A Future for Northern Ireland’s Built Heritage
Foreword

Northern Ireland’s built heritage is one of its prime assets. From stately homes cared for by the National Trust and open to the public, through those whose private owners have lovingly restored and care for their own homes to the excellent work being done by Building Preservation Trusts to rescue buildings which would otherwise be lost, many people and organisations are playing their part in keeping our heritage alive for current and future generations.

Preserving our built heritage is about much more than just protecting the sheer beauty of the buildings. It is a significant contributor to our efforts to combat climate change through recognising and realising the embodied energy in these venerable buildings. It is about retaining a tangible record of life in former times. It is also about recognising and passing on a respect for our past and our heritage, and realising that life in the past was very different from life today, and using that knowledge to recognise the importance of change in all our lives.

This document brings together papers from a wide range of those involved in the built heritage to provide a broad perspective on the issues. There are some clear themes running through the document, chief amongst them the intrinsic, cultural and aesthetic value of the built heritage and the need to preserve it. There are many means of protecting that heritage, and all need to be encouraged and delivered in the most appropriate ways to ensure that this record of our past continues into the future as a real and living part of our landscape and townscape.

Acknowledgements

This report was compiled and edited by Sue Christie with layout and design by Karen Nicholson and David McCann.

We would like to thank all of the authors for the time and effort they put into producing their articles. Many thanks to Marcus Patton for the cover illustration.

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Northern Ireland Environment Link (NIEL), March 2009
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Sustainability and the Built Heritage

Lydia Wilson, Architectural History Practice

Introduction
Sustainable development is a phrase used to convey a multitude of meanings – from growing the economy to managing consumption. Its recognised international definition is ‘development which meets the needs of the present without compromising the ability of future generations to meet their own needs’ (Brundtland Commission, 1987). The challenge lies in limiting development to levels that could conceivably allow the planet to replenish its finite resources.

Realistically, living sustainably means taking every opportunity to reuse or recycle resources, having an awareness of how our actions affect our environment, and trying to minimise the negative impact of those actions.

Buildings are vitally important – everyone needs shelter and warmth. However, buildings – in construction and use – also have the potential to hungrily consume resources and energy. In the simplest terms, the best way to minimise such harmful effects is to reuse the buildings that already exist, and make sure those buildings are insulated to minimise carbon emissions. Reusing existing buildings brings a number of benefits, but in environmental terms the biggest advantage lies in reducing waste and embodied emissions in demolition and construction.

Construction
Around a quarter of the UK’s yearly landfilled and incinerated waste is generated by the demolition and construction of buildings. Only 4% of the 70 million tonnes of building waste produced in the UK each year is recycled. The production of new building materials – 6 tonnes for every person living in the UK every year – accounts for 10% of national energy consumption. Reusing existing buildings saves waste and reduces the need for new building materials. A 2004 House of Commons paper issued by the Office of the Deputy Prime Minister stated: It is simply better in sustainability terms to use and recycle old buildings than to demolish them and build new ones.

Embodied Energy
All buildings contain embodied energy, which is the energy used to produce the materials that make up that building (or the energy that would be wasted if the building was demolished). Existing buildings represent a huge investment in embodied energy: research by English Heritage estimates that the energy wasted in demolishing one Victorian terraced house is equivalent to filling a car with 15,000 litres of petrol and driving it around the world five times.

Heritage bodies and developers who work with historic buildings agree that much of the UK’s historic building stock is robust and highly adaptable and, with regular maintenance, could survive almost indefinitely. If a ‘waste not, want not’ approach to development is adopted then repair of existing buildings should be paramount. In a far-sighted example of sustainability in practice, Northern Ireland’s Assembly members opted to repair Stormont rather than construct a new parliament building. Apart from the saving in new construction materials, the restored building and its green surroundings now act as a magnet for walkers and sightseers.

Cost
Some cite the cost of repairing an old building as prohibitive, but detailed research counters this argument. A 2004 study commissioned by Dublin City Council compared the cost of reusing a variety of existing buildings with the cost of demolishing and building anew. It found that constructing new buildings on brownfield sites was more expensive than retaining and reusing existing buildings, except where the extent of building repair and refurbishment needed was extremely – and unusually – high. Recent research in the
northwest of England found that the cost, over 30 years, of repairing and maintaining a typical Victorian terraced house was between 40% and 60% cheaper (depending on the level of refurbishment required) than replacing it with a new home. In Northern Ireland, Coleraine Council and Hearth Revolving Fund gave a lead in sustainable building practice by opting to restore rather than demolish Portrush Town Hall, a fine grade B1 listed example of Victorian public architecture, solidly constructed in red brick. The building was closed in 1997 after falling into disrepair. A plan to knock it down and rebuild in a similar style was proposed in 1999, at an estimated cost of £1.75m. This scheme was rejected in favour of restoration, which cost £1.6m. £1m of this was made up of grants only because of the building’s architectural and historical interest. The restoration saved money and limited the production of new building materials. We must learn the lesson: Northern Ireland’s heritage can be cost-effectively and sustainably reused.

**Environmental Performance**

The environmental performance of old buildings is often given as a reason for their replacement. Measuring the environmental performance of different types of buildings is an imprecise art which requires more research. Those who say old buildings are environmentally unfriendly are simply wrong, because the studies do not exist to prove it. What is indisputable is that old buildings have their own environmental advantages – evolved over centuries of providing warmth and shelter – including (very often) thick walls and a low window to wall ratio, which reduces carbon emissions through the glazing. Importantly, any building can also be adapted to provide immediate improved environmental performance using relatively cheap measures including, for example, lagging a loft or installing secondary window glazing.

The cost of maintaining a building over its lifetime should also be a key decider in whether an existing building is adapted or demolished. A 2006 report for English Heritage found that older houses cost less to maintain and occupy over their long-term lives than more modern housing. Maintaining a Victorian terraced house costs £1,000 less per year than maintaining a similar-sized building erected in the 1980s. This is largely due to the fact that older buildings tend to be constructed of durable materials like brick and timber, rather than modern materials like concrete blocks and PVC.

**Building Anew**

While it may be tempting to start afresh on an ‘eco-project’, every new build must necessarily incur environmental costs apart from those associated with manufacturing new building materials: either the loss of green space if the new building is constructed on a greenfield site, or – in the case of brownfield sites – the embodied energy wasted by demolishing an existing building in favour of an ‘environmentally friendly’ new one.

**Conclusion**

Our houses – in construction and use – are responsible for a large share of greenhouse gas emissions, and it is indisputably the responsibility of all of us to do whatever we can to reduce the burden on the planet. Reusing existing buildings is key to reducing waste and our carbon footprint, but it also has the positive side effects of encouraging traditional skills and maintaining the distinctive character of our towns and rural landscape. It is time to stop thinking about old buildings as stumbling blocks, and show that Northern Ireland can take a sustainable approach to building for the future.
Perusing some of the newspapers as they digested the publication of the last printed Built Heritage at Risk Catalogue in 2005 (Volume 7), you would be forgiven for thinking that our historic buildings were facing imminent collapse. Headlines such as Catalogue of Despair for Historic Buildings at Risk (Irish News, 13/05/2005) were sufficiently apocalyptic to evoke images of us conservationists flailing around hopelessly in the face of a metaphorical old building Armageddon. Media over-exuberance is perhaps to be expected but it is always disappointing that the nuances of many environmental issues, and the extent and nature of the challenges facing society, get crowded out in the search for a bit of drama.

Such an observation is not to downplay the size of the problem of derelict and neglected buildings, or the importance of any sort of media attention. Rather, there is a genuine concern that not only is the complexity of the issue not understood, nor explored in any great detail, but that the tone of the limited public debate is usually framed in a pessimistic or defeatist way (in spite of our best efforts). This is unfortunate, as highlighting the plight of the 501 buildings and monuments that currently occupy the online Built Heritage at Risk Northern Ireland (BHARNI) Register (as of 19th January 2009) is not intended to be a tale of woe. On the contrary, it is viewed as a springboard from which to target our collective efforts, whether through financial mechanisms or complementary policy initiatives.

Guaranteeing desirable outcomes depends greatly on partnership working and the power of persuasion based on the soundness of argument. The relative success of the Register has been built on the fact that it has more comprehensively quantified the number of buildings and monuments at risk and, in the process, has enabled an analysis of entries by way of location, ownership, and protected status, amongst other criteria. This greater understanding has not only bolstered demands for increased financial resources, but has informed important policy decisions such as the recent NIEA changes to its Historic Buildings Grant programme, which have opened up funding to grade B2 listed buildings. Additional resources are also now being directed towards building preservation trusts and other charities seeking to acquire and restore buildings at risk.

Welcome measures indeed. The impact in the broader policy arena of the Ulster Architectural Heritage Society’s extensive knowledge of the issue has allowed insightful responses to be made to various government consultations, such as draft Planning Policy Statement 21 and the review into the Domestic Rating System. As the graph in Figure 1 confirms, a majority of ‘Register’ entries are in
private ownership and logic would dictate that a range of favourable policies will be needed if the desired long-term impact of rescuing buildings is to be realised.

The final out workings of a number of consultations is awaited with interest, but our collective gaze must remain firmly focused on ensuring that effective policy instruments are in place across government; that both incentives and enforcement tools are available and used; and that the extra mile is travelled to encourage and support owners wishing to do the best for their historic building or monument.

