

WINDOWS – BUDAPEST

DON'T DESPAIR - REPAIR

The Georgian Group

I have been asked to say a few words about The Georgian Group, which was founded in 1937.

In December 1936, Lord Derwent, a young peer of some artistic sensibility and a pioneering advocate of Georgian and Regency architecture, had initiated a debate in the House of Lords in response, as he put it, to ‘the tide of careless destruction that is daily menacing the architectural beauties of our country’. His motion proposed that a census be undertaken of all buildings constructed between 1700 and 1830, with the aim of protecting those of sufficient importance.

Derwent worked with Douglas Goldring, a veteran campaigner against the capital’s demolition squads, who, in 1936 focused his attention on the perils facing Georgian buildings and outlined an idea for a society dedicated to the saving of them. The Georgian Group, as it has become known, was born and, by the autumn of 1937, was established in a small office in Cork Street, London. The younger core of the committee at that time included key figures in the world of architectural history, such as the poet John Betjeman, Christopher Hussey, James Lees-Milne and John Summerson.

The committee was faced with a growing list of buildings all over the UK that were under threat of demolition. One of the most significant and urgent was Norfolk House adjacent to Trafalgar Square, the Dowager Duchess of Norfolk joining the Georgian Group and enclosing with her subscription the message ‘would it be possible for the society to save Norfolk House from being pulled down?’ Ironically it was her son, the owner, who was in talks with a developer for its demolition. In the end just the important Music Room was saved.

In 2008 the Group is still campaigning with extreme vigour and we also play an educational role, offering Repair and Maintenance Classes and Summer Schools throughout the UK, as well as offering awards for sympathetic conservation work. Exhibitions and events are another important part of our work and this year we are holding a festival to mark the quincentenary of Andrea Palladio’s birth in 1508, which includes two symposiums, an exhibition of English neo-Palladianism and an architectural drawing prize awarded by the our patron, the Prince of Wales.

HISTORY & DEVELOPMENT

In the Elizabethan period in England (late C16), there was a quest for well-lit interiors which drove the builders of the time – in a manner reminiscent of medieval church builders – to produce increasingly ambitious structural solutions in order to maximise available daylight. This is a picture of Hardwick Hall in Derbyshire which attracted the description: ‘Hardwick Hall more glass than wall’. When lit up at night these Elizabethan powerhouses, usually proudly situated on high ground, shone like lanterns against the night sky leading to the term ‘lantern houses’.

In the early C18 the neo-Palladian movement in England campaigned to encourage builders to produce smaller windows, in which they were aided in three ways:

- a) rapid improvement in the quality of window glass from the 1680s onwards
- b) advances in window technology
- c) introduction of window tax in the 1690s

The outcome of this was that by the mid-Georgian period, around the middle of the C18, the facades of many buildings were fitted with precisely engineered sash windows. One of the earliest buildings in England to take advantage of the new technology was Hampton Court shown here.

(Fresh air and ventilation)

England seems to have lagged behind the Continent with respect to environmental control in buildings during the C16. In a letter to Dr Francis, Cardinal Wolsey’s physician, the humanist scholar Erasmus described local attitudes to ventilation:

‘...the English are totally regardless concerning the aspect of their doors and windows to the East, North and South...they glaze a great part of the sides (of the rooms) with small panes, designed to admit the light and exclude the wind; but these windows are full of chinks through which enters a percolated air which, stagnating in a room, is more noxious than the wind..’

In 1662 the immigrant Flemish architect, Sir Balthazar Gerbier contrasted the ill-fitting casements of England to the high standards of weather tightness achieved on the Continent with well-made wooden windows. So, no change there then!

In the course of the C17 we did change our approach in Britain, the turning point being a large-scale switch to wood technology for fenestration which began during the latter quarter of the C17. Spurred on by the rising popularity of the newly-invented sash window, the ventilation properties of which were ideally suited to the variable British climate and secular building in Britain was transformed in a space of about three generations.

In the fully-developed double-hung sash window Britain had found a modern, efficient instrument for ventilating small to medium-sized spaces. It remained the staple of British fenestration practice until the end of the C18.

The sash window was later itself to be undermined by the casement window, in different guises, during the C19 century for various reasons:

- a) a matter of style, as with the Gothic Revival
- b) materials and production techniques, such as metal windows at the end of the C19, which coincided with a return in architectural style to more English traditional imagery.

Ventilation continued to be a key issue, one addressed by the scientist and architect Sir Christopher Wren, architect of St Paul's Cathedral in London, who experimented with ventilation systems and window technology.

At one of his earliest buildings, the Sheldonian Theatre in Oxford, Wren introduced a new type of window, a circular pivot window, which 'contrived to admit air in foul weather, yet not one drop of rain'. Wren also played a pivotal role in the development of the sash window.

Renaissance window forms were introduced into Britain in the first half of the C16, but it was Inigo Jones in the early C17 who reinforced their use within a classical idiom. This gave rise to strict proportions of fenestration based on the villas of Andrea Palladio in the Veneto.

