

The Georgian Group Guides

Nº 8

IRONWORK



A Brief Guide to Georgian Ironwork

FRONT COVER RAILINGS, CLOCKWISE FROM TOP LEFT: DETAIL OF JEAN TIJOU RAILINGS FOR WILLIAM III AT HAMPTON COURT PALACE; GREEN-PAINTED GOTHIC RAILINGS OF 1835 AT EXETER; MID-GEORGIAN SPEAR-SHAPED BAR HEADS; BLUE-PAINTED RAILINGS OF THE 1720s IN SPITALFIELDS, EAST LONDON; LATE GEORGIAN AREA RAILINGS WITH JAVELIN BAR-HEADS IN NORTH LONDON; MID-GEORGIAN GILDED URN FINIAL.

INTRODUCTION

THIS SHORT GUIDE is intended as a general outline of the development of decorative and structural ironwork both inside and outside the Georgian house. For those seeking to repair or re-create Georgian ironwork, perhaps the most important section of this guide is the back page, with its list of suggested further reading and modern sources of information. Before you begin, always consult a recognised expert with no commercial interest. Your local District or Borough Council Conservation Officer, or a national organisation such as English Heritage or the Society for the Protection of Ancient Buildings, should be able to help in choosing reliable and experienced craftsmen and workmen.

WROUGHT AND CAST IRON

WROUGHT IRON — the purest form of iron, with less than 1% carbon content — was first manufactured in about 2000 BC. By c.450 BC it had reached Britain; it was not until the early 15th century, however, that the industrial process of smelting iron ore 'pigs' in a blast furnace was introduced — the resultant pigs being subsequently beaten into wrought iron. Blast furnaces prospered where there was plentiful wood — to make the charcoal needed for smelting — and iron ore; thus by 1700 the heavily-wooded Sussex-Kent border had become the centre for British iron production. By the time of the accession of George I in 1714 the industrial revolution was already under way; in 1709 Abraham Darby of Coalbrookdale in Shropshire began to use coke rather than the now scarce and expensive charcoal, allowing far higher temperatures to be achieved during the smelting process.

During the 17th and 18th centuries wrought iron was much used for gates and railings, where its malleability was a distinct advantage. Gate design reached its zenith with the work of the Huguenot craftsman Jean Tijou for the Late Stuart court; of these works, perhaps his masterpiece was the series of exquisitely-wrought riverside gates at Hampton Court Palace, executed for William III.

Cast iron — cast using remelted pig iron, with a carbon content of up to 5% — was well-known by 1700, but was largely confined to the manufacture of coarse, simple items such as cooking pots, firebacks and cannon balls. Its use only became widespread following the introduction in 1794 of Wilkinson's highly-efficient 'cupola' blast furnace for remelting pigs. By the end of the Georgian period casting techniques — employing either moulds or beds of wet sand — had improved tremendously and cast iron was beginning to be used for all types of structural, industrial and decorative purposes. It was found to be particularly useful in heightening fire resistance; however, unlike the more fibrous wrought iron it was relatively brittle and weak under stress — an unhelpful property which is now taking its toll of many Late Georgian structures. By 1840 cast iron columns and beams were being incorporated into all types of building, yet it was only with the introduction of steel in the late 19th century that a more lasting structural strength could be achieved.

