also inspired other designers, such as John Wellborn Root, who with Daniel Hudson Burnham formed the firm of Burnham & Root in 1873 in Chicago. Together they influenced early tall building construction in Chicago while making frequent use of terra cotta. Burnham & Root's Chicago Rookery Building (1886-88) combined a heavy masonry base and reddish-brown terra cotta cornice along with red brick and other decorative terra cotta features, reflecting the Richardsonian Romanesque style with Moorish/Byzantine accents. (Figure 2.9) The Rookery represented Root's first model for his ideal "commercial style" involving the use of brick, granite, and terra cotta in round arched Richardsonian Romanesque detailing, although this attempt was cut short by Root's early death.²⁰³ About the same time, Holabird & Roche's twelve storey Tacoma Building in Chicago (1886-87) used a skeletal structure clad in terra cotta and glass. Holabird had worked in Jenney's office in 1875 and became Roche's partner in 1881.²⁰⁴

Architect Charles B. Atwood joined Daniel Burnham in 1891 and designed the Chicago Reliance Building (1894-95), distinguished as the first metal frame structure to be clad in glazed cream-coloured terra cotta. The Reliance Building also broke a record for speed in construction when its fourteen storey steel frame was erected in only four weeks.²⁰⁵ Atwood also designed the eighteen storey Fisher Building shortly thereafter (1895-96)²⁰⁶, almost a repeat of the Reliance Building with the addition of more extensive Gothic terra cotta tracery and round-arched windows in the attic storey. (Figure 2.10)

Burnham and Atwood both figured critically in the 1893 World's Columbian Exposition, with Burnham serving as coordinator of the Exposition, and Atwood as its chief designer. Burnham promoted a form of French-inspired Beaux-Arts architecture as

²⁰³Ibid., 38.

²⁰⁴Curl, 320.

²⁰⁵Tunick, 1986, *ibid.*; Curl, 144.

²⁰⁶Curl, 43.

the favoured style of the Exposition buildings.²⁰⁷ The Exposition quickly became associated with the notion of the "white city", although it was not until the completion of the Reliance Building in 1895 that a similar result would be achieved with glazed terra cotta. The white shimmering effect of the Exposition resulted from a mixture of hemp and plaster sprayed with whitewash²⁰⁸ known as "staff".²⁰⁹

In the 1890s architect Louis Henry Sullivan also began to further illustrate the possibilities for tall building design, making extensive use of terra cotta as an exterior cladding material in Chicago and other midwest cities. Sullivan's 1896 essay, "The Tall Building Artistically Considered", with which his slogan 'form follows function' was associated, defined a role for the architect in creating beauty and in responding to the design problem of the tall building.²¹⁰ Sullivan's rental brochure for the Bayard Building in New York City demonstrated his commitment to terra cotta for its durability and fireproofing advantages with steel frame construction, as well his philosophy on terra cotta's ornamental use.

The material, terra-cotta or baked clay, is older than civilization yet very new in its modern application. It has been chosen for this front because of its great fire-resisting capacity, its peculiar timely adaptability to the scientific steel-frame method of construction. It is the most plastic materials in its raw state, suffering itself to be shaped with marvelous readiness, into every conceivable delicacy and variety of form and movement, yet, when once fired, these forms and delicacies become everlasting;²¹¹

Sullivan also advanced a "tripartite theory", asserting that tall buildings should be treated as if they were a column with a base, an unbroken shaft or mid-section, and a terminating capital. This approach came to be known generally as the Chicago school of architecture

²⁰⁷Ibid., 111.

²⁰⁸S. Chappell, "As If the Lights Were Always Shining", in J. Zukowsky, Chicago Architecture 1872-1922, (Chicago, 1987), 291-302.

²⁰⁹"Fifth Annual OAA Convention, President's Address", in Canadian Architect & Builder (February, 1894), 33.

²¹⁰M. Elia, Louis Henry Sullivan, (New York, 1996), 121-2.

²¹¹Rental brochure, "The Bayard Building", New York, in Van Zanten, 1986, 104.

and was reflected in the designs of Burnham, Root, and a number of other architects utilizing terra cotta during the late 19th and early 20th centuries²¹², although arcaded, tripartite construction was used earlier in New York beginning in the late 1870s.²¹³

Sullivan became a partner with Chicago architect Dankmar Adler in 1883 after having studied at the Massachusetts Institute of Technology in Boston. Sullivan had worked as a draftsman in the office of architect Frank Furness in Philadelphia and in Jenney's office in Chicago, and studied at the École des Beaux-Arts in Paris. Sullivan's decorative designs were based on natural forms inspired at the École, by the Gothic Revival motifs of Frank Furness, and especially by the designs of Christopher Dresser, who was a professor at South Kensington in London. Dresser had been strongly influenced by Pugin and by Owen Jones, and published extensively on decorative design and art manufacture in the mid-to-late 19th century.²¹⁴ Sullivan was also influenced by John Ruskin's theories, adapting Ruskin's artistic procedures for designing ornament in repeated scrolling acanthus-leaves, a favoured Ruskin motif.²¹⁵

Two of Sullivan's buildings outside Chicago actually established his approach to steel skeleton tall building construction involving the use of terra cotta. The Wainwright Building in St. Louis, Missouri (1890-91) was Sullivan's first attempt, combining red brick with red terra cotta ornamental spandrels and a deep band of ornate terra cotta around the tenth storey. (Figure 2.11) Sullivan's Guaranty Building in Buffalo, New York (1894-95), only slightly preceded by the Reliance Building, was the first building of its size and significance to be clad completely in terra cotta, reflecting Sullivan's characteristic

²¹²J. Zukowsky, "Introduction to Internationalism in Chicago Architecture", in Chicago Architecture, 20.

²¹³S. Landau, "The Tall Office Building Artistically Reconsidered: Arcaded Buildings of the New York School, c. 1870-90", in H. Searing, In Search of Modern Architecture (Cambridge, 1982), 136-7.

²¹⁴Van Zanten, 13-64. Sullivan was influenced at the École by Victor Marie Ruprich Robert, a professor of ornament. Sullivan also worked in F. Furness's office in 1873.

²¹⁵See L. Weingarden, "Louis H. Sullivan's Ornament & the Poetics of Architecture", in Zukowsky, 237-246.

use of low-relief, almost geometrical ornament as a dominant characteristic, with a unique ground plane treatment involving nearly free-standing piers clad in ornate terra cotta, with sloped-back shop windows allowing maximum light penetration.²¹⁶

Sullivan also utilized terra cotta as a cladding in a tripartite construction for large commercial retail stores. Adler & Sullivan's unexecuted seven-storey c. 1892 design for a wholesale store in Chicago for the estate of M. Meyer, for example, only slightly preceded by the Reliance Building, proposed the use of terra cotta cladding with a heavy cornice.²¹⁷ Sullivan's Chicago Carson, Pirie & Scott Department Store (1899-1901 & 1903-4), originally known as the Schlesinger & Mayer Store, was designed and built in two phases, with the upper stories of the building clad with white enameled terra cotta, although originally planned to be faced in white marble. The Carson, Pirie & Scott Dept. Store was Sullivan's last major use of terra cotta with large commercial stores.²¹⁸

By 1900 numerous steel frame buildings clad in terra cotta and glazed brick dominated Chicago's Loop; a number of these were designed by Burnham and Root, as well as Sullivan, and are now considered landmarks of the Chicago School of architecture. D. H. Burnham's design for the seventeen storey Chicago Railway Exchange Building (1904) housed most of the city's railroad business offices, utilizing highly glazed cream-coloured terra cotta on the exterior, along with several bas-relief glazed figures in the interior.²¹⁹ (Figure 2.12)

Sullivan also designed numerous small town banks in the U.S. midwest in the early 20th century, often utilizing mainly brick with more limited use of terra cotta in highly elaborate, often polychrome ornamental motifs. The National Farmers Bank in Owatonna, Minnesota (1906-08), Sullivan's first midwest bank, was richly decorated on both the

²¹⁶W. Jordy, "The Tall Buildings", in W. de Wit, 103.

²¹⁷Carr, 123.

²¹⁸See Jordy, 65-158.

²¹⁹Darling, *ibid.*

exterior and interior. Situated above a pink sandstone base, the central portion of the bank contains a green and blue terra cotta border that frames a large stained glass window, set in a reddish brown brick surround. The upper corners of the frame contain two brown terra cotta cartouches beneath a large brick and terra cotta cornice.²²⁰ Although Sullivan's affection for ornament and his use of terra cotta have not gone without criticism, he clearly exploited its potential for unique ornament, utilizing it as a material in its own right. Ironically, the Midland Terra Cotta Co., organized in 1910 in Illinois, actively advertised stock moulds that clearly imitated Sullivan's foliate motifs, describing them as "specially designed by our artists".²²¹

The towering Chicago Wrigley Building (1920-24) provides a later example of the use of terra cotta to emulate the image of the "white city". Executed by the Northwestern Terra Cotta Co. and designed by Charles G. Beersman of Graham, Anderson, Probst and White, the Wrigley Building's design was inspired by the 16th century Giralda Tower, a Moorish structure in Seville dating from the Spanish Renaissance.²²² The lively quality of its white glazed terra cotta cladding resulted from Beersman's "watercolour" approach, using six different shades of enamel finish, varying from gray to pale cream, growing increasingly lighter with height.²²³

Terra cotta was also used as an exterior cladding material, and to ornament a number of Chicago apartment buildings and hotels in the early 20th century, such as the Blackstone Hotel (1908), Chicago's first luxury hotel, along with another apartment

²²⁰de Wit, 166-7, 180. The Owatonna National Farmers Bank was more elaborate than Sullivan's other banks, containing polychrome terra cotta, cast iron, stained glass, murals, plaster and stencil work decoration. The bank's director later commented that the use of terra cotta still excited interest thirteen years after its construction, and that its considerably increased assets likely owed a good deal to its fine character.

²²¹Zukowsky, 152,447.

²²²Darling, *ibid*.

²²³Chappell, 298. The Wrigley Building underwent a major restoration in the 1970s-80s due to the development of fine surface cracks in numerous terra cotta units caused by water infiltration and abnormal expansion of the blocks. The Wrigley Building, along with 1100 of some 2600 terra cotta-clad buildings in Chicago were identified by six teams of building inspectors as having observable faults following the death of a pedestrian in 1974, caused by a fallen chunk of cornice.

building at 1550 No. State Parkway (1911).²²⁴ It also figured importantly during the 1920s in the highly imaginative designs of a number of movie theatres, at times featuring marquees displaying musical instruments or highly elaborate façades decorated with classical figures and details, along with automotive garages, warehouses and industrial buildings.²²⁵

New York City

After strong opposition by stone masons to the use of terra cotta ornament in the 1850s, little use was made of the material in New York City until the late 1870s, when architect George B. Post introduced red terra cotta in three buildings, again in the face of criticism, but in strong contrast to the earlier work that resembled stone, and with sufficient impact to sustain its continued use in the 1880s. The Henry M. Braem Residence (1878-80) was Post's first use of terra cotta in New York, sculpted by Isaac Scott at the Chicago Terra Cotta Co. and installed by James Taylor, followed by the Long Island Historical Society (1878-81), featuring large Viking and Indian heads sculpted in clay by Truman H. Bartlett of Boston and Olin Warner of New York. Post then utilized more than 2000 tons of terra cotta in the massive New York Produce Exchange building (1881-85), (Figure 2.13) sculpted in heads of buffalo, sheep, and other animals, along with roundels, modelled by Edward Kemeys and Domingo Mora.²²⁶ The contract was so large that the Perth Amboy Co., founded in 1879 in Perth Amboy, New Jersey, found it necessary to build additional kilns and plant facilities, nearly doubling the firm's size, bringing in British draftsmen, modellers, model makers and pressers.²²⁷ By 1881 the Perth Amboy

²²⁴C. Westfall, "From Homes to Towers: A Century of Chicago's Best Hotels & Tall Apartment Buildings", in Zukowsky, 267-290.

²²⁵Darling, *ibid.*; Westfall, "Buildings Serving Commerce", in Zukowsky, 87.

²²⁶Tunick, 1997, 18-20. The Braem residence terra cotta was produced by the Chicago Terra Cotta Co.; the Perth Amboy Terra Cotta Co. in New Jersey manufactured the terra cotta for both the Long Island Historical Society and the Produce Exchange Building.

²²⁷*Ibid.*; Geer, 50-51.

company had hired James Blashfield's nephew, Joseph Joiner, as Superintendent, and by 1891 the firm had at least 37 kilns,²²⁸ situated in what became known as the "Clay District", near extensive Cretaceous clay deposits.

Post utilized a tripartite design for both the Long Island Historical Society and the Produce Exchange buildings, along with prominent multi-storey arcades, elements that were characteristic of numerous other commercial buildings built in New York City during the 1870s and 1880s. This approach, which had the effect of unifying multiple stories both horizontally and vertically, along with a liberal use of glass, was traditionally attributed to the Chicago School beginning in the mid-1880s, although practiced in New York much earlier, becoming "available for the instruction of the Chicago architects".²²⁹

Architects Babb, Cook & Willard also made use of terra cotta as ornament with several warehouse and commercial tripartite arcaded buildings beginning in the late 1870s, including the firm's most celebrated building, the De Vinne Press (1885-86). Widely praised for its highly original and sophisticated design, the De Vinne Press combines red pressed brick with minimal terra cotta ornament, consisting of thin bands of ornament between the stories, narrow quoins at the corners,²³⁰ and highly abstract delicate perforated and solid terra cotta blocks situated above the entrance, allowing penetration of light into the interior. The name Theodore L. De Vinne & Co., a publishing firm, is also inscribed elegantly in terra cotta over the entry.²³¹ (Figure 2.14)

The architectural firm of McKim, Mead & White also designed several 1880s New York commercial buildings characterized by a strong tripartite design, the use of arcading

²²⁸By 1898 the Perth Amboy company had 46 kilns and the plant covered eight acres. R. Veit, "Skyscrapers & Sepulchers: A Historic Ethnography of New Jersey's Terra Cotta Industry", unpublished dissertation in Anthropology, University of Pennsylvania, 1997, 89-90.

²²⁹S. Landau, "Arcaded Buildings of the New York School, c. 1870-1890", in H. Searing, *In Search of Modern Architecture* (Cambridge, 1982), 136-64.

²³⁰*Ibid.*, 152-3; Curl, 46.

²³¹S. Tunick, "Terra Cotta--Don't Take it for Granite: 3 Walks in New York City Neighborhoods". (New York, 1995), 16-17. As discussed in Chapter III, Canadian architect John Horwood, who was working in New York in the early 1890s, was much impressed by the De Vinne Press building.

in the base or attic, and terra cotta ornament. Largely the work of Stanford White, the first of these was the American Safe Deposit Co. & Columbia Bank (1882-84).²³² Beginning in 1885 the firm designed a series of speculative commercial buildings for Ogden and Robert Goelet, prominent Manhattan real estate developers. The first of these, the Goelet Building (1886-87) (Figure 2.15) combined a large arcaded granite base with a rounded corner, contrasting colors of brick and gray terra cotta setting off the mid-section windows, and a single-storey attic with a prominent cornice. White also designed two other buildings for the Goelet brothers in New York, including the Judge Building (1888-89), and the Hotel Imperial (1889-91), the two-storey base of which was faced in marble with round-arched windows, with the use of white glazed brick and matching terra cotta on the upper floors.²³³

Two commercial buildings constructed in the early 1880s by Orlando B. Potter, also in real estate and the co-founder in the mid-1880s of the New York Architectural Terra Cotta Co., made use of red brick and brown terra cotta made by the Boston Terra Cotta Co. Astor Place (1881), the first of these, was designed by Starkweather & Gibbs, incorporating three terra cotta heads used as keystones over the second storey windows, along with terra cotta capitals surmounting brick pilasters on the fourth storey and additional interspersed ornament.²³⁴ (Figure 2.16) The red brick eleven storey Potter Building (1883-86), also designed by Norris Starkweather, was elaborately decorated with 450 tons of terra cotta made by the Boston Terra Cotta Co., along with a two storey cast iron base, and terra cotta fireproofing in the interior.²³⁵

Red and brown shades of terra cotta, reflecting regional differences in clay colour, also appeared in a number of late 19th century residences in New York, often accompanied

²³²Landau, 1982, *ibid.*

²³³L. Roth, McKim, Mead & White Architects, (New York: Harper & Row, 1983); 109, 138, 169. The Judge Building bore a remarkable similarity to the De Vinne Press Building.

²³⁴Tunick, 1995, 18.

²³⁵See Jones, 73-75 for greater detail concerning the Potter Building.

by red brick and brownstone. The Robb Residence, (1880) situated not far from the Braem residence in the Murray Hill neighbourhood, combined brownstone, brick and terra cotta, displayed in large shields and floral roundels, fruit and foliage swags, and topped by a terra cotta cornice and balustrade. Designed by McKim, Mead & White, it was owned by J. Hampton Robb, New York's Commissioner of Parks during the 1880s. In a nearby neighbourhood, reddish-brown terra cotta also ornamented the Gramercy (1882-83), also built in the early 1880s, integrated with red brick and a two-storey brownstone base with marble columns. New York's oldest existing cooperative, facing Gramercy Park, was designed in a strongly vertical version of the Queen Anne Revival style by George Da Cunha, featuring a corner turret, projecting bays, and a highly decorative façade. Unique high-relief terra cotta ornament is displayed above the third and fourth storeys, and narrow terra cotta banding appears at the upper levels.²³⁶ (Figure 2.17)

Above the third-floor windows are elaborate terra cotta Indian faces. The male face are surrounded by feather headdresses, and the female heads are crowned with headdresses displaying ears of corn. Above the fourth-floor windows are boldly sculpted eagles, heads, and figures. On the sixth and seventh floors are simple geometric squares of terra-cotta banding.²³⁷

In a similar material composition but completely different expression, Rafael Guastavino also designed two rows of narrow Moorish houses on the north and south sides of West 78th Street in 1885-86 for developer Bernard S. Levy. Guastavino, who became well-known for his system of fireproof tile arch vaulting, had come to New York from Catalonia in 1881. The first group of houses at 121-131 W. 78th Street were only 16' and 18' wide, utilizing brownstone on the ground floor and brick with terra cotta and brownstone ornament on the upper two stores, executed in Mudéjaresque details. A second group of houses, 118-134 W. 78th St., built in 1886 across the street, were more

²³⁶Tunick, 1997, 16.

²³⁷Tunick, 1995, 38.

conservative in design; the third of these, number 122, was later identified as Guastavino's first U.S. building to incorporate his unique vaulting system.²³⁸

Following James Renwick's early use of terra cotta in New York, more than thirty years later the firm of Renwick, Aspinwall & Russell made use of tawny, or a buff-yellow shade of terra cotta at 808 Broadway (1887-88). Situated across the street from the St. Denis Hotel, where Renwick used terra cotta beltcourses and window surrounds imitating stone in 1853, the buff terra cotta ornament on the fourth, fifth and six storey windows of 808 Broadway is Gothic, moving vertically in a carefully orchestrated rhythm toward a multi-layered, detailed terra cotta cornice.²³⁹ (Figure 2.18) Shortly thereafter, Renwick, Aspinwall & Renwick again used terra cotta in a highly elaborate cornice on St. Bartholomew's Parish House (1890-92), an arcaded building located at 205 East 42nd Street, built with the support of Mrs. W. K. Vanderbilt. J.C.B. Horwood, a young Canadian architect who at that time was training in New York City²⁴⁰, assisted in the St. Bartholomew's iron work, also remarking on, and sketching its elaborate cornice in a letter to Edmund Burke in Toronto, who in turn published Horwood's letter in the Canadian Architect & Builder.²⁴¹

McKim, Mead & White, and especially the work of Stanford White, played an important role in influencing a change from red to buff and yellow terra cotta during the last decade of the 19th century,²⁴² while utilizing varying materials and textures to differentiate different components of a tripartite construction. The firm adopted Italian Renaissance classicism as its favoured style and became its leading U.S. proponents. Stanford White

²³⁸S. Landau, "The Row Houses of New York's West Side", in JSAH (March, 1975), 24-25. See APT Bulletin, Vol. XXX, No. 4, 1999, Special Issue: Preserving Historic Guastavino Tile Ceilings, Domes and Vaults, for a complete discussion of the Guastavino patented vaulting system.

²³⁹Tunick, *ibid.*, 19-20.

²⁴⁰Carr, 1995, 13-17, 130-131.

²⁴¹"Architecture in New York" in Canadian Architect & Builder (January, 1891), 6.

²⁴²H. Croly, "The Use of Terra Cotta in the United States; How it has Increased", in The Architectural Record, (July, 1905), 90-91.

apprenticed in the office of Gambrill & Richardson in New York and worked closely with H. H. Richardson as his chief assistant during the 1870s for both the State Capitol in Albany and Trinity Church in Boston. White also traveled in Europe and admired Italian Renaissance architecture, had a natural talent for drawing and painting, and was especially attracted to texture and colour in building materials.²⁴³

White's design for the Madison Square Gardens (1887-95), one of the firm's best known buildings, utilized buff and yellow brick together with buff and brown terra cotta ornament. The details of White's ornament for the Madison Square Gardens reflected his study of northern Italy architecture and compared strongly with the Certosa at Pavia. (Figure 2.19) The design of the tower was based on the Moorish Giralda in Seville and incorporated terra cotta loggias. The building's extensive street arcading was reminiscent of the Ospedale Maggiore in Milan, filling the rim of the entire building site, providing public shelter. The tower also incorporated a copper weather vane in the figure of Diana, sculpted by White's friend August Saint-Gaudens, with whom he often collaborated.²⁴⁴ The Judson Memorial Church (1888-93) and Tower (1895-96), situated on Washington Square, also clearly reflected White's attraction for the Italian Renaissance and the use of brick with terra cotta, built primarily in shades of tawny brick, with a towering arcaded campanile characterized by increasingly larger arched windows approaching the top. Repetitive cream-coloured, strongly textural, geometric wide and narrow terra cotta bands ornament the base of the church and the tower, complemented by finer-grained and more delicate terra cotta ornament above, numerous marble inset roundels with terra cotta borders, and a bright red-tiled roof over the church entry.²⁴⁵ (Figure 2.20)

²⁴³H. Withey & E. Withey, *Biographical Dictionary of American Architects (Deceased)*, (Los Angeles, 1970), 652-3; Curl, 401. Roth, 86, 94 noted that Joseph Morrill Wells, McKim, Mead & White's chief assistant, was the main catalyst in influencing the Italian Renaissance as the firm's standard.

²⁴⁴Roth, 143-159, 161, 331-334. Madison Square Garden was unfortunately the site of White's tragic death in 1906 at age 53, at the height of his career, when he was shot by Harry Thaw, the jealous fiancée of Evelyn Nesbit. Withey & Withey, *ibid.*

²⁴⁵Tunick, *ibid.*, 23. The terra cotta on the Judson Memorial complex was slip-coated, made by the Atlantic Terra Cotta Co.

Louis Sullivan's only New York City building, the extant Bayard Building (1897-99), now known as the Bayard-Condict Building, situated on Bleecker near Broadway, represents perhaps his finest execution of geometric and natural forms, expressed in white or cream slip-coated terra cotta made by the Perth Amboy Terra Cotta Co. Sullivan used dense under-cut terra cotta ornament on the Bayard Building in an all-over fashion, revealing its underlying structure, expressing bearing members with substantial terra cotta columns, and non-bearing ones reflected in more slender forms.²⁴⁶ (Figure 2.21) Relatively flat, dense swirling patterns surmount the entrance, while repetitive patterns are displayed between floors throughout the mid-section. Increasingly complex forms are displayed near the top, including lions' heads, then large angels with outstretched arms beneath a deep terra cotta cornice.²⁴⁷

The last decade of the 19th century was characterized by new developments in polychrome glazed terra cotta, resulting from a growing demand for white terra cotta that could not be achieved through natural burnt clay bodies, requiring the services of a trained ceramic chemist.²⁴⁸ In 1894 the Perth Amboy Terra Cotta Co. hired T. C. Booth, an English potter, who developed coloured glazes; the American Terra Cotta Co. also produced coloured glazes in 1895 for a Cass Gilbert building in St. Paul, Minnesota.²⁴⁹ The American Architectural League displayed a full-sized storefront model of glazed polychrome terra cotta at their 14th annual exhibition in New York as an example of the possibilities for the use of coloured glazes, a virtual replication of the Kelly & McLinden hardware store built in 1898 in Perth Amboy, New Jersey, designed to emulate the Italian

²⁴⁶Tunick, 1997, 29.

²⁴⁷A display in the lobby of the Bayard Building describes the history of the site, which was originally acquired for farmland by the Bayard family in 1697.

²⁴⁸H. Plusch, "The Ceramic Chemical Development of Architectural Terra Cotta", in The Brickbuilder, (April, 1911), 83-85.

²⁴⁹Tunick, 1997, 54-56. Stanford White had begun requesting coloured glazes from the Perth Amboy Co. as early as 1882. Geer, 209.

Renaissance.²⁵⁰ (Figure 2.22) Although preceded by an order for shades of pink, yellow, brown, gray and white terra cotta made by the Perth Amboy Co. for the 1898 Dun Building,²⁵¹ the Broadway-Chambers Building (1899-1900), designed by architect Cass Gilbert, is the earliest extant example of polychrome terra cotta in New York City. The latter is composed mainly of brick, with polychrome terra cotta ornamenting the upper stories and cornice, mainly in pink cladding, along with delicate shades of green, yellow and orange.²⁵² Stanford White's use of pale green, rose and yellow high-relief figures in polychrome glazed terra cotta in the prominent classical pediment of the Madison Square Presbyterian Church (1903-06) represented the culmination of his career, and has often been described as the first well-known example of the use of polychrome terra cotta.²⁵³ (Figure 2.23) White was inspired by his viewing of the model at the Architectural League exhibition, and initially asked the Perth Amboy Co. to develop brilliant yellow and green glazes. An accidental firing was instrumental in the church's final, more subdued but highly praised scheme.²⁵⁴

At about the same time, monochromatic glazed terra cotta in shades of cream, light gray and white was used with increasing frequency in New York, often in the construction of tall office buildings, as well as a number of public buildings. Daniel Burnham's well-

²⁵⁰"League & T-Square Club Exhibitions", in The Brickbuilder (February, 1899), 23-26. The storefront, which was illustrated in The Brickbuilder, displayed shades of pale buff, white, and red, with greater amounts of green. "League & T-Square Club Exhibitions" indicated the model was displayed at the 14th annual exhibition of the Architectural League in New York City. J. Hewlett, "Polychrome Terra Cotta in Exterior Architecture", in The Brickbuilder, (April, 1911), 71 described the exhibit as occurring about 15 years previous.

²⁵¹Geer, *ibid.*; Tunick, *ibid.*, 55.

²⁵²Tunick, *ibid.*; Tunick, 1986, 20. "Polychromatic Terra Cotta Effects on Broadway Chambers, N.Y.", in Brick (August, 1900), 91, described the Broadway Chambers as "the first in the States to be decorated mainly by the use of polychromatic terra cotta", also made by the Perth Amboy Terra Cotta Co.

²⁵³Tunick, *ibid.*, 56; Hewlett, *ibid.*, 71. Geer, 211, described it as the "finest contract of glazed and polychrome work ever turned out by the Perth Amboy Co.". The National Terra Cotta Society described the church as "an epochal modern achievement in the successful relation of brick, granite, marble and terra cotta", which "greatly stimulated interest in the possibilities of polychrome glazes". F. Laurence, Color in Architecture, (New York, 1924), 25.

²⁵⁴Tunick, 1997, 56. Veit, 92-93 reported the Perth Amboy factory was frequently visited by Stanford White, who would often use the word "terrible" to describe a sculpted model, even though as a rule he was generally pleased with the firm's work. As an artist, he was never fully satisfied with his own work.

known Flatiron Building (1901-03) was New York's tallest building at the time of its construction, utilizing a strong tripartite construction with a three-storey stone base below a combined terra cotta and brick curtain wall, with a massive five-storey attic plus overhanging cornice. (Figure 2.24) The freestanding structure is situated on a triangular site and characterized by the all-over use of dense, highly ornate classical terra cotta ornament, combining rectangular and rounded motifs, using faces, lions heads and complex foliage forms. Its terra cotta cladding was installed simultaneously from the top as well as the bottom of its frame, taking advantage of its light weight and fire resistant advantages, and the use of moulds to execute repetitive forms.²⁵⁵

James Gordon's design for 36 Gramercy Park East (1908-10) used distinctive as well as repetitive Neo-Gothic terra cotta detailing, including large over-hanging gargoyles in the two-storey attic, providing a virtual time-lapse display of 20th century cream-coloured glazed terra cotta next to its red brick and brown terra cotta 1880s neighbour, the Gramercy cooperative. The sixteen storey Emmet Building (1912), another Neo-Gothic monochromatic building of the same period, designed by J. Stewart Barney, displays smooth surfaces and minimal decoration in the mid-section but concentrates extensive elaborate medieval animals and figures, along with shields, foliage and crests in the base and near its heavy cornice. (Figure 2.25) The predominantly commercial building was built by Dr. Thomas A. Emmet, a New York physician who incorporated an apartment for himself on the top floor.²⁵⁶

White glazed terra cotta was used about the same time as trim, in a striking combination with dark Manhattan schist, along with three terra cotta gateways, in six City University of New York buildings, designed in a Collegiate Gothic idiom (1903-08) by George Post,²⁵⁷ who had won a competition for the design of the complex. Six different

²⁵⁵Tunick, *ibid.*, 25.

²⁵⁶Tunick, 1995, 33, 37-38.

²⁵⁷Tunick, 1997, 95.

terra cotta gargoyle designs made especially for the project by the Perth Amboy Terra Cotta Co. were also illustrated in The Architectural Record in a somewhat fanciful discussion of their merits in Gothic architecture.²⁵⁸ In addition to his many projects in New York, and other U.S. cities, Post designed the Manufacturers' and Liberal Arts Building for the 1893 Chicago Columbian Exposition. He was also active professionally, serving as president of the Architectural League, a member of the Fine Arts Federation of New York, and twice president of the American Institute of Architects.²⁵⁹

Cass Gilbert's neo-Gothic design for the Woolworth Building (1910-13) utilized glazed terra cotta cladding in fifty-two of its fifty-five storeys, mainly in varying shades of light cream-coloured to dark ivory; considerable polychrome accents were also incorporated near the top of the building, but were seldom seen. Its public perception was almost uniformly white, and its construction was followed by a considerable increase in monochromatic cladding. (Figure 2.26) The Woolworth Building housed the headquarters of Frank W. Woolworth's successful retail business, first envisioned as twenty storeys, although several changes in Woolworth's plans resulted in his wish to construct the world's tallest building. Cass Gilbert used John Donnelly and Eliseo Ricci, two of his own modelers to work with the Atlantic Terra Cotta Co. in the design of the terra cotta, which included salamanders coiled near the front door and gargoyles projecting from its upper storeys. The building was constructed with amazing speed, at the rate of less than two days for each storey. Veit suggested the Woolworth Building "meant many things to many individuals", symbolizing U.S. industry and New York's commercial prowess, Frank Woolworth's own "rags to riches" storey, and especially the work of many immigrant craftsmen from England, Denmark, Hungary and Italy, building a monument

²⁵⁸C. de Kay. "Gargoyles, Old and New". The Architectural Record, (June, 1906), 93.

²⁵⁹Withey & Withey, 482-84.

"not just to the 5- and 10-cent store king, but to their skills, and to the potential of terra cotta."²⁶⁰

Interest in the use of colour was increasing in New York shortly after 1900, with bright or subtle shades of polychrome terra cotta gaining increasing use, especially in the design of theatres, schools, and apartment buildings, used to emphasize cornices, entrances, ground storey façades, or upper storeys, in an "enormous range of glazes...including metallic lusters, vivid yellows, cobalt blues, and fashionable Art Deco shades such as lime green, lavender, and ebony." Brightly glazed terra cotta was never the rule in New York, however, and was far outweighed by terra cotta that intentionally simulated stone.²⁶¹

The interior of the New Amsterdam Theatre (1902-03), designed by Herts & Tallant, contains exquisite deep bluish-green glazed Art Nouveau terra cotta newel posts and staircase banisters, modelled by Thorbjorn Basso, a Norwegian architect. Several theatres designed by architect Thomas Lamb incorporated polychrome terra cotta, such as the Audubon Ballroom (1912), which displayed a variety of richly modelled polychrome mythological icons, including the head of Neptune. Lamb's Loew's Theater, however, was carried out entirely in white glazed terra cotta in highly detailed Moroccan patterning.²⁶² Terra cotta became a favourite, if not customary material for U.S. movie theatres, although a preference was shown for deeply modelled monochromatic forms as opposed to polychromy.²⁶³

A number of other commercial establishments used polychrome to add colourful whimsy or humour to New York's buildings. The Child's Restaurant (1923) on Coney Island, designed by Ethan Dennison and Frederick Hiron, displays a delightful range of

²⁶⁰Tunick, *ibid.*, 69. Veit, 232-41, indicated the Woolworth Building was finally constructed at a height of 792 feet, cost \$13 million, and was paid for by Frank Woolworth in cash.

²⁶¹Tunick, *ibid.*, 63, 89.

²⁶²Tunick, *ibid.*, 88-90.

²⁶³Stratton, 1993, 209-210.

marine images and sea creatures in numerous roundels, large window ornaments, column capitals, and arcades.²⁶⁴ The Coney Island Child's Restaurant was illustrated a year later in the National Terra Cotta Society's Color in Architecture, described as an adaptation in stucco of a Spanish precedent with blue, green, vermilion and gold glazes.²⁶⁵

Brightly coloured terra cotta art deco bands or panels were displayed on both the upper-most and the lower levels of brick apartment buildings in New York between 1910 - 1930, partly in response to new zoning by-laws requiring upper building setbacks. For the large part, however, polychrome ornament was used in New York where it could be easily seen at the lower levels. Gramercy House (1929-30), designed by George & Edward Blum, who often used unique terra cotta patterns, incorporated brightly coloured turquoise, deep blue and pale yellow terra cotta zig-zag geometric motifs near the entrance and above the second storey. (Figure 2.27) Ely Kahn similarly used abstract and geometric polychromatic bands to decorate the top stories of 2 Park Avenue, coinciding with upper storey setbacks. Kahn chose both the treatment and the colors by observing full-scale plaster models on the roof of the building before making his final choice.²⁶⁶

Several Works Progress Administration (WPA) projects established by the Roosevelt administration after the Depression involved the use of terra cotta in sculptural art works and in murals, exemplified by a series of New York State Post Offices (1935-42), as well as a 1936 project employing twenty artists in the execution of a polychrome terra cotta fountain in Roosevelt Park, New Jersey. Although the industry was significantly waning, New York City continued to host several other projects between 1940-1968, such as an extensive residential project in the Bronx for more than 12,000 families which incorporated decorative polychrome terra cotta panels and figures.²⁶⁷

²⁶⁴Friends of Terra Cotta Newsletter, June 2001. At the time of writing, the Coney Island Child's Restaurant was an endangered structure proposed for a landmark designation hearing.

²⁶⁵Laurence, 14-17.

²⁶⁶Tunick, 1995, 37, 28-29; Tunick, 1997, 98.

²⁶⁷Tunick, 1997, 111-12, 119; Veit, 220.

Philadelphia & Washington, D.C.

The 1876 Centennial Exhibition in Philadelphia was characterized by a poor showing of American ceramic wares, demonstrating an imbalance in the U.S. industry, which at that time was mainly focused on terra cotta's structural and fireproofing aspects. Elaborate foreign displays such as Doulton's reflected an obvious interest in aesthetics. The effect of the Exhibition was to stimulate an interest in ceramic arts education in the U.S., influencing the establishment of a clayworking department at the Philadelphia School of Industrial Arts in 1880, where students were offered comprehensive industrial training along with experience in the modelling department of Stephens, Conkling & Armstrong, a Philadelphia terra cotta producer. The Eagleswood Art Pottery was also established in 1876 near Perth Amboy, New Jersey by Edward Spring, along with his friend James Taylor, offering artistic ceramic education and modelling skills. Ceramic departments were also later established at other universities which coordinated their programs with the terra cotta industry, such as at Ohio State University, providing the U.S. ceramic industry with skilled modellers, sculptors, engineers and chemists.²⁶⁸

Terra cotta was introduced and strongly influenced by the Philadelphia Railroad Station (1880-85), designed by Messrs. Wilson & Co., who were drawn to George Post's use of red terra cotta in the Long Island Historical Society in New York. The red brick and red terra cotta Pennsylvania Railroad Station, described by Stratton as "the nearest parallel in America to the contemporary use of terra cotta in Britain by Alfred Waterhouse", reflected a strongly vertical form with pointed windows and small terra cotta units in richly graduated decoration, and in small roundels of modeled heads representing humanity.²⁶⁹

²⁶⁸Stratton, 1993, 154-55; Tunick, 8-9, 105. Ohio State University's program was established in 1895. The New York State College of Clay-Working and Ceramics was also founded in 1900 at Alfred University. Both programs collaborated with the National Terra Cotta Society around 1920 in a study covering virtually all aspects of the terra cotta manufacturing process.

²⁶⁹Stratton, *ibid.*, 161.

Shortly thereafter, architect Frank Furness designed the university library, now the Furness Building (1888-1890), combining Gothic as well as Rundbogenstil elements in matching red brick, terra cotta and roof tile, in "one of the most willfully eccentric examples of ceramic architecture ever created".²⁷⁰ (Figure 2.28) Furness was Philadelphia's dominant architect from 1866, designing nearly 400 other buildings in and around the city, often displaying elements of several architectural styles and working in a bold manner. Furness was influenced by Ruskin and often adapted Christopher's Dresser's ornamental details,²⁷¹ and also drew ideas from H.H. Richardson's work. Furness invited Walter Smith to the Philadelphia Exhibition in 1876 and collaborated in the founding of Philadelphia's Museum and School of Industrial Art.²⁷²

Philadelphia's Museum of Art (1922-33), constructed much later, strongly resembling a Greek temple, is one of the finest examples of polychrome terra cotta in the U.S. Thirteen high-relief glazed, brilliant-coloured sculptures were incorporated in a 70 foot pediment, along with polychrome Ionic and Corinthian column capitals. (Figure 2.29) Designed by architects Horace Trumbauer, C.C. Zantzinger and C.L. Borie, Jr., the building was hailed by the Atlantic Terra Cotta Co., who developed the glazes and supplied the terra cotta, as the first structure of significance in 2000 years to use polychromy in this way, with the difference that in ancient Greece, the terra cotta details were painted on with pigments. The massive mythological figures were sculpted by C. Paul Jennwein, representing the theme of Western Civilization. The figure of Zeus alone weights 200 pounds and stands 12 feet tall.²⁷³

Leon Victor Solon, a ceramic colourist, or "polychromist" served as a consultant on the Philadelphia Museum of Art. Solon was a leading advocate of the use of colour in

²⁷⁰Ibid., 178.

²⁷¹Curl, 259.

²⁷²Stratton, *ibid.*

²⁷³Friends of Terra Cotta Newsletter, March, 1999.

architecture, having emigrated to the U.S. in 1909 after leaving his former position as the art director at the Stoke-on-Trent Minton China Works in England. Solon promoted the use of traditional classical and Italian Renaissance precedents in the use of polychromy and wrote for The Architectural Record. During the 1920s Italian Renaissance architecture, classical banks, Tudor and Jacobean schools, and French Renaissance theatres were promoted in the U.S. as appropriate styles for the use of glazed polychromatic ornament.²⁷⁴

The Pension Office Building (1882-84) in Washington, C. D., where pensions were administered to veterans of the Civil War, incorporated a large buff-coloured terra cotta frieze around the entire façade of the building, 36" high and 1200 feet long. Designed by architect Gen. Montgomery Meigs, sculpted by Caspar Buberl, and made by the Boston Terra Cotta Co., the frieze depicts human figures representing the U.S. navy and military, horses, boats, and other images depicting the Civil War. Twenty-eight panels were separately modeled by Buberl, with only minimal repetition occurring. Buberl emigrated to the U.S. in the 1850s from Bohemia and modeled other terra cotta work in the U.S.²⁷⁵ The Pension Building today houses the National Building Museum, which contains the archives of the Northwestern Terra Cotta Co.

Vernacular Terra Cotta & the Clay Workers in Perth Amboy

Terra cotta's vernacular use in the small city of Perth Amboy in the heart of New Jersey's "Clay District" was extensive, unusual and often highly original, strongly contrasting with its large scale commercial use in New York and other major urban centres. The Clay District, which became the centre of the U.S. terra cotta industry beginning in the late 19th century, was situated near New York City on Raritan Bay in New Jersey and

²⁷⁴Stratton, *ibid.* 203-4. Marc Solon, Leon's father, trained his son and was chief decorator at the Minton China Works.

²⁷⁵See Jones, 65-66, for a more detailed discussion of the Pension Office Building.

included the cities of Perth Amboy, South Amboy, and Woodbridge. By 1882 Perth Amboy was an important industrial centre with excellent railroad connections, the home of shipwrights, and cork, iron, brass, and coal industries, in addition to terra cotta and brick works. A little later the Perth Amboy, the New Jersey, Atlantic, and Federal Seaboard terra cotta plants were also situated in Perth Amboy, producing architectural terra cotta mainly for buildings in major urban areas elsewhere.²⁷⁶

Terra cotta appeared as decoration in Perth Amboy on its churches, public buildings, factories, and mainly on its commercial buildings. It also appeared in the form of statuary, murals, fence posts, carriage steps, and ceramic gravemarkers. Most of Perth Amboy's buildings, along with those in other nearby communities, reflect a vernacular architecture mainly dating from the period 1900-30, referred to by Veit as "Clay District Classical Revival". The latter is characterized by terra cotta decoration "ranging from simple to extravagant employed on otherwise unremarkable brick commercial buildings", displayed in mostly classical motifs. Most Perth Amboy terra cotta ornament is simple, minimal and buff or gray in colour, imitating stone, decorating small commercial buildings in the form of belt courses, detailing, sills, pilasters, cartouches, cornices and other trim. Only eight of Perth Amboy's commercial buildings are clad entirely in terra cotta. The nine storey Perth Amboy National Bank, the only "skyscraper", is clad primarily with glazed brown terra cotta with Art Deco motifs. Occasional original terra cotta sculptures include a green and gold Statue of Liberty on a fraternal hall, horse heads on former stables, a devil on a local restaurant, and a bas-relief speeding race car on a former garage.²⁷⁷

At one time more than 1,000 local residents reflecting a highly diverse ethnic composition worked in Perth Amboy's clay industry. Originally settled by Scottish and English immigrants, by 1913 the city was dominated by Eastern European immigrants, followed by Danes and Italians, who dominated the terra cotta plants. Perth Amboy was

²⁷⁶Veit, I, 39-42, 199-200.

²⁷⁷Ibid., 201-09.

also the home of several well-recognized sculptors, including Domingo Mora, who was born in Spain and headed up the Perth Amboy Terra Cotta Co.'s modelling and design department; Edward Kemeys, who created works for the Chicago World's Fair and was known for his Native American and animal sculptures; and Waylande Gregory, who used the Atlantic Terra Cotta Co. kilns to construct enormous ceramic sculptures during the 1930s. Victor Ricci had worked on the Lincoln Memorial and the Woolworth Building. Nels Alling was born in Denmark and became highly skilled in creating large terra cotta sculptures.²⁷⁸

Veit's study of 174 terra cotta gravemarkers between the 1870s and 1930s in twenty area cemeteries evidenced the use of distinctive iconographic forms associated with particular antecedents or ethnicities, along with the frequent use of colour, including white, red, blue, brown and yellow glazed markers (with both matte and glossy finishes), and red and buff unglazed markers. Most were associated with the 1910-20 period, explained in part by a significant number of residents who died in the 1918 influenza epidemic. The inscription on one of the markers, erected by his family and friends from Lambeth, England, suggests the deceased may have previously worked in the English ceramic industry. A small temple mausoleum made almost entirely of terra cotta marks the grave of Karl Mathiasen, the president of the New Jersey Terra Cotta Co., who was born in Denmark and worked in several U.S. terra cotta firms.²⁷⁹

Terra cotta gravemarkers were long used in parts of Europe, especially in Great Britain, and were popular in parts of the southern U.S. in the late 19th century. Veit explained their frequent use in the Raritan Valley, however, as an independent occurrence, explained by craftsmanship, ideology, economics, and particularly the ethnic diversity of the Valley during the late 19th and early 20th centuries, reflecting mainly Hungarian, Russian and Danish immigrant groups, although also representing Italian, German, Polish,

²⁷⁸Ibid., 192, 199-200, 217-20, 260.

²⁷⁹Ibid., 156, 165-74.

and Slavic backgrounds. The fact that little notice to date had been given to these ceramic gravemarkers, reveals a greater lack of recognition of the people they memorialize, than terra cotta's virtual invisibility as an architectural material. As expressed by Veit,

Their importance is highlighted by the fact that many of the people they commemorate, for reasons that are not clear today, seem to have eluded the census takers. So far as historical documents are concerned, they are invisible. They did not exist. But here in the cemeteries, we see the languages of the clay district, the skills of the modelers--unfettered from the designs of architects, and a colorful palette rarely employed in North American memorials.²⁸⁰

Advantages

Much more so than their counterparts in England, Americans valued terra cotta for its suitability for steel-frame tall building construction, the result of a combination of its fireproof qualities, light weight, durability, and generally lower cost compared with other buildings materials. At the same time, Americans appear to have equally valued terra cotta for its artistic qualities and its ornamental uses, especially its plastic advantages as a sculptural material, its flexible potential for varied shapes and sizes, and its potential wide-ranging palette of colours and textures. As a whole, it would likely not be inaccurate to conclude that for Americans, terra cotta had "incontestable advantages over the other leading materials", contributing directly to its "great success".²⁸¹

The early years of terra cotta's use in the eastern and midwestern U.S. seem to suggest regional differences in the perception of its advantages as an architectural material, with a higher value placed on its fire-resistant qualities in Chicago, as influenced by the disastrous 1871 fire, versus greater appreciation of its artistic merits and ornamental uses in Boston, as evidenced by its extensive use in the construction of the Boston Museum of Fine Arts beginning in 1870. Notwithstanding regional differences, the growing popularity of its use in the U.S. generally, beginning about 1880, much preceded steel

²⁸⁰Ibid., 153-4, 164, 180, 185, 192-3, 257-58.

²⁸¹Croly, "The Proper Use of Terra Cotta", in The Architectural Record, (January, 1906), 73.

skeleton construction and was "coincident with the sudden and enormous extension of American building and architecture"²⁸², bearing comparison with its use in England in the rapid growth of its cities during the 1870s and 1880s. Its advantages for use with steel-frame tall building construction a number of years later in the U.S. were seen as an opportunity for manufacturing improvements and further growth in its use due to its adaptability to the "aesthetic designs" of tall buildings. Its perceived appropriateness for the latter even led Croly to suggest

that in case terra cotta had not been made in this country at the time the steel frame came into universal use for tall buildings, that method of construction would have imperatively demanded its manufacture.²⁸³

Terra cotta's long-enduring durability and its retention of sharp details was promoted as an advantage from the outset of its use in the U.S., as exemplified by John Sturgis's 1871 comparison of its undeteriorated condition at Hampton Court, where brick, stone and almost every other "material used in the construction of the palace, is more or less worn and decayed".²⁸⁴ Much later Walter Geer also cited the disintegration of other materials, including timber, stone and iron, as a means of illustrating terra cotta's near indestructibility "when properly made and thoroughly burnt".²⁸⁵

The cost-saving advantages of terra cotta compared with stone were generally emphasized throughout the period of its popularity in the U.S., although over time this changed and later contributed to terra cotta's decline in use as a building material.²⁸⁶ During the early years of its use this advantage was especially seen as one of time, in addition to cost, when compared with carved stone, although added cost, as well as time

²⁸²Croly, "The Use of Terra Cotta in the United States", in The Architectural Record, (July, 1905), 89.

²⁸³Croly, "The Proper Use of Terra Cotta", 80.

²⁸⁴Sturgis, 40.

²⁸⁵Geer, 221.

²⁸⁶R. Mack, "The Manufacture & Use of Architectural Terra Cotta in the United States", in H. Jandl, editor, The Technology of Historic American Buildings, 1983, 146-7.

savings could result from replication of a plaster model in comparison with hand-carved stone or marble.²⁸⁷ Mack's analysis of cost differentials in the U.S. indicated that in the late 1880s terra cotta was less expensive than stone on a consistent basis; compared with hard stone, its cost was about 35-40% less, and for decorative areas this savings was even greater. In 1921 the cost of unglazed terra cotta, using repeated pieces and limited decoration, was about half the cost of granite with the same general appearance, while the cost of glazed terra cotta was about three-quarters that of granite. The cost of limestone in 1921, however, was significantly less than either unglazed or glazed terra cotta. The deciding cost factor between terra cotta and cut stone frequently rested on transportation costs. Stone was more economical when available locally, but terra cotta was usually less expensive if long shipping distances were involved, due to its much lighter weight.²⁸⁸

Terra cotta's light weight advantages for steel-frame tall building construction were significant, even when it was backfilled on installation, recommended particularly in extreme climates to avoid the formation of water pockets, ice and potential breakage. Hollow terra cotta blocks weighed about 70 pounds per cubic foot or 100-120 pounds filled, compared with 144 pounds for limestone and 168 pounds for granite.²⁸⁹ Major contractors also viewed the use of terra cotta as critical in reducing tall building construction time.²⁹⁰

U.S. advocates of terra cotta's ornamental advantages emphasized its plasticity, permitting the modeller to work easily and quickly. Even where no repetition was required, terra cotta offered the opportunity of improving the design--an advantage that Walter Geer, much like Ruskin, valued highly.

²⁸⁷Sturgis, 42, stated "It has been estimated that had the bas-relief of the pediment of Greenwich Hospital been executed in marble, it would have required somewhere about ten years to have completed it, but in terra-cotta it was done in two years."

²⁸⁸Mack, *ibid.*

²⁸⁹Geer, 227.

²⁹⁰Stratton, 1993, 189.

Foremost among the advantages of terra cotta as a building material, may be mentioned the facility it affords to architects to see the actual full sized details of the more ornamental portions of their designs before the work is burned, as where ... no moulds are used, and the work which is afterwards to be burned, and take its place in the building, is the model itself. It thus bears the impress at once of the mind of the designer, and of the skill and knowledge of the modelling artist. It can be studied, improved, or modified, and when entirely satisfactory, burned.²⁹¹

For others, its utmost advantage lay in its potential range of varied colours and textures, providing it with an aesthetic possibility that could not be achieved otherwise. In Croly's view, its glazed and coloured attributes were "most inimitable". Although Croly's prediction that polychrome terra cotta would be associated with even greater use was overestimated,²⁹² polychrome terra cotta was clearly more highly valued, and used to a greater extent in the U.S. than in England.

Terra cotta was not without its limitations as perceived by some American builders, including its potential to warp and shrink improperly in the drying and firing stages, its potential for breakage, and the time required for its manufacture. The first of these could be tempered by quality control and the use of relatively small pieces; breakage could be controlled to some extent by ordering extra pieces of repetitive patterns; and the timely ordering of terra cotta jobs was recommended to avoid potential delays.²⁹³

Major U.S. Manufacturers

Preceded by several pre-1870s small firms in the eastern U.S., Chicago was the centre of the terra cotta industry for a good part of the 1870s, to a considerable extent the result of the stimulating effect of the 1871 Chicago fire. By the late 1870s the "centre" of the industry had begun to shift to New Jersey, utilizing significant Cretaceous clay resources in the vicinity of Perth Amboy, New Jersey, near New York City.²⁹⁴

²⁹¹Geer, 216.

²⁹²H. Croly, "Glazed and Colored Terra-Cotta", in The Architectural Record, (April, 1906), 316.

²⁹³Mack, 121-22.

²⁹⁴Veit, 199.

Notwithstanding the dominance of the industry by east coast manufacturers until the 1930s, the U.S. terra cotta industry as a whole involved the activity of numerous firms located through the U.S., including several manufacturers on the west coast.²⁹⁵ (Figure 2.30)

Similar to England, many early firms began as small pottery or brick works that introduced a limited selection of architectural terra cotta trim, then expanded to produce a wide variety of architectural terra cotta products. A number of new firms established after about 1890 were the result of consolidation (and elimination) of two or more pre-existing companies into one larger firm, at times setting up additional plants in several cities. The U.S. industry was characterized by close ties within the industry, including family connections, and movements of a number of individuals between firms, represented in the most apparent example by James Taylor's frequent moves between firms during the 1870s-80s. Again represented best by James Taylor, the U.S. industry profited significantly from the experience and knowledge of a number of former British terra cotta workers, as well as British technology and clay-processing methods. Despite the existence at times of strikes and job loss due to consolidation,²⁹⁶ many terra cotta companies and associations played an important role in their workers' lives and in their communities.²⁹⁷ The following briefly highlights four major companies whose significance or history has not been discussed previously in this chapter.²⁹⁸

The New York Architectural Terra Cotta Co. was established in 1886 in New York by Asahel Geer and Orlando Potter, who owned extensive property in New York City. Walter Geer, a lawyer, served as President from 1886 to 1919, then becoming Chairman of

²⁹⁵Geer's 1920 Story of Terra Cotta identified 24 active, and 28 former U.S. manufacturers, although not including most of the pre-1870s firms.

²⁹⁶Veit, 113.

²⁹⁷Tunick, 1997, 47, 133.

²⁹⁸The Boston Terra Cotta Co. and the Chicago Terra Cotta Co. were both discussed earlier. See Tunick, 1997, for a list of early U.S. architectural terra cotta manufacturers (pre-1870s) in Appendix B, and an annotated reprint of "Society Members" and "Former Manufacturers" from Walter Geer's 1920 Story of Terra Cotta in Appendix C.

the Board.²⁹⁹ Geer's interest in history led him to publish a detailed history of the U.S. terra cotta industry in 1920. James Taylor, known as "the Father of American Terra Cotta" (Figure 2.31), who had worked for James Blashfield in England and joined the Chicago Terra Cotta Works in 1870, was the New York Architectural Terra Cotta Co.'s first Superintendent, leaving a similar position at the Boston Terra Cotta Co. In its first two years the New York Architectural Terra Cotta Co. supplied more than 2000 buildings in New York, Chicago, Detroit, Buffalo, and several other cities, and later competed vigorously along with other U.S. firms to obtain contracts across Canada. The New York company ceased to operate in 1932, when the Eastern Terra Cotta Co. took over its plants.³⁰⁰

Geer described the Atlantic Terra Cotta Co., also headquartered in New York City, as the "largest manufacturer of architectural terra cotta in the world",³⁰¹ the result of consolidating the Perth Amboy Co., the Excelsior, and the Atlantic companies in 1906.³⁰² The Atlantic Terra Cotta Co. had plants in New York City, as well as in Perth Amboy and Rocky Hill in New Jersey. The Atlantic Co. especially advertised its New York contracts, such as the Woolworth Building, while supplying contracts as far away as San Juan, Japan, So. America, Australia, and So. Africa. It also published a journal entitled Atlantic Terra Cotta from 1913 to 1942. Atlantic's Perth Amboy plant was the largest, and employed a number of English clayworkers.

at this works the Superintendent, the Assistant Superintendent, the Head of the Construction and Draughting Departments, several foremen, and a great number of other skilled workers--plaster men, molders, modelers, etc. are all Englishmen. There are twenty-one Englishmen in the Draughting Department of the Atlantic Terra Cotta Company, and most of the drawings for the Woolworth building were made by Englishmen.³⁰³

²⁹⁹Geer, 89-94, 277.

³⁰⁰Friends of Terra Cotta, "The New York Architectural Terra Cotta Co. Archive".

³⁰¹Geer, 247.

³⁰²Veit, 112-13.

³⁰³Quotation from British Clay Worker, 1912, 37, in Veit, 141.

The multi-factory Federal Seaboard Terra Cotta Co. was the result of a 1928 consolidation of three former New Jersey producers, the Federal Terra Cotta Co., the South Amboy, and the New Jersey terra cotta companies. It produced both architectural terra cotta and terra cotta wall ashlar blocks and slabs, an extruded product that enjoyed popularity in the 1920s.³⁰⁴ In 1928 Federal Seaboard produced more than 3000 tons of terra cotta monthly, employing from 800 to 900 workers.³⁰⁵ Four of the original founders of the South Amboy and New Jersey companies were born in Denmark.³⁰⁶

The Northwestern Terra Cotta Co. was incorporated in 1888 in Chicago and was the successor to a long line of earlier firms, principally, the Chicago Terra Cotta Co., along with the True, Brunkhorst & Co., and the True, Hottinger & Co.³⁰⁷ By 1900 Northwestern was the largest terra cotta producer in the country, dominating the U.S. midwest market, with 750 workers in their 24-acre plant. Northwestern advertised extensively in the U.S. through well-illustrated catalogues and agent contacts.³⁰⁸

Gladding, McBean & Co. was established in 1875 by Charles Gladding, George Chambers and Peter McGill McBean.. Today, it is the oldest remaining architectural terra cotta firm in the United States.³⁰⁹ The Gladding, McBean & Co. began as a small factory near San Francisco in Lincoln, California, producing vitrified clay sewage pipe. The plant gradually expanded to make a variety of clay wares; by 1884 it was manufacturing

³⁰⁴Veit, 123-24.

³⁰⁵Tunick, 1997, 139.

³⁰⁶Karl Mathiasen, for example, who was President of the New Jersey Co., was born in Denmark and began his clay career at the Alfred Hall plants in Perth Amboy, later working under James Taylor in both Boston and New York. Mathiasen also had interest in a tile company and a Danish porcelain and arts store in New York City; in 1910 he was decorated by the King of Denmark as the "Knight of Danebrog". Geer, 273-288.

³⁰⁷Gastav Hottinger, President of True, Hotting & Co. for several years, was born in Vienna, was an ivory carver, and worked as a modeler with the Chicago Terra Cotta Works prior to helping found the True, Brunkhorst & Co. John Brunkhorst was born in Berlin and was a terra cotta stove maker. Ibid., 156-8, 249, 281.

³⁰⁸Darling, n.p.

³⁰⁹Tunick, 1997, xiii, 141. Gladding, McBean & Co. was incorporated in 1886.

architectural terra cotta, becoming the predominate supplier for major cities on the west coast.³¹⁰ Peter McGill McBean, who was Secretary of the firm until 1894 and became its President in 1920, was a Canadian, born in Lancaster, Ontario in January, 1844.³¹¹ (Figure 2.32) Prior to joining Gladding and Chambers in their new business, Peter McGill McBean "worked as a building contractor in a family business and had also mastered the art of finance."³¹² The history of Gladding, McBean & Co. in Geer's Story of Terra Cotta revealed information concerning Peter McGill McBean's background and his namesake,³¹³ his early work in Chicago just after the fire, and his role as founding partner of the firm in 1875.

Just after the Great Fire of Chicago, when the city was rapidly rising from its ashes, three enterprising young men were employed there by as many different contracting companies. The youngest of the three had been born about twenty-five years before on the banks of the St. Lawrence River, of Scotch parentage, and named after Peter McGill, who had been associated with his father and his uncles during the early part of the last century in felling the Canadian forests along the St. Lawrence and Ottawa Rivers. Soon after the first trans-continental railroad was opened, the young man with the two Macs in his name went to California, where he remained for four years. Returning to Chicago two years after the Fire, on the first day of May, 1875, with Charles Gladding and George Chambers, Peter McGill McBean founded the now celebrated form of Gladding-McBean Company. for the manufacture of clay products in California.³¹⁴

³¹⁰Geer, 187-89. By 1920 the Gladding, McBean plant occupied 400 acres.

³¹¹Geer, 191, 286.

³¹²G. Kurutz, Architectural Terra Cotta of Gladding, McBean (Sausalito, 1989), 89. Industries of Canada: Historical & Commercial Sketches of Toronto & Environs, (Toronto, 1886), 105, listed William McBean, born in Canada and established in business in Toronto in 1875, as a builder, contractor, real estate and insurance agent, having erected buildings "of the most substantial character".

³¹³F. Halpenny, ed. , Dictionary of Canadian Biography, Vol. VIII (Toronto, 1985), 540-544. biography of Peter McGill, known until 1821 as Peter McCutcheon, describes McGill's career as a merchant, bank and company director, and politician. b. in Scotland, 1789, d. 1860 in Montreal. Peter McGill & Co. had offices in both Quebec (concentrated on the wood trades) and in Montreal (mainly supplying imported British manufactured goods). McGill became a member of the board of directors of the Bank of Montreal in 1819 and became its President in 1834, remaining as such until his death. He was a previous partner of, and closely associated with Samuel Gerrard, the first president of the Bank of Montreal. Gerrard had first suggested the erection of a monument to Nelson in Montreal and struck a committee which secured Coade Stone from the Coade Manufactory in England for the Nelson monument, and later for Canada's first Bank of Montreal (1818-19). See Chapter III.

³¹⁴Geer, 186-7. Much of the brief history of Gladding, McBean in Geer's 1920 Story of Terra Cotta was written by Peter McGill McBean.

Peter McGill McBean returned to California and managed the finances and sales of the firm from the firm's San Francisco headquarters. His son, Atholl McBean, also later served as secretary, then President of Gladding, McBean.³¹⁵ Most of Gladding, McBean's projects were in California, although they also supplied architectural terra cotta in Vancouver, Victoria, Seattle, and other growing Pacific northwest cities from the 1880s to 1920s.³¹⁶

A number of major U.S. firms joined a series of successive terra cotta manufacturing associations beginning in the 1880s. The earliest of these, the First and Second Brown Associations, attempted to restrict competition.³¹⁷ The National Terra Cotta Society was established in 1911 mainly through the initiative of Walter Geer, with a purpose of promoting high standards and the advantages of terra cotta, and to advance the mutual interests of its members. The Society produced a series of brochures and published two editions of Architectural Terra Cotta Standard Construction.³¹⁸ The latter contained detailed illustrations of a wide variety of terra cotta cladding architectural elements, along with various methods of support and anchorage used in setting terra cotta with steel frame and concrete construction. (Figure 2.33)

Although manufacturers denied the existence of pricing collusion, it eventually became apparent their activities were illegal. In 1921, a Federal Grand Jury indicted 22 corporations and 27 individuals "revealed to be the National Terra Cotta Society", on charges of price increases and monopolizing the U.S. terra cotta business, in criminal violation of the Sherman Anti-Trust Law. Another 1923 case involving the Atlantic Terra Cotta Co. revealed that firms had "agreed to divide the country into three parts with local companies providing the terra cotta for nearby projects." The trend in the terra cotta industry toward consolidation was apparent in other industries of this period.³¹⁹

³¹⁵Ibid., 189-91; Stratton, 1993, 193. Three of Gladding and Chambers' sons were also officers of the firm by 1920.

³¹⁶Kurutz, 130.

³¹⁷Veit, 110-12.

³¹⁸Geer, 236-41.

³¹⁹Veit, 112-14, 122.

Industry activity during both World Wars was considerably lower due to reduced construction and scarce labour. After World War II problems with corroding hangers, deteriorating terra cotta, and deferred maintenance on some older buildings began to surface, raising questions about the durability and indestructibility of terra cotta, although the real issues were sufficient support, appropriate anchorage, and water infiltration protection. By this time, despite technological advances, the production of terra cotta was judged to be too laborious, and style and material preferences brought a growing use of concrete, metal and glass.³²⁰ The Great Depression had the most significant impact on the industry, however, and suburban development had also begun to consume earlier clay pits and factory sites.³²¹ The Federal Seaboard Co. was one of the last to close, ceasing to operate in 1968.³²²

In addition to Gladding, McBean, still in operation today, the Boston Valley Terra Cotta Co. was established as a new firm in the late 20th century in Orchard Park, New York, just outside Buffalo. The Boston Valley Terra Cotta Co. has undertaken a number of major restorations in the U.S., such as the Guaranty Building in Buffalo and the Fred French Building in New York, along with the 1988 restoration of Loew's Theatre in Toronto and the recent reconstruction of a terra cotta fountain in Brockville, Ontario.

