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After the fire: reconstruction following destructive fires in historic buildings

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Abstract

Given the recent spate of high profile fires in historic buildings this article will consider the factors that influence the remedial approaches adopted. It will show that if the significance is of a high level, the extent of damage is not prohibitive and there are the financial means to allow, reconstruction may be an acceptable option. The exact form that this might take depends on a wide variety of factors, including the consensus reached by a range of stakeholders in the building; the exact nature of the significance; having sufficient documentation to establish a basis for accurate replacement (or, where this is lacking, to exclude this as an option) and what precisely the available funds will permit. It is suggested that there is considerable imprecision in the way in which types of reconstruction are categorised and that it remains of key importance to establish clearly what is meant in each individual situation. Although the emphasis should always be on preventing fires from occurring in the first place and of reducing as far as possible the potential damage that might result, having full and complete documentation for any important building is a necessary pre-emptive measure to allow for the worst case and give the subsequent potential for reconstruction.

Key words: fire, historic buildings, conservation, post-fire reconstruction, documentation.

Introduction

Standing in a historic building and observing the destruction and loss of fabric caused by a serious fire is a sad and sobering experience; one that suggests a pessimistic outlook for the building's future. However, when visiting such a building once reconstruction has taken place, seeing the high level of skill that has been employed and rooms fully reinstated, in many cases complete with their contents, the overriding impression is of optimism and of wonder at what can be achieved. This article examines such interventions in important historic buildings after there has been a destructive fire. These fires have occurred frequently, with future fires near certain, and how to respond to the resultant often badly damaged building is a topical issue, though one about which little has been written. Recent examples of fires include Notre Dame Cathedral in Paris in 2019; the Mackintosh Building at The Glasgow School of Art in 2018 and the National Museum of Brazil (Saint Christopher's Palace) in Rio de Janeiro, also in 2018.

Fire is potentially the most serious threat facing a historic building since it can cause significant destruction in a very short time and the results are largely irreversible, this being of concern because of the clearly finite nature of the built heritage and the artefacts it contains. Much has been done to improve fire safety in historic buildings, both to prevent the outbreak of fire and to control the spread of fire if it occurs and, where conservation constraints permit and financial resources are available, historic buildings have had fire compartmentation improved; fire detection and alarm systems upgraded and even fire suppression systems installed.¹ Routine upgrading work, particularly of electrical services, has also helped to reduce the risk. Owners and managers of buildings have assimilated the value of fire safety management and consequently where possible fire loading has been reduced, ignition sources identified and temporary risks (such as having contractors on site or staging events) addressed. Despite this there continues to be a regular incidence of serious fires in historic buildings. Obtaining accurate numbers is problematic because of the lack of heritage-specific recording of fire incidents, but data collected for England for example show that over 350 fires occurred in heritage buildings in 2018; of which around 40 caused serious damage to the building.²

What to do with important historic buildings following destructive fires is a subject attracting a good deal of strong opinion and controversy. The final decision on the future of the building in question is often a product of compromise reached among the stakeholders in the building, who may consist of the owners, the statutory authorities (including conservation

bodies) and the insurers; with expert and public opinion taken into account. It is rarely universally accepted.

Attitudes to badly fire-damaged heritage assets have changed, in part as society has come to attach more value to these assets, and while it was once far from uncommon that fire damaged buildings were demolished (for example nearly three hundred country houses in England that had serious fires were subsequently demolished³), it is considered that it is now unlikely that a building of any importance would be demolished. Following several recent high-profile fires, there have been swift and definitive public statements as to the intention to reconstruct⁴, and this makes an examination of the post-fire situation particularly apposite.

Each fire is unique, in terms of the characteristics of the fire itself; the level of resultant damage; the type and construction of the building and the location of the building. However, there are a number of commonalities after all destructive fires in historic buildings, related to the conservation approaches that can be adopted to ensure the future of the building and these are explored here. The article is based on a multi-mode research of the aftermath of a number of key fires in historic buildings, which comprised an interrogation of the published literature; visits to many of the buildings discussed to provide contextual data and interviews with key stakeholders and contributors involved both with specific fires and with the more general post-fire context. The aim has been to examine the key factors in the post-fire decision-making process and seek to clarify, with evaluation in the context of actual fires, the possible terms that can be used to identify the choice of intervention. Semi-structured interviews were carried out (9 in total), supplemented by a number of briefer telephone interviews and e-mail conversations, with respondents including conservation officers, directors, senior project managers, structural engineers, architects, conservators, property managers, planning advisers and specialist advisers.

The focus here is when a fire has caused considerable damage, since if the damage is very light then the most likely intervention for any damaged elements will be simply a repair, usually with like-for-like materials. Only single buildings are discussed and it is acknowledged that for a group of buildings, such as a historic area within a town or city, then the response to a large fire may necessarily be very different. It should also be noted that there have been many fires in historic buildings where subsequent reconstruction has been carried out and due to space constraints only a limited selection of fires has been examined here.

Before the approaches to reconstruction adopted following a number of notable fires can be usefully examined, it is first necessary to define the range of terms that can be used, as well as the main factors in deciding the nature of post-fire interventions.

Conservation Terms for Post-Fire Interventions

It should be noted at the outset that many of the conservation terms and underlying philosophies relating to historic buildings, emphasising such pre-emptive concepts as protection of fabric and conservative repair, may be of limited applicability where much that would otherwise be valued has been lost to the fire.