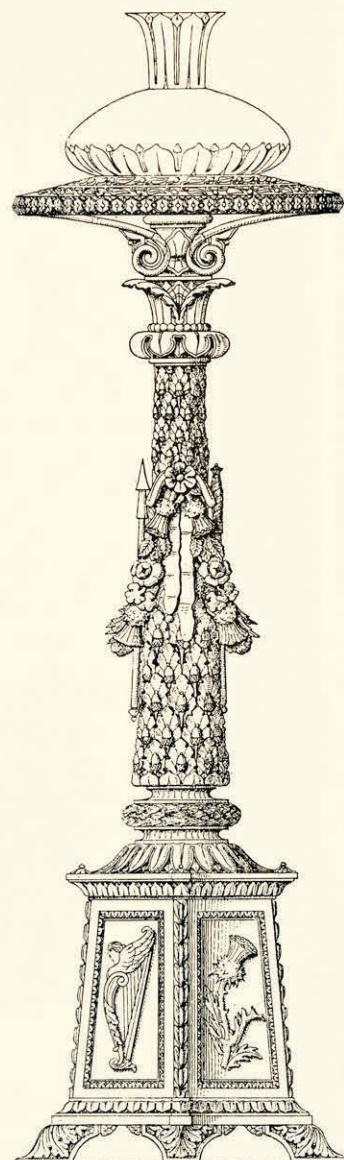
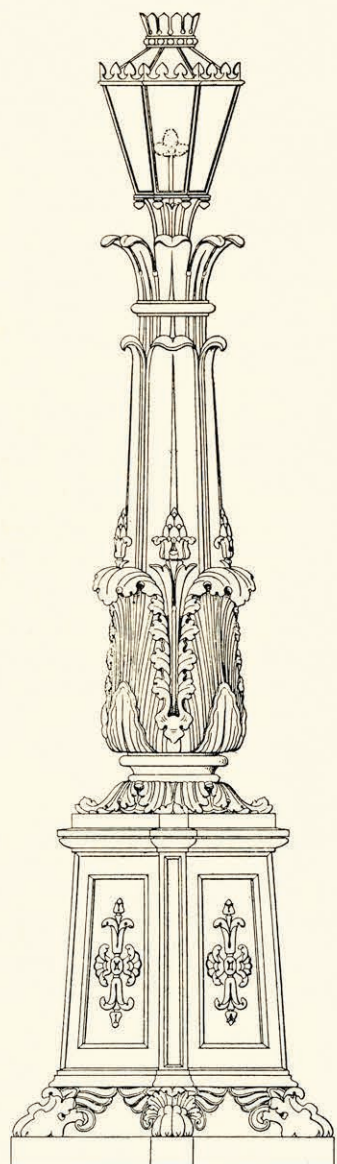


FIGURE 1-2: LAMPSTANDS FROM HENRY SHAW'S *EXAMPLES OF ORNAMENTAL METAL WORK* OF 1836.



FIGURE 3: BLUE-PAINTED IRON BALUSTERS AT 1 GREEK STREET, LONDON (BY PERMISSION OF TRADITIONAL HOMES MAGAZINE)

STAIRCASES

IN 1745 W & J Welldon's *The Smith's Right Hand* appeared, the first original collection of British designs for wrought ironwork of all kinds. Twenty years later, however, the elaborate, almost Rococo scrollwork featured in this manual was giving way to the more rigid and rectilinear forms of the Neoclassical Revival. Antique motifs such as the anthemion and the palmette being widely used in staircase balusters.

By 1800, thanks to the properties of wrought and cast iron, the staircase had become one of the most impressive and graceful features of the Regency interior. Wrought iron balusters were increasingly prevalent and in many instances only the mahogany, oak or grained pine handrail remained as a reminder of the traditional wooden stair. Even the treads and risers could be of iron. And bulky wooden newel posts were often replaced with an S-shaped termination of more thin iron balusters — a particularly common feature in houses of all sizes by 1820. The most remarkable property of the Late Georgian staircase, though, was its lack of apparent structural support consequent on the development of the cantilevered iron frame. Regency designers delighted in using iron to enable staircases of great grace and delicacy with dramatically swooping and curving handrails to be placed in improbable situations. The more ostentatious designers dispensed with the soffits under the stairs altogether, creating the impression of an open-string staircase that appeared to be made merely of treads and risers piled up on top of each other in mid-air. By the 1820s the most radically-planned houses were not even bothering to hide the ingenious iron supports: at Sezincote, for example, the iron girders which carried the main stair out were left totally bare, and pierced in a decorative fashion.

DOOR AND WINDOW FURNITURE

DOOR FURNITURE at the beginning of the 18th century was sparse and simple, generally limited to an iron knob with, possibly a rim or (later) a mortise lock. Brass could only be found adorning the doors and windows of the grandest houses, although by 1800 industrial advances had made it considerably cheaper and thus more widely available. As the century progressed casting techniques improved, and the simple early forms were transformed into lively and intricate designs. By 1820 the classic lion's-head iron door knocker had become very popular, as had those incorporating such topical motifs as sphinxes, crocodiles, or naval emblems. For the more humble, rural dwelling the classic Norfolk or Suffolk door latches were now adapted for mass-production by machine. Yet it must be remembered that even the Late Georgian door was by no means overburdened with iron or brass door furniture. Letter boxes were, of course, a mid-Victorian innovation — the postal system only truly began in 1840 — whilst door numbers were only used sporadically during this period (although mandatory in London after 1805). Nor was the Georgian door — in contrast to many modern 're-creations' — ever a panoply of shiny brass fittings. Although brass door furniture was more common than formerly, cast iron was by 1800 still the most widely-used material for door furniture. The iron was rarely left bare but was usually painted a matt black; messy 'Berlin black' was most frequently used, but modern blackboard paint is a good and more reliable substitute. A simple, black-painted knocker was