Conclusion

Terra cotta's acceptance as a decorative material in the U.S. was influenced by its extensive decorative use in the Boston Museum of Fine Arts in the 1870s, along with the increasing use of fictile materials in Boston during the same period. Conceived as an art training school as well as a centre for the display of fine arts, the Boston Museum also marked the arrival in the U.S. of Walter Smith, a British professor trained at South

³²⁰Tunick, 1997, 113-14.

³²¹Veit, 132.

³²²Tunick, *ibid.*, 117.

Kensington who had a far-reaching influence on art education in America during the 1870s and '80s. The Boston Museum also marked a strong technological link between England and the U.S., through the use of terra cotta made at John Blashfield's works and the nearly simultaneous importation of British technology to Chicago through James Taylor.

Compared with the influence in England of terra cotta's use reflecting the Italian Renaissance style in the South Kensington Museum, its arrival in the U.S. in the Gothic style appears to have less influence on its expression there, occurring in a wide variety of styles, sometimes evoking a mix of elements, such as the Richardsonian Romanesque, northern Italian, neo-Gothic, Queen Anne, "Chicago", Moorish, Art Deco, and the vernacular Clay District Classic Revival style of the New Jersey Clay District.

Much more so than in England, terra cotta became a favoured building material in many rapidly growing U.S. cities, offering numerous advantages, especially for steel frame tall building construction. While many U.S. architects used terra cotta, particularly those associated with the Arts and Crafts movement, Sullivan likely deserves the credit for exploiting terra cotta's potential and contributing to its increasing popularity shortly before the turn of the century, using it freely in natural abstract forms in an all-over approach.³²³ The low-relief foliate, swirling modelling approach that generally characterized terra cotta in the U.S. is largely reminiscent of Richardson's use of crafted brick, and was also influenced by the modelling style of the Boston Terra Cotta Co.

Terra cotta's monochromatic use far outweighed its appearance in a polychromatic form in the U.S. By the end of the 19th century glazed ceramics dominated terra cotta's use in the U.S., while in Britain it appeared far more frequently in its unglazed form. Terra cotta's potential in colour was exploited far more extensively in the U.S. than in England, paradoxically advanced by Leon Solon, who was born in England and previously served as the art director of Minton China. Used somewhat unsuccessfully on tall buildings,

³²³Stratton, 1993, 177.

polychrome terra cotta frequently expressed the identity of small and mid-sized buildings, especially in Art Deco motifs. Similar to the British experience, nearly all terra cotta made after 1890 was "made to order" with relatively little use of stock or catalogue items.³²⁴

The U.S. terra cotta industry clearly benefited from British technology and expertise after the 1870s; however, by the 1890s the Americans were proclaiming the merits of their own industry and beginning to resent the migration of British clayworkers despite the number of British workers still represented in the industry.³²⁵ Yet the U.S. terra cotta industry as a whole, including its founders, clayworkers and sculptors reflected the participation of many cultures, a characteristic that in many respects remained nearly invisible save for the vernacular gravemarkers in the New Jersey Clay District, giving evidence to their skills, languages, and sense of pride in their local industry.

The U.S. industry was differentiated from its British counterpart by the consolidation of independent terra cotta manufacturers into larger, even mega-firms. Both the U.S. and England reflected movements of workers and management between firms or to establish new firms, the formation of terra cotta associations, and the collaboration of industry with ceramic and clayworking schools. Associations in both countries promoted the use of the material and attempted to control competition--with unfortunate results in the U.S. although not without parallels in other industries. Terra cotta's use and manufacture in the U.S. extended for a longer period, although activity in both countries was reduced during both World Wars and the Great Depression. The use of terra cotta in U.S. public works projects during the 1930s-'40s and the expansion of New York's economy in the '50s contributed largely to this difference.³²⁶ Terra cotta's highly labour-intensive process, compounded by its competition with other emerging materials and styles, eventually resulted in the virtual disappearance of the industry by the late 1960s.

³²⁴Ibid., 190.

³²⁵Ibid., 186-7.

³²⁶Tunick, 1997, 118.

III. Terra Cotta in Central Canada

Clay roofing tiles and bricks were used in some of Canada's first east coast settlements. During the 16th century Basque whalers brought red clay tiles as ballast in Spanish galleons from Spain to Labrador on the Strait of Belle Isle, using them on the roofs of tryworks and cooperages at their whaling stations, centred at the harbour of Red Bay in Newfoundland.¹²⁷ Although clay tiles are perhaps best described as "close cousins" of architectural terra cotta,¹²⁸ the durability of the roofing tiles found in the 1970s at the Red Bay site serve as a reminder of terra cotta's tradition as one of the world's oldest building materials. As it had in the U.S., terra cotta also made a "false start" in central Canada with the importation of Coade Stone to Montreal, appearing early in the 19th century, only a few years later than in the U.S. Terra cotta's first use to ornament several residences in central Canada in the early 1880s went virtually unrecognized, although gaining rapid popularity a few years later. Appearing predominantly in a rich orangey-red colour together with red pressed brick, unglazed decorative terra cotta reached the peak in its popularity in Ontario about 1894, just a few years later than in England and the United States.¹²⁹

¹²⁷An exhibit at the Canadian Museum of Civilization in Hull, Quebec demonstrates the likely appearance of a 16th c. Basque tryworks, displaying original clay tiles found at the Red Bay site. H. Kalman, A History of Canadian Architecture, Volume I (Toronto, 1994), 13-15. Bricks were also made on the site of Canada's earliest settlement on Ile Saint-Croix in 1604-05 for use in chimneys, and across the Bay of Fundy at Port Royal the following summer. T. Ritchie, Canada Builds (Toronto, 1967), 205.

¹²⁸M. Weaver, Conserving Buildings. Guide to Techniques and Materials, (New York, 1993), 109.

¹²⁹The Fourth Report of the Bureau of Mines, 1894 (Toronto, 1895), 18, noted the popularity of pressed brick and terra cotta. Statistics in the Bureau of Mines' Fifth Report, 1895 (Toronto, 1896), 12, indicate the manufacture of these products peaked in 1894.

Early Use of Coade Stone in Montreal

Coade Stone was imported from England for use in parts of the Nelson monument (1808-09) in Montreal, situated in Jacques Cartier Square near Montreal's City Hall. The original figure of Horatio Nelson, several relief plaques around the base commemorating Nelson's battles, and a crocodile above the base were made at Mrs. Coade's manufactory and shipped to Montreal in 1808. The column, base, and the tablet holding the figure of Nelson were made of grey limestone that originated near Montreal. (Figure 3.1) Designed by British architect Robert Mitchell, who used Coade Stone in England on other occasions, the Nelson column is Canada's earliest Neoclassical monument, built only four years after the Battle of Trafalgar and thirty years before the Nelson Column in London. The original figure of Nelson was replaced with a fibreglass copy in 1981,³³⁰ withstanding Montreal's severe climate for more than 170 years, making Coade Stone a wise choice in Canada.³³¹

Ten years later, Coade Stone was imported to Montreal again, in the form of four relief plaques to decorate the Bank of Montreal (1818-19), Canada's first bank built expressly for that purpose, situated nearby on St. Jacques Street. (Figure 3.2) The four plaques, depicting agriculture, commerce, navigation, and arts and manufactures (Figure 3.3) were Canada's first narrative relief bank ornamentation, adaptations of earlier designs attributed to sculptor John Bacon. Bacon, one of England's most important late 18th century neo-classical sculptors, worked at Coade's from 1771 until 1799. The acquisition of Coade Stone for both the Bank of Montreal and the Nelson column was arranged by one of Montreal's leading merchants, John Richardson. Richardson, along with other prominent Montreal merchants closely connected with London, were members of the

³³⁰A. Kelly, Mrs. Coade's Stone, (Reading, Berks, 1990), 234-5, 241, 295-297, 441. The original figure of Nelson, also reported by Kelly as being replaced in the 1970s, is "now in the care of the City Engineer"; the plaques at the base have also been replaced. See also M. LaFrance, "Coade Stone in Canada", APT, Vol. V, No. 3 (1973), 103-107; H. Pullen, "Montreal's Monument to Nelson", in Canadian Geographical Journal, Vol. LXXIV, No. 2 (1967), 58-63; L. Wells, "Terra Cotta in North America", unpublished M.A. thesis (Univ. of York, England, 1991), 5.

³³¹Weaver, 110.

Nelson Monument Committee. The three storey Bank of Montreal (1818-19), built of local limestone, was described by Kalman as classically inspired with "characteristically Canadian restraint". Although the original Bank of Montreal was removed in 1870, the Coade Stone plaques were preserved in a passageway connecting the two existing buildings of the Bank of Montreal.³³² The use of Coade Stone to decorate Canada's first purpose-built bank can be viewed as a harbinger of terra cotta's use a century later as a decorative and cladding material on numerous banks and financial institutions.

Urban Growth, Building Materials, and Advances in Building Technology

The introduction of terra cotta as a decorative material coincided with a period of rapid growth in central Canada's towns and cities, along with a significant increase in its manufacturing base. Canada's growing urban areas, much as in the United States, were likewise subject to the increasing threat of disastrous fires during the mid-to-late 19th century, creating a demand for firesafe building materials and building by-law changes which became the focus of the Ontario Association of Architects during the 1890s.

Terra cotta's growing popularity in central Canada in the late 1880s and early 1890s coincided with the introduction of significant advances in building technology, including the use of iron and steel framing systems and electric elevators, making possible the construction of multi-storey buildings. Following methods and examples already adopted in the U.S., Canadian architects had begun to use new construction methods involving the structural use of iron in association with masonry by the late 1880s. In 1894 central Canada ventured into the use of steel-frame methods with the construction in Toronto of

³³²Kelly, 40-41, 295, 300, 441-2; LaFrance, *ibid.*; Pullen, *ibid.*; Kalman, Vol. 1, 186-7, 249; Weaver, *ibid.* A second Bank of Montreal was built next door in 1845-46, designed by John Wells and renovated in 1901-5 by McKim, Mead and White, who replaced Wells' original dome with a new one made of Guastavino tile. Kalman, Vol. 2, 579-81. See LaFrance, as well as Pullen for a list of the other members of the Nelson Monument Committee. LaFrance suggested Halifax, Fredericton, St. John, and Quebec City as likely areas for research that may reveal other early use of Coade Stone in Canada.

the Robert Simpson store, designed by architect Edmund Burke.³³³ Like their U.S. counterparts, Canadian architects soon began to encase these interior metal frameworks with firesafe porous terra cotta, which by 1887 was being produced in Canada.³³⁴ Shortly after the turn of the century Canadian architects and builders and architects began to import glazed terra cotta from the U.S. and England to clad the exteriors of tall buildings, relying on its firesafe advantages, its light weight and durability, and its added benefits facilitating greater floor area and speedy construction, much as in the U.S. Canada's cities had also begun converting their horse-drawn street cars to electric trolleys in the 1880s and 1890s, bringing workers from their newly constructed 'suburban' residences to their jobs in the inner city. Often after the turn of the century, the destination of these workers was to buildings clad with glazed terra cotta located on downtown street car routes.

Significant changes in design and architectural style also occurred in central Canada during the late 19th century following trends in England and the U.S., often influencing a shift from limestone to sandstone, and to brick construction with carved sandstone or terra cotta ornament. In addition to terra cotta, a number of other new or improved building materials had already become or were becoming available in Canada as a result of the advancing industrial revolution, many of which facilitated greater speed in building while serving to ornament Canada's growing building stock. Some of these products were produced in Canada, although often supplied by agents from the U.S., facilitated by the expansion of the railroad system, or shipped from England to Montreal's recently improved port facilities and distributed by rail to other Canadian cities. These included such products as moulded, ornamental and plain pressed brick, along with glazed or enamelled brick; metal building cornices or entire building fronts of galvanized iron, steel,

³³³K. Crossman, Architecture in Transition, 1885-1906, (Montreal, 1987), 67; A. Carr, Toronto Architect Edmund Burke, (Montreal, 1995), 115.

³³⁴D. Wilson, Lost Horizons: The Story of the Rathbun Co. & the Bay of Quinte Railway (Belleville, 1983), 38-39; "Terra Cotta as a Building Material", in The Canadian Architect & Builder (hereinafter CAB) (January, 1888), 8.

or aluminum; fibrous plaster, staff, and cement architectural ornaments; artistic iron work, and a variety of types of art glass. Sophisticated sawing machines were also producing an endless variety of highly decorative wood trim patterns, especially for domestic use.³³⁵

Responding to the 1851 Exhibition in London, England, there were at least four "crystal palaces" in Canada by 1860, hosting annual regional or rotating provincial exhibitions displaying agricultural, arts, and industrial products. By 1891, Canada had more than a dozen such halls. For the most part, with the exception of Toronto's 1858 iron and glass Palace of Industry, Canada's late 19th century exhibition halls used different materials and were smaller than Paxton's 1851 British model but were nonetheless impressive structures. In 1878, Toronto founded its annual fair and reconstructed its 1858 Palace of Industry in a modified design at a new site, now the Canadian National Exhibition, renaming it the Crystal Palace. By the late 1880s and early 1890s, many cities were hosting permanent regional exhibitions,³³⁶ at times awarding prizes to regional brick and terra cotta manufacturers.

The Use of Terra Cotta Regionally

Terra cotta was first used as a decorative material in domestic architecture in the early 1880s in southwestern Ontario. Terra cotta was introduced by a Canadian architect who had worked in the United States, whose later use of terra cotta in public architecture likely did much to advance its acceptance elsewhere in Ontario. New York City architects first introduced terra cotta in Montreal in the late 1880s, a city whose commercial architecture generally was strongly influenced by the U.S., especially New York City.

³³⁵Products advertised in the CAB between 1888 and 1899. See also N. Tausky & L. DiStefano, Victorian Architecture in London & Southwestern Ontario, (Toronto, 1986), 80-99 and Ritchie, *ibid.*

³³⁶F. Graham, "The Crystal Palace in Canada", in Bulletin Society for the Study of Architecture in Canada (SSAC), Vol. 19, No. 1, 4-12. G. Durand's design for London, Ontario's Main Exhibition Building (1887) was made entirely of wood and glass, using a colour scheme of terra cotta, sage green, brown, and Indian red trim. M. Edey's 1898 Aberdeen Pavilion in Ottawa used pressed metal, wood, and glass with steel trusses.

The westward expansion of Canada's railway system precipitated Winnipeg's rapid growth in the 1880s, while also facilitating terra cotta's extensive use in the city after the turn of the century.

London, Prescott, and Stratford, Ontario

Although small compared with other growing Ontario cities such as Toronto and Ottawa, London's growth in the late 19th century was steady and substantial. Following the 1870s, when London's railroad system expanded and several 'suburbs' first appeared, the city's economic base relied mainly on its industry, especially the rapidly growing Labatt and Carling breweries. As a result of a disastrous mid-century fire and subsequent building by-law changes, after the 1850s much of London's architecture was built of locally made brick, using clay that produced a yellowish buff colour. London's cultural pursuits also expanded in the late 19th century with the formation of several art societies and the Western School of Art and Design. London's new Second Empire style Masonic Temple and Grand Opera House (1880-1) celebrated this movement, designed by Thomas Tracy and George Durand, using red brick with stone carvings symbolizing the arts, and tiles custom-made by the Minton Co. in Stoke-on-Trent, England displaying Masonic motifs. Ideas for the building were generated by a trip taken by Durand and a Masonic delegation in 1880 to several U.S. cities, including Boston, New York, Rochester, and Albany to visit similar buildings.³³⁷

George F. Durand was born in London, Ontario in 1850 and encouraged to pursue a career in architecture by his father. James Durand, a Scotsman, came to Canada and founded a London building business, enrolling George at age fourteen in the art school of J. R. Peel, a London marble sculptor and drawing teacher. George Durand apprenticed

³³⁷Tausky and DiStefano, 49-59, 90-94, 124-6, 230-267, 322-24, 363-4. Thomas Stent was the sole agent in Ontario for the sale of Minton's encaustic tiles. Laver and Stent had earlier prepared designs for the parliamentary and departmental buildings in Ottawa.

with William Robinson, London's city engineer and one of its most influential architects in the late 1860s. Beginning in 1870 Durand worked in Albany, New York for several years as the chief assistant to architect Thomas Fuller in the construction of the New York State Capitol Building. During this time the Capitol building was being built according to the plans of Fuller and August Laver. Durand's work with Fuller ended in 1876 when Fuller was dismissed after controversy over the cost and design of the New York State Capitol building and Fuller's position as a "foreign architect". Fuller highly praised Durand's skills as an architect and regretted his loss at this time,³³⁸ later showing his ultimate respect by attending Durand's funeral in London in 1889.³³⁹ (Figure 3.4) Durand worked with architect Thomas Tracy from 1878-1882 until taking up his own practice. Durand's architecture between 1880 and 1889 reflected a wide diversity of styles, a common underlying appreciation for materials and eclecticism, and his approach to architecture as an artist.³⁴⁰

Durand used decorative terra cotta with red brick on two residences built between 1880 and 1884, situated side by side on Queens Street in London, contrasting with much of the city's yellow brick architecture. The first belonged to Benjamin Cronyn, Jr., a London alderman and Mayor in the 1870s. "Oakwood" (1880-82), named after a grove of oak trees surrounding Cronyn's residence, was a large picturesque residence with a French Mansard roof, a large verandah, and elaborate interior wood panelling. Its theme was portrayed in inset terra cotta panels of oak leaves situated above the entrance and the second

³³⁸Ibid., 223-28. Durand was described by a local London paper at the time of his death as "the best designer in the Dominion". Fuller was replaced as architect for the New York State Capitol Building by H.H. Richardson, L. Eidlitz and F.L. Olmsted.

³³⁹"Death of Mr. Geo. F. Durand", CAB (January, 1890), 4. Fuller was born in England, came to Canada in 1857 and later designed Ottawa's first Centre Block of the Parliament Buildings, demonstrating his attraction for both polychromy and progressive technology. Fuller's design was influenced by Waterhouse's design for the Manchester Assize Courts in England. C. Young, The Glory of Ottawa, Canada's First Parliament Buildings, (Montreal, 1995), 30-43.

³⁴⁰Tracy had also worked as London's engineer. Tausky & DiStefano, 228-9, 234, 243-252. Durand's career was cut short by his illness and death in 1889, "induced it is believed by overwork." "Death of Mr. Geo. F. Durand", *ibid.*

storey window, along with three bay window panels featuring fruit spilling from flowers, humming birds and other motifs.³⁴¹ (Figure 3.5)

John Labatt, Jr.'s residence next door, known as "Endiang" (1882-84) reflected Durand's attraction for eclecticism, incorporating many elements of the Queen Anne Revival style, including steeply roofed gables, projecting bays and prominent chimneys. Labatt was a member of London's Board of Trade and took over his father's brewery in London in 1868, which experienced rapid growth under his operation. Incorporating elaborate carved wood panelling on the interior, the exterior of Labatt's residence was decorated with terra cotta panels³⁴² manufactured by the Boston Terra Cotta Co. and listed in their 1884 catalogue³⁴³, apparently situated beneath several windows in two prominent projecting bays. (Figure 3.6) Durand may have learned of the Boston Terra Cotta Co. during his 1880 U.S. tour, likely attracted as a sculptor to the material itself and to the firm's on-site sculptors' studio space and its school of modeling and sculpture. Durand would have also likely known of the use of terra cotta at the Boston Museum of Fine Arts, due both to the proximity of Boston to Albany and the timing of Durand's work there, which coincided exactly with the construction of the Museum during the 1870s.

The Boston Terra Cotta Co. 1884 catalogue also listed a building designed by J. P. Johnston and owned by J. P. Wiser, Esq. of Prescott, Ontario³⁴⁴, a small town situated south of Ottawa on the St. Lawrence River, just north of Ogdensburg, New York. Wiser, of Dutch descent, was originally from Upper New York State and operated a highly successful distillery in Prescott from 1857 to 1917. Wiser also owned and operated a 500

³⁴¹Tausky & DiStefano, 278-80; F. B. Taylor, London Free Press, June 22, 1955). The Cronyn residence, later occupied by London manufacturer Frank Leonard, was acquired c. 1930 by the London Central Baptist Church. Three sides of the original building are hidden by additions; the terra cotta panels, unfortunately mostly painted green, are still visible on the original front elevation.

³⁴²Tausky & DiStefano, 286-87. The Labatt residence was demolished.

³⁴³N. Jones, *ibid.* Appendix D, Boston Terra Cotta Co. Catalogs, 1884-5, 100. (1884 catalogue). listed the John Labatt, Esq. Residence, architect G. F. Durand, London, Ont. My appreciation to Nancy Jones for having drawn the Labatt and Wiser listings in the 1884 catalogue to my attention.

³⁴⁴*Ibid.* Unfortunately, no information was located during the course of this research identifying the origin or work of the architect, J. P. Johnston.

acre farm just outside Prescott, raising prize cattle and horses, and hops for his distillery. John Labatt likewise operated a brewery in Prescott for a short period, from 1864 to c. 1866,³⁴⁵ and thus likely knew Wiser. J. P. Wiser was a member of Parliament and built a stately home c. 1880 in Prescott, later known as "Rushton Hall", that was once visited by Sir Wilfred Laurier. The house was decorated with stained glass windows depicting Wiser's prize horses, a fireplace carved in Potsdam sandstone, and lavish interior wood panelling carved over a period of two years by a woodcarver from England,³⁴⁶ said to be "the same master craftsman who did the panelling in Ottawa's Parliamentary Library". The grey brick house was decorated with black trim and "splashes of red", including red tile walks,³⁴⁷ along with what appears to be a terra cotta panel displayed above the door and the use of clay tile ridge-capping and crests on the roof. (Figure 3.7)

Red brick was favoured for a number of commercial buildings in Stratford, situated near London, such as the Worth Block (1880), displaying red decorative brick basketwork in a Romanesque façade on Market Square.³⁴⁸ Yellow brick was chosen for Stratford's urgently needed County Court House, however, the town's most prominent building of the 1880s. Situated prominently on a sloping site next to the Avon River and designed by George Durand, the new court house was the result of many years of planning

³⁴⁵J. Morris, *Prescott 1810-1967*, (Prescott, 1967), 80-81. Wiser's Whiskey was made in Prescott until 1932; as of 1967 it was being made in Belleville, Ont. John Labatt operated John Smith's brewery in Prescott for a short time. Smith was a friend of Labatt's father, John K. Labatt.

³⁴⁶"Re-Opening of Wiser Residence Recalls Glamorous Chapter of Prescott's Early History", in *Prescott Journal* (June, 1947), stated the house was built in the 1880s, "by a series of meditative moods, as well as money." Wiser also had extensive ranching acreage in the U.S., and was reportedly Canada's first exporter of cattle to Britain. An essay by Wm. Teatero, 1977, provided along with other research material on Rushton Hall by the Grenville Co. Historical Society, dated Wiser's house to the late 1850s. Rushton Hall's style and interior furnishings, however, especially the wood panelling, date the house much closer to 1880. The Parliament Library was finally completed in 1876. Red Potsdam sandstone from the state of New York was also used along with Nepean sandstone on Ottawa's first Parliament Building. Young, 102-3. A stained glass window from Rushton Hall (demolished) depicting a prize "Rysdyk" horse is on display at Upper Canada Village.

³⁴⁷P. Stephenson, "The J. P. Wiser Mansion and its Environs as I Remember it before Demolition", unpublished document held by the Grenville Co. Historical Society.

³⁴⁸K. Ashenburg, *Going to Town*, (Toronto, 1996), 222. The Worth Building (architect unknown) displays terra cotta capitals above brick pilasters, framing the upper storey windows.

by London County Council, who clearly appreciated Durand's work.³⁴⁹ Virtually a study in polychromy, Durand's use of rich, reddish-brown terra cotta allegorical panels on the exterior of the Perth County Court House strongly complemented its pale yellow local brick and plum-coloured Credit Valley sandstone, along with a greenish-gray slate roof and wood trim elements closely matching the colour of the terra cotta. Durand's controlled use of a variety of materials, colours and textures provides a visual contrast with earlier Canadian court houses, enhancing the building's late Victorian eclectic architecture, a composite of Richardsonian Romanesque, Queen Anne Revival and Italianate features.³⁵⁰ The interior contains encaustic tiles, an ornate wooden staircase carved in floral motifs, and elaborate carved courtroom furniture, some of which was designed by George Durand.³⁵¹

Durand's use of terra cotta on the Perth County Building was extensive, providing an allegory of its functions as well as the county's business. A complex terra cotta pediment in the Court House's principal gable contains cherubs, a female figure representing "Justice", and strongly curving floral detailing, topped by a terra cotta lion with the initials "PC" for Perth County.³⁵² (Figure 3.8) Immediately below, displayed beneath three round-arched two-storey Richardsonian Romanesque windows, are six allegorical terra cotta panels, representing the arts, manufacture, justice (two panels), agriculture, and architecture. (Figures 3.9, 3.10, & 3.11) The panel on the far left representing the arts contains a painter's brush, musical instruments, books, angels, a theatrical mask and other motifs, along with the name "H. Plaffehaeit" carved in the lower

³⁴⁹Durand's plans for the Perth Co. Court House and the nearby Jail were approved in June, 1885; it opened in May, 1887. Perth County Council Minutes, Report of Comm. on Council Property on Court House & Jail, June 11, 1885, 22; Perth Co. Council Minutes, Report of Co. Property Committee, December 7, 1887, 23.

³⁵⁰M. Carter, *Early Canadian Court Houses* (Ottawa, 1983), 118; C. Bart-Riedstra, Stratford-Perth Archives, brochure entitled "Perth County Court House Opened May 9, 1887". I am grateful to Carolyn Bart-Riedstra at the Stratford-Perth Archives for her research assistance on both the Perth Co. Court House and Stratford City Hall.

³⁵¹Tausky & DiStefano, 316.

³⁵²Bart-Riedstra, *ibid.* The lion was first mounted over the main entranceway and was not placed above the gable in its intended location until 1967.

right hand corner, presumably the name of a modeller, sculptor, or artist involved in designing or making the panels.³⁵³ The panel on the far right representing architecture contains a compass, egg and dart moulding, and other instruments symbolizing architecture, along with the inscription "Geo. F. Durand, architect".³⁵⁴ Although it is likely that Durand designed the terra cotta panels since he was often involved in the decoration details of his buildings, his exact role in this regard is not entirely clear.³⁵⁵ Several terra cotta roundels also appear on the building, including two displaying heads representing manufacture and agriculture, and four representing the hand of God giving benediction. (Figure 3.12) Durand is presumed to have been influenced in the design of the benedictory roundels by a keystone for the 12th century German Merseburg Cathedral, as evidenced by his personal collection of sculptural illustrations of important European buildings, excerpted from a Parisian journal.³⁵⁶

The manufacturer of the Perth County Court House terra cotta panels remains undetermined although given the high quality of the sculptural work, the shape and size of the panels, Durand's trip to Boston, and his use of the Boston Terra Cotta Co. a few years earlier for the Labatt residence, it appears likely the panels were made by the Boston Terra Cotta Co. works.³⁵⁷ The minutes of the Perth County Council provided limited information, recording only a payment to "Terra Cotta Co." for the Court House.³⁵⁸ Two

³⁵³Tausky & DiStefano, 316.

³⁵⁴Bart-Riedstra, *ibid.*

³⁵⁵Tausky & DiStefano, *ibid.* Some of Durand's drawings for the interior woodwork and courtroom furniture in the Court House reportedly still exist.

³⁵⁶*Ibid.*, 73-74. Durand's papers included extensive clippings from the journal Materiaux et Documents d'Architecture et de Sculpture, including an illustration of a keystone with a similar but not identical benedictory hand in the crypt gate of the Merseburg Cathedral, along with a book from Scotland illustrating parish kirks and manses. Durand was also known to have subscribed to the U.S. journals Inland Architect & Builder and the Northwestern Architect & Improvement Record.

³⁵⁷The Hynes brothers' Can. Terra Cotta Co. began producing terra cotta c. 1884, and the character of their work appears dissimilar to the sculptural work on the Perth Co. Court House. Illustrations from the 1884 Boston Terra Cotta Co. catalogue contained in Jones, *ibid.* contain a number of terra cotta panels and roundels similar in shape and size to those displayed on the Perth Co. building. The Grand Exposition Building of the Mass. Charitable Mechanics Association, displayed in the 1884 catalogue, also contained a large terra cotta pediment reminiscent of the size of the main pediment in the Perth Co. Court House.

³⁵⁸Perth County Council Minutes, Dec. 31, 1887, 67.

different sources have been identified as possible manufacturers in the literature. These include the "Terra Cotta Company of Terra Cotta, Ontario",³⁵⁹ although no terra cotta is known to have been produced at any of the brick plants that were operated in Terra Cotta beginning shortly after 1900,³⁶⁰ along with the Matheson and Heard Marble Works in London, Ontario. The latter firm appears to have been involved only in the terra cotta framing of a marble slab that is still displayed in the vestibule of the Perth County Court House.³⁶¹

George Durand's use of terra cotta during the 1880s, mainly in southwestern Ontario, was integral to his approach to architecture as an art, clearly reflecting his early training by a sculptor and his desire to be known as an architect-artist. Although selective in his use of the material, at times using carved stone instead, Durand utilized terra cotta often, in a variety of architectural styles in a creative, even bold manner, at times to express verticality. Consistently, however, he used terra cotta as only one element in a balanced mixture of materials that reflected a conscious palette of colour and texture, an interest in the arts and crafts, and an attraction for polychromy, with the latter likely influenced by his work with Thomas Fuller.³⁶²

Stratford's red brick City Hall (1898-99), built on Market Square to replace the city's first town hall on the same triangular site blended admirably with its surrounding context, using red brick with reddish-brown Credit Valley carved sandstone and red terra cotta decorative features. Its late Victorian design was the work of Toronto architects

³⁵⁹Tausky & DiStephano, 316.

³⁶⁰Toronto Region Architectural Conservancy, 139; M. Zatyko, Terra Cotta: A Capsule History (Erin, Ont., 1988). See also discussion concerning Terra Cotta, Ontario in the Manufacturing section later in this chapter.

³⁶¹W. Johnston & H. Johnston, History of Perth County to 1967, (Stratford, 1967), 69. Perth Co. Council Minutes, Dec. 18, 1888 recorded approval of payment to John Matheson "for the terra cotta work around marble slab in the vestibule in the Court House."

³⁶²Durand also used extensive decorative terra cotta in the Upper Canada College (1887-91) (demolished) in Toronto along with carved sandstone. His design borrowed heavily from H.H. Richardson's work. Tausky & DiStephano, 338; see also "Our Illustrations: Design for New Upper Canada College, Toronto", in CAB (March, 1889), 27. See Tausky & DiStephano for other examples of Durand's use of terra cotta elsewhere in southwestern Ontario.

George King and John Siddall, combining elements from a variety of styles, mainly relying on the Queen Anne Revival while incorporating Flemish Renaissance gables and other elements characteristic of the style. The use of red brick versus buff brick³⁶³ to match the Perth County Court House was intensely debated by Stratford City Council, who finally chose red brick, but left the choice of the manufacturer to the architects and the Building Committee. The architects preferred the use of red pressed brick made by the Toronto Don Valley Pressed Brick and Terra Cotta Co., along with the use of terra cotta to improve the "appearance and solidity" of the building.³⁶⁴ (Figure 3.13)

Ottawa

By 1880 Ottawa had begun to reflect its new status as the nation's capital. Although smaller than Toronto and Montreal, Ottawa's population more than tripled between 1881 and 1911. Much of this growth occurred in the late 1880s-'90s, with the expansion of the federal civil service occurring mainly from 1901 to 1921.³⁶⁵ The importance of Ottawa's lumber industry had lessened by the late 19th century, while reflecting greater diversity. T. M. Clark's New Edinburgh Brick Works had produced white bricks since the early 1870s, relying on an extensive deposit of white shell marl in the Thomas MacKay Estate. Clark obtained a patent for the manufacture of bricks, terra cotta, and artificial stone in 1876. In 1880 he advertised he had won first prize at the

³⁶³"Buff bricks and terra cotta. . . ." in *CAB* (Nov., 1894), 137 noted that buff bricks and terra cotta were used recently in Toronto and Montreal although "red and brown shades for brick work will probably remain in greatest demand...."

³⁶⁴The Milton Pressed Brick Co. was the alternative manufacturer, although no records exist indicating which firm was chosen. Agenda Paper 1998-06, Historic Sites and Monuments Board of Canada, 63-78; Meeting 469 of Stratford City Council, Nov. 3, 1898, 30; *Weekly Herald*, November 24, 1897: "White or Red Brick", *Evening Beacon*, Nov. 3, 1898, 4; "Red Pressed Brick", *The Evening Beacon*, Nov. 4, 1898, 3. C. Bart-Riedstra, "City Hall Tour prepared for Tourism Stratford", 1998, 6-9, reported "terra cotta was used for ornamental capitals on the brick pilasters on the front entrance way as well as for corbelling, for stops on the recessed brick on wall dormers, and for decoration at either side of the entrance way."

³⁶⁵J. Taylor, *Ottawa: An Illustrated History*, (Toronto, 1986), 81, 120, 210-212. Ottawa's population increased from over 27,000 in 1881 to about 87,000 in 1911; its civil service grew from 900 to about 10,000 between 1901 and 1921.

provincial exhibition and the praise of Canada's first chief architect, Thomas Seaton Scott, for the superiority of Clark's white bricks, used to decorate Cartier Square Drill Hall (1879-82) in the "shape of ornamental panels and moulded strings, in addition to ordinary plain."³⁶⁶ (Figure 3.14)

The earlier construction of Ottawa's Parliament Buildings demonstrated a remarkable familiarity with British architectural developments and stimulated an interest in polychromatic building materials, carved decoration, and progressive building innovations in Ottawa.³⁶⁷ New buildings constructed on Wellington Street across from Parliament Hill during the 1880s still reflected the stone image of the Parliament Buildings,³⁶⁸ although a growing number of private sector commercial buildings built on nearby Sparks, Bank, and Elgin streets during the late 19th century were made of brick. Ottawa's red brick Central Chambers (1890-91), a rare example in Canada of Queen Anne Revival commercial architecture, designed by architect John J. Browne of Montreal, came to the attention of the Ontario Association of Architects at their 1894 meeting for its plate-glass oriel windows. The Central Chambers Building displays numerous red terra cotta panels detailed in rich Arts and Crafts imagery, such as sun flowers, lilies, and pomegranates. The panels are set above red granite panels separating round-headed arches that contain voussoirs of alternating terra cotta and red sandstone.³⁶⁹ (Figure 3.15)

³⁶⁶Notes collected by Tom Ritchie, "Old Brick Collection at NRC". 1989; Patent 6689, Can. Patent Office Record, Vol. IV No. 11, Nov. 1876; Building Ottawa Research Project: The Citizen, June 28, 1878, March 17, 1879; Ottawa City Directory, 1880; quotation from Dept. of Public Works' Annual Report of 1879 in FHBRO Building Report No. 84-38, by J. Adell.

³⁶⁷C. Young, 13, 32-39, 88-89, 102-5. The Parliamentary Library, completed in 1876, was Canada's first iron dome. A large influx of Scottish stone masons came to Ottawa to complete the first Parliament Buildings. A number of stone cutters left for Chicago in 1872 to take part in the rebuilding after the 1871 fire. See Building Ottawa Research Project, articles from The Citizen, 1871-74.

³⁶⁸The Langevin Block and the Union Bank are characterized by the use of New Brunswick sandstone with carved decoration. Local Architectural Conservation Advisory Committee (LACAC), Ottawa: A Guide to Heritage Structures, (Ottawa, 2000), 58-60.

³⁶⁹"Ontario Association of Architects", in CAB (February, 1894), 29-30. The roof of each bay of oriels is also capped with terra cotta tiles. L. Maitland & L. Taylor, Historical Sketches of Ottawa, (Peterborough, 1990), 40; Central Area West Heritage Study Evaluation Report, City of Ottawa. A Toronto Pressed Brick and Terra Cotta Co. advertisement in the CAB (January, 1893), iii, stated the "Central Chambers, Ottawa" was a "sample of their work." John Browne's father, George Browne was an

Ottawa's domestic architecture in the 1880s-'90s reflected a variety of styles. The Queen Anne Revival style was especially popular in Centretown, situated within walking distance of Parliament Hill. A number of Centretown's vernacular Queen Anne residences built during this period, often grouped together on one side of the street, were characterized by the use of red brick, matching terra cotta panels, and decorative brick, owned by James A. Corry, a prominent Ottawa builder.³⁷⁰ Corry also built the eclectic "Hollywood Parade" (1893), a group of narrow rowhouses with Romanesque and Moorish elements, combining red brick and countless small red terra cotta tiles, displayed alongside red granite, white marble, art glass, and a pressed metal cornice.³⁷¹ (Figure 3.16)

Between 1909 and 1918 a number of tall commercial buildings clad or decorated with glazed cream-coloured terra cotta were built near Parliament Hill, several of which were located on Sparks Street, one of Ottawa's main electric streetcar routes.³⁷² Most were built by the private sector but served the expanding office needs of the federal government. The entire narrow façade of one of Sparks Street's first tall buildings, the seven storey Canada Life Building (1909-10), designed by Ottawa architects Weekes and Keefer, was faced in English semi-glazed terra cotta with classical motifs, lending a rich sculptural effect.³⁷³ A slim but elegant decorated cornice and arched windows grace the top, classical low relief stringcourses repeat between the stories, and richly sculptured classical

important Montreal architect who studied in the office of Russell Sturgis in New York, then visited Europe for three years, and studied at the So. Kensington school of art, receiving design prizes in international competition. George Browne later erected a number of buildings in Winnipeg. "A Group of Winnipeg Architects", *CAB*, (Jan., 1897), 3-5.

³⁷⁰J. Smith & Associates et al. "Centretown Heritage Conservation District Study", Winter 1996-97, 43-44, 72.

³⁷¹Kalman, Vol. 2, 635; LACAC, 88. The "Hollywood Parade" recalls Rafael Guastavino's narrow rowhouses on 78th St. in New York City (1885-86), executed in the Moorish style in brick with terra cotta ornament. See S. Landau, "The Row Houses of New York's West Side" in *JSAH*, Vol. XXXIV (March, 1975), 22-25.

³⁷²Taylor, 102, 142, 215.

³⁷³The Canada Life Assurance Co. Building, built as a speculative venture, is also known as the Saxe Building. "Two New Buildings, Ottawa, Ont.", in *Construction* (May, 1913), 173-77; Saxe Building Federal Heritage Building Review Office (FHBRO) Report 85-22, June, 1986.

decoration frames the entrance and emphasizes the ground floor, which once also featured two fluted Ionic terra cotta columns.³⁷⁴ (Figures 3.17 (a) and (b))

Weekes and Keefer again used English glazed terra cotta in the Sparks Street façade of the former Birks Building (1910-11), making it "one of the most attractive commercial buildings in the city." First built for Rosenthal & Sons, it was quickly acquired by Henry Birks, who was born in England and began a continent-wide expansion of his jewellery business in 1911 beginning with his Ottawa store. Although unfortunately removed and replaced with brick, the glazed Doulton terra cotta cladding above the ground floor included a renaissance-inspired continuous balcony on the top floor below a slim decorated cornice, five stories of mainly smooth cladding, along with a cast iron marquee and fluted terra cotta Ionic columns flanking the entrance.³⁷⁵ (Figure 3.18) Arthur Weekes was born in Canada and opened an office in Ottawa in 1907 with Boston architect E. A. Machado, who had trained in the offices of Shepley, Rutan and Coolidge, the Boston firm that took over H. H. Richardson's practice on his death. Allan Keefer was born in Ottawa and trained elsewhere before joining Weekes in 1907.³⁷⁶ Both Weekes and Keefer contributed richly to Ottawa's early 20th century architecture.

The narrow Hope Building, designed by Werner Ernest Noffke, one of Ottawa's most prominent 20th century architects, was also built on Sparks Street in 1910, just a few doors east of the Canada Life Assurance building. The nine-storey steel-frame building originally contained a printing office on the ground office and small upper storey offices rented to professionals. The Hope Building's first eight floors are clad with Stanstead

³⁷⁴The existing ground floor façade may hide the original columns. An ad by Eadie-Douglas in Construction (c. Dec., 1912) indicated the Canada Life Building was under contract for the use of Burmantoft's Terra Cotta.

³⁷⁵"Completion of the Rosenthal Building, Ottawa." Contract Record, Vol. 25 (May 10, 1911), 35, contained in Birks Building FHBRO Report 85-22, June, 1982, 119-122: "Two New Buildings, Ottawa, Ont.", *ibid*.

³⁷⁶Keefer may have also trained in the offices of Shepley, Rutan and Coolidge. Central Area West Heritage Study, Preliminary Inventory Data, August, 1997.

granite and decorated with bronze spandrels.³⁷⁷ The attic storey is clad in glazed cream-coloured terra cotta, featuring an open-bed triangular pediment and four large terra cotta consoles, a cartouche holding an anchor, and a large statue of "Hope", all made by the Doulton Company. (Figure 3.19 (a) and (b)). Although the terra cotta consoles bear similarity to several patterns in Doulton's 1883 catalogue, their design appears to be unique, possibly cast according to detailed designs by Noffke.³⁷⁸ It is also not certain whether Noffke executed the details of the statue of Hope. On other occasions he was known to have used local sculptors, such as William "Couer de Lion" MacCarthy, to design carved stone work associated with some of his other Sparks Street buildings.³⁷⁹ Noffke reportedly also used white terra cotta cladding on the five-storey O'Brien's Tailor Shop (demolished), constructed one year later on King Street in Toronto.³⁸⁰

Noffke emigrated to Canada from Poland with his family in the 1880s. Werner apprenticed at a young age with Ottawa architect Adam Harvey in the mid-1890s. At the same time he studied at night at Ottawa's Fine Arts Association, winning the Ontario School of Art's 1894 Mechanical Medal. Noffke also worked in the office of Ottawa architect Moses Chamberlain Edey, and later took up practice with George W. Northwood, who ran the firm's office in Winnipeg. Noffke established his own Ottawa practice in 1908 and became strongly associated with Spanish Colonial Revival domestic architecture characterized by red tile roofs, for which there was no precedent in Ottawa. Noffke also travelled extensively in the United States during 1924.³⁸¹

³⁷⁷FHBRO Report No. 85-15, 93-95. The statue of Hope and the top two storeys in drawings illustrated in "The Hope Building, Ottawa", in *Construction*, (June, 1913), 236-37, were marked "Terra Cotta or Bedford Stone". A revised elevation clearly individually numbered small units covering the entire top storey. The Hope Building was also known as the Bible House.

³⁷⁸Stratton, Vol. 2, 138, stated: "Doulton's catalogues illustrated . . . capitals, trusses and other components, none of which attempted to emulate the complexity and artistry of the forms produced to architects' designs."

³⁷⁹S. Ricketts, unpublished research essay, "W. E. Noffke: An Ottawa Architect", Dept. of Canadian Studies, Carleton University, 1989, 49-50.

³⁸⁰TRAC, 64-5.

³⁸¹Noffke's office was located in the nearby Central Chambers Building. Ibid., 4-7, 14-26, 62.

The former Bowles Lunch building, a 24-hour restaurant that was often frequented by journalists and parliamentarians from nearby Parliament Hill, was also built on Sparks Street c. 1916-17.³⁸² With the exception of a large, slightly rounded ground floor window area and entrance on the ground floor, the Sparks Street façade of the two and one-half storey building was originally clad entirely in buff-coloured semi-glazed terra cotta, decorated with an egg-and-dart frieze and a deep cornice. Numerous small blue and buff-coloured terra cotta tiles with delicate and highly complex motifs, along with S-scrolls, are set discretely on the underside of the cornice, as well as the underside of the lintels and embrasures of three second-storey windows. The former Bowles Lunch is Ottawa's only example of the use of glazed coloured terra cotta, the use of which was also highly infrequent in Ontario. The building's Spanish Revival theme, rarely used for commercial buildings in Ottawa, is further reflected in its one-sided red Spanish-tiled roof.³⁸³ (Figure 3.20 (a) and (b)) Many basic elements of the design of the former Bowles Lunch building are strongly reminiscent of the Kelly & McLinden hardware store (1898) in Perth Amboy, New Jersey, the first U.S. building to use extensive glazed polychrome terra cotta. 134 Sparks Street was likely designed by architects Hand, Harris & Merritt, the architects for three Bowles Lunch buildings using glazed terra cotta in Toronto, all constructed shortly before Ottawa's Sparks St. building, each with its own design and distinctive decorative terra cotta details.³⁸⁴

³⁸²Bowles Lunch, Ltd. was first listed at 134 Sparks Street in the 1917 Ottawa City Directory, 226, 895. Ottawa's newspaper offices for The Citizen were located next door.

³⁸³Another Bowles Lunch building was located at 30 Rideau Street in Ottawa (demolished); it is not known whether it was also clad with glazed terra cotta. The ground floor terra cotta cladding on 134 Sparks Street was removed in 1980 and replaced with concrete parking; the remainder of the terra cotta exterior remains little changed. Central Area West Heritage Study, Inventory Data, City of Ottawa, March 1998. The decorative transoms in the second storey windows of 134 Sparks Street were not part of the original design.

³⁸⁴Hand, Harris & Merritt had offices in one of these Toronto buildings. The terra cotta used on two Toronto Bowles Lunch buildings, both demolished, was made by the Northwestern Terra Cotta Co. of Chicago. H. L. Bowles of Springfield, Mass. headed up this restaurant chain. See TRAC, 102-105. "Recent Buildings, Toronto", Construction (March, 1913), 87; "Building for Bowles Lunch Room, Toronto", Construction (March, 1915) 123-127; and "Recent Buildings, Toronto", Construction (August, 1915) 334-37. See also E. Minton, Ottawa Reflections of the Past, (Toronto, 1974).

Two additional terra cotta-clad buildings were built on Wellington Street across from Parliament Hill. The Rideau Club (1911) was situated at the corner of Metcalfe Street, providing an excellent view from its balcony of Ottawa's Parliament Buildings. A prestigious private club for Ottawa's elite businessmen, the Rideau Club was designed by H. C. Stone,³⁸⁵ a former New York architect who opened a Montreal practice in 1901.³⁸⁶ The four-storey structure was clad entirely with smooth white glazed Burmantofts' terra cotta, remarkably resembling stone, with the Club's crest, the building's only sculptural decoration, situated over the entrance. (Figure 3.21) The Rideau Club burned in a disastrous fire on October 23, 1979, although the "four once-white terra cotta walls, now streaked with smoke and soot", survived the fire intact, along with the crest.³⁸⁷ The Norlite Building, today known as the National Press Club, situated on Wellington Street (1917-18) across from Parliament Hill, was built by the Norlite Realty Co. and quickly rented to the federal government during a period of shortage in office space in Ottawa. Displaying details characteristic of the Italian palazzo style and designed by Ottawa architects W. J. Abra, Hugh A. Wright, and C. P. Meredith, six stories of the Norlite Building are clad in light cream-coloured semi-glazed terra cotta. The two lower floors are faced in limestone. The attic features small twin towers with round festooned windows, along with round-arched windows and terra cotta rosettes. Small ornamental terra cotta balconies that once decorated the attic were later removed.³⁸⁸

³⁸⁵C. Little, The Rideau Club A Short History The First 100 Years 1965-1965 (Ottawa, 1965), 15, 25. The 1911 building replaced an earlier Rideau Club on the same site, built in 1875.

³⁸⁶I. Gournay & F. Van Laethem, Montreal Metropolis 1880-1930 (Toronto, 1998), 207.

³⁸⁷C. Lynch, Up From the Ashes The Rideau Club Story, (Ottawa, 1990), 5-8. The fire was so intense that the Langevin Block across the street was evacuated and sustained some damage. The four walls of the Rideau Club were demolished, but the Club's crest was carefully preserved, reportedly enhancing the interior of the Rideau Club's replacement facilities on Bank Street.

³⁸⁸FHBRO Building Report 87-41. The National Press Building today houses the Parliamentary Press Gallery. See "New Norlite Building, Ottawa", Construction (May, 1918), 142-44. Ottawa's Transportation Building (1916) is discussed in the New York Architectural Terra Cotta Archive section of this chapter.

Ottawa's use of glazed terra cotta in several tall office buildings was generally characterized by slender tripartite construction, often featuring continuous balconies and rounded windows near the top, constrained surface ornament, and the occasional use of elaborate sculptural effects on the ground floor or crowning the top.

Toronto

Toronto's population grew faster than any other city in central Canada between 1881 and 1911, increasing by more than six times and accompanied by a virtual "boom" in its industrial base.³⁸⁹ Brick played an important part in Toronto's development from early times, due to its remote location from stone quarries and the existence of extensive nearby clay resources.³⁹⁰ Following a recession in the mid-1870s, a phenomenon that affected most of central Canada's growing cities, Toronto experienced a dramatic increase in construction beginning in the early 1880s which virtually lasted until the beginning of World War I. Toronto's 1880s-90s development was strongly influenced by H. H. Richardson's Romanesque Revival architecture, especially in the realm of public and commercial development. This brought an increase in the use of sandstone, beginning with the construction of the Ontario Legislative Building (1886-1892), designed by Buffalo architect Richard A. Waite, strongly characterized by its use of red Ontario Credit Valley sandstone. The latter was quickly followed by Toronto's City Hall (1890-1899), designed by architect Edward James Lennox, whose attraction to carved decoration also led him to use terra cotta on a number of occasions. Inspired by Richardson's Austin Hall at Harvard in Boston, the carved sandstone capitals on the principal entrance of Toronto City

³⁸⁹J. Careless, *Toronto to 1918*, (Toronto, 1984), 200, 109. Toronto's population grew from over 86,000 in 1881 to nearly 377,000 in 1911. Its manufacturing grew from 530 businesses in 1871 to 2400 in 1891. In the early part of this period parts of some industrial processes were still carried out by skilled tradesmen or craftsmen.

³⁹⁰T. Ritchie, *Canada Builds 1867-1967* (Toronto, 1967), 206-7. Limestone and sandstone could be obtained from Kingston by the 1850s, although Toronto builders began importing considerable stone from Ohio, Scotland and England. C. Fouts et al, "Building Stone and Historic Structures in Downtown Toronto" (Toronto, 1991), 3.

Hall display intricate grotesques, among which can be found Lennox's face.³⁹¹ (Figure 3.22) Lennox was born in Toronto and trained in the office of Toronto architect William Irving, who was born in Scotland, the son of a stone carver and contractor. Lennox was a member of the Toronto Architectural Eighteen Club, and by 1885 his architectural practice was one of Canada's largest of its kind. Lennox is well known for his associate work with Chicago architect H. I. Cobb in the design of the King Edward Hotel (1900-1902), a prominent brick Toronto hotel whose upper two stories are clad and decorated with a glazed terra cotta cartouches and a cornice, made by the Perth Amboy Terra Cotta Co. of New Jersey.³⁹² Lennox has been described by Litvak as having a "signature use of intricate brickwork and terracotta", exemplified by his use of decorative terra cotta in the early 1880s in the Queen Anne Revival Lailey residence.

Much of Toronto's domestic stock built during the 1880s-90s was in the Queen Anne Revival style, relying on the plentiful supply of locally manufactured red brick and often decorated with matching red terra cotta stringcourses or panels.

The city seized upon the style immediately and was among the last to let it go. Even today, when one thinks of older residential Toronto, images come to mind of bay windows, shaped gables and terracotta panels, all in a deep red brick, house after house, street after street.³⁹³

E. J. Lennox's somewhat angular Queen Anne style design for the William Lailey residence (1884) was characterized by a prominent porched entrance, sharply pointed roof, oriel windows, a polygonal tower, and several terra cotta panels. Three identical panels were situated between the bay windows on the tower, featuring shallow relief stylized

³⁹¹M. Litvak, Edward James Lennox "Builder of Toronto", (Toronto, 1995), 19-23. Lennox won the competition for the design of City Hall and travelled to Buffalo, Boston, Albany, Pittsburgh and other U.S. cities prior to proceeding with construction.

³⁹²Litvak, 53; TRAC, 42-45. An inspection of samples from the upper two stories of the King Edward Hotel, carried out at the request of the Toronto Regional Architectural Conservancy, confirmed the use of glazed architectural terra cotta, although having an appearance of stone and described elsewhere previously as being made of stone.

³⁹³L. Maitland, The Queen Anne Revival Style in Canadian Architecture (Ottawa, 1990), 42, called Toronto "the self-annointed Queen City".

flowers and vases in the Elizabethan style; another vertical high relief panel on a chimney depicted sunflowers in a vase.³⁹⁴ The terra cotta details of the three identical rectangular panels on the Lailey residence (Figure 3.23) compare exactly with designs appearing in the Hynes brothers' 1887 Canadian Terra Cotta Co. Catalogue, although broken down into several separate illustrations in the catalogue and categorized as patterns for the design of beltcourses, tiles, or panels.³⁹⁵

Robert Simpson's large residence (1883), known as "Haddon Villa", is another early 1880s Toronto example of the use of terra cotta with brick in the Queen Anne style. Designed by Henry Langley & Edmund Burke, Haddon Villa combined red brick, rusticated stone, and a deep terra cotta stringcourse, along with false half-timbering in the gables resembling the work of Richard Norman Shaw in Bedford Park in London. Simpson was born in Scotland and founded the Toronto Simpson department store business. Burke designed Toronto's first Chicago-style department store for Simpson in 1894 in Toronto, incorporating decorative terra cotta with brick.³⁹⁶ The furnishings of Toronto's growing number of affluent homes also displayed the material results of the city's cultural expansion, influenced in part by its relatively high proportion of British-born residents, and by Toronto artists such as George A. Reid. Reid, a painter and teacher, was active in the 1903 founding of the Arts and Crafts Society of Canada, whose members ascribed to William Morris's Arts and Crafts ideals.³⁹⁷

The John Kay and Son (later known as the Wood Gundy building) carpet store (1898) played an important role both in the transition between the use of red unglazed decorative terra cotta and the era of "white" glazed terra cotta in Toronto,³⁹⁸ and in the

³⁹⁴The Lailey residence was demolished. Litvak, *ibid.*: L. Maitland, 120, 123; TRAC, 8. Litvak cited the Lailey residence as having been built in 1883, while Maitland and TRAC recorded 1884.

³⁹⁵As illustrated in Jones, Appendix I.

³⁹⁶A. Carr, Toronto Architect Edmund Burke Redefining Canadian Architecture (Montreal, 1995), 53-54; Maitland, 43, 124.

³⁹⁷K. Lochman et al. eds., The Earthly Paradise, (Toronto, 1993), 26-30.

³⁹⁸TRAC, 30-33. The terra cotta façade of the John Kay store was dismantled in 1984 and reassembled as part of the new Scotia Plaza building at 11 Adelaide St. W. in Toronto. The TRAC survey

introduction of polychrome terra cotta in central Canada. Designed by S. G. Curry, the five-storey building was covered in a subtle shade of cream-pink terra cotta made by the Doulton Co. Its design was characterized by plain lower storey surfaces, arched upper storey windows, and a prominent decorated attic and fourth storey, with sculpted cartouches and repeating small and larger Ionic columns. (Figure 3.24) The John Kay store is particularly remarkable for its use of coloured glazed terra cotta in the same year that the Perth Amboy company in New Jersey first manufactured successful terra cotta glazes, used in polychrome shades of pink, yellow and other colours in a cafe in the Dun Building (1898) in New York, and in the Kelley & McLinden hardware store (1898) in Perth Amboy. The John Kay and Son store also appeared only three years after the lavish Birkbeck Bank in London, which used shades of pink, green, and brown glazed Carraraware made by Doulton.³⁹⁹

Toronto's growing retail sector was accompanied by a vigorous expansion of the city's banking and financial organizations between the mid-1890s and World War I. Serving clients and financial interests in Canada far beyond the city's boundaries, from the Atlantic to the Pacific,⁴⁰⁰ this rise in the city's finance sector contributed to the vertical growth of Toronto's downtown beginning in 1909, with the construction of a number of tall bank buildings clad or decorated with glazed cream-coloured, buff or white terra cotta. The architectural firm of Darling and Pearson contributed importantly to the use of glazed terra cotta in Toronto, designing numerous banks and other commercial office buildings.⁴⁰¹

generally classified terra cotta's use in Ontario into two phases: the "red" unglazed terra cotta decade of 1885-1894, and the "white" glazed decade of 1909-1919.

³⁹⁹See Tunick, 1997, 55. Cass Gilbert's Broadway-Chambers Building (1899-1900) in New York also used shades of pink with yellow and green. The Doulton Co. in England had first introduced Carraraware polychrome glazed terra cotta in 1888.

⁴⁰⁰In 1891, 30% of Toronto's population was British-born, while 65% was Canadian-born. Careless, 120, 149, 201. The Arts and Crafts Society held its first Toronto exhibition in 1904, in which architect Frank Darling exhibited his work. K. Lochman et al. eds. . *The Earthly Paradise*. (Toronto, 1993). 26-30.

⁴⁰¹Especially notable among these were the Mutual Life Assurance Co. (1909-11), the Standard Bank (1909), the Bank of Montreal (1909), the Union Bank (1910), the CPR Building (1911-13), the Metropolitan Bank (1912), and the Dominion Bank (1913-14).

The significance of the Standard Bank of Canada (1909) as Toronto's first tall building to be clad in glazed terra cotta was succinctly described in 1911 in Construction.

The new premises of the Standard Bank of Canada, corner of King and Jordan streets, is the first structure to reach completion of several imposing buildings that will shortly effect a marked change in the architectural aspect of what might be termed Toronto's financial district. Aside from this it can lay claim to the distinction of being the first important office building in Toronto, introducing on an extensive scale the use of terra cotta in its external scheme, for apart from the two lower stories, which consist of hammered granite.... the entire exterior, including the deep cornice enclosing the roof, is carried out in this material.

The steel framed Standard Bank was also praised by Construction for its use of "possibly the first colored terra cotta work seen in Canada", incorporating green panelling with greyish-white Carrara terra cotta, described as emphasizing the continuity of graceful vertical lines expressed in its exterior design. (Figure 3.25) Typical of many banks designed by Darling & Pearson, the interior made extensive use of marble, along with plastering by W. J. Hynes.⁴⁰² A few years later the Standard Bank was to be over-towered by several nearby buildings using glazed terra cotta, perhaps prompted in part by the rapid 13-day completion of its steel frame structure.⁴⁰³

Darling and Pearson's "modern renaissance" design for the six-storey Union Bank (1910) on King Street was also clad with English glazed terra cotta, this time using semi-glazed Leeds Fireclay's Burmantoft's product. The Union Bank was commended at the time for its honesty in the use of terra cotta, described as finally representing a "design expressive of itself and not suggestive of stone". White and cream shades of glazed terra cotta were seen as increasingly popular due to its clean appearance and easy washability,⁴⁰⁴ although by 1930 the Union Bank's elegant design was showing the effects of urban

⁴⁰²"The New Premises of the Standard Bank, Toronto", Construction, (October, 1911), 48-50.

⁴⁰³TRAC, 47. The Standard Bank was demolished in 1963.

⁴⁰⁴"A Bank Designed in Glazed Terra Cotta", Construction (January, 1912), 62-64.

pollution.⁴⁰⁵ Darling and Pearson made highly effective all-over use of small repetitive classically-inspired terra cotta detailing and low-relief panels between stories, contributing to the building's horizontal rather than vertical emphasis. The top was capped by a deep terra cotta cornice, along with a prominent round-arched entrance and a granite base. (Figure 3.26)

The 15 storey Canadian Pacific Railway Company building (1911-13), also by Darling and Pearson, was acclaimed as "the tallest structure in the British Empire" upon completion, only suffering in comparison with "the work being carried on in the very large business centres" in the U.S. such as New York and Chicago. Implicitly recognizing an earlier debate in central Canada about modern skyscrapers, Construction's praise for the phenomenon of the tall building noted the majority "look upon it as a necessary evil".⁴⁰⁶ Darling and Pearson reduced the vertical impact of the C.P.R. Building through the use of semi-glazed terra cotta horizontal coursing of alternating ornamented and plain bands in subtle classical detailing, capping the building with rounded corner towers and rich sculpted horizontal panels, along with arcaded two storey windows and balconies in the attic. (Figures 3.27 and 3.28) Less than twenty years after its completion, however, the C.P.R. Building's entire terra cotta cladding was removed and replaced with Indiana limestone, for reasons that are still not entirely clear.⁴⁰⁷

Frank Darling was born in Canada of Scottish and English descent, and trained in the office of Henry Langley. In 1870 he went abroad to work in the offices of George Edmund Street and Arthur Blomfield. Returning to Canada by the early 1870s, Darling

⁴⁰⁵TRAC, 48-49. A possible lack of proper maintenance, along the Union Bank's deep cornice may have contributed to rain not washing its surface easily.

⁴⁰⁶"C.P.R. Building, Toronto", in Construction (August, 1913), 295-98. New York was cited as having 175 buildings of 15 stories or more, along with the 50+ storey Woolworth Building. Tall buildings were also described as creating "awe and wonderment". The base of the CPR building was treated in Stanstead granite.

⁴⁰⁷TRAC, 121-27. TRAC reported that Contract Record referred to weathering of the terra cotta, although suggested the move may have instead reflected a decline in the use of terra cotta and a desire to give the building a more "up-do-date look".

partnered with Toronto architect Samuel G. Curry in 1880. John Pearson joined the firm in 1893, becoming a principal with Darling in 1899, a partnership that endured until Darling's death in 1923.⁴⁰⁸ Darling was awarded the Royal Institute of British Architects' Royal Gold Medal in 1915, conferred for the first time "upon a Dominion citizen." Darling's award recognized his "skill in the art of design", and the persistent "artistic and moral development of his work." The RIBA also praised Darling's "profound influence upon the sane growth of architecture throughout the Provinces" undertaken in the context of extreme climatic variability across Canada, "where structural materials are obtained at considerable expense and time...."⁴⁰⁹ G. E. Street was associated strongly with Gothic architecture, and admired brick and marble northern Italian architecture. Street had used terra cotta along with brick and stone in a chapel alteration.⁴¹⁰ Street also worked directly with sculptor George Tinworth in 1876 on Tinworth's large terra cotta triptych for York Minster.⁴¹¹ John Pearson was born and educated in England and came to Canada in 1888. Together with his extensive work with Darling, Pearson is especially noted for his design for Ottawa's second Parliament Building following the fire of 1916, together with J. Omer Marchand.⁴¹² Pearson believed "the building material of each district must dominate in a general way its architectural individuality"; his knowledge of these materials has also been described as "amazing."⁴¹³

The firm of Burke, Horwood & White made important contributions to the use of terra cotta in Toronto, such as the use of sharply detailed Doulton red decorative terra cotta

⁴⁰⁸S. Beszedits, Eminent Toronto Architects of the Past Their Lives & Works (Toronto, 1983), 77-83.

⁴⁰⁹"The Royal Gold Medal, 1915", in Construction (March, 1915), 89-90.

⁴¹⁰A. Street, Memoir of George Edmund Street, R.A. 1824-1881, (New York, 1972, reprint of 1888 publication), 21, 109. Street published Brick & Marble Architecture in the Middle Ages: Notes on Tours in the North of Italy in 1855; excerpts of his work with examples of brick and terra cotta architecture were published in Construction in May, 1909.

⁴¹¹Stratton, 1993, 92.

⁴¹²Beszedits, 79.

⁴¹³"John A. Pearson, Master Builder" (reprint of A. Sullivan's The Yearbook of Canadian Art, Toronto, 1913), in G. Simmins, Documents in Canadian Architecture, (Peterborough, 1992), 134-38.

along with red brick in the Ryrie Building (1891),⁴¹⁴ and their well-known, recently restored four storey Methodist Book and Publishing Company (1913-16) containing offices and a printing facility. At the time of its completion, the new Methodist Book Room was praised as "one of the largest and most up-to-date publishing buildings in Canada." Its neo-Gothic design, clad in cream matt-glazed terra cotta over steel skeleton construction, with interior hollow tile floor arches,⁴¹⁵ features extensive Gothic detailing, including distinctive terra cotta rosettes containing an open book and sculpted medieval scribes, situated in a band around the building between the second and third stories.⁴¹⁶ (Figure 3.29) Much of the firm's use of terra cotta can be attributed to John Horwood's early 1890s training in New York City and his strong attraction for ornament. Burke's interest in terra cotta mainly stemmed from his preference for terra cotta as a fireproofing material although he was known to make extensive use of decorative terra cotta, such as in his design for the Owens Art Museum (1893-95) at Allison Ladies' College in Sackville, New Brunswick.⁴¹⁷

In addition to its extensive use in domestic and commercial architecture in Toronto, terra cotta also played an important role in the design and construction of public architecture in the early 20th century, such as the Royal Ontario Museum, and the Toronto General Hospital, along with a number of restaurants and theatres.⁴¹⁸ In 1911, a new Gooderham Fountain made entirely of white Doulton's Carrara terra cotta was built at Toronto's Exhibition Grounds. The large fountain, a gift by George H. Gooderham, President of the

⁴¹⁴TRAC, 21. A 1913 addition to the Ryrie Building also used Doulton terra cotta.