Considering in more detail current entries to the BHARNI Register, it is informative to note that numerous buildings and monuments have been added since its launch in 2004 – over 40 in 2008 alone. This is largely as a result of the decision to expand the previously named Buildings at Risk NI Register to include above ground scheduled masonry monuments (and hence the name change from BARNI to BHARNI), as well as the ongoing second survey process under which new buildings have been listed, and existing derelict ones rediscovered. However, more encouragingly, there have also been many individual successes. There is insufficient space to list them all here but a sprinkling of examples would include: Ormeau Park House; Holywood Old School; Laurel View Villa, Donaghmore, County Tyrone; Robbs Ferry Cottage, Portadown; and the former Fire Station, Hawkin Street, Derry. Other prominent buildings where work is still ongoing include the Crescent Arts Centre in Belfast and the Playhouse Theatre in Derry; both having featured on the BBC Restoration series. Further good news stories can be discovered in the recently published BHARNI Catalogue (Volume 8), available in hardcopy from the UAHS, or as a PDF on www.uahs.org.uk.

Successes are now closely monitored by NIEA for audit purposes following the publication of the Northern Ireland Sustainable Development Strategy in 2006, in which the target of rescuing 200 BHARNI Register entries over a 10 year period was established. This opens up an interesting debate as to the merits of such a target-based culture; targets being of some benefit in helping to focus the mind whilst providing a means of measuring success over time. However, their usefulness should also be open to scrutiny as there is always a danger that the sometimes subjective determinant of quality may be consumed in the push for quantity. As our local built heritage represents a small and fragile resource, we trust that our decision makers will resist such temptations.

Many of our buildings at risk have withstood years of decay and neglect, and we would do them a great disservice if, in our haste, their specialness was lost through inappropriate intervention. We should all strive for speedy and imaginative conservation schemes, but quality control is always preferable to quantity control; the successful schemes of the past ably demonstrate that, where circumstances permit, a creative solution will eventually emerge.

*The views expressed in this article are solely the author’s and do not necessarily reflect those of the Ulster Architectural Heritage Society.*
The Northern Ireland countryside remains dotted with countless vacant traditional buildings, particularly in our upland areas. Often these are unseen by the passerby - more often than not they are sited sensitively into the surrounding countryside and make use of natural undulations to provide shelter from the weather. They also tend to be modest in construction, with few of the design flourishes often seen in the ‘Big Houses’ of the countryside. Look more closely though and these important landmarks, while conforming to certain traditional standards in terms of materials, design principles, method of construction and location, still exhibit the individual character and quirks not often seen in, for example, urban terraces, suburban estates and modern villas. They also represent links to our collective and family histories, with echoes of stories, folklore and ways of life bound up in the stone and lime mortar of the walls.

While it is a good thing that many of these homesteads remain, many more have been lost to dereliction and a trend towards replacement that continues apace. In many ways this reflects a mindset that has seen these buildings not as important aspects of our heritage but as ‘monuments to poverty’, replacement of which marks a symbolic break with a less than prosperous past. However, often it instead reflects a belief that vernacular rural dwellings are not capable of being renovated to provide for modern 21st century family living.

Through its Mourne Homesteads Scheme, Mourne Heritage Trust set out to prove that not only were these dwellings capable of such adaptation, but that this could also be done without significantly detracting from their essential characteristics - producing for the modern age homes of comfort and character, as well as preserving the folk memory that goes along with them. It is the Trust’s fervent hope that in these times of relative prosperity, notwithstanding the recent economic ‘wobbles’, we are sufficiently mature as a society to reappraise our attitude to these important remnants of who we are and where we came from.

Seven buildings, reflecting a variety of vernacular styles and settings, were renovated to an exacting specification from the Northern Ireland Housing Executive in terms of space, insulation, modern amenities, etc. This was not without its challenges, but with creativity and good design these were overcome. Where the space requirements could not be accommodated within the envelope of the original building, outbuildings were incorporated to provide living space. Where outbuildings did not exist, extensions were used with a preference for a rear extension over extending upwards or in length, allowing the original dwelling to remain the dominant feature of the site.

The benefits of this type of reuse are manifold. All of the homesteads were returned to their original owners with a covenant requiring their permanent occupation by persons with a local connection. Exemplifying the importance of the family ties, the owner of one of the homes saw his daughter inspired to relocate from England along with her young family, attracted by the opportunity to live in a house not only close to her ‘home place’ but also closely linked to her family’s history. Being abandoned, these houses are generally located in areas that have experienced depopulation so their restoration brings life back into rural areas.
helping sustain communities, schools, parishes. In areas of high landscape quality, which can suffer from the effects of second home ownership and rising house prices, there is scope to combine the restoration of our built rural heritage with the provision of affordable and/or social housing.

As previously touched on, these buildings blend almost seamlessly into the countryside and, unlike many of more modern construction, do not jar with our landscapes. Their renovation therefore not only removes the blight of dereliction but enhances the landscape in a way that only the most well designed and built modern houses can do. Among other things, and particularly in a place like the Mourne and Slieve Croob AONB, this represents a benefit to tourism.

Thick walls, small windows and low ceilings combine with siting in lee of hillsides or among mature native trees to not only enhance character but to ensure that heat is retained, particularly if thermostats are kept at a low but consistent level.

You do not have to take the word of Mourne Heritage Trust for these benefits! As well as through an independent evaluation of the scheme by the Cardiff Research Group, the various levels on which renovation of traditional buildings impacts has been publicly recognised far and near in the form of several prestigious awards. At a Northern Ireland level presenting the RSPB Planning Award to MHT in 2006, Hazel Bell, chairperson of the Royal Town Planning Institute (NI branch) said I was delighted that the RTPI could work in partnership with the RSPB to recognise this inspiring example of sustainable development. UK level recognition followed from the Civic Trust with an award given to projects of cultural, social or economic benefit to the community. Peter Bembridge, Managing Director, said that the

Most recently in 2007, a Diploma from Europa Nostra, the European Union’s Cultural Heritage Award, was presented at a glittering ceremony in Stockholm City Hall, Sweden, in the presence of Their Majesties the King and Queen of Sweden. The award placed the cottages in the company of such sites and artefacts as the New York Palace and Café, in Budapest, Hungary, the Palace of Westminster in London, ancient wall paintings at Fulda in Germany, Brunel’s SS Great Britain ship and a rock carved church at Cappadocia in Turkey. The citation from Europa Nostra on the Mourne scheme praised the sensitive rehabilitation...
Of derelict dwellings, with scrupulous regard for vernacular materials and techniques, that has greatly enhanced the landscape and generated educational and employment benefits.

Of course this very positive picture does not come without its caveats. Renovation is not for everyone and can be more expensive than new build, partly because of the limited availability of traditional building skills in Northern Ireland. However, as attitudes mature and planning policy evolves to provide more incentives towards retention and renovation, there is a sense that these skills will revive further and any differential in cost between renovation and new build will be less and less significant. Of course, one thing the scheme does not directly address is how sympathetic new build can greatly enhance the rural landscape. But it does give many pointers. The siting and features of these traditional properties can inspire and shape new design, be it in relation to details like windows and doors or broader shapes, such as broken rooflines and the irregular alignment of sections of the dwelling to give the appearance of a collection of smaller buildings. The Mourne Homesteads now stand as testament to what can be achieved when imagination, determination, sympathetic design and excellence in construction are applied to traditional buildings. They also mark a fitting legacy to the late Dick Oram, one of the driving forces behind the scheme. These once almost derelict structures are now comfortable family homes with all the conveniences of 21st century living, together with the character that only time and history can provide. And, as the pictures illustrate, anyone going down the road of renovation will be well rewarded for any additional expense.

In 1957, the eminent academic and author Estyn Evans, a man not native to Mourne but inextricably associated with it, wrote in *Irish Folk Ways* that ... *more could be said of the old styles, at their best providing homes of character, comfort and beauty*. The Mourne Homesteads Scheme demonstrates that they not only could do so in Evans’ time but in the modern age.

For owners inspired by this project interested in taking up that challenge we would recommend a publication that accompanied the scheme *Traditional Buildings in Ireland: A Home Owners Handbook* written by Dawson Stelfox and Richard Oram, which draw on the Mourne Homesteads experience and other examples. It provides practical guidance for those wishing to maintain, repair or restore traditional buildings. Copies of the handbook on CD Rom or of the external evaluation of the Mourne Homesteads scheme can be obtained from Mourne Heritage Trust. Tel. (028) 4372 4059, www.mournelive.com, or email mht@mourne.co.uk.
Learning from Experience on Orkney

Michael Coulter, Northern Ireland Environment Agency

At one stage in my career I was responsible for the maintenance of monuments and listed buildings throughout most of the north of Scotland, including the northern isles of Orkney and Shetland. The entire area is fascinating and interestingly contrasted. The Orkney archipelago is reminiscent of Northern Ireland, especially around Strangford Lough (my home area), except that the Orkadian landscape is almost bare of trees - and hedges are non-existent.

My key lesson from there was, and still is, the fantastic sense of ownership, by the whole community on Orkney, in particular, of their very rich archaeological and architectural heritage. All of their school children appear to visit the local monuments, with their teachers, and adults automatically bring their friends and visitors to them. That is something which I aspire to achieve here in Northern Ireland.

I am an island (of Ireland) born architect, who was then living on the bigger neighbouring island (of Great Britain), in Edinburgh (where I trained in architecture and architectural conservation), and paid to help advise the northern islanders on the care of their monuments and listed buildings. Shetlanders – or Zetlanders as some map still remind us – were (crudely and rather inappropriately) characterised as fishermen with a craft (a small holding), as opposed to the Orcadians – farmers with a boat - and, as a result, a greater sense of attachment to the land and its heritage. Both groups of islanders had a great sense of independence, the Shetlanders often providing the reminder that the Norwegian capital, Oslo, is closer to them than London. However, it was the Orkadians, with their real sense of ownership of their monuments, who left me with a sense of being a ‘blow-in’ - a short term in-putter to their long term care ... and how right they were! Indeed it was, in part, as a result of experiencing that strong sense of local ownership which caused me to choose to return home to Northern Ireland to help save, protect and promote our built heritage.