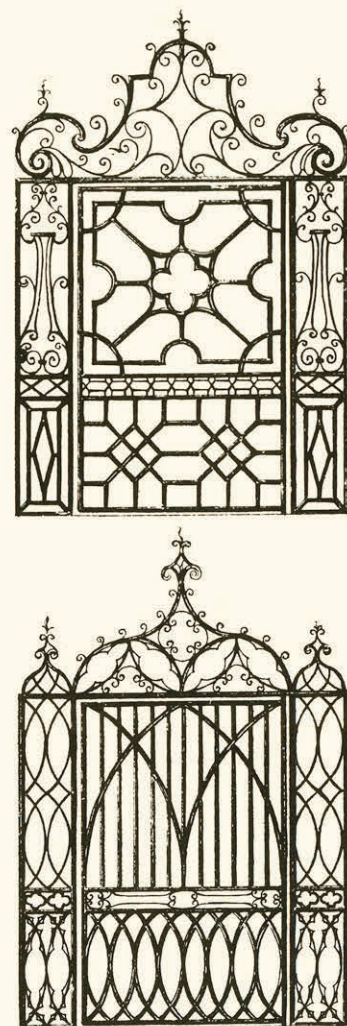


FIGURE 4: GATE DESIGNS FROM W & J WELLDON'S *THE SMITH'S RIGHT HAND* OF 1745.

probably what Dickens envisioned when he wrote *A Christmas Carol*; Marley's ghost would undoubtedly recoil in horror at some of the shiny fripperies now posing as 'Georgian', 'Regency' or 'Victorian' reproductions. The unsubtle brightness and thin superficiality of many of these modern examples tends to obscure the aesthetic worth of the internal and external doors to which they are attached. (Many so-called 'Georgian' door handles, for example, are not only in shiny, thin brass but actually of the lever-handled variety — a type rarely found on doors before the 20th century.) It is important, then, to retain all original ironwork — knockers, hinges, locks, numbers and other items — if you do have to repair or remove old doors; this applies as much to the simplest internal doors as to the grandest front entrances.

Iron window furniture, too, grew considerably more complex during the Georgian era. As with door furniture, however, many of the 'traditional' products now available are poor, over-brassy approximations of original models. Copious examples showing the true historic development of this feature can be seen at the Brooking Collection in London and Dartford (see Sources of Information, below).

RAILINGS AND BALCONIES

DOMESTIC WROUGHT IRON railings first appeared in Britain in the early 17th century, whilst cast iron examples were first used (despite Wren's personal opposition) for the boundary fence of St Paul's Cathedral in 1714. Railings were first used in a Georgian square in 1735, for the perimeter of Lincoln's Inn Fields in London. Alas, however, these — together with countless other excellent examples of municipal ironwork — were removed wholesale during the Second World War, and never returned. (As is now widely known, iron railings were in fact wholly useless to the armament manufacturers, and most of the donated ironwork remained rusting in store for years.)

Early Georgian railings generally comprised heavy, massive uprights with spiked finials — in the form of halberds, javelins, arrows or other weapon heads. As the century progressed railings became more complex, with additional cross-pieces (the 'dog-bars' at the bottom were designed to literally keep out dogs) and more elaborate patterning between the bars — often of cast or stamped lead, rather than iron — and more delicate finials. In addition to being employed for small-scale embellishments at the intersection of diagonal bars, lead was also generally used to bed the iron railings into the bare stone. In 1774 Robert Adam designed the famous 'Heart and Honeysuckle' railings for no.7 Adam Street in the Adelphi development. The anthemion motifs and urn finials which characterised these railings — manufactured by the equally famous Carron Company of Falkirk, in which Adam's brother John was a partner — influenced countless subsequent designs, their descendants proliferating along the streets of the fashionable new towns such as Brighton and Cheltenham.