⁴¹⁵"Methodist Book Room", Construction, (January, 1916), 9-14, 31. The terra cotta was made by the Atlantic Terra Cotta Co.

⁴¹⁶L. Wells, "Spirited Resurrections: The Restoration of Architectural Terra Cotta", in TRAC, 128-132. The Methodist Book & Publishing Co., also known as the Wesley Building, today is known as the CHUM/City Building, located at 295 Queen Street.

⁴¹⁷Carr, 82-4, 142-48. The Sackville museum's exterior was of olive-coloured sandstone, faced with large terra cotta relief work and blind colonnades. Horwood later designed the Hudson Bay stores in Victoria and Vancouver, which made extensive use of white glazed terra cotta.

⁴¹⁸See TRAC's Terra Cotta Artful Deceivers, 1990 for excellent documentation of the use of terra cotta from 1884 to 1919 in Ontario, especially in Toronto.

Board of Directors of the Canadian National Exhibition, soon became a favorite resting place and meeting point, situated on the concourse between the Manufacturers' Building and the Gallery of Applied Arts.⁴¹⁹

Montreal

By the late 19th century, Montreal, located at the head of the St. Lawrence River directly north of New York, was Canada's largest city, as well as a thriving railway centre and port. Montreal's population also grew significantly between 1881 and 1911, more than tripling. Increasing construction in the 1880s peaked in 1887, with rapid growth again after 1906, which eased with World War I. Much of Montreal's earlier commercial development was built of greystone, a hard local limestone.⁴²⁰ The majority of Montreal's residents between the 1880s and 1920 lived in dense multiple-unit brick veneer or greystone Victorian rowhouse dwellings. The Queen Anne Revival style had a limited impact on Montreal's domestic architecture. Red brick was usually used to contrast with other materials and was "considered a poor substitute for the abundant local stone."⁴²¹ Some red brick commercial buildings began to appear during the 1880s using decorative brick and small terra cotta decorative elements; somewhat later, the same terra cotta decorative elements could be found in enamelled bright colours, contrasting with dark red brick.⁴²²

⁴¹⁹"The New Fountain at the Exhibition Grounds, Toronto", *Construction*, (September, 1911), 90. The fountain was described as almost an exact copy of one of two similarly designed fountains by Michael Angelo in front of St. Peter's in Rome.

⁴²⁰Kalman, Vol. 1, 247-8; I. Gournay & F. Van Laethem, eds., *Montreal Metropolis 1880-1930* (Toronto, 1998), 20, 27-8. In 1850 Montreal's population was 48,000. By 1931 the city had grown to one million.

⁴²¹F. Remillard and B. Merrett, *Montreal Architecture: A Guide to Styles and Buildings* (Montreal, Meridian Press, 1990), 98. See Kalman, Vol. 2, 615, for a discussion of the Parkins house, a Montreal Queen Anne Revival residence built in 1885 of red brick with terra cotta accents.

⁴²²R. Lemire & D. Pigeon, "Le terra cotta: un matériau de construction oublié", in *SSAC Bulletin* (August, 1981), 2-3. The new Grand Trunk Railway terminal (1888-89), designed by Thomas S. Scott of Ottawa and Edmund P. Hannaford, also used "red brick and terra cotta throughout". See Gournay and Van Laethem, 47, and "Montreal" in *CAB*, January, 1889, 9.

Montreal's commercial architecture, construction methods and materials after 1880 were strongly influenced by the U.S., in part as a result of expanding railway connections to the south. Montreal's architecture increasingly "stood within the sphere of New York City", although also influenced by prominent Boston architects.⁴²³ The ten storey New York Life Insurance Co. Building (1887-88), was Montreal's first tall building as well as Canada's first example of the U.S. tall office building, a red sandstone structure designed by New York architects Babb Cook and Willard, situated on St. James Street at Place d'Armes.⁴²⁴ (Figure 3.30) The building's high-relief American-made terra cotta decoration, moulded in lions' heads, shields, horizontal bands and corner turrets in a colour matching the building's red sandstone, was also "a material new to Montreal".⁴²⁵ The red sandstone used in the upper levels of the building was imported from Scotland, and the matching granite base had come from the Thousand Islands.⁴²⁶ Babb, Cook and Willard were already known for their tall arcaded tripartite warehouses in New York City, such as the much praised De Vinne Press Building (1885-86), completed only two years earlier, which also used terra cotta lions' heads near the cornice of its 1890-92 addition.⁴²⁷

The influence of New York architects in Montreal continued after the turn of the century, at times collaborating with local architects. Montreal's Ritz-Carlton Hotel (1911-12) on Sherbrooke Ave., designed by architects Warren & Wetmore of New York City, was clad with grey limestone with matching terra cotta accents, presented in a tripartite

⁴²³Gournay and VanLaethem, 26-27, 115.

⁴²⁴The New York Life building's construction method, involving load-bearing masonry with metal reinforcing in the floors, had been used ten years earlier in the U.S. K. Crossman, Architecture in Transition (Montreal, 1987), 79; A. Carr, "New Building Technology in Canada's Late 19th-Century Department Stores" in JSSAC, Vol. 23, No. 4 (1998), 128.

⁴²⁵Gournay & Van Laethem, 126. Its interior construction used hollow brick fireproof partitions and flooring by the Raritan Hollow & Porous Brick Co. Ad in the CAB, (January, 1893) viii. See also Lemire, *ibid*.

⁴²⁶"Our Illustrations. The New York Life Insurance Company's New Building". in CAB, February, 1888, 4; Gournay & Van Laethem, *ibid*.

⁴²⁷Landau, "Arcaded Buildings of the New York School, c. 1870-1890", In Search of Modern Architecture, 152-3.

design that was similar, but better balanced than its counterpart building in New York, the Manhattan Ritz-Carlton (1910).⁴²⁸ Several Canadian architects, including a number who had studied in Boston, also made use of glazed terra cotta as a cladding or decorative material in Montreal during the 1909-1914 period. The brick and terra cotta eight storey Southam Building (1913-14), designed by Montreal architects David Brown and Hugh Vallance, is decorated with "a wonderful assortment of terra cotta figures...depicting the four continents, animals, grotesques and floral emblems" displayed on the building's lower two floors.⁴²⁹ Brown and Vallance also used cream and white glazed Doulton Carrara terra cotta along with stained glass in the elaborate rotunda, and as panelling in the halls, corridors, and several rooms of the New Medical Building at McGill University (1910).⁴³⁰ David R. Brown had apprenticed to A. F. Dunlop in Montreal in 1885, and worked with Shepley, Rutan and Coolidge in Boston, taking up practice in Montreal in 1892. Hugh Vallance had studied at MIT and in Paris, and was chief draftsman with Hartwill, Richardson and Driver in Boston in the early 1900s, taking up partnership with Brown in 1907 in Montreal.⁴³¹ Several elegant theatres clad or decorated with glazed terra cotta were also constructed in Montreal after 1910, such as the Strand (1912), the Corona (1912), and the Imperial (1913).⁴³²

The influence of William Morris and the Arts and Crafts movement was particularly evident in Montreal beginning in the 1880s and continuing far beyond World War I, especially as demonstrated by the work of Montreal architects Edward and W. S. Maxwell,

⁴²⁸The Ritz-Carlton Development Co. was headquartered in London, England. Gournay and Van Laethem, 130-31.

⁴²⁹R. Lemire, "Tudor Gothic in Downtown Montreal 1900-1919", in SSAC Bulletin, (March, 1987), 13-18. Lemire described the Southam Building as being designed in the Commercial Gothic style and suggested its ornament was related "in a minor way" to Cass Gilbert's Woolworth Building in New York.

⁴³⁰"The Medical Building, McGill University", Construction, (March, 1912), 47-57.

⁴³¹Gournay & Van Laethem, 205-08.

⁴³²Lemire & Pigeon, *ibid.*, 2-6; Gournay & Van Laethem, *ibid.*; see D. Lanken, Montreal Movie Palaces (Waterloo, Ont., 1993), 46-57.

who were "very much a part of the inner circle" of the Art Association of Montreal."⁴³³

The Maxwell brothers stood out prominently among Montreal's architects using glazed terra cotta as a cladding and decorative material. Edward Maxwell apprenticed in Montreal and worked in the offices of Shepley, Rutan & Coolidge in Boston beginning in the late 1880s, shortly after the firm took over the practice of H. H. Richardson. Edward returned to Montreal in 1891 and attended the 1893 Chicago Exposition. He was profoundly affected by Richardson's architecture; Edward also had an extensive library, including books by Pugin, Ruskin and Street. William Maxwell worked in his brother's office in the mid-1890s and in Boston during the late 1890s; he also studied in Paris in 1899 in a large atelier, making a tour of northern France and Italy in 1900. William had a strong interest in ornament and fine craftsmanship. The Maxwell office was Canada's largest and most prominent firm before World War I,⁴³⁴ contributing to some of its finest architecture.

The Dominion Express Building (1910-12), situated in the heart of Montreal's financial district, was designed by the Maxwell Brothers, clad mainly with white glazed Doulton terra cotta above a granite base. Its tripartite composition reflected the building's supporting steel frame, lending a strong vertical emphasis. The one-storey attic was emphasized through round-arched windows with sculpted ornament and two continuous decorated balconies, which also served to identify the top floor luxurious dining club quarters of the Montreal Club, containing arts and crafts furnishings. Decorative terra cotta spandrels decorated the floors between stories. (Figure 3.31) Shortly thereafter, the Maxwell brothers' design for the yellow brick High School of Montreal (1912-14) featured large glazed white terra cotta caryatids entitled Truth, Research, Greek and Roman, along with Ionic terra cotta columns and a central pediment made by the Atlantic Terra Cotta Company.⁴³⁵

⁴³³K. Lochnan, 21-26.

⁴³⁴R. Lemire, ed., *The Architecture of Edward and W.S. Maxwell* (Montreal, 1991), 17-41.

⁴³⁵*Ibid.*, 81-83; 162-5. Full-scaled drawings prepared in the Maxwell office were used by Doulton & Co. for the Dominion Express Co. building. Photos of models of the High School of Montreal

Winnipeg

Situated northwest of Chicago and known as "The Chicago of the North", Winnipeg's rapid growth in the late 19th and early 20th centuries reflected mass immigration patterns, unprecedented grain prices and the opening of western Canadian development.⁴³⁶ With only modest development prior to 1870, Winnipeg grew steadily during the latter part of the 19th century, with much of its growth attributable to a decision to route the Canadian Pacific Railway through the city, followed by a real estate boom in 1881-82.⁴³⁷ The earlier dominant use of wood was soon replaced by locally manufactured common brick along with Tyndall stone that was easily supplied by large quarries near the city. Architects Charles A. and Earle W. Barber used terra cotta as a trimming on Winnipeg City Hall (1884-86), built of red brick and cream-coloured stone. (Figure 3.32) Borrowing from a wide variety of styles, including Romanesque, Islamic and other elements, City Hall has been described as

Victorian free composition at its best, and worst--an unrestrained *tour de force* that effectively (and, to present-day eyes, endearingly) expressed the unbridled dynamism of the city.⁴³⁸

Shortly after 1900, in the view of the Winnipeg Builder's Exchange, the increased use of "artificial substitutes" such as terra cotta and cement blocks, along with pressed brick "to save time and money" would lead to "the appearance of the city suffering", preferring instead the use of stone made at the city's local quarries.⁴³⁹ Between 1902 and

caryatids are reportedly contained in the Can. Architecture Collection at McGill University. See also "The Dominion Express Building". *Construction*, (November, 1912), 46-7.

⁴³⁶Winnipeg Architecture Foundation. "Winnipeg Architecture: A Terra Cotta Tour", 1998, 2, 3.

⁴³⁷Winnipeg citizens fought to influence the federal government to route the CPR through the city, finally winning its approval in 1881. A. Artibise, *Winnipeg: An Illustrated History* (Toronto, 1977), 16, 23-6. In 1868 Winnipeg's population was 100; it grew to 8,000 by 1881 and had increased to 25,000 by 1891. Kalman, Vol. 1, 358.

⁴³⁸Kalman, 359. Winnipeg's City Hall (1884-86) was demolished in the 1960s.

⁴³⁹"Winnipeg Builder's Exchange", in *CAB* (January, 1905), ix.

1908, Winnipeg's population mushroomed from 48,000 to 128,000, accompanied by a construction expenditure of more than \$50 million, "a record unparalleled by any city of its size on the North American continent." Winnipeg's economy in the early 20th century relied both on its importance as a wholesale distribution centre for Western Canada and as a railway centre. By virtue of its excellent rail connections with cities in eastern and western Canada and the United States, building materials not available locally could easily be transported to Winnipeg's extensive rail centre and stored there for easy access. A 1909 review of recent building activity viewed the use of terra cotta in Winnipeg as significant, associating its use in part with the city's large supply yards, as well as its role as a major Canadian railway centre.

Concrete and terra cotta are being used to a very marked extent, in all classes of business and public buildings. A very large amount of material, such as pressed brick, terra cotta, cement, etc. must be imported or brought from the East, but very large supply yards have been established where stocks of almost every material an architect or contractor should desire may be obtained upon short notice.⁴⁴⁰

Winnipeg's growth was due in part to its new role as a wholesale trading centre, associated with the construction of other transcontinental railways. Its role as a grain trading centre led to a rapid expansion in financial institutions to serve grain transactions and banking and real estate connections beyond Winnipeg during a period of rapid western Canadian settlement.⁴⁴¹ Much of Winnipeg's rapid development after 1900 was associated with the growth of its banking and financial institutions, many of which were decorated or clad with glazed terra cotta. Darling and Pearson led the way in central Canada in the use of terra cotta with tall banking institutions after 1900 with their design for the Union Bank (1903-04), which towered far above its mainly two and three storey neighbours at that

⁴⁴⁰"The Gateway to the Granary of the British Empire", in Construction (December, 1909), 55-68. Winnipeg's railway centre was described as "one of the largest, if not the largest in Canada": the article also claimed that Winnipeg had the "largest individual railway yard in the world."

⁴⁴¹Artibise, 30-33.

time. The Union Bank was Winnipeg's first steel cage.⁴⁴² Reflecting a restrained Renaissance Revival style, the building's exterior walls are made mainly of yellow pressed brick. Decorative terra cotta imitating stone was used extensively on the building's lower two floors, to decorate porthole windows in the top storey, and in quoins and as decoration around the windows.⁴⁴³ The Union Bank was illustrated in an early 1900s U.S. architectural reference publication, emphasizing the speed of its steel-frame construction and "the method of providing supports for the terra-cotta cornice which is hung from the steel work."⁴⁴⁴ (Figure 3.33)

The use of terra cotta in Winnipeg was most fully explored and exploited by John D. Atchison, who had trained in Chicago in the offices of William Le Baron Jenney, and was also involved in the planning of the 1893 Chicago Exposition. Atchison's design for the twelve storey former Union Trust Building in Winnipeg (1912) utilized white glazed terra cotta cladding and exemplifies the influence of Chicago through its two-storey attic, uniform mid-section displaying extensive glass, and a three-storey base made up of two storeys of marble. Atchison's North West Trust Building (1909) is classical in inspiration, clad in cream-coloured glazed terra cotta with accents of green, with a richly sculpted pediment containing cherubs with sheaves of grain and garlands of fruit, vegetables and flowers.⁴⁴⁵ The Confederation Building (1912), built for the Confederation Assurance Co. and designed by J. Wilson Gray, also provides an excellent example of the influence of Chicago, as well as the growth of large corporate enterprises during this period. Bright white glazed terra cotta was used to clad the building's monumental cornice, the largest in

⁴⁴²Crossman, footnote #24, 164.

⁴⁴³Winnipeg Architecture Foundation, 8. Terra cotta was also used as an interior fireproofing material. "Gateway to the Granary", 61.

⁴⁴⁴American Technical Society, Cyclopedia of Architecture, Carpentry, and Building, (Chicago, 1912, also published in 1907), 42-58. The Winnipeg Architecture Foundation, *ibid.*, reported that the Union Bank's cornice "is made of galvanized steel that was moulded and painted to resemble stone or terra cotta."

⁴⁴⁵*Ibid.*, 4, 11, 14. Atchison also designed the Lombard Commerce Building (1912), the Curry Building (1915), and the North West Travellers' Building (1908; 1914; 1916) in Winnipeg. He often used terra cotta made by the American Terra Cotta Co. of Chicago.

Winnipeg, as well as the mid-section between its expansive windows, lending a horizontal emphasis to its seven repeating floors.⁴⁴⁶ (Figure 3.34)

The overlap between Winnipeg's rapid growth and the use of terra cotta resulted in an almost endless variety of shapes, patterns and designs, along with excellent examples of polychrome terra cotta, providing "an unparalleled sampling in North America of the variety, versatility and beauty of this material." The Lindsay Building (1911-12), for example, designed by John Woodman and Raymond Carey, offers a full palette of ivory decoration, some with dark green accents, including lions with coats of arms, maple leaves and British emblems, garlands and fruit, angel twins,⁴⁴⁷ and sheaves of grain symbolizing Winnipeg's role as a grain trading centre. (Figure 3.35)

Montreal architect Percy Erskine Nobbs' design for the remodelled Birks Building (1914) stands out not only in Winnipeg, but in central Canada for its unusual frieze in polychrome terra cotta inlay and terra cotta medallions, along with the use of granite, Tyndall stone, stucco, and bronze. First designed in 1901 in the Romanesque manner by architect George Browne for the YMCA, the building was literally transformed by Nobbs' Italianate design. The frieze, covering the entire Portage Ave. frontage of the building, tells the story of the meeting of the Queen of Sheba and King Solomon, depicted in terra cotta inlays of buff, red, white, and black. Six terra cotta medallions below the frieze, designed to look like mosaics, portray the sources of jewellers' materials: turquoise, an elephant for ivory, a merman diving for pearls, a diamond, tortoise-shell, coral and mother-of-pearl, and a gnome smelting precious metals. Terra cotta was also used in window frames and quoins.⁴⁴⁸ (Figure 3.36 (a) and (b) Nobbs was influenced by the

⁴⁴⁶Winnipeg Arch. Foundation, 9. See L. Dick, "The Architecture of Image and Domination: Winnipeg's Confederation Life Building", SSAC Bulletin (Sept., 1987), 3-6.

⁴⁴⁷Frank Lindsay was a stage coach driver and built this ten storey trapezoidal building after succeeding as a businessman. Winnipeg Architecture Foundation, 3, 22, 31.

⁴⁴⁸Winnipeg Architecture Foundation, 20: "The Remodelled Birks Building, Winnipeg". in Construction, (August, 1916), 295-6. Nobbs consulted with Ramsay Traquair of McGill University in the design of the frieze.

British Arts and Crafts Movement and the ideas of the Gothic Revival. He was born in Scotland, graduated from Edinburgh University Dept. of Fine Art, and won a prize from the RIBA and an Owen Jones studentship for work in colour. He was appointed as Professor of Architecture at McGill University in 1903,⁴⁴⁹ and advanced the need for travelling Canadian studentships in France, the United Kingdom and Italy. Nobbs was clearly opposed to the use of meaningless ornament, as well as false construction simulating other materials.⁴⁵⁰

Winnipeg's strong growth after 1903 was slowed by a recession ten years later, as well as by World War I. Winnipeg's devastating general strike in 1919 marked the ending of its strong prosperity and the beginning of a period of stagnation that was also experienced in central Canada's other cities, although to a much less greater degree.⁴⁵¹

Canadian Architectural Professionalism & Technical Education

Terra cotta's introduction in central Canada occurred at a time when Canadian architects were gradually influenced less by English architectural ideals and developments, and increasingly drawn to American technology and styles. Many of Canada's architects had emigrated from England in the mid-19th century, bringing knowledge from their British apprenticeships, often making return visits, and reading British journals to keep abreast of new developments. The influence of English knowledge and values lessened at the 1870s, although without disappearing, while Canadian architects increasingly found it desirable and necessary to gain experience in the offices of architectural firms in major eastern U.S. cities to keep up with rapid change in construction technology, materials and styles. Canadian architects were also influenced by late 19th century U.S. architectural

⁴⁴⁹Crossman, 124-5. Nobbs' appointment at McGill followed Stewart Capper's departure.

⁴⁵⁰P. Nobbs, "The Architecture of Canada", in Construction, (October, 1910), 56-60.

⁴⁵¹Artibise, 109-110. Illustrations of the strike on June 21, 1919, known as "Bloody Saturday", reveal that demonstrations took place in the square in front of the 1903-04 Union Bank.

journals, especially prior to the publication of Canada's first on-going professional journal, the Canadian Architect and Builder beginning in 1888.⁴⁵²

The influence of American ideas in the 1880s was such that many Canadian architects could be characterized as having "a widespread admiration for American technical and commercial ingenuity", as demonstrated by the growing popularity of the Richardsonian Romanesque style in Toronto. At the same time, they began reacting to the frequent choice of U.S. architects for new Canadian projects in the 1880s and '90s, such as the New York Life Insurance building in Montreal, the competition for a new city hall in Quebec City, and several Ontario competitions, beginning in 1880 with the provincial Parliament buildings.⁴⁵³ The frustration of many Canadian architects during the 1880s-90s with the increasing use of U.S. architects in Canadian cities, along with their own recognition of the need for better technical education culminated in the rapid formation of a number of professional organizations. Foremost among these were the Architectural Guild of Toronto in 1888, the Ontario Association of Architects (OAA) in 1889, the Province of Quebec Association of Architects (PQAA) in 1890, and the Toronto Architectural Eighteen Club in 1899. In 1888 the Canadian Architect and Builder also began providing a medium to discuss new construction methods and materials, especially terra cotta, while publishing the views and the proceedings of the annual meetings of the OAA and the PQAA. By the end of the 19th century Canadian architects were motivated not by the desire to eliminate the influence of U.S. ideas and techniques in Canada, but to find an effective form of co-existence with American architects, while developing an expression that was distinctly Canadian--"if not unique in form and structure, . . . at least . . . adapted to local conditions, climate, materials, and way of life."⁴⁵⁴

⁴⁵²G. Simmins, Ontario Association of Architects A Centennial History 1889-1989, (Toronto, 1989), 11-18.

⁴⁵³Crossman, 4-6, 10-13; Gournay & VanLaethem, 1998, 73.

⁴⁵⁴Crossman, 1.

The 1889 OAA founding was influenced by George Ross, Ontario's minister of education. Ross was motivated to improve the provincial school system and was responsible for the School of Practical Science, a Toronto technical school established in 1878 which as yet provided no formal architectural courses. Ross visited several U.S. technical schools during 1885-86, and in 1888 recommended the introduction of a course in architecture at the School of Practical Science. Ross had recognized the need to improve technical education standards as early as 1883, having referred in his first annual report to

the importance of technical education in its relation to the development of our national products and manufacturing interests, pointing out that the want of our country is skilled labor, and that if we educate our mechanics we shall not only diminish importation but increase our exportation of manufactured goods.⁴⁵⁵

Ross's linkage of education with Canada's manufacturing interests⁴⁵⁶ is reminiscent of the philosophy of the Science and Art Department in England. The influence of the latter was felt in Ontario as early as 1876 when the Ontario Society of Artists, formed in 1874, founded a school of art and offered a program similar to the one at South Kensington, offering both day and evening classes and the use of casts provided by the Ryerson Educational Museum.⁴⁵⁷ In 1878, the freehand drawing methods of Walter Smith, contained in his Teacher's Manual for Freehand Drawing in Intermediate Schools, as well as his drawing books, were authorized by the Province of Ontario for use by teachers in the public school system. Smith had trained at So. Kensington and headed up the Boston Normal Art School in Boston, then organized art classes all across the U.S. in the 1870s. Smith made no direct reference to terra cotta in his 1878 handbook, although a strong

⁴⁵⁵G. W. Ross, Annual Report of the Minister of Education, 1890, xxviii, in Simmins, 28.

⁴⁵⁶Ontario's Board of Arts and Manufacturers was formed in 1857, offering courses and lectures at a number of Mechanics Institutes in the province. Simmins, 252.

⁴⁵⁷Carr, 1995, 10-14. Several Ontario architects who played an important role in the use of terra cotta were members of the Ontario Society of Artists, namely, Edmund Burke, J.C.B. Horwood, and Frank Darling. Burke's partner, Henry Langley, represented the Ontario Society of Artists on the selection committee for the 1876 Philadelphia Centennial.

advocate of its use. The handbook's instructions on "Designs for Pottery", however, clearly reflected his attraction to clay's plasticity and are reminiscent of Ruskin's views.

Ceramic art affords man a wide field for the display of his aesthetic taste. The clay with which the potter works in the production of table-ware, vases and many other things, is so plastic that he can easily give the most beautiful forms to the productions of his hand. It also furnishes a surface to which exquisitely graceful decoration can be readily applied. . . .⁴⁵⁸

Smith's handbook included illustrations and exercises on symmetry and repetition, as well as examples of historical ornament and decorative art. Several illustrations bear comparison with patterns later appearing in Ontario's decorative terra cotta panels and stringcourses.

Smith's advice on industrial drawing and art education, provided in a series of public lectures in Montreal and Quebec in April and May in 1882, potentially held greater significance for central Canada. The lectures were arranged by the Council of Arts and Manufactures of the Province of Quebec which was "anxious to bring before the public and those engaged in teaching the best thought of modern times of the subject of Industrial Drawing...." Smith acknowledged the mechanics' institutes, evening drawing schools, and some technical classes that "have long existed in the several Provinces of this Dominion...."; he also spoke of the program at South Kensington and at Leeds, as well as a new technical school "just now" being established at South Kensington "that will some day be the glory of the world...." He emphasized that England's original movement had originated in the manufacturing and trade industry, established by Prince Albert to create a national educational system in elementary art and science. Smith challenged Canada to establish its own department of science and art and to protect its own developing industries through the use of fiscal policy.

⁴⁵⁸W. Smith, Teacher's Manual for Freehand Drawing in Intermediate Schools, Intended to accompany the Drawing-Books for Intermediate Schools, by the same author, (Toronto, 1878), 138-9. The 1878 handbook also referred to "the opportunity for great improvement in the designs of ordinary pottery products. The public taste is rising. . . ."

We want to-day a statesman who will do for Canada what Prince Albert did for England; develop its natural resources and make skilled its unskilled labor; stop all her importations of manufactures by making her own products superior to any that can be bought outside the Dominion, and though it may not be done in a moment, if the foundations be well and truly laid, there will come a time when the flowing tide of invasion...will be rolled back by native superiority....

Fiscal laws will, must, ought to protect the industries of a country until they can run alone.

Who is to do this kind of work for Canada? We have seen the formation of a Canadian Royal Academy. When is the Science and Art Department of Canada to come? Who shall do for the Dominion what Prince Albert did for Great Britain? It cannot be self-creative. It is not of sufficient consequence to any one Province to do it⁴⁵⁹

Although no direct link has been established through this research between Smith's influence in central Canada and Ross's subsequent recommendation to establish a course in architecture and his emphasis of the need to develop our own manufacturing products, it is apparent that an awareness had already developed in central Canada of the South Kensington model of technical education, merging the interests of science and manufactures with art and architecture.

George Ross looked to Toronto's Architectural Guild of Toronto for their support in establishing the architectural course at the Toronto School of Technical Science. The Guild formed a special committee to help form a provincial association of architects, culminating in the formation of the OAA in 1889.⁴⁶⁰ Committee members included Toronto architect Edmund Burke, who served as a strong advocate for the use of porous terra cotta as a firesafe building material in central Canada, along with Frank Darling and E.J. Lennox. By 1890 the School of Practical Science was offering its first course in architecture in the University of Toronto's civil engineering program, using Beaux-Arts

⁴⁵⁹W. Smith, "Technical Education and Industrial Drawing in Public Schools," Reports and Notes of Addresses Delivered at Montreal and Quebec (Montreal, 1883), 3-24. Smith had also prepared a number of papers as a basis for the lectures on the general subject of industrial drawing and technical education.

⁴⁶⁰Simmins, 32-33. The Guild was formally established in 1888.

teaching methods.⁴⁶¹ Two years later Prof. Galbraith addressed the opening of the Engineering Laboratory of the School of Practical Science, noting that

The department of architecture has recently been established and is provided with a good collection of photographs and drawings. A large number of casts, models and plates will be required however to complete the equipment.⁴⁶²

Galbraith's appeal for casts was apparently heard, as evidenced by plaster casts in the architectural library of the School of Practical Science used by students in learning the historical applications of the five orders of architecture.⁴⁶³

The Toronto Architectural Sketch Club, organized in 1889, complemented the School of Practical Science's program, providing its members, who mainly reflected an interest in the Arts and Crafts, with technical lectures and the opportunity to participate in monthly sketch competitions.⁴⁶⁴ In 1891 the Sketch Club was presented with a lecture on modelling by Michael J. Hynes. Michael Hynes and his brother, William, had been associated with Toronto's most important plaster business since 1876. Beginning c. 1884 they were also the proprietors of the Canadian Terra Cotta Company, producing "terra cotta work of the highest artistic degree of perfection...."⁴⁶⁵ Hynes illustrated how works of art are reproduced from clay models and spoke on the Romanesque style developed by Richardson in the U.S., specifically regretting

⁴⁶¹Crossman, 31-33; Simmins, 25-29.

⁴⁶²Address by Professor Galbraith, "Technical Education". School of Practical Science (Toronto, 1892), microform. Galbraith noted technical instructors "should include engineers, architects, manufacturers, artisans, miners, and agriculturists...."

⁴⁶³Simmins, 32-33.

⁴⁶⁴"Toronto Architectural Sketch Club", CAB, (January, 1890), 6; Carr, 1995, 14-15.

⁴⁶⁵TRAC, 1990, 10; L. Wells, 1991, 16-17; "Industries of Canada: Historical and Commercial Sketches of Toronto and Environs" (Toronto, 1886), microform.

that the architects of Canada had not seen fit to deal with the natural foliage of their country, or to take up the Renaissance of the modern Italian treatment.⁴⁶⁶

A few years later, on presenting his paper entitled "Terra Cotta" to the OAA, Michael Hynes, described by an OAA member as "one of our best modellers in plaster and terra cotta", expressed his hope to provide practical illustrations on the qualities of terra cotta in the School of Practical Science.⁴⁶⁷

Several Ontario architects who figured importantly in the role of terra cotta in central Canada were active in the OAA and served as members of its Executive around the turn of the century. Edmund Burke was a founding OAA member and served as president in 1894 and 1905-07. George Durand was the OAA's first vice-president. Frank Darling was also a founding member and served as president in 1895.⁴⁶⁸ James Patrick (J. P.) Hynes, the younger brother of Michael and William Hynes, who had worked in the offices of Darling and Curry,⁴⁶⁹ served as OAA President in 1922-23 and as secretary from 1935 to 1945. J. P. Hynes along with architects Feldman and Watson used cream-coloured glazed terra cotta in their exemplary Moorish design for the St. Charles Hotel (1914) in Toronto.⁴⁷⁰ Hynes led the OAA's long fight for the provincial registration of architects which finally culminated in the 1931 Architects Act, and was also highly active in the Toronto Architectural Eighteen Club.⁴⁷¹ In late 1900, the OAA held its first meeting in its new

⁴⁶⁶"Modelling", CAB (June, 1891), 64. M. Hynes also noted at that time that "Frank Darling had presented the Sketch Club with the original models of the ornament for the improvements in the Dominion Bank, together with some of the lecturer's own work."

⁴⁶⁷M. Hynes, "Terra Cotta", CAB (February, 1899), 37-39. In 1894 the School of Practical Science conducted crushing strength tests of porous terra cotta. "Recent test.....", CAB, (October 1894).

⁴⁶⁸Carr, 1995, Chronology; "Death of Mr. Geo. F. Durand", 4; Simmins, 260.

⁴⁶⁹Arthur, 252; Simmins, 262, 269. J. P. Hynes worked in Darling & Curry's office as a draughtsman or student.

⁴⁷⁰The St. Charles Hotel, located at Bay and Richmond Streets, was demolished 20 years after construction. TRAC, 106-7; see also "The Modern Hotel and Restaurant", Construction (August, 1915), 328-30.

⁴⁷¹Simmins, 96-99, 108, 114. J.P. Hynes also wrote a history of the Toronto Architectural Eighteen Club. See Simmins, 51.

premises at 94-96 King Street West, which they jointly rented with the Engineers' Club of Toronto. The rooms were furnished in Arts and Crafts decoration with William Morris wallpaper and a Morris oak chair, and a library available for the use of members.⁴⁷²

William J. Hynes also presented a paper on plain and ornamental plastering at the 1899 OAA meeting. William Hynes, who advertised his work after 1895 as a "modeller and manufacturer of architectural and decorative ornaments in fibrous plaster and staff", compared his methods of working with staff, made of fibrous plaster and modelled and cast in a mould, as being "similiar to the Terra Cotta." Hynes advised the OAA that staff, intended for interior decorative use, had been used on a temporary basis for exterior purposes at the 1893 Chicago exhibition to produce the "white city effect".⁴⁷³ Illustrations of William Hynes' clay models for decorative terra cotta for the Brown Brothers Warehouse in Toronto, designed by architect Beaumont Jarvis, also appeared in the Canadian Architect and Builder the same year, (Figure 3.37) along with several illustrations of his work in staff.⁴⁷⁴

The Toronto Architectural Eighteen Club was formed in 1899 by a group of architects who disagreed with the OAA's approach to education and its views on compulsory licensing.⁴⁷⁵ The Eighteen Club members were especially interested in the artistic side of architecture, drawing on the Arts and Crafts Movement that flourished in England in the 1880s, as well as the views of British architect William Lethaby, who argued that good design relied on the appropriate use of materials. This attraction for the British Arts and Crafts tradition within the Club was accompanied by an interest in on-

⁴⁷²Simmins, 46, 280. The Morris chair was purchased for \$7.55. For photos of the OAA's rooms, see article by E. Burke, "Reducing the Fire Loss in Building", CAB (March, 1901), 52-54.

⁴⁷³W. J. Hynes, "Plastering, Plain and Ornamental," CAB (February, 1899), 32-34; ad for William J. Hynes, Contractor and Plasterer, CAB (Sept., 1895), viii.

⁴⁷⁴"Sketch Model for Terra Cotta, Brown Bros.' Warehouse, Toronto", CAB, (April, 1899); "Clay Model of Portion of Terra Cotta Cornice, Brown Bros.' Warehouse", CAB (July, 1899), 149.

⁴⁷⁵Simmins, 56-61. The Eighteen Club changed its name to the Toronto Society of Architects in 1906.

going developments in architecture in the U.S. Both J. P. Hynes and John Charles Batson (C. B.) Horwood, who were highly active in the Eighteen Club, had recently returned from studies in the U.S.⁴⁷⁶ John Horwood had worked in New York City in the early 1890s, reportedly in the offices of Renwick and Aspinwall. During this time he played a significant role in informing Edmund Burke, his later partner, on contemporary fireproof construction methods, as well as terra cotta's use as a decorative material in New York. Burke shared Horwood's letters and papers with the OAA, as well as the Canadian architectural profession generally through the publication of Horwood's advice in the Canadian Architect and Builder. Horwood, whose later use of terra cotta and approach to architecture reflected a strong interest in the Arts and Crafts, argued for a greater emphasis on ornament in the training of Canadian architects, as "notwithstanding the somewhat limited expenditure of our clients, we would find it easier to occasionally introduce it in our work. . . ." Horwood's later use of terra cotta clearly reflected his attraction for ornament, although he also recognized the value of plainer surfaces and the use of limited decoration, having seen and been influenced by Babb, Cook and Willard's De Vinne Press Building in New York.

Yet let us ever remember that as the enrichment of a piece of detail work brings it more prominently before us than if left plain, there is therefore the greater need of the whole work being good.

These remarks are not intended to imply that a piece of work well studied in relation to voids and surfaces does not very often look infinitely better than many a highly ornamented building not so studied. As a matter of fact there is a red brick printing house on Lafayette place, New York, which certainly belongs to the former class, and everything has been so thoroughly studied and made appropriate to its position, that it has become to the writer one of the most instructive buildings he has ever seen.

Horwood acknowledged that Canadian architects benefited from U.S. technology and on-going American stylistic developments, while serving as a strong advocate for the

⁴⁷⁶Crossman, 89-91, 94.

development of Canadian architecture, calling for "work which will possess a distinctively national mode of expression, and which...other peoples will study it with profit as they have studied American architecture."⁴⁷⁷

In 1900 the Eighteen Club became affiliated with the Architectural League of America (ALA), which in turn was associated with several U.S. societies, including the Architectural League of New York and the Chicago Architectural Club. From 1901 until 1912 the Eighteen Club held six ambitious exhibitions, the sixth of which was the sole "Canadian-only" exhibition. The other five exhibited entries by such members of the Eighteen Club as Frank Darling, Edmund Burke, J.C.B. Horwood, and E. J. Lennox, along with works entered by U.S. ALA members. American entries included works by such prominent firms as Carrère and Hastings of New York,⁴⁷⁸ who designed the terra cotta-clad Transportation Building (1911-12) in Montreal⁴⁷⁹ and Cass Gilbert,⁴⁸⁰ who designed numerous New York City buildings utilizing polychrome terra cotta, such as the Woolworth Building (1910-13). With the exception of the third exhibition, each was accompanied by an elaborate catalogue displaying evidence of the members' Arts and Crafts interests. The 1902 catalogue displayed two inglenooked interiors, one American, and one Canadian, along with an ad for tile and hardwood mantels by a Toronto agent for "stock English floor and wall tile", providing an interesting comparison with an ad by the Rathbun Co. in the Canadian Architect and Builder a few years earlier displaying an elaborate terra cotta inglenook, accompanied in the same ad by a hardwood mantel and bookcase.⁴⁸¹ (Figure 3.38) Works presented in the first five exhibitions reflected two

⁴⁷⁷Horwood, "American Architectural Methods," CAB, (January, 1893), 8-9. See Carr, 13-17, whose research on J.C.B. Horwood indicated that he "reputedly" worked for in the office of Renwick & Aspinwall in New York City, and at the Brooklyn Institute of Arts and Sciences.

⁴⁷⁸Simmins, 5. Both John Carrère and Thomas Hastings had worked with McKim, Mead & White in New York. Curl, 1999, 130; Gournay & VanLaethem, 208.

⁴⁷⁹Gournay & VanLaethem, 159, 162.

⁴⁸⁰Crossman, 94.

⁴⁸¹Simmins, 50-2, 62-63; CAB (January, 1897).

themes then-predominant in American architecture: those in the Arts and Crafts manner involving simple materials and honesty of approach, and Beaux-Arts inspired items reflecting much of the work of large firms in the eastern U.S. Works exhibited by Canadian architects have been described as fitting "without a ripple into both American molds."⁴⁸²

The Architectural Eighteen Club finally reconciled its differences with the OAA in 1912. Although most of the Club's reform proposals did not succeed, their differences with the OAA about compulsory licensing reflected a similar debate that occurred in England in the 1890s. In both England and Canada, testing for technical competence challenged the view by Arts and Crafts architects that architecture is a fine art, as opposed to a science.⁴⁸³

The Call for a School of Ceramics by the Canadian Clay Industry

By 1900 formal educational ceramics departments had recently been established at two U.S. state universities, including Ohio State University and the New York State College of Clay-Working and Ceramics at Alfred University.⁴⁸⁴ In late 1894 the author of a paper on Canadian cement, lime and clay products at a meeting of the Ontario Mining Institute noted the strength of the pressed brick and terra cotta industry in Ontario and urged the School of Practical Science in Toronto and the School of Mining at Kingston to include training in clay-making and ceramics in their programs, pointing out the existence of a new program at Ohio State University, noting that "Work of that character is much needed in Ontario as in Ohio, and the professors of our scientific schools cannot too soon prepared to enter upon it."⁴⁸⁵

⁴⁸²Simmins, 52-54.

⁴⁸³Ibid., 56-64.

⁴⁸⁴Tunick, 1997, 105.

⁴⁸⁵"Canadian Cement, Lime, and Clay Products", CAB (October, 1894), 132-133.

More than ten years later, the need for such a program was still a subject of discussion at the fifth annual convention of the Canadian Clay Products Manufacturers, held in Toronto in December, 1906. Following the presentation of a timely lecture on "Technical Education" by Professor Edward Orton, Jr. of Ohio State University, the Hon. Dr. Pyne, Ontario's Minister of Education, "intimated that a class in the School of Science for the training of clay workers was a thing of the near future." A committee of the Clay Products Manufacturers association was appointed to meet with Professor Galbraith, Principal of the School of Science "in reference to the establishment of a school of ceramics in connection with the University".⁴⁸⁶

Five years later, the Canadian Clay-Workers' Association still despaired the lack of progress and approved a resolution

to the effect "that this convention heartily approves of the Technical Commission appointed by the Dominion Government, and would urge upon the Commission the necessity of considering the interests of the clay-workers of the Dominion, and would suggest a formation of the department for the study of ceramics, as it is one of Canada's largest and most important industries."⁴⁸⁷

Although most architectural terra cotta production by Ontario's brick and terra cotta companies had ceased by 1905,⁴⁸⁸ lacking further evidence, it would appear that the vast size of the U.S. terra cotta industry by this time may have deterred any governmental assistance in Canada to ceramics education. The Clay-Workers Association resolution occurred just prior to a substantial growth in construction in central Canada, accompanied by an increased importation of terra cotta from the U.S. The urgent call for ceramics training in Canada also preceded, but corresponded generally with a period of serious

⁴⁸⁶"The Canadian Clay Products Manufacturers", CAB (December, 1906), 186-87. Among others on the committee were J. B. Millar of the Don Valley Brick Works, Vice-President and in-coming President of the association; and J. S. McCannell, Managing Director of the Milton Pressed Brick Co. and current Vice President of the association.

⁴⁸⁷"The Canadian Clay-Workers' Convention", Construction (January, 1911), 88.

⁴⁸⁸TRAC, 10.

consideration of the construction of an architectural ceramics works in Canada by one of England's major terra cotta companies. During 1914 some instruction in ceramics was provided by Joseph Keele of the Canadian Geological Survey at the University of Toronto, along with an evening lecture course at Toronto's Central Technical School. A Ceramic Division in the Department of Metallurgy was not finally inaugurated at the University of Toronto, in response to the requests of the Canadian National Clay Products Association, until 1925.⁴⁸⁹

Advantages

The perspective of central Canada's architects on the advantages of terra cotta were likely shaped to a considerable extent by the views of both their English and U.S. counterparts, and by Canadian architects and manufacturers. These were reflected in a number of articles and commentaries on terra cotta published in the Canadian Architect and Builder and Construction, as well as other British and U.S. journals of the day.

Terra Cotta as a Decorative Material

The advantages of terra cotta as a decorative material received considerable attention in the Canadian Architect and Builder as reflected by a number of articles quoting from U.S. and British journals and the occasional publication of professional papers presented in the U.S., England, or in Canada. Terra cotta's decorative use in central Canada was also influenced through the CAB by Canadian architectural students taking training in the U.S. and England, and by the comments of a few Canadian architects having experience with the material. Many of terra cotta's decorative advantages were presented positively and with enthusiasm. At times, however, alternative views described some of its

⁴⁸⁹R. Montgomery, The Ceramic Industry of Ontario, 39th Annual Report of the Ont. Dept. of Mines (Toronto, 1930), 12. The Canadian National Clay Products Assoc. "gave substantial financial aid for the first three years" of the ceramic program at the Univ. of Toronto, taught at least until 1930 by Robert J. Montgomery.

advantages as disadvantages, questioned some of its characteristics, or discussed technical issues associated with its use. The overall result potentially left Canadian architects who had no direct knowledge of, or experience with its use, in a rather unclear position, possibly leading them to be somewhat cautious in its use.

Terra cotta was presented as a far less expensive alternative to carved stone for both interior and exterior decoration where "any amount of ornamentation is introduced in the mouldings". When used in plain blocks or work with no repetition, however, it was argued that stone might actually be cheaper.⁴⁹⁰ John Horwood's discussion of architecture in New York, contained in his letter to Edmund Burke and published in 1891, argued that terra cotta offered an economical means to add greater enrichment to Canadian buildings.

I think it is the addition to this of a free use of stone and carving and other enrichments which gives it a wealthy appearance compared with our buildings, which show a forced economy of architectural ornament. One of the most used molding enrichments employed here, I think, is the egg and dart, in almost endless variety; and I never before realized what an effective one it is, though I should judge it is somewhat a costly one to cut in stone, but in terra cotta there is not that objection.

In a reference to the St. Bartholomew Mission Building in New York City, Horwood provided a detailed sketch of its highly elaborate cornice (Figure 3.39) noting

It might be interesting to you to know that the terra cotta (buff) cornice alone, as per sketch, some 75 ft. on front elevation with returns of about 25 and 10 ft. on the sides, will cost \$4,000.

Horwood's description of New York architecture also showed he was impressed with the use of buff coloured brick and terra cotta in that city, describing the latter as a new material in his experience.

Several new buildings they have put up and are finishing here are very beautiful, though the material seems somewhat strange; no doubt because it

⁴⁹⁰J. Joiner, "Terra Cotta in Architecture", CAB (August, 1898), 140-141; "Terra Cotta as a Building Material", CAB (January, 1888), 15.

is new to me. They are built of buff colored brick (a good many similar to the Roman brick) and buff terra cotta of a very ornate character, and mostly with an Italian Renaissance feeling about them. The Hotel Imperial is one of the most notable ones of which I speak.⁴⁹¹

In 1893 an unidentified Canadian architectural student in London, England also remarked on the "surprising skill" with which terra cotta was being used there, viewing its extensive use as "largely responsible for the extreme richness of the work now being done".⁴⁹²

The predominant view presented in the CAB on its use as a decorative material was that terra cotta had a distinctive character and that it should never be made to look like, or imitate stone, or made in "too large pieces". In 1898 the CAB published a paper by Joseph Joiner, read before the Cincinnati Chapter of Architects, emphasizing terra cotta's almost endless artistic possibilities along with a number of its other characteristics which, in Joiner's view, made it "stand pre-eminently to the front as [a] building material". Joiner was from England and was John Blashfield's nephew, and had been hired in 1881 as superintendent of the works of the Perth Amboy Co. in the U.S.⁴⁹³ Joiner held strong views that if terra cotta imitated stone that "it immediately becomes a counterfeit" and that one of its greatest advantages is the satisfaction that results from its use in buildings designed with its specific use in mind. Joiner argued that terra cotta should not be made in "pieces that would cube up more than six feet or seven feet", and that objections to the necessity of frequent joints due to a greater number of smaller pieces could be overcome by the use of a lap or cover joint.⁴⁹⁴

The design and use of "lap joints" in relation to weathering and the maximum length of terra cotta work were discussed at the 1899 OAA meeting following a presentation by

⁴⁹¹"Architecture in New York", CAB (January, 1891), 6; Horwood, 1893, *ibid.* See Carr, 1995, 130-131, and footnote 16, 201.

⁴⁹²"Notes by a Canadian Architectural Student in London", CAB (January, 1893), 4.

⁴⁹³Joiner, *ibid.*; Geer, 1920, 49. See also "Terra-Cotta", CAB (July, 1900), 143, an article reflecting a lecture by J. C. Nichol at the Midland Institute in Birmingham, England.

⁴⁹⁴Joiner, *ibid.*

Michael Hynes' paper on terra cotta . Hynes also held that terra cotta should be made "in small pieces", agreeing with Alfred Waterhouse's view on this point; Hynes himself had successfully made much larger pieces but believed that "such construction was an error."⁴⁹⁵ Hynes also discussed and sketched three different types of lap joints. The first type of joint was the one most commonly used, although prone to breakage; Hynes noted that "a great many of these pieces are thrown away because of that little lap being broken off", even before it was put into position. Hynes' preferred joint was described as practical, inexpensive, and as not showing any mortar joint. Hynes described the third joint as one that had also "been in use". Burke expressed frustration with his experience with lap joints on the Simpson building, stating he "gave it up with regard to weathered joints" due to the extent of cornices, instead making weatherings of thin sheets of cast iron.

These weatherings are carried on iron brackets bedded in the terra cotta, and lipped over the edge of the mouldings so that no wet whatever can get into the terra cotta beneath. That seems to me the simplest way in our climate, where almost any material of a clayey nature is in danger of disintegration by frost.

Hynes disagreed with the use of sheet iron or any other material to cover terra cotta, noting "if it is good, it does not want anything to preserve it." Burke agreed with Hynes on the use of smaller terra cotta pieces, mainly to ensure straight work. Notwithstanding his proactive stance on porous terra cotta as a preferred fireproofing material, Burke held strong views on the amount of time required between contracting and the receipt of decorative terra cotta, stating

there was a time in my experience when the mention of terra cotta made me feel like using strong language, and vowing that I would never have

⁴⁹⁵Hynes stated he had made "pieces containing 13 and 14 cubic feet" and that Joseph Joiner had argued that 7 cubic feet was the maximum, although Hynes felt its use could be extended somewhat beyond the latter. M. Hynes, "Terra Cotta", CAB, (February, 1899), 37-39.

anything to do with it. My advice to architects is not to use it unless they can get the contract placed with a very large firm, and to take plenty of time.⁴⁹⁶

Mr. Pearson⁴⁹⁷ was also interested in Hynes' discussion of lap joints and observed that it was the joint, not the terra cotta that was causing trouble. Commenting that terra cotta had to be backed up, Pearson was of the view that it was difficult to properly fill the hollow spaces at the back of terra cotta, which he asserted could not be done before the pieces were set in the building. Hynes advised that all terra cotta could be "stood up and filled thoroughly with cement and brick previous to being used; if it is set into the wall in the hollow form, then there is a great deal of difficulty in filling it."⁴⁹⁸ On another technical matter, Mr. Siddall, who made reference to how terra cotta was used in the "old country",⁴⁹⁹ discussed an experience in Toronto with terra cotta "he had never had before", in which some terra cotta work, perfect in all respects when built in, had begun to scale off after three or four months. Michael Hynes described a similar situation he had known of in Chicago, caused inadvertently by some modeller's clay being applied over the terra cotta before it was fired.⁵⁰⁰

Other views on the durability and weathering of terra cotta generally argued its proven longevity and its advantages over other building materials. Joiner asserted terra cotta's durability exceeded that of all other materials and had already been proven .

⁴⁹⁶Ibid. Burke had experienced a delay in receipt of terra cotta for the top storey of the 1894 Simpson building, built in less than six months at the request of his client.

⁴⁹⁷"Mr. Pearson" was likely John A. Pearson, who in partnership with Frank Darling later designed numerous Toronto buildings making use of terra cotta.

⁴⁹⁸"Terra Cotta", *ibid.* Joiner, *ibid.*, argued that when terra cotta was "filled up solid with concrete or brickwork" its strength was favorable with, if not far superior to stone.

⁴⁹⁹"Mr. Siddall" was likely John W. Siddall, who was born and trained in England and came to work in Canada in 1891. Siddall, along with George King, used terra cotta to ornament the late 1890s Stratford City Hall.

⁵⁰⁰The Chicago case Hynes referred to was supervised by "Thomas Taylor, a man very well enlightened in such matters....". Hynes may have erroneously been referring to James Taylor of the Chicago Terra Cotta Works, or Robert Taylor, his brother, who was foreman at the same firm. Geer, *ibid.*, 171-2 noted James Taylor "knew the mechanical end of architectural terra cotta as few men have known it, but ...his hazy conception as to how hard terra cotta should be fired permitted some inferior work to leave the factory."

We know that timber will rot, stone will disintegrate, iron will oxidize, and all other materials will more or less yield to the destroying influences of the elements; but hard-burned terra cotta will stand in defiance of all weather.⁵⁰¹

Sir Henry Doulton, quoted in 1893 from a presentation on terra cotta before the Royal Institute of British Architects, cited four examples of terra cotta lasting a century, noting "There is, of course, terra cotta and terra cotta; but there is no reason why terra cotta should not be absolutely imperishable."⁵⁰² The Canadian architectural student in London, however, was of the opinion that despite the "boast" of terra cotta's permanence, "it does not always weather well", although in his view moulded and carved brickwork seemed to persevere London's climate.⁵⁰³

The CAB also presented the view that one of terra cotta's best decorative advantages was its plasticity, and that terra cotta modellers were "not mere mechanics, but artists".⁵⁰⁴ In 1893 a discussion of recent articles appearing in Building News, the CAB emphasized that the objection by some architects that terra cotta encourages repetitive details had recently been overcome by Doulton's new manufacturing process that permitted the clay to be manipulated by hand in "direct working" and "one operation", instead of having to use the process of moulding. Although the visual effect was judged to be the same, a terra cotta modeller could build up the entire ornament in clay, or alternatively add separately modelled pieces of clay to the planes of a moulding, while carved stone work involved "sinking below the surface of the block to produce the moulding or ornament." Referring to remarks by British architect Ingress Bell on the subject, the article advanced that

⁵⁰¹ Joiner, *ibid.*

⁵⁰² "Durability of Terra Cotta", CAB (June, 1893), 70.

⁵⁰³ "Notes by a Canadian Architectural Student in London", *ibid.*; "Terra-Cotta", *ibid.*

⁵⁰⁴ Joiner, *ibid.*

we must divest our minds of the habit of thinking in stone, in dealing with this material, and until this habit is acquired our terracotta architecture will be a failure.⁵⁰⁵

Ruskin's comments on terra cotta were also briefly highlighted, quoting his view that many of Italy's architects had expressed their "best thoughts" in brick, "or in the softer material of terra cotta".⁵⁰⁶ On the same subject, but with a different view, the editor of the CAB reported the concerns of a recent writer that terra cotta's plasticity could lead to an "overloading" of ornament that if allowed to increase, would seriously deter from terra cotta's otherwise positive contributions to building construction.⁵⁰⁷

Although presented at a time when terra cotta had largely ceased to be used in domestic architecture, especially in the Queen Anne Revival style, Philadelphia architect William Price's paper on design, read at the OAA 1903 convention, took a strongly negative view of the use of terra cotta as a decorative material. Price decried all "senseless ornament", viewed as the use of ornament for its own sake, calling terra cotta "tortured mud" with "wriggles all over it. . . ."⁵⁰⁸

Commentaries on the colour and appearance of terra cotta generally advanced the principle of "honesty" in architecture and a somewhat conservative view of the use of colour. A quotation from the British Clayworker argued that imparting a different colour to terra cotta blocks than possessed naturally is neither artistic or effectual. If the natural colour of the clay were not acceptable, adding chemicals to the clay compound was preferred to the use of washes or pigments for permanency's sake, especially if the extra expense and labour could be recouped. If not, "the best course to adopt is to abandon the

⁵⁰⁵"Terra Cotta: Its Use and Abuse", CAB (April, 1893), 50. It was also reported that previous difficulties in shrinkage and warping had been removed by Doulton's new manufacturing processes.

⁵⁰⁶"Ruskin on Brickmaking", CAB, (July, 1893), 77.

⁵⁰⁷"The plastic character of terra cotta....", CAB, (December, 1894), 150.

⁵⁰⁸W. Price, "Design", CAB, (February, 1903), 31-34.

manufacture of the blocks . . . and exploit the clay for other purposes."⁵⁰⁹ Joiner argued for the use of a slightly different shade of terra cotta instead of one exactly matching the accompanying brick, especially to help express special motifs. In a comment clearly reflecting the British or U.S. use of terra cotta "some twenty years ago", however, he noted that principally buff and red had dominated but "in the eighties an agitation of colors commenced" and a variety of colours were demanded. Joiner's paper presented a unique view that the appearance of terra cotta generally always had "a peculiar brightness", described as a "metallic condition" caused by being fired at a high temperature "that lends a more cheerful aspect to buildings than any other building material known."⁵¹⁰

Terra Cotta as a Fireproof Material

Terra cotta's value as a fireproof constructional building material ranked importantly among its many advantages although clearly secondary to its chief advantage and intended purpose as a decorative material.

As a building material terra cotta is chiefly intended for decorative and protective purposes. It takes the place of expensive stone carving for exterior and interior decoration. As a fire-proof material, it ranks among the very best.

The first issue of the Canadian Architect and Builder identified a variety of fireproofing uses of porous terra cotta and terra cotta lumber, particularly to encase iron or steel framework, for use in constructing interior walls and partitions, and in flooring and roofing. In addition to its advantages for "fire-proof construction", porous terra cotta was praised for its reduced cost compared with common brick for this purpose, as well as its light weight and the avoidance of "massive or heavy walls of stone or brick".⁵¹¹

⁵⁰⁹"Coloring Architectural Terra-Cotta", CAB, (July, 1895), 87. See also "Color in Brickwork", CAB, (April, 1896).

⁵¹⁰Joiner, *ibid*.

⁵¹¹"Terra Cotta as a Building Material", CAB (January, 1888), 15. The active manufacture of porous terra cotta by both the Rathbun Co. in Deseronto, Ont. and by the Montreal branch of the International Terra Cotta Co. was noted in the same article.

In 1898 the editor of the CAB also called for changes to building by-laws in Canadian cities to provide protection from the threat of disastrous fires, challenging Montreal and Toronto to "lead the way", and identifying the need for expert advice from experienced architects.⁵¹² Advice and recommendations were finally provided to Toronto City Council in 1895, largely led by the knowledge and interest in fireproofing techniques of Toronto architect Edmund Burke, whose expertise was informed by John Horwood's training in New York City and prompted by the disastrous fire in March, 1895 of the Toronto Simpson Building. Following a thorough study of building ordinances in London, England, New York, and Chicago, a committee of Toronto architects appointed by the OAA stressed the urgency for by-law changes and recommended that all public buildings or hotels over 50 feet in height, and buildings of any other type above 70 feet, be built with walls of brick, stone, or terra cotta "or other hard incombustible materials", with floors and roofs of brick or terra cotta arches. The committee especially recommended the use of porous terra cotta as a protection for exposed steel and iron work.

The exposed parts of all constructional steel and iron work, supporting walls, floors, roof or stairs, shall be efficiently protected with at least 2 inches of porous terra-cotta; or where such is not feasible, with wire lath and plastering of sufficient thickness.⁵¹³

Changes to Toronto's building by-laws were not finally made until 1907,⁵¹⁴ long after Toronto's disastrous fire of 1904. Numerous articles in the CAB during the 1890s also addressed the "lessons" of the Simpson Store fire and discussed firesafe construction methods in the U.S., particularly the use of porous terra cotta to encase iron and steel.

⁵¹²Editor, CAB, "The Toronto Fire By-Law" (March, 1888), 2; "Fire Prevention", CAB (November, 1890), 123-124.

⁵¹³"Building Construction in its Relation to Fire Protection", CAB, (March, 1895), 38-39. Members of the OAA committee included such architects as Edmund Burke, J.A. Pearson, and E. J. Lennox.

⁵¹⁴"Recent Amendments to the Toronto Building By-Law", CAB, (May, 1907), 51-52.

The six-storey 1894 Simpson Store, designed by Edmund Burke, was Canada's first attempt at curtain wall construction. Rather than using a fully freestanding metal frame, however, Burke used a two-storey internal steel cage, encasing it with cut stone, brick and decorative terra cotta on the exterior, with the outer walls above the third storey made of buff brick with terra cotta decoration on the top floor supplied by the Beamsville Pressed Brick Co. in Beamsville, Ontario. Time constraints required that the 1894 Simpson building be erected in less than six months, and cost limits placed by Burke's client meant that the building was not fully fireproofed.⁵¹⁵

When the 1894 Simpson Store collapsed only three months later in a disastrous fire, only the protected steel columns on the lower two floors that had been encased with cut stone, brick and ornamental terra cotta escaped destruction. In an article examining "the facts", the CAB argued the Simpson Store was not firesafe;

Had it been intended to make the building fire-proof, the iron beams, which as our illustration shows, became so terribly twisted, would have been encased in fire-proof material, such as porous terra-cotta. But this was not done.⁵¹⁶

The Rathbun Co. of Deseronto, Ontario, who had been manufacturing porous terra cotta since 1887, was quick to proclaim that the recent fire had "demonstrated that porous terra cotta is the only effective protection against fire", claiming that it "is recommended by all Architects."⁵¹⁷ Shortly after the Simpson Store fire the Rathbun Co. demonstrated the manufacture of porous terra cotta at their plant, as well as its strength-bearing capacity and its fire safety in a series of tests performed for a number of invited Toronto architects. The

⁵¹⁵"Store of R. Simpson", CAB, (Jan., 1895), 12-13. Ad by Beamsville Pressed Brick Co. in CAB, (February, 1895), xi: "See the new Simpson Building. . . This is a sample of our work in Buff Brick and Terra Cotta." For a full discussion of the 1894 Simpson Store and its 1895 replacement, see A. Carr, 115-121, 123; and Carr, "New Building Technology in Canada's Late Nineteenth-Century Departments Stores" in Architecture in Canada, Vol. 23, No. 4, 1998, 124-42.

⁵¹⁶"Building Construction In Its Relation to Fire Protection", *ibid.*; quotation from "Popular Impressions vs. Fact", CAB, (April, 1895), 54.

⁵¹⁷Ad by the Rathbun Co. in CAB, (April, 1895), x.

details of the tests were published in the CAB along with comments by several architects regretting they had not been aware earlier of the "character of this material, as they had been importing more expensive and less efficient material for some of their buildings during the last two years."⁵¹⁸

The exterior of the 1895 Simpson Store, designed by Burke along with his new partner, John Horwood, was virtually the same as the 1894 store except for an extension of the building although Burke had this time used a free-standing iron skeleton and the interior was now "fully fireproofed", although still without the use of porous terra cotta.⁵¹⁹ Subsequent discussions during the mid-to-late 1890s in the CAB on what constituted adequate fireproofing often revolved around the use of terra cotta lumber and porous terra cotta versus concrete, although the former clearly held favour. Edmund Burke's paper on the protection of steel frame buildings from rust and fire, presented at the 1898 OAA convention, cited "lessons" from a major fire in Pittsburgh of the same year as the latest and most valuable to date for steel frame buildings. Burke's rating of the value of various fireproofing materials, as demonstrated in Pittsburgh, clearly favoured terra cotta over hard burnt clay or concrete:

- 1st. Terra cotta lumber or porous terra cotta.
- 2nd. Hard burned clay of the hollow arch type.
- 3rd. Concrete.⁵²⁰

Burke also published information sent to him by John Horwood on fireproof construction methods in the U.S.⁵²¹ In a highly detailed letter concerning fireproof

⁵¹⁸"Tests of Fire-Proofing Material", CAB, (June, 1895), 78-82.

⁵¹⁹Carr, 1995, 117. Fireproofing for the 1895 Simpson Store involved the use of poured concrete around the columns and concrete block infill.

⁵²⁰Burke recommended porous terra cotta floor arches, and "at least 2 inches of terra cotta beneath the bottom flanges of the girders" as the required protection for floors. E. Burke, "Two Questions in Connection with Steel Construction in Buildings", CAB, (February, 1898), 31-34.