Marble Hill, to the west of London on the river Thames, has the 'classic' fenestration of Palladio's villas. Namely, 1-3-1... The window pattern is not actually based on classical antiquity, but follows the design of Venetian *palazzi*, a design in Venice that goes back to the C12.

It has been convincingly shown that the design of the Georgian façade is controlled by the width of the window. At Marble Hill all the windows are 40" wide. (The width of the window here would, in classical terms, be called a *module*). Not only the windows but equally all the spaces between them both laterally and vertically are either 40", 60", 80" or 120". Each side is symmetrically balanced by the other.

While the 'hole-in-the-wall' window is one of the architectural features that defines the final point of transition from the medieval to the classical in Britain, it is the introduction of the wooden sash window that gave the subsequent British development its particular character. So the sash window became a catalyst for the creation of a genuine alternative British classical language of fenestration, related to French and Italian models from which it drew inspiration, yet following an independent route.

The sash window is a vertical sliding window containing a counterbalancing device consisting of a set of weights, lines and pulleys. There are three principal hypotheses for its development:

- 1) It originated in France and spread to Holland and England at the end of the C17.
- 2) It was developed in Holland and adopted by the English and some other European countries in the last quarter of the C17.

- 3) It was a post-Restoration English invention and did not reach Holland before the 1680s, or France before the 1690s.

Sliding doors and windows had been used in France from a very early date, sliding windows having been mentioned in French literature as early as 1261 and doors seem to have pre-dated these by several centuries. Some medieval windows in France still survive (in effect no more than vertical sliding shutters). By the end of the C16 glazed horizontal sliding timber windows were used in Parisian shops and, by the mid-C17 glazed vertically-sliding windows, precursors of the sash window were definitely in use in domestic buildings in France. In Holland sliding windows are believed to have been used in timber-framed buildings from as early as the C15.

Late C17 sash windows in England usually consisted of an eight-over-eight panel (meaning that each sash was divided into eight sections by the glazing bars, which were normally very thick and the panes were small. Initially only the lower sash was hung on cords and counterbalanced by hidden weights to allow it to be raised and lowered with ease.

In the early C18, as the cost of larger sheets of glass fell, the 'six-over-six' window became common, and 'four-over-four' was also not uncommon. After 1709 windows of buildings in London were required to be set back four inches from the face of the external wall, following an Act of Parliament intended to reduce the risk of the spread of fire, although the wide box containing the weights remained exposed. Later in the century, in 1774, this was further developed when a subsequent Act stipulated that the weight boxes be recessed into the brickwork, so it is relatively easy to spot a post-1774 building in London, which can be a help with dating.

It was with the arrival of the box-frame sash window towards the end of the C17 that the ideal structural arrangement for the true Classical window type was realized and it is the expressive way in which sash windows were used as much as their actual size and number that identifies a Baroque building in England. The English Baroque sash window tended to be rather narrow and tall (a width/height relationship of 1:2.5 being common) This gave a strong impression of verticality.

A combination of technological and stylistic factors, especially the introduction of new materials and techniques, along with the growth of neo-Classicism, led to the continuing refinement of the sash window during the latter half of the C18 and into the C19. A good example of this can be seen in the work of Robert Adam, as here in Fitzroy Square dating from 1792, home to the Georgian Group in London.

Towards the end of the C18 other architectural styles became popular as well, notably the Picturesque which introduced increasing variety with more complex window forms. One of these was the introduction of 'margin lights'.

These are sashes with a large central pane flanked by slim strip panes and they gained popularity in the work of Sir John Soane during the 1820s.

Another model was the hybrid Gothic/Classical compass-headed window in which glazing bars intersect at the top of the window forming pointed lights.

By the middle of the C19, partly as a result of manufacturing developments in plate glass, windows became far heavier, losing the delicate appearance of earlier Georgian glazing bars.

This led, eventually, through modern framed-construction techniques to broad expanses of plate glass used in the C20, particularly on Art Deco buildings of the 1930s, such as the Firestone building shown here, tragically demolished at the end of the last century.

Maintenance

There are several reasons why windows decay:

- Water is allowed to stand on horizontal planes, such as sills
- Paintwork has cracked
- Moisture becomes trapped, at the points where the paint has cracked, attracted by capillary action. This can easily occur between a timber sill and the masonry below
- Adjoining masonry is sometimes left in a damp state for long periods of time
- Condensation persistently forms on the inside face of the glass, especially in bathrooms and unheated rooms

Other forms of decay include the wood-boring larvae of certain types of beetle, and dry rot, a specific type of fungus. Dry rot rarely affects windows, although it is sometimes found behind sealed shutters and in the boxes of sash windows when there has been an outbreak of fungus elsewhere in the building.

Movement in buildings, in masonry or timber-frame walls, can lead to distortion of windows, causing them to jam and, in certain cases, cracking the glass, although historic buildings can tolerate a surprising amount of movement.

There is often a temptation for owners to despair and consider replacing historic windows but in almost every case this is not necessary. Historic windows can normally be repaired.

