

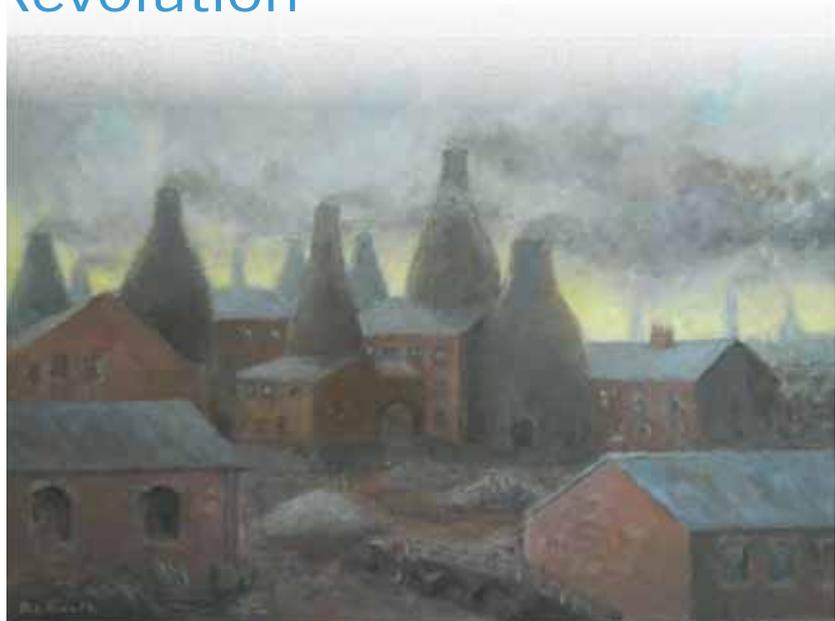
Ceramic tile production and the Industrial Revolution

By David Stock

When conjuring up images of ceramic tile production in Europe our hearts and minds are naturally drawn to Castellón and northern Italy, where longstanding, reputable companies are dedicated to manufacturing products and machinery of the finest calibre. The abiding influence of those Mediterranean countries has overshadowed the historical contribution of Great Britain and the continental nations that experienced the effects of the Industrial Revolution in the late eighteenth and nineteenth centuries when Spain and the patchwork states of the Italian Peninsula were often troubled and economically underdeveloped.

During the Industrial Revolution the major centres of ceramic tile production took shape in Western Europe where marked changes to manufacturing were introduced. This major turning point in history had far-reaching implications for the production and decoration of ceramics as machines and manufacturing processes replaced traditional handwork. The production technologies that supplanted time-honoured craft techniques were established in Britain before being adopted by fiercely ambitious manufacturers in Germany, France and independent Belgium. Transfer printing was one of the most important, emerging in north-western England in the second half of the eighteenth century. Britain led the world in mechanised tile production and decoration with such products becoming cheaper and much more accessible than had previously been the case.

The growing ubiquity of ceramic tile in parish churches and public buildings throughout the British Isles made an



The firing up of bottle neck oven kilns at WT Copeland-Spode in Stoke-on-Trent. The appearance and atmosphere of the English countryside was irrevocably altered by the onset of the Industrial Revolution and the commencement of ceramic tile and pottery production in Shropshire and Staffordshire. This is a painting of the Stoke skyline by Robert Lewis Booth.

immediate impression on manufacturers and consumers across continental Europe – and the United States – where large scale production began to cater for the demands of the New World. More antiquated methods lingered along the Iberian Peninsula and in the Netherlands, which struggled to keep pace with its neighbours as its traditional forms of energy and transportation (scenic windmills and dilatory canals) were rendered obsolete by steam mills and railways. Kilns for ceramic tile and earthenware had first appeared in Utrecht, Delft and Gouda in the seventeenth century, when sought after blue and manganese tiles were shipped from Friesland and Rotterdam to places as distant as Brazil and the Russian Empire.

Great Britain

North Staffordshire became a nascent centre of ceramic tile production in the 1600s due to an abundance of clay, salt, lead and coal. The local industry flourished from the 1720s onwards following a discovery, attributed to John Astbury, which facilitated the creation of cream and white products that were deemed more attractive and palatable than the red and brown tiles and tableware fashioned in the region previously. This was made possible by sourcing heated and ground flint from southern England

and France and applying the siliceous dust to the dense reddish-brown clays extracted by companies dotted across the Potteries. Fewer tiles were made in Britain in the late eighteenth and nineteenth centuries but much was to change in the Victorian period.