⁵²¹"Architecture in New York", CAB, (January, 1891), 6.

building in New York, read by Burke at the third annual meeting of the OAA, Horwood cited extracts from the New York Building Law pertaining to buildings over 85 feet, including a requirement that "hard burnt clay or porous terra cotta; or wire or metal lath" be used to encase the bottom flanges and all exposed portions of wrought iron or rolled steel floor beams. Horwood's accompanying illustrations on fireproof building were also published in the CAB, including a section "through the first storey opening of a large building which has sills and strings of terra cotta", along with a section of the terra cotta cornice in the St. Bartholomew Mission Building in New York City (Figure 3.40) providing the following description of the construction method for the terra cotta cornice:

The I beams resting upon the wall are placed over each console. The terra-cotta fascia and outer edge of moulded soffit are hung upon the flanges of the beams running parallel to the walls. The projecting beams are anchored well down the back of a wall, sufficient to give at least 33% of weight of brickwork in excess of the weight of the overhanging cornice.⁵²²

Advertisements in the CAB during the late 1880s-90s by the Rathbun Co. and the Montreal Terra Cotta Lumber Co. often listed recent buildings in Ontario and Montreal utilizing their porous terra cotta or terra cotta lumber, while at the same time illustrating various uses of these products. Other advantages of terra cotta fireproofing were also identified, such as its low cost, light weight, reduction of noise, and its "cooling in summer, and warming in winter".⁵²³ Despite increased competition by reinforced concrete systems beginning around the turn of the century, the use of porous terra cotta for fireproofing purposes continued well into the second decade of the 20th century. The value placed on terra cotta as a fireproofing material in central Canada appears to have been equal with, if not greater than the appreciation of its qualities in the U.S. during the same time period.

⁵²²J. Horwood, "Some Observations on Fireproof Building in New York". CAB (March, 1893), 36-38.

⁵²³E.g., see ads by the Rathbun Co. in the CAB (April, 1889), iv., (December, 1890), 137; and by the Montreal Terra Cotta Lumber Co., CAB, (January, 1900), x.

After 1900 the time-cost advantages of the use of glazed terra cotta with steel frame construction were also simply but easily identified through illustrations in both the Canadian Architect and Builder and Construction demonstrating the speed with which terra cotta-clad tall buildings were constructed. The modern advantages of both terra cotta cladding and fireproof terra cotta were clearly set out by a civil engineer in 1907 in a detailed discussion of the construction of a steel building in Chicago.

Right next to the steel comes the terra cotta or concrete fireproofing. Each column in a fireproof steel building is encased in terra cotta from top to bottom. This is called fireproofing the steel. Terra cotta is a clay product that has been burned with exceptional thoroughness. It has come to have a large place in building operations. And it is used not only to encase the steel frame of the building, but also to form the arches of the floors and in a more refined state to cover and ornament the street elevations of the building. As the terra cotta, piece by piece, begins to creep over the steel, the brick contractor and the stone contractor begin to follow.⁵²⁴

Michael J. Hynes as an Advocate of Canadian Terra Cotta

The artistic value of terra cotta as a decorative material, along with the relatively weak demand by Canadian architects for Canadian-made terra cotta were strongly emphasized by Michael J. Hynes in his paper on terra cotta, presented at the January 18, 1899 meeting of the Ontario Association of Architects. More so than any other manufacturer, architect, or builder, Hynes was an outspoken and strong advocate for the use of Canadian-made terra cotta in central Canada, demonstrating an interest in fostering Canadian industry even after the demise of his own company, and in the face of increasing imports from strong U.S. and British industries.

Michael and his brother William, both natives of Toronto, inherited their father's plaster business and expanded it in the mid-1880s to include the manufacture of terra cotta, becoming proprietors of the Canadian Terra Cotta Company. The Hynes brothers claimed in 1886 that their facilities and headquarters held "the finest display in the Dominion of

⁵²⁴J. Ewen, "Modern Steel Buildings", CAB, (May, 1907). 72-74.

ornamented centres, cornices and plaster cast work generally, terra cotta trimmings and fronts, and imported art tiles in great variety." Their "terra cotta work of the highest artistic degree of perfection" was described as their specialty.⁵²⁵

Michael Hynes' 1899 paper⁵²⁶ reflects an astute knowledge of the contemporary state of development and manufacture of the material in the U. S. and its revival and use in England, as well as a familiarity with notable individuals associated with its manufacture in both England and the U.S. Hynes' paper also documented the attempts of a "Staffordshire man" to make terra cotta in Canada and revealed that Hynes once employed an unidentified British terra cotta worker who later returned to his original shop in England.

In touching upon the revival of Terra Cotta, reference must be made to England. The architecture of each country has developed its own individuality, and in England had the advantage of such men as Blashfield, Sir Henry Dolton, Sir George Skey, Jennings, Gibbs, Cowan and others; and even in the hands of these men, and under the leading architects of the day, the material as first produced, could not be called beautiful. The South Kensington Museum, and the Albert Memorial Hall, show what might be accomplished but in no way satisfied the architects or the artistic public.....

Contrast this work at the Albert Memorial Hall with the gates at Lord Rosebery's mansion, made with clay carefully washed and free from impurities, mixed with broken glass, spar and grog..., properly dried and burned; this work could never be taken as an "imitation" of brown stone, granite or any material, but is simply Terra Cotta.

Another instance of success in the early days, is the Dulwich College, carried out after the design of the late Charles Barry, and costing some \$140,000.

Terra Cotta received a great impetus when Sir Henry Dolton's [sic] Works were erected upon the Thames embankment in London, for the manufacture of this material and other fine art goods. I have just received a letter from a fellow-workman, at one time with me, but who has returned to England to his old shop. He informs me that there are three Terra Cotta Works, where there was only one when he left a few years ago. The English architects must have created this demand, and I trust Canadian architects will follow their example.

⁵²⁵"Industries of Canada: Historical and Commercial Sketches of Toronto and Environs, " (Toronto, 1886), microfiche. TRAC, 10-11 reported the Hynes family was involved in ornamental plaster since 1840, and the Hynes brothers in the same since 1876.

⁵²⁶See also TRAC, 1990, 12, for a partial reprint of the text of Hynes' 1899 OAA paper, which this thesis has attempted to not duplicate for the most part .

The work in the United States has made rapid strides. Much has been accomplished, but Englishmen have been at the head, men such as James Taylor, Joseph Joiner, and others, all of whom received their practical education in England. In the United States to-day, the importation of Terra Cotta, delf, china, etc. is visibly decreasing. Why? Because a demand having been created--the architects giving the preference to home industries--... with the result that to-day large works are dotted all over the country, doing a substantial, profitable business....

Terra Cotta in Canada has failed for two reasons--first and foremost, lack of support upon the part of the architects; second, because every person who connected himself with it, made a brick, and making brick takes up about twenty-four hours a day, and leaves very little time for attention to Terra Cotta.....

In scarcely two countries will the difficulties met with be the same....Sometime ago, a Staffordshire man, who met with success in England, conceived the idea that the possibilities of making money in Canada in the Terra Cotta line were exceptionally good, and a test of certain clays obtained in Canada seemed to warrant the investment, so he made it, and failed. Then he tried imported workmen, and failed, then imported clay, and failed again....so he concluded that to make a success of the undertaking he would have to import British atmosphere.⁵²⁷

Hynes indicated his remarks should not be misconstrued as advertising for any existing terra cotta works although he had been associated with the Rathbun Co. in Deseronto after the liquidation of his own firm "some years ago".⁵²⁸ His outspoken comments clearly document the frustrated attempts of highly skilled Canadian artisans in the plaster trade and terra cotta manufacture in maintaining their investment in the face of a highly competitive U.S., as well as British industry.

The question has probably occurred to you, and naturally, "Why is it that in Canada, we have not a first-class Terra Cotta Works?" Gentlemen, the answer is with yourselves. Except in a few individual cases, you do not ask for the material. Possibly you are prejudiced against it, and desire to remain so. It may be that you are not conversant with its utility, its virtues and its beauty, and have either been too busy or too indifferent to look into the matter with that degree of interest and study which the subject demands.

⁵²⁷Hynes, "Terra Cotta", *ibid.*, 37-39.

⁵²⁸M.J. Hynes was described as the superintendent of the terra cotta works at the Rathbun Co. in "Tests of Fire-Proofing Material", *CAB*, (June, 1895), 78-79. Hynes was also described as "the Rathbun Company's Artist" for the firm's decorative terra cotta. See ad by T.A. Morrison & Co., an agent in Montreal for the Rathbun Co. *CAB*, (February, 1895), xi.

While in the United States numerous buildings, some of them twenty stories high, have been constructed of this material, as yet you have failed to put it to anything like general use in this country.....

If you will create the demand, there is no doubt that some responsible firm will rise to the occasion, and will meet the demand with material that will be as good, if not better, in artistic excellence [sic] and in quality, as any that can be procured in any foreign country; for in Canada we have plenty of the raw material; we have the capital, and we can soon secure the artists and workmen if we have not got them now....⁵²⁹

The ironic sale in 1900 of Hynes' "patent kiln for the burning of terra cotta" to the Perth Amboy Terra Cotta Co. in the U.S. shortly after the Perth Amboy firm had completed a series of experiments in, and finally produced highly successful glazed polychrome terra cotta.⁵³⁰ Hynes' 1899 remarks also reflect his up-to-date knowledge of contemporary U.S. developments with polychrome terra cotta and glazed terra cotta generally.

You have now Terra Cotta in all colors at your disposal; all American Companies advertise Terra Cotta in all colors glazed and semi-glazed, while an English firm came out with an advertisement some years ago, "A new building after every shower." Glazed Terra Cotta, so far has not met with much success, but I feel that it could judiciously be introduced in particular places.⁵³¹

The report of the sale of Hynes' patent kiln in the CAB also suggests that works produced by the Canadian Terra Cotta Co. may have been fired in a muffled kiln much like that used by Blashfield in England, later introduced by James Taylor in Chicago.⁵³²

As reflected in Hynes' comments, the use of glazed terra cotta as a cladding material for tall iron or steel framed buildings had already become a common phenomenon by 1899 in Chicago and New York. The American tall building itself, however, had become the

⁵²⁹"Terra Cotta", *ibid.*

⁵³⁰Geer, 1920, 57. Tunick, 1997, 55-56 reported that Perth Amboy had first manufactured glazed polychrome terra cotta in 1898.

⁵³¹"Terra Cotta", *ibid.*

⁵³²"Mr. M.J. Hynes is said to have sold....", CAB, (June, 1900), 121. "The special feature of this kiln is that the fire, after passing up through the walls to the top of the kiln, is brought down again through the centre, thus heating the kiln more uniformly throughout."

focus of considerable criticism in architectural forums in central Canada during the 1890s, viewed generally as unacceptable in Canadian cities. Steel framed tall buildings encased in terra cotta first received endorsement in central Canada in 1897 through the leadership of Stewart H. Capper, who had recently come to Canada from Scotland to take up the new post of McGill University's head of architecture.

Stewart H. Capper and the American Tall Building

The ten storey New York Life Insurance Co. Building (1887-88) in Montreal was Canada's first example of the U.S. tall office building. By 1895 Canada had only a few multiple storey office buildings; no steel frame building as yet existed that was not supported by masonry.⁵³³ Discussions at meetings of both the PQAA and the OAA in the early 1890s were critical of the lofty buildings being built in both Chicago and New York. A. T. Taylor's paper on "The Functions of Truth in Art" presented to the PQAA in 1892 praised John Ruskin's writings and emphasized the principle of always letting "a thing look what it is, and do not make it try to look like something else". When contemplating the upcoming 1893 Chicago "White City", Taylor also warned against "the lack of truth in construction and in outward finish". Viewing Chicago's tall buildings as "stupendous blunders", Taylor expressed concern about their scale and mass and the long-term results of rust and decay on iron or steel.⁵³⁴ Similarly, the president of the OAA remarked in 1893 that such construction

was the outcome of special requirements in American cities, and could not well be compared with work done in Canada or the old country. The growth of American cities rendered necessary the erection of these enormously high

⁵³³Crossman, *ibid.*, 78 also noted that a slowdown in construction during the early 1890s was a disincentive to most new large projects, especially tall commercial buildings.

⁵³⁴"Montreal", *CAB*, (December, 1892), 120. Taylor used porous terra cotta with steel beams in the main floor of his design for the Library Building at McGill Univ. in Montreal in 1893. "Illustrations, New Library Building", *CAB*, (August, 1895), 96.

buildings, and as a result this steel construction with curtain walls had been developed in New York and Chicago....⁵³⁵

One year later at the OAA annual meeting Edmund Burke, the new president, offered the view that steel or iron construction encased in terra cotta or another non-combustible material, was the "front of the future". Burke's support for terra cotta related not only to concerns about adequate fire safety, but to difficulties, in his view, associated with achieving "really artistic effects" in building fronts made entirely of cast iron.⁵³⁶

Montreal architect W. E. Doran's 1896 paper on "Truth in Architecture" counted "crystal palaces" and tall office buildings as the only original modern day architectural forms. Doran included large retail stores in the former, which were appropriate enough until the same type of construction brought about "monstrosities" of seventeen to even thirty stories. While Doran did not reject iron and steel construction,

what I do advocate is that this construction be tested by the principles of truth, and the material be protected by coating with copper or other metals which, if it cannot prevent decay, will at least retard it.... This use of exposed iron or steel would therefore lead to an architecture special to itself, and proportions suitable to such construction.⁵³⁷

The same year, the CAB advised that new projects in both Toronto and Montreal evidenced "that the craze for tall buildings which has marked Chicago and New York... is exerting its influence upon the architecture of our Canadian cities", suggesting limiting new buildings to a maximum of six or eight storeys.⁵³⁸

In Quebec in 1897 at the seventh annual meeting of the PQAA, A. T. Taylor's retiring speech as President regretted the lack of progress in architecture over the last sixty years despite advances in science and engineering. Dismissing a series of styles that had

⁵³⁵"Some Observations on Fireproof Building in New York", *ibid.*, 38.

⁵³⁶"Second Day", *ibid.*, 31. Burke's comment preceded his use of terra cotta as a decorative material on the first Simpson building.

⁵³⁷W. Doran, "Truth in Architecture" (concluded from May issue), CAB, (June, 1896), 86-87.

⁵³⁸"Tall Building", CAB, (December, 1896).

followed the Gothic Revival, Taylor commented favorably on the recent contributions of H. H. Richardson and the current U.S. study of Italian Renaissance architecture, but deplored the "outrageously ugly" tall buildings in U.S. cities. Taylor praised the classic and Gothic work of some of Canada's architects over the past fifty years and welcomed the recent move to better training, especially looking forward to contributions that would come from the new chair of architecture at McGill University.⁵³⁹ Professor Stewart Henbest Capper's paper on "The American Tall Building", presented the same day⁵⁴⁰ and published in the CAB in January, 1898, criticized New York architecture, especially its "extravagant" ornament. At the same time Capper called for an end to the rejection of the tall building, emphasizing the need to recognize this type of construction as an effort to solve contemporary problems.

The problem asking for solution is an eminently modern one. Architecture cannot, on pain of proving untrue to her traditions as a living art, refuse to entertain it...and eventually to reach a satisfactory solution. We must, I hold, put definitely aside the criticism so often heard: "These tall monstrosities are not architecture at all; they are only engineering, with a stone veneer." They are buildings of our modern city streets; and if these be not architecture, where indeed is modern architecture to find her place?

In addressing the use of appropriate materials, Capper emphasized the need to conceal steel skeletons "in a fire and weather-resisting shell" and to reflect their construction in horizontal building stages. Capper advanced terra cotta as the most appropriate and "honest" cladding material to achieve both these objectives, rejecting a veneer of stone as a both "unnatural", even shocking substitute.

⁵³⁹"Province of Quebec Association of Architects. Proceedings of the Seventh Annual Convention", CAB, (October, 1897), 190-193. The PQAA Council report also praised the Architectural and Arts and Crafts Exhibition held at the last annual meeting and "numerous friends who so readily lent valuable and precious objects of art for exhibition."

⁵⁴⁰The CAB's 1897 PQAA meeting report contained an abstract only of Capper's paper. Although describing his discussion of concealed steel skeleton construction, the October, 1897 issue made no reference to Capper's endorsement of the use of terra cotta.

To deny...to iron and steel the position they have conquered in the world of modern construction is, of course, wholly futile. But from their perishable nature they must be hidden away from their own protection. How, then, are they to be dealt with? The most obvious method is to case the metal in some form of plastic material, such as terra-cotta: steel construction, thus treated, is quite capable of honest above reproach. Whether stone is a wholly legitimate substitute for a plastic material thus required to case it in is a good deal more open to question. It is certainly more costly and more difficult to handle; above all, it is a less natural material when so used. We are all so thoroughly accustomed to stone... that it is certainly a shock to see it cramped on to a steel backing, treated like a veneer, pared down and pinned and bolted into place. This is certainly not material used in its natural way; it is so unnatural, and shocks so irretrievably, that I very much doubt if it can be accepted esthetically as so satisfactory as a wholly plastic material.

Capper's only reservation on the use of terra cotta was that colour and texture could be easily obtained with stone but were not available "in any terra cotta or similar material",⁵⁴¹ although successful glazed polychrome terra cotta became available one year later in the U.S., and had been first produced successfully in the late 1880s in England.

Capper rejected the lavish ornament on many of New York's tall buildings, particularly recent ones placing extensive "superfluous" decoration in the top storeys. In his assessment the sheer size of these structures contributed interest; to add excessive ornament was meaningless and detracted from their mass, while repetition of simple detail could be quite effective. In Capper's view "an almost monotonous repetition is of potent artistic value" on very large buildings, noting that some of the "comparatively 'tall buildings' of old Edinburgh... are totally devoid of architectural ornament" although having distinctive value through the repetition of certain features. Capper found New York's exaggerated cornices to be particularly difficult, suggesting it was preferable instead to create greater vertical depth at the top, "including a storey or more in the depth of the cornice and its members" and possibly the use of deep consoles to achieve a more

⁵⁴¹S. H. Capper, "Some Notes in Criticism of 'The American Tall Building'", CAB (January, 1898), 5-8. Capper was born in London, studied at the Univ. of Edinburgh and in Paris, travelled in France and Italy, and taught at the School of Applied Art and the Univ. of Edinburgh before moving to Montreal to become the first Macdonald Professor of Architecture at McGill in 1896. He returned to Great Britain in 1903. Gournay and VanLaethem, 205.

favourable result. Capper accepted the principle of ornamentation near the base, arguing the need to enrich the entrance. He also dismissed the use of strongly vertical lines, favouring instead an emphasis on horizontal division in order to express the "fact that these great buildings are erected in horizontal stages".⁵⁴² Montreal architect Charles Baillairge emphasized the need a few years later to reduce the number of horizontal sections in tall buildings and to use a "salient horizontal feature such as a continuous balcony or ornamental bracket" to reduce the height of cornices.⁵⁴³

The debate about tall buildings in Canada had essentially ended by the turn of the century.⁵⁴⁴ The acceptance of terra cotta as a suitable cladding material in steel frame construction, as advanced by Capper, clearly arrived in the context of the principle of "truth in architecture". It also occurred during the underlying search for a Canadian expression of tall buildings. Capper's approach argued for both a more simplified approach and one that had been used in the "old country"--thus distinguishing Canadian architecture from its more "extravagant" New York counterpart.

Terra Cotta Manufacture and Supply

By the late 1880s several small pressed brick and terra cotta manufacturers had been established just west of Toronto using clays well suited for this purpose⁵⁴⁵ in response to a growing demand in Ontario for both products, especially for domestic use with the popular Queen Anne, as well as the Romanesque Revival styles.⁵⁴⁶ Before that time all pressed brick in central Canada was imported from the United States,⁵⁴⁷ as was a limited amount of

⁵⁴²Ibid. Capper suggested the cornice of Vignola, "with its deep consoles" and greater vertical depth as a successful classic example for restudy.

⁵⁴³"Originality of Design in Architecture...How Sky-scrappers can be made more Aesthetic". CAB, (December, 1902), 144.

⁵⁴⁴Crossman, 84.

⁵⁴⁵First Report of the Bureau of Mines, 1891 (Toronto, 1892), 101.

⁵⁴⁶A. Keefer in TRAC, 1990, 5, noted the "nearly perfect symbiotic relationship" between terra cotta and the Queen Anne and Romanesque revival styles in Ontario during the late 19th century.

⁵⁴⁷Fifth Report of the Bureau of Mines, 1895 (Toronto, 1896), 12.

U.S. manufactured terra cotta.⁵⁴⁸ Three small Ontario terra cotta manufacturers were established before the late 1880s, all situated outside the small nucleus of firms west of Toronto. These included T. M. Clark, who obtained a patent for the manufacture of brick and terra cotta in 1876 at the New Edinburgh Brick and Terra Cotta Works in the Village of New Edinburgh near Ottawa; the Hynes brothers, who produced terra cotta along with moulded brick and plaster work at the Canadian Terra Cotta Company in Toronto; and the Rathbun Company in Deseronto, which made porous terra cotta beginning in 1887, along with a limited amount of decorative work after c. 1893 as one component of a wide range of other products.

Most of Ontario's pressed brick and terra cotta firms situated near or in Toronto advertised their wares in the Canadian Architect and Builder from the late 1880s to the early 1900s. The annual Bureau of Mines reports also reported statistics on the manufacture of pressed brick and terra cotta, as well as documentation concerning some individual firms, mainly those established west of Toronto in the late 1880s. In the Bureau of Mine's first annual report, published in 1891, Director Archibald Blue emphasized the suitability of clay beds in both the Medina and the Hudson River formations for the manufacture of pressed brick and terra cotta. (Figure 3.41) By 1891 the superiority of this clay and its convenience to Toronto had resulted in the establishment of seven firms producing pressed brick, fancy brick, roofing tile and "a quantity of ornamental and porous terra cotta".

it is only four years ago that we became conscious of having a clay suitable for the manufacture of pressed brick and architectural terra cotta of the very best quality, and we know now, what was not suspected at first, that a bed of it in the Medina formation is 400 to 600 feet in depth and lies exposed for more than a hundred miles within easy reach of the principal cities of the province. We know also that a lower formation (the Hudson River shales),

⁵⁴⁸Jones, unpublished dissertation, Appendix D listed two Ontario buildings in the Boston Terra Cotta Co. 1884 Catalogue. T. Ritchie, "Terra-Cotta in Canada", 56, stated that Canadian architects first brought terra cotta from the U.S. "largely from a centre of manufacture in Ohio... developed at the deposits of certain clays which were particularly suited to the production of terra cotta."

upon which the city of Toronto stands, yields a clay which, if that be possible, is even superior to the Medina; but no one thought of experimenting upon the Hudson River shales for this purpose until a year ago.⁵⁴⁹

The Bureau of Mines suggested in 1894 that despite the success to date of this industry, it was believed capable of even further development, claiming that Ontario was favoured over most Canadian provinces and U.S. states in the qualities and convenience of the shales of the Hudson River and Medina formations.

The manufacture of pressed brick and terra cotta began here only six years ago, and last year, in spite of the collapse in the building trade, the value of the output of six works was \$286,230. It gave employment to 209 workmen and paid them wages to the amount of \$95,400. The improvement already noticeable in the architecture of our cities as a consequence of the use of pressed brick and terra cotta is bringing this material fast into favor....⁵⁵⁰

The Ontario pressed brick and terra cotta industry reached its peak in 1894, falling off to lower volumes thereafter, likely precipitated in part by a depression in building activity generally in 1895.⁵⁵¹ The Bureau of Mines' special report on the clay industry in Ontario in 1906 noted that the manufacture of terra cotta was reduced from earlier times with the exception of two Milton firms, and that most terra cotta recently used in the province was being imported from the United States.

This branch of clay manufacture is not as flourishing in Ontario of late years as it was formerly. Since the burning of the Rathbun Company's terra-cotta plant at Deseronto, there has been little done in this line in Ontario. A few buildings have been erected, using Ontario terra-cotta, made by companies

⁵⁴⁹First Report of the Bureau of Mines, 1891, 4-6. Skilled workmen in the pressed brick and terra cotta industry were paid an average of \$12.60/week compared with an average \$18.66/week for stonecutters. Montgomery, 21-22, also referred to the Medina formation as Queenston shale, and to the Hudson River formation as Lorraine Shale.

⁵⁵⁰Fourth Report of the Bureau of Mines, 1894, (Toronto, 1895), 18.

⁵⁵¹Fifth Report of the Bureau of Mines, 1895 (Toronto, 1896), 12. Ontario mineral data during the 1890s rarely reported terra cotta production (including architectural and porous units) separately from pressed brick and roofing tiles. At its peak in 1894 this combined industry produced some 25.5 million units, compared with 13.6 million in 1891 and 8 million in 1897. In 1896 terra cotta represented about 20% of the combined production of pressed brick and terra cotta. Report of the Bureau of Mines, 1898, 17; Sixth Report of the Bureau of Mines, 1896 (Toronto, 1897), 13.

manufacturing pressed brick. Chief among these companies is the Toronto Pressed Brick Company, of Milton, Ontario; and also the Milton Pressed Brick Company, of Milton....Most of the terra-cotta used in Ontario recently has been imported from the United States, where it has been claimed that the clay is much purer, but since these companies in Ontario have been using the ground shales, the quality of red terra-cotta could not well be improved.

The 1906 report also noted that suitable clays had not yet been located in Ontario for the production of "any of the other colours of terra cotta", such as buff, white, cream, etc.⁵⁵²

Shortly thereafter, despite the fact that glazed terra cotta was never manufactured in central Canada, Construction reported the discovery in Ontario of glazing clay deposits, the first yet found in Canada. Reference was also made to samples of these deposits having been burned in some of England's potteries.

Glazing clay deposits have been discovered in large quantities near the town of Dorchester, Ontario. Samples of this clay have been submitted to Mr. Hays, government analyst, Toronto, who states that the quality is of the finest. Quantities of it have been burned, it is stated, in the kilns of some of the large English potteries which manufacture fine glazed sanitary ware and the finished product has shown a quality of the best. The principal glazing clay beds have heretofore been found in the state of Ohio, the above being the first deposit of the kind found in Canada.⁵⁵³

Some terra cotta producers may have used specially made hand press machines for the production of terra cotta tiles,⁵⁵⁴ although hand presses in Ontario appear to have been mainly used for making ornamental or fancy brick.⁵⁵⁵ The 1906 Bureau of Mines' discussion of terra cotta manufacture described the use of plaster of Paris moulds made in accordance with required drawings, followed by the preparation of plaster of Paris casts,

⁵⁵²M. Baker, Clay and the Clay Industry of Ontario, Report of the Bureau of Mines 1906, Vol. XV, Part II (Toronto, 1906), 120.

⁵⁵³"Glazing clay deposits...", Construction, (November, 1907), 56.

⁵⁵⁴Ad by the Laidlaw Manufacturing Co., Hamilton, CAB, (December, 1889), v, promoting a variety of brick machines, including brick re-presses and "terra cotta presses", indicating a catalogue was available. "Brickmaking and Brickbuilding in Nova Scotia", CAB (December, 1895), 124, referred to "a Raymond or some other of the repress machines with which your manufacturers produce the beautifully moulded forms of brick and terra-cotta shown in the catalogues I have seen...."

⁵⁵⁵First Report of the Bureau of Mines 1891, 101-105.

reportedly covered by the thoroughly worked compact clay. The plaster cast was then removed, and the clay model was dried and burned in a kiln.⁵⁵⁶

Late 19th Century Brick & Terra Cotta Manufacturers

The following compendium of central Canadian terra cotta producers, the bulk of whom were located in Ontario and allied with the manufacture of pressed brick during the late 19th century, provides information concerning the location of the works, years of operation, the proprietors of each firm and its products. Two Quebec firms identified in the context of this research are also briefly discussed, along with a brick and terra cotta firm in Victoria, British Columbia that existed for a brief time in the 1890s. With respect to the east coast of Canada, an 1892 article in the CAB regarding brickmaking in Nova Scotia reported that despite the existence in the Annapolis Valley of kaolin, a type of clay conducive to making terra cotta, "No ornamental brick is made in the country, and as for terra cotta it is unknown."⁵⁵⁷

As appropriately suggested by the Toronto Region Architectural Conservancy, the reference to "terra cotta" in the name of a brick manufacturing company should be treated with caution unless evidence can be cited that the firm actually produced the material. Two brick firms situated in the town of Terra Cotta, Ontario, for example, including the Terra Cotta Brick Co., established c. 1910, and the Halton Brick Co., begun c. 1912, manufactured dry-press brick but no evidence exists that either firm ever produced terra cotta. The town of Terra Cotta, located northwest of Toronto, formerly known as Salmon Village, was apparently renamed to reflect the colour of the clay from which these two companies produced pressed brick in the early twentieth century.⁵⁵⁸

⁵⁵⁶Baker, 120, 5. Down-draft kilns becoming were "very popular" in Ontario in 1906.

⁵⁵⁷This article briefly discussed the International Brick & Tile Co. of Nova Scotia, which made only common brick. "Brickmaking and Brickbuilding in Nova Scotia", *ibid*.

⁵⁵⁸TRAC, 1990, 139; editor's note in CAB, (February, 1891); R. Montgomery, The Ceramic Industry of Ontario, 39th Annual Report of the Ont. Dept. of Mines, (Toronto, 1930), 148-9; see also M. Zatyko, Terra Cotta: A Capsule History, (Erin, Ont., 1988).

- *T. M. Clark's New Edinburgh Brick and Terra Cotta Works*

Thomas McLeod Clark's New Edinburgh Brick Works was first listed in the Ottawa City Directory in 1872-73, appearing consistently until 1880, when the firm was identified as the New Edinburgh Brick and Terra Cotta Works. Clark's brick works last appeared in the Ottawa directories in 1886, although between 1882 and 1886 no reference to terra cotta appeared in the firm's name.⁵⁵⁹ Clark had come to Canada from Scotland and settled in the township of Gloucester in the County of Carleton in 1868. During the early 1870s and 1880s Clark was a fire and life insurance agent for the Royal Insurance Co. of England, and for D. Y. Stewart & Co. of Glasgow, manufacturers of gas and water pipes.⁵⁶⁰ Clark's New Edinburgh Brick Works was situated within the MacKay Estate where he relied on an ample supply of good quality marl "of a pinkish white colour, of the most valuable commercial character".⁵⁶¹ (Figure 3.42)

Clark was married to Jessie MacKay, the third daughter of the Hon. Thomas MacKay, the Scottish stonemason who held the contract for construction of the first eight locks of the Rideau Canal.⁵⁶² T. M. Clark was also the brother-in-law of Thomas Coltrin Keefer, a highly respected internationally renowned civil engineer who served as one of Canada's commissioners for both the 1851 and 1862 exhibitions in London, and as Canada's executive commissioner for the 1878 Paris International Exhibition.⁵⁶³

⁵⁵⁹Ottawa Directory for 1872-73, 161; Ottawa Directory, 1880, 2; Ottawa Directory, 1886, 350.

⁵⁶⁰H. Belden & Co., Historical Atlas of Carleton Co. Illustrated, 1879, 46; 1870-71 City of Ottawa Directory; Ottawa Directory 1875; Ottawa & Kingston City Directory, 1875.

⁵⁶¹Ottawa Directory 1872-73, 161; Belden & Co., ii. Notes by Tom Ritchie dated April 27, 1988 re Old Brick Collection at National Research Council, courtesy of Mark Arnott at NRC, also indicated "R. W. Ells Report on the Geology & Natural Resources of the Ottawa Area, ... 1901, stated that shell marl formerly used for brickmaking was taken from the shores of Hemlock (MacKay) Lake near Rockcliffe Park."

⁵⁶²Village of Rockcliffe Park LACAC, "Walking in the Village of Rockcliffe Park", 1982, 7-8, 53-54.

⁵⁶³H. Morgan, The Canadian Men & Women of the Time, 1898, 522. Keefer was made an officer in the Legion of Honour by the French Government for the highly successful Canadian display at the 1878 exhibition. L. Murphy, Thomas Keefer, 1977, 49.

Clark obtained a patent for the manufacture of bricks and terra cotta in 1876, emphasizing the production of terra cotta as a substitute for carved stone, reflecting similar attitudes of the time toward the use of terra cotta in both England and the U.S.

Be it known, that I, Thomas McLeod Clark of the City of Ottawa, County of Carleton, province of Ontario, Brickmaker, did invent a certain new and useful composition of matter to be used in the manufacture of following, viz.

White, cream coloured, pink or marble white or streaked bricks,-- terra cotta, artificial stone, plain, or as a substitute for cut or ornamental building stone for blocks, sills, mullions, copingstones, string cornices, cornices and other mouldings, arch bands, key blocks, and all kinds of plain and ornamental architectural building material in imitation of, and as a substitute for cut or carved stone, or plaster of paris mouldings, etc., also for the manufacture of pottery.

The nature of my invention is a composition made from shell marl and aluminous earth or clay. The silicious property of the marl in most cases obviates the necessity of using sand except for moulding purposes, either crushed or ground together or separately, then mixed and tempered with water, and with or without sand and moulded in the usual way in a Brick or Pug Mill or by hand in moulds.⁵⁶⁴

Clark claimed during the late 1870s that his "architectural blocks" were "as durable as stone and more than 50 per cent cheaper"⁵⁶⁵ and that large quantities of his white bricks were being shipped as far away as Albany and New York.⁵⁶⁶ Clark's advertisement in the program for the City of Ottawa and Dominion Exhibition, which also appeared in Ottawa's 1880 directory, emphasized his products were "Indestructable by Frost" and announced that his firm had been awarded first prize at the Provincial Exhibition. It also contained a

⁵⁶⁴Clark's patent application stated "The marl possesses the property of deoxidizing the clay. The colour of the brick or terra cotta can be then determined and secured from pure white to pink." Patent No. 6689 issued Oct. 21, 1876, Canadian Patent Office Record, Vol. IV No. 11, Nov. 1876, as described in Tom Ritchie's notes at the NRC and courtesy of Martha Edmond.

⁵⁶⁵"White Bricks & Architectural Blocks", The Citizen, March 11, 1880, Building Ottawa Research Project, City of Ottawa archives.

⁵⁶⁶"Patent White Bricks", The Citizen, June 28, 1878; "White Bricks, The Citizen, April 3, 1880, Building Ottawa Research Project, City of Ottawa Archives.

statement by Thomas S. Scott, Chief Architect of Canada, attesting to the superiority of Clark's products.⁵⁶⁷ (Figure 3.43)

Although Clark appears to have been the only terra cotta producer in Ottawa at this time, W. M. Somerville also advertised the import of terra cotta goods and other materials during the 1870s through the Ottawa Marble Granite & Drain-Pipe Depot⁵⁶⁸, as did A. K. Mills, a dealer supplying fire clay and terra cotta goods.⁵⁶⁹

- *Canadian Terra Cotta Company*

Michael J. and William J. Hynes' Canadian Terra Cotta Company was established in Toronto c. 1884⁵⁷⁰ or 1885⁵⁷¹ and was also known at various times as the Canadian Terra Cotta Co. and Plaster Cast Works,⁵⁷² and the Hynes Terra Cotta & Brick Co.⁵⁷³ Headquartered in a four-storey building at 88 York Street, the new firm was an expansion of the prominent plaster work business first established thirty years earlier by their father, William Hynes.⁵⁷⁴ Their kilns were situated at the foot of Jarvis Street with yards in Ontario Place, and at Parliament and Amelia Streets. In 1886 the firm advertised their

⁵⁶⁷Woodburn, "Guide to the City of Ottawa & Dominion Exhibition". 1879. microfiche: ad by New Edinburgh Brick and Terra Cotta Works, Ottawa Directory 1880, 2. In Nov., 1890, the CAB editor, 124, made reference to T. M. Clark's "Building Superintendence", available through a book agent in Toronto.

⁵⁶⁸Ottawa City Directory 1873-4; 1879 City of Ottawa Directory. Somerville advertised "American & Italian marbles", "Scottish granite monuments", and building stone from Cleveland, Ohio; the origin of terra cotta goods "imported direct" was not specified.

⁵⁶⁹Ottawa Directory 1874-75.

⁵⁷⁰The apparent manufacture of the 1884 Lailey Residence terra cotta by the Canadian Terra Cotta Co. suggests that the firm was producing terra cotta as early as 1884.

⁵⁷¹TRAC, 10, 139, citing an advertisement brochure by the "Hynes Plasterers". March of Progress, copy reportedly held by the City of Toronto Archives.

⁵⁷²Industries of Canada: Historical & Commercial Sketches of Toronto & Environs. Toronto, 1886, microfiche. The Hynes' firm was first listed in the Toronto City Directory for 1887, 572, as the Canadian Terra Cotta Co.

⁵⁷³Ads for "Hynes Terra Cotta & Brick Co. [Ltd.]", CAB (Jan. 1889), 17; (April 1889), iv. The firm was listed as both the Canadian Terra Cotta Co. and as the Hynes Terra Cotta and Brick Co. in the Dominion of Canada Business Directory 1890-91, (Polk & Co., 1890-91), 1380-83, 1880.

⁵⁷⁴William Hynes (senior) was a member of the Toronto firm of Hynes Bros. between 1840 and 1875, and passed away on May 1, 1896. "Personal", CAB (May, 1896), 65.

works, outfit and stock all compare favorably with any similar establishment in Europe or the United States. The firm give employment to an average force of seventy-five hands--often many more in the fulfilment of extensive contracts. The most superior workmanship and excellence of material characterises all their contracts....Terra cotta work of the highest artistic degree of perfection is their specialty, and in which they have distanced all competition. Both in this line and general contract work they have carried to a successful issue the most important jobs in the city....⁵⁷⁵

In 1889 the Hynes brothers thanked architects and builders for the "very liberal patronage we have received during the past year in our new industry", noting that details for all orders would be undertaken to complete satisfaction "as we submit models and photographs before burning."⁵⁷⁶ The Hynes brothers also carried stock in red terra cotta with other colors available through order. The firm advertised their ability to supply ornamental bricks and terra cotta "for plain or ornamental designs" in all manner of architectural details, such as panels, pilasters, capitals, friezes, finials, string courses, cornices, square tiles, etc.⁵⁷⁷ They also claimed the use of "first-class clays" along with "competent artists, moulders, pressers, finishers and burners", proposing to keep on hand stock shown in their 1887 catalogue, but requesting that orders be placed as far in advance as possible due to the time required for manufacture.⁵⁷⁸

Although advertisements for the firm last appeared at the end of 1890,⁵⁷⁹ the Hynes Terra Cotta and Brick Co. was liquidated in 1893.⁵⁸⁰ The main cause of its closure as described by Michael J. Hynes--the lack of adequate demand by Canadian architects and

⁵⁷⁵Industries of Canada: Historical & Commercial Sketches of Toronto & Environs, 1886, *ibid.* The Canadian Terra Cotta Co. were also dealers in builders' supplies. In June, 1889, the firm advertised, CAB, vi, that their stock had been moved to larger premises, showing an address of "Esplanade, foot Jarvis Street".

⁵⁷⁶Advertisement, CAB, January, 1889, *ibid.*

⁵⁷⁷Advertisement, CAB, April, 1889, *ibid.*

⁵⁷⁸TRAC, *ibid.*, extract from the Introduction to the firm's 1887 catalogue.

⁵⁷⁹Ad by Hynes Terra Cotta & Brick Co., CAB (December 1890), vi, indicated the firm also had agents in Montreal and Hamilton. In 1892 the Toronto City Directory (Might's), 917, identified Arthur F. Banks as President and M. J. Hynes as Manager.

⁵⁸⁰The Hynes Terra Cotta & Brick Co. was listed in Might's Toronto City Directory for 1893, 893, as "in liquidation". Ads for the firm last appeared in the CAB in Dec., 1890.

builders--was previously discussed in his paper, presented at the 1899 OAA meeting. It also appears that the entry into the Ontario market between 1888 and 1891 of several other pressed brick and terra cotta manufacturers, situated mainly west of Toronto, likely created excessive competition for the Hynes' works.⁵⁸¹ By 1895 M. J. Hynes had become the superintendent of works for the manufacture of both porous and ornamental terra cotta for the Rathbun Company in Deseronto,⁵⁸² as well as their artist.⁵⁸³ Separate advertisements also began appearing in the CAB by W. J. Hynes c. 1893 as a contractor and plasterer, and as a "modeller and manufacturer of architectural and decorative ornaments in fibrous plaster and staff" in 1895.⁵⁸⁴ Michael Hynes' documentation in his 1899 paper concerning the unsuccessful attempts of a British terra cotta manufacturer to produce terra cotta in Ontario, as well as Hynes' employment of a British terra cotta worker for a time in his Toronto firm, provide the basis for further research.

Illustrations from the Canadian Terra Cotta Co. 1887 catalogue⁵⁸⁵ verify the firm undertook terra cotta modelling to the designs of several well known Toronto architects, such as Langley & Burke, E. J. Lennox, and Gordon & Helliwell, while also likely stocking some terra cotta for use in stringcourses, panels, caps and other architectural purposes. (Figures 3.44, 3.45, 3.46) Examples of the Canadian Terra Cotta Co.'s work, based on the comparison of designs in the firm's 1887 catalogue with extant late 19th century Ontario architecture, are recognizable throughout the province. The apparent excellent condition of this terra cotta serves to confirm Michael Hynes' conviction of the

⁵⁸¹The Toronto City Directory for 1893 listed six terra cotta manufacturers in addition to the Hynes' firm (which was in liquidation).

⁵⁸²"Tests of Fire-Proofing Material", CAB, June, 1895, 78.

⁵⁸³Ad by T.A. Morrison & Co., Montreal, agent for the Rathbun Co.'s porous and ornamental terra cotta, in CAB, February, 1895, xi.

⁵⁸⁴Ads for "Wm. J. Hynes, Contractor and Plasterer", CAB, February, 1893; CAB, March, 1895, 50.

⁵⁸⁵L. Wells' unpublished dissertation, contains complete illustrations from the Canadian Terra Cotta Co.'s 1887 catalogue.

necessity of well burned terra cotta in the Canadian climate, as exemplified in his comments in 1899 on the deterioration of Italian terra cotta used on the Oak Hall in Toronto.

The Oak Hall building affords a good illustration of how architecture may be embellished with sculpture, but the Italian Terra Cotta was not sufficiently burnt for this climate. The winter has caused some of the figures to drop an arm or a limb, which are now glued on with cement.... This shows the necessity of well burnt Terra Cotta for this climate. All the Canadian Terra Cotta is standing as fresh as the day it was put up.⁵⁸⁶

- *The Rathbun Company*

The Rathbun Company, situated in Deseronto, Ontario, west of Kingston on the shore of the Bay of Quinte, began making porous terra cotta in 1887 at the first plant of its kind in Canada. Holding the first Canadian patent for such a product, the mixture of clay and sawdust was both logical and beneficial to the Rathbun Co., which had its beginning as a lumber manufacturing business.⁵⁸⁷ The Rathbun Co. was first established in Canada in 1848 by Hugo Berghardt Rathbun, who came to Canada from Auburn, New York. Auburn is situated directly south of Deseronto on the opposite side of Lake Ontario, near both the city of Syracuse, as well as Oswego, at the outlet of the Erie Canal system. In 1864 Edward Wilkes Rathbun (1842-1903), H. B. Rathbun's eldest son, who was born in Auburn and educated and trained in New York City, came to Canada and soon assumed control of his father's business. Edward Rathbun soon began adding more lumber yards in both Canada and at Oswego, along with a number of associate industries at Deseronto, such as a shipyard, a charcoal works, and a sash, door and blind works, which was Canada's largest such factory in the 1870s.

⁵⁸⁶"Terra Cotta", *ibid.*, 38. See TRAC, 32 for an illustration of the Italian terra cotta work in the Oak Hall (1893) in Toronto (demolished 1938), designed by George Harper.

⁵⁸⁷R. Cook, editor, Dictionary of Canadian Biography, 1901 to 1910, Vol. XIII (Toronto), 853-55; D. Wilson, Lost Horizons: The Story of the Rathbun Company and the Bay of Quinte Railway (Belleville, 1983), 38-39. The TRAC survey, 9, stated the Rathbun Co. obtained patents for the terra cotta process in the early 1880s, and "more than likely, the required moulds, from an known American firm."

In the early 1880s Rathbun built and operated several railways to transport his products, including the Bay of Quinte Railway and the Kingston, Napanee & Western Railway, along with a line of steamers. Later on, the Rathbun Co. also produced both rail and street cars.⁵⁸⁸ The town of Deseronto could be described as a classic company town during the Rathbun Company's prime years. At its peak in the 1880s the firm employed around 1500 workers in a variety of industries located within the immediate district. The Rathbun family was highly esteemed in the community and played an important part in the physical, social, and economic development of Deseronto, at times contributing buildings, funds, land, and even infrastructure for a variety of causes and improvements.⁵⁸⁹

The manufacture of porous terra cotta building materials in Canada was pioneered by Edward Wilkes Rathbun, who became Deseronto's first mayor on its incorporation in 1889. Edward Walter Rathbun, his son, became superintendent of the terra cotta works in 1891.⁵⁹⁰ Frederick Sherwood Rathbun, Edward Wilkes' brother, who was also educated in New York, served as secretary and treasurer of the Rathbun Co. after 1880. F. S. Rathbun was especially admired by Michael J. Hynes, who viewed the latter as "one who was alive to its [terra cotta's] possibilities, and who from a personal as well as a business standpoint was a strong advocate for its use". Hynes also called F.S. Rathbun's late 1898 death an "irreparable loss for Terra Cotta".⁵⁹¹

The Rathbun Company built a sizable new building with adjacent drying rooms for the manufacture of porous terra cotta in the late 1880s, situated immediately next to the Bay

⁵⁸⁸Hugo Rathbun was born in New York state in 1812 of English descent, and soon became associated with wood lumbering interests. *Ibid.*, 13-19, 58-60.

⁵⁸⁹Wilson, 7, 47, 53. See also Cook, *ibid.*, regarding donations and works by the Rathbun Co. in Deseronto, including a telephone system, newspaper, cemetery, street lights, church lands, concert hall, and workers' homes.

⁵⁹⁰The Rathbun Co. built the first Portland cement plant in No. America and Canada's first flour mill using the roller process. Edward Wilkes Rathbun was mayor of Deseronto for fifteen years; he was also appointed as a member of the Royal Commission on the Forests of Canada and was a governor of the Kingston School of Mines. Wilson, 49, 52.

⁵⁹¹"The Late Mr. F.S. Rathbun", *CAB* (Jan., 1899), 9; "Terra Cotta", *ibid.*, 37.

of Quinte Railway. (Figure 3.47) The plant was in full production by 1889, at first producing around 30 tons of the porous units per day, employing more than 40 workers.

A mixture of clay and sawdust worked into the appropriate shape was fired in kilns, where, during the process, the sawdust, acting as additional fuel, was burned out. This produced a porous brick-like block with ample strength for most building applications; fireproof and only about one third the weight of conventional brick. The name terra cotta, in reference to colour, was derived from the shade of red produced by this product..... The capacity of the works was initially about thirty tons of material per day, but could be expanded to an output of over fifty tons per day by providing additional machinery as required.⁵⁹²

The firm's first-edition 1888 illustrated sales catalogue advertised "the manufacture of porous terra cotta for fire-proofing and building purposes", a new industry involving an entire range of porous terra cotta materials, such as small hollow light weight bricks, described as the same size as common red brick, used in the construction of a porous terra cotta segment arch in factories, warehouses and stores. The firm also emphasized their ability to ship by rail and water.⁵⁹³ Near the end of 1890 the CAB identified a list of "prominent buildings" that had used the Rathbun Company fireproofing products, such as the Bank of Commerce and Board of Trade buildings in Toronto, the Printing Bureau in Ottawa, and the Sun Insurance Building, St. Lawrence Sugar Refinery, and the Canadian Pacific Station in Montreal.⁵⁹⁴

The Rathbun Co. vigorously advertised its porous terra cotta from 1888 until 1898 and first advertised ornamental terra cotta in 1893, the same year that the Canadian Terra Cotta Co. was liquidated. Initially, the Rathbun Co. advertised that special designs could

⁵⁹²Porous terra cotta products were produced by the Rathbun Co. at a cost of about \$400 per ton, and sold at the works for up to \$1200 and \$1500 per ton. Wilson, 38-9. The firm's several kilns used to fire the porous products had a combined capacity of 300,000 pieces and were constructed on the down-draft principle. "Tests of Fire-Proofing Material", CAB (June, 1895), 78-79.

⁵⁹³The Rathbun Co.'s 1888 catalogue advertised the following porous terra cotta products: flat arches in varying thicknesses, flat arch floor joists, segment arches, hollow bricks, partition blocks, furring tiles, porous or solid hollow brick for wall furring, and porous terra cotta for the protection of wooden beams for fireproofing iron or wooden columns. Rathbun Co., The Rathbun Company, Deseronto, Ontario, Canada: Manufacturers of Porous Terra Cotta (Deseronto, 1888), 1-36, National Library.

⁵⁹⁴See "Fireproofing having become a necessity...", CAB, (December, 1890), 137.

be made to order in red, buff or brown, along with the availability of a "large stock on hand of strings, panels, tiles, caps, etc.". In 1895 they indicated ornamental terra cotta was available in "any color in stock or made to Architects' details, by the Rathbun Company's Artist, M.J. Hynes". Using clay beds located at nearby Napanee, the Rathbun Co. also manufactured pressed brick beginning about 1895, which continued to be advertised in the CAB along with ornamental and porous terra cotta until 1898. In the late 1890s the Rathbun Company, listed as being headquartered in Deseronto, advertised the existence of agencies in numerous towns and cities in Ontario, and in Montreal, Winnipeg, Oswego (New York), London, England and Glasgow, Scotland.⁵⁹⁵ In 1896 Deseronto experienced a disastrous fire that destroyed much of the Rathbun Company plant and an extensive part of the town. Although the terra cotta plant survived the fire of 1896, it was destroyed two years later by another fire, and was never rebuilt.⁵⁹⁶ The Rathbun Co. continued to advertise terra cotta as late as 1905, suggesting the firm may have later become agents for foreign terra cotta companies.⁵⁹⁷

- *Montreal Terra Cotta Lumber Company*

A Montreal branch of the International Terra Cotta Co. was described as "now in active operation" in the first issue of the CAB, published in January, 1888. Apparently the Rathbun Co.'s major competitor in Quebec, the Montreal Terra Cotta Lumber Co. advertised the manufacture of terra cotta lumber and porous earthenware, indicating that their works and headquarters were located at Maisonneuve, with an office on St. Peter Street. The firm promoted the fireproof advantages of porous terra cotta for use in the

⁵⁹⁵Ads for The Rathbun Co. appearing in the CAB in July, 1893, Jan., 1895, Jan., 1896, Jan., 1897, and August, 1898. "Tests for Fire-Proofing Material", *ibid.* T.A. Morrison & Co. was a Montreal agent for the Rathbun Co. for porous and ornamental terra cotta as evidenced by their ad, CAB (Feb., 1895), xi.

⁵⁹⁶D. Martin, Deseronto and the Rathbun Company, (Belleville, 1960), 9; Wilson, 51, 60. The Rathbun Company was not liquidated until 1923.

⁵⁹⁷TRAC, 10.

construction of inside walls, partitions, floors, ceilings, furring and roofs. It also claimed its products were recommended by architects, and were "certain to reduce the cost of fire insurance".⁵⁹⁸ In 1891 their porous terra cotta had already been used in twenty-six buildings in Montreal, including Montreal's City Hall on Notre Dame Street.⁵⁹⁹

The firm was listed in Montreal directories as having a factory at Maisonneuve from 1888-89 until at least 1896-97.⁶⁰⁰ In 1898, N. T. Gagnon, the firm's selling agent in Montreal, stated that in his experience, obtained in "unusual facilities and opportunities" in Europe and America, he had "yet to find a material which has the fire-resisting qualities of porous terra cotta".⁶⁰¹ In 1900, the Montreal Terra Cotta Lumber Co. advertised that their porous terra cotta floors had recently been used "in the new wing of Ottawa University, Ottawa", along with two large Dominion Cotton Mills electric towers in Montreal.⁶⁰²

- *Toronto Pressed Brick and Terra Cotta Company*

In 1891 the Bureau of Mines referred to the Toronto Pressed Brick and Terra Cotta Co. as the "pioneer of the pressed brick industry in Ontario". Located on a "mountain slope" next to the Credit Valley Railway, about two miles west of Milton, and organized in 1888 by Hewson Murray, Q.C. of Toronto, the firm's market was largely Toronto,

⁵⁹⁸"A New Building Material", CAB (January, 1888), 15; ad for Montreal Terra Cotta Lumber Co., CAB (July, 1888), 2. Montreal Terra Cotta Lumber Co. first appeared in Lovell's Montreal Directory for 1888-89, 552.

⁵⁹⁹Ad for the Montreal Terra Cotta Lumber Co., CAB (January, 1891), 10. J. Barsalou was listed as President in 1888, apparently replaced by A. Desjardins, M.P. in 1891. N. T. Gagnon was also identified as Manager, then Secretary or Selling Agent in all ads after 1891.

⁶⁰⁰Lovell's Montreal Directory for 1888-89, 552; *ibid.* ...for 1894-95, 831; *ibid.* for 1896-97, 844.

⁶⁰¹"Qualities of Fireproofing Materials", CAB, (March, 1898), 49-50. Gagnon's letter to the editor in response to E. Burke's "Two Questions in Connection with Steel Construction in Buildings", *ibid.*, referred to a porous terra cotta flat arch "designed and introduced by Mr. Thos. A. Lee, of Denver", Co., superior "to all rivals and competitors....", raising the possibility the Montreal Terra Cotta Lumber Co. may have supplied Lee's porous terra cotta products after c. 1897. See also "Test of Fire-Proofing Materials", CAB (April, 1895), 50.

⁶⁰²CAB (January, 1900), x. Ads for the Montreal Terra Cotta Lumber Co. also appeared in the CAB during 1903 and 1904.

although sales were reported from Charlottetown in Prince Edward Island to Victoria in British Columbia. The firm's product was mainly pressed brick in a range of colours, although moulded and ornamental bricks, roofing tiles and terra cotta were described as "a specialty". In 1891 the company employed an average of sixty workers seasonally, with seven kilns, three power presses, pug mills for the preparation of clay for terra-cotta work, and five hand presses for "fancy brick and tile".⁶⁰³

The Toronto Pressed Brick and Terra Cotta Co. advertised its products in the CAB regularly between 1889-1893, mainly promoting the manufacture of plain, moulded and ornamental fine pressed brick, in a range of colors, along with all kinds of roofing tile during this period. The firm's extensive ad in the 1890-91 Dominion of Canada Business Directory referred to the manufacture of terra cotta tile and string courses, emphasizing in the CAB their "special and prompt attention to architects' terra cotta drawings" between 1901 and 1907. The 1906 Bureau of Mines report on the clay industry in Ontario described the Toronto Pressed Brick and Terra Cotta Co. as "the only large terra-cotta works in Canada", under the supervision of Mr. J. Lewis, a brother of the company's manager, Mr. C. J. Lewis, emphasizing "the excellence of the products testify to Mr. Lewis' ability in this line of work." Both red and buff terra cotta were produced by the plant at this time, using clay from a fifty foot high bank of Medina shale situated near the works.⁶⁰⁴ The Toronto Pressed Brick and Terra Cotta works at Milton was totally destroyed by fire the same year, although by late 1907 the firm was rebuilt, when it resumed promotion of both pressed brick and architectural terra cotta.⁶⁰⁵

⁶⁰³First Report of the Bureau of Mines, 1891, 103.

⁶⁰⁴Baker, 66-68. The Toronto Pressed Brick Works was also reported as making "all kinds of roofing tile and cornice decorations."

⁶⁰⁵Ads for Toronto Pressed Brick & Terra Cotta Co. in CAB (September, 1889), viii; (Jan., March, 1890), (June, 1890), ii; (Dec., 1890), ii; (Jan., 1893), iii; (February, 1893), iii; (Sept., 1901); "Notes", CAB (August, 1906), xi; ad, CAB (October, 1907), 6.

According to Ritchie, the Toronto Pressed Brick & Terra Cotta Co. supplied terra cotta for many office buildings and houses in the Toronto area,⁶⁰⁶ along with the red pressed brick, round brickwork columns, and crisply sculpted red terra cotta capitals on the Macdonald Institute (c. 1901) at the Agricultural College in Guelph, Ontario.⁶⁰⁷

- *Ontario Terra Cotta & Pressed Brick Company*

Situated at Campbellville, near Milton, the Ontario Terra Cotta & Pressed Brick Co. was organized by M. L. Livingstone of Toronto in 1889 and began operations the same year. The firm's plant at Campbellville was situated on the Credit Valley Railway line, enabling the transport of Medina shale from their quarry located nearby at Nelson. The "best market" for their products was in Montreal, where it was used in the construction of a number of large buildings although the firm's products were also used in Toronto and elsewhere in Ontario. The plant contained eight kilns, a large power press for moulding plain brick, a pug mill for mixing clay for terra cotta work, steam presses for plain and moulded brick, and hand presses for roofing tiles and ornamental brick. Relatively large shapes of architectural terra cotta were claimed to be a specialty of the company, with four skilled workers devoted to this aspect of the operation.

Architectural terra-cotta in many large and handsome designs is a special feature of these works. Except in the preparation of the clay, terra-cotta is a product of the sculptor's hand, unless a number of pieces of the same pattern are required, when a cast in plaster of Paris is made. Four skilled designers are employed in this branch of the work.

Twenty-five to thirty workers were employed in the firm's operations. The Bureau of Mines also reported the firm's clay was "teamed by farmers of the locality to the works at

⁶⁰⁶Ritchie, 1970, 56-57.

⁶⁰⁷Baker, 120.

Campbellville during the winter", and at other times when possible, paying local farmers by the ton for this service.⁶⁰⁸

The firm's products were advertised in the CAB during 1890 and 1893, promoting plain and ornamental pressed brick, as well as terra cotta strings, panels, and cornices in a variety of patterns, with terra cotta made both to architects' details and in stock.⁶⁰⁹ The Ontario Terra Cotta & Pressed Brick Co. along with the Toronto Pressed Brick Co., and Messrs. Taylor Bros. of Toronto (the Don Valley Brick Works) reportedly also each had a "very creditable exhibit" at the 1892 industrial fair.⁶¹⁰

- *Beamsville Pressed Brick and Terra Cotta Company*

The Beamsville Pressed Brick Co. was situated near the village of Beamsville, Ontario, east of Hamilton on the south side of Lake Ontario on land used since 1870 for the manufacture of common brick and drain tile by William Tallman & Son, prior to their opening a pressed brick works plant in 1890. The Bureau of Mines reported that a sample of the clay, of a rich brown colour, the same as found in the Medina formation to the north, had been sent to Ohio in early 1890 for testing and found to be "so excellent that the firm determined to erect works at once." The works was located next to the Grand Trunk Railway where products could be easily shipped to Hamilton, Toronto, Montreal and other markets. In its early years the plant, which employed forty workers, produced mainly fine pressed brick, both plain and ornamental.⁶¹¹

⁶⁰⁸First Report of the Bureau of Mines, 103-4. CAB ads indicated the Ont. Terra Cotta & Brick Co. had a Toronto office and an agent in Montreal. See Ritchie, 1970, 56.

⁶⁰⁹Ads for Ontario Terra Cotta Brick & Sewer Pipe Co., CAB (April, 1890), xi, (Jan., 1893), vii. Also listed as the Ontario Terra Cotta Brick Co. in the Dominion of Canada Directory 1890-91, 1880.

⁶¹⁰Notation in CAB, (September, 1892), 92.

⁶¹¹First Report of the Bureau of Mines, 102; ad for Beamsville Pressed Brick Co. in the CAB, (January, 1893), iv, stated "established 1870".

In 1894 the firm announced that in addition to pressed brick, "we are now prepared to supply terra cotta and roofing tile in any quantities".⁶¹² In 1895, the Beamsville Pressed Brick Co., which by this time had offices in both Montreal and Toronto, proudly advertised that the new Simpson Building at the corner of Yonge and Queen Streets in Toronto "is a sample of our work in buff brick and terra cotta." Red and brown brick and terra cotta were also available.⁶¹³ In 1900, George Crain, the new proprietor, announced that the Beamsville Pressed Brick & Terra Cotta Co. was the successor to the former firm, advertising "architectural terra cotta a specialty", along with fine pressed and ornamental brick, fireproofing, hollow brick, roofing and drain tiles.⁶¹⁴ Although the firm continued advertise occasionally until 1907, no further reference to terra cotta appeared after 1900.

- *Milton Pressed Brick Company*

The Milton Pressed Brick Company, situated one and one-half miles west of Milton, was opened in 1890 by David Robinson, President. The works employed about twenty men and was situated next to a quarry on the slope of the mountain yielding a reddish-brown clay from the Medina formation. Its location next to the Credit Valley Railway also provided easy access to their market, which was primarily Toronto.⁶¹⁵ although a Montreal agent was added in the early 1890s.⁶¹⁶

The Milton Pressed Brick Co. advertised only infrequently during the 1890s. Beginning in 1892 the firm promoted terra cotta in addition to pressed and ornamental bricks, which were available in a variety of colours. Ads appeared more frequently beginning in 1901 when J. S. McCannell became the Managing Director, promoting

⁶¹²Ad for Beamsville Pressed Brick Co., CAB, (January, 1894), x.

⁶¹³Ad for Beamsville Pressed Brick Co., CAB, (February, 1895), xi.

⁶¹⁴Ad for Beamsville Pressed Brick & Terra Cotta Co., CAB, (Jan., 1900), ix.

⁶¹⁵First Report of the Bureau of Mines, 102-3.

⁶¹⁶Ad for Milton Pressed Brick Co., CAB, (June, 1892), 64.

architectural terra cotta in addition to pressed bricks.⁶¹⁷ McCannell served as First Vice-President of the Canadian Clay Products Manufacturers Association in 1906; five years later he reported on behalf of a committee of the Canadian Clay-Workers Association on the need for a ceramic education program in Ontario. The Milton Pressed Brick Co. won a silver medal for their exhibit at the 1901 Pan-American Exhibition, displaying both terra cotta and pressed brick, described and illustrated in the CAB. (Figure 3.48)

It is an arch framed on both sides with light coloured pressed brick and terra cotta. On each side of the door are fluted terra cotta columns. The top of the doorway has three pieces and the top of the arch is covered with terra cotta. Across the front in letters of gold is the title of the company. The exhibit has been awarded a silver medal.⁶¹⁸

In 1903 the firm promoted their "specialty of ornamental brick and terra cotta mantels", continuing to advertise the same regularly in the CAB until 1906, when reference to architectural terra cotta was dropped from their ads.⁶¹⁹ In 1930 the Bureau of Mines reported the forty year old Milton Brick plant had made terra cotta "to some extent... but this has been discontinued."⁶²⁰

- *Don Valley Pressed Brick Works*

The Don Valley Pressed Brick company was begun by the Taylor Brothers of Toronto in 1891. By 1906 the company was viewed as one of Ontario's oldest and "certainly one of the best brick plants in Canada". Situated on the west bank of the Don River between a spur of the Canadian Pacific and the Belt Line Railway, the plant utilized

⁶¹⁷Ad for Milton Pressed Brick Co., CAB, (June, 1901), 130; "The Canadian Clay Products Manufacturers", CAB, (Dec. 1906), 186-7; "Can. Clay-Workers' Convention", Construction, (Jan., 1911), 88.

⁶¹⁸"A Canadian Exhibit at the Pan-American", CAB, (November, 1901), ix.

⁶¹⁹Ad for Milton Pressed Brick Co., CAB, (Jan., 1903), x. The 1906 Bureau of Mines report did not refer to terra cotta when discussing the Milton Pressed Brick Co.

⁶²⁰Montgomery, *ibid.*, 121. G. Guillet, The Clay Products Industry of Ontario, (Ont. Dept. of Mines, 1967), 86-89, reported that the Milton Brick Co. Ltd. was still in business, producing 30 million brick annually.