Although the Edinburgh based Historic Monuments and Buildings Branch (HMBB, of the Scottish Development Department) was the statutory decision making body in relation to the prime Built Heritage on the islands, the combined input of planning related decision by the Orkney Island Council, and the higher (than HMBB) level of grant-aid that they offered for works to listed buildings, etc, provided local representatives with very strong leverage in any negotiations. Nowhere else did I experience that same level of local ownership, investment, commitment or ultimate success in retaining (built) heritage. Thus Orkney provides a great role model.

In addition, on those occasions when we might feel that NI is 'remote' from the main tourist 'hot spots' in England or France, it is worth remembering the northern islanders, whose 'country' is rather more difficult, time consuming and expensive to get to than ours, yet they still maintain a significant tourist trade ... and, for example, the Orkadian silver jewellery industry (Ortak) that derives much additional trade from it. Following a recent policy review, resulting in a very significant increase in the amount of grant money available, the extent of grant eligibility and in the percentage of grant-aid, the Northern Ireland Environment Agency (NIEA) now pays grant-aid at a consistent 35% (replacing the former 20%, 33.3% and 35% - although a higher percentage applies to work on historic thatch roofs) for work of maintenance or repair to the historic fabric of Listed Buildings throughout Northern Ireland. It also pays 75% of related fees for architects, etc. The 35% reflects the average cost of utilising appropriate conservation related materials and practices, for example, the use of cast metal gutters and downpipes, or, say, real stonework, as opposed to cheaper, short term - and generally less sustainable - alternatives.

In the current economic climate this grant-aid helps lever in additional investment to the local economy throughout NI, on at least a one to three basis, and in most cases significantly more, because owners also tend to undertake other non grant-eligible works at the same time. By its very nature and scale, most of this work, which is undertaken by the hard hit construction sector, supports local jobs and skills. In turn, that investment also helps to support local shops, offices and housing etc, in addition to helping underpin tourism, reinforce local community identity and, last but by no means least, pride of place.

In many instances investment in listed buildings, often the key visual structures in a neighbourhood, helps to stimulate further redevelopment. So, in summary, this is your heritage, our heritage, and by caring for it, it can work for us to help sustain our quality of life, jobs and our economy.
Conservation in Practice

Dawson Stelfox, Consarc Design Group

Looking after our built heritage not only preserves the past for the future but also acts as a major catalyst for regeneration, provides significant employment and is an important contributor to sustainability. However, there are a number of significant barriers to quality conservation in Northern Ireland:

1. Skills shortages and knowledge gaps in consultants and contractors.
2. Regulating systems which are process led, not output led, and a lack of resources in Planning Service and NIEA to support and guide.
3. Restoration costs can be significantly higher than new construction and VAT is applied to repair and restoration works but not new build.

How can these barriers be overcome?

1 Skills Shortages and Knowledge Gaps

The recently published Skills Need Analysis of the built heritage sector by the National Heritage Training Group (www.nhtg.org.uk) is a stark demonstration of the skills shortages and knowledge gaps in the construction industry in Northern Ireland. The report provides hard evidence of both demand and supply related to work on pre-1919 buildings and makes a number of strong recommendations, including the need to:

- Improve education, publicity and information sources to activate demand and raise the market for use of traditional building skills.
- Develop cross border partnerships to maximise flexibility and capacity of the workforce.
- Stress the sustainability of conserving and reusing old buildings.
- Encourage accreditation of contractors and consultants.

The Review also outlines a Skills Action Plan for Northern Ireland with three key themes:

- Increase awareness of and demand for the use of traditional building craft skills and materials.
- Work towards achieving a fully skilled and qualified built heritage sector.
- Deliver flexible training and skills development to meet the needs of contractors and consultants.

The review points out that only 4% of architects in Northern Ireland are accredited in conservation, whilst 75% of them are confident of working on historic buildings, accounting for some 30–40% of their workload.

There is a general move towards the specialist training and accreditation of conservation professionals — architects, engineers, surveyors. This is directed by being a condition of grant aided projects in England, Scotland and Wales and the indication of a move in this direction in the new NIEA Historic Buildings Grant Scheme.

The RSUA runs an accessible Conservation course, open to architects and other design professionals, leading to a Certificate or Diploma in Historic Building Conservation, and the University of Ulster is planning an MSc in Conservation.

There is a lack of useful, practical guidance for consultants and contractors. Building Regulations are written for new construction and often judgement is required in interpreting them for existing buildings. There is little official guidance and authoritative technical advice is needed on, for example:

- Upgrading existing buildings to meet energy use standards.
- Adapting historic buildings to be accessible for all users.
- Meeting fire regulations without structural alterations or intrusions.

Extensive advice is available from GB bodies, for example, Historic Scotland, but detailed, tailored information relevant to Northern Ireland is in short supply. NIEA does publish some technical guidance notes and the Northern
Ireland Stone Database (www.stonedatabase.com) is a free technical website on all aspects for the use of stone in buildings, and associated mortars, fixings etc, but a much more comprehensive set of guidance documents and material is needed.

The maintenance, repair, conservation and restoration of historic buildings involves use of a carefully balanced mix of skills, materials and techniques. Definitions of these terms are given in the British Standard (BS 5750), but are summarised below using the example of a sliding sash window.

**Maintenance**: Minor works to ensure continuing good performance and condition for example replacing sash cords and painting.

**Repair**: Works of correction or replacement to an element of the building or object e.g. replacing a parting bead or a rotted cill member, but not the whole window.

**Conservation**: Works to conserve the integrity of the original object with the maximum amount of historic material - for example a thorough dismantling of a jammed up and partially rotted sash window, repairing elements as necessary and reassembling the original.

**Restoration**: Works to restore the original character where elements are missing or incapable of restoration. For example, putting back in correctly detailed sliding sash windows.

Practical conservation involves using all of these methods, quite possibly in one element and almost certainly in any one building. The process by which the decisions are made as to what method is used for each element in crucial to the success of the project, and that process should be the same regardless of whether it is a vernacular cottage, a church or a castle. This does differ from a museum type approach where ‘preservation’ of the object, without it needing to function in a practical way, is an option.

The principles on which that process is founded are:

- A thorough understanding of the building in historic, architectural and physical terms.
- Maximisation of the retention of original fabric.
- Protection and preservation of historic character, patina and ambience.
- Reversibility of necessary interventions.

This also has to be founded on an understanding that most buildings have to ‘work’ and that those in active use will be better cared for than those lying empty and unused.

**2 Statutory Systems and Support**

Despite some recent improvements, there is still a widespread feeling that the Planning & Listed Building systems are process-led rather than outcome-led, resulting in extensive delays and little value added content.

There should be early recognition of the overall public value of a project and the practical support of statutory authorities, co-ordinated by Planning Service, should follow from such recognition. This support should manifest itself in helping applicants through the statutory processes.

In addition to this, there are a number of broad policy initiatives

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**The Conservation Process**

The process of conservation should include all the following elements:

**Survey**

Understanding the building - historical development - architectural intentions - how it is constructed - condition it is now in

This should be recorded to inform future generations of the status of the building at this point in time.

**Standards**

What is expected of a conservation project - contents, sourcing information.

Designing the project to meet those standards, and integrating them with your requirements of functionality.

**Specification**

Setting down the standards of materials and workmanship that you want to or need to work to.

**Sourcing**

How to achieve what you want - sources of materials and skilled labour.

**Supervision**

Making sure you get what you have specified. Keeping records of work in progress and what you have actually done, to assist future work.
that could significantly benefit heritage-led regeneration including:

- Adoption of the ‘Poundbury’ principles, named after the Prince of Wales’s new development which involved re-writing the road layout rule book to place an emphasis on people, not cars, with intelligent mixed-use rather than discrete zoning, socially mixed communities and traditional scale, materials and design. These principles would benefit heritage-led regeneration projects by introducing a level of flexibility into planning and road design guidance.

- A robust policy of assessing the case for enabling development, measuring heritage and other public benefits. There are many cases where restoration of heritage buildings is not a viable proposition. Whereas grant aid can provide the solution for community groups and Trusts, a solution for private sector developers may well require enabling development, that is development that otherwise would not get planning permission but can be justified if it secures the future of historic buildings. This is a difficult policy area but whilst English Heritage have detailed policy guidance, there is no such local policy based on Northern Ireland experience.

- Policy Interpretation and guidance: PPS 6 (Planning Archaeology and the Built Heritage) and PPS 21 (Sustainable Development in the Countryside) both have significant impacts on the use, repair and restoration of the built heritage, but interpretation of policy is somewhat subjective and complex. In the case of PPS 21 this is partly at least to be realised with the commissioning of a Design Guide for rural Northern Ireland. However, this may not go far enough in interpreting policy. For example, the policy detail in PPS 21 supports repair and reuse of vernacular buildings whilst at the same time the ‘headline’ policies seemingly reduce the criteria for allowing replacement dwellings. As PPS21 stands at the moment, the concern is that it will encourage owners of restorable vernacular houses to let them decay to a point where they can say they are no longer capable of viable restoration, yet still sufficiently intact to allow a replacement permission. In high scenic areas such as AONB’s, at least, policy guidance must make it clear that restoration is the primary choice.

3 Cost
The perception, and sometimes reality, of high restoration costs is a major factor in preventing repair and reuse projects. In simple, short term costs this may well be the case but a broader view and new initiatives are required to offset these perceptions.

VAT
There is a long-standing campaign to demand VAT equality at 5% on all construction works. This has widespread support amongst heritage organisations, on the basis that it would encourage more works of repair and maintenance to be carried out and that it would reduce the cost differential between restoration and new build where such choice exists. It is also proposed that the total tax take would remain similar, the saving in repair cost VAT being offset by greater income from new build construction. Non-recoverable VAT is eligible for grant aid from NIEA and churches can avail of the Chancellor’s Listed Building of Worship initiative and reclaim VAT on works of repair and alteration.