In 1835 Herbert Minton (Minton's) and Walter Chamberlain of the Worcester Porcelain Company obtained shares in a patent developed by Samuel Wright, for encaustic ceramic tiles. Minton also acquired Wright's stock of old buff-coloured tiles and supplied them to Kilmory Castle in Lochgilphead. Their respective firms prioritised production of ceramic tiles inspired by the medieval collections of architects and antiquarians such as Augustus Pugin and Lewis Cottingham. Both manufacturers realised that demand for their earliest creations was predominantly confined to ecclesiastical communities and not the domestic market. Chamberlain supplied encaustic tiles to churches before Minton having installed product at Holy Trinity, Stratford-upon-Avon in 1837. However, his encaustic tiles were not as well made as Minton's and he elected not to develop colour combinations beyond unimaginative brown and yellow.

Chamberlain discontinued tile production in 1848 with the most prestigious commissions directed towards Minton's whose expanded colour range

– with blue and green shades – complemented older conventional hues and made sophisticated pavements possible. The support of Augustus Pugin was tremendously rewarding, as the leading Gothic revivalist decorated Minton floor tiles with his own designs. The undertaking that arguably defines their association is the flooring of the Palace of Westminster, where heraldic inscriptions and neo-Gothic patterns abound. Tiles manufactured and designed during the Victorian period often trace and encapsulate the art history of the nineteenth century, revealing the artistic moods and popular tastes of the era. Minton's encaustic floor tiles were produced for the monarch's residence on the Isle of Wight and for imposing public structures such as Liverpool's neoclassical St George's Hall.

The production of ceramic wall tiles progressed remarkably in the 1840s when Minton's made 6-inch square tiles from milled and moistened dust clay. The company adopted the compression method pioneered by Richard Prosser which had advanced the manufacture of smaller articles such as buttons and mosaic pieces. These products possessed obvious advantages as they needed less time to dry, and were able to be fired without contracting or warping as regularly. Their smooth surfaces made it possible to accelerate and sharpen printing processes and various decoration techniques, which encouraged mass production of affordable ceramic tiles to an impressively high standard. Tiles with machine moulded designs covered with translucent or opaque glazes became a widespread and inexpensive alternative for architectural use. Printing methods evolved continuously, with advances in lithography enabling myriad colours to be printed at once. Pugin favoured multicoloured designs whereas John Moyr Smith used monochrome prints to reproduce biblical scenes as well as Shakespearean and Aesopian stories. Improvements were made to quicken the process of printing from engraved plates and airbrushes were attached to pumps for the stencilling of ceramic colours and glazes. George Henry Grundy decorated dust-pressed tiles with photographic images of church steeples and attractive market towns.

Increased mechanisation and steam power changed the tile industry, with machines such as pug mills and pulverisers having an immediate effect. Kilns were improved and firings became more accurate due to devices such as Wedgwood's eighteenth-century pyrometer and Watkin's nineteenth-century heat recorder. These devices were observed through spy holes to ensure that correct judgements could be made on the progress of the firing, and the point at which to desist. Such advances were invaluable as the manufacturing process – from extraction to decoration

– ultimately rests on the ability of those products placed in the kiln to withstand the effects of exposure to extreme heat. Specialisation developed within the industry, as evidenced by the emergence of companies such as Staffordshire's A.F. Wenger, which began to supply ready-made colours and glazes around Great Britain and elsewhere, thus dispensing with the customary practice of each pottery composing its ceramic colours and glazes independently. Specialist decorators – such as W.B. Simpson and Sons – acquired unadorned product from the most prolific manufacturers and glazes and pigments from Wenger.

The machines and technical innovations of the nineteenth century overhauled extant tile making techniques. Handmade and hand-decorated product routinely exhibited diversity in form and decoration with no two tiles ever being exactly alike. Machine produced and mechanically embellished tiles had a regulated finish and boasted remarkable consistency in size and decoration. Handcrafts were needed to put the finishing touches to products and this was often the task of female workers. Examples include the opaque and translucent glazes applied over dust-pressed relief tiles and transfer prints added and coloured before glazing. Manufacturers and decorators spent long hours engaged in physically deleterious and repetitive work which came with associated health risks such as emphysema and lead poisoning, caused

by the inhalation of dust and close contact with lead-based glazes. The tireless efforts of committed reformers like William J. Furnival did much to reduce those insidious side effects in the twentieth century.