It has become evident both from the literature and in the course of interviewing a wide range of practitioners and stakeholders that, when discussing the possible options for a historic building following a serious fire, there is a marked interchangeability of terms used, with reconstruction, rebuilding, restoration, replication, reinstatement and recreation being used frequently and interchangeably to mean the same thing. It is useful therefore to examine terms in more detail and what these might mean from a building conservation perspective, this potentially allowing for a clearer understanding of what is proposed (or realised) and the underpinning rationales.

The most commonly used building conservation terms are defined in the widely accepted Burra Charter.⁵ Potentially relevant terms for post-fire interventions are restoration and reconstruction, which are defined thus: "*Restoration* means returning a *place*⁶ to a known earlier state by removing accretions or by reassembling existing elements without the introduction of new material" and "*Reconstruction* means returning a *place* to a known earlier state and is distinguished from restoration by the introduction of new material".⁷ Restoration is frequently used colloquially, often incorrectly, as a catch-all term, but used with its correct meaning may be applicable where there is only light damage and no new materials are required. Reconstruction is the most appropriate term to describe post-fire interventions where elements have been badly damaged or destroyed.

The Charter makes it clear that while new work should be readily identifiable, reconstruction should be "identifiable on close inspection or through additional interpretation"⁸, with the further advice (in the Practice Note for New Work which supplements the Charter) that this could be by way of "subtly modifying materials or details, or by incorporating the date and/or marking devices that indicate the extent of the work"⁹ in order to promote honesty (or legibility). Since therefore post-fire reconstruction work may

not always be immediately obvious, which in the interests of a harmonious whole may actually be advantageous, it is suggested that there may be the need to offer additional interpretation in order to categorically acknowledge the fire and what has subsequently been done to reconstruct and is now being presented.

Replication is sometimes used colloquially when discussing works to rectify fire damage, though its conservation definition as "the construction of a copy of a structure or building, usually on another site¹⁰" suggests that it is not an appropriate term and it has also been dismissed as not being a valid conservation process.¹¹

Seeking to offer better clarity for a variety of approaches to reconstruction, the terms *rebuilding*, *nearly rebuilding* and *contemporary design* were adopted by a pan-Scandinavian team which looked at the wider issue of fire in heritage.¹² Rebuilding here is intended to mean an accurate reconstruction. Nearly rebuilding is making "something reminiscent" but simpler and it is suggested that this may be a disappointing option if it doesn't resemble the lost building closely enough. Contemporary redesign would be building something new in the place of the lost.

Slightly modifying the three descriptive categories suggested in the 1993 Options Report after the Windsor Castle fire¹³, and similar in scope to the Scandinavian categories, *authentic reconstruction*, *equivalent reconstruction* and *contemporary redesign* have subsequently been suggested¹⁴; a combination of these options might also be used, with different approaches being appropriate for different areas or rooms within a building. Where there is insufficient evidence for an authentic reconstruction (reconstruction on a like-for-like basis), then equivalent reconstruction is suggested as a possible alternative, this term meaning that something reminiscent of the original is built, likely to be simpler and with the use of contemporary techniques. However, as will be seen below, lack of evidence may not be the only reason why this option is adopted; cost and materials are also relevant. By contemporary redesign is again intended new design to replace that which has been lost.

Authenticity is an important concept and is normally vested in original historic fabric, with interventions into a building seeking to minimise or avoid negative impact on that fabric. In terms of post-fire reconstruction however, authenticity refers to accurate reproduction of missing elements using the same materials and techniques and retaining the original design and layout for any parts that have been lost, and relies heavily on an adequate level of documentation.

Interventions are likely to also include some aspects of *adaptation*, defined as "changing a *place* to suit the existing use or a proposed use".¹⁵ With a significant level of damage to a building after fire there is the opportunity to improve the building for contemporary needs if there are the financial means to allow for this. The Burra Charter is very clear that adaptation is only acceptable where it would have a minimal impact on the cultural significance.¹⁶ The introduction of new services is common - for example modern electrical systems and modern fire detection and alarm systems, and such adaptations may be required to satisfy building codes or regulations (though these may be relaxed for historic buildings in certain cases). Such adaptation is an unavoidable addition to authentic reconstruction and it would make no sense to ignore this opportunity; it would in any case be impossible to install for example an electrical system exactly as it was 'the day before the fire'.

Factors in Post-Fire Decision-Making

From fieldwork and the literature review a range of factors have been identified which determine the future of a historic building following a serious fire and the viability of and approach to possible reconstruction. This is proposed in a hierarchical order, although it is acknowledged that this might be overridden by individual circumstances.

Significance

The level of significance of a historic building is perhaps of paramount importance in determining its future after a serious fire. Cultural significance is at the heart of Burra Charter, and is synonymous with the terms cultural heritage significance/value¹⁷; heritage significance¹⁸ and cultural historic value¹⁹ which are used elsewhere. The Burra Charter, encompassing a broad range of values, defines cultural significance as meaning "aesthetic, historic, scientific, social or spiritual value for past, present or future generations".²⁰ The most recent international doctrinal text on authenticity in reconstruction (The Riga Charter²¹) advises that although there is an established presumption against reconstruction, it may be acceptable following loss if an asset has outstanding significance (and only where appropriate documentation exists; the overall urban or landscape context is not falsified and existing historic fabric is not damaged).²² This implies conversely that a building which only has a limited cultural significance is less likely to be reconstructed after a fire.