Whole Life Costs and Carbon Costing
Short term costing does not take into account longevity of materials, carbon use during manufacture and transporting, or the embodied energy of existing buildings, all of which — when properly considered — support the value of historic buildings.

Grant Aid
The new NIEA grant system provides significant levels of historic building grant aid and has revitalised the conservation workload in Northern Ireland. There is also a wide range of other grants and loans – see AHF website (www.ahfund.org.uk).

There is a risk of ‘battle fatigue’ in the conservation movement – owners and consultants wrestling with unnecessary hurdles, where even the statutory and funding bodies put in place to help end in creating bureaucratic and unresponsive systems. The rules need to be re-written and all policies, guidance and state support should be aligned to achieving what has now been well proved by many built examples, that regeneration for our towns villages and countryside can be efficiently and effectively achieved by investment in historic building restoration, repair and reuse.
‘Home and Dry’ for Owners of Historic Buildings

Rita Harkin, Ulster Architectural Heritage Society

The Ulster Architectural Heritage Society has long recognised the importance of connecting directly with listed building owners. These undervalued custodians of our built heritage often feel isolated and daunted at the prospect of researching their building, dealing with architects, and embarking upon restoration schemes.

Owners’ Forum in the award winning Braid Museum and Arts Centre in Ballymena in November 2008 where the new grant regime could be explained. Over 700 owners signed up, so the thirst for this down-to-earth approach to providing practical information and showcasing best practice is still evident. We are collaborating with the Federation of Ulster Local Studies and the Glens of Antrim Historical Society to organise ‘Traditional Buildings in the 21st Century’ in Cushendall on Saturday 25 April.

The generously illustrated and accessible www.homeanddry.info web site was a key component of the HLF application, giving the owners a helping hand from the comfort of their home.

The ‘Home and Dry’ series, initially funded by the Heritage Lottery Fund, has sought to demystify the methods of care and repair by bringing conservation professionals and craftsmen to owners in informal interactive settings within historic buildings across the North. Venues have included the Verbal Arts Centre, Derry, Clotworthy House, Antrim, Markethill Courthouse and the Ulster Folk and Transport Museum, Cultra where the courtyard has acted as a perfect showcase for skills demonstrations.

The series began in 2001 and events have been held in all six counties as well as Donegal, where the ‘How to Restore Traditional Buildings’ event on Gola Island attracted over 200 applicants!

Last year we were asked by the Northern Ireland Environment Agency to organise a Listed Building Owners’ Forum in the award winning Braid Museum and Arts Centre in Ballymena in November 2008 where the new grant regime could be explained. Over 700 owners signed up, so the thirst for this down-to-earth approach to providing practical information and showcasing best practice is still evident. We are collaborating with the Federation of Ulster Local Studies and the Glens of Antrim Historical Society to organise ‘Traditional Buildings in the 21st Century’ in Cushendall on Saturday 25 April.

The generously illustrated and accessible www.homeanddry.info web site was a key component of the HLF application, giving the owners a helping hand from the comfort of their home.
In a time of great economic uncertainty, particularly in the construction industry, focusing on much-needed training provision and value-added craft skills can promote a swifter recovery. Maintenance of existing buildings represents a substantial percentage of construction work and is of course much more sustainable, yet colleges almost solely concentrate on new build and often neglect to teach the key differences between traditional and modern construction.

An important piece of research by the National Heritage Training Group is the first to have focused on traditional building skills on an all-Ireland basis and it provides a thorough baseline study on the built heritage sector. ‘Traditional Building Craft Skills: Assessing the Need, Meeting the Challenge – Skills Needs Analysis of the Built Heritage Sector in Ireland’ was launched in January by Sir Reg Empey, Employment and Learning Minister, at the Grade A listed Crumlin Road Gaol, where sensitive repair to the stone and ironwork by skilled local craftsmen has taken place.

The report identified that most craftspeople lack the specialist knowledge and experience in traditional methods and materials. The vast majority of those working on pre-1919 buildings are general builders, with only 14% seeing themselves as conservation or heritage specialists. Their use of a mixture of traditional and modern materials for repairs work can damage and undermine the integrity of the historic building.

Not only does the report highlight the importance of and potential wrapped up in our historic buildings and traditional craft skills, but it also maps out the crucial steps that should be taken to improve the training infrastructure in Ireland. It is heartening to note that NIEA’s Moira Depot is to take the lead and that Northern Ireland is to benefit from the Heritage Lottery Funded Training Bursary Scheme led by Historic Scotland with a focus on masonry.

Copies of the report can be viewed at www.nhtg.org.uk. The Ulster Architectural Heritage Society has published a series of Directories of Traditional Building Skills in association with the NIEA. The latest edition is available to view at www.uahs.org.uk.
Raising a Glass to the Cathedral Quarter

Rita Harkin, Ulster Architectural Heritage Society

In an increasingly visual society we all need to be much more imaginative in the way in which we grab the public’s attention. The Cathedral Quarter ‘buildings at risk’ beer mat was designed to get everyone talking about the future of these assets within the heart of the birthplace of Belfast.

The mat is the latest feature of the long running ‘Let’s Get It Right’ campaign where an exciting fusion of arts and heritage groups, architects, artists, playwrights, and local businesses have been working together to effect change and encourage exemplary arts and heritage-led regeneration.

Planning Service designated the Cathedral Conservation Area in 1990 and its policy is to: “protect and enhance the essential characteristics of the Cathedral Conservation Area and encourage the retention, rehabilitation and re-use of existing buildings wherever possible”.

All the buildings shown on the mat are located within the Conservation Area and range from the distinctive listed 19th century red brick group on curved Lower Garfield Street to the fire-damaged 1930s North Street arcade, with its unusual kinked plan form. All are underused and some were earmarked for demolition as part of the ‘Royal Exchange’ retail driven proposals for the area. However, all the buildings are brimming with potential and the beer mat aims to prompt debate about their immediate and long-term future in this designated cultural quarter.

...is rewarding

The buildings on the reverse are in the Cathedral Conservation Area. Most are vacant and some have been proposed for demolition. All are capable of re-use. Enterprising businesses like the John Hewitt and the Duke of York are breathing life back into the birthplace of Belfast.

Find out how you can make a difference.
www.uahs.org.uk

ULSTER ARCHITECTURAL HERITAGE SOCIETY
Northern Ireland’s Building Preservation Trusts

Primrose Wilson, Northern Ireland Association of Preservation Trusts

We all accept the mantra ‘Reuse first, recycle second’ in relation to our household rubbish. But do we use the same philosophy when considering what to do with our historic buildings? Do we consider that by retaining them we will be saving embodied energy, regenerating communities and creating employment, as well as helping our environment? Those who own and live in historic buildings do this day-by-day (even though they may not see it in quite those terms!). But what happens when a historic church or school closes and becomes a magnet for anti-social behaviour? Often the cry goes up for its demolition! But there are dedicated people within the built heritage movement who want to reuse those buildings for the public good.

There are some 25 Building Preservation Trusts in Northern Ireland ranging in size and age. Hearth, the longest established trust, formed in 1972, has restored some 40 historic buildings at a cost of £5 million. In contrast, the newest member of the Association, the Follies Trust, was only formed in 2006 and is just completing its first project! Building Preservation Trusts (BPTs) are charitable bodies and companies limited by guarantee. Some trusts are formed to save just one building (for example Belmont Old School Trust) but others, known as revolving fund trusts (for example Hearth), use the roll over from the sale of successful projects to fund other schemes.

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In A Sustainable Development Strategy for Northern Ireland – First Steps Towards Sustainability a stated key target is to ‘Rescue at least 200 structures on the Built Heritage at Risk in Northern Ireland Register by 2016’. BPTs are playing a key role in assisting the NIEA to deliver this target by restoring buildings at risk. We were delighted when additional public recognition of the contribution BPTs are making to the sustainability agenda came to Hearth when it was declared Winner of NIHE Home Energy Awards 2009 – most energy efficient refurbishment scheme – for its project to restore Ormeau Park House, Belfast.

BPTs are formed by local groups who are concerned about a historic building in their area which has been neglected and is an eyesore. They recognise its potential to regenerate their locality, to bring in external funding and to enhance their community facilities. BPT members, who frequently serve as trustees also, act in a voluntary capacity. Those involved do not live in the buildings they restore – they rescue them for their communities. There is no personal benefit to the trustees other than as members of the community in which the building is located.

A restored building has the potential to attract tourists to the area and provides an excellent example of sustainable development. Historic buildings which have been restored by building preservation trusts in Northern Ireland include Gracehill Old School, the chimney at Sion Mills, Christ Church, College Square North, Belfast, Mullyncovet Mill, Belcoo, Hollywood Old School, Portrush Town Hall and Belmont Old School in East Belfast (to name but a few!). Projects currently underway include the restoration of White House, Newtownabbey, and Conway Mill, in West Belfast, by local trusts. Meanwhile studies continue by the Friends of Lissan Trust and Cushendun BPT to find a way forward for Lissan House and the redundant Church of Ireland in Cushendun.

It is great to restore a historic building but it must have a use to ensure its future economic sustainability. BPTs carry out feasibility studies and prepare business plans long before they apply for funding to restore a property. The solution is different for each building, but to obtain public funds there must be access and a good economic use. But sometimes finding the new use is a major problem. The BPTs have a range of expertise to draw on – other trusts from around the UK as well as in Northern Ireland. The Association of Preservation Trusts, which I chair, is a networking organisation. We meet twice a year, usually in the most recently completed project, and are inspired by others ingenuity and flair. And perhaps to muse on a few lines from a well-known poet:

This now our Heritage
To guard, delight in, brood upon,
And in these transitory fragments
scan
The immortal longings in the soul of man.