During the second half of the nineteenth century, machine production was denigrated on aesthetic as well as moral grounds by art critic and watercolourist John Ruskin and artist and socialist William Morris. Morris discovered that his handmade tiles were unavoidably expensive to make and only available to the most affluent of consumers. He struggled to fashion large enough quantities thus ensuring that prices remained undesirably high. The virtue of contemporary manufacturing techniques was unequalled output at an affordable expense. Industrial revolution affected not only the production but also the consumption of ceramic tiles. Urbanisation closely linked to industrialisation and modernisation led to the expansion of cities and rigorous building regulations came into force. Machine-made ceramic tiles with colourful and cleanable surfaces helped to assuage doubts about public health and hygiene. Those products added an important aesthetic element to architecture with appreciable amounts of ceramic tile used in household settings where sanitation was paramount – kitchens and bathrooms – and more ornamental areas such as porches and fireplaces. Tile began to be laid on an escalating scale



William de Morgan decorated tiles for his lifelong friend William Morris.

in commercial and public buildings (e.g. town halls and hospitals, libraries and schools, banks and railway stations) as well as entertainment centres such as theatres and public houses.

The application of ceramic tiles mass-produced by machines was actively encouraged by architects and designers. Charles Locke Eastlake popularised the notion of decorative arts and became one of the principal exponents of an aesthetic movement known as Modern Gothic. He was an ardent enthusiast of ceramic tiles and advocated their use in domestic environments. Transfer-printed and relief-pressed glazed tiles became so inexpensive that builders could afford to install them at the bottom end of the market, with an upsurge in use amongst butchers and fishmongers. Their shops were often tiled from top to bottom with panels depicting cows and sheep and fish. Decorative friezes on plain white tile and dados of machine-moulded or transfer-printed tiles were standard in such premises until the 1960s and seventies when misguided attempts at urban redevelopment resulted in the unnecessary demolition of so much Victorian architecture in favour of dreadful concrete brutalism. The most common application of ceramic tiles occurred in cast-iron fireplaces manufactured by enterprises such as Coalbrookdale in Shropshire and Carron in Central Scotland. Tiles were fitted on either side of the grate to ensure fireproofing, and to reflect much needed warmth back into room.

In this expanding economy, new firms were established. Tiles could be distributed across the British Isles due to an extensive canal system and the untrammelled advance of steam locomotives. The decision of the Worcester Porcelain Company to cease manufacturing tile ensured a near-monopolistic trade environment for Herbert Minton to flourish. Maw and Co. emerged from that defunct tile-making business and became a massive producer of dust-pressed wall and encaustic floor tiles at Broseley and Jackfield – Shropshire towns close to the Ironbridge Gorge. T&R Boote commenced tile production in Staffordshire in the 1850s and focused their attention on the new dust-pressed encaustic tiles invented by William Boulton and Joseph Worthington. This type of ceramic tile was attainable for ordinary householders and concerns such as Herefordshire's Godwin and the Architectural Pottery Company capitalised on this demand. Historic pottery companies – Doulton and Wedgwood for example – acquiesced to the manufacture of ceramic wall tiles to compete with

the multitude of firms formed in Stoke-on-Trent (e.g. Sherwin & Cotton) during the mid-Victorian period.

Most potteries and factories were modelled at first on the traditional pot-bank plan which consisted of an open yard surrounded by bottle kilns and workshops. This confused and inefficient system seemed rather archaic in a time of specialist and large scale production and was eventually supplanted by the purpose-built factory. Charles Lynam pioneered the construction of such premises in Shropshire and Staffordshire. Linear production formed the basis of his work with raw materials entering the facility at one end and finished tiles departing from the other. The needs of the workers were also taken into account with the cramped and hellish conditions once looked upon as a necessary evil, thankfully replaced by spacious and well ventilated centres of activity. Factories were increasingly well heated and steam power was used to drive heavy machinery. Business owners wishing to impress visitors and passers-by created authoritative facades and distinguished staircases adorned with fine majolica tiles to demonstrate their affluence and to underline their success.

Continental Europe

Industrial developments in Britain spread rapidly to continental countries such as Germany, where the most important nineteenth-century concern was Villeroy & Boch who had operational factories in Saxony, Saarland and Septfontaines in Luxembourg. The celebrated inventions and manufacturing techniques emanating from

Britain transformed production at the company's Septfontaines premises with J. F. Boch developing the first transfer printing workshop on the European continent, following a visit to Staffordshire in 1823. The introduction of dust-pressing techniques occurred as early as the 1840s but much of the prestigious firm's output in the late nineteenth and early twentieth centuries was produced in Mettlach and Dresden. Mettlach – a town situated between Merzig and Trier – was the most prolific manufacturing centre with enormous quantities of encaustic and plain floor and wall tiles created on the banks of the Saar. The lesser factory at Dresden produced reasonably small amounts of stove and wall tiles (and mosaics) whilst the encaustic tiles fashioned at Mettlach became known throughout Europe as *Mettlacher Platten* and were used extensively in public buildings and churches.