In addition to the degree of significance, there is also the question of what impact a fire has had on the significance of a building and this depends on what exactly that significance is based on. This could be composed of tangible or intangible values, or a

combination of both. In a case where significance was based on age and the existence of original historic fabric (where tangible values are predominant) and this has been lost as the result of a fire, then the significance could have been substantially diminished. If the overall level of damage is coincidentally sufficiently high then reconstruction may not be appropriate, and the building could face demolition, or be considered for incorporation as a partial element in a new design. However, where the significance is based on intangible values, such as the symbolic stature of the building within a community, when significance represents a public interest²³, the demands for the buildings' reinstatement will likely be stronger. In fact the importance of symbolism, or community value, which may be related to many factors including historical association, can be very high. This might be in relation to a city, to a country, or to a culture. This is exemplified by the situation immediately after the fire at Notre Dame where there were strong feelings expressed about the symbolic importance of the cathedral both to Paris and to France.

Level of damage

Another important consideration is the level of damage to the building and what is physically left after the fire. The worst case scenario would be that very little is left, for example where a timber building has been involved. This might normally mean that reconstruction is less likely, though there are exceptions to the rule where significance is particularly high.

Following a fire at the medieval timber church at Södra Råda in Sweden in 2001, which had fine interior paintings (some dating from 1323), all that remained was a collection of charred timber beams.²⁴ Despite this, a project led by the Swedish National Heritage Board decided to reconstruct the church, using the original medieval methods of construction (this project had a long gestation and was only completed in late 2018).²⁵ At the other end of the scale is a fire which has been relatively small and caused only localised damage and in this case it is thought that like-for-like repair is the most likely intervention.

Somewhere in between sit a considerable number of large-scale fires in important buildings, which have caused considerable damage and which suggest numerous possibilities for the future of building. However, the prerequisite for reconstruction is usually a viable structural shell and where collapse has occurred or the structure has been sufficiently weakened such that complete rebuilding would be required, the possibility of complete loss is higher and the feasibility of reconstruction reduced.

Availability of funds

If the level of significance and the level of damage suggest that reconstruction might be a suitable option for the building, whether this is possible depends on the availability of the means to pay for it.²⁶ There are a number of sources of funds, a combination of which may be required, which include insurance pay outs, national or local governmental contributions, heritage grants, donations (corporate and private) and, in some cases, internal funding. Both the source of the funds, which may come with conditions attached, and the amount of money available are likely to have an impact on the exact nature and extent of reconstruction.

Substantial sums are likely to be involved. Restoration after the fire at Windsor Castle in 1992 cost £36.5 million (£65 million at today's prices). After the 2014 fire, the Mackintosh Building reconstruction project cost around £35 million²⁷ (after the 2018 fire a far more substantial sum will be required). At Clendon Park the initial estimated project cost was £30 million.²⁸ For Notre Dame, reflecting the importance of the building, French billionaires, multinationals and private citizens have reportedly offered €880 million (£762 million) for the restoration, though the likely cost is as yet unknown.²⁹

Insurance is often important, but is not always critical. In the case of the uninsured National Museum of Brazil, following destruction by a fire in 2018, the Brazilian Culture Minister announced the reconstruction project on the same day as the fire; the Brazilian authorities have promised funds and governments and cultural organizations across the world have pledged to offer additional financial backing.³⁰ Neither Windsor Castle nor Notre Dame³¹ (see both below) was insured.

Level of documentation

Both from a practical point of view, in terms of having accurate information on which to plan reconstruction, and from a conservation perspective to define possible approaches, having sufficiently detailed information about the building before a fire is of crucial importance. The commonly held view is that reconstruction should only go as far as the point at which conjecture, or speculation, begins³², or in other words any reconstruction needs to be supported by adequate documentation (it is for this reason that *recreation* is excluded as a term for post-fire options, since this is defined as "conjectural reconstruction"³³). Indeed, documentation is so central to post-fire interventions that it has been suggested that for very important buildings creating full records of the building should be a priority in case the worst happens.³⁴

Notable Fires and Varying Approaches to Reconstruction

Having considered various approaches for a fire damaged building from the perspective of building conservation philosophy and some of the main issues determining the response, it is useful to consider this in light of the actual approaches adopted after important fires (and likely approaches where the fires are more recent). These are presented below in chronological order.

York Minster, 1984 and Hampton Court Palace, 1986

These two earlier fires are considered together here since the subsequent interventions were similar in approach. In essence authentic reconstruction was carried out, however in both cases there were elements of adaptation.

The Cathedral Church of St Peter, York Minster was constructed over a long period, starting in the early 13th century. It is Grade I listed³⁵ and together with its precinct is a Scheduled Monument.³⁶ The 1984 fire, which had not been the first in the history of the Minster, destroyed the south-transept roof. After much consultation and deliberation, it was decided to carry out an authentic reconstruction, with the new roof matching the original design and constructed in like-for like materials, with the main timbers being of seasoned oak. In order to improve fire protection however, the boards (which had originally covered the web of the vault), and had contributed to the intensity and spread of the fire, were replaced during the reconstruction with a metal mesh covered on both sides with fire-retardant plaster.³⁷

Hampton Court Palace is near Kingston upon Thames in south-west London. It has been a royal palace since 1529, and is also Grade I listed and a Scheduled Monument. The fire in 1986 caused extensive damage to the King's Apartments in the Fountain Court area of the palace. The reconstruction was authentic, returning the palace as close as possible to its original design, with most materials and construction techniques being like-for-like. One compromise had to be made due to the lack of availability of materials in the quantities required; the ceiling of the Cartoon Gallery was re-plastered onto an expanded metal mesh, since supplies of riven oak laths were insufficient.³⁸ The adaptation in this case was again related to fire protection - smoke vent panels (drop-out hatches) were introduced into the new roof, which were designed to operate quickly in the event of fire (the 1986 fire had been contained below the lead roof, which had intensified it, before the fire service were eventually able to remove some of the lead to allow for venting).