Walter de la Mare

Ormeau Park House, Belfast
Breathing New Life into Old Buildings

Diane Ruddock, The National Trust

Most people, when they think of the National Trust, think of the ‘grand’ built heritage in the care of the conservation charity: the neo-Classical splendour of Castle Coole, or the quirky two facades of Castle Ward. The Trust is well known for such treasures, but this is only part of the picture.

The National Trust in Northern Ireland is also responsible for many other buildings – from mills to monuments, cottages to public houses, and two villages (Cushendun and Kearney). These are an equally important part of our built heritage in Northern Ireland. Here are some examples of how the Trust is investing in and breathing new life into old buildings.

Many of the 200 smaller buildings in the Trust’s care are part of demesnes which have a ‘big house’ at their heart. As well as having architectural or vernacular interest in their own right, they also form part of the social history of the area. The cottage names, which we retain today, reflect either the occupations or surnames of former residents whose life and work contributed to the well-being of the close-knit estate community.

Crom, near Newtownbutler in Co. Fermanagh, is known for its stunning setting on Lough Erne and its biodiversity. But Crom is also distinguished by its built heritage. Some buildings, associated with the hard work of the demesne – the Old Farmyard, the Forge Yard – were tucked away, so as not to mar the views from Crom Castle which remains in private ownership. Others, however, are beautifully proportioned cottages or follies, set comfortably in the landscape forming an integral part of the visual treat.

Since acquiring Crom Demesne in 1987, the Trust has invested steadily in the fabric of the buildings. In the early 1990s, with grants from Northern Ireland Tourist Board and International Fund for Ireland, the Old Farmyard buildings were sensitively restored to provide seven holiday cottages, visitor reception, tearoom, and access to the lough. Most of our projects at Crom have been more modest, keeping cottages in good order, and gradually bringing those in poorest repair back into use.

In recent years we have added Mullynacoagh Gate Lodge, Kerr’s Cottage and the Gardener’s Bothy to the list of buildings restored to high standards.

We have also concentrated on The Argory, near Moy, in the past three years, with long-disused buildings painstakingly restored and available for letting. These include Red Cottage, Conlon’s Cottage, Meadow Cottage and the East Pavilion. The mansion at The Argory re-opened in Spring 2008 following an 18 month conservation project costing more than £1.2 million. This involved structural and renovation work to replace outdated wiring, security and fire detection systems. All 82 windows were removed and refurbished carefully to ensure that none of the original panes of glass from 1825 were broken. Eight miles of electrical and electronic cabling were installed throughout the mansion and all kinds of packaging, from bubble wrap to acid free tissue.
and wood, were used to protect over 5,000 items during the work. We also came up with imaginative schemes to provide new uses for buildings. A prime example is the Laundry House at Castle Coole, where work is nearing completion on a sensitive conversion project which will provide two new apartments available for letting. We have also just converted a vacant building in the Forge Yard at Crom into three bedroom accommodation. More unusually, we restored the Bothy on Salt Island, Strangford Lough. This simple stone building is now a bunkhouse providing basic accommodation for canoeists using the Strangford Lough canoe trail. It’s a far cry from a National Trust mansion, but with its running water, toilets, wood-burning stove (bring your own wood) and kitchen area (bring your own cooker) it provides welcome shelter at the end of a day’s paddling – a veritable ‘Hilton’ of bothies!

We take advantage of our cottage restorations and other building projects to include high insulation and energy efficiency standards. For example, Meadow’s Cottage at The Argory has lambswool wall insulation and Warmcell (recycled denim and paper) in the roof. Solar thermal water heating is being introduced in a new apartment being created within the mansion at Florence Court, as well as at the extended visitor facilities at Carrick-a-Rede.

Conservation often goes on behind the scenes with no public profile. So when it came to restoring the Crown Bar, Belfast in 2007, the idea of remaining open for business seemed preposterous at first! But for six months, specialist conservators worked on the paintwork, tiles, ceramics, glass, mirrors, and woodwork, alongside the Crown’s regular customers and tourists attracted to this fine ‘high-Victorian gin palace’. The project was carried out with funding from and full support of Mitchells and Butlers, who leases the Crown. Customers enjoyed seeing what is involved in making their ‘local’ so special, while the conservators welcomed the opportunity to showcase their skills.

Ongoing investment in the fabric of our buildings is crucial to the National Trust. Many major projects would have been impossible without grant aid from the Northern Ireland Environment Agency. We have worked closely with colleagues at the Agency to pilot a ‘continuing care’ project, which ensures that properties can be maintained in good order by adopting a stitch in time approach to conservation. This approach is relevant to everyone with responsibilities for historic buildings.

Apart from the intrinsic value of our built heritage, the Trust’s work demonstrates that there are many benefits to breathing new life into old buildings. In the past three years we have invested around £5million in building conservation projects, and we spend about £450,000 each year on repairs and protection. Most of this money is invested in the Northern Ireland economy, using local firms and enhancing local specialist skills.

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Through these projects, the Trust makes a useful contribution to the protection of Northern Ireland’s built heritage. But looking more broadly, there are huge opportunities to use the built heritage across our cities, towns and villages as a catalyst for economic regeneration through sensitive reuse.

It is essential that Northern Ireland has robust land use planning policies that protect our built heritage, as well as economic development policies which recognise the value of our built heritage to underpin urban regeneration and support our developing tourism economy. In this way, we can ensure that that Northern Ireland’s built heritage legacy has a meaningful part to play in our future social and economic well-being.

Photos by Peter Muhly.
Historic buildings coming on the market — even those in poor condition — are distinctive and unusual properties, and often local landmarks. Once restored they make excellent and memorable houses, splendid offices and grand (or cosy) houses. They are not everyone’s cup of tea, but the person whose cup of tea they are will seize them with both hands once introduced and suitably financed. Listed buildings make up roughly 4% of our building stock, and anyone who wants an old building of character will not be spending much time looking at the remaining 96%.

However, even the most determined of historic building hunters draws the line at some buildings that are just too derelict, too remote, too large or simply the wrong shape for their purpose, and those buildings would be lost were it not for the Preservation Trust (BPT). A BPT is a charitable body (usually a company limited by guarantee) managed by a voluntary committee that raises money in the form of grants and loans to enable it to buy and restore buildings at risk which have fallen by the wayside. Once restored, the trust may decide to sell the building on and, after repaying its loans, it will hopefully have made a modest surplus to put into the kitty for a more ambitious project the next time - this type of trust is known as a revolving fund. Or it may have acquired the building to run it for a particular purpose, and will usually take on longer term mortgages to enable it to pay off the restoration costs without selling the property, which it may then manage as a community resource or museum.

There are now half a dozen active BPTs in Northern Ireland, and a number of others are preparing for schemes or have already completed projects and become building managers rather than BPTs. At Gracehill the Old School has just been restored by a local trust, which is going to run the building for a variety of uses including educational purposes. At Belmont old school in east Belfast, the BPT set out to restore the building as a creche but found themselves taking on a much more ambitious scheme that has resulted in excellent facilities including a cafe and meeting rooms, while the school’s distinctive white timber tower, once threatened with demolition, remains a proud and much-loved symbol of that part of the city.

There are two revolving fund trusts in the province. The Belfast Buildings Preservation Trust has completed two large and very prominent restorations of burnt-out ecclesiastical structures in the city, Christ Church and St Patrick’s Schools. The latter had been gutted by fire but now forms excellent facilities for community use. Christ Church was restored in association with the Royal Belfast Academic Institution and is now its library and IT centre — a demonstration that old buildings are nothing if not flexible and quite capable of meeting the challenges of modern life. Again there is space that is used for lectures in the building so that the public can appreciate the fine interior as well as the exterior shell.

The other is Hearth Revolving Fund, which is the oldest and was for many years the only BPT in Northern Ireland. It was established in 1972 by the National Trust and the Ulster Architectural Heritage Society. With the Troubles getting under way it was not a propitious time to be restoring property of any kind, let alone the kind of small houses that had no statutory protection (listing didn’t really get under way here till 1974) and was considered unfit and thoroughly undesirable by most public authorities. As a result, Hearth sidetracked for a number of years into forming a housing association with a similar objective, and Hearth Housing Association restored 20 or 30 houses as social housing before the Revolving Fund got under way again in the mid 1980s.

Hearth’s first scheme was the small stone lockhouse on the Lagan Navigation at Drumbeg. Built in 1760, it would be the oldest house in Belfast if it was situated 20 yards further north and lay within the city boundary. The little building was faced with a closing order as it had no proper services and was very run down, but Hearth was able to borrow sufficient funds to restore it, sell it on to new owners and repay its loans. The Revolving Fund still had no real funds to move on, but over the next few years it was able to build up a modest capital sum and restore more buildings as it went. These included an
important group of a dozen houses below St Patrick’s Cathedral in Armagh, terrace houses in Moira which stimulated the restoration of many more derelict houses in the village, and a terrace of late Georgian houses in the Markets area of Belfast which became the first city centre houses offered for sale for many years, as well as

associated with problem buildings, the fees earned from outside work can be ploughed back into Hearth’s own projects.

Hearth is expected shortly to enter into a ‘back to back’ arrangement with the Department of the Environment in taking over the first historic building in the province to be compulsorily acquired following building repairs notices. As difficult owners are one of the commonest reasons for buildings falling into disrepair, this mechanism opens the way for Trusts to take on a number of other prominent buildings at risk and should form an important precedent.