At the same time, newly-fashionable iron balconies or 'verandahs' were becoming increasingly common in Britain's Regency towns. They were cantilevered out from the first floor, generally painted green — not black, a late 19th century innovation which is now ubiquitous — and usually found on the principal or garden fronts, supported not only by the brackets visible on the underside but by iron girders which extended far into the house. Sometimes glazed, and usually of a lively, Neoclassical design, they were almost invariably festooned with honeysuckles (one of the most popular plants of the period), wisteria, virginia creeper, ivy or other climbers, all of which were hugely popular by 1820.



FIGURE 5: REGENCY BALCONY ON A PRINCIPAL STREET FRONT IN AMBROSE PLACE, WORTHING, SUSSEX.



FIGURE 6: A 'TRAFALGAR BALCONY' OF 1810 IN ESSEX.

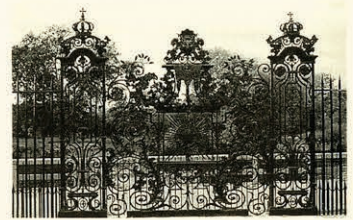


FIGURE 7: RIVERSIDE GATE BY TIJOU AT HAMPTON COURT.

PAINT COLOURS FOR IRONWORK

WROUGHT IRON WAS extensively used for staircases during the Georgian period. Delicate balusters of the 17th and early 18th centuries were often painted blue — probably to highlight the supposed ‘blueness’ of the metal. Internal and external ironwork in the grandest houses might be painted with white lead and then dusted with ‘smalt’ — a bright and lustrous finish of ground blue cobalt glass. Alternatively, a more greyish blue made by mixing indigo with white lead could be used — a finish recommended in Neve’s *The City and Country Purchaser* of 1703. And after 1724, when the pigment Prussian Blue became widely available in Britain, wealthy households were able to paint their ironwork in bright royal- or mid-blues. Since indigo, smalt and Prussian Blue were all very expensive, however — being two or three times the price of the ‘common colours’ — warm lead-greys or stone colours (to match the masonry) were more frequently used for painting most external and internal ironwork.

By the end of the 18th century ironwork of all types was frequently painted green — a finish intended to suggest the patinated bronze of the classical world. Olive- or dark-greens were not only used for ironwork inside or attached to the house, but also for all kinds of gates, perimeter railings, furniture and other items found in the garden. John Pincot’s ‘invisible green’ of 1811, for example, was explicitly designed to be ‘agreeable when relieved by verdure and vegetation’. Black, it must be stressed, was used to paint railings and other ironwork only after the death of Prince Albert in 1861.

STRUCTURAL IRONWORK

IN 1778 DARBY AND PRITCHARD erected the first iron bridge in the world at Coalbrookdale in Shropshire. By 1795 the engineer Thomas Telford was building iron bridges such as that at the Pont Cysyllte Aqueduct, which used cast iron arches spanning 45 feet, while established architects such as Nash and Wyatt eagerly seized on the new opportunities offered by iron construction. Although Nash’s first iron bridge, erected at Stanford Court in Worcestershire in 1795, instantly collapsed, his subsequent uses of cast iron were more successful as well as equally spectacular. In 1815 he installed the celebrated ‘bamboo staircase’ at Brighton Pavilion. This structure was wholly of cast iron: not only the balusters (cast and painted to imitate real bamboo) but also the treads, stringers, risers and handrails were of iron. Iron framing was subsequently used by Nash for the first floor rooms leading off this stair; thus, despite the fragility of Nash’s decorative domes, the Pavilion’s basic structure has proved strong and secure enough to withstand bombs and hurricanes. By the mid-1820s Nash was describing himself — with typical exaggeration and immodesty — as ‘the principal user, and perhaps I may add the introducer of cast-iron in the construction of floors of buildings’.

Nash was not the only Regency champion of iron construction. Humphry Repton advocated the use of iron not just to mimic more traditional materials and dispositions but to create ‘many beautiful effects of lightness’. These qualities were enthusiastically exploited by the architects of new industrial buildings, who utilised cast iron columns to create large, spacious, well-lit areas. From the 1780s onwards windows, too, were being constructed not merely of softwood but also of iron, with glazing bars of cast iron, brass, copper or even