Hudson River shale, which outcropped at the base of the river bank and burned to a deep red color. A proportion of lime was also present, burning to an attractive buff colour. The Taylor Brothers first erected a plant "of the best and most modern description" with eight kilns, employing fifty-five workers in its first year of operation. Beyond Toronto, its market was anticipated to include Buffalo and other U.S. cities.⁶²¹ (Figure 3.49) The three Taylor brothers, John Frederick, William Thomas and George Arthur, members of a third generation York County family, had previously established several paper mills along the Don River. The Taylor brothers became bankrupt in 1901 and the business passed into the hands of their brother-in-law Robert Davies, at which time the name of the firm was changed to the Don Valley Brick Works.⁶²²

As evidenced by its advertising in the CAB, the Don Valley Pressed Brick Works produced pressed plain and ornamental brick only during its first years of operation, although by 1893 the firm began promoting its terra cotta and enamelled bricks "in all shades".⁶²³ In late 1893 the firm announced that both their brick and terra cotta had won gold medals at the Chicago exhibition.⁶²⁴ The next year the Don Valley Pressed Brick Works also displayed their products at the 1894 Toronto Industrial Fair, exhibiting some elaborate terra cotta works. (Figure 3.50) The Don Valley Pressed Brick Works also produced an 1894 catalogue illustrating moulded and ornamental bricks and advertising their terra cotta, listing a number of buildings using their red and buff bricks and terra cotta in the last year in Toronto, Ottawa, and other smaller Ontario towns. The Ontario Bank in Kingston was identified as having utilized the Don Valley Pressed Brick Works red bricks

⁶²¹ First Report of the Bureau of Mines, 104-5; Baker, 111.

⁶²² The Taylor family had extensive property in the region of the Don Valley. J. Basco, "The 1894 Don Valley Pressed Brick Works Catalogue", in APT Bulletin, Vol. IX, No. 1, 1977, 31. No known connection existed between the three Toronto Taylor brothers and James Taylor of Chicago although further research appears to be merited.

⁶²³ Ad for Don Valley Pressed Bricks, CAB, (March, 1893), x.

⁶²⁴ Ad for Don Valley Pressed Bricks, CAB, (Dec., 1893), ix.

and terra cotta during the same year.⁶²⁵ Today the sharply preserved egg and dart terra cotta moulding, keystone and whimsical faces appearing on either side of one of the building's entrances bear a warm golden buff-to-brown colour and serve as an example of the firm's fine ornamental terra cotta work, as does a terra cotta panel situated over another entrance, decorated with floral work entwined around the name of the bank. (Figure 3.51) The 1894 catalogue also identified a number of buildings using the firm's products in Montreal, Vancouver, and New York state.

Beginning in 1902 the Don Valley Brick Works promoted both architectural and porous terra cotta along with enamelled and vitrified paving bricks, adding a specialty of terra cotta mantels in 1903, as had the Milton Pressed Brick Works. After 1903 the firm's ads emphasized mainly porous terra cotta.⁶²⁶ In 1906 the firm was identified as the only Ontario plant manufacturing enamelled (glazed) brick, a product described as very popular at that time. "The pressed brick, whether red or buff as required, are dipped on face in a glaze, after which they are dried. This dipping is repeated several times"; the bricks were then burned in a coal-heated muffle kiln⁶²⁷ at a temperature similar to, but somewhat lower than glazed terra cotta.⁶²⁸ The CAB noted in 1907 that

a contract for the supply of 600,000 white enamel brick was recently awarded this company by the Dominion Government, to be used in the erection of the Mint at Ottawa.⁶²⁹

⁶²⁵See Basco, *ibid.*, for excerpts from 1894 catalogue. J. McKendry, With Our Past Before Us, 19th-century Architecture in the Kingston Area (Toronto, 1995) 123, described the Kingston bank as the Rectory Block, designed by architect Joseph Power, noting pressed brick, terra cotta and Credit Valley stone "were not part of Kingston's tradition". Power also used terra cotta and red bricks on the J.A. Hendry residence in Kingston. "Our Illustrations", CAB, (March, 1888), 3. The terra cotta face on the Ont. Bank Building appeared on the cover of T. Ritchie's article, "Terra-Cotta in Canada", in The Canadian Architect (August, 1870), 55-57.

⁶²⁶Ads by Don Valley Brick Works, CAB, (April, 1902), 55; (Jan., 1903), x; (Nov., 1903), 188.

⁶²⁷Baker, 112.

⁶²⁸The peak firing temperature used by the Toronto Brick Co. in the 1960s was 1850° F., using glazed coatings of any colour. Guillet, 1967, 54. Weaver, 115 stated that glazed terra cotta is "fired usually at temperatures of between 1562° and 2192°F"; he also reported typical temperature firing ranges for terra cotta in the US as defined by low, medium and high pyrometric cones, from a low of 2079°F to a high of 2305°F. Terra cotta glazes are "usually applied in two or three thin coats."

⁶²⁹"Plant of the Don Valley Brick Works, Toronto", CAB, (Jan., 1907), 12-13.

J. C. Eaton's residence in Toronto, using the "only thoroughly vitrified facing bricks ever manufactured in Canada" was featured in the firm's large ad in Construction in 1909, only two years following the completion of the Debenham House in London, England. In 1912 the Don Valley Brick Works featured another large ad in Construction showing an aerial view of downtown Toronto, identifying over fifty buildings using their porous terra cotta fireproofing, pressed brick, and/or their enamelled brick products.⁶³⁰

- *Laprairie Pressed Brick and Terra Cotta Company*

In July, 1892 the Laprairie Pressed Brick and Terra Cotta Company "was being organized" in Montreal by a number of promoters, including Peter Lyall,⁶³¹ Archibald Dunbar Taylor, and William Johnson, all of Montreal; Thos. August Brisson, of Laprairie, Quebec, Hugh Cameron of Toronto, and Thomas Henry Rothwell of Goderich, Ontario. The company was incorporated the same year "to manufacture brick and tiles, etc.". The company held its first annual shareholders' meeting in December, 1893 when it was decided to invest additional capital in the existing plant, with the intention of manufacturing about ten million common and pressed bricks during 1894. In 1895, T. A. Morrison & Co. advertised as an agent for LaPrairie Pressed Bricks in Montreal,⁶³² which at that time produced pressed brick, ornamental terra cotta, and porous terra cotta fireproofing

⁶³⁰Construction, (Dec., 1912), 25; Construction, (Oct., 1909), 25; Guillet, 47, reported the Don Valley Brick Works was purchased by the Toronto Brick Co. in 1956, which was still producing glazed brick in 1967. J. B. Millar of the Don Valley Brick Works was elected President of the Can. Clay Products Manufacturers Assoc. in 1906. "The Canadian Clay Products Manufacturers", *ibid*.

⁶³¹Peter Lyall executed the masonry work for the New York Life Ins. Co. building in Montreal. "Our Illustrations", CAB, (Feb., 1888), 4; "Montreal", CAB, (Jan., 1889). Lyall also advertised in the CAB as an agent in Montreal for Corncockle Red Sandstone from Dumfriesshire, Scotland, (January, 1890).

⁶³²"Manufactures & Materials", CAB, (July, 1892), 72; "The Laprairie Pressed Brick...", CAB, (Oct., 1892), 103; "Manufactures & Materials", CAB, (Jan., 1894), 15; ad for T. A. Morrison & Co. CAB, (Jan., 1895), xi. In 1891-92, T. A. Morrison & Co. was also an agent in Montreal for the Ont. Terra Cotta & Pressed Brick Co., promoting pressed bricks, terra cotta, and porous terra cotta.

materials.⁶³³ The LaPrairie Pressed Brick & Terra Cotta Co. was also listed as a terra cotta business in the Business Directory of Canada in 1899.⁶³⁴

- *Burlington Pressed Brick and Terra Cotta Company*

The Burlington Pressed Brick and Terra Cotta Co. in Hamilton, Ontario manufactured roofing tile as a specialty, producing plain and glazed shingle tile in interlocking diamond and spanish patterns. The firm was incorporated in 1892 and advertised in the CAB during 1895. It was also listed as a terra cotta business in Freeman, Ontario, in the 1899 Business Directory of Canada.⁶³⁵

- *Port Credit Pressed Brick and Terra Cotta Co.*

The Port Credit Pressed Brick and Terra Cotta Co. of Port Credit, Ontario, situated just south of Toronto, was the successor to the Thomas Nightingale Pressed Brick Company. The latter was established c. 1892, using red shale of the Medina formation to make common brick and drain tile in its first year of operation.⁶³⁶ In late 1893, the Port Credit Pressed Brick and Terra Cotta Co., with works at Port Credit and an office in Toronto, advertised the manufacture of plain, moulded and ornamental pressed bricks, promoting these products in the CAB until June, 1895. At that time, the manufacture of terra cotta and enamelled bricks in various colours was also specified in addition to pressed

⁶³³Lovell's Montreal Directory for 1894-95, 837; and for 1896-97, 849.

⁶³⁴Business Directory of Canada & Newfoundland, Vol. 2, 1899, n.p.n.

⁶³⁵Ibid.; "Personal", CAB (September, 1892), 90; ads for the Burlington Pressed Brick & Terra Cotta Co., CAB (February, 1895), and (March, 1895).

⁶³⁶B. Clarkson, Credit Valley Gateway, the Story of Port Credit, (Port Credit, 1907), 174, reported Nightingale opened a brick yard in Port Credit in the 1880s and that some time after 1900 many Italian immigrants worked for the firm. Second Report of the Bureau of Mines, 1892 (Toronto, 1893), 7, reported Nightingale's firm was founded in 1892; Dom. of Can. Business Directory, vol. 1, 1890-91, reported T. Nightingale as a terra cotta works. The T. Nightingale Brick Works was previously listed in Toronto directories from 1877 to 1887. Toronto City Directories for 1892, 1476 and 1893, 1546, listed Nightingale as a brick manufacturer.

brick and roofing tile. Only pressed and common bricks and "shaped bricks and arches" were advertised in 1907, manufactured at their works in Port Credit.⁶³⁷

- *Rosedale Pressed Brick and Terra Cotta Company*

The Rosedale Pressed Brick and Terra Cotta Co. was organized in Toronto c. 1893, erecting buildings and leasing a twenty-seven acre deposit of clay on the banks of the Don River. Manufacture was anticipated to commence shortly in the "necessary plant" that had been ordered by Mr. John Flett, President, and Mr. J. V. Wright, Managing Director.⁶³⁸ The Rosedale Pressed Brick and Terra Cotta Co. was listed as a terra cotta and a brick manufacturer in the Toronto directories for the years 1894 and 1895 only.⁶³⁹

- *Ormstown Brick and Terra Cotta Company*

In August, 1894, the CAB reported that Messrs. Harold Corbett, George McCullough and Mrs. Elizabeth Butterworth, all of Ottawa, along with Samuel Thornley of Chicago intended to apply for a charter for the manufacture of pressed brick and terra cotta and other purposes.⁶⁴⁰ The Ormstown Brick & Terra Cotta Co., John G. Butterworth & Co., agent, was listed in Ottawa city directories beginning in 1892-93, continuing until 1895-96 only.⁶⁴¹

⁶³⁷Ads for Port Credit Pressed Brick & Terra Cotta Co. in CAB, (Dec., 1893), ix; (June, 1895), ix; and (October, 1907), 6.

⁶³⁸"Manufactures & Materials", CAB, (Sept., 1893), 98. The Bureau of Mines also referred in their 1891 report, 105, to "a new company" being organized that was "erecting large works in the Don Valley between the second and third ravines of Rosedale."

⁶³⁹Might's Toronto City Directory for 1894, 1613; and for 1895, 1641a.

⁶⁴⁰"Manufactures & Materials", CAB, (August, 1894), vii.

⁶⁴¹Might, Ottawa City Directory 1892-3, 1894-5, 1895-6. The 1896-97 Ottawa directory listed J. Butterworth as a coal agent.

- *Ottawa Brick and Terra Cotta Company*

The Ottawa Brick and Terra Cotta Co. was incorporated in Ontario in 1927. The firm was the successor to a brick works established in 1893 by Morris and Ballantyne on the Billings Bridge site just south of the Rideau River in Bowesville, at that time a suburb of Ottawa. The 1893 brick works changed hands several times until it was taken over by Merkley's, Ltd. some time between 1912 and 1919. The Merkley brothers began operating the Billings Bridge works as the Ottawa Brick and Terra Cotta Co. c. 1924.⁶⁴² In addition to red brick, the firm produced red hollow building tile, i.e. fireproof terra cotta at least until 1930 at their plant formerly located next to the R. A.. Centre, mixing shale with red-burning clay from an adjacent pit that was situated at an incline to the plant.⁶⁴³ No ornamental terra cotta is known to have been produced at the works, although the Ottawa Brick and Terra Cotta Co. also made a small amount of moulded brick.⁶⁴⁴ The plant at Billings Bridge was demolished c. 1961 when Merkley Supply Ltd. was established at a different Ottawa location. The firm markets a wide variety of building supplies today, including brick units that can be used to create sculptured or carved brick decorative murals, a number of which have been used in a number of Toronto and Ottawa schools.⁶⁴⁵

⁶⁴²I am grateful to Serge Barbe, City of Ottawa Archives for bringing the Ottawa Brick & Terra Cotta Co. to my attention. It is not clear when the Billings Bridge works began producing fireproof terra cotta. This brief history is based largely on R. Montgomery, The Ceramic Industry of Ontario, (Toronto, 1930), 111; G. Johnston, "Bowesville: A Place to Remember", (Gloucester Historical Society, 1988), 67; Ottawa Directories between 1893 and 1924; and the website of Merkley Supply Ltd. www.merkleysupply.com

⁶⁴³Montgomery, 1930, reported the firm had 9 down-draft kilns and 1 scove kiln.

⁶⁴⁴Johnston, 70.

⁶⁴⁵Telephone interview with Robert Merkley July 25, 2001. Merkley Supply is an agent through Canada Brick for Endicott Clay Products in the U.S., which supplies "green brick units", into which mural designs can be sculptured in wet clay according to the client's specifications, which are then shipped to the job site. Endicott Clay compares the end product with terra cotta murals, noting a resurgence of interest over the past decade in the use of "brick art" in decorating modern buildings. www.merkleysupply.com

- *British Columbia Terra Cotta Company*

The British Columbia Terra Cotta Co. in Victoria, B. C.. was incorporated in September, 1890. In 1892 the company "produced some fine samples" and Messrs. Evans, Coleman and Evans had been appointed as Vancouver agents. By 1895 a liquidator had been appointed for the firm, then referred to as the British Columbia Pottery & Terra-Cotta Co.⁶⁴⁶

Although central Canada's terra cotta industry never reached the production volume or had the impact of the British or U.S. industries, it was distinguished from its counterparts in several respects. It was characterized by its strong alliance with the pressed brick industry, by the relatively small size of the firms, which apparently operated as sole entities, without consolidation; and by its relatively short production period, which coincided closely with the peak popularity of the Queen Anne Revival, as well as the Romanesque Revival styles in central Canada. In addition to its manufacture of decorative terra cotta, made by at least eight brick and terra cotta producers, central Canada's industry was also characterized by its production of fireproof terra cotta.⁶⁴⁷ Evidence to date clearly suggests that the Hynes brothers' Canadian Terra Cotta Co. had links with the industry in England, by having hired a worker formerly employed by a British firm, and with the U.S. by virtue of having sold the patent for their kiln to the Perth Amboy Co. in New Jersey. With few exceptions, the high quality of the decorative terra cotta produced in central Canada attests not only to the suitability of Ontario's clay resources,⁶⁴⁸ but the skills of the industry's workers and its management, particularly the Canadian Terra Cotta

⁶⁴⁶"Messrs. Evans, Coleman & Evans...", *CAB*, (March, 1892), 27; "Manufactures & Materials", *CAB*, (May, 1895), 69.

⁶⁴⁷No clear evidence to date suggests that the LaPrairie, Port Credit, Rosedale, or Ormstown firms actually produced terra cotta at any time during their operation. The Burlington firm specialized in roofing tile.

⁶⁴⁸Early reports of the Bureau of Mines attested to the particular suitability of Ontario's clays in the Medina and Hudson River formations to terra cotta production. Montgomery's comment in 1930, 9, that "the local clay is not well suited to this product, although certain types could be made" was an exception to the department's dominant view during the period 1891 to 1895.

Co., the Toronto Pressed Brick & Terra Cotta Co., the Milton Pressed Brick Co., and the Don Valley Brick Works.

Terra cotta's production in central Canada, which began as early as 1876 and continued until c. 1907, was most significant during the period 1885-1898, with the peak occurring in 1894. Its relatively short period of production in comparison with both England and the U.S. appears to have been the result of several factors, including a depression in building activity in 1895, the rising strength and availability in Canada especially of U.S.-produced terra cotta, and a gradually increasing trend during the late 1890s and early 20th century toward the use and production of glazed terra cotta. The increasing trend during the late 19th century to obtain architectural training or experience abroad, especially in major U.S. eastern cities or in England, likely also influenced an incoming generation of Canadian architects to look to U.S. and British manufacturers in place of Canadian-made products. Ontario producers were disadvantaged in comparison with those in the U.S. by the long-delayed response by the provincial government to the clay industry's call for a clay-working and ceramics program, which might have facilitated a diversification of Ontario's brick and terra cotta firms to the production of glazed terra cotta in Ontario. The limited ceramic instruction in 1914 at the Toronto Technical School, prior to the establishment of a full program at the Univ. of Toronto in 1925, unfortunately coincided with the beginning of the World War I. The value of clay products generally in Ontario between 1914 and 1918 fell off dramatically and never regained its former strength.⁶⁴⁹

⁶⁴⁹Montgomery, 5-6.

Supply of Terra Cotta by U.S. and British Manufacturers

The red decorative terra cotta used in Ontario from c. 1884 until the late 1890s appears to have been largely supplied by regional brick and terra cotta producers.⁶⁵⁰ Terra cotta was used only infrequently in central Canada between 1880-1884 before most Ontario firms were founded. During this time the Boston Terra Cotta Company's 1884 catalogue listed only two Ontario buildings, including the J. P. Wiser residence in Prescott and the John Labatt residence in London, discussed previously in this chapter. No additional Boston Terra Cotta Co. catalogues apparently exist to determine whether this firm, which operated from 1880 to 1893, may have supplied other buildings in central Canada. The location of the firm's works in Boston provided easy access to both rail and sea. Ontario and Quebec were situated just outside the reach of the Boston Terra Cotta Co.'s main outlets for its products, which included the eastern U.S., mainly Massachusetts, New York and Philadelphia, as well as the U.S. midwest.⁶⁵¹

Michael J. Hynes' 1999 paper on terra cotta suggests considerable competition by the U.S. industry by the mid-1890s, although little other evidence has indicated major competition by foreign terra cotta manufacturers prior to 1900. The use of Italian-made terra cotta in 1893 on the Oak Hall in Toronto, designed by George Harper, appears to have been an isolated incidence marked mainly by its well-publicized failure, likely due to inadequate firing and Canada's freeze-thaw cycles, as highlighted by Hynes.⁶⁵² Holbrook and Mollington advertised as sole agents for artistic and plain tiles made by Maw & Co. and by Minton Co. during the 1880s and 1890s, and as "architectural sculptors" and

⁶⁵⁰TRAC, 2, also came to this conclusion as a result of their 1990 survey on terra cotta's use in Ontario between 1884 and 1894, a period they described as the "red" decade.

⁶⁵¹Jones, Appendix D details all buildings listed by the Boston Terra Cotta Co. in their 1884 and 1885 catalogues. Jones noted a 1890 Boston Terra Cotta catalogue was listed by the Albany State Library, although it could not be located in 1998. Jones, ii, 45, 49, 57-8.

⁶⁵²Hynes, "Terra Cotta", *ibid.*, 38; TRAC, 32. Hynes also noted at this time in Toronto, in addition to Italian terra cotta on the Oak Hall, there were samples of "some English, some American and some Canadian" terra cotta.

modellers, with an office in Toronto.⁶⁵³ Stratton reported that both Maw and Minton, major British tile manufacturers, also made some faience, or glazed terra cotta during this period.⁶⁵⁴

An increase in both U.S. and British foreign competition was evidenced shortly after the turn of the century. The Luxfer Prism Company, Ltd., an agent for architectural terra cotta made by the Perth Amboy Terra Cotta Co. in New Jersey also promoted its "color effects and artistic modelling", its permanence, and its cost as "infinitely cheaper than stone" during 1901 and 1902.⁶⁵⁵ George Woolliscroft & Son of Hanley, Staffordshire, England promoted their tiles, mosaics, faience and terra cotta decoration in the CAB from 1903 to 1907 to their "Canadian friends", with catalogues available in their agents' offices in both Montreal and Toronto.⁶⁵⁶ Montreal agent E. F. Dartnell also advertised the supply of ornamental terra cotta, enamelled brick, hollow brick and terra cotta fireproofing, making reference to both domestic, "English and American" products in the 1908-10 period.⁶⁵⁷

Beginning in 1906 and continuing at least until 1912, the Leeds Fireclay Company, which became the largest clay manufacturer in northern England, began promoting its Burmantoft's terra cotta in Canadian architectural journals. Burmantoft's products were

⁶⁵³Toronto Directory for 1881 (Might & Co., 1881), 526; Toronto City Directory for 1888 (R. Polk, 1888), 618; Toronto City Directory for 1895 (Might & Co., 1895), 1490; ad in CAB (Jan., 1897), i.

⁶⁵⁴Stratton, 1993, 231. Ads appeared in the CAB in May, 1897 and August, 1898 by Rice Lewis & Son, Ltd., promoting encaustic and ceramic tiles, and faience through their Toronto office; no manufacturer was named. The Malkin Tile Works in Bursley, England also advertised tiles and a catalogue in the CAB during 1903.

⁶⁵⁵Ads in CAB (May, 1901), Luxfer Supplement; and (March, 1902), xiv. Samples were available in a Toronto office. The timing of these ads began one year after the CAB reported, June, 1900, 121, that M. J. Hynes had sold the patent for his kiln to the Perth Amboy Terra Cotta Co.

⁶⁵⁶Ads in CAB (Jan., 1903), xii; (May, 1903), xii; (May, 1906), ii; (Jan., 1907), ii. George Woolliscroft & Son was in operation from 1894 to 1909. Stratton, *ibid.*, 231.

⁶⁵⁷"Building Materials & Supplies", in Construction, (Aug. 1908), 70; ad in Ottawa City Directory, 1910, 756.

widely associated with the name of Alfred Waterhouse in England.⁶⁵⁸ The Eadie-Douglas Company served as an agent in Montreal for the Leeds Fireclay Co., promoting terra cotta as "the ideal building material for the severe Canadian climate". In 1908 Eadie-Douglas reported that Burmantoft's terra cotta had been used "in some of the largest buildings in Canada",⁶⁵⁹ later identifying a list of fourteen buildings already constructed in central Canada which had used Burmantoft's terra cotta, along with nine others "under contract".⁶⁶⁰ Seven buildings listed by Eadie-Douglas were designed by Darling and Pearson, who often used Leeds Fireclay's terra cotta, although not exclusively. Burmantoft's glazed terra cotta was also used in the massive façades of the French Renaissance style Jacobs Building (1909-1910) in Montreal, designed by architects Mitchell and Creighton, and on the narrow Mason & Risch Building (1911), designed "for the display of piano and other musical accessories" by architects Bond & Smith.⁶⁶¹

Doulton & Co. appears to have been Leeds Fireclay's major British competitor in central Canada, especially after about 1909. Earlier evidence of Doulton's influence in Canada was evidenced in the CAB by publication of excerpts of Sir Henry Doulton's RIBA paper on terra cotta in 1893 and of a notice of his death in late 1897, identifying him as "head of the celebrated firm of Doulton & Co.". ⁶⁶² Examples of several important

⁶⁵⁸Stratton, *ibid.*, reported Burmantofts was a brand name under which the Leeds Fireclay Co. produced large slabs and blocks of architectural faience after 1889.

⁶⁵⁹Ads by Leeds Fireclay Co. in CAB (March, 1906, iii; (Jan.I, 1907); and in Construction, (Oct., 1908), 14; (Dec., 1908), 100; (April, 1910), 100. The name Eadie-Douglas was changed in 1912 to Douglas-Milligan Ltd., with "live agents in the leading cities throughout Canada". Construction, (May, 1912), 8.

⁶⁶⁰Ad by Eadie-Douglas, Ltd. in Construction (December, 1912). Although too numerous here to list in entirety, those already erected included such buildings as the McDonald Engineering Building and the Linton Apartments in Montreal, the Bank of Nova Scotia in Winnipeg, and the Metropolitan Bank in Toronto. Among those under contract were the Rideau Club and the Can. Life Ins. Building in Ottawa, and the Jacobs Building No. 2 in Montreal.

⁶⁶¹Burmantoft's cream coloured "Marmora" terra cotta was used on the Jacob's Building, along with ornamental cast iron store fronts. "Attractive Exterior of Jacob's Building", Construction (April, 1910), 100; "Canada's Largest Concrete Building", Construction (March 1910), 57. "The Mason & Risch Co.'s New Premises, Toronto", Construction, (Oct., 1911), 65-73.

⁶⁶²"Durability of Terra Cotta" in "Useful Hints", CAB, (June, 1893), 70; "Personal", CAB, (Dec., 1897), 27. The former quoted Doulton's remarks on two century-old examples of terra cotta in England.

Canadian buildings supplied by Doulton were illustrated by Wells,⁶⁶³ the earliest of which was the 1898 John Kay store in Toronto at 36-38 King St. West, discussed earlier in this chapter. Nearly ten years later, Darling and Pearson used Doulton's greyish-white Carrara terra cotta on the Standard Bank (1909) in Toronto, displaying green terra cotta panelling between the windows. Carraraware was potentially valued in Canada for its frost-resistant white crystalline glaze, and for its appearance imitating Carrara marble. Carraraware was also known for its wide range of polychromatic shades.⁶⁶⁴

Carrara terra cotta was also used by architects Brown and Vallance in the interior of the new Medical Building at McGill University in Montreal (1910), and Doulton's white glazed terra cotta was used by Edward and William Maxwell in the Dominion Express Building (1910-12).⁶⁶⁵ The glazed terra cotta panels in the utmost storey and the elaborate statue of "Hope" capping the Hope Building (1910) on Sparks Street in Ottawa were also made at the Doulton potteries in England. Unfortunately subsequently removed, the glazed terra cotta which originally clad the former Birks Building on Sparks Street in Ottawa, designed by Weeks and Keefer, also used glazed terra cotta made by Doulton.⁶⁶⁶ TRAC evidenced a series of unfortunate problems encountered with Doulton's supply of terra cotta for the Mutual Life Assurance Co. of Canada in Toronto (1909-11), including repeated shipment delays and "imperfections" in several terra cotta units which likely caused Darling and Pearson as well as their clients, considerable grief.⁶⁶⁷

stating: "There is, of course, terra cotta and terra cotta; but there is no reason why terra cotta should not be absolutely imperishable."

⁶⁶³Wells, *ibid.*, Appendix II, Examples of Terra Cotta Buildings in Canada - Material supplied by Royal Doulton Potteries, Royal Doulton International Collectors Club. These included the John Kay Store (1898), Toronto; Bank of Montreal (1910), Toronto; the CPR Hotel (1913), Vancouver; the Calgary Herald (1913), Calgary; Toronto General Trust Co. Toronto; Toronto Gen. Hospital (1910-11); Winnipeg Paint & Glass Co.; St. John's Episcopal Church, Saskatoon; Guarantee Building, Montreal; Standard Bank (1909), Toronto.

⁶⁶⁴Stratton, 1993, 103, 108.

⁶⁶⁵"The Dominion Express Building, Montreal, Quebec", *ibid.*

⁶⁶⁶FHBRO Report 85-22 re Birks Building, 1982, 122.

⁶⁶⁷The Mutual Life Assurance Co. Building opened in late 1911; issues relating to the terra cotta were not finally resolved until 1916. TRAC, 74-77, 83-85, 93, 99, also identified the Toronto General Trust (1909) by G. M. Miller, and the Bank of Montreal at Queen & Yonge Sts. (1909), both by Darling

Stratton reported the British firm of Gibbs and Canning made consistent attempts to develop an export market to Canada in the early 20th century, even planning the construction of a Canadian manufacturing works. This effort, however, appears to have been abandoned at the beginning of World War I.

One of the first stages in Gibbs and Canning's efforts to develop trade in Canada after 1912, was setting up agencies in all the major cities. A high commission of 7 1/2% was offered as an incentive. Further plans evolved through discussion with a Mr. Laferme who came over to Tamworth from Montreal. An arrangement for the transfer of stock was agreed and the directors accepted the proposal of a factory being built in Canada, subject to supplies of a clay suitable for making architectural ceramics being assured. Plans for a new works were dropped at the outset of the First World War.⁶⁶⁸

Transport expenses, including possibly two railway hauls, sea passage, and packing costs were major problems to overcome in the establishment of foreign terra cotta markets, particularly in the case of British firms. About the same time that both Gibbs and Cannings and Doulton & Co. were experiencing success in breaking into the Canadian market, their attempts were frustrated by a sharp increase in rates charged by Canadian railway companies. Efforts by both companies to obtain a reduction in the rate for terra cotta apparently did not succeed.⁶⁶⁹

Hathern Station Brick and Terracotta Co. in England supplied seven terra cotta and faience contracts in Canada between 1896 and 1917.⁶⁷⁰ Known today as Ibstock Hathernware Ltd., the firm still manufactures architectural terra cotta and faience today for

& Pearson, as Doulton terra cotta. TRAC, 74-77, 83-85, 93, 99. With the exception of the Standard Bank and the Bank of Montreal in Toronto, both built about the same time as the Mutual Life Assurance Co., Darling & Pearson do not appear to have used Doulton's terra cotta again.

⁶⁶⁸Gibbs & Canning, Directors' meetings of July 3, 1914 and March 25, 1915, in Stratton, 1983, Vol. I, 337. Stratton noted "Having worked consistently to develop a trade with Canada, there is no mention of the schemes at all after the Armistice of 1918."

⁶⁶⁹Gibbs & Canning, Directors' meetings of April 19 and August 21, 1912, in Stratton, *ibid.*, 312. Stratton noted Gibbs & Canning supplied terra cotta for the World Building in Vancouver (1912). Shipping and other delivery costs added over one-half the value of the original contract. Breakage in shipping resulted in a claim by the World Building contractors and the use of stone in some of the missing blocks.

⁶⁷⁰Stratton, *ibid.*, Vol. II, 226.

use in both restoration and "new build" projects. In recent years Ibstock Hathernware carried out a few restoration projects in Canada, including the Canada Life Assurance Building (1912) in Calgary, Alberta (now the Hollinsworth Building), the Hiram Walker Distillery Head Office (1894) in Windsor, Ontario, and the previously discussed Mutual Life Assurance Co. building in Toronto.⁶⁷¹

Several U.S. manufacturers evidently competed intensely to supply the Canadian market with terra cotta after 1900. Some were more successful than others, as reflected in the Archive of the New York Architectural Terra Cotta Company (NYATCC). Essentially a record of the firm's mostly unsuccessful attempts to supply projects across Canada from 1912 to 1919, with the bulk of these projects relating to the 1912-1914 period, the NYATCC Archive is uniquely valuable for a number of reasons, including the identification of known U.S. terra cotta manufacturers of fifty-six buildings supplied across Canada, along with eight Canadian buildings using English-made terra cotta.⁶⁷²

(Appendix II)

The Atlantic Terra Cotta Co., the "largest manufacturer of architectural terra cotta in the world" in 1920, with plants in New Jersey and on Staten Island in New York state⁶⁷³, and the Northwestern Terra Cotta Co., whose works were located in Chicago,⁶⁷⁴ were equally successful in supplying over half the Canadian terra cotta projects listed in Appendix II. The remaining Canadian projects were supplied mainly by the Federal Terra

⁶⁷¹I am grateful to Geoff Hollis of Ibstock Hathernware for his assistance by e-mail. See website at: www.hathernware.co.uk

⁶⁷²Appendix II identifies Canadian projects with known terra cotta manufacturers, extracted from a list contained in the New York Architectural Terra Cotta Co. Archive, courtesy of the Avery Architectural and Fine Arts Library, Columbia University in the City of New York. The NYATCC Archive also lists a number of Canadian terra cotta projects with "unknown" manufacturers", and "dead" or "abandoned" projects during this period, as well as others where terra cotta was "omitted" or stone was used in its place. I am grateful to Janet S. Parks, archivist at the Avery Library, Columbia University, for her assistance in reviewing selected Canadian projects in the NYATCC Archive. See TRAC, 1990, 55 for brief data concerning four Ontario contracts actually awarded to the NYATCC.

⁶⁷³Geer, 1920, in Tunick, 1997, 138.

⁶⁷⁴Geer, 1920 in Tunick, 1997, 139 described the Chicago Terra Cotta Works as "the oldest manufacturers of architectural terra cotta in the country".

Cotta Co., whose plant was located in New Jersey, and an equal number of English manufacturers, along with seven other U.S. firms located in the U.S. midwest and on the west coast.⁶⁷⁵ On a regional basis, the thirty-four projects located in central Canada during this period were supplied mainly by both the Northwestern Terra Cotta Co. and the Atlantic Terra Cotta Co., followed by the Federal Terra Cotta Co. The remaining seven projects in central Canada were supplied by Doulton, Leeds Fireclay, or other "English" manufacturers.⁶⁷⁶

The significance of any one firm in supplying the Canadian market could vary within a given year, according not only to the number of projects, but the tonnage supplied, which varied significantly between different projects. Walter Geer, Jr., Vice-President of the NYATCC, reported that terra cotta tonnage closed across Canada by U.S. manufacturers during 1912, a "fair building year", totalled 8,439 tons. The Northern Clay Co. in Washington supplied the largest amount of tonnage that year, followed by the American Terra Cotta Co. of Minnesota, the Northwestern Terra Cotta Co., the Gladding-McBean Co. of California, and lesser amounts supplied by several other firms.⁶⁷⁷

The New York Architectural Terra Cotta Company Archive

The New York Architectural Terra Cotta Company was founded in New York City in 1886, operating successfully until 1932, when it went into bankruptcy.⁶⁷⁸ Walter Geer

⁶⁷⁵The remaining seven firms included the St. Louis Terra Cotta Co., with works at St. Louis, Mo.; the South Amboy Terra Cotta Co., N.J., the American Terra Cotta Co., near Chicago; the Northern Clay Co., Auburn, Washington; Washington Brick, Lime & Sewer Pipe Co., Spokane; Denny-Renton Clay Co., Seattle; and Gladding-McBean & Co., whose plants were located in Oakland and Lincoln, California.

⁶⁷⁶One project in Moncton, N.B. was supplied by the Atlantic TCC. Twenty-two projects west of Winnipeg were mainly supplied by the Northwestern and the Atlantic companies, along with several firms located in the U.S. midwest and on the west coast, with only one supplied by a British manufacturer.

⁶⁷⁷Geer stated these figures were "a correct transcript taken from report of the National Terra Cotta Society". Letter to Francis Hankin & Co. from W. Geer, Jr., dated Jan. 29, 1914, contained in NYATCC archive. The year 1912 reflected a number of terra cotta projects in western Canada.

⁶⁷⁸Tunick, "The New York Architectural Terra Cotta Company Archive", brochure published by the Friends of Terra Cotta Press, New York, n.d.

was President of the firm from 1886 until 1919, when he became chairman of the board; his son, Walter Geer, Jr., held a number of positions during his tenure with the firm, including Asst. General Manager, Vice-President, and Secretary. James Taylor, the "Father of the American Terra Cotta Industry" was also the firm's first Superintendent from 1886 until 1893.⁶⁷⁹

The Archive of the NYATCC is valuable since few primary records of other U.S. terra cotta manufacturers exist, and for the extent of detail available in this data, which gives evidence of the firm's estimating process.⁶⁸⁰ The value of these records with respect to this thesis derives from primary correspondence evidencing general difficulties encountered by this major manufacturer in attempting to secure contracts in Canada, as well as details of estimates, notes, and correspondence relating to specific terra cotta projects in central Canada. The Archive suggests the existence of highly competitive bids between U.S. manufacturers for Canadian projects, while also demonstrating high Canadian tariffs affecting the import of terra cotta. Both these factors likely influenced not only the choice of specific manufacturers by Canadian architects or their clients, but the extent of terra cotta's use in central Canada during the early 20th century. The following discussion of NYATCC's difficulties in competing for Canadian projects and its estimating process is based on an examination of archival correspondence between the New York Architectural Terra Cotta Company⁶⁸¹ (Figure 3.52) and their agent in central Canada, Francis Hankin

⁶⁷⁹Geer, 277, 303; Tunick, 1997, 135; correspondence in NYATCC archive.

⁶⁸⁰Tunick, *ibid.* Tunick also reported in "Six Terra Cotta Archives", a brochure distributed by the Friends of Terra Cotta, New York, that in addition to the NYATCC Archive at Columbia University, archival records of the Gladding, McBean & Co. are available at the Calif. State Library in Sacramento; of the Northwestern Terra Cotta Co. at the National Building Museum in Washington, D.C.; and of the American Terra Cotta Co. at the Univ. of Minnesota.

⁶⁸¹Often such correspondence was signed on behalf of the NYATCC by Walter Geer, Jr., Asst. General Manager.

& Co., along with a review of selected files and records relating to specific Ontario projects pursued by the NYATCC.⁶⁸²

During part of 1912, and from 1913 to 1917, Francis Hankin & Co. represented the NYATCC in most of Ontario, all of Quebec, British Columbia, and in Canadian provinces on the Atlantic coast, maintaining offices in Montreal, Toronto and Vancouver. Francis Hankin also contacted architects from time to time in other towns and cities within this territory, such as Ottawa and Hamilton. In addition to the NYATCC, Hankin also represented the Hathern Station Brick & Terra Cotta Co. in England during 1912, but relinquished this connection on finalizing an agreement with the NYATCC in January, 1913, signed by Walter Geer, President.⁶⁸³

In early 1913 Hankin observed, in a letter to the New York office of the NYATCC, that it was "almost impossible" to obtain permission to amend original quotations in most cases in Toronto, expressing concern that "your figures are much too high" and urging the New York office to allow Hankin & Co. to quote "competitive prices" in the future. Shortly thereafter, Hankin commented on the "cutting and peddling of business which seems to prevail at present in this market", suggesting this activity was mainly "due to the fact that terra cotta has not been in sufficiently long use to enable the architects to appreciate that the quality is of vital importance."⁶⁸⁴ By the spring of 1913 the NYATCC recognized the firm's original figures had been "so high in the majority of cases that it has been impossible to obtain an opportunity to make any reduction after the general contract is let."

⁶⁸²Fourteen projects in Ontario in several cities and towns, involving varied building types and net tonnage, were selected for review for purposes of this thesis from the NYATCC Archive, spanning the years 1912 to 1916.

⁶⁸³Letter from Hankin & Co. to NYATCC dated Dec. 11, 1912, Box 240; letter from NYATCC to Hankin & Co. dated Jan. 7, 1913, Box 240; Agreement between NYATCC and Francis Hankin & Co. dated Jan. 2, 1913, Box 270, NYATCC Archive. The agreement appointed Hankin & Co. for the sale of NYATCC products in "all Canadian territory east of 85° longitude west from Greenwich" and in British Columbia. The N. J. Dinnen & Co. represented the firm in Manitoba, Saskatchewan, Alberta and western Ontario during the same period.

⁶⁸⁴Letters from Hankin & Co. to NYATCC dated February 4, 1913 and Feb. 12, 1913, Folder #1, Box 240, NYATCC Archive.

Proposing a somewhat revised pricing strategy, the New York office noted it was "very anxious" to execute a number of orders in central Canada, advising it would make it a point "to send in our tender at a rather lower figure originally", while still urging Hankin "to secure us an opportunity to reduce our price".⁶⁸⁵

Two months later, Hankin reiterated difficulties in even getting opportunities to quote in Toronto "as your figures are so regularly very much higher than your competitors" again urging the NYATCC to reduce their prices generally. Hankin recognized the firm would not wish to adopt a policy to sacrifice paying work to obtain

unremunerative operations in this country but we should be obliged if you could make the general level of your prices somewhat lower as we do not think you would be swamped with orders in view of the prices which your competitors are accepting.⁶⁸⁶

In practice, total selling prices, profit percentages, and commission rates appear to have been reduced or adjusted in attempts to encourage the awarding of a contract to NYATCC, especially for high prestige projects, such as the Royal Bank Building in Toronto. In the case of the latter, the New York office anticipated there would be keen competition, as other terra cotta producers were also "anxious to secure a contract of this character, owing to the small amount of building in Canada during the past few months."⁶⁸⁷ Hankin was equally desirous of securing the Royal Bank building contract, urging Walter Geer, Jr. in New York to make every effort possible to secure this work

as we have met with a great many disappointments in Terra Cotta, never having been in the running on any big work. The building in question is on the main street of Toronto, at the opposite corner to the CPR Building on which Northwestern Terra Cotta was used, and would be invaluable as an advertisement if we could pull it off.⁶⁸⁸

⁶⁸⁵Letter from NYATCC to Francis Hankin & Co. dated April 5, 1913 in response to letter from Hankin & Co. of April 3, 1913, Folder #1, Box 240, NYATCC Archive.

⁶⁸⁶Ibid., letter from Francis Hankin & CO. to NYATCC, June 25, 1913, Box 240.

⁶⁸⁷Ibid., letter from NYATCC to Francis Hankin & Co., Aug. 14, 1913, Box 49.

⁶⁸⁸Ibid., letter from Hankin & Co. to NYATCC, Aug. 13, 1913, Box 49.

The contract for the Royal Bank Building, designed by architects Ross & MacDonald, was closed by the Federal Terra Cotta Co. at \$35,000, only a few thousand dollars below the estimate by NYATCC.⁶⁸⁹

In other cases, great differences occurred between the NYATCC tender on given projects and those submitted by other firms. The NYATCC estimate for a theatre and office building at St. Catherine's and St. Timothy streets in Montreal by architect Thomas W. Lamb, for example, was nearly twice that provided by another firm.⁶⁹⁰ The NYATCC's price for the Goodyear Tire Rubber Co. in Toronto was reportedly "higher than any of the other figures quoted". Hankin reported the firm "who submitted the terra cotta for their other buildings in the U.S.A.", had tendered "no doubt" at a low figure.⁶⁹¹ NYATCC submitted a total job cost of \$15,975 for fully glazed terra cotta with "selected and polychrome color" for the proposed Booth Theatre at Bank and Slater streets in Ottawa during 1914, designed by architect C. H. Crane. NYATCC's proposed twenty per cent profit figure, compared with much lower profit figures reflected on other projects, likely contributed to their lack of success on this project.⁶⁹² In some cases the NYATCC records provided evidence of reasons for not using terra cotta, or of previous difficulties with the NYATCC or with terra cotta made by other manufacturers. Brown and Fryer, who were contacted by Hankin concerning the use of terra cotta for the Drewery Apartments in Hamilton, said the NYATCC price "frightened them altogether" and decided to cut terra

⁶⁸⁹Executive & Selling Data, Job #23947, Box 49, NYATCC Archive. NYATCC's proposed profit rate was 10%, with a total proposed selling price of \$38,900.

⁶⁹⁰Ibid., letter from Hankin & Co. to NYATCC, May 13, 1916, Job #26799, Box 139. NYATCC's total selling price for this project was \$11,900, vs. that of another firm, believed to be Atlantic TCC, of just over \$6,000. The NYATCC also attempted, but was unsuccessful in securing other contracts for Lamb's theatres in central Canada, including alterations to the Regent Theatre in Toronto, and Montreal Loew's Theatre, both in 1916.

⁶⁹¹Report dated Jan. 2, 1913, Folder #1, Box 240, NYATCC Archive. Appendix I shows that the Atlantic Terra Cotta Co. had won this contract in December, 1912.

⁶⁹²Ibid., Executive & Selling Data, Job #24659, Box 71. NYATCC's proposed 20% profit for the Booth Theatre was significantly higher than other jobs reviewed in central Canada, which were as low as 2% on the Fire Hall in St. Catherine's, but usually fell in the 5-7% to 10-11% range.

cotta from the project entirely, as they "found it much too expensive."⁶⁹³ Upon calling on architect William McFarlane concerning the Birks Building, Hankin recorded:

Was a partner with Ross & McFarlane. Afraid of t.c. after experience with English material. Tried to talk him over and got him to admit that we were in a better position than others to give good service.⁶⁹⁴

On calling on Toronto architect Charles J. Read with regard to Shea's Theatre, Read advised that he would allow the Hathern Co. in England to submit an estimate for this terra cotta work, although "under no consideration" would he permit the NYATCC "to figure on this job for it appears that they used him badly over a job some time ago".⁶⁹⁵

Other difficulties experienced by Hankin & Co. and the NYATCC included short time frames within which to prepare estimates and a lack of opportunity to review plans outside some architects' offices.⁶⁹⁶ In specific cases, Hankin & Co. expressed concern that only one bid could be submitted, with no subsequent opportunity for revisions. Darling and Pearson apparently allowed one price submission only as a policy, advising Hankin & Co. with respect to the Dominion Bank in Toronto that they were prepared to accept the NYATCC's tender provided it was the lowest, although they would "give out absolutely no information and the matter will be decided entirely on price."⁶⁹⁷

- Duty and customs expenses were very high, although rates seem to have varied during given years. Duty and customs expenses represented approximately 37% of the

⁶⁹³Note by Hankin & Co. re call on Brown & Fryer dated Nov. 11, 1912, Box 241, NYATCC Archive.

⁶⁹⁴Ibid., report dated Jan. 13, 1913, Folder #1, Box 240. This report was not specific as to which city the Birks Building was to be located. On Feb. 6, 1913, Hankin reported a call on architect Ross McDonald, who as "spokesman on W.P. on Chateau Laurier wants full information as to how we intend going about the work". No subsequent follow-up on the latter was reported in the file.

⁶⁹⁵Undated report, Folder #1, Box 240, NYATCC Archive.

⁶⁹⁶On the Ryrie Building in Toronto, Burke, Horwood & White allowed only two days for receipt of tenders after a review of plans in their office (no plans were allowed out of the office). Ibid., letter from Hankin to NYATCC, July 2, 1913, Box 241.

⁶⁹⁷Letter from Hankin & Co. to NYATCC, June 4, 1913, Job #23714, Box 42. Darling & Pearson also advised Hankin & Co. on the Metrop. Bank in Toronto at Bathurst & College Sts. they "will not permit of revised tenders being submitted. Once your tender is in it remains as submitted." Letter from Hankin & Co. to NYATCC dated Jan. 10, 1913, Job #23006, Box 22, NYATCC Archive.

tonnage price, or 18% of the total selling price for several jobs costed out by the NYATCC during 1913, with freight charges adding another 13%. NYATCC calculations for the Dominion Bank of Toronto, for example, involved duty and customs expenses of \$9643, with additional freight charges of \$3571, and shipping costs of another \$747. NYATCC's total proposed selling price for the Dominion Bank was \$49,800.⁶⁹⁸ Duty and customs charges for two projects during 1912 represented approximately 45%, and for one project in 1914, 43% of the tonnage price.⁶⁹⁹ Despite these already extremely high charges, in February, 1915, Francis Hankin advised the NYATCC, "Please do not overlook the fact that the revised Canadian Customs Tariff has added another 7 1/2% duty on Terra Cotta."⁷⁰⁰ Although these rates seem unreasonable today, twenty years earlier the CAB reported a 50% duty was not preventing the import of large quantities of American-made slate and wired goods to Australia.⁷⁰¹

Archival records revealed relatively low cost differences for glazing treatments, such as an added \$5.00/ton for fully glazed finish on an unidentified Ottawa building,⁷⁰² versus an added \$3.00/ton for a matt glazed finish on the Dominion Bank in Toronto. Quoted lump sum prices included "the making of Details and Setting Drawings and all modelling, etc."⁷⁰³ Only one file of those reviewed contained actual drawings, prepared

⁶⁹⁸Ibid., Executive & Selling Data, Job #23714, Box 42, NYATCC Archive. Labor and materials for the Dominion Bank were calculated as \$28.84/ton, with an added \$3.00/ton for a matt glazed finish, on 830 net tons.

⁶⁹⁹Ibid., Exec. & Selling Data, Job #22699, Box 14; Job #23006, Box 22, Box 71.

⁷⁰⁰Letter from Francis Hankin & Co. to NYATCC, Feb. 23, 1915; also repeated in letter from Hankin & Co. to NYATCC dated April 15, 1915 in reference to Can. Bank of Commerce Building in Belleville, Ontario. TRAC, 52, reported that duty and customs charges represented 30% of the tonnage price during 1919.

⁷⁰¹"The Commissioner of Customs..." in CAB, (March, 1894), title page.

⁷⁰²Job #25088, Exec. & Selling Data, Box 84, architect M. E. Davis, for a building comprising 45,000 pieces, "three carloads ashlar blocks". The \$5/ton cost for a fully glazed finish was added to charges of \$27.67/ton for labor and materials.

⁷⁰³Job #23714, Exec. & Selling Data, Box 42. Although not contained in the file, 1/8" general drawings were submitted to NYATCC by Darling & Pearson, along with 1/2" details. NYATCC proposed delivering the terra cotta for the second story of the building by Aug. 15, 1913, with the "balance of the Terra Cotta required at the rate of Two Stories per week" Letter dated May 28, 1913, signed by W. Geer, Jr., NYATCC to Darling & Pearson.

for an estimate for the Transportation Building in Ottawa. Manufacturers' estimates were normally prepared on the basis of a detailed review of blueprints, calculating costs according to specific dimensions and details.

The NYATCC prepared a number of alternative estimates for an office building at Rideau and Sussex streets in Ottawa, designed by architect J. Albert Ewart for the owner Charles Jackson Booth, known today as the Transportation Building (1916).⁷⁰⁴

Although NYATCC was unsuccessful in obtaining the contract, significant efforts over three years by both Ewart and the NYATCC appear to have been expended involving a variety of design assumptions and considerable differences in the extent of exterior terra cotta facing. The original estimate, prepared in 1913, assumed that both the Colonel By and Rideau Street fronts of the proposed eight-storey building would be faced entirely in the "best grade" semi-glazed terra cotta. Four subsequent estimates prepared in 1914 were based on a number of alternative assumptions, including (1) omission of two typical stories; (2) terra cotta above the second storey sills and lintels only, with a simplified plain cornice, mouldings and balustrade at the top of the building; (3) simplified spandrels and window mullions ornament, from scroll ornament to a plain fluted ornament; and (4) terra cotta for sills only on two sides and the rear elevations, with the use of limestone on the rest of the building. Although no design details were contained in the file for the first five estimates, the archive contained two revised sketch drawings dated August 30, 1915, apparently submitted later by Ewart as the basis for additional estimates. The first of these (Figure 3.53) shows detailing of "Cornice and Parapet Trim", all assumed to be of terra cotta, virtually in the same design details that exist in built form today although extant in copper with the exception of terra cotta corner battlements. The second (Figure 3.54) "Trim 7th floor", details two versions of elliptical heads above the seventh floor

⁷⁰⁴J. Albert Ewart was also assoc. architect with D. Everett Waid of New York City for 180 Wellington St. (Metropolitan Life Building) in Ottawa (1924-27). C.J. Booth was the son of John R. Booth, a prominent Ottawa lumber baron of the late 19th century.

windows,⁷⁰⁵ the first of which compares with that extant with the exception of existing tablet flower terra cotta decoration between the sixth and seventh storey. As built, the Transportation Building in Ottawa reflects a tripartite composition consisting of a two-storey base of terra cotta cladding, five floors of alternating vertical panels of buff-coloured glazed terra cotta and pale yellow brick, and a one storey attic faced in glazed terra cotta with an elaborate copper cornice and terra cotta corner battlements. The terra cotta decorative work, as well as the copper cornice, is carried out in Gothic details. (Figure 3.55) It is apparent from the date of construction of the Transportation Building (1916) that the imported terra cotta, regardless of manufacturer, would have been subject to increased tariffs which reportedly came into effect in 1915. The ultimate use of extensive brick in addition to terra cotta cladding, and the substitution of a copper cornice in place of terra cotta may reflect the increased tariff, although by this time a trend was already apparent in both central Canada and the U.S. toward the greater use of brick together with terra cotta. The use of a buff coloured terra cotta facing on the Transportation Building,⁷⁰⁶ lightly scored on the surface, with a glaze imitating granite, reflects a return about this time by some U.S. terra cotta manufacturers to an intentional imitation of stone, although now through glazing, much as terra cotta had imitated stone earlier.⁷⁰⁷

⁷⁰⁵Job # 24163, Box 56, NYATCC Archive. Estimates prepared by NYATCC for terra cotta work for the Transportation Building, as described, were \$761,110 for the original estimate; \$631,780; \$230,945; \$169,700; \$13,930 for the four estimates in 1914; \$97,200 for the cornice and parapet trim, and \$66,025 for the trim 7th floor as shown in drawings dated Aug. 30, 1915.

⁷⁰⁶Jeff Keays of Everest Restoration advised in an interview March 3, 2000, that exterior terra cotta work carried out on the northeast corner of the Transportation Building revealed the use of 4" thick terra cotta units that were stacked and caulked, without the use of any ties. "Hollow tile" terra cotta was also used in the Transportation Building for fireproofing purposes. I am grateful to Donald A. Maclellan, President, Viking Rideau Corp., as well as Jeff Keays of Everest Restoration for their assistance in this regard.

⁷⁰⁷See Tunick, 1997, 62-67. In 1916 the NYATCC sent three "granite samples" to an architect in Massachusetts.

Conclusion

U.S. and British terra cotta manufacturers played a significant role in supplying architectural terra cotta in central Canada after the turn of the century following the demise of Ontario's brick and terra cotta manufacturers. As evidenced by the Boston Terra Cotta Co. 1884 catalogue and the relatively infrequent use of terra cotta in Ontario during the early 1880s, U.S. manufacturers played very limited role in central Canada prior to the founding of most Ontario brick and terra cotta manufacturers. Evidence suggests that the impact of British manufacturers, particularly Leeds Fireclay Co. and Doulton Co., was most significant in central Canada shortly after 1900, from about 1906 until 1911. While both firms continued to supply some buildings after this time, evidence in the New York Architectural Terra Cotta Archive indicates the role of British suppliers was clearly secondary to the dominance of certain major U.S. manufacturers on the east coast and in the midwest between 1912-19, especially the Northwestern Terra Cotta Co. in Chicago, and the Atlantic Terra Cotta Co. in the states of New York and New Jersey, with a smaller role for the Federal Terra Cotta Co. in New York. Not surprisingly, the NYATCC Archive also suggests that U.S. manufacturers on the west coast played a more significant, although not exclusive, role in supplying buildings in western Canada, especially in British Columbia during the pre-war period. It has been shown that another major English manufacturer, Gibbs and Canning, considered the market for terra cotta in central Canada lucrative enough to seriously consider establishing a branch plant here early in the 20th century although these efforts were dropped with the approach of World War I. In 1899 Michael Hynes also described the efforts of a Staffordshire terra cotta manufacturer, who attempted to make terra cotta in Canada although repeated efforts ultimately led to failure.

High Canadian tariffs on the import of U.S.-made terra cotta⁷⁰⁸ alone no doubt had a reductive effect on the use of architectural terra cotta in central Canada. Yet the existence

⁷⁰⁸This research provided no evidence of tariffs on British-made terra cotta although it is doubtful protective measures would have been specific to the U.S. alone.

of these high rates, coupled with the extent to which terra cotta was utilized in Canada after the turn of the century, especially between 1909 and 1914, is indicative of the aesthetic and practical value placed on this material by central Canadian architects and their clients. The existence of high Canadian tariffs in the face of an absence of a glazed terra cotta industry in central Canada appear to run contrary to historical evidence concerning the application of Canadian tariffs, unless employed as a protective measure for brick and other Canadian-produced building materials generally. Canada's first broad tariff structure, known as the "National Policy", was adopted in an effort to allow Canadian industry to develop, allowing raw materials into Canada at low tariff rates while applying steep import duties of 25 to 30% on all other goods that Canada could manufacture.⁷⁰⁹ Canadian tariffs were also often applied in response to threatened Canadian companies during periods of depression, or during events or times with wide-reaching economic implications, such as World War I, which precipitated Canadian nationalism and calls for greater protection of goods "Made-in-Canada".⁷¹⁰

A distinctive sentiment on the use of Canadian-made building materials was evidenced in The Canadian Architect and Builder during 1894--the same year that pressed brick and terra cotta manufacture peaked in Ontario, and one year prior to a depression in building generally. The issue from a Canadian perspective involved large quantities of sandstone that were being imported annually from the U.S. into Canada, although the argument might have equally applied to the import of foreign-made terra cotta. The article revealed a refusal by New York tradesmen to handle imported materials and a resolve to protect U.S. industries from future foreign competition. The editor's parting comment also suggests a future justification for importing glazed terra cotta into Canada, even with high tariffs, in view of the "exhaustion" of central Canada's terra cotta production.

⁷⁰⁹ C. Brown, The Illustrated History of Canada, (Toronto, 1991), 340.

⁷¹⁰ S. Clark, The Canadian Manufacturers' Association (Toronto, 1939), vii-viii, 58, noted that important industries, such as iron and steel, lumber, and brick, organized themselves into independent trade associations after the turn of the century.

Architects who pass by native in favor of foreign material are quite as unpatriotic as the professedly Canadian company which gives work that should properly belong to Canadian architects into the hands of a foreigner. In this connection we observe that the affiliated building trades in New York City have passed a resolution that after June 1, 1894, they will "refuse to handle any imported decorative or other material, and will take any steps necessary to protect the industries affected." "The onus of this complaint," ... "lies against the practice of wealthy men with snobbish tendencies favoring foreign material for their buildings...." We quite understand that in some instances it is necessary to go abroad for a suitable material, but this should not be done until the possibilities of home production have been exhausted.⁷¹¹

⁷¹¹"A Large amount of stone...", CAB, (June, 1894), 74.

IV. Conclusion

It has been seen that the use, manufacture and supply of terra cotta in central Canada during the late 19th and early 20th centuries can only be understood from an international perspective, particularly its earlier use and manufacture in England and the United States. The revival of architectural terra cotta in England was an outgrowth of expanding mid-19th century industrialization, John Ruskin's concerns about the future of handcrafted materials, and the emerging British Arts and Crafts movement. It was influenced strongly by Italian Renaissance red brick and terra cotta architecture in 15th century northern Italy, early precedent of its use by Italian craftsmen in 16th century England, and its utilization in Germany in the early 19th century. Terra cotta was made in London and known and used architecturally as Coade Stone between 1769 and 1838; it was also made and used briefly in England in imitation of stone in the 1840s in several Gothic churches, although severely criticized. Terra cotta was first used at South Kensington as a decorative and fire-resistant material in the 1850s, followed by the marked exploitation of its decorative potential in 1864-66 in a buff colour with dark red brick in the Lecture Theatre of the Victoria & Albert Museum. Terra cotta's liberal use at the South Kensington complex was due considerably to the appreciation of its merits and the design skills of Royal Engineer Capt. Francis Fowke, in collaboration with his friend, sculptor, and modeller Godfrey Sykes. Its flourishing in England derived as well from terra cotta's role in the educational program of the Dept. of Science and Arts, in concert with early terra cotta manufacturers. Terra cotta's display in the Museum of Construction and Building Materials from 1860, and in other later exhibitions contributed to broader international recognition of its architectural advantages.

Little use was made of terra cotta in England outside South Kensington during the 1860s-70s with the exception of its extensive decorative use at both the Wedgwood

Institute and Dulwich College, where the skills of early manufacturers Mark Blanchard and John Marriott Blashfield and several modellers were displayed, although marked by controversy. Its first significant use to cover an entire building occurred in the 1870s with the construction of the massive Natural History Museum at South Kensington, designed by Alfred Waterhouse, although again the subject of some controversy due to the occurrence of significant manufacturing delays. Waterhouse's more liberal use of terra cotta in the Natural History Museum in both repetitive and unique decorative forms, as well as in colour, however, led the way to greater freedom in its use in an evolution of architectural styles in England during the late 19th century.

A series of Prudential Insurance Co. commissions from the late 1870s to 1900 involved the significant use by Waterhouse of red terra cotta and red brick in Gothic details, which came to symbolize commercial success. Terra cotta was also used frequently to decorate numerous Birmingham schools and other public buildings during the same period. The burgeoning British terra cotta industry, especially such major firms as Gibbs and Canning, J. C. Edwards, and Leeds Fireclay, used often by Waterhouse and other architects, expanded and prospered with its growing popularity.

The British interest in terra cotta peaked in the mid-1880s amidst an increasing British attraction for eclecticism, freely expressed in the Queen Anne Revival movement spanning the 1870s to 1890s. Rooted in the use of cut brick by Shaw and Stevenson, terra cotta became the ornament of choice for red brick residences in London's quickly growing suburbs, displaying arts and crafts and Renaissance motifs, expressing a search by their owners for beauty and truth. Flemish variations of the "Queen Anne" also abounded, making extensive use of buff and yellow terra cotta along with constructional terra cotta, in both domestic use and a number of schools.

Faience, or glazed terra cotta was introduced in England in the 1870s and 1880s, an outgrowth of the tile industry, accompanied during the same period by a new sculpture

movement strongly associated with the Doulton Co. and the work of sculptor George Tinworth. Doulton's introduction of Carraraware in 1888, also available in polychrome glazes, made possible the manufacture of large architectural faience forms that were resistant to pollution and frost, finally permitting its wide-spread use to cover entire building façades. The first extensive use of polychromatic faience in England occurred in the 1895 Birkbeck Bank in London, using elaborate Renaissance decoration in pink, green and brown. A limited number of British architects, inspired by the Arts and Crafts movement, used faience and colour during the 1890s to display art nouveau motifs, especially associated with the work of W. J. Neatby, the head of Doulton's architectural department. Halsey Ricardo's 1890s writings, as well as his use of Carraraware and glazed polychromatic brick in the house of retail magnate Ernest Debenham just after 1900 advanced the use of glazed polychromatic washable ceramics in England.

The use of faience as an exterior cladding material gained favour in England after 1900 in a specific set of building types, lending identity to public houses, theatres and cinemas, retail chain stores, cooperative stores, and seaside resorts. Although often the work of particular architects, little replication of design or detailing occurred. Faience was seldom used in the design of office buildings in England in both the pre-World War I and inter-war periods, although it was associated with a number of London hotels. The early 1900s steel-framed Savoy Hotel set a precedent for this trend in cream-coloured Carraraware with highly ordered classical detailing and prominent green chimney banding.

The British terra cotta industry began with small firms near London but shifted after the 1870s to larger firms in the Midlands that relied extensively on coal measure clays. The industry included hundreds of manufacturers during the span of the revival, although the bulk of contracts were mainly held by a few large firms. The Terra Cotta Association, formed in England around 1900, did little to promote the use of the material, mainly regulating prices. Vulnerable to the peaks and troughs of the building cycle, and

increasingly unable to reconcile a highly labour intensive material with rising prices, accompanied by increasingly modern architectural tastes, the industry all but disappeared at the beginning of World War II.

British architects who used terra cotta often valued it mainly for its decorative merits, especially its highly plastic qualities and its potential use in a nearly infinite variety of shapes. Its superior durability, pollution-resistant washability, cost-saving and fire-resistant benefits were clearly recognized, but were often the subject of controversy and debate. England's use of terra cotta was characterized in the late 19th century mainly by strongly curving shapes and deeply modelled forms. Although not the choice of most leading architects, terra cotta's architectural use was especially advanced by a number of British architects and designers who used it skillfully and often, beginning with Capt. Francis Fowke. Alfred Waterhouse's role as a prominent figure in the architectural profession did much to further its acceptance as a modern material that was capable of many adaptations. The work of many others, such as T. E. Collcutt, George & Peto, Martin & Chamberlain, Charles Townsend, Halsey Ricardo, and W. J. Neatby was motivated to a considerable degree by an interest in the Arts and Crafts, the influence of Ruskin, and terra cotta's 15th century use in northern Italy.

Coade Stone was imported to the United States on a limited basis and used architecturally from the late 18th to early 19th centuries. Several small U.S. firms in the eastern U.S. made terra cotta during the 1840s-60s, when it enjoyed limited use as a substitute for wood ornament and carved brownstone. Architect James Renwick's use of terra cotta to decorate several New York City buildings in the early 1850s was strongly opposed by stonecutters and masons, who argued the material was not durable.

