20th-Century Heritage: Recognition, Protection and Practical Challenges

Introduction

For these reasons 20th-century heritage is threatened in many parts of the world. Anomalies exist even in those places that have reasonably well-established frameworks for the recognition and protection of heritage places generally. In Australia, for example, the Sydney Opera House, an international icon, remains unprotected by heritage legislation locally and has not yet been nominated for the World Heritage list. This said, its iconic status is likely to secure its future and the proposed upgrading of the building is under close scrutiny locally and internationally.

Others have discussed issues relating to lack of recognition and protection and this contribution focuses on the third of the dilemmas commonly quoted when discussing the sustainability of 20th-century heritage – the practical challenges associated with its conservation. These mainly concern built heritage.

Over the last 10–15 years much has happened in terms of the identification, protection and practical conservation of 20th-century heritage. Interestingly there has been a coming together of professionals from all over the world on this subject that has stimulated debate on an international level. This has in turn promoted local responses. Generally heritage conservation is locally driven, with strategic responses coming late to the cause. Therefore in many places there has been a tendency to address the issues strategically from the outset and accordingly see positive results more quickly. There has also been a good international cross-fertilisation of ideas and practice in this area of conservation early on.

This process has been partially driven by the formation of DOCOMOMO international. The Council of Europe has been actively engaged in the identification and care of 20th-century heritage since the late 1980s and key heritage agencies and organisations in Europe and North America have also played an important role. In addition there have been a number of major international conferences on the subject over the last 20 years.

In principle, the philosophy and methodology adopted for the conservation of 20th-century heritage should be no different to that utilised for buildings from the more distant past. However, there are a number of characteristics of modern buildings, such as material and structural innovation, that pose new conservation challenges particularly in relation to conservation of the original fabric. This paper introduces the polemic, highlights the conservation issues – particularly in relation to the repair of original fabric – and discusses how these issues may be reconciled with the conservation aim of retaining significance.

The legacy of 20th-century architectural history and theory is rich and diverse. Undoubtedly, however, it is the evolution of modernism that has effected the most significant change to the built landscape over the last 100 years. Modernism was conceived with the aim of expressing the opportunities and optimism of the new age. Modern architecture instigated a break with traditional architectural forms, planning and the use of materials. Architecture, which was to be the highest form of artistic expression, was based on a new vision of artistic abstraction, a new understanding of spatial qualities, utilising new technology, structural innovations and new materials. Mass production and prefabrication were to provide the infrastructure of a new society, to raise levels of hygiene, amenity and standards of living. Architecture was considered a powerful tool in social reform.

Architects exuberantly used new materials that were not fully understood in terms of their long-term performance. Traditional construction methods were largely abandoned to create the new functionalist machine. The misapprehension that modern buildings were low maintenance compounded many of the material and construction problems, such as early material failure, inefficient detailing and poor energy performance. Many 20th-century buildings have not well-stood the test of time and their perceived inability to age gracefully has challenged fundamental conservation principles such as 'do as little as possible' and 'reversibility' and has resulted in such places now being at risk of permanent damage or loss.

There are a number of characteristics of modern architecture that pose particular conservation challenges; these are introduced in the following section.

Design and functionalism

The realisation of the concept of functionalism – an important characteristic of the Modern Movement –poses a number of conservation issues including:

- how buildings can be adapted for new spatial and planning requirements (given the specificiality of design, large expanses of glazing and so on)
- how buildings can be upgraded for modern environmental performance requirements (given they were designed at a time of seemingly inexhaustible energy)
- how current health and safety requirements can be met (where materials have been used that are now considered hazardous)
- identifying compatible uses for very large modern buildings
- the economic viability of repairing large buildings (cost of repair and adaptation).

Scale and functionality are both characteristics of modern architecture that have been cited as difficulties in their adaptive re-use. Scale can be problematic in two ways: due to the challenge of finding compatible uses for very large buildings, or simply due to the capital outlay required for their repair.

The adaptation of large, deep spaces of industrial buildings from the 19th and 20th centuries is one that is being grappled with in many places around the world and is not necessarily specific to this period. More difficult is the accusation that a modern building carefully designed to fulfil a very specific function (following the edict of form follows function) can be less flexible than its predecessors in accommodating change and, therefore, is in danger of obsolescence and premature demolition.