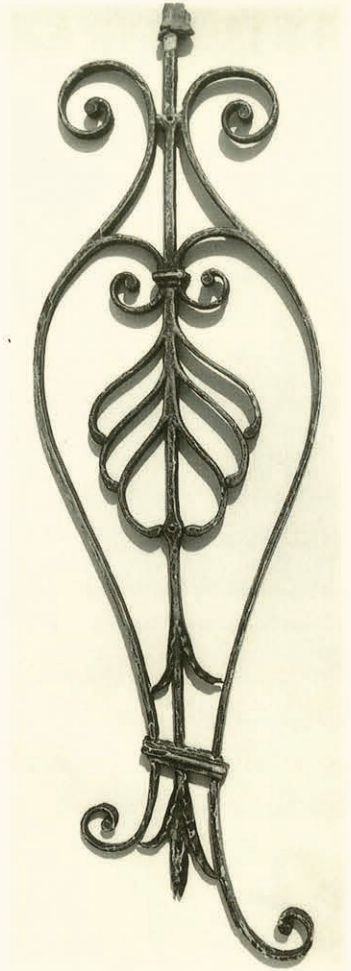


FIGURE 8: A BALUSTER OF 1785 FROM A DEMOLISHED ROBERT ADAM HOUSE (LATTERLY THE CHINESE EMBASSY) IN PORTLAND PLACE, LONDON (THE BROOKING COLLECTION)

bronze. Such advances enabled glazing bar thicknesses to be reduced at no cost to the overall integrity of the structure. In 1793 one sales catalogue was already confidently declaring that ‘The change now taking place in the materials for sashes, skylights, fan-lights, staircases &c. &c. from Wood to Metal has, besides the elegance of appearance, the advantages of strength and extensive durability’.

THE CONSERVATORY

PERHAPS THE MOST IMPORTANT advance in the context of glazing, however, was the invention of the curved glazing bar. In 1815 Sir George Mackenzie published an article calling for the introduction of glass greenhouse roofs ‘parallel to the vaulted surface of the heavens, or to the plane of the sun’s orbit’, which included a design for a revolutionary greenhouse built as a half-dome and not as the habitual straight-sided glass box. The following year J C Loudon patented the curved cast-iron glazing bar for specific use in greenhouses. The effect of this invention was substantial, enabling Mackenzie’s vision to be promptly realised. No longer did greenhouses have to resemble flat-walled houses; instead, new curved-roof greenhouses — most effective when built as a complete hemisphere — could present a far larger area for the sun to shine through, and thus prove far more effective at propagation. In 1823 Loudon erected a domed conservatory on the side of his own villa in Porchester Terrace, in the fashionable Bayswater area of West London, and was soon enthusing about its properties and advantages:

‘The greenhouse may be designed in any form, and placed in almost any situation. . . Even a house looking due north, if glazed on three sides of the roof, will preserve plants in a healthy, vigorous state. The curvilinear principle applied to this class of structures admits of every combination of form . . . ‘and soon? the clumsy shed-like wooden or mixed roofs now in use will be erected only in nursery and market gardens.’

Metal-framed glasshouses were provided with another recent advance: steam heating, supplied through cast-iron piping. This combination of greenhouse and steam was first attempted in 1788, and by 1820 was widespread. Most importantly, this stylish adornment to the house and garden was within reach of every class of household. As Loudon pompously noted in 1838, ‘The enjoyment afforded by a greenhouse, however small, are very considerable; and where there are children, these enjoyments may be mingled with useful instruction’.

The most suitable form for a Late Georgian conservatory or greenhouse (there was no distinction made between the two terms; the former was simply more pretentious) was one which best harmonised with the adjacent house. Unfortunately, although today Britain is enjoying a revival of interest in conservatories, many manufacturers appear to have forgotten this simple precept, and their designs have degenerated into crude, unsubtle and oversized parodies of Regency or Victorian models.

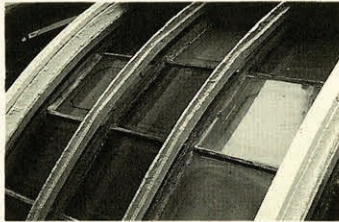


FIGURE 9: EARLY CURVED GLAZING BARS AT THE CONSERVATORY AT ATTINGHAM PARK, SHROPSHIRE (EDWARD DIESTELKAMP)