Small areas of decay can be scraped out and the remaining sound timber treated with a suitable preservative. Larger voids, those that are not too near a joint, can be partially filled with a timber patch. In certain cases fillers can be used to infill small sections or feather in joinery work, although, of course, the better quality the joinery is the less need

there will be for filler. Traditional fillers were made of white lead paste and linseed oil putty, sometimes with chalk or sawdust to provide bulk.

Some general rule-of-thumb guide lines are:

- Where decayed timber is to be removed to form a splice repair, the minimum amount of existing timber should be removed to allow an effective repair
- Repairs should follow any existing deformations in the line of the window
- The timber used in the repair should match the original as closely as possible as the joint between the two may fail if the two species have different rates of expansion and contraction and, ideally the line and density of the grain (the number of growth rings) should match and the new timber be well seasoned
- One important point is to try to ensure that structural integrity of the window is maintained and that the window continues to function as it was designed to
- If possible repairs to windows should be carried out *in situ*

When repainting it is seldom necessary to strip all the old paint off completely. Only loose and defective areas of paint, putty or filler need be removed. Paint of course, provides its own historic record. When stripping off paint and putty great care should be taken and blow lamps should not be used under any circumstances, because of the fire risk. Finally, on no account should windows be stripped by immersion in a bath of caustic soda (or any other chemical paint stripper) as this method damages the timber and dissolves the glue from their joints, thereby weakening them.

Historic paints often contain high levels of lead and burning it off will release toxic fumes. Rubbing down with abrasive paper also generates toxic dust so the safest method is to use wet abrasive paper. Lead-based paints and primers, which provide the best protection, cannot legally be used in the UK, except on certain types of buildings, grades 1 & 2, within the national listing system.

A quick word about glass. It is still possible to obtain original glass, although with some difficulty, but it is worth the search as the quality of original glass is far different from modern productions and contributes very significantly to the inherent qualities of historic buildings. There a few companies that do today produce replicas of historic glass.

DO's & DONT'S

- Repair wherever possible, rather than replace
- Don't alter window openings in proportion or detail as they help establish character
- Retain and re-use all historic details, including old glass, window fittings and ironwork (such as balconies and balustrades)
- Replace damaged or missing pieces with accurate modern reproductions or reclaimed originals that match those that have survived
- Paint windows rather than stain them; stains were not used historically

PVCu – Plastic windows

A major issue for us all is the rise of the ubiquitous PVCu PLASTIC window. The Georgian Group strongly campaigns against their use in the UK for the following reasons:

- Plastic windows cannot, at the moment accurately mimic the appearance of original Georgian sash windows with their original glass
- When double-glazed PVC-u replacement windows were first mass-marketed in the 1960s & 70s, their biggest selling point was that, unlike ‘down-market’ old timber, the new material would last indefinitely, no maintenance guaranteed – thirty years later those who fell for the first hard-sell were surprised to find a new generation of salesmen trying to sell them a PVC-u upgrade to replace their once-in-a-lifetime product – there is no such thing as a maintenance-free building product!
- PVC-u frames need to be cleaned every six months or dirt embeds itself in the material. They do not weather attractively and prolonged exposure to ultra-violet light from the sun chalks the surface, making it grainy and dirt-retentive. Pollution and sunshine eventually combine to yellow the surface and attack the structure, making the frames brittle and prone to cracking – softwood timber has none of these qualities – it remains a common misconception that wooden window frames are troublesome to maintain; properly coated and periodically painted wooden windows will last for well over a hundred years – current generation PVCu will begin to degrade and discolour after around twenty
- Unsound pieces of timber windows, when they do start to deteriorate, can be replaced at a fraction of the cost of a replacement PVCu window
- The production and disposal of any type of PVCu creates toxic chemicals. These are released twice, once during the manufacture – a process which uses up many times the amount of energy required to produce a wooden frame – and again when the material has to be disposed of – by incineration or in landfill sites
- Three European Commission studies on PVC and PVCu waste management, published in 2000 stated that PVC waste volumes would almost double over the next twenty years. Significant quantities of PVC additives will leach out of landfills and incineration creates even more hazardous waste. It is fair to say that the use of timber can also be environmentally damaging, although this can relatively easily be overcome through the use of sustainable resources

Energy

The policy with regard to historic windows in most local authorities in England is that repairing the originals and then installing secondary glazing, with little invasion on to the historic fabric, is preferable. This, according to energy bodies, is only half as efficient as

double glazing, particularly with the new technique of filling the void between the panes of glass with argon gas, which has higher thermal properties than air.

Some manufacturers of sash windows in Britain claim that they are able to produce double-glazed windows that are virtually indistinguishable from originals.

One argument is, of course, that if historic buildings are to survive then they have to provide a reasonable level of comfort for their occupants...but we have to define what a reasonable level may be.

English Heritage and, in general, the amenity societies, such as the Georgian Group, concerned with historic buildings in Great Britain, take the view that repairs to existing windows and the introduction of draft proofing and good quality secondary glazing systems significantly improve the energy-related performance of a historic window.

I think that's all I have time for but I leave you with the message – don't despair, repair.

Michael Bidnell

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