The evolution of building services has occurred more rapidly this century than any other. The energy crisis of the mid to late-1970s had a major effect on how buildings are serviced, and the heating and cooling requirements of many early and mid-century buildings are today unsustainable. The economic ceiling heights of the 1950s and 1960s do not accommodate the additional servicing requirements of the workplace of the 21st century and this can have a major impact on the future of commercial buildings of this period.

For example, Joseland and Gilling's former Qantas building in Sydney (designed in 1970) had a 5000-square underground computer centre that was outmoded before the building was finally completed in 1982 (Jahn 1997). This building was innovative in a

number of ways, including the way in which the structure and the services were integrated. Interestingly the lengthy delay in construction was also a result of (or a victim of) its innovative design, with the building unions demanding that provisions should be made in the workers' salaries for the experimental construction typology (Jahn 1997). The late 20th-century changes in technological requirements has meant that the inefficiency of the design to meet these standards has had an effect on the economic viability of the building due to the amount of unusable floor space within its prime Central Business District location.

Modern health and safety requirements also have an impact on industrial and commercial buildings. For example, the Boots factory in Nottingham, England (designed by Owen Williams in 1931) had all its glazing replaced during major conservation works carried out in the 1990s. This decision was based on the extent of the deterioration of the steel frames, to address the significant problems of thermal gain – a major problem for glass-walled buildings of the early and mid-century – and to meet the European Community's hygiene requirements for areas where food products are under preparation. The opening lights were replicated but are now inoperable, the glazing sections have been thickened to accommodate double-glazing, and the toughened safety glass gives a tinted appearance. The work has resulted in the continued use of this highly significant building; however, it has undergone major material replacement and something of its original lightness and transparency – an integral part of its significance – has been lost.

Lifespan

An argument that is frequently mounted, particularly in relation to post-war buildings, is that they have been intentionally designed to have a short lifespan. However, examining the philosophies of the early 20th-century modernists, it is only those described as 'futurist' that specifically address this in the early life of modernism. Without over generalising, the idea of throwaway architecture may gain legitimacy in the second half of the 20th century, where lightweight, demountable structures started to play a more important role in the provision of both public and private facilities. Nevertheless, there are a number of dilemmas posed by this issue of lifespan including:

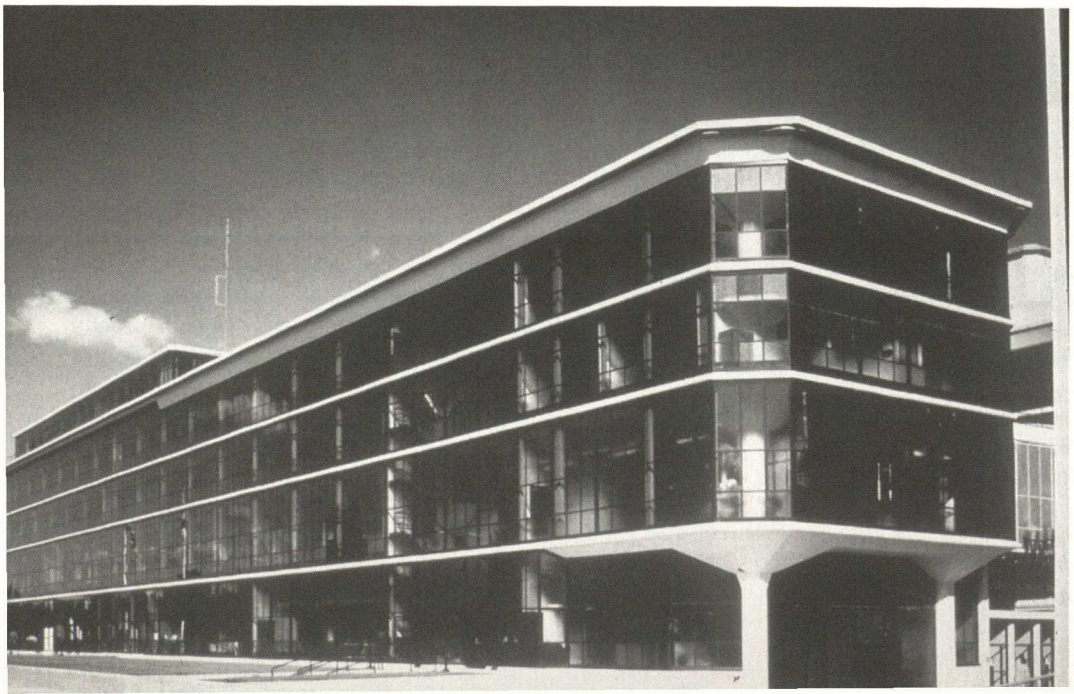
- how to conserve buildings, intentionally designed for short lifespans;
- how to reconcile the poor technical performance of some materials and systems and their conservation;
- the difficulties of adapting modern buildings that are functionally obsolete for contemporary use requirements and performance criteria;
- the economic viability of repair;
- sustainability.