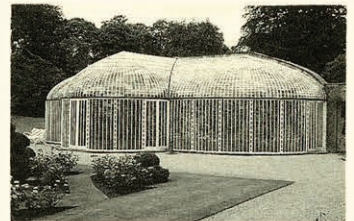
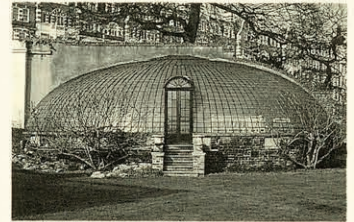


FIGURE 10-15: CURVILINEAR CONSERVATORIES OF THE 1820s: AT GROVE HOUSE, REGENT'S PARK, LONDON (TOP) AND DALLAM TOWER, CUMBRIA (MIDDLE) AND BICKTON LODGE, DEVON (BOTTOM) (EDWARD DIESTELKAMP, ROBERT THORNE)

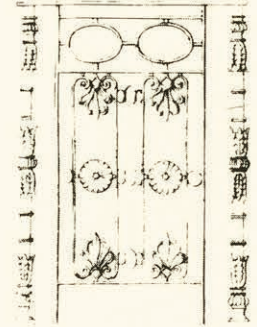
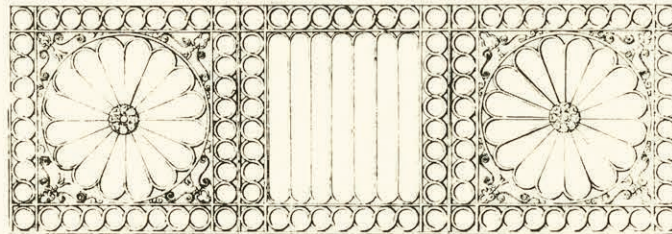
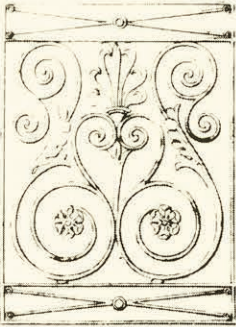
THE MAINTENANCE AND REPAIR OF IRONWORK

DECORATIVE IRONWORK, particularly if outside, is often not as decayed as it at first seems. Before deciding whether repairs are necessary, it is vital to clean off all extant rust and paintwork. Remember that, whereas the amount of rust may seem substantial, rust occupies seven times the area of unoxidised iron.

Details of the maintenance and repair of ironwork are given in John and Nicola Ashurst's excellent English Heritage guide of 1988, *Practical Building Conservation vol.4: Metals*, pp.23-39. Basic rules to follow are: retain as much original fabric as possible; repair rather than replace; replace like with like (i.e. wrought iron with wrought iron and cast iron with cast iron); use traditional repair techniques; do not be too afraid of rust — underneath there may be enough unoxidised metal left for the piece to remain in use; and remove all loose dust, paint and grease before repainting.

The prime function of paintwork is protection, not decoration, and it must be applied continuously to be effective. Remember, too, that if you remove all the paint layers prior to repainting you are thereby eradicating the ironwork's paint history — making it impossible to determine the original colours in the future; thus it is probably best to keep one area unstripped. And before repainting, ensure that the iron surfaces are entirely clean and rust-free.

FIGURE 13: DESIGNS FROM COTTINGHAM'S *THE SMITH AND FOUNDER'S DIRECTOR* OF 1824.



SOURCES OF INFORMATION

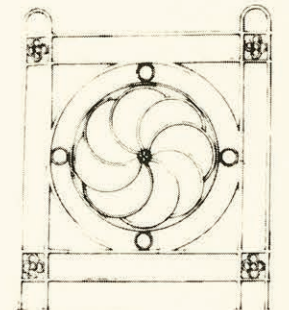
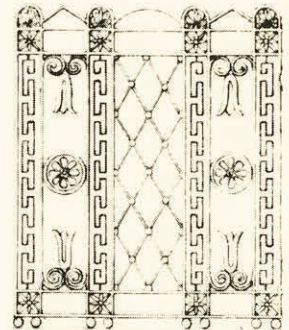
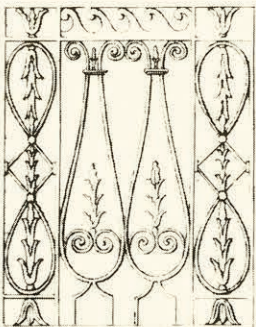
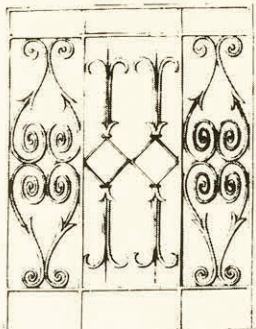
The Cast Metals Federation, The National Metal Forming Centre,
47 Birmingham Rd, West Bromwich, B70 6PY, tel. 0121 601 6390.