Prestigious commissions came from abroad with Villeroy & Boch supplying large tile panels for Amsterdam's Rijksmuseum in 1883. Growing freedom and recognition for Catholics across the Netherlands in the nineteenth century coincided with the Gothic architectural resurgence that brought about the development of Catholic churches in places where the Dutch Reformed faith did not necessarily hold sway. A distinct shortage of encaustic tiles manufactured at home forced ecclesiastical architects to rely upon Germany for adequate supplies. The neo-Gothic minor Catholic basilica of St Nicolaas constructed in IJsselstein has a superb floor composed entirely of encaustic Villeroy & Boch products. The historic Bolshoi Theatre in Russia's capital is similarly enriched



Jules Loebnitz emerged as a key figure in nineteenth-century French tile production.





Boulenger specialised in ceramic tiles in the Picardy region of northern France until the factory's closure in the 1980s.

by these colourful German-made tiles. There are fine examples of dust-pressed Villeroy & Boch tiles such as the elaborate hand-painted interior of the Pfund Dairy, which survived the Allied bombing of Dresden in 1945. Mass production techniques were needed to meet the escalating demand for Art Nouveau tiles at the beginning of the twentieth century, with Villeroy & Boch building a new factory on the outskirts of Lübeck to cater for this burgeoning market.

Villeroy & Boch's rivals gradually came into being, with the Norddeutsche Steingutfabrik established in Bremen in 1869. Servais & Cie in Ehrang, and Georg Bankel's Nurnberger Land firm quickly followed suit, commencing production in 1877 and 1889. Wandplatten Fabrik was founded in Bonn – the future *de facto* capital of West Germany – in 1896. The recently unified German Empire experienced a boom in the manufacture of dust-pressed Art Nouveau ceramic wall tiles – for which there was a lucrative export market – until the unexampled bloodshed of the First World War.

Developments in Germany were echoed in France to some extent, as tile manufacturers quickly became aware of the advantages arising from the new technology. Dust pressing, transfer printing, and machine-moulded decoration were integrated into local production practices with Parisian enterprise Loebnitz et Fils emerging as one of the most acclaimed and popular. The firm was originally known as Pichenot and specialised in award-winning stove tiles before coming under the direction

of Jules Loebnitz in 1855. He transformed the fortunes of the company towards the end of the century, when facades decorated with tiles and architectural ceramics became surprisingly modish. Loebnitz supplied architects with a complete range of products and became famous for decorating the entrances and pavilions of trade gatherings such as the Paris Exhibition in 1889. French manufacturers tended to operate on a rather parochial basis and forged their reputations in certain cities and provinces. Loebnitz tiles are overwhelmingly concentrated in the Paris metropolitan area.

Beauvais and the surrounding Picardy region of northern France was home to numerous ceramic tile makers. Facades decorated with tiles and multi-coloured ceramics emerged in fashion-conscious Paris before architects and manufacturers in textile-rich Beauvais came to develop their own inimitable style. Greber could lay claim to being the provincial peer of the most eminent Parisian companies whilst firms such as Colozier produced encaustic tiles in abundance at a large factory in Saint-Just-des-Marais. Perhaps the most intriguing local manufacturer of encaustic tiles was Boulenger, which commenced production in the quaint Oise town of Auneuil (eleven kilometres south-west of Beauvais) in 1883. The old factory dominated the economy and landscape of the town with its decorative inlaid tiles used to brighten the facades and floors of several landmarks including the parish church and cafe-hotel. Depopulation and a subsequent

lack of development have preserved such structures and left them unobscured by construction. The company museum is renowned for the encaustic tiles that cover the building from floor to ceiling. Residents of the town remain deeply aware of the aesthetic and cultural significance of these products with the diligent efforts of the Auneuil workforce leading to the creation of exquisite ceramic tiles that capture and evoke a glorious period in French manufacturing history.

Boulenger's defining overseas commission was the Mortuary Chapel of St Mary's church in the London suburb of Chislehurst, once part of Kent, which served as the burial place of exiled French emperor Napoleon III, who settled in England after a decisive Prussian victory at the Battle of Sedan in 1870. The former ruler was laid to rest, with special tiles – bearing the *N* of Napoleon and the French Imperial Eagle – manufactured in northern France and shipped across the Channel. Another centre of ceramic tile production in the industrialised north of the country, was the town of Maubeuge: where Douzies and Boch Freres made copious amounts of product. Boch Freres was a Walloon enterprise with its principal factory at La Louviere in French-speaking southern Belgium. Ceramic tiles and sanitary ware were manufactured in the *Sillon industriel*, the first truly industrialised region of continental Europe. Tile producers were also active in eastern France with the Societe Anonyme des Carrelages Ceramique receiving



Amsterdam's De Distel embraced the modern technology that largely emanated from England.

plaudits for the encaustic tiles fashioned at its premises in Burgundy.