Uppark, 1989

Uppark in West Sussex, owned by the National Trust, is a Grade I listed country house built about 1689, which had survived with little alteration since the 18th century. There was serious fire in 1989, which resulted in the loss of the roof and most of the floors, and caused a large amount of damage throughout the building. There was a lot of public discussion about the future of the house, which included early calls for its demolition and others for a new interior of modern design. SPAB's³⁹ advice was to employ architects and designers to "add their contribution"⁴⁰ in the form of contemporary redesign where the destruction was total. This it was argued would make Uppark "far more alive and interesting than a sterile copy of a vanished work of art"⁴¹.

However, in addition to what had survived in-situ (including plasterwork, carved and gilded ornamentation and all the chimneypieces), the archaeological salvage operation recovered much useful material from the debris in the building.⁴² There had also been a successful salvage operation during the fire which had succeeded in removing most of the collection. This had been purchased for Uppark (and for another family house from whence it had come to Uppark) between the late 1700s and the early 1800s⁴³, and would be best put back into an appropriate setting. Another important factor was that the insurance for the building was for reinstatement⁴⁴ (though this was later rendered academic by a successful legal action against the contractors who had caused the fire⁴⁵). There was also a detailed photographic record of the interior.⁴⁶

It was therefore decided to carry out an authentic restoration, returning the house as close to the pre-fire situation as possible (to 'the day before the fire') and it was suggested that that if the work was carried out with skill, the reconstruction process might be a question of skilful repair, rather than pastiche reproduction.⁴⁷ In fact in the subsequent work, many elements that had been damaged were able to be repaired; where damage was greater, fragments of the original were incorporated where possible (for example in the reconstructed ceilings) and where destruction was more complete the same materials and designs were used (for example for the main stairs).

Thirty years after the fire, the impression given by Uppark today is not that of a 'sterile copy' and the current visitor numbers of around 82,000 per annum⁴⁸ suggest that the reconstruction has been successful and that the house continues to be appealing to those who ensure its future viability. Although to the careful viewer the evidence of the actual fire and the subtle blending of original fabric with new following reconstruction are there to be seen,

it is perhaps not obvious to the casual visitor. However, Uppark is straightforward about acknowledging the fire as part of the story of the building, both in the literature available and with a video and display boards explaining the fire.

Windsor Castle, 1992

In contrast to Uppark, following the fire at Windsor Castle in 1992, and in what has been described as a wholly pragmatic decision to not to carry out authentic reconstruction⁴⁹, different approaches were adopted for different sections of the building. The Castle is a royal residence, occupied as such for over 800 years, and it has been suggested that "nowhere in the country is richer, either historically or symbolically⁵⁰"; this is reflected in the dual designation: Grade I listed and a Scheduled Monument. The fire caused severe damage to the north-east section of the Castle, with 115 rooms, including major state rooms, being badly affected.

Once again a great deal of opinion was expressed as to how the building should be reconstructed and there was an involved process of decision making, with debate focused on whether to restore or not, and to do an authentic restoration or to "use equivalent means to produce the same effect"⁵¹. The Castle is part of the Royal Household, with the rooms either for private or state use, and the views of the royal family (the key committees being chaired by the Duke of Edinburgh and the Prince of Wales), in tandem with the chance to improve the efficient use of the building by reconfiguring certain spaces, were notable considerations in addition to those related to heritage.

The finally agreed approach was that for rooms that were important for state occasions, with contents which had been saved from the fire, such as the Octagonal and State Dining Rooms, equivalent reconstruction was adopted. This meant that visually the rooms were identical following reconstruction, but that changes were made to background materials and construction. For other rooms sympathetic, but nevertheless contemporary, redesign was adopted. This was the case for the chapel area, where the layout was rationalised to improve circulation and a new lobby (the 'lantern lobby') and a new chapel were designed; St. George's Hall received a new steel roof structure (though the external profile was retained) and a hammer-beam ceiling which offered the most recent interpretation of a tradition of redesign in gothic style⁵². In part the decisions were financial, since an authentic reconstruction was far more expensive and the Castle hadn't been insured.⁵³ There was also good precedent for making changes in that the building had been subject to continual and

substantial alterations in the past, with new architectural ideas being incorporated (this meant furthermore that selecting an appropriate 'authentic design' to return to for authentic reconstruction would have been problematic).

Stoke Rochford Hall, 2005

Stoke Rochford Hall is a Grade I listed country house near Grantham in Lincolnshire. It was previously used as a training and conference centre and is currently a hotel, banqueting and conference centre. There was a serious fire in 2005, which caused widespread damage to the building, including the loss of the roof and upper floors. The reconstruction was funded by an insurance pay out.