Terra cotta was first used extensively to ornament a public building in 1870-76 in the Boston Museum of Fine Arts, designed by John Sturgis, a U.S. architect with British training who described terra cotta's advantages to the American Institute of Architects in

1871. The Boston museum purposely reflected the structure and function of South Kensington, housing art training classes directed by Walter Smith, who had studied at South Kensington and later established art classes across the U.S. Red and buff-coloured terra cotta, made at John Blashfield's works in England, together with red brick made a pronounced entrance in the U.S. together in the Gothic style, breaking the Italian Renaissance precedent at South Kensington. The importation of Blashfield's terra cotta and the nearly simultaneous move to Chicago in 1870 by James Taylor, who had worked for Blashfield, marked the transfer of British technology to the U.S. Unfortunately, the mid-1870s were also marked by the failure of Blashfield's British firm.

James Taylor became the superintendent of the Chicago Terra Cotta Co. in 1870, the first major U.S. architectural terra cotta manufacturing firm. Taylor transformed the American industry by introducing Blashfield's muffle kiln and British terra cotta technology. Taylor was later associated with numerous other firms, becoming known as the "father of American terra cotta". Rapid rebuilding in Chicago after the 1871 fire stimulated the terra cotta industry, with terra cotta's decorative and fire-resistant protective use by a number of prominent architects, including Canadian architect Cyrus P. Thomas, whose use of terra cotta in Burke's European Hotel impressed both John Sturgis and James Taylor.

Boston experienced a growing interest in fictile materials and in the arts and crafts beginning in the late 1870s, precipitated by the Museum of Fine Arts, the work of architect H. H. Richardson, and the manufacture of terra cotta in Boston. Richardson's Trinity Church, situated on Copley Square across from the Museum of Fine Arts, made remarkable use of polychromy in masonry in his first use of the Romanesque style. It also incorporated Richardson's signature use of bright red terra cotta roof tiles, hip rolls and crockets, along with fine imported British arts and crafts interior furnishings. Richardson made limited but skillful use of crafted brick during the 1870s in Boston, and his atelier

teaching style and well-furnished library inspired an interest in the Arts and Crafts among his many apprentices. James Taylor's founding of the Boston Terra Cotta Co. in 1880 elevated terra cotta's artistic potential through its on-site school of modeling and sculpture and the work of sculptor Truman Bartlett, while facilitating the use of rich reddish-brown terra cotta throughout the northeast and midwest U.S. through the early 1890s. A distinctive American clay-modelling approach characterized by swirling, somewhat constrained, and more shallow patterns than the more deeply modelled British forms emerged from the work of the Boston Terra Cotta Co., as well as the influence of H.H. Richardson's work in crafted brick.

Terra cotta was also used as ornament in a number of tripartite arcaded brick and masonry buildings in New York City during the late 1870s to early 1880s, designed in the Italian Renaissance manner by such prominent U.S. architects as McKim, Mead & White, Babb Cook & Willard, and George B. Post, who did much to advance terra cotta's use in New York. Post's incorporation of 2,000 tons of terra cotta in the New York Produce Exchange Building in the early 1880s caused the Perth Amboy Co., the first major terra cotta firm in New Jersey, to virtually double its capacity.

William Le Baron Jenney's early 1880s Home Insurance Building in Chicago, the first U.S. self-sustaining exterior wall metal frame structure, though covered entirely in stone, paved the way for terra cotta's later role as a cladding material with steel-framed construction. Burnham & Root's Rookery Building, completed about the same time, influenced tall building tripartite construction in the "Chicago style", using masonry, red brick and extensive reddish-brown decorative terra cotta, followed soon after by Atwood & Burnham's early 1890s thirteen storey Chicago Reliance Building. The latter was the first U.S. building to be clad in glazed cream-coloured terra cotta, inspired by the 1893 Chicago Exhibition. The subsequent increasing use of glazed monochromatic terra cotta cladding in numerous commercial buildings in Chicago and some midwest U.S. cities was also

strongly associated with the work of Louis Sullivan, who valued terra cotta for both its highly plastic qualities and its timely use with steel frame construction. Sullivan's complex floriate sculptural approach, strongly influenced by Ruskin and the Arts & Crafts movement, was characterized by the use of dense, all-over, often undercut ornament.

Polychrome glazed terra cotta was first successfully manufactured in the U.S. beginning in 1898 by the Perth Amboy Terra Cotta Co., assisted by the skills of an English potter. It was first used extensively the same year on a hardware store in Perth Amboy and displayed as a full-scale model at the Architectural League of America exhibition in New York. Glazed polychromy was advanced in the U.S. by H. D. Croly's articles about the same time, and by Léon Solon, an advocate of colour in architecture who had emigrated from England, trained at the Minton works. Polychrome terra cotta was used to some extent in the U.S. during the first two decades of the 20th century on small and medium-sized buildings, especially banks, hotels, commercial buildings, theatres and restaurant chains. In New York, it often decorated theatres and public buildings as well as brick apartment buildings, displayed in art deco motifs and metallic glazes, and was only rarely used in ashlar blocks in the 1930s in modern idioms. Monochromatic glazed, often cream-coloured terra cotta was used far more often in such major U.S. cities as New York and Chicago in the early 20th century to clad steel skeleton office buildings in a tripartite design, frequently with a four to five storey base, a tall mid-section, and a three to four storey attic with a heavy overhanging cornice. Terra cotta's decorative applications ranged from the use of dense, elaborate all-over ornament, exemplified by the Flat Iron Building in New York City, to more simplified embellishment, such as in the Railway Exchange Building in Chicago, both built just after 1900.

The U.S. terra cotta industry was first centred in Chicago although its primary locus soon shifted to an area of Cretaceous clay resources in New Jersey. By the 1930s numerous firms had been established all across the U.S. Many, like the Gladding,

McBean & Co. in California, founded by Charles Gladding and Peter McGill McBean, who was born in Lancaster, Ontario, Canada, began with the production of vitrified clay sewer pipe and a limited range of trimmings, later expanding to a wide range of architectural terra cotta products. The U.S. industry was characterized by close ties between companies and family connections, and at times played important roles in the lives of their communities and workers. Many early 20th century U.S. firms had extensive facilities, the result of consolidating several smaller companies into much larger operations. The National Terra Cotta Society promoted terra cotta's advantages and published standard construction methods. Both World Wars, as well as the Great Depression, affected the industry's eventual decline. The U.S. use and manufacture of terra cotta was considerably diminished by the mid-1930s although continuing in a limited fashion to the late 1960s.

Terra cotta's use in the U.S. peaked in the mid-1880s as it had in England, but was less controversial. Terra cotta was valued far more in the U.S. than in England for its use with steel frame tall building construction, the combined result of its fireproof resistance, light weight, durability, rapid construction, and its lower cost. Americans appear to have valued terra cotta's aesthetic advantages at least as much as their British counterparts, exploiting its plastic qualities through a variety of textured, increasingly low relief surface treatments. During its latter stages in the U.S., terra cotta imitated granite in flat veneer surfaces. U.S. architects clearly appreciated the aesthetic merits of polychrome glazed terra cotta more than their British counterparts, even viewing it as an art form.

The use and manufacture of terra cotta in the U.S. in the late 19th century was at first influenced extensively by the British attraction for the material, by British terra cotta technology, and by many of its highly skilled workers who were employed in the U.S. terra cotta industry. By the 1890s Americans had begun to reject this association, gradually developing their own technology and leading manufacturers, and fostering their own skilled modellers. Americans increasingly reflected their own Arts and Crafts movement in

different styles and through their own sculptural expressions of the material, ultimately incorporating terra cotta into their architecture to a far greater degree than in England.

Similar to the U.S. but a few years later, central Canada made limited use of Coade Stone beginning in 1809, made in England and imported to Montreal by several merchants closely associated with London. Coade Stone's 1818-19 decorative use in the façade of Canada's first purpose-built bank and its first bank narrative panels signaled its much later use on numerous Canadian banks and financial institutions. Following this "false start", characteristic also of England and the U.S., terra cotta's entry in central Canada began in 1876 with a newly obtained patent for the manufacture of white brick, terra cotta, and artificial stone in Ottawa by Thomas McCleod Clark, who had emigrated from Scotland in the 1860s. In the early 1880s architect George F. Durand, also of Scottish descent, introduced terra cotta panels in the London residences of two prominent southwestern Ontario figures. Those displayed on the Queen Anne Revival home of brewer John Labatt, Jr. were imported from the U.S., made by the Boston Terra Cotta Co. First trained as an artist by a sculptor, Durand worked as Canadian architect Thomas Fuller's assistant on the State Capitol building in Albany, New York during the 1870s. In terra cotta's most extensive use to date in central Canada, Durand displayed large allegorical terra cotta panels representing art, agriculture, science and architecture in the 1885-87 Perth County Court House in Stratford, clearly symbolizing the building's function. Combining reddish-brown terra cotta with buff brick and plum-coloured Credit Valley sandstone in a rich display of polychromy, Durand integrated Queen Anne Revival, Italianate, and Richardsonian Romanesque features in an eclectic blend, reflecting his background as an architect-artist and the influence of Fuller, who designed Canada's first Parliament Buildings.

Decorative terra cotta appeared frequently in Queen Anne Revival domestic architecture in Ontario during a period of rapid growth in the 1880s-90s, flourishing

especially in Toronto and Ottawa. Used with red brick and made by a small number of pressed brick and terra cotta manufacturers near and in Toronto, red terra cotta appeared frequently in decorative panels near the entrance, beneath or framing windows, or in continuous stringcourses, contributing distinctive identity to the vernacular residences of many prominent members of Ontario's growing middle-class. Red terra cotta also frequently decorated Ontario's late 19th century schools and churches, as well as many commercial businesses in the Richardsonian Romanesque style.

Terra cotta played a significant role in the evolution of Canada's late 19th and early 20th century commercial architecture, first used as ornament, then as cladding on the exterior of many of its first tall office buildings. American-made high relief terra cotta work decorated Montreal's and Canada's first tall building, the late 1880s New York Life Insurance Co., designed by U.S. architects Babb Cook & Willard, who used terra cotta during the 1870s-80s in New York. Numerous terra cotta panels with distinctive arts and crafts motifs also ornamented the early 1890s Central Chambers in Ottawa, a Queen Anne Revival commercial building designed by John Browne, the son of Montreal architect George Browne, who had studied in New York and at South Kensington. The exterior of Canada's first steel-frame structure, the 1894 Simpson store in Toronto, designed by architect Edmund Burke, incorporated decorative terra cotta, likely influenced by Burke's commitment to terra cotta as a fire-resistant material, along with a department store proposal in Chicago designed by Louis Sullivan that was to be sheathed entirely in terra cotta. Frank Darling and John Pearson's use of extensive decorative terra cotta in the 1903-04 Union Bank in Winnipeg virtually led the rest of central Canada in terra cotta's utilization as a decorative or glazed cladding material in numerous pre-first World War tall bank headquarters, financial institutions, and office buildings.

The 1880s-90s were characterized by an increasing need and desire for improved technical education among Canadian architects, who were gradually less affected by

England and increasingly influenced by American ideas, while beginning to struggle with the notion of a distinctively Canadian architectural identity. The 1880s move to establish a School of Practical Science in Toronto was accompanied by a similar interest in Quebec. Walter Smith, Director of Boston's Normal Art School, lectured the Quebec Council of Arts and Manufactures on industrial art education, discussing the South Kensington program, challenging Canada to establish its own department of science and art, and urging it to develop and protect its own industries. Beginning in the mid-1890s and continuing until about World War I, Canadian clay manufacturers and workers repeatedly called for a formal ceramics program in Ontario similar to those established in the U.S. A formal program was not finally established in Toronto until 1925.

A number of architects who figured importantly in the use of terra cotta as a building material in central Canada were leaders or active in several architectural organizations formed in Ontario and Quebec from the 1880s. At times during the 1890s members of the Toronto Architectural Sketch Club and the OAA heard lectures on clay modelling and terra cotta presented by the Hynes brothers, both skilled Toronto plasterers and terra cotta modellers who owned the Canadian Terra Cotta Co. Toronto Architectural Eighteen Club members were especially interested in the Arts and Crafts, influenced by both the British and U.S. movements. In 1900 the Eighteen Club became affiliated with the newly formed Architectural League of America, in turn associated with counterpart organizations in New York, Chicago, and Philadelphia. During the next decade Eighteen Club members displayed their own designs at annual exhibitions alongside those of prominent U.S. members, thus opening themselves to the influence of fellow architectural League members.

Tall buildings were a subject of much debate in central Canada around the turn of the century. In the late 1890s Canadian architects often criticized New York architecture for its "extravagant" ornament, viewing tall buildings as solely suited for the U.S. In 1897

McGill University's new chair of architecture Stewart Capper, recently arrived from Scotland, promoted acceptance of steel skeleton construction in his paper "The American Tall Building". Capper advocated the use of terra cotta as the most honest cladding material to reveal the underlying structure, to express horizontal building stages, and to provide adequate fire safety. To reduce the impact of tall buildings and achieve a favourable result in Canada, Capper advocated enrichment of the base and the use of horizontal repetitive elements throughout the mid-section. He clearly urged the avoidance of heavy overhangs, suggesting re-study of successful classical examples, potentially substituting a storey or more in the depth of a cornice, along with the use of deep consoles.

Later tall buildings clad with terra cotta, especially in Ontario and Quebec, often demonstrated Capper's principles, especially in the design of the "attic" and base, although at times with greater vertical instead of horizontal emphasis. Mainly using monochromatic cream-coloured glazed terra cotta as in New York and Chicago, they differed from their U.S. counterparts through reduced building heights, fewer stories in both the attic and the base along with much less use of elaborate ornament, and generally greater use of classical sculptural motifs. Terra cotta was used in a variety of architectural styles, including Beaux-Arts, Edwardian Classical, "Chicago", and Italian Renaissance idioms. Each building was characterized by its own distinct identity, assisted by Canadian architects' skillful exploitation of terra cotta's plastic advantages.

A tendency toward regional differences also occurred, with greater height and mass and more frequent use of horizontal banding and textured surfaces in classical motifs in Toronto, with a stronger vertical emphasis generally characterizing Montreal's tall terra cotta-clad buildings. Ottawa's typically more slender architecture often featured continuous balconies, slightly rounded windows near the top, with occasional elaborate ornament crowning the top or framing the entrance. Winnipeg's tall terra cotta-clad buildings clearly reflect Chicago architecture to a greater degree, often with prominent

cornices and single-storey attics, a strong vertical emphasis, repetitive window treatment, and far greater use of elaborate, as well as high relief distinctive ornament.

Glazed terra cotta was also used after 1900 at times to clad or decorate hotels, with examples in Toronto and Montreal. As occurred in both England and the U.S., central Canada's theatres were often characterized by the use of glazed terra cotta, or less frequently terra cotta along with brick. A number of the former were designed by U.S. architects, such as Thomas Lamb, who used terra cotta frequently in his theatre designs in New York. Terra cotta also appeared on some musical instrument stores and a number of warehouses in Toronto. Its use in the design of apartment buildings was much less common than in New York or Chicago, although scattered instances occurred in Montreal, Ottawa, and Winnipeg.

Polychrome terra cotta occurred rarely in Ottawa, occasionally in Montreal, infrequently in Toronto, and often in Winnipeg. The John Kay store in Toronto made early use of cream-pink terra cotta in 1898, only three years after the London Birkbeck Bank, and the same year that polychrome glazed terra cotta was first used extensively in the U.S. Green glazed terra cotta panels appeared with greyish-white cladding in the 1909 Standard Bank just a few years after green banding and cream-coloured terra cotta were used in the Savoy Hotel in London. Polychrome glazed accents were also used in a few restaurants in Toronto about 1915, with Ottawa's Bowles Lunch restaurant following shortly thereafter. Occasional use was made of small colored enamelled tiles with red brick in Montreal. Numerous office buildings and banks in Winnipeg displayed rich distinctive ornament accented in a variety of colours, with several instances of the use of green with cream. Percy Nobbs demonstrated his interest in the arts and crafts in Winnipeg in 1914 in a remarkably distinctive manner, using polychrome in the remodelled Birks Building to create a storey-telling frieze in terra cotta inlay, along with polychrome terra cotta medallions.

Compared with the major producers in both England and the U.S., central Canada's terra cotta industry and its manufacturers were much smaller and associated far greater with the pressed brick industry. Beginning as early as 1876, terra cotta's production predominantly occurred from the late 1880s to late 1890s, peaking in 1894, just a few years later than in England and the U.S. A depression in building in 1895 precipitated a decline from which the industry never really recovered, largely ceasing by 1906. The pressed brick and terra cotta industry was mainly situated west of Toronto, using deeply bedded shale in the Medina formation, along with two firms in Toronto using shale in the Hudson River formation. Both burned to a rich red colour, although some lime also allowed limited production of golden brown terra cotta. Porous terra cotta and terra cotta lumber were manufactured from the late 1880s to the late 1890s mainly by two firms, one of which made important contributions to the community in which it was located. Shortly after 1900 the Don Valley Pressed Brick Works became the sole Ontario manufacturer of enamelled brick, a popular product that was prominently displayed on the early 1900s residence of J.C. Eaton in Toronto. Although glazed architectural terra cotta was never produced in central Canada, large "glazing clay" deposits were discovered in Ontario in 1907 and reportedly burned in the kilns of some large English potteries. Gibbs & Canning in England made repeated efforts to establish a works in Canada between 1912-14; another "Staffordshire man" also tried a number of times to produce terra cotta in Ontario but failed.

The Boston Terra Cotta Co. supplied a very limited amount of decorative terra cotta in Ontario during the early 1880s. Both U.S. and British manufacturers competed in the supply of glazed terra cotta in central Canada beginning around the turn of the century, with the Doulton Co. and Leeds Fireclay in England playing an important role from the late 1890s until around 1910. The Atlantic Terra Cotta Co., Northwestern Terra Cotta Co., and the Federal Terra Cotta Co. dominated the supply of glazed terra cotta in central Canada

from 1912 to 1919, making highly competitive bids along with a number of other U.S. firms. The New York Architectural Terra Cotta Co. Archive revealed important details of the estimating process for specific projects in central Canada, especially demonstrating high Canadian tariffs on the import of glazed terra cotta.

Canadian architects' views on terra cotta were influenced by articles and commentaries on its advantages from U.S. and British journals published in the Canadian Architect and Builder and in Construction. The favourable views and expertise of Canadian architect John Horwood on the decorative and fireproof uses of terra cotta in New York City, and of a Canadian student in London were also published, along with Ontario manufacturer M. J. Hynes' paper on its advantages. Collectively these influenced Canadian architects to value terra cotta primarily for its artistic and plastic qualities. Terra cotta was described as extremely durable if well burned, resisting the effects of frost and moisture, "in defiance of all weather". Canadian architects were also influenced to never use or make terra cotta to imitate stone, to favour the natural burned colour of the clay, and to avoid altering its colour. Terra cotta was not without its detractors, with some concern that its use could lead to overloading of ornament; a prominent U.S. architect also referred to terra cotta as "tortured mud". A few Toronto architects expressed concerns about manufacturing delays and technical aspects of its use. Porous terra cotta and terra cotta lumber were used extensively for interior and protective constructional purposes, promoted and fostered by the fireproofing knowledge and expertise of Toronto architect Edmund Burke, who was informed by John Horwood's training in New York City, prompted by the Simpson building fire, and aided by the OAA's study of building ordinances in North America and London.

The Canadian Terra Cotta Co. in Toronto was influenced by the British industry, having employed a skilled terra cotta worker who had worked with an English firm. Michael J. Hynes, its owner, was an ardent advocate of Canadian-made terra cotta. Hynes

demonstrated an astute knowledgeable of terra cotta as well as contemporary developments and figures in both the U.S. and England. In 1900, following the closure of his firm at least partly caused by increased competition from the U.S., Hynes sold his patent kiln to the Perth Amboy Terra Cotta Co. in New Jersey, a major firm that two years earlier was the first in the U.S. to produce successful polychrome glazes.

Canadian architects and others who used, made or advocated terra cotta's use were likely influenced in their use of the material by their background, training or work experiences abroad. Frank Darling and John Pearson made significant use of terra cotta in central Canada. Darling had worked in London in the office of G. E. Street. Street knew John Ruskin, had designed encaustic tiles and studied marble and brick and terra cotta architecture in northern Italy, and worked on a terra cotta triptych with George Tinworth. Darling was awarded the 1915 Royal Institute of British Architects Gold Medal award for his persistent skill in design in Canada. Pearson was born and trained in England, was of Scottish descent, had an astute knowledge of materials, and designed Canada's second Parliament Building. Percy Nobbs was born in Canada, studied in Scotland, worked in London, and was awarded the Owen Jones travelling studentship in mosaic decoration. George Durand was also of Scottish descent and had worked with Thomas Fuller in the U.S. Stewart Capper was born in London and educated in Edinburgh. Like many other Scots, T. M. Clark had also emigrated to central Canada during the early to mid-19th century. T. M. Clark was also the brother-in-law of internationally renowned Canadian civil engineer Thomas Keefer, who represented Canada at the London exhibitions in 1851 and 1862, and in Paris in 1878.

Other architects had trained or worked in the U.S. in the offices of prominent architects who used terra cotta or were closely associated with the Arts and Crafts movement. John Horwood worked in James Renwick's offices in New York City, who pioneered the use of terra cotta in New York City. Horwood shared his expertise with

Edmund Burke, who published Horwood's letters in the Canadian Architect & Builder. Horwood and several other Canadian architects were also likely influenced through their affiliation with the American Architectural League. Edward Maxwell admired the work of H. H. Richardson and worked in the Boston offices of his successors, Shepley Rutan & Coolidge. His brother William also worked in Boston. Both clearly appreciated the arts and crafts, working closely with Canadian artists and craftsmen and advancing the Arts and Crafts movement in Montreal. John Atchison trained with William Le Baron Jenney in Chicago, and worked with Atwood & Burnham in the planning of the 1893 Columbian Exposition. Cyrus Pole Thomas, who used terra cotta in Chicago, was born in England, the son of William Thomas, the "builder of Toronto", and was the nephew of John Thomas, carver-in-chief of the British Houses of Parliament. C. P. Thomas also pioneered new materials in Canada, using cast-iron storefronts in Halifax in 1860.

The use of terra cotta in central Canada between 1880 and 1919 was clearly influenced by the revivals in both England and the United States. Terra cotta's utilization in central Canada reflected many aspects of its architectural application in both England and the U.S. with respect to building types and sculptural style. Late 19th century unglazed terra cotta's manufacture in central Canada also reflected long-honored practices and processes abroad. Although facing many obstacles to glazed terra cotta's use in Canada after the turn of the century, Canadian architects benefited from its manufacture in both England and the U.S., along with related U.S. technological developments. Canadian architects also benefited from their training in both countries, where they were influenced by the British and U.S. arts and crafts movements. Yet central Canada's utilization and production of terra cotta neither reflected a "mirror image" of either England or the U.S, or a mere amalgam of both. Instead it was characterized by distinct differences reflecting Canada's emerging cultural, social, and architectural values, expressed through different patterns in terra cotta's use, appearance, the level of its acceptance, and its manufacture.

Similar to the peak years of its use in England, terra cotta's domestic application in Ontario during the 1880s-90s was especially associated with the Queen Anne Revival style, reflecting Canada's close ties with England during the late 19th century. Ontario's domestic use of unglazed terra cotta to ornament Queen Anne Revival residences occurred overwhelmingly in red terra cotta panels and stringcourses together with red pressed brick. While reflecting its use in England in part, London's suburbs also used extensive buff and yellow terra cotta, along with constructional terra cotta in Flemish variations of the style, along with more deeply modelled forms and greater use of drapes, grotesques, and flowing figures. While the British middle class use of terra cotta reflected their search for beauty and truth, its display by a number of prominent Ontario industrialists and retailers, such as John Labatt and J. P. Wiser, who likely knew each other, along with Robert Simpson, Timothy Eaton, and George Gooderham seemingly symbolized terra cotta's role in the advancing industrial revolution, their own appreciation for the arts and crafts, and their new wealth and social status.

As terra cotta's late 19th century use on numerous British Prudential Insurance Co. buildings came to symbolize commercial success, its frequent appearance on central Canada's banks and financial headquarters suggests a similar association with financial success and stability. The actual use and appearance of terra cotta in these commercial building types varied considerably between England and central Canada. Waterhouse was influenced by his late 19th century client and regional clay resources in the Midlands to use mainly red brick and red terra cotta, often in high-relief Gothic ornament. Cream-coloured glazed terra cotta was used somewhat later in central Canada as a cladding and decorative material in a number of banks and financial institutions, often in classical idioms, along with luxurious marble and sculpted plaster interiors. A number of small midwest U.S. banks also displayed terra cotta with a distinctly different appearance and terra cotta style

characteristic of Louis Sullivan's work, using highly floriate, complex polychrome together with brick.

Central Canada's use of glazed monochromatic cream-coloured terra cotta as a cladding or decorative material in early 20th century steel skeleton office and financial headquarters construction differed from its use in the eastern and mid-western U.S. in both architectural design and the extent of elaborate decoration, characteristically reflecting greater restraint. Little use of terra cotta occurred with office buildings in England during the pre-World War I period, although its strong association with hotels shortly after 1900 may have influenced Canada's use of terra cotta in tall building office construction.

Central Canada's reduced use of polychrome suggests the influence of England, where colour largely reflected the natural burned colour of the clay, and an appreciation for honesty in materials. Ontario's only infrequent use of polychrome accents with restaurants, such as in two Bowles Lunch buildings, appears to reflect the broader use of polychrome in the U.S., even the influence of the first extensive use of polychrome in the U.S. in the 1898 Perth Amboy hardware store. Winnipeg's much more liberal use of polychrome accents reflects its stronger association with Chicago architecture.

Evidence has not clearly indicated a singular strongly characteristic "terra cotta style" exclusive to central Canada. Late 19th century decorative terra cotta was characterized predominantly by strongly curving shapes, although modelled in more low-relief forms than those typically appearing in England. The occasional later use of small textured classical details in an all-over repetitive fashion in Toronto, although differing from the styles in both England and the U.S., appear to reflect a distinctive design penchant used by Darling & Pearson that never fully developed into a characteristic Canadian style.

Terra cotta's close alliance with the manufacture of pressed brick during the late 19th century, differing from terra cotta manufacturing patterns in both England and the U.S., reflects the strong association of unglazed decorative terra cotta with pressed brick in

the Queen Anne Revival movement, especially in Ontario. It also suggests the valued use of regional materials expressing Ontario's well-suited clay resources. Ontario's much delayed assistance in establishing a formal clay-working and ceramics program, together with the size and proximity of the U.S. industry, likely played an important role in hindering the manufacture of glazed terra cotta in central Canada, despite the successful manufacture of enamelled brick and attempts by two British producers to establish works in Canada. In turn, the absence of Canadian-made glazed terra cotta, along with high Canadian tariffs and costly internal freight rates likely contributed to a lower level of its use in central Canada compared with some major U.S. eastern and midwestern cities. Winnipeg's greater use of glazed terra cotta appears to have been associated to a large extent with its major railway role, the timing of its rapid growth, and the Chicago training and influence of architect John Atchison.

During the span of its revival terra cotta was praised and valued for its many advantages, each contributing special, even unique benefits to its use as a building material. Its real value and importance lie in its adaptability and responsiveness to evolving trends in design and construction, which make it a barometer of larger issues. This is demonstrated by the intriguing, sometimes tangled web of its use and manufacture in England, the United States, and central Canada. Terra cotta's manufacture was extremely complex, requiring the selection of suitable clays, lengthy clay-processing methods, the experienced skills of craftsmen and artisans, and careful drying and firing methods. This process remained largely consistent from Coade Stone's late 18th century production into the early 20th century, even characterizing much of terra cotta's manufacture today. This highly labour-intensive process reflects terra cotta's role as a transitional material, bridging both pre-industrial and industrial production methods and construction technology. Its manufacture in moulds, an advance from time-consuming hand-carved stone and one-of-a-kind handcrafted materials, was an important industrial advantage, permitting its repetitive use in

one façade while facilitating the repeated use of moulds to create stock items. Despite this advantage, little use was made of stock or "catalogue terra cotta" since most architects preferred to create their own design details--one of terra cotta's contradictions as a building material. By the 1920s-'30s extrusion methods were being used to produce thin, flat veneer glazed ceramic units, utilized in increasingly modern styles while three-dimensional forms were still produced in largely hand-crafted methods. Veneer forms, however, brought no particular advantages over other materials and were associated with terra cotta's decline in use and popularity, reinforcing the enduring attraction of its unique three-dimensional handcrafted ceramic qualities and characteristics.

Terra cotta's wide range of appearances and uses reflected its somewhat ambiguous but versatile role as a transitional material. It was used in decorative, constructional, and fire-protective applications, as well as a hollow cladding and veneer sheathing material with steel skeleton construction. It took on a multitude of visual forms, appearing in various shades of red, buff, grey, yellow and even shades of blue in its unglazed forms, reflecting regional clay resources, as well as a wide range of polychrome glazes, ranging from subtle to brilliant colours, in both matt and highly glazed surfaces. Terra cotta often imitated stone as well as other materials, contributing to its "invisibility". Its unglazed surface could also be left rough or tooled to a variety of surface textures. Terra cotta was especially valued by Ruskin and others for its high plasticity, lending itself easily to varied relief forms and sculptural techniques, especially strongly curved or swirling forms. Glazed terra cotta's reduced plasticity rendered it less capable of high relief forms but well-suited to its use in several early 20th century architectural styles.

Compared with stone, terra cotta's cost advantages were often considerable, although varying with the extent and type of decorative work involved, the availability of local stone, and a wide range of potential tariff, shipping and transportation costs. Terra cotta was extremely durable and could withstand some of the worst weather extremes; if

not well made and burned, however, deterioration could occur. Terra cotta's advanced production methods involving the use of moulds created greater time efficiencies; likewise, its use in steel framed construction led to greatly reduced building times. Yet its use required early design work and timely ordering by architects to avoid potential manufacturing delays. These seeming contradictions contributed to terra cotta's frequent association with controversy and debate.

Terra cotta was used frequently by some architects, although not all. It appealed especially to those interested in the arts and crafts due to its highly versatile decorative applications. Architects who had trained with other firms that had used terra cotta, or who appreciated fictile materials, structural polychromy, and materials that terra cotta imitated, such as marble, were also inclined toward its use. Terra cotta also held an attraction for architects using emerging forms of modern construction, especially its well-suited application for steel-framed tall building construction. Terra cotta was utilized in a range of evolving styles during its revival, especially various forms of classicism. It was also particularly adept in expressing the late 19th and early 20th century attraction of many architects and their clients for ornament, eclecticism, and the arts and crafts. Terra cotta met and served many of the material requirements of rapidly growing towns and cities during the 1880s-90s and the booming pre-World War I years, especially those with excellent transportation connections.

Terra cotta clearly made a significant and valued contribution to central Canada's architecture and the growth and development of its cities, largely due to its inherent complexity, unique characteristics, and its role as a transitional building material. Terra cotta's use and manufacture in central Canada was influenced by its revival in both England and the United States, although characterized by distinct differences reflecting Canadian values and culture. Recent indications of a growing interest in its use in conservation and new-build projects, especially in England and the United States, validates terra cotta's time-

tested importance as a building material and confirms a renewed interest in the arts and crafts.

Appendix I

Manufacture of Terra Cotta

Much of the knowledge about terra cotta manufacture in the late 19th and early 20th centuries was based on experience and apprenticeships; few manuals or technical publications existed.⁷⁰⁸ Many of the accepted manufacturing practices and processes were established and remained largely unchanged from the time of Coade's, Blanchard's and Blashfield's works, to a great extent requiring the expertise of highly skilled labour and craftsmanship. The processes most affected by technological advances were clay excavation and preparation, as well as the glazing and firing stages.⁷⁰⁹ The following describes basic late 19th century manufacturing stages involving commonly accepted processes, permitting the production of high quality unglazed terra cotta.

Clay Selection, Extraction & Preparation. The raw materials from which terra cotta was made, and still is, varies widely in type and proportion; the clay bodies most suitable are characterized by certain properties, such as a slight porosity to avoid excessive shrinkage. To achieve these, the raw materials typically consisted of a mixture of marls (clay mixed with sand), ball clays, fireclays, and grog (previously fired, ground terra cotta or other burnt clay material). Any of these could be used separately, especially marls, although it was unusual to find the right combination of properties required for large blocks. Marls used on their own tended to shrink more than the standard accepted proportion of 1/12 or 1/13 of full scale size. Shrinkage was mainly controlled by adding grog, or sometimes sand. Clays with a high iron content burned to a bright red colour;

⁷⁰⁸

T. Prudon, "Architectural Terra Cotta and Ceramic Veneer in the United States Prior to World War II", unpublished dissertation, Graduate School of Arts and Sciences, Columbia University, 1981, 53.

⁷⁰⁹Stratton, 1983, Vol. 1, 267-68.

others burned naturally to buff or blue colours. Adding ball clay achieved a stone colour.⁷¹⁰

The clays were carefully sorted and selected and for the most part removed by hand from open pit mines or quarries. Weathering, referred to as "blunging" in England, involving layering of clays on the ground for one or two seasons to expose them to frost and rain,⁷¹¹ was a long established clayworking custom considered important for terra cotta. The weathered clays were then tempered, involving grinding and screening, and the addition of grog and water to achieve the appropriate degree of plasticity. The mixture was then "pugged" or put through a pugging mill, sometimes a number of times.

Models and Moulds. Except when making unique sculptural pieces, terra cotta usually required the making of models, as well as moulds into which the clay was hand-pressed. Typically plaster was used, although clay, stone and wooden moulds were used in early times. Larger terra cotta firms had a separate plasterers' or modellers' shop, employing highly skilled modellers or sculptors. Usually a manufacturer would quote a price based on small-scale drawings, used to estimate the quantity of terra cotta required, as well as the extent of decorative work. On reaching an agreed contract, drawings were usually supplied by the architect at 1/2" or 1" scale, and where needed, full scale sections. These were used by draftsmen in the works to determine how various architectural elements could be made into convenient blocks, with the aim of using repetition as much as possible to reduce the number of moulds. Moulds were constructed 1/12 oversize to allow for clay shrinkage. Each block was identified, both in the drawings and the actual block, to ensure appropriate fitting and unit assembly. Typically a letter of the alphabet

⁷¹⁰Ibid., 215-16.

⁷¹¹Weaver, 114.

was assigned for each contract, followed by another letter or number, and at times, the initials of the building. Most architectural forms were modelled as well as moulded.⁷¹²

Hand Pressing. The plastic clay mixture is hand-pressed or "beaten" into the mould by a skilled craftsman or "presser", taking care to eliminate all air pockets and defects, or the unit might burst or crack in the kiln. The blocks are typically hollow on the back to promote easier drying, even firing, and reduced weight; internal webbing or stiffening is also added to strengthen the walls of the unit. The exterior walls are typically 1" to 1 1/2" thick.⁷¹³ Figures 3.56, 3.57, and 3.58 illustrate a typical hand-pressed late 19th century hollow-cast decorative terra cotta block, with interior webbing (along with finger marks, apparently made by the removal of excess clay), and an identification code, likely manufactured by the Canadian Terra Cotta Co. The swirling nautilus shell design compares almost exactly, with only minor detailing differences, with a beltcourse design illustrated in the Canadian Terra Cotta Co. 1887 Catalogue. (Figure 3.59) It is also the same pattern appearing in a decorative stringcourse in the former Naylor's Theatre in Deseronto, Ontario. (Figure 3.60)

Finishing & Drying. After drying, the clay unit releases itself from the mould, the result of shrinkage. The clay unit is then "tooled", involving smoothing of the surface to ensure production of a fine vitreous surface during the firing process, referred to as the "fireskin". The clay blocks are then dried for anywhere from several months to only a few days.⁷¹⁴ Two drying systems were developed. The first involved rooms steam heated with pipes, followed later by a tunnel drier.

Firing. The use of a kiln that consistently achieved over 1000°C, while protecting the goods from flames and smoke, was essential and could be achieved by either a muffle

⁷¹²Stratton, *ibid.*, 217-22. Stratton, 222-236, provides a detailed discussion of modelling and molding methods, based on P. N. Hasluck's *Terracotta Work*. (London: Cassell, 1905), described as the only authoritative text published in England on terra cotta manufacture.

⁷¹³Weaver, *ibid.*

⁷¹⁴Weaver, *ibid.*, described the possible use of a variety of "tools", such as a wooden spatula, steel trowel, or even a leather shoe tongue.

kiln, used by most early English firms, or a down-draft kiln. James Taylor installed an improved version of Blashfield's muffle kiln at the Chicago Terra Cotta Works in 1871. (Figure 3.61) Blashfield's 1860 patent muffle kiln could burn 25 tons of terra cotta in each firing in its largest form. Down-draught kilns were dome-shaped and were more widely used in the Midlands in England, and later in the U.S.⁷¹⁵

⁷¹⁵Stratton, 1993, 37-39. Weaver, 115, described a usual terra cotta firing temperature range as between 850 and 1200 degrees Centigrade.

Appendix II
New York Architectural Terra Cotta Company Archive
Projects in Canada with Known Terra Cotta Manufacturers 1912-1919

Province	City	Job #	Date	Architect	Project	Manufacturer
Alberta	Banff	24679	4/21/14	Govt. architect	Banff Baths	Northwestern TCC
Alberta	Calgary	22393	5/31/12	Teague, James C.	Mackie office building	Atlantic TCC
Alberta	Edmonton	22085	3/5/12	Blair, W.W.	Office (Can.Pac.Railway)	St. Louis TCC
Alberta	Edmonton	22963	10/29/12	Dow, John K.	McLeod Building	Washington TCC
Alberta	Edmonton	24201	11/26/13	Nobbs & Hyde	Aris Bldg. (U. of Alberta)	Atlantic TCC
Alberta	South Calgary	22705	8/19/12	Dominion Realty	Can. Bank of Commerce	Northwestern TCC
Alberta	Taber	22838	9/24/12	Dominion Realty	Can. Bank of Commerce	Northwestern TCC
British Columbia	East Vancouver	25048	8/7/14	Hershburg, V. D.	Can. Bank of Commerce	Federal TCC
British Columbia	New Westminster	23252	1/28/13	Gardiner & Mercer	Columbian Building	Northern Clay
British Columbia	Vancouver	22964	10/29/12	Barott Blackader Webster	Van. CPR Terminal	South Amboy TCC
British Columbia	Vancouver	23261	1/30/13	Braunton & Liebert	Stand.Trust & Ind. Bldg.	Denny Renton
British Columbia	Vancouver	23129	12/20/12	Griffith, H. S.	Y.M.C.A.	Northwestern TCC
British Columbia	Vancouver	23001	11/9/12	Painter & Swales	Vancouver Hotel (CPR)	American TCC
British Columbia	Vancouver	23162	1/4/13	Russell Babcock Rice	Wear Building	Atlantic TCC
British Columbia	Vancouver	22678	8/12/12	Sharp & Thompson	Vancouver Club	Gladding McBean
British Columbia	Vancouver	23069	11/30/12	Somervell & Putnam	Yorkshire Guar. offices	Leeds Fire Clay
British Columbia	Vancouver	23793	6/24/13	Stevens, H. L.	Credit Foncier Bldg.	Northern Clay
British Columbia	Victoria	24264	1/19/14	Burke Horwood & White	Hudson Bay Co. store	American TCC
Manitoba	Winnipeg	22026	2/19/12	Atchison, J. D.	Boyd Building	Northwestern TCC
Manitoba	Winnipeg	23380	3/5/13	Atchison, J. D.	Merchants Bank of Can.	Northwestern TCC
Manitoba	Winnipeg	22394	5/27/12	Northwood, G. W.	Notre Dame Ins.Co. office	Doulton
Manitoba	Winnipeg	22578	7/12/12	Pratt & Ross	Winn. Electric Railroad	Northwestern TCC
Manitoba	Winnipeg	22490	6/19/12	Russell, J. H. G.	Git. Western Perm. Loan	Northwestern TCC
New Brunswick	Moncton	24024	7/30/14	Frechet, R. A.	church	Atlantic TCC
Ontario	Fort William	24914	7/3/14	Mason, R. E.	apartment Broche St.	Federal TCC
Ontario	Hamilton	24559	3/24/14	Mills & Hutton	Y.M.C.A.	Northwestern TCC
Ontario	Hamilton	24563	3/25/14	Stewart & Witton	Commonwealth Realty Bldg	Atlantic TCC
Ontario	London	28650	8/9/19	Crane Kiehler Schley	Allen Theatre	Federal TCC?
Ontario	London	24918	6/27/14	Graham, John	Ford Motor Service Bldg.	Northwestern TCC
Ontario	London	22167	3/28/12	McBride, H.	Molsons Bank	Northwestern TCC
Ontario	London	26115	8/20/15	Purdy & Henderson	bank	Atlantic TCC

Province	City	Job #	Date	Architect	Project	Manufacturer
Ontario	Port Arthur	23816	7/11/13	Brown & Vallance	Port Arthur Building	Atlantic TCC
Ontario	St. Catherine's	22651	8/3/12	Dominion Realty Co.	Can. Bank of Commerce	Northwestern TCC
Ontario	St. Catherine's	22009	2/14/12	Nicholson, A. E.	United Gas Co. office	English firm
Ontario	St. Catherine's	23422	3/15/13	Nicholson, A. E.	Fire Hall	Northwestern TCC
Ontario	St. Catherine's	23186	1/10/13	Nicholson, A. E.	Bank of Montreal (alterns)	Northwestern TCC
Ontario	St. Catherine's	28348	3/27/19	Nicholson, A. E.	Nihan Building (addn)	Atlantic TCC ?
Ontario	Thorold	24663	4/17/14	Nicholson, A. E.	Imperial Bank	Atlantic TCC
Ontario	Toronto	25106	8/26/14	Belfrey, F. E.	Commercial High School	Atlantic TCC
Ontario	Toronto	24115	10/18/13	Burke Howard & White	Methodist Book & Pub. Co	Atlantic TCC
Ontario	Toronto	24392	2/10/14	Chadwick & Beckett	Fitzgerald Building	English firm
Ontario	Toronto	22217	4/9/12	Chapman & McGriffin	Public Library-Dovercourt	Doulton
Ontario	Toronto	23006	11/9/12	Darling & Pearson	Metropolitan Bank	Federal TCC
Ontario	Toronto	23714	5/29/13	Darling & Pearson	Dominion Bank	Northwestern TCC
Ontario	Toronto	24556	3/24/14	Feldman, J.	warehouse 260 Richmond	Northwestern TCC
Ontario	Toronto	23098	12/7/12	Goodyear Tire & Rubber	Goodyear Tire & Rubber	Federal TCC
Ontario	Toronto	22957	10/25/12	Gordon & Helliwell	warehouse add'n York St.	Northwestern TCC
Ontario	Toronto	24408	2/11/14	Graham, John	Ford Motor Service Bldg.	Northwestern TCC
Ontario	Toronto	24920	6/27/14	Lennox, E. J.	Excelsior Life Ins. Co.	Atlantic TCC
Ontario	Toronto	23663	5/17/13	Lempert, Leon H. & Son	Shen's Hippodrome theatre	Atlantic TCC
Ontario	Toronto	25177	9/23/14	Prack & Perrine	Wrigley Building	Federal TCC
Ontario	Toronto	23947	8/13/13	Ross & MacDonald	Royal Bank (Yonge/King)	Federal TCC
Ontario	Toronto	23040	11/21/12	Ross & MacFarlane	Central School Interior	Federal TCC
Ontario	Waterloo	28850	12/17/19	Sharp & Homer	Mutual Life Assur. (addn)	Doulton
Quebec	Montreal	22058	2/27/12	Bostrom, R. E.	McGill St. Building	Atlantic TCC
Quebec	Montreal	24305	1/12/14	Brown & Vallance	store Catherine St./Dom.Sq	Atlantic TCC
Quebec	Montreal	24527	3/17/14	Graham, John	Ford Motor Service Bldg.	South Amboy TCC
Quebec	Montreal	24557	3/31/14	Hoyle & Davis	Bank of Toronto	Atlantic TCC
Quebec	Montreal	23605	4/30/13	Rea, Kenneth	Guarantee Building	Doulton
Quebec	Montreal	22892	10/9/12	Weschelberger, J.	Western Apartments	English
Saskatchewan	Moose Jaw	23894	7/25/13	Rea, Kenneth	Royal Bank of Canada	Atlantic TCC
Saskatchewan	Regina	24382	2/4/14	Ross & MacDonald	Hotel Qu'Appelle	Atlantic TCC
Saskatchewan	Saskatoon	22727	8/2/12	Fingland, William	dept. store 3rd Ave & 21st	St. Louis TCC
Saskatchewan	Saskatoon	22574	7/18/12	James Chisholm & Son	Canada Building	St. Louis TCC

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Illustrations



1.1 Bust of Roman emperor, Hampton Court Palace, Middlesex (1515-20). From Stratton, Terracotta Revival.



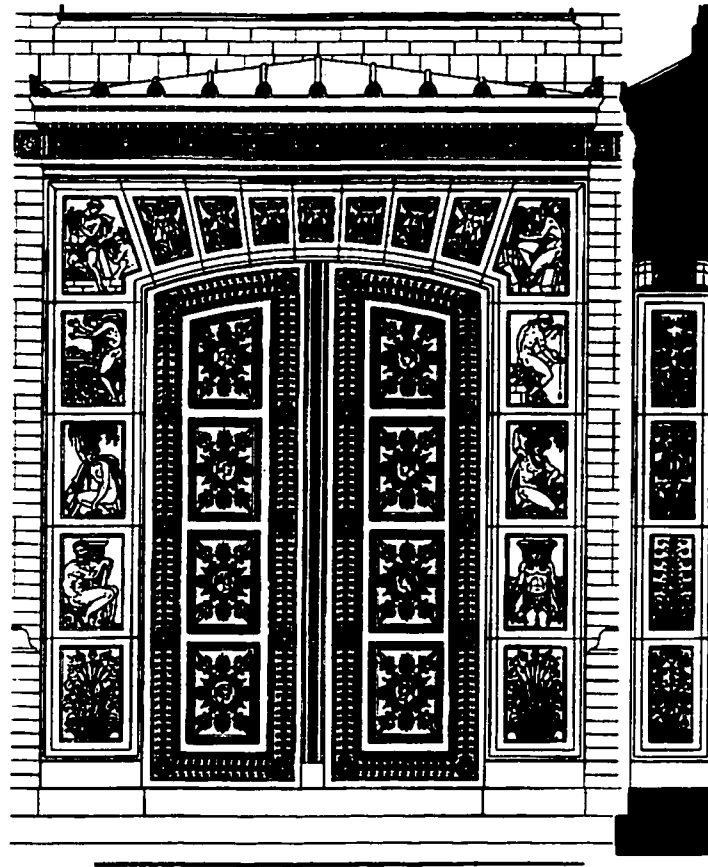
1.2 Enamelled polychrome terra cotta by Luca della Robbia (c. 1442). From Pope-Hennessy, Luca della Robbia.



1.3 Detail of terra cotta surround, St. Stephen's Church at Lever Bridge, Lancashire (1842-45). From Jolley, "Edmund Sharpe & the 'Pot' Churches", in Architectural Review.



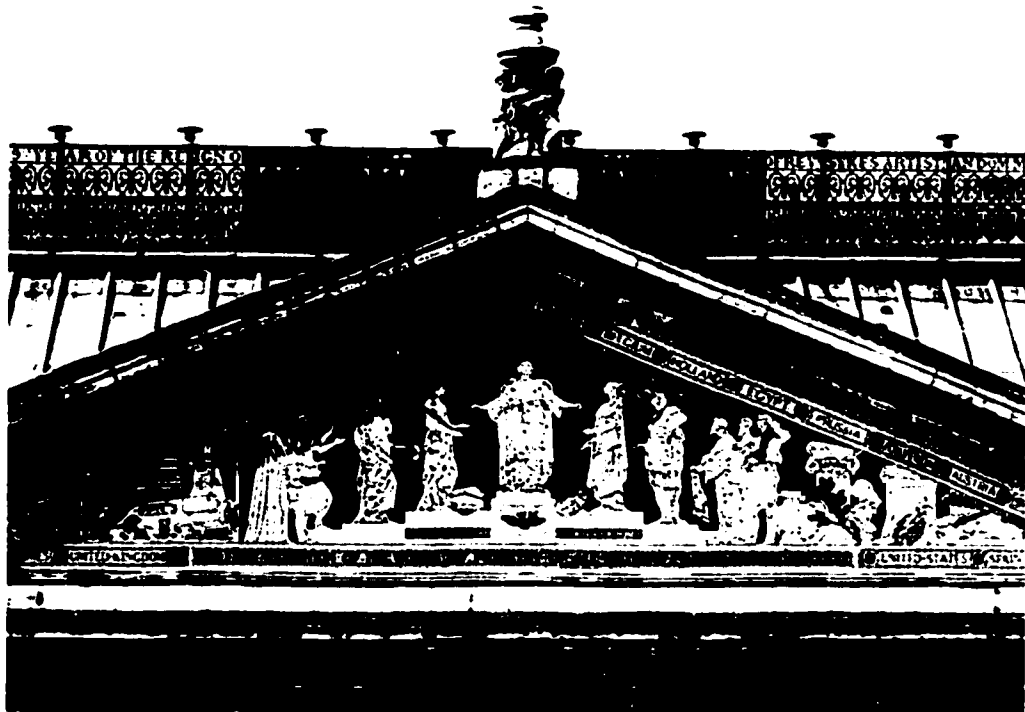
1.4 Church and Little Cloister, Certosia di Pavia (1478), Italy.
From Mars, Brickwork in Italy.



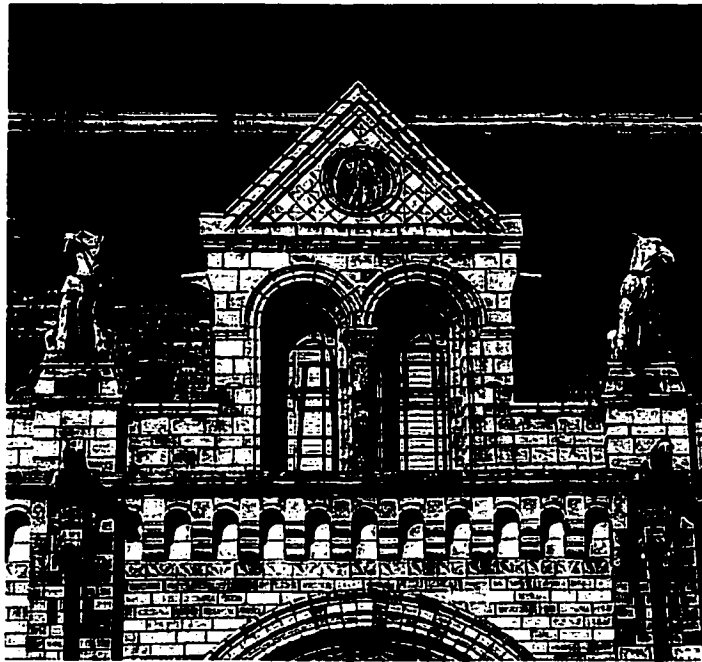
1.5 Terra cotta allegorical panels surrounding bronze doors of Bauakademie (1831-36), Berlin. From Bergdoll, Karl Friedrich Schinkel.



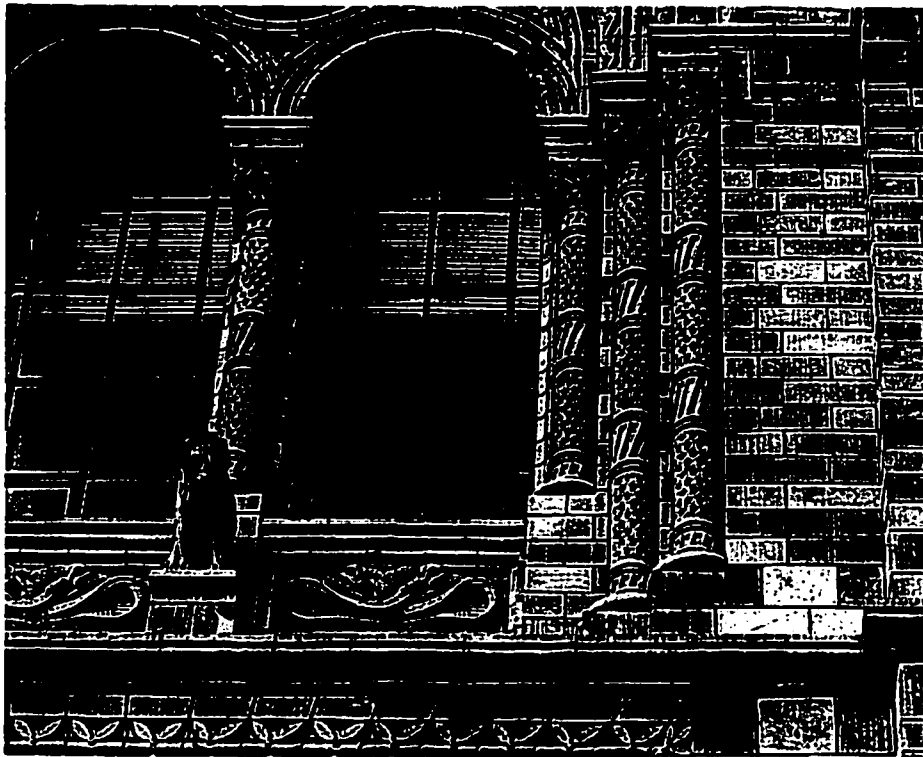
1.6 Lecture Theatre Block, Victoria and Albert Museum (1864-66), South Kensington, London. From Stratton, Terracotta Revival.



1.7 Detail, Pediment of Victoria and Albert Museum (1864-66).
From Barnard, The Decorative Tradition.



1.8 Extinct animal figures on cornice of Natural History Museum (1873-81), South Kensington, London. From Stratton, Terracotta Revival.



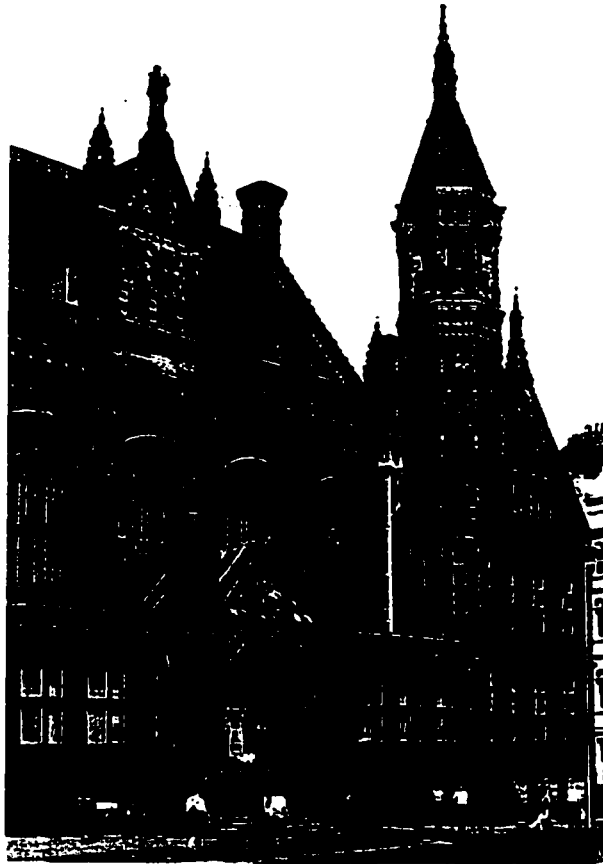
1.9 Detail of coloumn patterns and zoological figures, Natural History Museum (1873-81), London. From Girouard, Alfred Waterhouse and the Natural History Museum.



1.10 Wedgwood Memorial Institute (1863-73), Burslem, Staffordshire, showing one of Blanchard's "Months" panels (above) and one of Blashfield's "Process" panels (below). From Stratton, Terracotta Revival.



1.11 Prudential Assurance Co. Head Office (1878 block on left; 1897-1901 extension on right), Holborn, London. From Stratton, Terracotta Revival.



1.12 (a) Assize (Victoria Law) Courts (1887-91), Birmingham.
From Stratton, Terracotta Revival.



1.12 (b) Detail of Queen Victoria statue over Law Courts entrance (1887-91), Birmingham. From Stratton, Terracotta Revival.



1.13 52 Cadogan Square (1886), Cadogan Estate, Chelsea, London. From Stratton, Terracotta Revival.



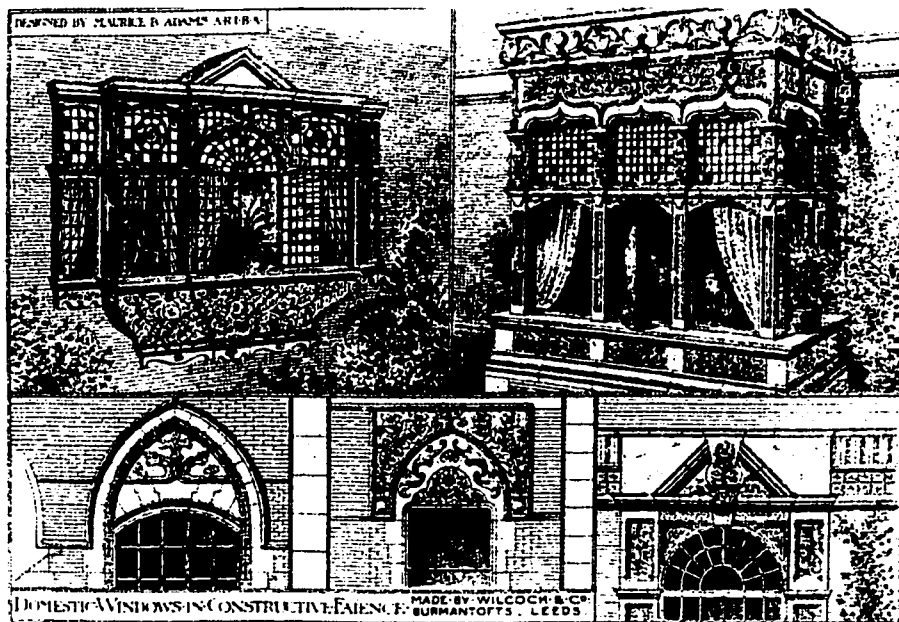
1.14 104-8 and 109-11 Mount Street (1885-90), Mayfair, London.
From Stratton, Terracotta Revival.



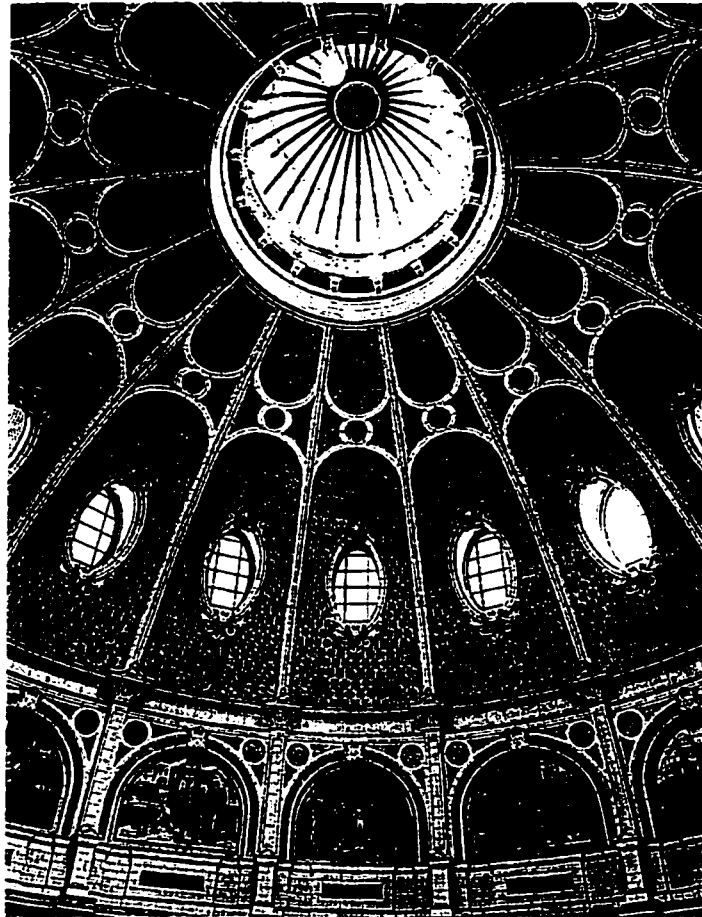
1.15 Detail of terra cotta ornament surrounding entrance of 128 Mount Street (1886-88), Mayfair, London. From Stratton, Terracotta Revival.



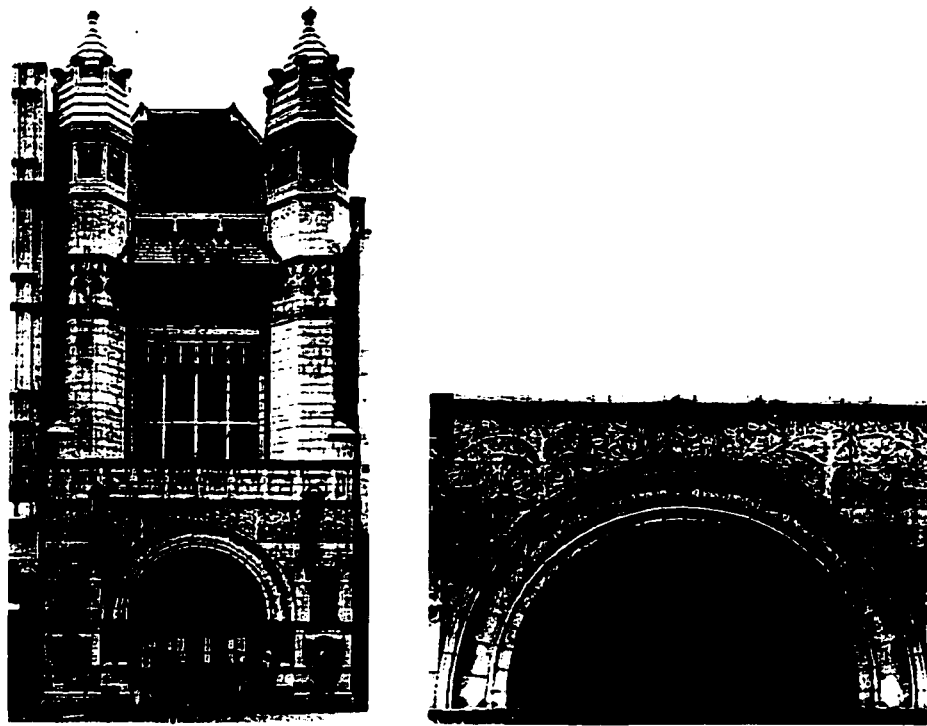
1.16 “Sons of Cydippe” (cc. 1884) by George Tinworth. From Stratton, Terracotta Revival.



1.18 Faience designs by Maurice B. Adams in 1882 catalogue of Wilcock & Co., Burmantofts, Leeds. From Barnard, The Decorative Tradition.



1.19 Polychrome faience in Birkbeck Bank interior (1895), London. From Stratton, Terracotta Revival.



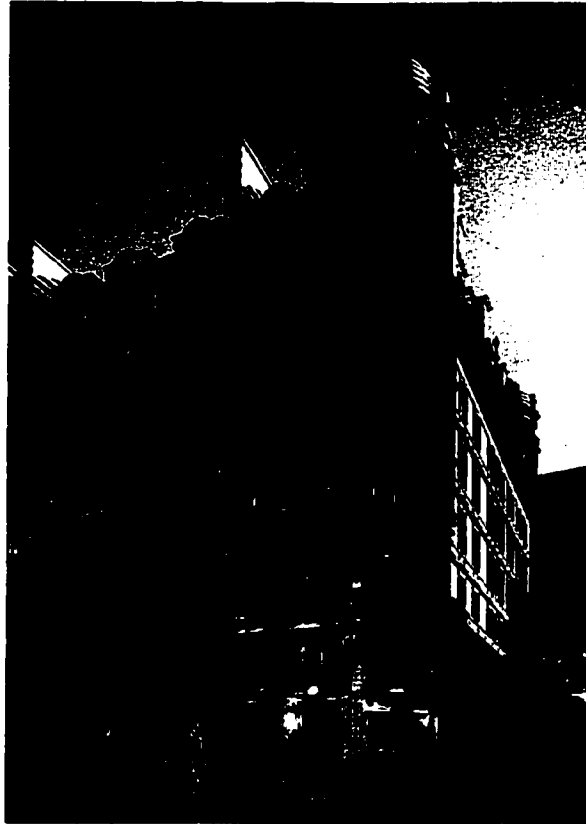
1.20 Bishopsgate Institute (1892-4), London, with detail of frieze.
From Stratton, Terracotta Revival.