It is one of Hearth’s tenets that no listed building need ever be lost, and by tackling some of the most difficult cases it hopes to provide planners with sufficient examples of what can be done to stiffen their resolve in refusing Listed Buildings Consent for demolition in more straightforward cases. With the BARNI catalogues and a number of willing BPTs on hand, most buildings can be restored. And if that point is successfully made there are other challenges, for example how old buildings can be upgraded to meet the challenge of increasingly stringent building regulations and energy standards. In a recent (unlisted) building restoration, Hearth Housing Association demonstrated that old houses can come very close to the standards achievable in new construction while still retaining most of their character. Where there are important interior features to retain the challenge is greater, and this is an area which Hearth intends to explore further in the next few years, while continuing to provide new life for old buildings that may have looked like they had reached the end of their road.
Compulsory Acquisition of a Listed Building: The Stable Block at Sion Mills

Michael Coulter, Northern Ireland Environment Agency

Article 109 of the Planning (NI) Order 1991 states (1) If it appears to the Department that, in the case of a listed building ... reasonable steps are not being taken for properly preserving it, the Department may ... compulsorily acquire the building and any land ... which appears to the Department to be required for preserving the building or its amenities, or for affording access to it, or for its proper control or management.

This is a very strong power, and not one that the Department would seek to use lightly. However, in some cases the use of even such seemingly draconian powers is appropriate. The compulsory acquisition of the Stable Block at Sion Mills is just such a case – and a first in Northern Ireland.

Some years ago, when I was the Principal Conservation Architect with the Department (1999–2002), I agreed with a group of various stakeholders representing the Built Heritage Sector/Lobby that the Stable Block in Sion Mills was the longest standing, 'thorn in the flesh' of Built Heritage Conservation in Northern Ireland. I also sought and obtained agreement from the group that, given that this would be the first time in Northern Ireland that these powers were (then likely) to be applied, it would be prudent to focus on a single case, least we made any mistakes which might render our attempts at legal action ineffective – thus our risk would be limited to a single 'loss' rather than multiple losses.

Even with a focus on one single case, this has been an exceptionally difficult, challenging and very time (and resource) consuming action that has had many many twists and turns. That is not to say that I am seeking to focus on an excuse for, or justification of, the length of time taken over this case. It is more a statement of fact. A very considerable amount of work has been done on this case over many years.

That said, the Minister’s decision - indeed his instruction – to move to compulsory acquisition was very welcome.

Also very welcome has been the outcome of the recent appeal against the earlier Repairs Notice – an essential pre-requisite to compulsory acquisition served under Article 80 of The Planning Order – and the works associated with it. The appeal was not upheld (see Planning Appeals Commission website).

An appeal against such a notice and associated works may be made (only) on the following grounds (see Article 80(8)):

(a) that some or all of the works were unnecessary for the preservation of the building.

(b) in the case of works for affording temporary support or shelter, that the temporary arrangements have continued for an unreasonable length of time.
(c) that the amount specified in the notice is unreasonable or that the recovery of it would cause him hardship.

The outcome is that, in essence, compensation to which the owner is, or would otherwise be, legally entitled will be used to offset the cost of works carried out under the terms of the Repairs Notice. Thus we have the successful completion of this first ever Article 109 compulsory acquisition of a listed building in Northern Ireland.

That said, although we (the Department) now own the building and have secured it by ‘mothballing’, the long-standing intention has always been to pass the building on to an appropriate – caring – owner for conservation and reuse. The HEARTH Building Preservation Trust has long been seen as the most appropriate alternative owner, and it has also, along with the local Strabane District Council, been a strong supporter of the compulsory acquisition.

We hope that HEARTH will soon agree to accept ownership of the building (some legal issues remain to be resolved) and to advance a scheme that will, inevitably, involve some degree of informed restoration.

Thus we look forward to seeing the building returned to its original appearance and given an appropriate use that will help sustain its future.

Meanwhile, as all of this action (much of it in the background away from public view) has been taking place we have issued letters of concern to more than twenty other buildings/buildings owners, highlighting our powers, but seeking to ensure appropriate action to save these buildings without having to take more ‘draconian’ action up to and including compulsory acquisition. I am pleased to report that in the majority of these cases this has resulted in positive works, by the owner, to help secure these listed buildings from further damage or rapid deterioration. I have no doubt that the effectiveness of these letters has been enhanced by the fact that the Department has now undertaken its first compulsory acquisition under Article 109 – that is, by using our statutory teeth.

In parallel with using the ‘teeth’ or ‘big stick’ of the legislation we have also revised our grant-aid policy in an effort to encourage more positive action by existing owners of listed buildings.
Increasing awareness of climate change and its possible effects on our environment are now widely known. It is predicted that changes we will see over the next 100 years include variations in temperature, rainfall, extreme weather events, groundwater and sea level. This concern often concentrates on the impact climate change will have on natural environments — loss of habitats to sea level rise, etc — often neglecting the impact on the material environment especially the historic built environment (buildings we see and use every day). Our historic buildings were designed for our specific local climate. Changes to this climate will accelerate some processes of building decay, whereas others may be delayed. Weathering scientists can describe the effect these changes will have on individual decay processes but it is difficult to determine the overall risk posed by climate change on complete structures undergoing a range of complex decay processes using currently available data.

Some multi-disciplinary initiatives are already underway to address these problems. The Noah’s Ark Project (http://noahsark.isac.cnr.it/) has brought together researchers from all over Europe to investigate the wide range of effects global climate change may have on Built Heritage. Some of its objectives include the production of web-based Climate Risk Maps and a Vulnerability Atlas for heritage managers to assess the threats of climate change. CyArk (www.cyark.org), whose mission is to digitally preserve cultural heritage sites at risk by collecting, archiving and providing open access to data created by laser scanning (Figure 1), digital modelling, and other state-of-the-art technologies, has already collected large amounts of data on some of the world’s most iconic ancient structures. Preserving these structures in digital form provides heritage professionals with tools and information they can use to help physically preserve their sites. This practice also provides for a universally accessible repository of cultural heritage information. This information can also become a catalyst for educational initiatives, and ensures that future generations have access to a record of human history that may have otherwise been lost forever.
With ever increasing computing power combined with easy access to the Internet the time has arrived where a person is no longer bound to their local surroundings to experience built heritage. Virtual buildings and environments are readily available and navigable. These buildings are recorded using the very latest 3D surveying technologies. Some of these laser-based scanners can capture 500,000 points on a surface in one second and some can scan from up to 300m away while maintaining an accuracy of 2mm. Object scanners, at the other end of the scale, can capture over 30,000 data points on small objects, building stones or architectural detail with accuracies of 0.05mm in seconds. It is now possible to capture a whole building in 3D with millimetre accuracy in less than a day. This is digital reality, not virtual reality.

Both these large- and small-scale scanning technologies have been used by weathering scientists working on the Limestone Project (www.qub.ac.uk/geomaterials/epsrc), a joint study involving researchers from Queen’s University and Oxford University investigating the catastrophic decay of building limestone. Part of this research involved the 3D monitoring of buildings, walls and in situ building stones (Figure 2).

The Limestone Project also included laboratory-based accelerated weathering experiments on limestone blocks, during which the exposed surfaces were regularly captured with an object scanner (Figure 3).

Digital elevation modelling and geostatistical analysis of the data collected is helping to shed new light on the scale, rate and range of processes involved in the decay of limestone buildings in the natural environment (Figure 4).

This routine monitoring of our historic structures can aid scientists with predicting what will happen to our built heritage and allow them to check the accuracy of climate change decay models by asking the models to predict what has already occurred.

As well as showing buildings as they are, computer modelling of these historic structures can show us how they used to look in the past – virtual reconstruction. Combining this with climate change and decay process models it should be possible to show how these structures may react and look in the future under a wide range of scenarios.

This process of virtual reconstruction can be extended to virtual restoration. An object or even a building that is incomplete, visually unattractive or difficult for the public to comprehend can be placed inside a virtual showcase. Missing pieces, surfaces or walls can then be replaced using 3D graphics software. This technology will allow us to display a multitude of possible solutions for incomplete objects and structures, which should help improve the public understanding of heritage. In some situations this could mean we can avoid the need to produce physical replicas of an object. It may also allow us to circumvent the debate about conservation and restoration, as the original will remain untouched.

Engaging today’s digital generation with a format they understand more than most, 3D, will hopefully encourage them to gain further knowledge of the problems associated with climate change – which can only help empower the decision makers of the future.

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Figure 3. DEMs of weathered experimental blocks. A, Stone surface before weathering. B, Stone surface after 80 intensive weathering cycles.

Figure 4. Time series DEMs from part of New College wall, Oxford. Areas of major loss are highlighted in 2008. From 2006 to 2008 a volume of limestone equivalent to the volume of a football was lost over just this area (1.5m x 0.9m).
Introduction: The Nature of Stone Decay

All stone will eventually decay through natural weathering processes, and placing stone in a building does not immunise it from such weathering. It is widely accepted, however, that placing stone in an urban environment typically exposes it to a wide range of additional weathering processes and new micro-climatic conditions. These can drastically accelerate decay and significantly curtail the ‘life expectancy’ of stonework. The classic example of this is, of course, the exposure of stone to elevated levels of atmospheric acidity associated with pollution derived from the burning of fossil fuels. This most obviously produces the classic cocktail of pollutants that make up so-called ‘acid rain,’ and which in turn has been responsible for the enhanced dissolution of many limestone buildings. This especially applies to the detailed ornamentation and statues found on prestigious buildings that have a high surface area and are therefore more exposed to the effects of rainwash (Figure 1).

‘Acid rain’ is not, however, the only means by which atmospheric pollution attacks stonework, and may not even be the major one, given that many buildings are not made of limestone, but may be constructed of, for example, quartz sandstones that are relatively immune to dissolution. Instead, atmospheric pollution can act in a number of ways to damage buildings that are linked to the deposition of complex acid particulates directly onto the stone surface, reactions between moist stone and gases in the atmosphere (mainly oxides of nitrogen and sulphur) and the direct deposition of moisture on stone through dew and frost.