The post-fire interventions in this case were a combination of near authentic reconstruction and contemporary redesign. The principal ground floor rooms were returned to their previous appearance. Minor modifications had to be made to allow for structural requirements: several additional steel beams were inserted at first floor level to reinforce the lattice of original cast iron beams (most of these staying in-situ meant that there was maximum retention of historic fabric), and the ceiling reconstruction used fibrous-cast plaster instead of solid-cast in order to reduce load on the floor above.⁵⁴

Elsewhere however, the decision was made to depart from the original design, partly to secure the commercial viability of the building and partly to reduce floor loads, but also to reduce cost; the cost of a full authentic restoration had been estimated at £20 million, but only £12 million was available (including that required initially for salvage and enabling works). Modern commercial accommodation was installed on the first floor and the shape of the roof was altered to create space for a new plant room, though the latter is not visible from ground level.

Clandon Park, 2015

Clandon Park, near Guildford in Surrey, is a country house owned by the National Trust and was constructed between 1725 and 1731. It is listed as Grade I. Before the fire, which occurred in April 2015, the centrepiece Marble Hall had been described as one of the great rooms of early Georgian England⁵⁵ and was considered as the architect Giacomo Leoni's masterpiece. Sadly, the fire was very destructive with the fire report stating that the building had been 95% damaged.⁵⁶

At the time of writing the building consists of the full masonry structure, up to and including chimney stacks and parapet; with the building fully enclosed in scaffolding,

including a temporary roof. The roof and many of the floors and ceilings were lost in the fire, with some structural elements subsequently removed during enabling works to allow for safe working conditions below. However, the damage is certainly not total - one room survived the fire almost intact; some wall finishes and features have also survived (for example plasterwork, statues in alcoves and chimney pieces) and there are also some partial timber survivals (for example panelling and window shutters) - and it was concluded post-fire both that Clandon remained of outstanding national significance⁵⁷ and that some degree of restoration could take place.⁵⁸

Clandon Park is similar to Windsor Castle and Stoke Rochford in that a varied, or combined, approach to reconstruction has been proposed. This seeks to balance conservation requirements with the need to provide a viable future for the building (which had falling visitor numbers before the fire)⁵⁹. Clandon is a departure from the choice of authentic restoration at Uppark and, though a similar approach might have been financially possible at Clandon, it was felt that this might be restrictive and that, in responding to more dynamic societal expectations from heritage, a more engaging visitor experience was required.⁶⁰ There was consequently an international competition to choose an architect to deliver the project, and the winning design was a combination of authentic reconstruction of the principal ground floor rooms; together with contemporary interventions in other areas which were not of the same historic significance - including a modern staircase in a now open four-storey space; a modern exhibition space with the bare brickwork walls exposed by the fires as a backdrop (this serving also to acknowledge the event of the fire) and a roof-top viewing and seating area.

A historic building requires a suitable use to assure its future and where this equates to having sustainable visitor numbers, the proposed varied approach to reconstruction, with the inclusion of a modern exhibition space, offers a pragmatic solution. It should be pointed out that this is not the final design since the National Trust and their architect-led team are currently undertaking a detailed feasibility study for the reconstruction, which includes the preparation of concept designs, and the final proposal will also be subject to statutory consent.

The Mackintosh Building, Glasgow School of Art 2014 and 2018

The Mackintosh Building at Glasgow School of Art was designed by Charles Rennie Mackintosh, an architect, artist and designer who was a pioneer of modernism, blending Scottish and Japanese influences with art nouveau to create his own unique aesthetic⁶¹, which

it has been suggested "heralded the birth of a new style in 20th century European architecture"⁶². The building, finished in 1909, is considered to be his masterpiece and is Category A under the Scottish listing system⁶³ and is of international importance. In 2009 the building was judged to be the best building of the past 175 years, in a UK-wide poll run by the Royal Institute of British Architects.⁶⁴

There was a serious fire in the west wing of the building in May 2014 which caused considerable damage, most notably to the famous Mackintosh Library which was almost completely destroyed, as well as to the 'Hen-Run' (an external corridor) and some studios and archival stores. Total fire losses were estimated to be about 17%.⁶⁵ The chair of Glasgow School of Art signalled the relatively light damage to the building, suggesting optimistically the day after the fire that it had been "slightly bruised" and that the lost library would be "recreated".⁶⁶

The post-fire project was initially limited to reconstruction of the fire damaged elements, but the opportunity was subsequently taken to expand the project and carry out a comprehensive refurbishment of the whole building⁶⁷; this including complete re-servicing; extensive external repairs and conservation work on the internal finishes (this was not covered by the insurance paying for the reconstruction and was being funded separately). The library was considered the most important space and was in the process of being painstakingly and accurately reconstructed, although interestingly not to the day before the fire, but to as built in 1909, with the idea of going back to the original design intent⁶⁸ (bookshelves and a staircase up the second floor added at a later date were not going to be reinstated). With an urgency to have an important component of the teaching space of Glasgow School of Art returned to use as quickly as possible, reconstruction work was started in 2015 and, despite the time-consuming level of detail required in the reconstruction this was a fast-paced project⁶⁹, on-schedule for completion within 5 years of the fire.

Work was in fact nearing completion when there was a second fire in June 2018. This was a fire on a much bigger scale than the previous one and caused extensive damage to the building. At first the viability of the building structure was itself in doubt (and there was initially quite a large exclusion zone around the building because of potential structural collapse⁷⁰), consequently this time no announcement was made about the intention to reconstruct until 3 months after the fire⁷¹.