1.21 Debenham House (1905-07), London. From Stratton,
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1.22 The Everard Printing Works (1901-02), Bristol, showing detail of Gutenberg at his press. From Stratton, Terracotta Revival.



1.23 Savoy Hotel (1904-5), Strand, London. From brochure by
Hathenware Ceramics Ltd.



1.24 Salutation Inn (1902), Birmingham. From Stratton,
Terracotta Revival.



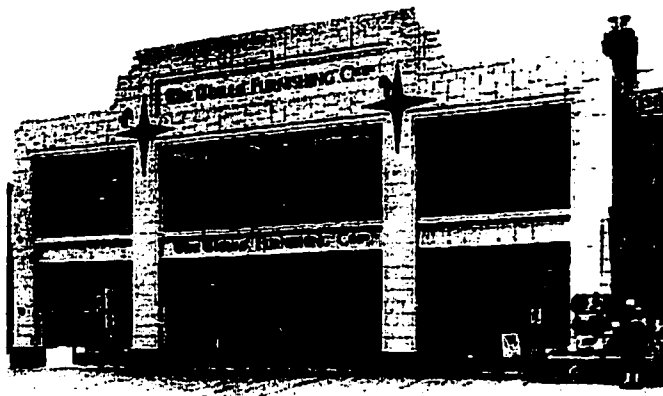
1.25 Piccadilly Circus Station (1906), London. From Stratton, Terracotta Revival.



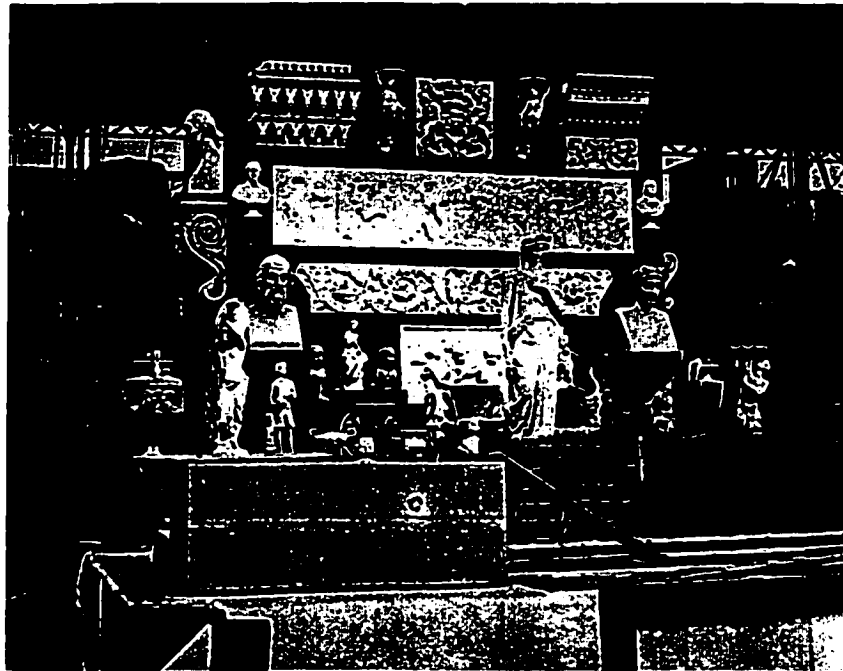
1.26 Hackney Empire Theatre (1901), London. From Stratton, Terracotta Revival.



1.27 Carlton Cinema (1928), Upton Park, London. From Stratton, Terracotta Revival.



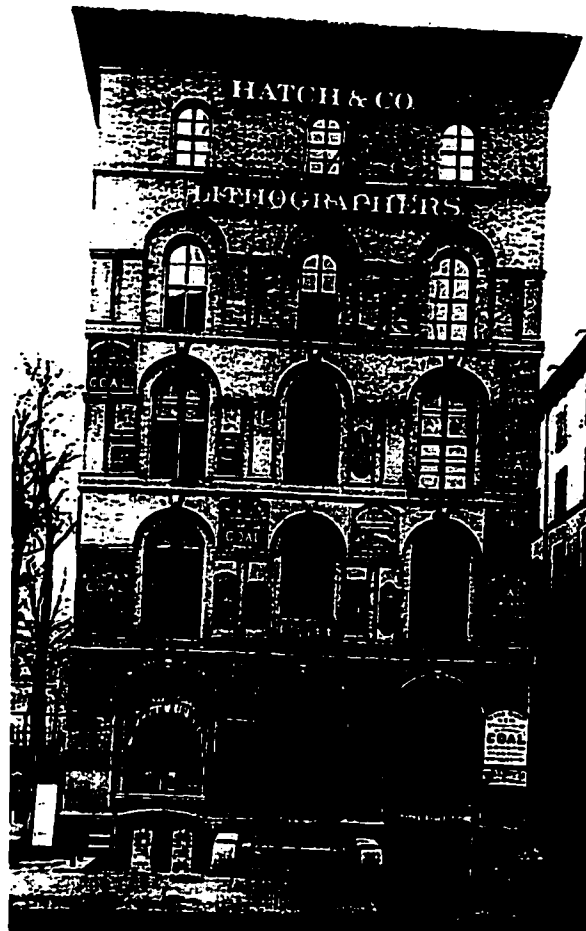
1.28 The Times Furnishing Company store (1926), Ilford, Essex.
From Stratton, Terracotta Revival.



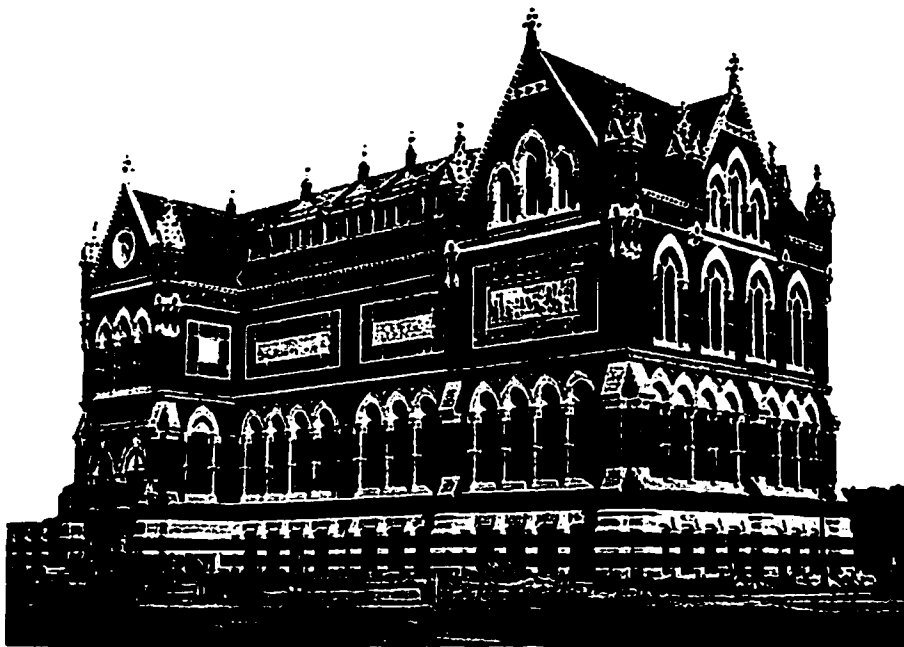
1.30 John Blashfield (on left) in his booth at the 1862 Exhibition. From Floyd, "A Terra-Cotta Cornerstone for Copley Square: Museum of Fine Arts, Boston, 1870-1876, by Sturgis & Brigham", JSAH.



2..1 Coade Stone chimeny piece, The Octagon House (1799), Washington, D.C. From Neblett, "A Search for Coade Stone in America", in APT.



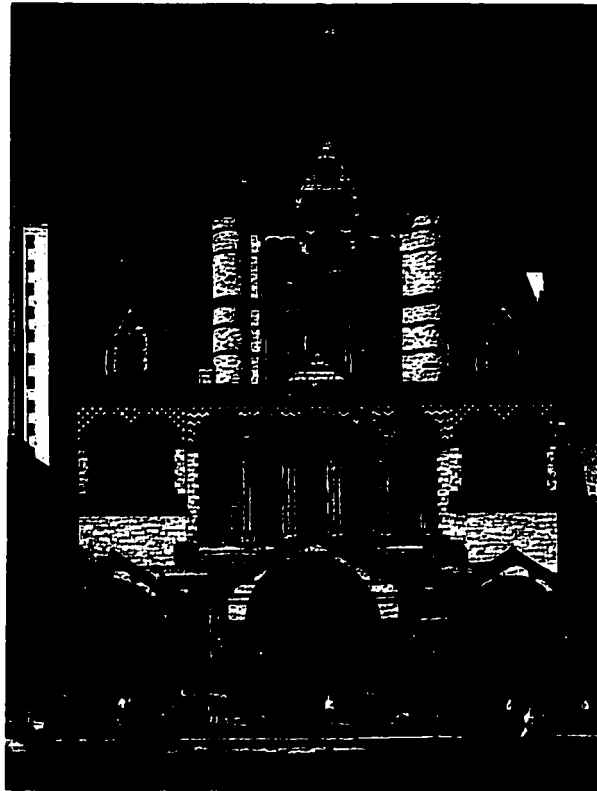
2.2 Trinity Building (1851-53), New York. From Tunick, Terra-cotta Skyline.



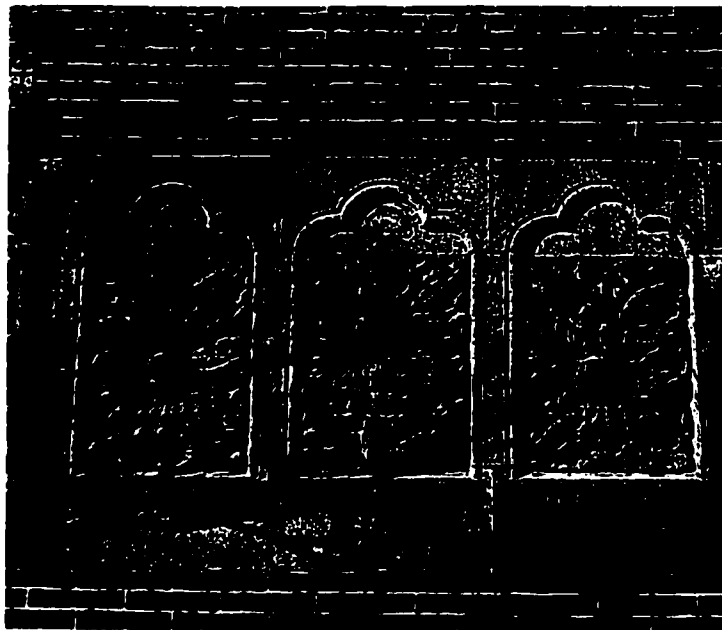
2.3 Boston Fine Arts Museum (1870-76), north elevation. From Stratton, Terracotta Revival.



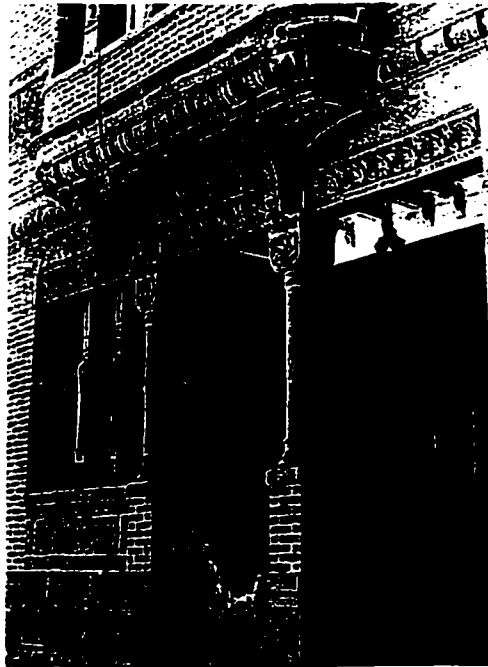
2.4 Detail, portion of north elevation of Boston Fine Arts Museum (1870-76). From "An Early Example of the Use of Terra Cotta in America" in The Brickbuilder.



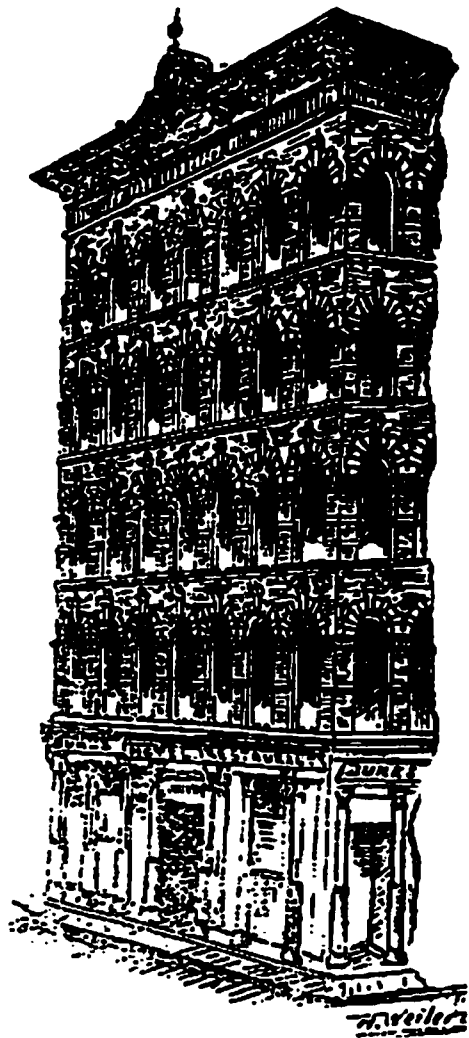
2.5 Trinity Church (1872-77), Copley Square, Boston. From O'Gorman, Living Architecture: A Biography of H. H. Richardson.



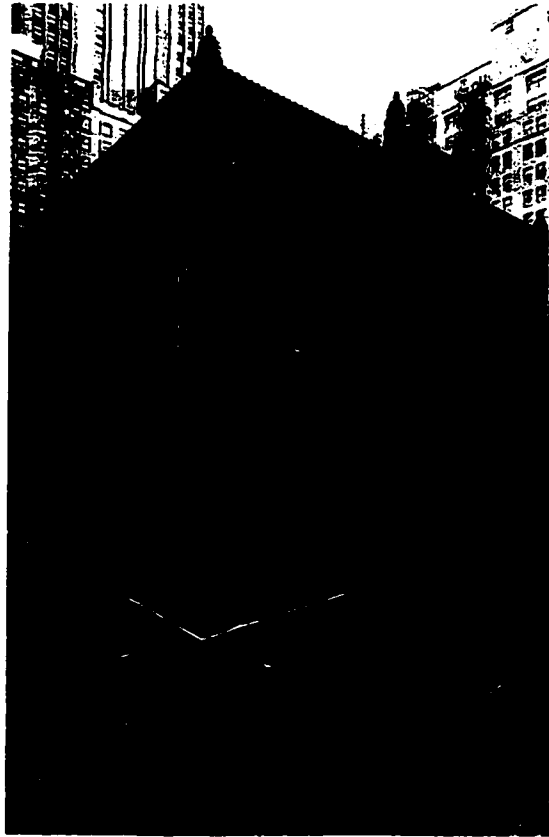
2.6 Detail of crafted brick panels on south chimney of Trinity Church Rectory, Boston. From Floyd, H. H. Richardson: A Genius for Architecture.



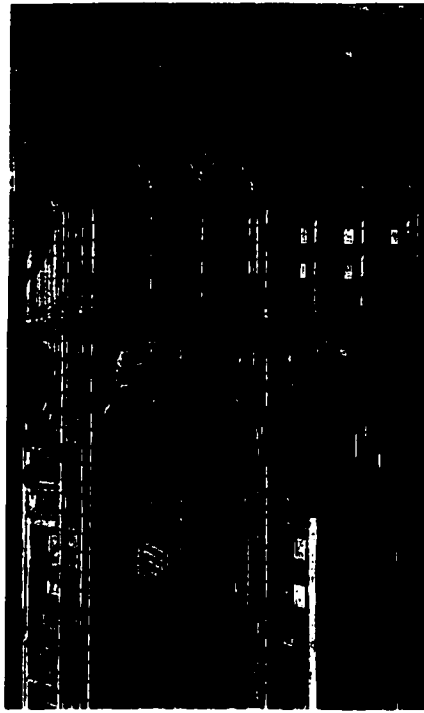
2.7 Porch of residence, Commonwealth Ave. and Gloucester Sts. (1881-82), Boston. From Stratton, Terracotta Revival.



2.8 Burke's European Hotel (c. 1872), Chicago. From Taylor, "Architectural Terra-Cotta No. 9", in The Clay Worker.



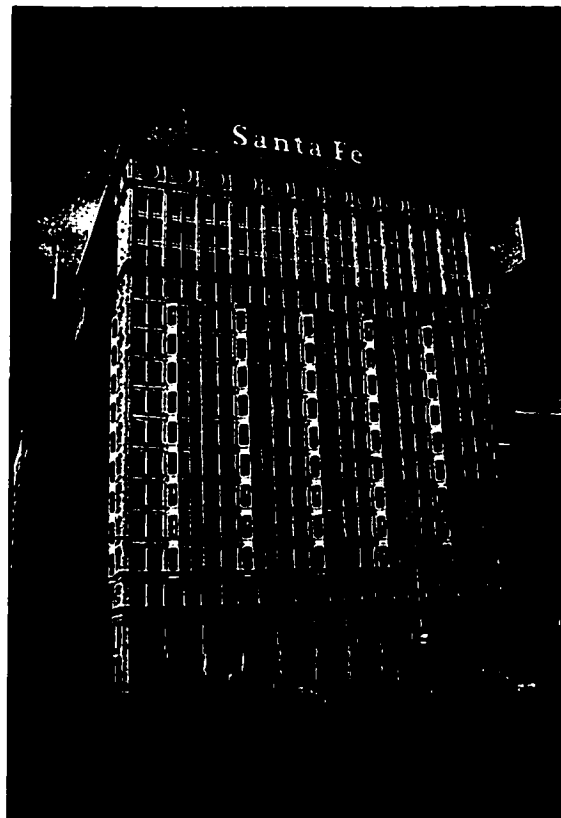
2.9 The Rookery Building (1886-87), Chicago. From Elia, Louis Henry Sullivan.



2.10 Fisher Building (1895-96), Chicago. From Zukowsky, Chicago Architecture 1872-1922.



2..11 Wainwright Building (1890-91), St. Louis, Missouri. From Elia,
Louis Henry Sullivan.



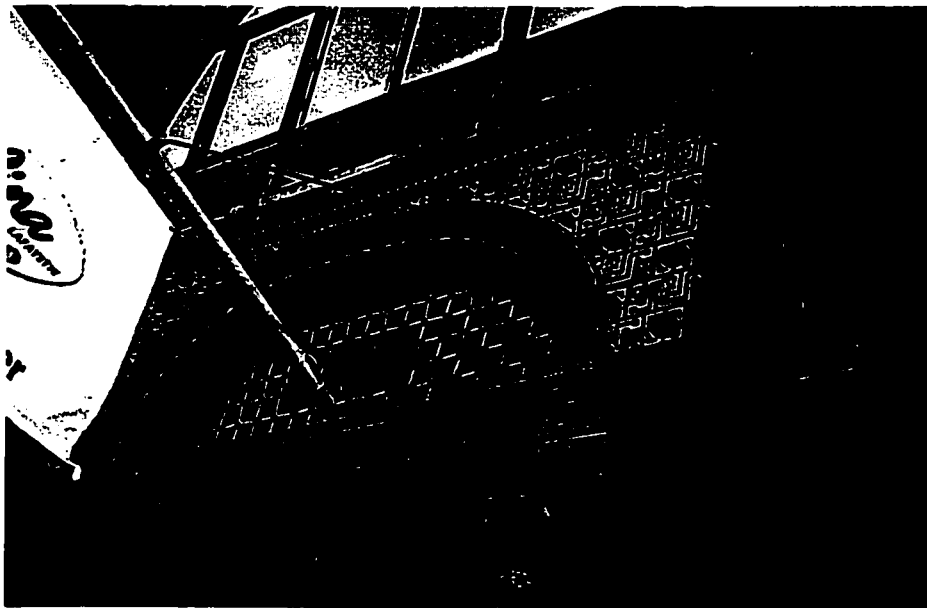
2.12 Railway Exchange Building (1904) (now Santa Fe Center), Chicago. From Darling, Architectural Terra Cotta in Chicago.



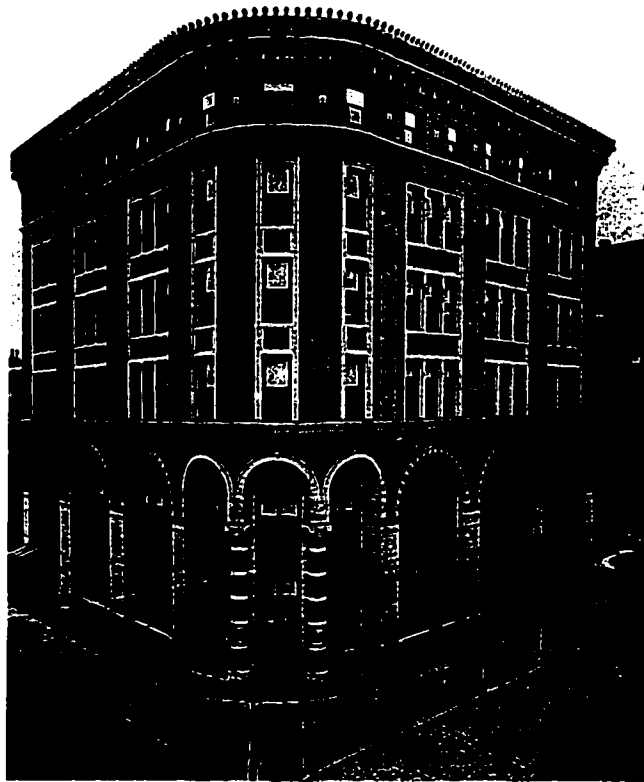
2.13 New York Produce Exchange Building (1881-85), New York City.
From Landau, "Arcaded Buildings of the New York School, c. 1870-90",
in In Search of Modern Architecture.



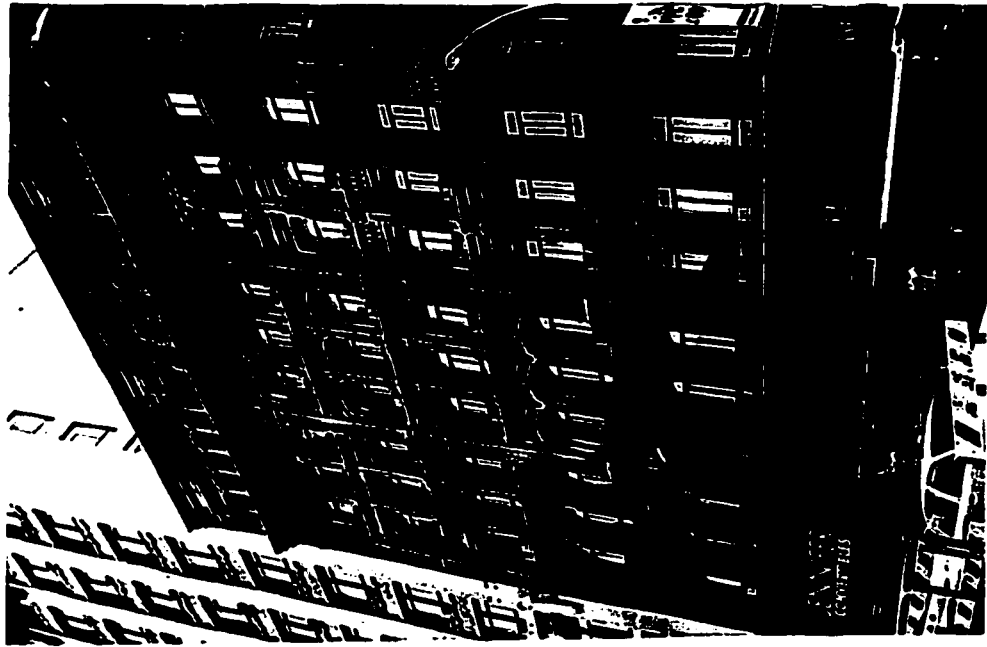
2.14 (a) De Vinne Press Building (1885-86), New York City. From Landau, "Arcaded Buildings of the New York School, c. 1870-90", in In Search of Modern Architecture..



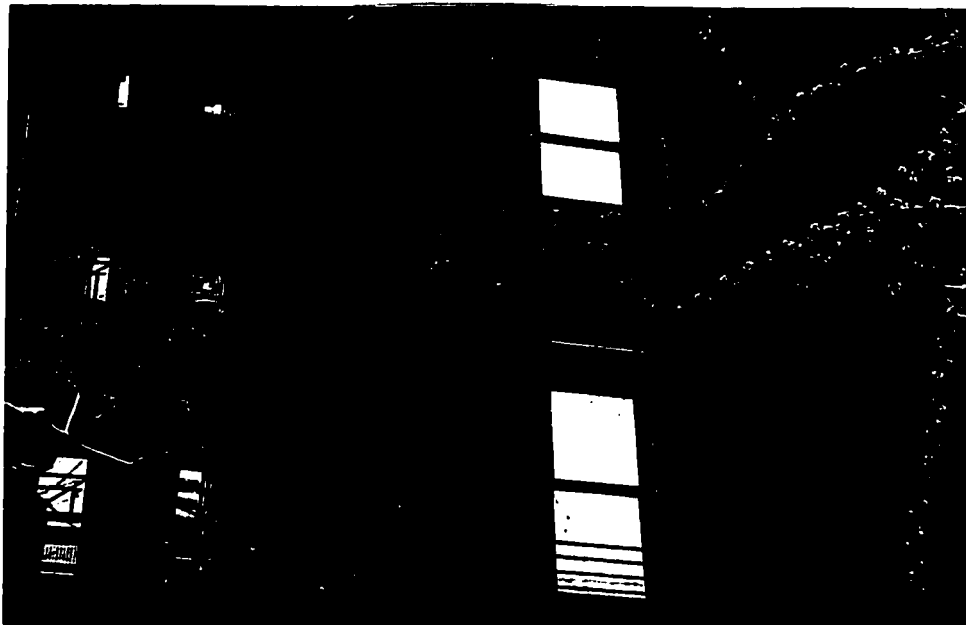
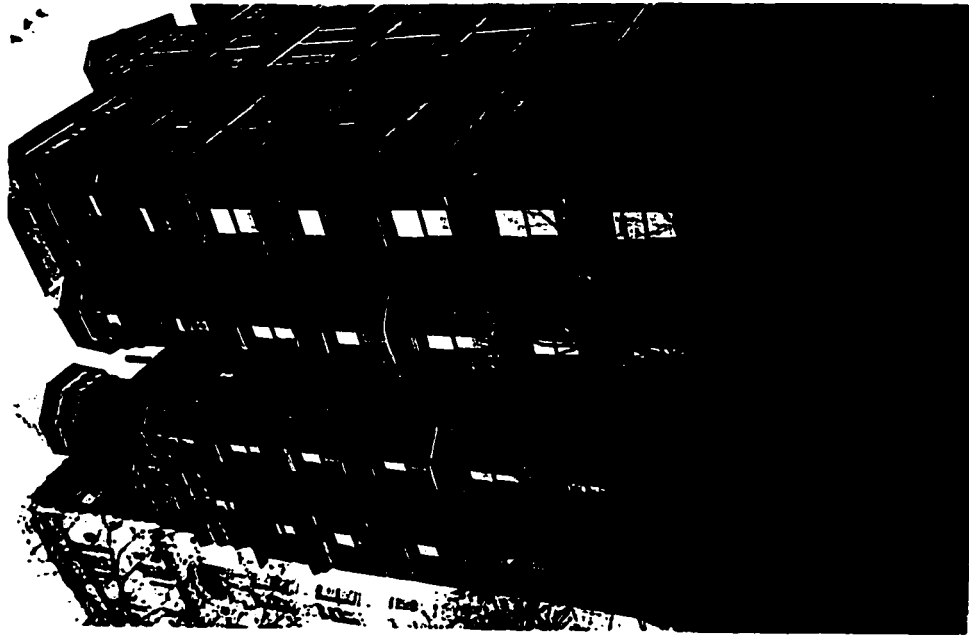
2.14 (b) Detail of entrance of De Vinne Press Building (1885-86), New York City. Photo by author.



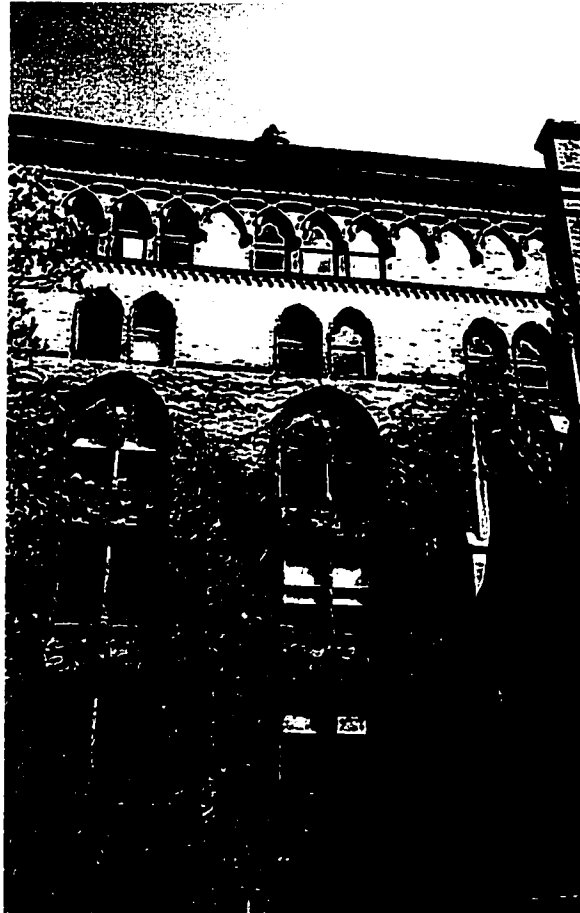
2.15 Goelet Building (1886-87), New York City. From Roth, McKim, Mead & White Architects.



2.16 Astor Place (1881), New York (above), with detail of terra cotta heads as keystones and other ornament (below). Photos by author.



2.17 The Gramercy (1882-3), New York City, with detail of terra cotta panels. Photos by author.



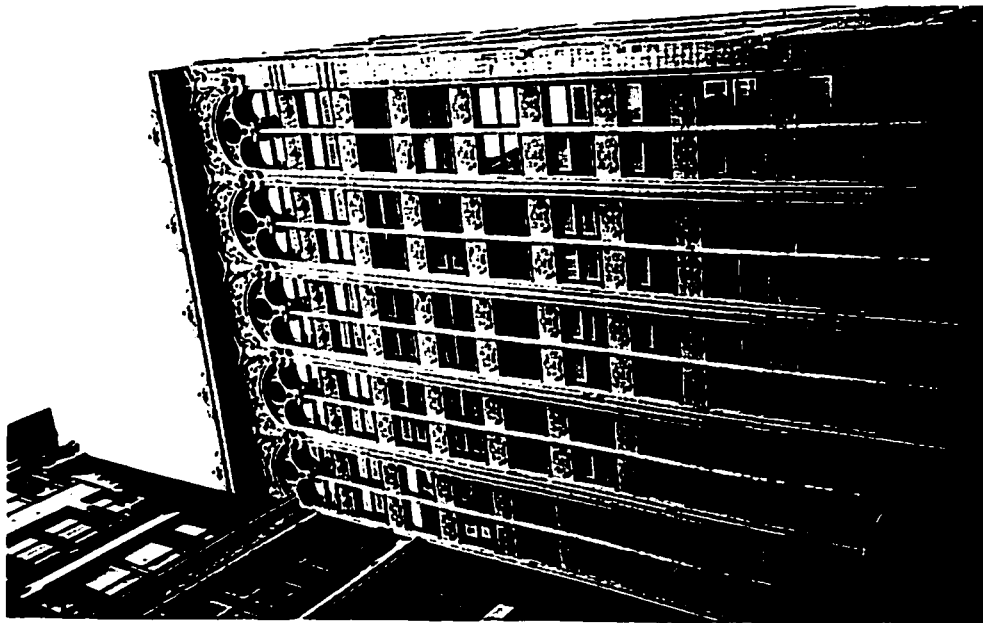
2.18 808 Broadway (1887-88), New York, showing terra cotta cornice and Gothic terra cotta ornament on windows below. Photo by author.



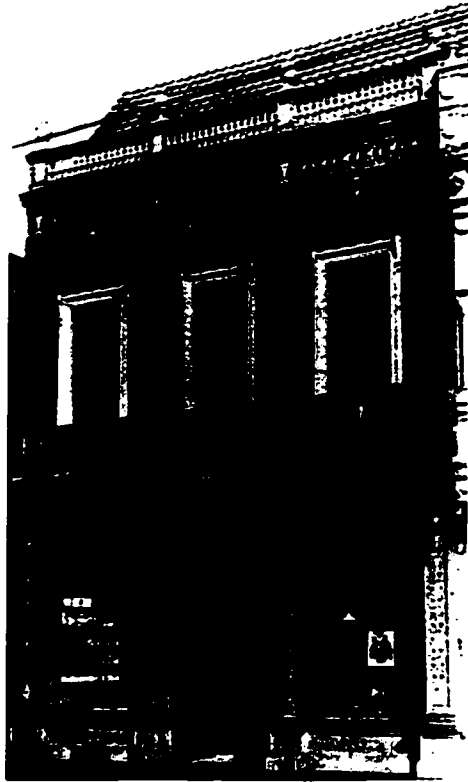
2.19 Madison Square Gardens (1887-95), New York City. From Kidney, The Architecture of Choice: Eclecticism in America 1830-1930.



2.20 Judson Memorial Church (1883-93) and Tower (1895-96), New York, with detail of base. Photos by author.



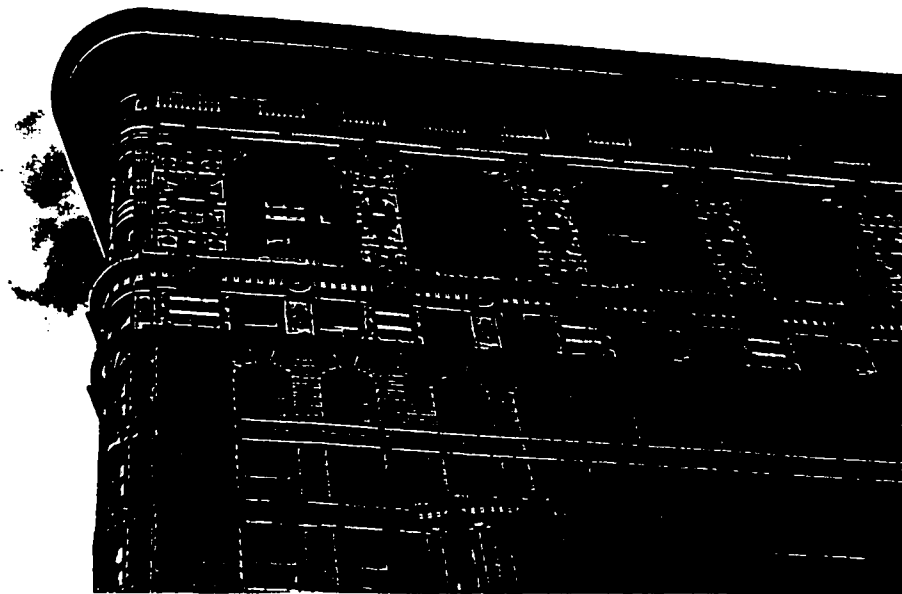
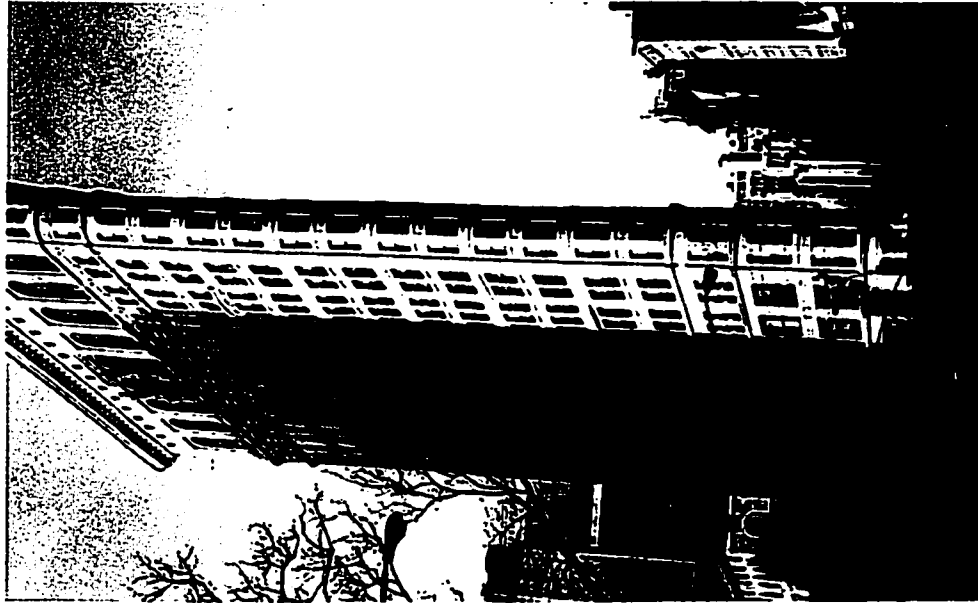
2.21 Bayard Building (1897-98), New York, with detail of lions' heads and angels below cornice. Photos by author.



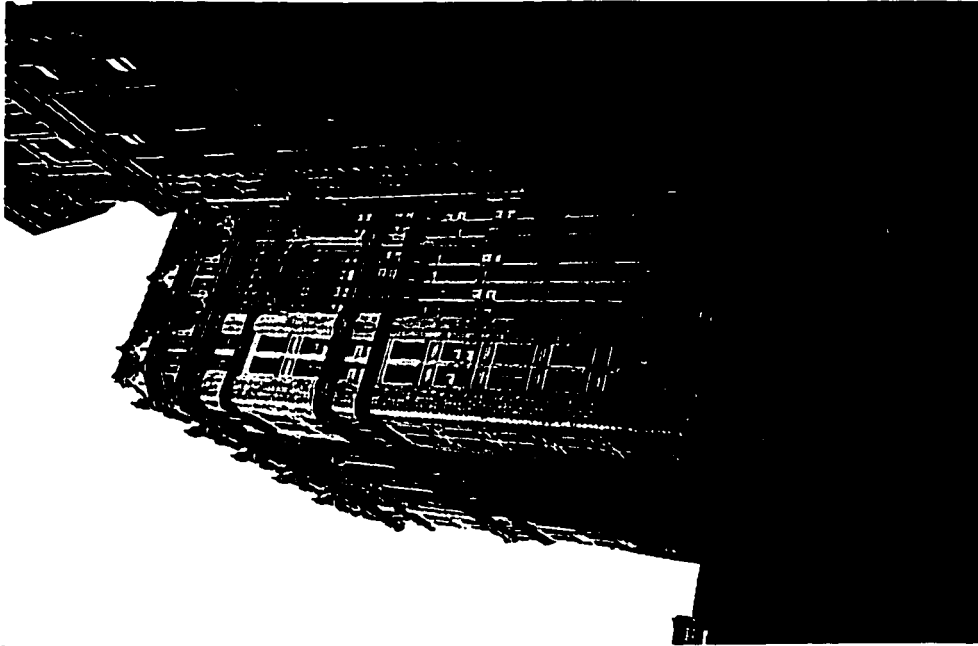
2.22 The Kelly & McLinden hardware store (1898), Perth Amboy, New Jersey. From Tunick, Terra-Cotta Skyline.



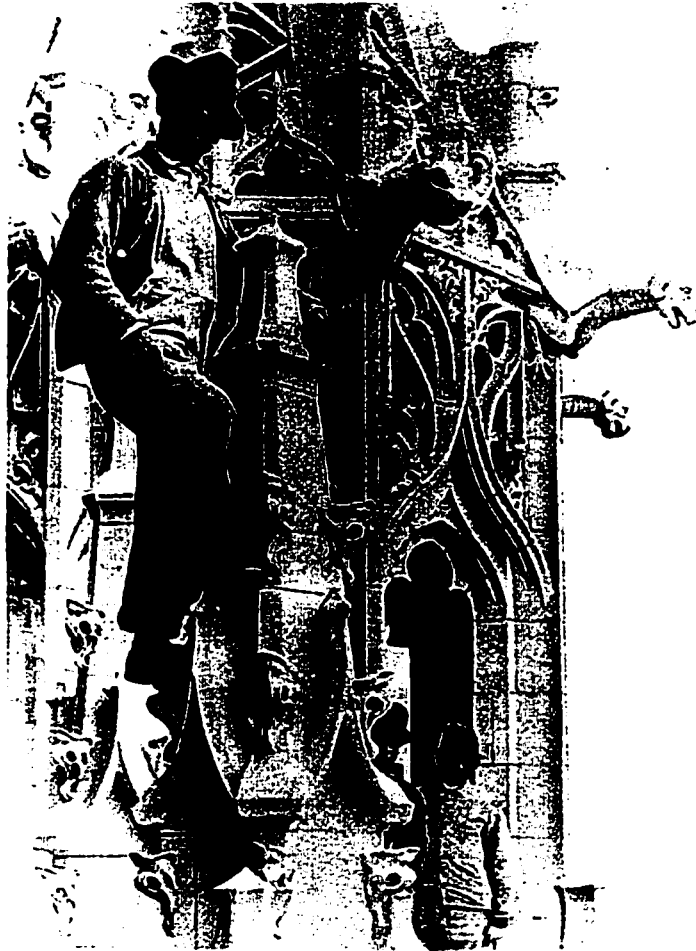
2.23 Madison Square Presbyterian Church (1903-06), New York. From Laurence, Color in Architecture.



2.24 Flatiron Building (1901-03), New York, with detail. Photos by author.



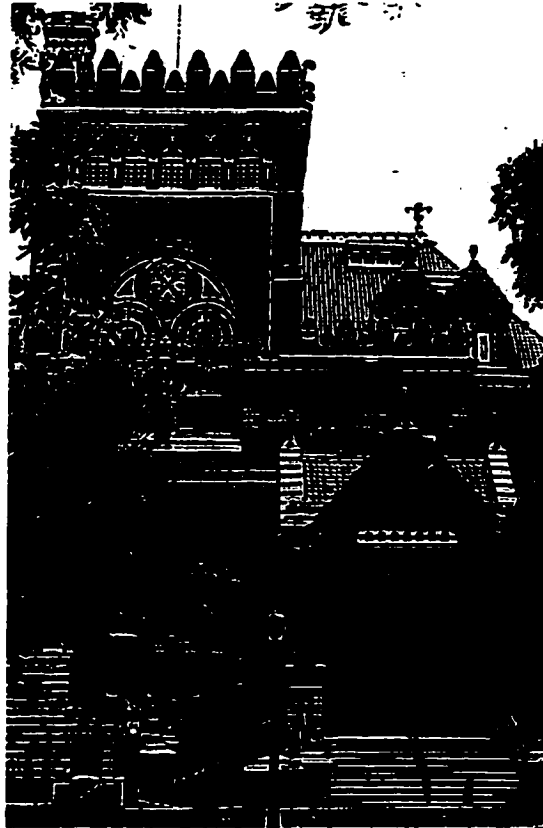
2.25 Emmet Building (1912), New York, with detail of base. Photos by author.



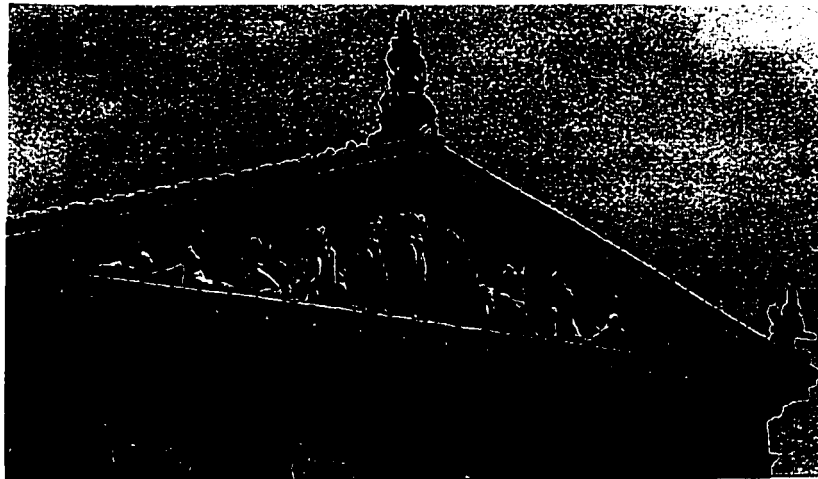
2.26 Woolworth Building (1910-13), New York, with workmen. From Tunick, Terra-Cotta Skyline.



2.27 Gramercy House (1929-30), New York, detail of turquoise, yellow and blue geometric terra cotta band. Photo by author.



2.28 Furness Building (1888-90), Philadelphia. Fron Stratton, Terracotta Revival.



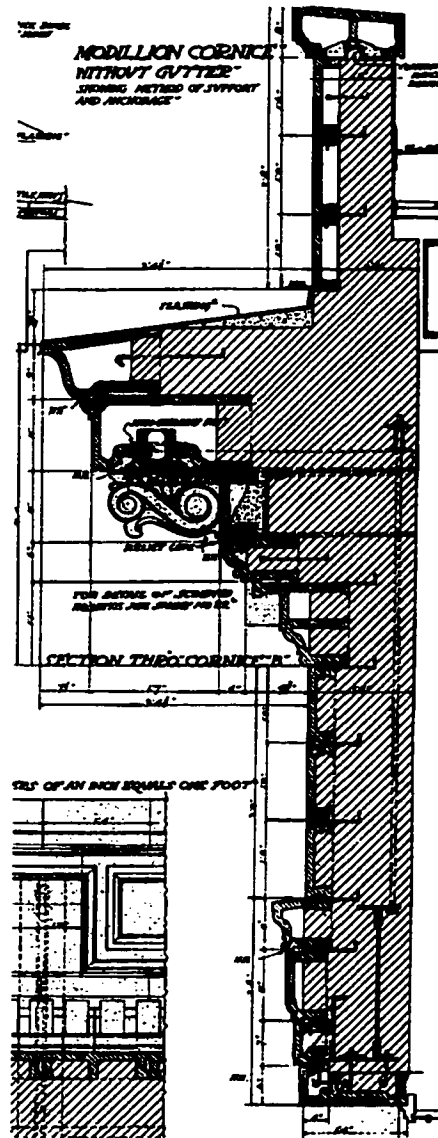
2.29 Philadelphia Museum of Art (1922-33), showing detail of polychrome sculpture in pediment, north wing. From Stratton, Terracotta Revival.



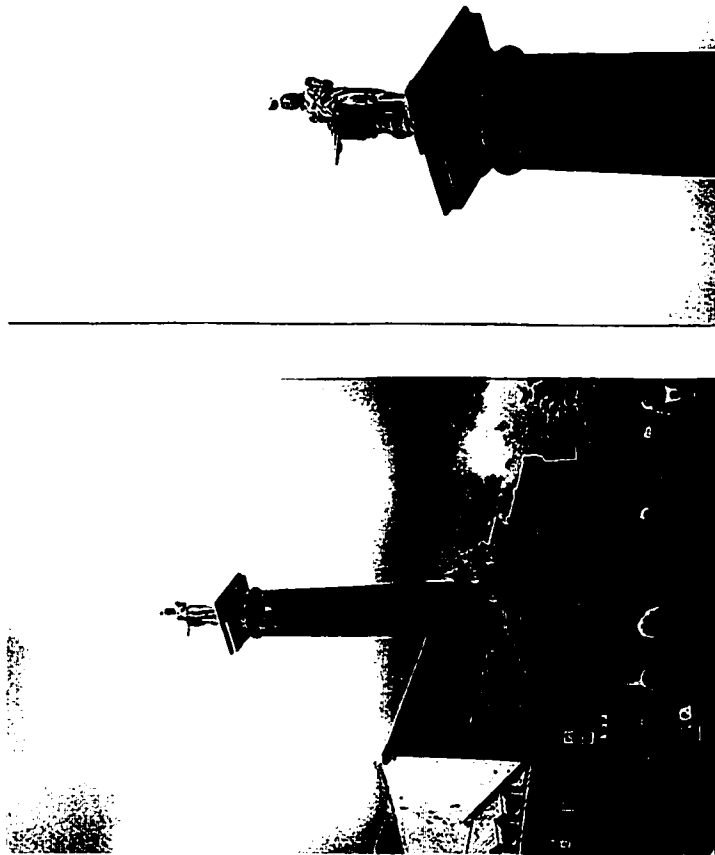
2.31 Portrait of James Taylor (c. 1885), “the Father of American Terra Cotta.” From Tunick, Terra-cotta Skyline.



2.32 Portrait of Petter McGill McBean, born in Lancaster, Ontario, Canada, one of the founders of Gladding, McBean & Co. From Geer, Story of Terra Cotta.



2.33 Example of method of support and anchorage. From National Terra Cotta Society, Architectural Terra Cotta Standard Construction, 1927, in Boston Valley Terra Cotta brochure.



3.1 Nelson Monument (1808-09), Jacques Cartier Square, Montreal, with detail of figure of Nelson. Photos by author. (Depicts fibreglass replace of original Coade Stone figure.)



3.2 Bank of Montreal (1818-19), Montreal. From Lafrance, "Coade Stone in Canada", in APT.



a.



b.



c.



d.

3.3 Coade Stone plaques, Bank of Montreal (1818-19), Montreal.
a. Agriculture. b. Commerce. c. Arts & Manufactures. d. Navigation.
From Lafrance, "Coade Stone in Canada", in APT.



3.4 Portrait of architect George F. Durand (1850-89), c. 1888. From Tausky & DiStefano, Victorian Architecture in London and Southwestern Ontario: Symbols of Aspiration.



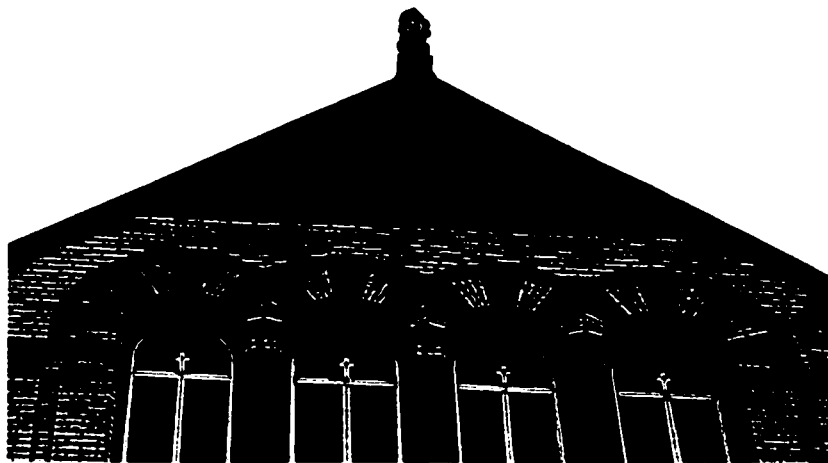
3.5 Oakwood (Cronyn residence) (1880-82), London, Ontario, detail of panels. Photo by author.



3.6 Endiang (Labatt residence) (1882-4), London, Ontario. From Illustrated London.



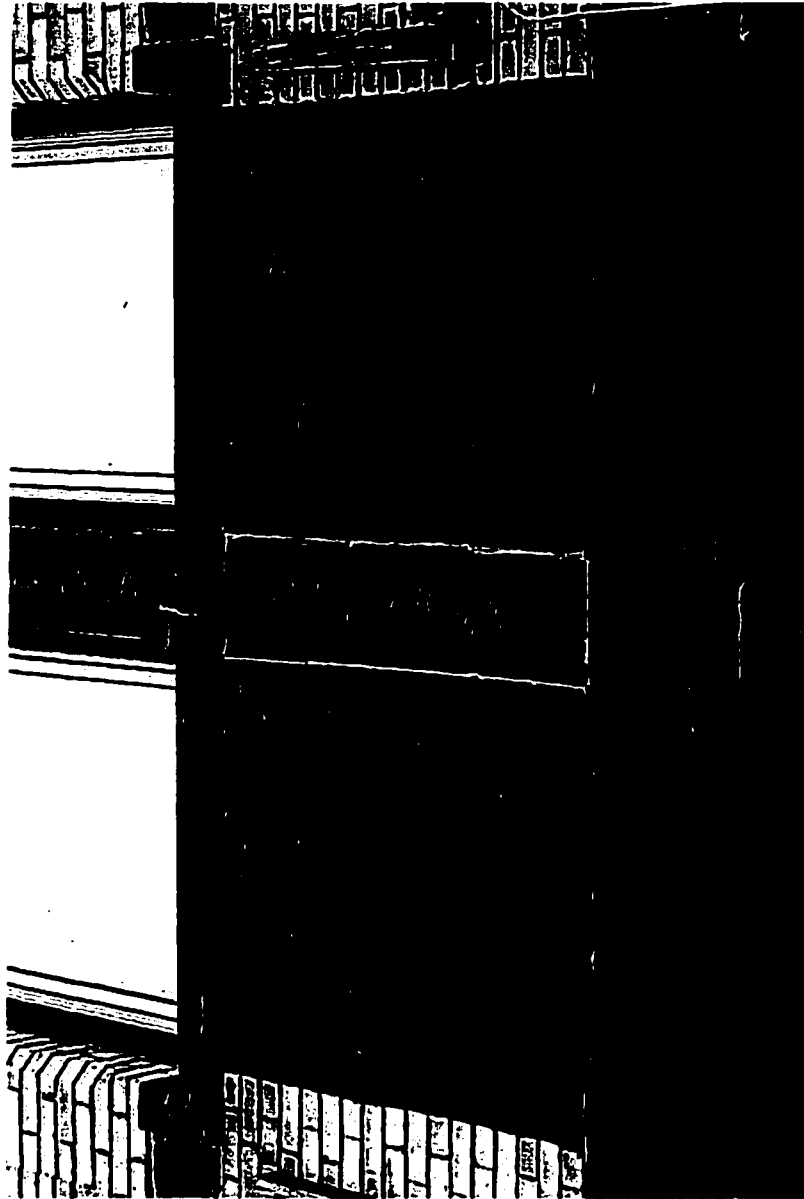
3.7 Rushton Hall (Wiser residence) (c. 1880-84), Prescott, Ontario.
Courtesy of Grenville County Historical Society, Prescott, Ontario.



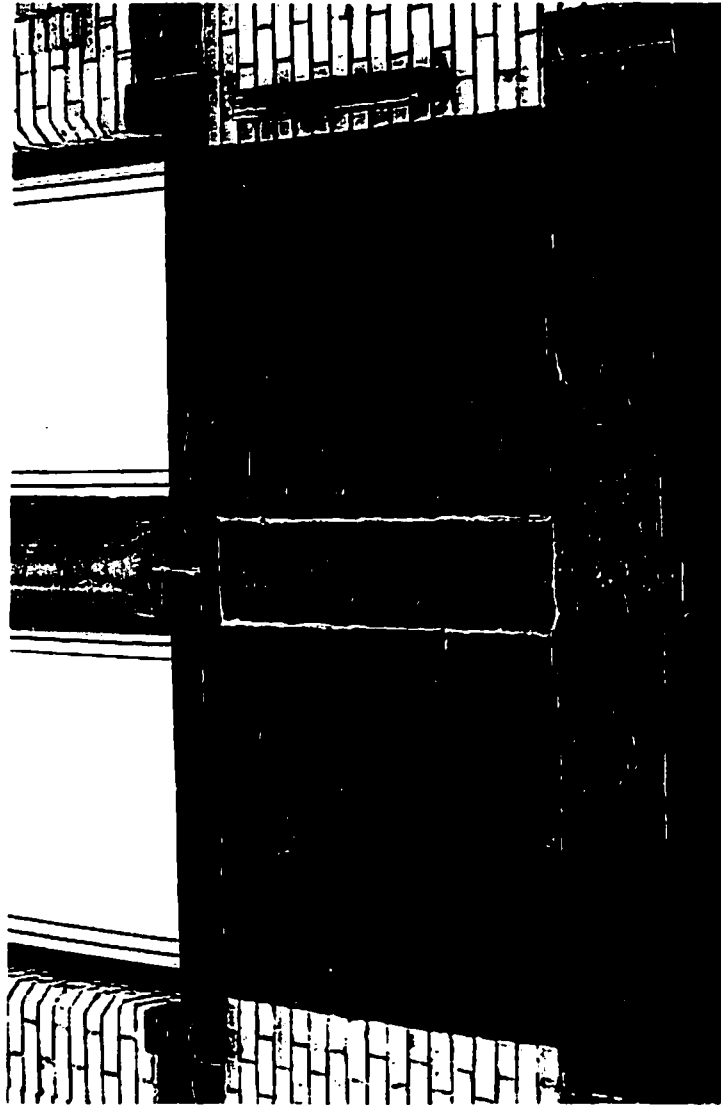
3.8 Perth County Court House (1885-87), Stratford, Ontario, with detail of terra cotta pediment in central gable. Photos by author.



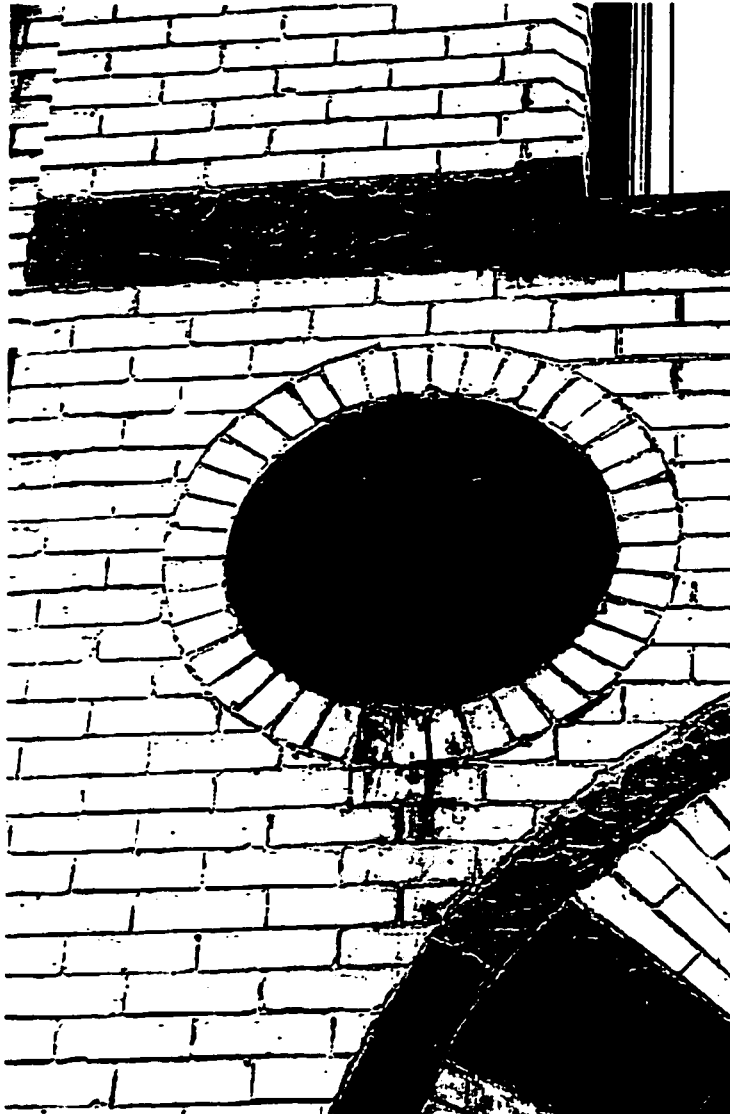
3.9 Arts and Manufacture Panels, Perth County Court House. Photo by author.



3.10 Panels representing Justice, Perth County Court House. Photo by author.



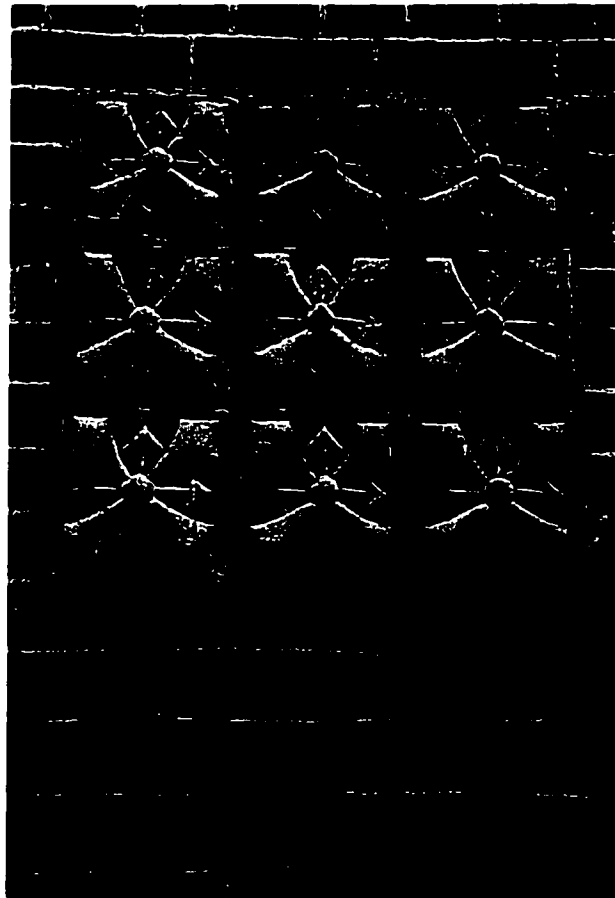
3.11 Panels representing Agriculture and Architecture, Perth County Court House. Photo by author.



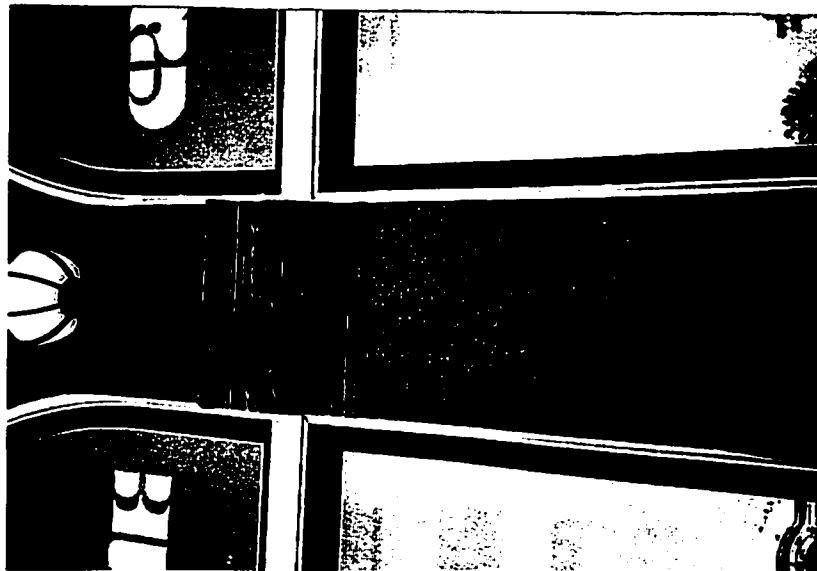
3.12 Terra cotta roundel containing a hand giving benediction, Perth County Court House. Photo by author.