Despite arguments about the short lifespan of more recent buildings, with rare exceptions to date it is usually the case that the original architect will argue that some pains should be expended to retain their building rather than accept it has a limited life. The argument for intentional short lifespan is one that has been used to support demolition on a number of occasions. Costs of repair against cost of new building will always be an argument used against conservation. However, this approach is unlikely to continue as sustainability becomes an aim of new development, and as energy audits for buildings begin to be used for assessing new work against adaptation of existing structures. However, while energy audits often prove the environmental value of retention of more-traditional buildings, this may not be the case for buildings designed from the mid-century onwards, which were conceived at a time of seemingly inexhaustible and cheap energy and constructed of materials that are high energy to produce.

In the UK it has become apparent that modern buildings do generally require initial (medium level) repair within about half the time of more traditionally constructed buildings – usually about 25–30 years after construction. Major repairs may be necessary within 50–60 years rather than the 100–120 years commonly documented for the more traditional building stock (Thorne, in Stratton 1997: 200, 201).

However, if it is symptomatic of our society that longevity plays only a minor role in the way we build, then perhaps the conservator's role of the future is in documentation rather than in physical intervention.

The reasons for the generally accepted reduced life span of more recent buildings is frequently a result of their technical innovation and this is discussed in more detail in the following section.



The D10 building of the Boots Factory in Nottingham, England, after major conservation works in the 1990s (Photo: S. Macdonald)

Materials

The introduction of many new materials – plastics, different types of glass, fibreglass, synthetic rubber, fibreboard, metals and so on – the use of new component-based building systems and the use of traditional materials in new ways are characteristics of the modern-century building industry. This has, however, spawned some difficult conservation problems for these buildings that can be summarised as:

- the use of new materials with unproven performance records;
- the use of new materials without knowledge of best practice methods for use;
- the use of traditional materials in new ways, or in combination with new materials;
- poor workmanship and quality control (new materials chosen for reasons of economy);
- the use of prefabricated, component-based construction systems;
- the rapid development of materials and their equally rapid supercession;
- the effect of pollutants on modern materials;
- the use of materials now identified as hazardous;
- the lack of an established salvage industry for modern buildings

The use of new materials without knowledge of best-practice methods for use

The proliferation o0f new materials and building systems from this century meant that in some cases the technology was not fully developed prior to the material going into widespread use. Reinforced concrete, which had been in use from the late 19th-century, became one of the most widely used materials of the 20th century. However, until the 1970s the standards that governed its use did not fully recognise all the good practice requirements that control its use today. For instance, the depth of cover to reinforcement was generally inadequate and has resulted in typical concrete decay problems that are difficult to address in many cases without radical change to the building's appearance. The use of calcium chloride as an additive to speed up curing, the use of seawater and many other practices now recognised as detrimental to concrete's long term durability, have resulted in early deterioration of reinforced concrete.

Unlike a masonry building, where individual stones or bricks can be repaired or replaced as decay occurs, the structural stability resulting from such problems can threaten a concrete building's survival and often radical and expensive repair is required to maintain them. For example the church of Notre Dame du Raincy of 1923, designed by Auguste Perret (sometimes called the grandfather of concrete construction), has had a rolling programme of repair that involved gradual replacement of the deteriorating concrete blocks, leaving the original design but little of the original material. The concrete repairs at Le Corbusier's Unité d'Habitation in Marseilles, completed in 1952, grappled with how to retain the bêton brut and adopted an approach that conflicts with concrete specialists' advice. The natural, rough board marked finish of the concrete at the Unité provided the model for the use of concrete for the next 20 years and its appearance is central to the building's significance.