At the time of writing the building consists of external masonry walls; internal masonry cross-walls; main connecting steel beams (some badly distorted) and a partial concrete slab at second floor level, which offers some weather protection to the floors below. There is extensive damage to the stonework and some exterior walls were found to have moved from position by up to 100mm in places.⁷² Most of the superstructure above second floor level has been removed due to concerns about stability and the structure has been made safe with the use of an extensive support and restraint system, consisting of scaffolding, and lattice and box trusses. All of the intricately designed and detailed interiors were lost in the fire, with almost all timber being consumed, and in most places the interior surfaces are now bare masonry.

The evidence submitted as part of the Scottish Parliament's (Culture, Tourism, Europe and External Affairs Committee) 2019 investigation⁷³ following the second fire reveals that there is very divided stakeholder opinion as to the future for the building, with suggestions ranging from a completely new building to full and accurate reconstruction of the existing. Although the Glasgow School of Art has clearly stated its intention to authentically reconstruct the Mackintosh Building the Committee has recommended that a full consultation exercise should be undertaken to "fully acknowledge and understand differing viewpoints, before making a formal decision on whether or not to rebuild"⁷⁴ and this parallels the Riga Charter which calls for full and open consultations to establish the need for reconstruction.⁷⁵

Although any reconstruction project will be a very big challenge, and major structural stabilisation and repair work will be required before the interior is addressed⁷⁶, there is a good case for authentic reconstruction. The level of documentation existing before the 2014 fire was already very good, with an extensive archive, including Mackintosh's original drawings and some design development drawings; as-built drawings; detailed survey-based architectural drawings from the early 1990s and glass plate photographic negatives showing an exceptional level of detail for the key spaces⁷⁷. After the first fire this material was augmented by very careful archaeological salvage and recording work and by a Building Information Model (BIM) that was created for the whole building, based on a point cloud survey using 3D laser scanning and supplemented by detailed site surveys.⁷⁸ This meant that by the time of the 2018 fire, there was an exceptionally comprehensive record of the Mackintosh Building and, despite the extensive damage to the building, this now allows for the possibility of a full and accurate reconstruction.⁷⁹ There are also the funds to do so because the building was fully insured for reinstatement.

The widely-acknowledged high level of significance is in the importance of the building as a symbol to the city of Glasgow and as the central element of a working school of art; both of these factors support reconstruction. It is also the best example of Charles Rennie Mackintosh's unique work, underlining his importance as an architect and designer, thus it could perhaps be argued (particularly for the interior) that another element of the significance is in the artistic design intent, rather than in the original fabric, and that authentic reconstruction could re-establish this: the finished building can potentially look exactly as Mackintosh intended, albeit in a new materials, missing only the 'patina of age' (which will eventually develop as the building weathers and is used).

Cathédrale Notre-Dame de Paris, 2019

Notre Dame Cathedral, considered a masterpiece of Gothic architecture, is one of the most well-known buildings in the world and at the time of the fire was the most visited monument in France.⁸⁰ It dates from the Middle Ages, being just over 850 years old; with construction started in the 13th century and finished in the 15th century. The cathedral was badly damaged during the French Revolution and was restored in the 19th century by the architect Viollet-le-Duc. It is an integral part of the UNESCO World Heritage Site 'Paris, rives de la Seine' (Paris, banks of the Seine).⁸¹

The fire in April 2019 resulted in the collapse of the famous spire, which was added in the 19th century restorations; the loss of large sections of the roof covering and supporting structure and the collapse of two sections of the vaulted stone ceilings. The fire was mostly at high-level and a good deal of the interior is unadorned stone, with therefore a lot less to contribute to the fire and the consequent loss of fabric as a result of it. Works are currently being carried out to stabilise the structure of the cathedral.

President Macron of France stated just hours after the fire that the cathedral would be rebuilt and that work would be completed within 5 years. Subsequently a wide range of approaches to reconstruction has been suggested, including a number of contemporary designs, partly in response to the French authorities' announcement that an international architectural competition would be held to redesign the cathedral's roofline. However the Senate (upper chamber) of the French Parliament has recently caveated a restoration bill for the cathedral with a demand that it is rebuilt exactly as it was before the fire and have also removed special exemptions from planning, environmental and heritage controls, which had been intended to speed up the rebuilding process to allow completion within the 5 year

period.⁸² Even with the exemptions, the achievability of the 5 year completion period has been widely questioned, with many experts suggesting that it is not enough.⁸³

There is currently a lively debate between proponents of authentic reconstruction and those of contemporary redesign, with equally strong voices for the building to be returned to a pre-fire configuration, complete with a reconstruction of Viollet-le-Duc's spire, and at the other end of the spectrum, various architectural concepts including a glass roof and a roof garden. Undoubtedly this is a kind of building conservation test case in terms of which direction the reconstruction will take. Despite the political statements, the competition and the keenness of architects to design something of the 21st century as part of the reconstructed building it is thought possible, given the very high level of cultural significance of the building and the fact that it is an integral part of a world heritage site, that authentic reconstruction might be chosen as the preferred option.

This could prove to be problematic in terms of materials for reconstruction of the roof structure, since the quantity of oak in suitable lengths is not likely to be available. A potential and pragmatic solution to this could be the use of a steel roof structure. Although this would not be authentic in material or design, it is perhaps less of a concern where the element in question will not be visible in the finished construction; it would be hidden in this case by the stone vaulted ceilings beneath and by the roof covering above.