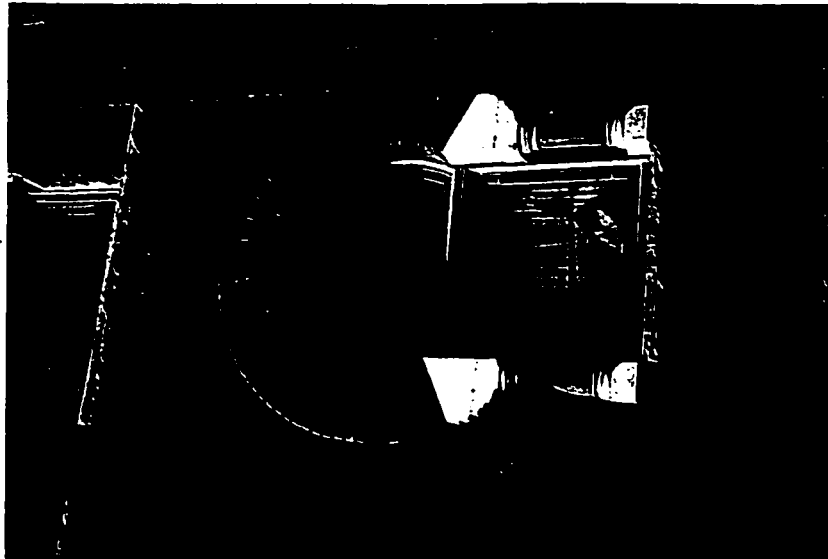
3.13 Stratford City Hall (1898-99), Stratford, Ontario. Photo by author.



3.14 Detail of ornamental panel, Cartier Square Drill Hall (1879-82),
Ottawa. Photo by author.



3.15 Central Chambers Building (1890-91), Ottawa, details of entrance with voussoirs of alternating terra cotta and sandstone (above), and terra cotta panel with sunflower motif. Photos by author.



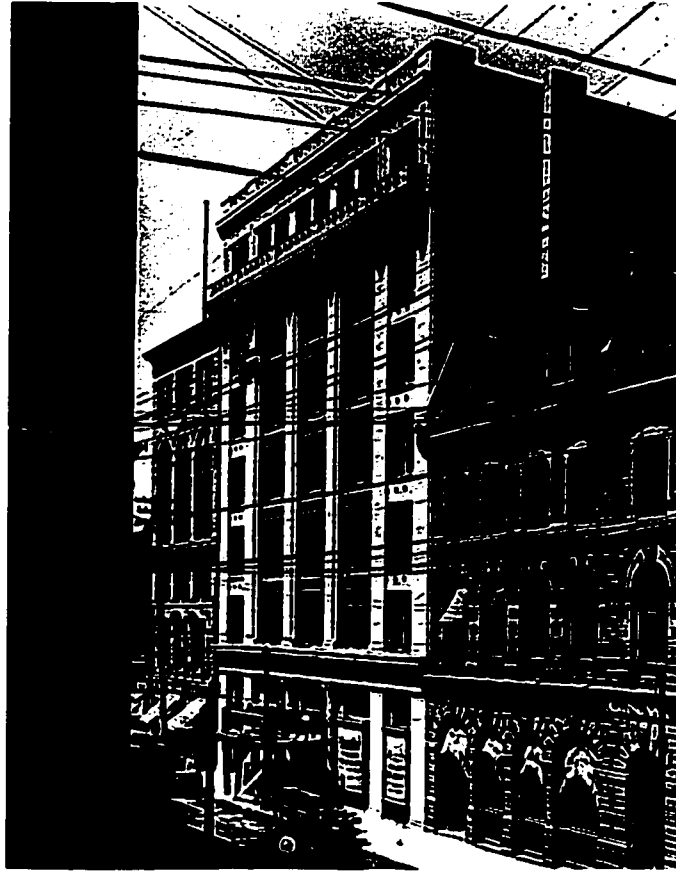
3.16 Hollywood Parade (1893), Ottawa (above), with detail of terra cotta tiles, marble, granite, and stained glass. Photos by author.



3.17 (a) Canada Life Assurance Co. (Saxe) Building (1909-10), Ottawa.
From Construction, May, 1913.



3.17 (b) Detail of glazed terra cotta ornament, ground floor of Can. Life Assurance Co. (Saxe) Building, Ottawa. Photo by author.



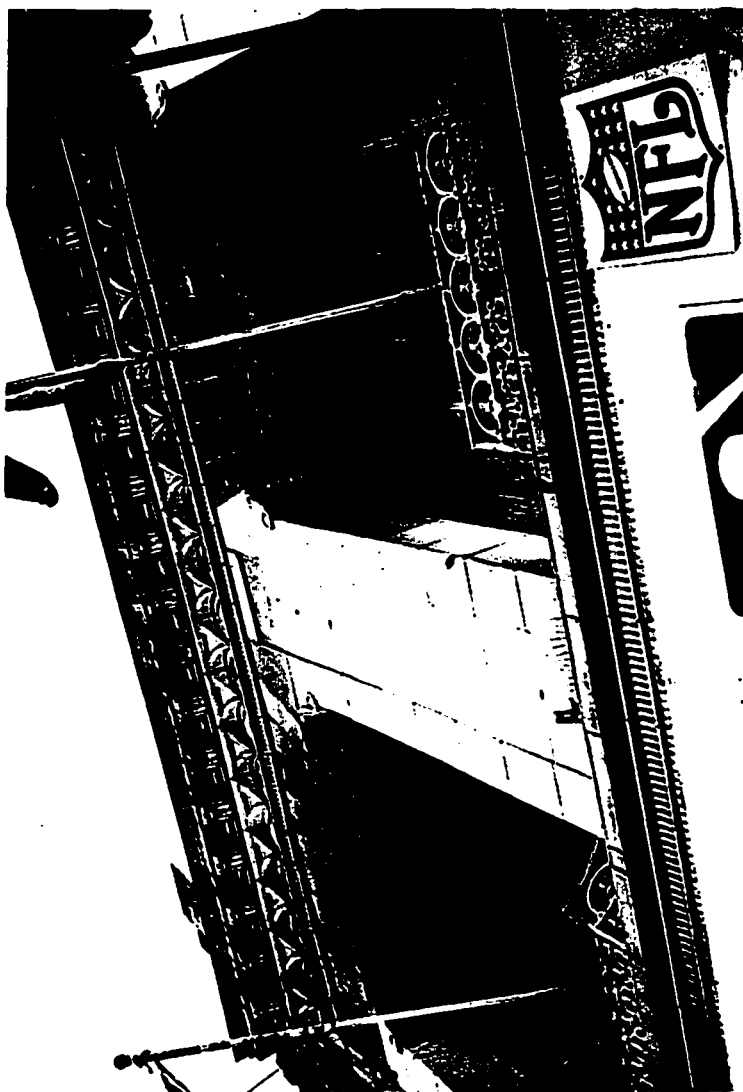
3.18 Former Birks (Rosenthal) Building (1910-11), Ottawa. National Archives, William Topley Collection, PA42816.



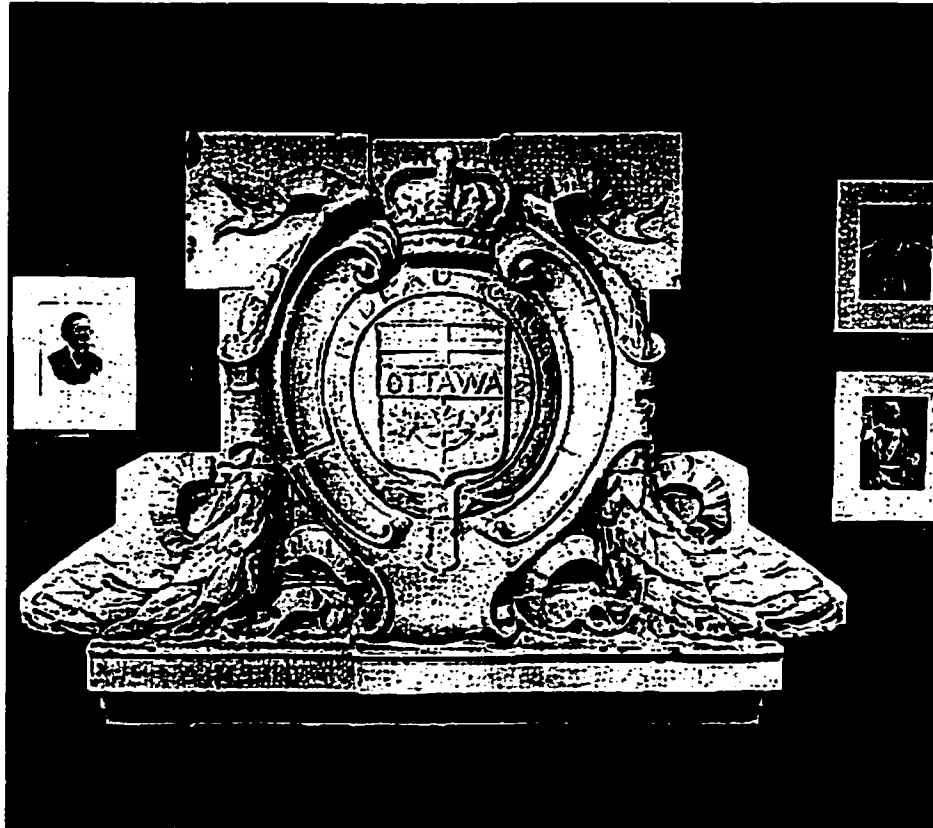
3.19 (a) Hope Building (1910), Ottawa, with glazed terra cotta statue of "Hope" made by Doulton & Co. Photo by author.



3.20 (a) Former Bowles Lunch Building (c. 1916-17), Ottawa. National Archives, William Topley Collection.



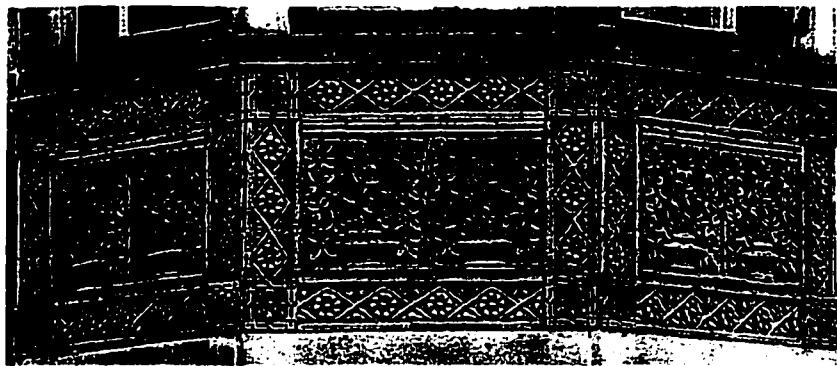
3.20 (b) Detail of blue and buff glazed terra cotta tiles on underside of lintels and cornice, former Bowles Lunch Building, Ottawa. Photo by author.



3.21 Terra cotta crest that once adorned the entrance of the Rideau Club (1911), Ottawa, saved from the fire. From Lynch, Up From the Ashes.



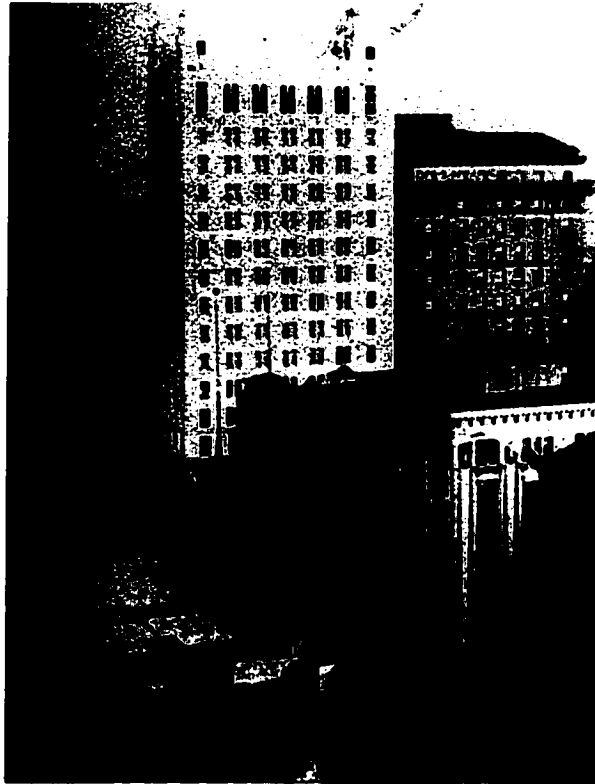
3.22 Carved sandstone on Toronto City Hall (1890-99), Toronto, Ontario, showing face of E. J. Lennox (centre). From Litvak, Edward James



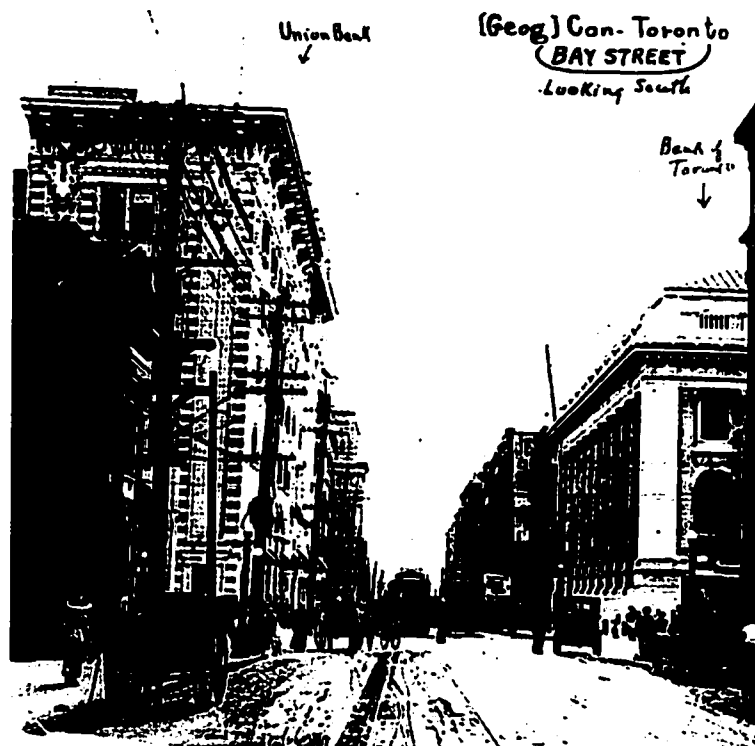
3.23 Terra cotta panels under bay windows of Lailey residence (1884).
Toronto. From Maitland, The Queen Anne Revival Style in Canadian
Architecture.



3.24 John Kay & Son Store (1898), Toronto. National Archives, F. Micklethwaite Collection, RD000345.



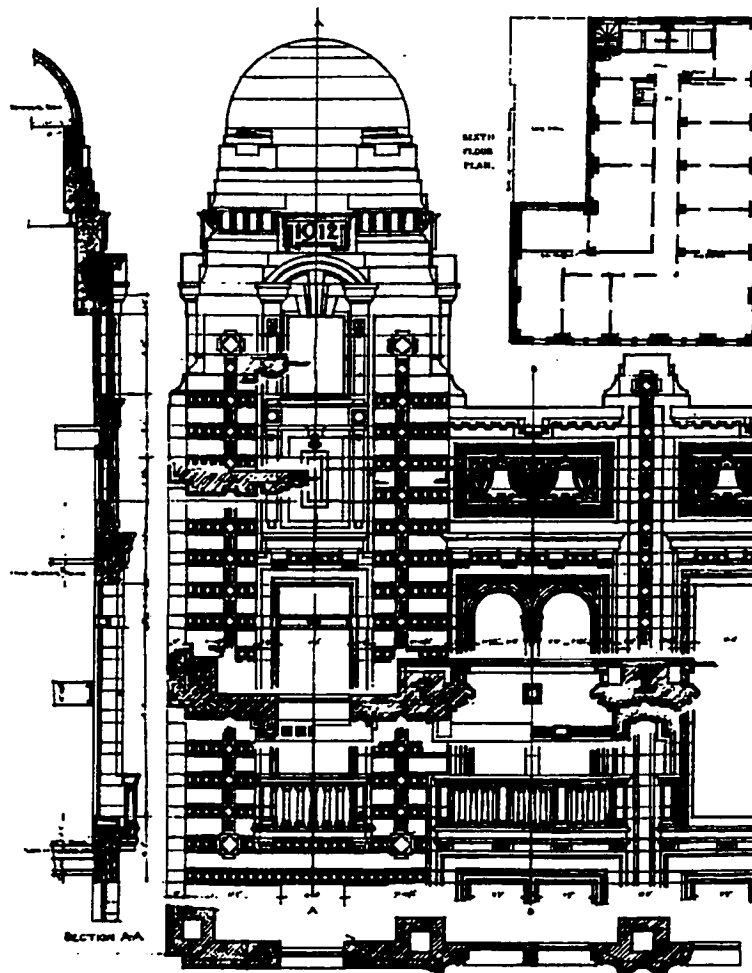
3.25 Standard Bank (1909), Toronto, in foreground, righthand corner. Canadian Pacific Railway Building and Traders' Bank in background. From TRAC, Terra Cotta Artful Deceivers.



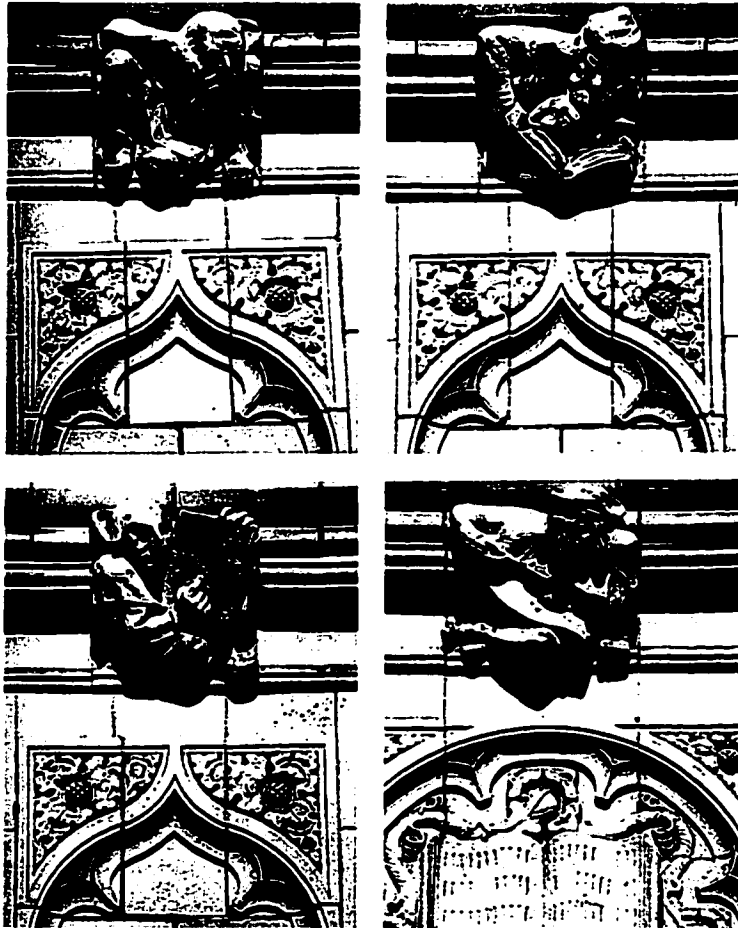
3.26 Union Bank (1910), (on left), Toronto, 1911 photo. From TRAC, Terra Cotta Artful Deceivers.



3.27 Canadian Pacific Railway (CPR) Building (1911-13) (on left),
Toronto. National Archives, Peake & Whittingham Collection, PA60392.



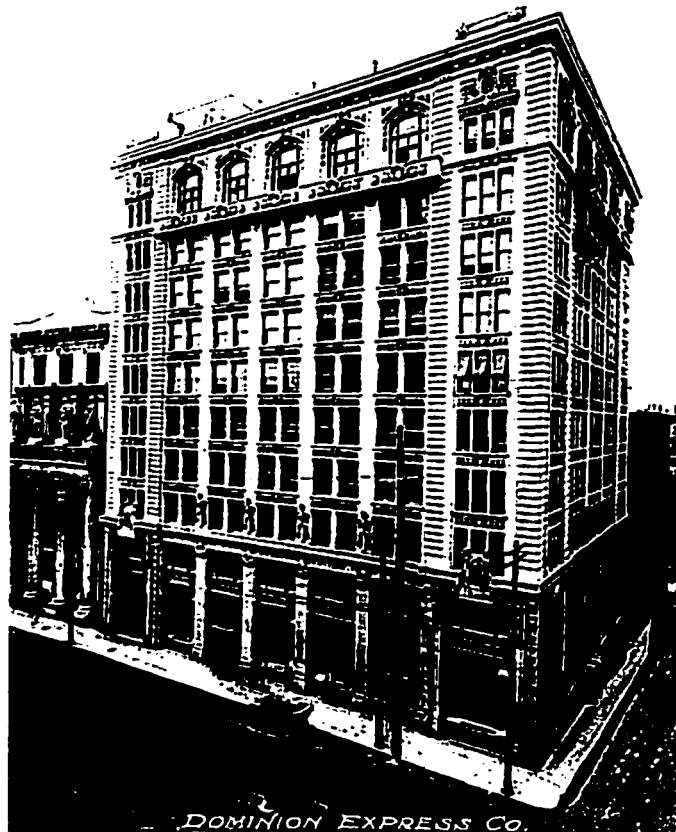
3.28 CPR Building, Toronto, detail of 15th storey and above. Drawing from Construction, August, 1913.



3.29 Methodist Book & Publishing Co. (1913-16), Toronto, detail of terra cotta medieval scribes. From TRAC, Terra Cotta Artful Deceivers.



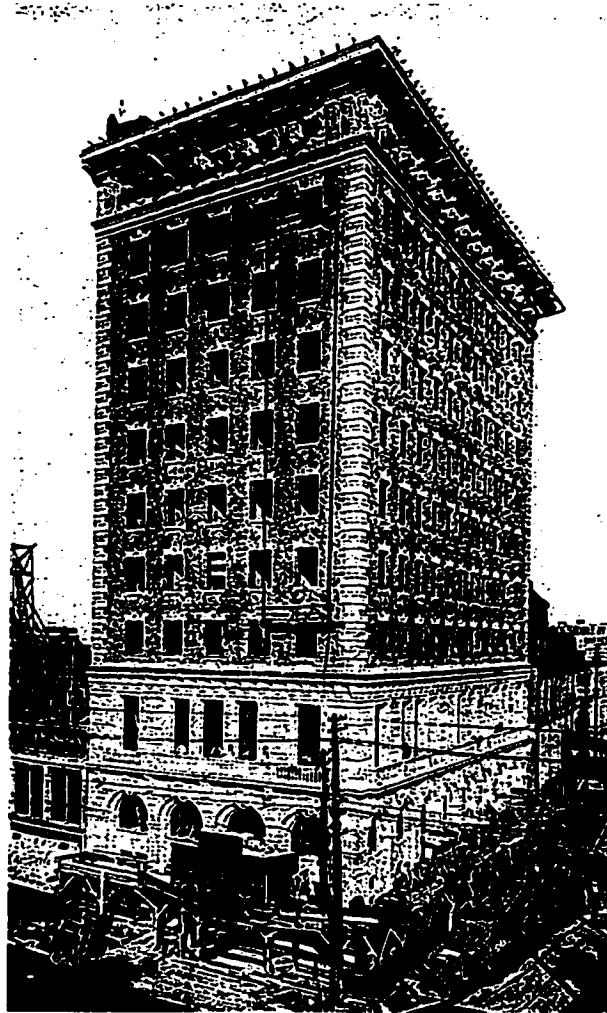
3.30 New York Life Insurance Co. Building (1887-88), Montreal.
National Archives, Albertype Co., PA45937.



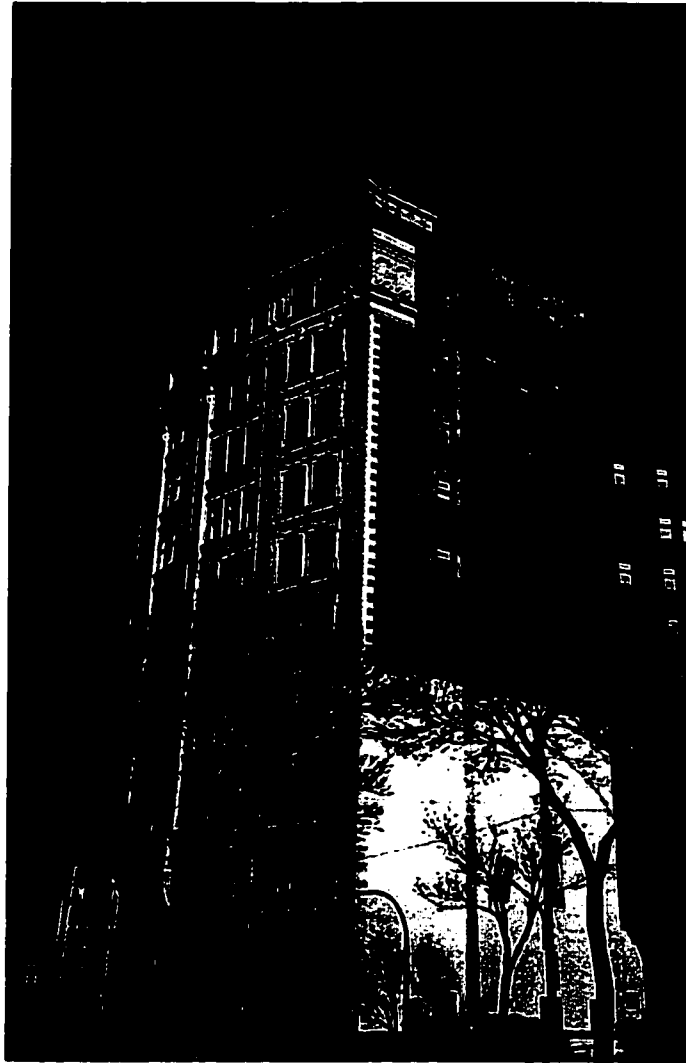
3.31 Dominion Express Building (1910-12), Montreal. National Archives, Albertype Co., PA45945.



3.32 Winnipeg City Hall (1884-86), Winnipeg. From Kalman, A History of Canadian Architecture, Vol. I.



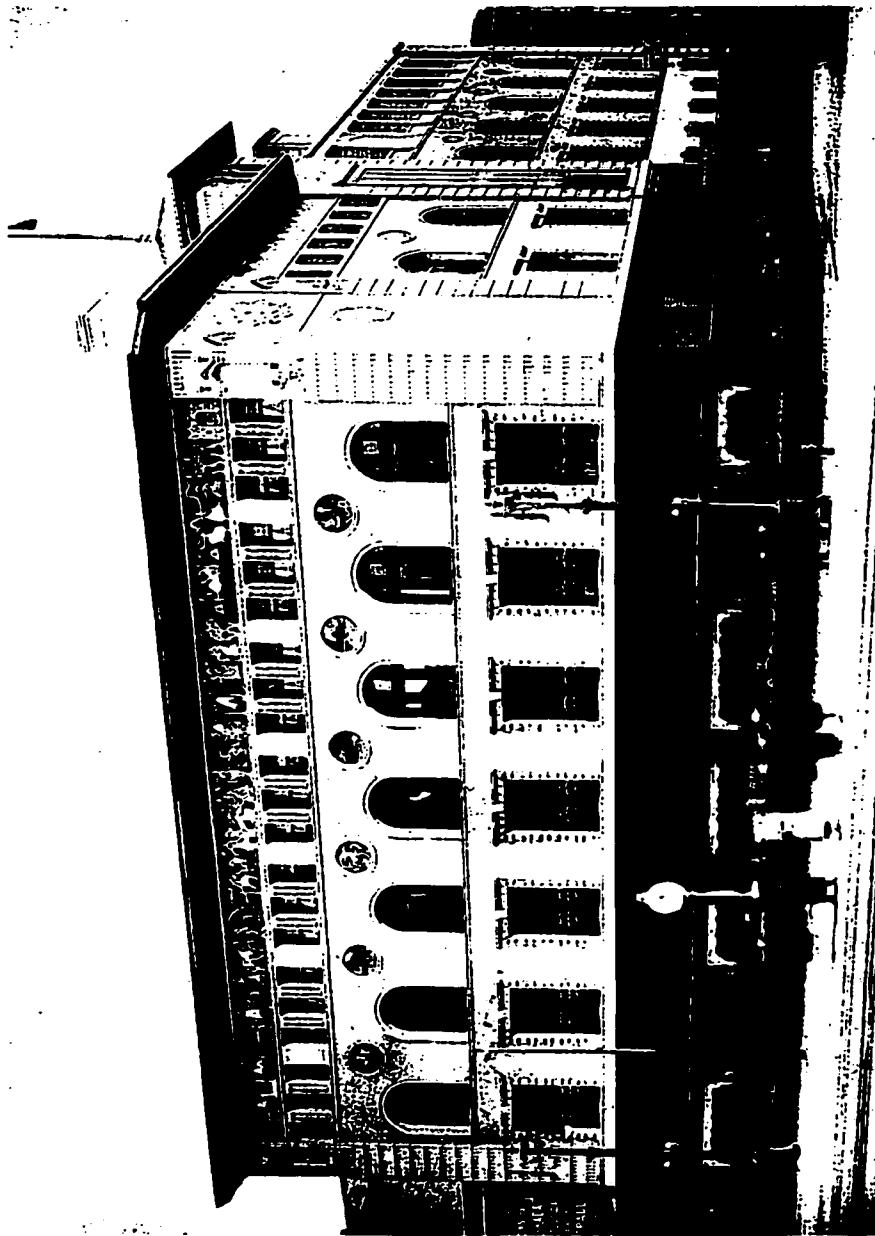
3.33 Union Bank Building (1903-04), Winnipeg, under construction.
From American Technical Society, Cyclopedia of Architecture, Carpentry,
& Building.



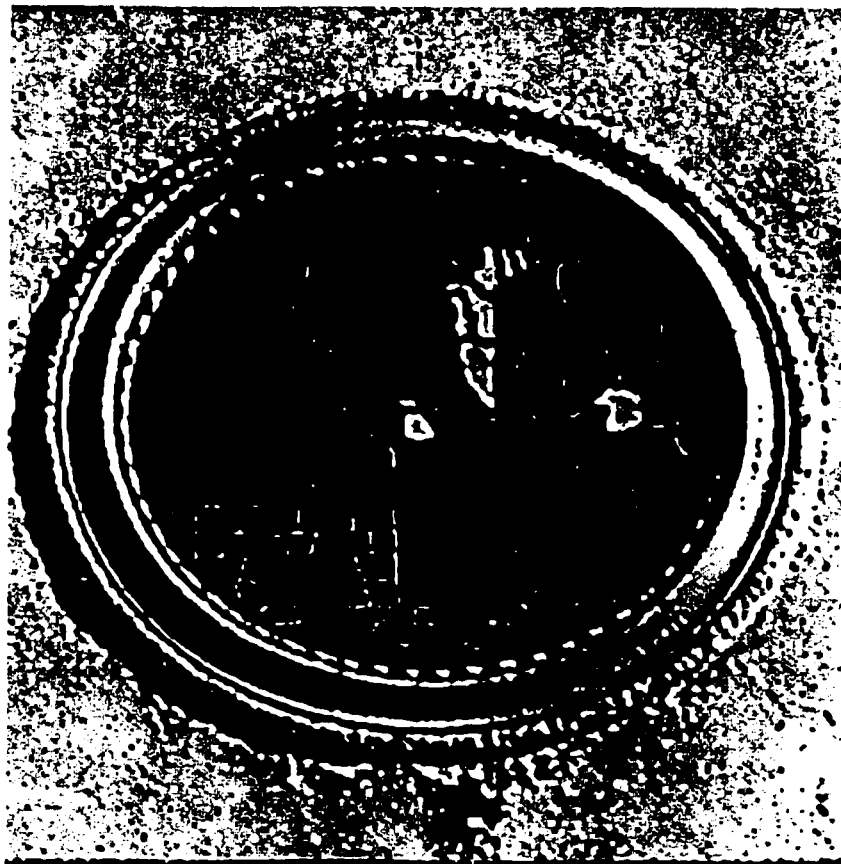
3.37⁴ Confederation Building (1912), Winnipeg. Photo courtesy of Stuart Lazear.



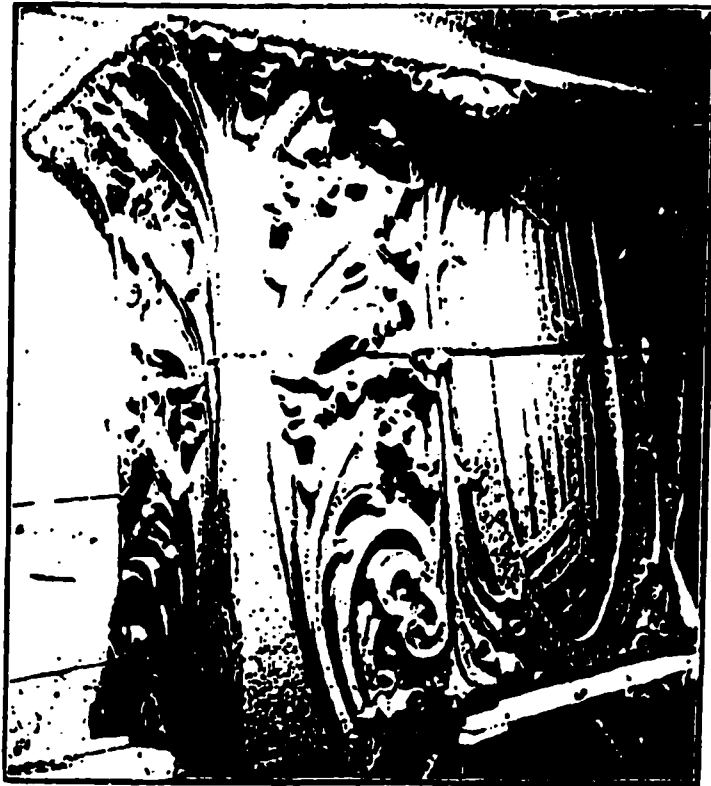
3.35 Detail of glazed terra cotta ornament representing sheaves of grain, Lindsay Building (1911-12), Winnipeg. From Winnipeg Architecture Foundation, "Winnipeg Architecture: A Terra Cotta Tour".



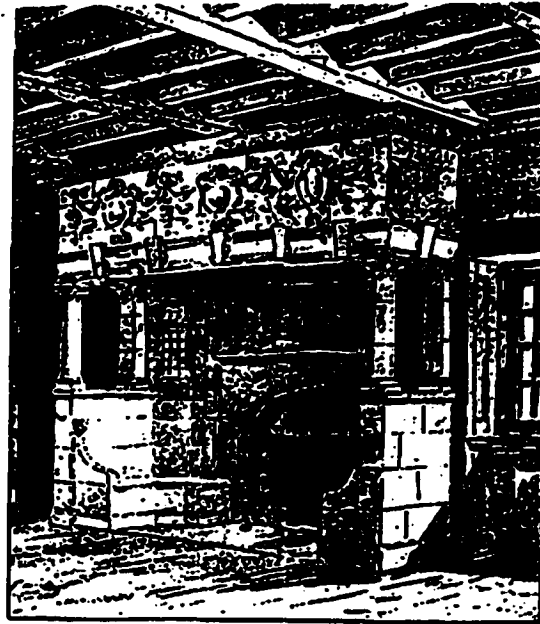
3.36 (a) Re-modelled Birks Buildings (1914), Winnipeg, Portage Ave. frontage in foreground, showing terra cotta frieze and medallions. From Construction, August, 1916.



3.36 (b) Detail of terra cotta medallion depicting gnome melting precious metals, re-modelled Birks Building, Winnipeg. From Winnipeg Architecture Foundation, "Winnipeg Architecture; A Terra Cotta Tour".



3.37 Clay model of part of terra cotta cornice, Brown Bros. Warehouse, Toronto, by W. J. Hynes, Toronto. From Canadian Architect & Builder, July, 1899.



TERRA COTTA MANTEL.

Rathbun Company

Head Office and Works :

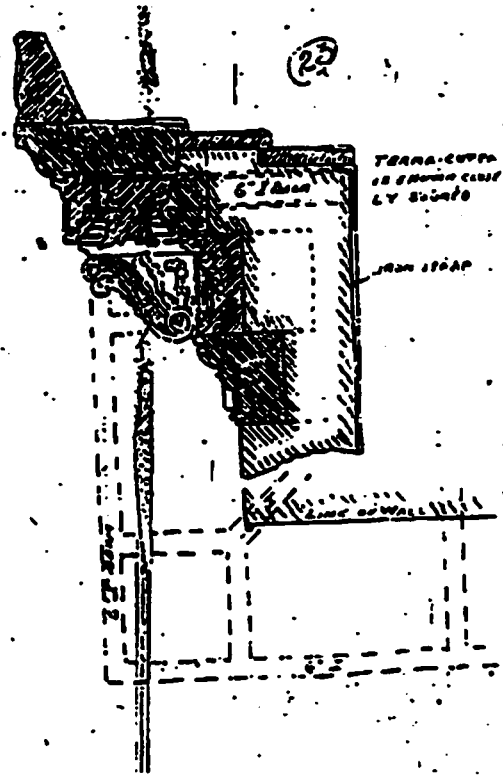
DESERONVILLE, ONT.

Agencies at Toronto, Montreal, Rochester, Ottawa, Belleville, Gravenhurst, Peterborough, Guelph, Niagara, Kingston, Prescott, Campbellton, Lindsay, Winnipeg, Chicago, N. Y.; Charlotte, N. Y.; London, Eng.; Glasgow, Scotland.

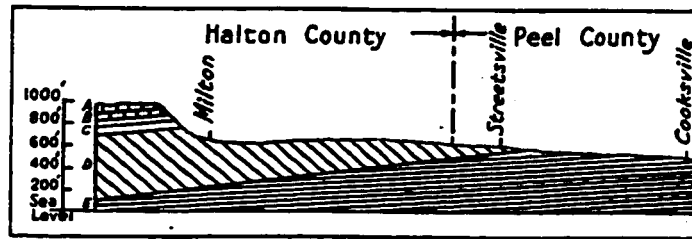
3.38 Rathbun Co. ad displaying sketch of terra cotta mantel and inglenook. From Canadian Architect & Builder, January, 1897.



3.39 Sketch of terra cotta cornice, St. Bartholomew Mission Building (1890-91), New York, by J.C. B. Horwood. From Canadian Architect & Builder, January, 1891.



3.40 Section of terra cotta cornice of St. Bartholomew Mission Building, New York. From J.C.B. Horwood's paper, "Some Observations on Fire-proof Building in New York", Canadian Architect & Builder, March, 1893.



3.41 Section through parts of Halton & Peel counties, Ontario, showing (D) Medina and (E) Hudson River shale formations. From Montgomery, The Ceramic Industry of Ontario. 39th Annual Report of the Ontario Dept. of Mines.



3.42 Topographical map of MacKay Estate, 1864, showing "Extensive Deposit of White Marl" (encircled) to right of Hemlock Lake. National Archives, NMC17613.

NEW EDINBURGH Brick & Terra Cotta Works

Awarded First Prize at the Provincial Exhibition.

T. M. CLARK, Proprietor and Patentee,

Office:—In Ottawa, Ont. Nos. 2 and 4 Elgin Street. Works: At New Edinburgh,
Ontario, Canada.

Building Bricks, Plain and Ornamental Cornices, &c., Architectural
Blocks, with Designs, in White, Cream Color, Drab, Gray, Brown, Black, &c.
In Stock or executed from Architect's own designs.

Architects and Builders who have used them for several seasons pronounce them
indestructible by Frost, unsurpassed in Color, Beauty, Smoothness and Finish, and
also in Crushing Resistance. Either Sand or Water Moulded. These White Bricks
are cheaper and better than any others offered in Canada or the United States, and
do not discolor, being white throughout.

Adopted by the Chief Architect of the Dominion of Canada, and by the Architect
of the American Government for Post Office at Albany.

Department of Public Works of Canada,

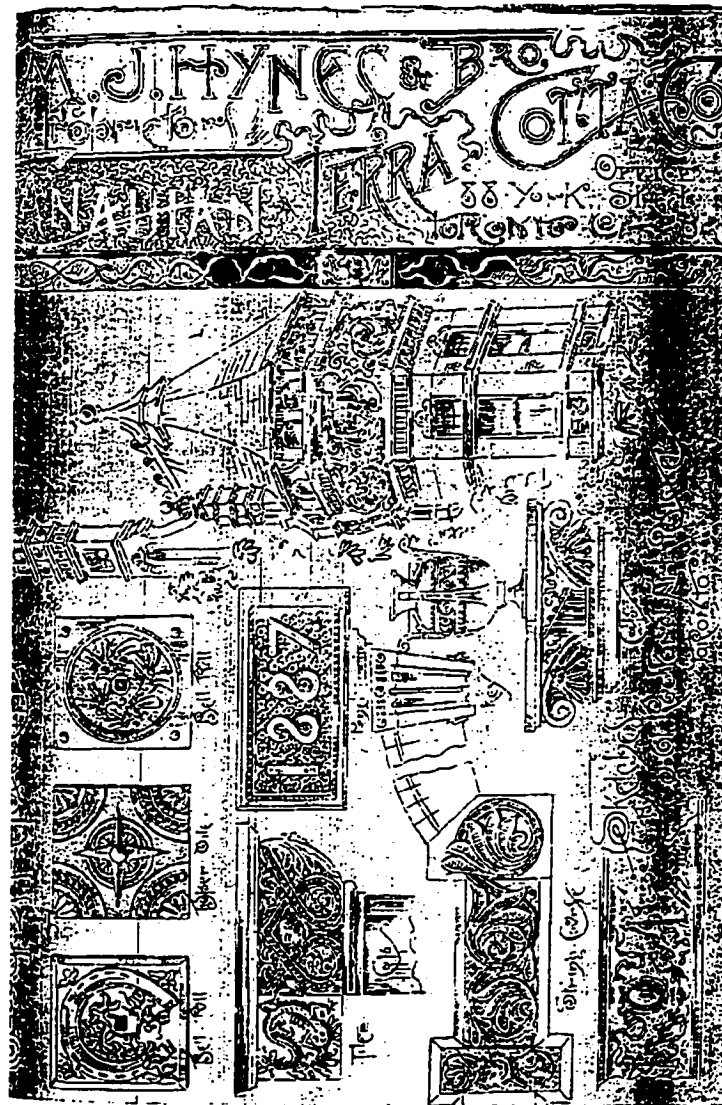
Chief Architect's Office, Ottawa, 3rd March, 1879.

I have much pleasure in stating that the samples of White Bricks submitted by
you to this Department are superior in every particular (including resistance under
pressure) to any heretofore tested by me; in color they are also very pleasing.

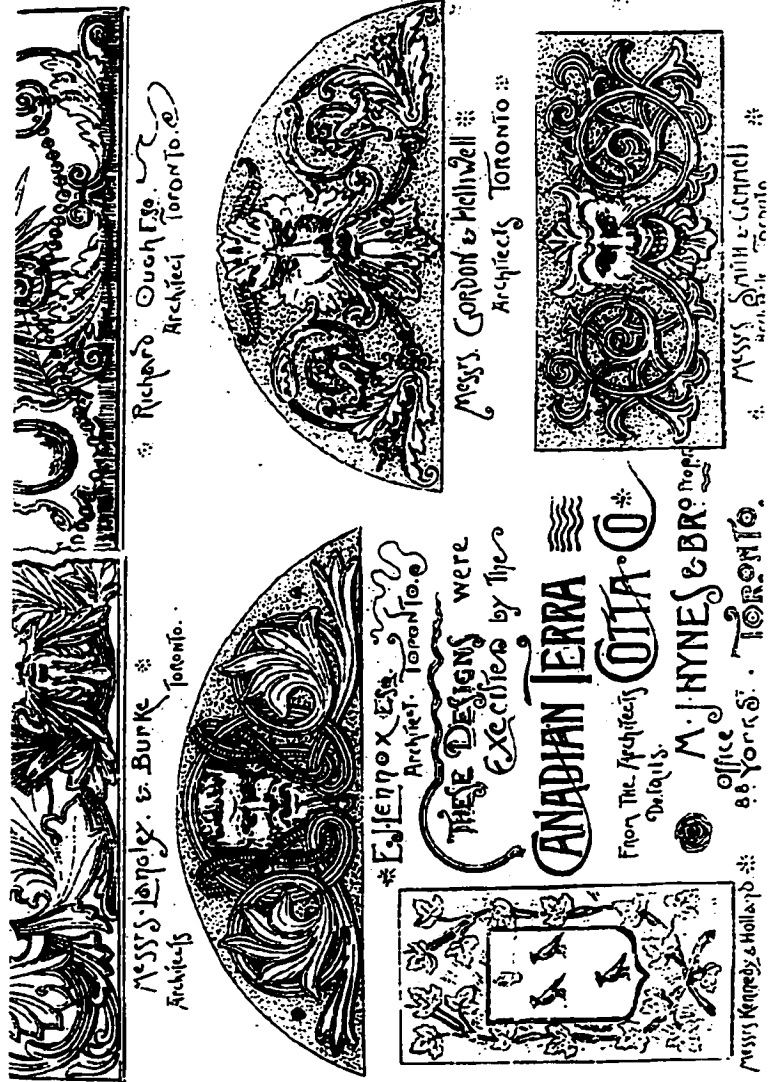
To T. M. CLARK,
Prop. New Edinburgh Brick and Terra Cotta
Works, Ottawa, Canada.

THOS. S. SCOTT,
Chief Architect of the Dominion
of Canada.

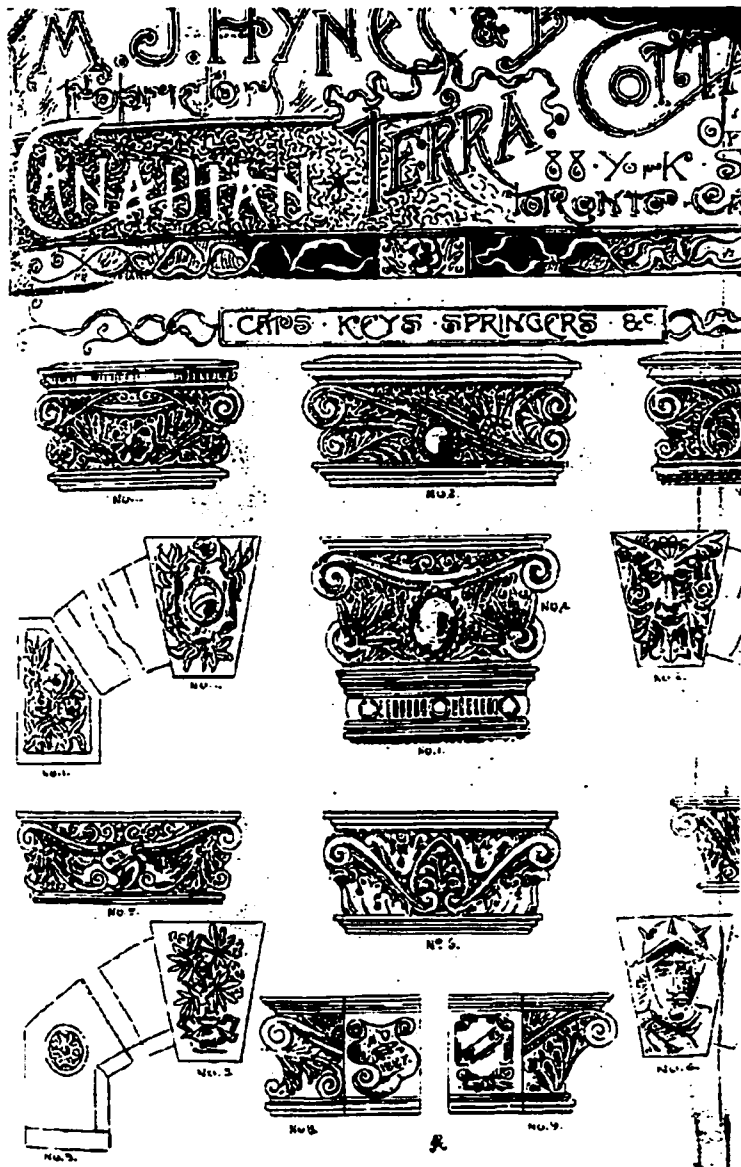
3.43 Advertisement for T. M. Clark's New Edinburgh Brick & Terra
Cotta Works with attestation by Thomas Seaton Scott, Chief Dominion
Architect. From Ottawa City Directory, 1880.



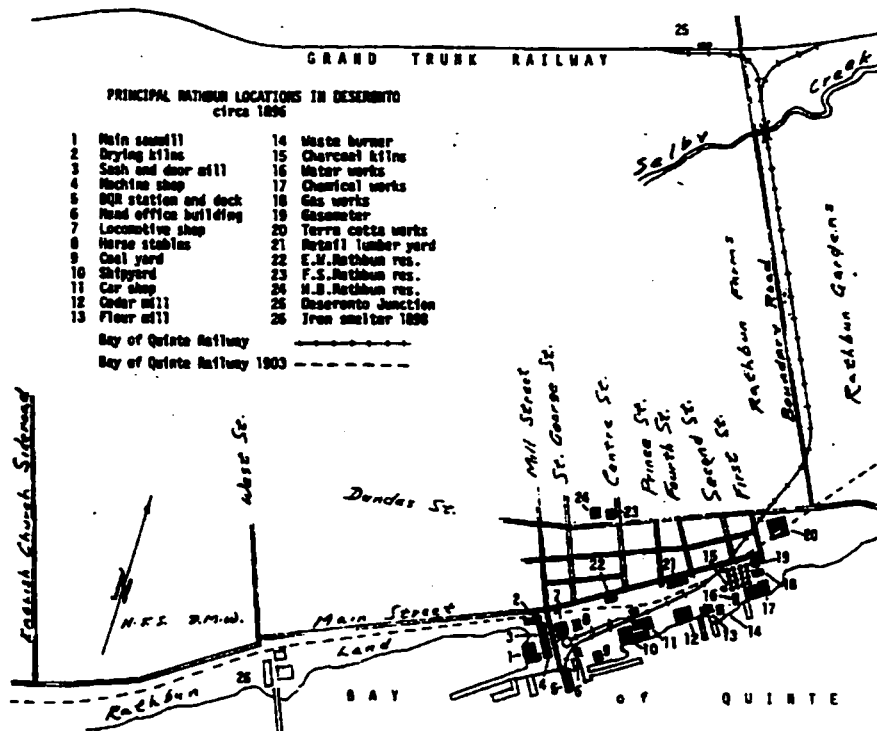
3.44 Extract from Canadian Terra Cotta Co. 1887 catalogue. From Wells, "Terra Cotta in North America".



3.45 Extract from 1887 Canadian Terra Cotta Co. catalogue. From Wells, "Terra Cotta in North America".



3.46 Extract from 1887 Canadian Terra Cotta Co. catalogue. From Wells, "Terra Cotta in North America".



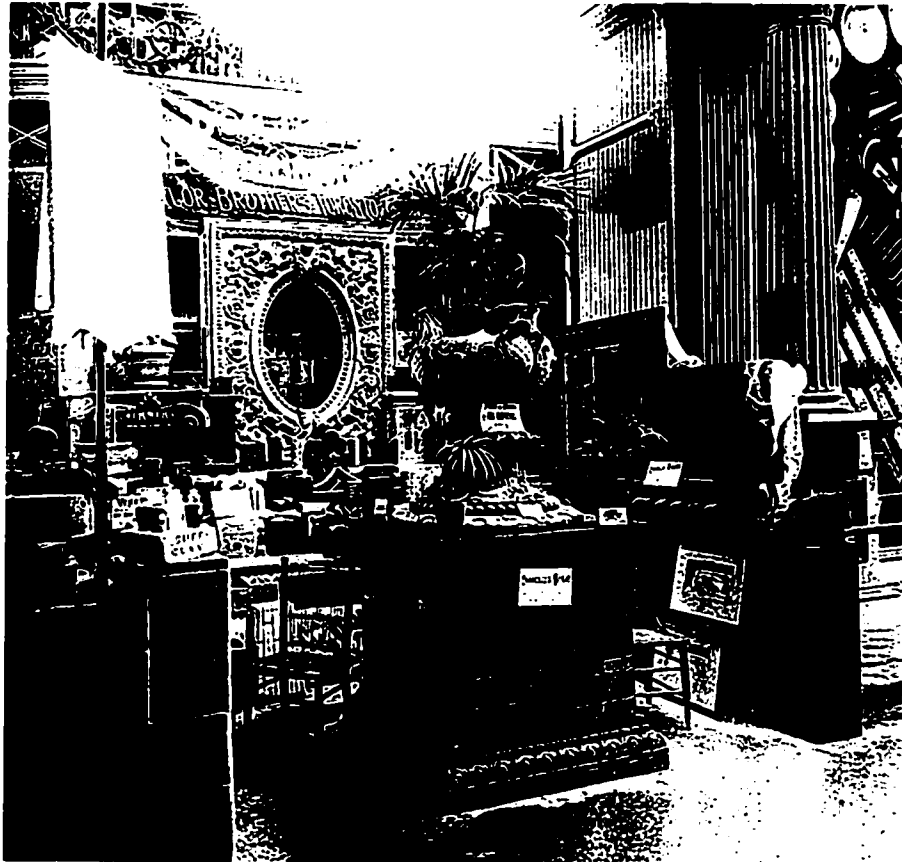
3.47 Map of Rathbun Company principal locations in Deseronto, Ontario, c. 1896. From Wilson, Lost Horizons: The Story of the Rathbun Company and the Bay of Quinte Railway.



3.48 Milton Pressed Brick Co. Exhibit at Pan-American Exhibition.
From Canadian Architect & Builder, November, 1901.



3.49 View of Don Valley Pressed Brick Works, Toronto, c. 1894.
From Basco, "The 1894 Don Valley Pressed Brick Works Catalogue",
in APT Bulletin.



3.50 Don Valley Pressed Brick exhibit at Toronto Industrial Fair, 1894.
From Basco, "The 1894 Don Valley Pressed Brick Works Catalogue",
APT Bulletin.

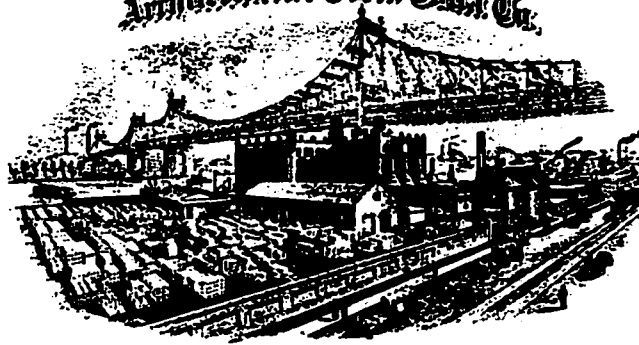


3.51 Ontario Bank, Kingston, Ontario, detail of terra cotta panel (above), and terra cotta grotesque and surround. Terra cotta manufactured by Don Valley Pressed Brick Co. Photos by author.

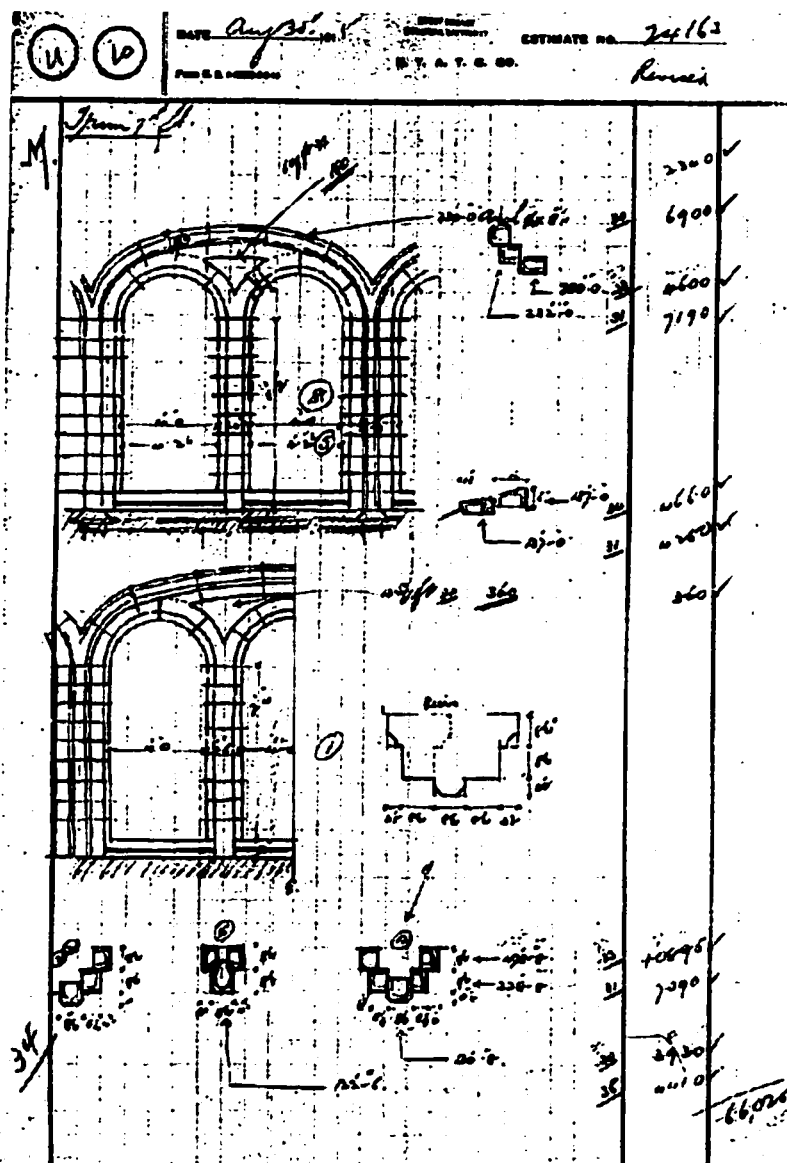
WALTER GERR, President
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New York
 Architectural Terra Cotta Co.

INCORPORATED 1889
 OFFICE AND WORKS
 401 VERNON AVENUE
 BROOKLYN, N. Y.
 TELEPHONE 700 ASTORIA



3.52 New York Architectural Terra Cotta Co. office and works as shown on firm's letterhead. From Box 42, NYATCC Archive, courtesy of Avery Architectural & Fine Arts Library, Columbia University in the City of New York.



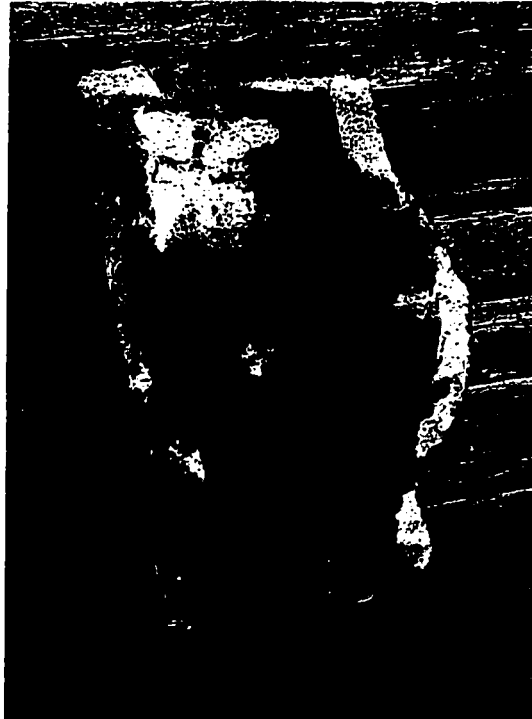
3.54 Drawing of seventh floor trim, used to prepare NYATCC estimate for Transportation Building, Ottawa. From Box 56, Job #24163, NYATCC Archive, courtesy of Avery Architectural & Fine Arts Library, Columbia.



3.55 Transportation Building (1916), Ottawa. Photo by author.



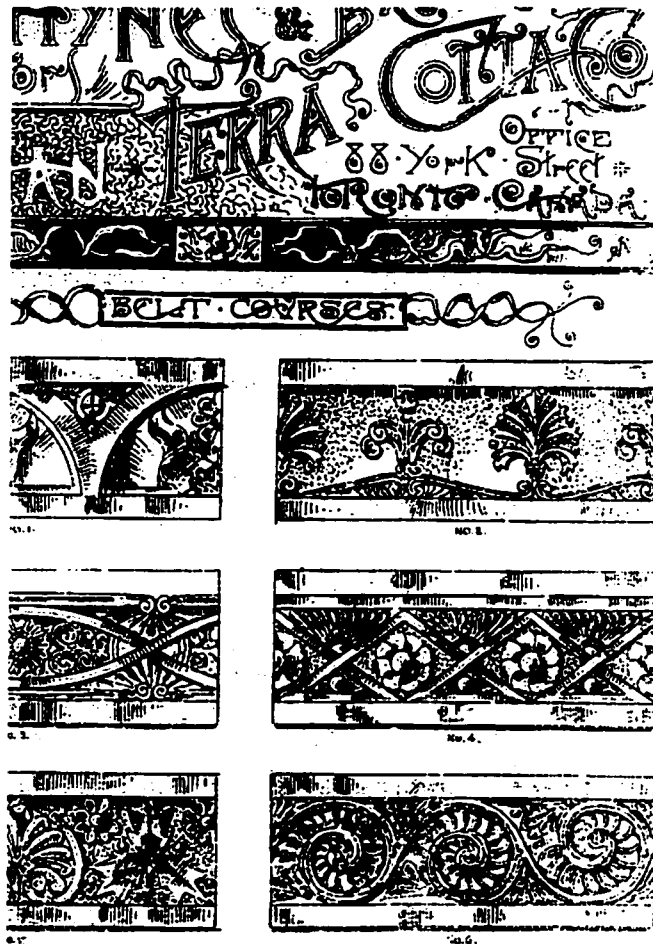
3.56 Late 19th c. hollow-cast decorative unglazed terra cotta block, likely made by the Canadian Terra Cotta Co. Photo by author.



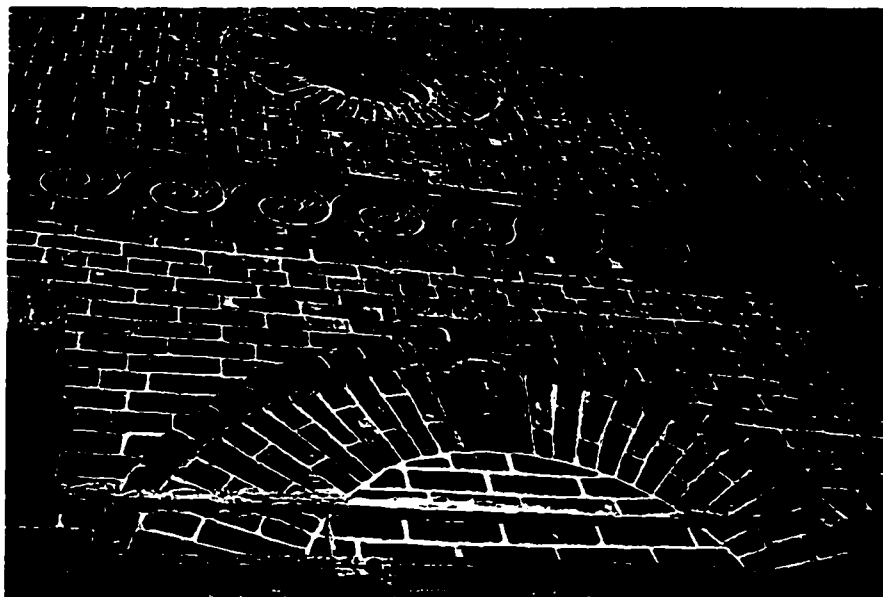
3.57 Rear view of hollow terra cotta block showing internal compartment construction (“webbing”), with finger marks. Photo by author.



3.58 Identification code (A4) on edge of late 19th c. terra cotta block.
Photo by author.



3.59 Terra cotta beltcourse designs. Extract from 1887 Canadian Terra Cotta Co. catalogue. From Wells, "Terracotta in North America."



3.60 Detail of terra cotta stringcourse and keystone, former Naylor's Theatre, Deseronto, Ontario. Photo by author.



3.61 Muffle kilns introduced by James Taylor in Chicago, 1871. The wall inside the kiln (right) protects the terra cotta ware from direct fire exposure. From Tunick, Terra-cotta Skyline.