These effects are generally referred to under the combined title of ‘acid deposition’ rather than ‘acid rain’. In this way acid reactions can take place in sheltered areas that are not normally reached by rain. Of these reactions, the most important is that between sulphur dioxide from the burning of fossil fuels that converts first to sulphur trioxide and then to sulphuric acid. This can react with, for example, limestone (calcium carbonate) to form much more soluble calcium sulphate or gypsum. In rain-affected areas gypsum is washed away and this forms the basis of much solution loss, but in sheltered areas the gypsum can crystallise on the surface and through the incorporation of combustion particles and soot, it forms the black crusts that are so common on buildings in polluted environments (Figure 2). This can even occur on non-limestone buildings because the acid can react with the lime in mortars and the dust that lands on buildings is often rich in calcium carbonate or gypsum itself – where the particles have reacted with gas in the atmosphere before deposition. In fact, the presence of dust on the surface of stone has been shown to help the formation of gypsum crusts, through acting as crystallisation nuclei for gypsum precipitation.

Figure 1. Solution and loss of detail from a Portland limestone statue erected in Trafalgar Square in 1675.
The Importance of Salts

The significance of gypsum and associated black crusts goes far beyond the damage that it can do to the look or aesthetics of a building — although this is possibly the main reason why building owners have in the past spent millions of pounds cleaning them. Gypsum is a salt and if it is washed into a stone and allowed to crystallise within pores the stresses generated can contribute to the eventual breakdown of the stone. This can be accomplished through the loss of individual grains from the surface (granular disintegration) or by contour scaling if the salt accumulates within the stone in a zone that is related possibly to its frequent wetting depth. Ultimately such ‘salt weathering’ tends to produce hollows as salt is retained in areas that are sheltered from rain that would otherwise wash the salt away, and so once a hollow is established it is likely to continue to grow (Figure 3).

Salt weathering is not restricted to repeated solution and re-crystallisation, and salts such as gypsum can absorb moisture directly from the atmosphere if certain combinations of temperature and relative humidity are crossed. This causes the crystals to expand (hydration) and contract again when the environment crosses back over the threshold (dehydration). Within an urban environment, these thresholds can be crossed several times a day and, even though the individual stresses associated with the expansion and contraction of salt within pores are unlikely to fracture the stone, their constant repetition can ultimately lead to breakdown through fatigue failure (much like it is eventually possible to snap metal by bending it backwards and forwards many times).

It is the fact that salts can subject stone to multiple stress cycles over a single day that makes it such a potent cause of decay. Much more so than, for example, frost, which is infrequent and requires special weather conditions. Frost can, however, be very effective at exploiting weaknesses within stone created by long-term salt weathering and so it is common to see a major loss of stone after a frost, even though it was not its main cause. It should also be remembered that salts can also get into stone from other sources, such as rising groundwater, and directly from marine aerosols and often it is the combination of salts from different sources that cause most damage. For example, sodium chloride from sea salt (and road salt) is not particularly aggressive as it does not hydrate and dehydrate in the same way as gypsum, but when mixed with gypsum it can increase the latter’s solubility and help it penetrate deeper into stone.

To Clean or Not to Clean

It is the ability of salts to penetrate into stone that lies at the centre of the scientific debate as to whether black crusts should be removed from buildings. One school of thought suggests that for many weak stones they could act as a protective layer that binds the stone together. Cleaning it away, especially using aggressive blasting and washing techniques, can both remove protection crust and directly erode the weakened subsurface layer. Conversely, others argue that black crusts act as a reservoir of potentially damaging salts that can be washed into the underlying stone to crystallise and cause damage (Figure 4).
This is particularly the case on non-calcareous stones such as most sandstones that do not react directly with pollutants to form gypsum. As such, it is argued by some that gypsum crusts should be removed as a matter of urgency. This debate is, of course, in addition to the often more heated argument amongst architects and conservators as to whether crusts should be removed on aesthetic grounds or whether buildings should retain their surface ‘patina’ and be allowed to show their age.

From a scientific standpoint, decisions as to whether to clean and, if so, by what method are best left to individual buildings, stone types and environmental conditions. For example, black crusts on a stone such as Portland limestone that is used in many prestigious buildings (for example Belfast City Hall and the Parliament Building at Stormont) do not appear to have much of an impact on the underlying stone and are relatively easy to remove – preferably by washing them off slowly using a fine mist. In contrast, the removal of crusts from many sandstones can expose a layer of weakened stone underneath that can be lost either during cleaning or soon afterwards by salt weathering. In the case of sandstones the situation can be complicated because, although they do not necessarily contain calcium carbonate, the grains are often cemented together by iron minerals. Over time, this iron can be dissolved and brought towards the surface where it precipitates to create a hard outer layer below a gypsum crust, but at the expense of weakening the interior of the stone by gradually removing the ‘cement’ that held it together.

If aggressive cleaning not only removes the gypsum crust, but also breaks through the iron-hardened layer it can trigger the rapid, ‘catastrophic’ decay of individual blocks – especially if salts that had previously been washed into the stone are progressively ‘activated’ by wetting and drying as the block is worn back. This is the reason why, on many of our older sandstone buildings, it is possible to see numerous gaps where individual blocks have disappeared. It is also why many conserved sandstone buildings have a ‘patchwork’ appearance where blocks that have started to decay catastrophically have had to be replaced. This pattern of decay does, however, provide a very important insight into building stone decay. Even though atmospheric pollution may create the right conditions for decay, the actual pattern of decay is dictated by the type of stone, and within a single stone type, the precise rate of decay can be determined by often subtle differences in the chemistry, physical properties (especially porosity) and overall strength between individual blocks.

Acknowledgements
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Useful Websites for Background on Urban Stone Decay
Technical High School Aachen: http://www.stone.rwth-aachen.de/wgn_strt.htm
Queen’s University Weathering Research Group: http://www.qub.ac.uk/schools/gap/Research/EnvironmentalChangeEC/Geomaterials/Weathering/
Masonry Research Group at Robert Gordon University Aberdeen: http://www2.rgu.ac.uk/Schools/mcrg/mcrghome.htm
The Natural Stone Database for Northern Ireland: http://www.stonedatabase.com/

Figure 4. Black gypsum crust on Scrabo sandstone, Belfast. Removal of the crust results in rapid loss of the weakened sandstone underneath.
As with so much in life, the difficulty with trying to manage our stone-built heritage for future generations is that as soon as you think you have solved one problem, another one raises its head! More than that, the new problems could very well be linked to the unforeseen consequences of the original, well-meaning intervention.

**Historic Patterns of Air Pollution: The Case of Belfast**

For much of the 1980s and 1990s Belfast was an ideal natural laboratory for the study of the effects of atmospheric pollution on buildings. One reason was that it has a wealth of stone buildings, many of which were constructed over a short time span, related to the late nineteenth century expansion of the city. In addition, many of them are constructed of the same stone type, Scrabo sandstone from Newtownards, that not only allows for comparison between buildings but which has also proven to be a very sensitive indicator of pollution-related damage. Buildings in ‘clean’ rural areas that are constructed of Scrabo sandstone have survived for sometimes hundreds of years with no appreciable decay, but when exposed to high levels of salt in polluted urban and/or coastal environments it is a stone that can decay very rapidly. The detailed response can, however, be complicated because, after the stone was formed the strata were cut through by volcanic rocks that locally baked the sandstone to varying degrees. This produced the range of colours for which the stone was initially prized and also made it variably susceptible to decay. Thus, in many Scrabo buildings it is common to find different blocks decaying at different rates and exhibiting different patterns of decay (Figure 1). However, whilst the peculiarities of stone type might dictate the details of decay, the single factor that set Belfast apart from other cities in the late twentieth century was the persistence of high levels of atmospheric pollution. So much so, that along with Newry and Londonderry, Belfast had to be excused from compliance with EU regulations on air quality related to sulphur dioxide. A situation that was compounded by similarly high levels of atmospheric particulates.

**Origins and Implications of Belfast’s Pollution Problem**

The reason for Belfast’s inability to meet pollution targets was part political, part social and part environmental. First, clean air legislation came late to Belfast,
1964 as compared to 1956 for England, and it took many years for it to be rolled out across the city. Second, enforcement of the legislation depended on identifying those who were burning high sulphur fuels. A strategy that was unlikely ever to be effective given the social unrest at the time and the failure of which resulted in problems of atmospheric pollution centred mainly on the inefficient, widespread domestic burning of coal and oil. This resulted in turn in high sulphur and particulate emissions that were difficult to pinpoint and control compared to point sources, such as power plants. Compliance was also made difficult by the nature of EU legislation, which did not refer to average levels of pollutants, but set maximum levels that could only be exceeded on a very limited number of days before air quality standards were breached. Compliance with this type of standard was very difficult for Belfast because of its location within a steep-sided valley. This is because under clear winter conditions (normally associated with high pressure or anticyclonic conditions that can persist for several days) cold, dense air drains into the valley and creates a ‘temperature inversion’ that prevents air for rising and therefore traps pollutants below it (Figure 2). The consequence of this was frequent periods during winter when air quality fell below EU standards. This failure to comply with prevailing standards was, however, symptomatic of a much longer period throughout the late nineteenth and twentieth centuries when air quality over Belfast must have been even worse and during which the stone-built heritage of the city was under sustained attack, especially from acid deposition. An indication of the persistence of this problem was provided in the early 1990s when a research project at Queen’s University placed small stone tablets at locations across Belfast. Microscopic examination of these tablets showed that after as little as one year of exposure in the docks area of the city, tablets of Portland limestone that were sheltered from rainfall developed complete crusts of gypsum (calcium sulphate) from the reaction between sulphur dioxide in the atmosphere and the moist stone (calcium carbonate). Similar tablets exposed to rainwash at the same locations showed no gypsum formation, but did show that the calcium carbonate crystals that make up the stone had been noticeably etched by acid rain. This shows that damage to stone resulting from exposure to pollutants can occur very rapidly, and that by changing characteristics that can in turn influence factors such as surface porosity and permeability, these changes could have long-term consequences for the performance and durability of the stone. At the time, it also suggested that a lot of the cleaning of buildings that was under way (mostly to ‘brighten up’ the city, rather than for sound conservation reasons) was likely to be very short-lived – which might explain why prestigious buildings such as the City Hall have had to be cleaned at regular intervals.