Auguste Perret's church of Notre Dame du Raincy of 1923
(Photo: S. Macdonald)

The use of materials with unproven performance record

Using materials that had unproven performance records has built-in problems to the fabric of many buildings. High-tech buildings pose some particular issues. Neither the Pompidou Centre (1974–76) in Paris nor Lloyds Bank (1986) are statutorily protected yet they are undoubtedly 20th-century icons. Both have just gone through major repairs to correct a number of faults relating to the use of particular materials, detailing problems and workmanship deficiencies. This repair programme, as with many associated with more recent buildings, is the subject of some rather fierce litigation and the projects have been clothed in secrecy.

Traditional building methods developed over hundreds and thousands of years. Changing the way traditional materials were used, or altering the materials they were used with, has initiated new technical problems that can be difficult to fix. At Bankside Power station in London – reopened a few years ago as the new Tate Gallery – the use of a cement mortar in combination with particular bricks caused a chemical reaction, triggered by pollution associated with the buildings former use; the result was jacking of

the brickwork. Works to improve the water penetration to the top of the building were carried out and the rest of the building left and closely monitored rather than raking out and repointing the joints, the cost of which of course would be astronomical. Investigating and dealing with this single material issue has already cost a huge amount of money, largely due to the scale of the building.

Thin stone-cladding used in curtain walling in the post-war period is another example of a traditional material being adapted in a new way: problems with warping and fixings has resulted in some high-profile cladding failures such as Alvar Aalto's Finlandia Hall (1965). The use of stained plantation-grown softwoods for timber frame windows and other exposed timber work is a typical characteristic of many of the houses designed in the post-war period, particularly in the late-1960s and early 1970s. Their early deterioration means complete replacement may be necessary within their first medium repair cycle (30 years).

The effect of pollutants on modern materials is another problematic issue. Aluminium cladding is a typical example of a modern material that has not performed well in inner-city environments. Rumour has it that the marble cladding on the recently completed Getty started sugaring before the building was even completed as a result of Los Angeles's atmospheric pollution!

Poor workmanship

This is a common cause of problems in buildings, particularly of the mid-century, partly as a result of a deskilling of the building industry after World War II, and poorly defined work standards. Many building problems are a direct result of insufficient attention to detail. The Alexandra Road Housing Estate in London, completed in 1978, is one of England's youngest listed buildings. Poor reinforcement placement has resulted in insufficient cover to prevent corrosion of the reinforcement. The US$2.5 million concrete repair works carried out in 1998 attempted to minimise the impact of the repairs on the appearance of the building as an exposed concrete monolithic structure. This proved extremely difficult to achieve. The more usual approach is to include the application of an opaque coating to cover the repair patches.

The use of prefabricated component-based construction systems

This practice has brought many difficulties – many systems were quickly obsolete. Despite the concept of component assembly, often they were designed so that it is impossible to remove individual sections. The development of new materials such as plastics, paints, metals, and the huge range of component-based systems has moved so rapidly that many materials were superseded relatively quickly and are now no longer available. Replacement on a like-for-like basis, therefore, may require expensive handcrafting of what was intended to be a cheap mass-produced item. In addition, the salvage industry for 20th-century buildings is as yet largely undeveloped.

Recognising conservation as a process, rather than an event in time, is therefore vital. A solution may be found in the future and a holding repair may in some cases provide a temporary answer. The Metropolitan Cathedral of Christ the King in Liverpool, England (c. 1961) is listed at the highest level of protection. Despite being designed to last 500 years, during the late 1990s it underwent the second stage of a major programme of repair, to address the problems with the mosaic cladding to its ribs. The unavailability of the replacement mosaics is just one of the number of issues that led to the decision to overclad the ribs. This was to provide a holding repair until a more appropriate method can be identified that addresses the technical problems, and until a new source of the material can be identified and afforded. The dilemmas associated with the adaptation of traditional mosaic techniques to modern concrete construction are causing considerable problems internationally. The incorporation of contemporary art, such as mosaic murals, was a feature of many post-war buildings. The importance of the role of contemporary art in architectural design during this period is well recognised. English Heritage's post-war listing programme, for example, included a thematic study that identified a number of art works associated with buildings that have now been listed both individually and as part of an ensemble.