Discussion

Reconsidering the three terms suggested for reconstruction options in the light of the past and current reconstruction projects discussed above, it is clear that they are in some instances too broad in scope to give, once applied as labels, a clear idea of the exact form of reconstruction that has been adopted or is proposed. 'Authentic restoration' is the term which is perhaps least problematic because it would appear to allow for the least variance. However there is perhaps no true 'authentic reconstruction' since for example services will be modern and other functional or protective improvements may be made, and thus should strictly be referred to as 'authentic reconstruction with adaptation'. Additionally, as shown in several cases (notably at Hampton Court and parts of Stoke Rochford), an approach which is authentic in intention may actually include minor changes to materials.

'Equivalent reconstruction' offers the least clarity of the three terms, with a meaning that is not immediately self-explanatory. It has been used to describe a situation, such as for the dining rooms at Windsor Castle, where the surface treatment is identical to what was lost,

with the supporting fabric using contemporary materials and techniques where these can't be seen; but also with the suggestion that the basis is building something reminiscent and simpler. Perhaps a clear distinction is required between an identical surface result supported by non-original materials and techniques on the one hand; and something that really is simpler and merely reminiscent on the other. The former suggests itself as more appropriate where perhaps funding is inadequate or key materials may be lacking for full authentic reconstruction; the latter where evidence is lacking (though caution is required here with a potential implication of conjecture).

Both of the above options leave an opening to criticism for being copies or fakes. However, as has been seen, the level and nature of significance may allow that such reconstructions are acceptable, and in order to maintain honesty there clearly needs to be acknowledgment of what has been done and is now being presented, such as at Uppark.

'Contemporary redesign' describes certain aspects of the Windsor approach, but somehow fails to acknowledge how well this new work fits with and is sympathetic to the surviving fabric. Given the opportunity, reconstruction might include some spatial redesign and rationalisation of layout and may allow a historic building to have a viable function to survive into the future, however this could potentially be in tandem with the use of authentic materials and techniques, and here also the 'contemporary redesign' label is possibly not a good fit.

Concise description is made harder to achieve because, as has been seen at Windsor Castle and Stoke Rochford, and as proposed for Clandon, there is a good possibility that the selected approach will be in reality a combination of approaches, varying with the exact nature of the building; the particular element or space under consideration and the level and extent of fire loss.

Conclusion

Because of the concerns with the terms for reconstruction options highlighted above; the likely combination of approaches adopted within a single project and because of the observed interchangeability of terms used by practitioners and stakeholders, it is suggested that it is perhaps erroneous to seek to apply too precise a descriptive label without supporting explanation. Therefore, it is thought that the emphasis should be on establishing clarity among practitioners and stakeholders about what exactly is proposed or has been done in each individual case, and what the terms in use actually mean.

Given the frequency of fires in historic buildings, and since the basic aim of conservation is to be able to hand on what we value to future generations, if we don't reconstruct at least the most important buildings, our stock of buildings to hand on will be reduced. Exactly what form that reconstruction takes in practice is open to subjective interpretation and depends on a variety of factors, with significance, the level of damage and the nature of funding being preeminent. Irrespective of approach however, there is a need for pragmatism in the reconstruction process to take advantage of the opportunities for improvement created by the fire. This has been evident in most completed cases and is related to safeguarding the future viability of the building, a concern which factors strongly in ensuring its survival. Even when authentic reconstruction is the preferred option it is thought that aiming to achieve such viability, when it can be incorporated without a negative impact on the significance, should take precedence over a pedantic insistence on total accuracy.

The prime concern should be to prevent a fire occurring at all costs, but planning for a post-fire scenario should be carried out as part of the overall emergency planning process; it is not acceptable to assume that a fire won't happen and wait until one does until thinking about what to do afterwards. As an element of such planning, the importance of documenting any important historic building in as much detail as possible should be stressed. This pre-emptive measure gives the possibility of reconstructing the building should the worst occur and without it, lacking in evidence and with conjecture becoming more prominent, the range of options would be severely limited.

Experience has shown that with sufficient funds available even the most badly fire-damaged buildings can be revived for future generations. Taking the long view, a serious fire can be considered as a major but not necessarily terminal event in the life of a historic building. In fact many buildings with a long history have experienced a fire at some stage in their existence and in this context fires, with the reconstruction work which follows, are a part of the story of the building and more recent fires should perhaps be regarded in a similar light.

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³ Beckett; Lost Heritage / England's Lost Country Houses.

⁴ Folha de S.Paulo *Minister of Culture says*; BBC News, *Glasgow Art School's Mackintosh* and Guardian, *Notre Dame fire: Macron and Vaaju.com, The first big decision*.

⁵ Australia ICOMOS, *The Burra Charter*.

⁶ "Place means a geographically defined area. It may include elements, objects, spaces and views. Place may have tangible and intangible dimensions." (Australia ICOMOS, *The Burra Charter*, 2).

⁷ See note 5 above, 2.

⁸ See note 5 above, 7.

⁹ Australia ICOMOS. *Practice Note: Burra Charter*, 3.

¹⁰ Historic England *Advisory Note on the Reconstruction*.

¹¹ ICOMOS New Zealand *Charter*, 6.

¹² Laurila (ed.), *Can we learn from*, 61.

¹³ Nicolson, *Restoration: the Rebuilding of*, 78. The Options Report had used the word 'restoration', rather than 'reconstruction'.