The three European countries where tin-glazed ceramic tile production had endured and remained especially popular were the Netherlands and Spain and Portugal. Although the changes brought about by machine production caused a precipitous slump in the export market for Dutch tin-glazed tile several firms continued to manufacture them as demand never completely disappeared. In the late nineteenth century, newly established concerns – e.g. Rozenburg in Den Haag, and De Distel in Amsterdam – embraced the technology of dust-pressed tiles whilst older companies (such as Delft's De Porceleyne Fles) came to incorporate modern dust-pressing techniques into their staid repertoires which consisted mostly of conventional tin-glazed products with their origins in the 1600s. Dutch ceramic tile makers usually persisted with hand-painting and stencil decoration (ceramic pigment brushed through thin sheets of metal with cut-out designs) even when equipped with the latest machinery. It can therefore be argued that craft processes such as hand decoration survived in the Netherlands long after their decline in neighbouring countries.

Hand-decorated and dust-pressed tiles can still be admired in public spaces including the Haarlem and Leeuwarden railway stations which have tiles supplied by Rozenburg. Large houses in Amsterdam have lobbies and porches featuring the dust-pressed and stencilled wares of De Porceleyne Fles and numerous commercial premises throughout the famous metropolis are enriched by elaborate figurative scenes hand-painted on tiles made locally by De Distel. Tiled porches and entrances to private homes became fashionable

from the mid-nineteenth century onwards as a decorative and functional feature. Machine-pressed glazed wall tiles (and complementary hard-wearing floor products) could be cleaned with ease whilst dramatically enhancing the appearance of a shopfront or house. Maastricht – the capital of the Limburg region – became synonymous with dust-pressed tiles boasting transfer printed decorations. Alfred Regout – a confirmed Anglophile – is known to have imported engraved copperplates from England which may explain why transfer printing techniques were so commonplace in the southern Netherlands during the late Victorian period. The decoration techniques favoured by Limburgish manufacturers were possibly influenced by the city's geographical proximity to Belgium and Germany, where transfer printing methods were similarly widespread.

Tin-glazed tile production was popular in Spain until well into the twentieth century, with consumer demand noticeably strong in regions such as Andalusia, Catalonia and Valencia. Machine production belatedly made inroads in those industrial centres with machine-made floor tiles being produced by Miguel Nolla in Valencia and Escofet, Tejara y Cia in Barcelona. Moorish-inspired *Cuenca* tiles became a large-scale industry in Seville where Carlos Pickman and Ramos Rejano specialised in their machine pressed production. Hand-painted tiles were virtually ubiquitous in Portugal throughout the

nineteenth and twentieth centuries but stencilling was introduced to heighten the output of companies responsible for creating the large quantities of ceramic tile used on Portuguese building facades. Dust-pressing was implemented by the Sacavem firm in Lisbon during the late 1800s to produce transfer-printed and machine-moulded tiles with relief decorations. These machine-made tiles looked incongruous and mediocre alongside the hand-made products but hand-painted or stencilled tin-glazed tiles often had simpler designs that worked especially well when repeated en masse.

Detailed transfer-printed designs seemed quite superfluous when used in this way, unlike Spanish *Cuenca* tiles which lent themselves much better to machine production. This was arguably due to the fact that the original technique had simply consisted of moulding the plastic clay with a stamp. Machine intervention in this case predictably led to the creation of a more uniform but visually acceptable product. The first challenge in mechanised tile production had been to find answers to the technical problems of creating and decorating them. Once these concerns had been convincingly remedied matters of good design had to be considered. The mass production of ceramic tiles affected architects and designers differently, some embraced the change and tried to work positively with it, whilst others reacted unenthusiastically and returned to craft techniques. Machine production fostered discussion about the importance of design and heralded the emergence and involvement of exceptionally gifted designers – such as William de Morgan and Walter Crane – in the ceramic tile industry. ¹¹

REFERENCE: van Lemmen, Hans, *Tiles in Architecture* (Laurence King Publishing, 1993).



Walter Crane (1845-1915) was part of the Arts and Crafts movement, producing paintings, illustrations, ceramic tiles and other decorative arts.