Use of materials now known to be hazardous

Another issue typical of conservation projects dealing with more recent buildings is the use of materials that are now known to be hazardous and where removal rather than repair is required to satisfy health and safety requirements. The widespread use of asbestos, plywoods made with glues containing formaldehyde and the use of halon as a fire suppressant can all pose a hazard to humans.

In 1999, a pair of fibre-cement houses in Sydney were found by the Land and Environment Court not to be significant enough to be listed, despite being very early examples of the use of this material. The developer used the argument that, as they were constructed of a hazardous material, despite their good condition, they must be demolished. However, bravely, the local council resolved to list the cottages despite the argument that the asbestos cladding was a health risk, as the cottages do not pose any current threat.

Developing standards for the handling of such materials will become an important issue as more buildings from this period become recognised as significant. Scientific data will be required to develop such standards and proper condition assessments by experts may be required as part of this process.

Detailing

The way in which modern buildings have been detailed is another difficulty for the conservator. The abandonment of traditional detailing to achieve the new modern aesthetic, and the lack of knowledge for best methods of detailing new materials to ensure long-term survival, have resulted in short-term failures. High Cross House in Devon (by William Lescaze from 1932) is typical of an endemic problem to many modern buildings – insufficient weathering details. Here the architect involved in the building's recent conservation and reopening as a house museum was able to modify the detailing around the windows in an unobtrusive manner, introducing some drip lines and weathering details to prevent the ongoing water ingress at these points.

Unsightly staining of fair faced concrete buildings from the 1960s due to inadequate weathering details, problems associated with flat roofs, and technical problems caused by the incompatible combination of materials, such as different metals, are also issues related to the detailing of modern buildings.

Maintenance

The built-in material problems and lack of maintenance often associated with more recent buildings inevitably exacerbate deterioration. New materials were often naively believed to be mainte-

nance free, although many buildings did have maintenance programmes included as part of the architects brief, but which have never been implemented.

Regular maintenance is vital for the longevity of buildings of any age, and yet there are specific access issues for some types of modern buildings – high rise for example – that have considerable cost implications. The development of 'maintenance free' treatments – coatings for concrete buildings are typical – can often create new problems by introducing additional maintenance cycles for the newly introduced material. There are specific issues that relate to the life cycle of modern materials that pose new problems requiring creative solutions.

Patina of age

The patina of a place is a symbol of its passage through time. Preserving patina has been a low priority in the conservation of buildings from the more recent past due to:

- the comparative accelerated ageing of modern architecture
- the short-term performance of modern materials
- an unrecognised nostalgia for ageing modern buildings.

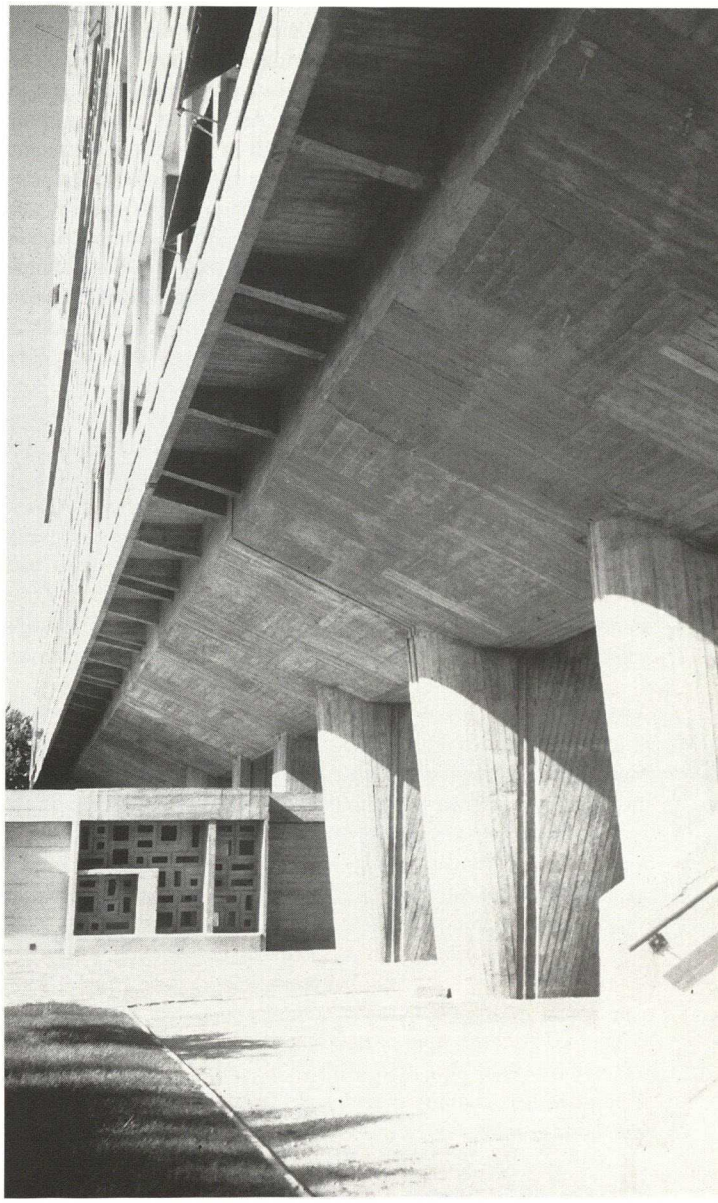
The perceived inability of more recent structures to age gracefully is principally a function of the abandonment of traditional construction techniques and materials. However, it may also be that we are not used to the romanticism of modern ruin, as opposed to weathered traditional buildings.