¹⁴ Bold, Larkham and Pickard, *Authentic Reconstruction: Authenticity, Architecture*, 203.

¹⁵ See note 5 above, 2.

¹⁶ See note 5 above, 7.

¹⁷ See note 5 above, 2.

¹⁸ English Heritage, *Conservation Principles, Policies and Guidance*.

¹⁹ Widely used in Scandinavia, see for example: Swedish Code of Statutes, *Heritage Conservation Act*, 11.

²⁰ See note 5 above, 2.

²¹ ICCROM/Latvian National Commission for UNESCO/State Inspection for Heritage Protection of Latvia, *The Riga Charter*.

²² *ibid*, 2.

²³ British Standards Institution, *BS 7913: 2013 Guide to*, 6.

²⁴ See note 12 above, 30 and Riksantikvarieämbetet, *Kyrkan brinner! (The church is burning!)*, 40-41.

²⁵ Hantverkslaboratoriet, Göteborgs Universitet, *Rekonstruktionen av Södra Råda*.

²⁶ Crowdy, pers. comm.

²⁷ Guardian, *Glasgow School of Art's*.

²⁸ Malcolm Reading Consultants, *Clandon Park International Design*.

²⁹ Guardian, *France announces contest*.

³⁰ Smithsonian.com. *Around 2,000 Artifacts Have*.

³¹ Nicolson, *Restoration: the Rebuilding of*, 78 and La Parisien, *Notre-Dame n'était pas assurée*.

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- ³² Historic England, *Historic England Advisory Note*, 3; ICOMOS New Zealand, *Charter*, 7 and Grimmer, *The Secretary of the Interior's Standards*, 227.
- ³³ See note 11 above.
- ³⁴ Maxwell, *Cost Action C17: Built Heritage*, 11.
- ³⁵ Important historic buildings are 'listed' in England to give them statutory protection; Grade I is the highest category, for buildings of 'exceptional interest' (only 2.5% of listed buildings are Grade I). (Historic England *Listed Buildings*).
- ³⁶ Principal heritage assets sometimes carry a dual protection as listed buildings and as scheduled monuments, with the latter having a wider scope and carrying precedence.
- ³⁷ BBC News, *Remembering the York Minster and Chapter of York, The 1984 Fire*.
- ³⁸ Fishlock, *The Great Fire at*, 102.
- ³⁹ SPAB is The Society for the Protection of Ancient Buildings, a UK building conservation body.
- ⁴⁰ Venning, "Uppark: Accept No Facsimile", 11.
- ⁴¹ *ibid.*
- ⁴² National Trust press release, October 1989; quoted in Cruikshank, *Rebuilding Uppark* and National Trust, *The Fire at Uppark*.
- ⁴³ National Trust, *Uppark*, 20-26.
- ⁴⁴ *ibid.*, 41.
- ⁴⁵ Rowell and Robinson, *Uppark Restored*, 169.
- ⁴⁶ Hunt and Boyd, *New Design for Old Buildings*, xxi.
- ⁴⁷ Cruikshank, *Rebuilding Uppark*, 56.
- ⁴⁸ Foster, pers. comm.
- ⁴⁹ Morrice, *A report into recent*, 12.
- ⁵⁰ Nicolson, *Restoration: the Rebuilding of*, 4.
- ⁵¹ *ibid.*, 72.
- ⁵² Giles Downes, architect, commenting on his designs used for Windsor Castle, in the documentary *Windsor restored - After the fire* (Royal Collection Enterprises Ltd., 1997).
- ⁵³ See note 50 above, 78.
- ⁵⁴ Cattell, pers comm.
- ⁵⁵ Jenkins, *England's Thousand Best Houses*, 730.
- ⁵⁶ Strudwick, *Report of Fire*, 3.
- ⁵⁷ Ptolemy Dean Architects, *Clandon Park Conservation Statement*.
- ⁵⁸ Foy, pers. comm.
- ⁵⁹ Fenton & King, *When old is new*, 11.
- ⁶⁰ See note 58 above.
- ⁶¹ Dezeen, *Glasgow School of Art*.
- ⁶² Glasgow School of Art, *The History of the*.
- ⁶³ Category A in Scotland is the equivalent of the Grade I listing in England.
- ⁶⁴ Times, *Mackintosh building is Britain's*.
- ⁶⁵ Davidson, pers comm.
- ⁶⁶ Channel 4 News, Interview with Muriel Gray.
- ⁶⁷ Brown, pers. comm.
- ⁶⁸ *ibid.*
- ⁶⁹ *ibid.*
- ⁷⁰ Echlin, pers comm.
- ⁷¹ BBC News, *Glasgow Art School's Mackintosh*.
- ⁷² See note 70 above.
- ⁷³ The Scottish Parliament Culture, Tourism, Europe and External Affairs Committee, *The Glasgow School of Art*.
- ⁷⁴ *ibid.*, 6.
- ⁷⁵ See note 21 above.
- ⁷⁶ McKinnon, pers. comm.
- ⁷⁷ Brown, pers comm.
- ⁷⁸ *ibid.*
- ⁷⁹ See note 65 above.
- ⁸⁰ Paris: Official website of the Convention and Visitors Bureau, *Cathédrale Notre-Dame de Paris*.
- ⁸¹ UNESCO, *Paris, rives de la Seine*.

⁸² Architects' Journal, *Notre-Dame: French Senate*.

⁸³ *ibid.*