Figure 3. Belfast Metropolitan College (Portland limestone) showing soiling from the bottom up in response to vehicular pollution, seven years after it was last cleaned.
The advantage of these elevated levels of pollution, at least from the researchers viewpoint, was that it gave an extremely useful insight into the conditions that must have prevailed in other cities, such as London, prior to the introduction of clean air legislation and provided the opportunity to study and understand under controlled conditions the nature of the mechanisms responsible for stone decay. Fortunately, for those who live in Belfast, but perhaps not so much for the city’s buildings, this all changed in the late 1990s.

### Changing Patterns of Atmospheric Pollution and their Consequences

The main strategy to control domestic air pollution has traditionally been to pursue those who burned high sulphur fuels that also invariably produce large quantities of smoke (particulates). Belfast is not the only city where such an approach failed to solve pollution problems and, for example, Dublin continued to be plagued by serious smogs up until the 1980s. In response to this the Irish government decided to adopt an alternative strategy when, in 1990, they banned the sale of high sulphur coal in the Dublin area.

This produced almost immediate and very effective results in terms of reducing atmospheric sulphur, together with a 70% reduction in black smoke levels and marked reductions in respiratory and cardiovascular death rates, which were considered to be linked to the reduction in particulates. Learning from this example, similar restrictions were eventually introduced in Northern Ireland through a 1998 regulation that banned the delivery and sale of any solid fuel having a total sulphur content greater than 2 per cent. Again, this produced a rapid and marked improvement in the general air quality of cities such as Belfast, although not overcoming completely the pollution-concentrating powers of winter temperature inversions.

At the same time that legislation was being introduced to combat, in particular, the domestic burning of bituminous coal, other changes were also under way in Northern Ireland. Not least of these was the roll out of natural gas provision across the region, and it is difficult to estimate how much this also contributed to an improvement in air quality. In contrast, increased prosperity and economic activity has also seen a rise in road traffic and arguably a shift in emphasis away from problems associated with coal, towards a rising awareness of vehicle pollution — especially related to diesel emissions. Thus, just when owners thought that it was safe to clean their buildings without the risk of them rapidly re-soiling, along came another pollution source. This time, however, instead of buildings soiling effectively from the top down in response to dispersed pollution, many buildings now appear to be soiling from the bottom up in response to ground level sources (Figure 3). Soiling is also much more likely to take the form of an oil-based residue than the traditional gypsum crust that formed when the atmosphere was rich in sulphur.

### The Effects of Reducing Atmospheric Sulphur and Particulates

Almost by accident, soon after the introduction of restrictions on the sale of high-sulphur fuels in Belfast an opportunity arose to study the effects of the legislation on buildings. This came about when the exposure trials described in the previous article in this fact sheet were repeated and samples of building stone, including a range...
of different quartz sandstones, were placed at the same locations within the city. The original aim was to study the growth of gypsum crusts and it came as something of a surprise when, after only a few months of exposure it was not sheltered samples that went black, but those that were exposed to rainwash that went green! Closer examination showed that this was due mainly to the growth of a film of algae across the surfaces of stone blocks. Since then it has become apparent that this ‘greening’ of sandstones is now a widespread phenomenon across the city. Particularly on sloping surfaces over which rain can wash, but increasingly across whole façades. As well as producing a pattern of soiling that is almost the inverse of that produced by black crusts that favoured sheltered areas, the exposure trials of the late 1990s also showed that the growth of algae significantly reduced the surface permeability of the stones. Because of this it is likely that, whilst not preventing water from soaking in, algal films could inhibit the rate at which moisture dries out, keeping stone wetter for longer and allowing water and any dissolved salts to penetrate deeper into a building.

Any reduction of the ability of black crusts to form might also have other unforeseen consequences. For example, recent studies of crust formation in Oxford (which previously burnt a lot of coal) and Budapest (which still experiences high levels of sulphur and particulate pollution), have shown that when relatively weak limestones scale and lose their black crusts under pollution-rich conditions, new crusts can rapidly form and seal the surface – in much the same way that a grazed knee will scab over. One of the key components of this process appears to be the rapid deposition of a surface layer of dust that can be transformed and/or incorporated into the new crust. In this way, stone that might otherwise have decayed in a matter of years has in some cases survived below a succession of gypsum crusts for centuries (Figure 4). Furthermore, ongoing research is beginning to suggest that if the newly exposed surfaces are no longer able to ‘scab over’ they can begin to retreat very rapidly, especially if salt has been allowed to accumulate deep within the stone over many hundreds of years. Clearly, one way in which crust development is inhibited is to remove sulphur and dust from the atmosphere.

Possible Impacts of Predicted Climate Change

In the case of Northern Ireland most climate change models suggest that the most significant changes that could take place over the coming century are not linked directly to the proposed rise in average temperature, but to potentially major changes in rainfall patterns. Although this seems difficult to credit, there is widespread agreement that winter rainfall in the northeast of Ireland could increase by up to 20% and that, although summers should on average become dryer and warmer, wet winters are due to get both longer and milder. If this is the case it is possible to envisage that the process of greening on buildings could become even more pervasive. Included in this prediction are a number of feedbacks, in that up until now high levels of sulphur might have inhibited the growth of algae and other organisms, and that locally at least the nitrogen oxides produced by vehicles could act as a fertiliser for algal growth. In areas affected by vehicle pollution it is also possible that soiling could now become more varied, and work in London has already identified complex biomineralogic crusts that can lead to the yellowing rather than the blackening of buildings. The crusts may, however appear blacker in summer as organisms dry out, before rejuvenating with the onset of winter and so buildings could begin to experience seasonal colour changes. There is also anecdotal evidence that cleaning buildings can accelerate colonisation, possibly though opening out the texture of the stone and providing a multitude of microenvironments for algae to colonise, whilst at the same time removing sulphur compounds. Because of this we could see an increased use of biocides in conjunction with cleaning, although these tend to have a finite active life and are difficult to apply evenly. Any promotion of deep wetness may also require the construction industry to examine new specifications for masonry as well as prompting scientists to review their models of, for example, salt weathering that were previously based on the repeated near-surface wetting and drying of stonework.

Conclusions

The lessons to be learnt from studying stone decay in cities such as Belfast are to some extent very simple and centre around one word – uncertainty. What is clear is that future patterns of building stone soiling and decay are likely to be complex and in some respects unpredictable. We can learn lessons from past interventions, and to an extent future patterns of decay will continue to be influenced by legacies from previous environmental conditions, for example, deeply embedded salts and other pollutants. But it seems clear that we are also entering new climatic and pollution regimes that are likely to trigger novel and as yet unresearched processes of decay. For example, relatively little is known about the physical and chemical consequences of biological colonisation on stonework compared to our knowledge of processes such as salt weathering. This in turn means that we will have to contemplate new conservation strategies that must first be tested for their effectiveness and long-term impact and for which new guidelines must be developed. For those who fund and specify conservation treatment, it also highlights the danger of assuming that strategies that worked in the past will continue to be appropriate. Because of this, ‘conservation by formula’ is no longer acceptable when individual buildings and building materials may act in very different ways and require individually designed conservation strategies.

Acknowledgements

Support for the background research for this fact sheet was provided by an award from the Engineering and Physical Sciences Research Council (EP/D008603/1).

Useful Websites for Background on Urban Stone Decay

Technical High School Aachen: http://www.stone.rwth-aachen.de/wsn_strt.htm
Queen's University Weathering Research Group: http://www.qub.ac.uk/schools/gap/research/EnvironmentalChangeEC/Geomaterials/Weathering/
Masonry research group at Robert Gordon University Aberdeen: http://www2.rgu.ac.uk/Schools/mcrg/mcrghome.htm
The Natural Stone Database for Northern Ireland: http://www.stonedatabase.com/
Recommendations

Northern Ireland Environment Link

- The value of the built heritage should be recognised in policies, funding and practices throughout Northern Ireland.

- Renovation of existing buildings, especially listed and vernacular, should be promoted as a viable and valuable means of stimulating local areas and supporting economies.

- All policies, guidance and state support systems need to be aligned to promote and encourage renovation.

- Vernacular buildings can be successfully renovated to provide modern, efficient homes, but this requires further support for owners to save derelict buildings, rather than build anew.

- Owners of listed or vernacular buildings should be encouraged and facilitated to protect and maintain their buildings, but where this is not done compulsory acquisition should be used to protect the heritage.

- Whole life costings (including embodied energy) need to be considered when deciding whether to renovate or rebuild a property.

- The VAT system should be revised to remove the bias against renovation.

- Creative solutions (for example, cross-sectoral partnerships, innovative uses and targeted incentives) should be developed to bring the buildings on the ‘At Risk’ register (BHARNI) back into use.

- PPS21 should be revised to ensure that renovation is presumed over replacement, especially for vernacular buildings.

- Architects, contractors and consultants should be provided with the skills and guidance necessary to conserve historic structures.

- Traditional building skills should be encouraged and fostered to ensure a new generation of skilled craftspeople.

- Historic buildings should be monitored to determine and minimise the threats to them, including those from climate change.
Northern Ireland Environment Link

Northern Ireland Environment Link is the forum and networking body for organisations interested in the environment of Northern Ireland. It assists members to develop views on issues affecting the environment and to influence policy and practice impacting on the natural and built environment of Northern Ireland.

Full Members
A Future for Northern Ireland’s Built Heritage

Produced by

Northern Ireland Environment Link
89 Loopland Drive
Belfast
BT6 9DW
Tel: 028 9045 5770
Email: info@nienvironmentlink.org
Website: www.nienvironmentlink.org

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