The Brooking Collection includes a vast invaluable collection of Ironworks, from fanlights to grates to window furniture, from every window. Write to: The Brooking Collection, The School of Architecture and Construction, University of Greenwich, Avery Hill Campus, Avery Hill Road, Eltham SE9 2UG.

Ironbridge Gorge Museum, Ironbridge, Telford, Shropshire TF8 7AW, tel. 0195 243 3522. An excellent museum at Coalbrookdale, the birthplace of the Industrial Revolution.

The Society for the Protection of Ancient Buildings, 37 Spital Square, London E1 6DY, tel. 0207 377 1644. Sound advice on building history and structural repairs, including an invaluable range of information sheets.

Metalwork Department, The Victoria and Albert Museum, South Kensington, London SW7 2RL, tel. 020 7942 2468. Expert advice as well as a wealth of examples.



FURTHER READING

John and Nicola Ashurst, *Practical Building Conservation vol.4: Metals* (English Heritage, 1988)

Dorothy Bosomworth, "Railings Revived" in *Traditional Homes*, May 1985.

Amina Chatwin, *Cheltenham's Ornamental Ironwork* (Cheltenham, 1974)

Davey, Heath, etc., *The Care and Conservation of Georgian Buildings* (Edinburgh New Town Conservation Committee/Butterworths, 1978)

Edward Diestelkamp, 'Building Technology and Architecture 1790-1830' in ed. White and Lightburn, *Late Georgian Classicism* (The Georgian Group, 1988)

Jacqueline Fearn, *Cast Iron* (Shire, 1990)

John Gay, *Cast Iron Architecture and Ornament* (John Murray, 1985)

John Harris, *The British Iron Industry 1700-1850* (Macmillan, 1988)

The Iron Revolution (R.I.B.A. Heinz Gallery catalogue, 1990)

John Sambrook, *Fanlights* (Chatto and Windus, 1989)

Lindsay Seymour, *Iron and Brass Implements of the English House* (Academy Editions, 1988)

D S Waite, *Ornamental Ironwork* (1990)

Suggested pattern-books

Robert and James Adam, *Works in Architecture* (1774)

L N Cottingham, *The Smith and Founder's Director* (1823)

J C Loudon, *An Encyclopaedia of Villa, Farm and Cottage Architecture* (1833)

Peter Nicholson, *Mechanical Exercises* (1812)

Henry Shaw, *Examples of Ornamental Metalwork* (1836)

W & J Welldon, *The Smith's Right Hand* (1745)

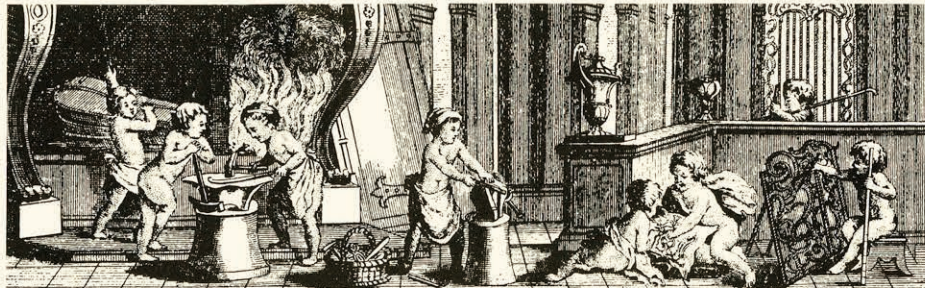


FIGURE 14: A FANCIFUL FURNACE FROM BLONDEL'S *LIVRE NOUVEAU* OF 1761.

The Georgian Group exists to save Georgian buildings, townscapes, monuments, parks and gardens from destruction or disfigurement, and to stimulate public Knowledge of Georgian architecture and Georgian taste. The Group offers a yearly programme of visits and educational events; applications for membership can be obtained from the Group office at:

The Georgian Group,
6 Fitzroy Square, London, W1T 5DX,
tel: 020 7529 8920
email: office@georgiangroup.org.uk

web site address: www.georgiangroup.org.uk

The Group is a registered charity (no.209934) and benefits from Covenants.