The shiny new materials and streamlined forms that characterise modern architecture may not have left room for an evolving patina. This aesthetic argument is one that has prompted the replacement of building materials instead of repair in many projects involving more recent buildings, using the argument that repair without reconstruction will rob the building of what is central to its authenticity – its image.

The role of the black and white photograph in reinforcing the importance of the appearance of modern buildings as recently completed cannot be overlooked. There are many anecdotes about how these images have directed a building's conservation. At Bungalow A, the architect Berthold Lubetkin's country house designed in 1933–36 in England, the new owners have taken a very conservative approach to the repair. Interestingly enough they have left the outside of the sun trap in the state it was when they acquired the house – covered in lichens and moss, and nothing like it appears in the architectural journals of its heyday. When many of the windows came to be replaced at the Connell Ward and Lucas's White house in England a few years ago, a debate about their colour ensued. Previous replacements had introduced powder-coated, white window frames based on the fallacy that it had always been painted white. In fact the house had been sugar-almond pink with black windows, but the prior works reinforced the misconceptions about architecture from this period and it being about white cubes.

Recognition

One of the difficulties in recognising the value of the more recent past is its proximity to us in time. It is still comparatively recently that we waged campaigns for the recognition of Georgian, then Victorian, and even more recently, Federation architecture. Increasingly, a more diverse notion of what heritage is and how we



Le Corbusier's Unité d'Habitation in Marseilles (1952). The repairs have acknowledged the importance of the surface finish of the concrete, which has been preserved. (Photo: S. Macdonald)

assess its significance is encouraged. Thus, as Gavin Stamp, past-Chair of Britain's Twentieth Century Society said (Stamp, in Hunter 1996), 'the wheel of fortune is revolving more and more quickly, and the interval between creation and revival is diminishing'.

There is still, however, a lack of general appreciation of post-Edwardian 20th-century places. Although the year 2000 prompted reappraisal of the 20th century's successes and failures, the histories are yet to be comprehensively written. Buildings from the more recent past constitute a very small percentage of our statutorily protected buildings and it is only in very recent times in some places that proactive programs of identification and protection have been initiated. In some countries this is yet to occur. Without wider public recognition it is difficult to convince people of the value of tangible evidence of the recent past. Experience from other places has shown that publicity and education programmes are necessary to attain the required level of public support. Without such support, 20th-century heritage is likely to remain at risk.

Many of the practical issues discussed in this paper have been

identified in Europe and in North America over the last 15 years and have resonance in places with milder climates as well. The key challenges of recognition, identification and protection run in parallel with these technical issues. As statutory listing programmes for 20th-century places are still in the formative stages, places from the more recent past tend to be protected reactively. The trigger is often at the time of the building's first major repair cycle, or the sale of the item from the owner who commissioned the building. Given the technical problems that have been identified with conserving some 20th-century buildings and the importance of carrying out adequate repairs when they are needed to retain their architectural value, it is important that we act quickly if we are to prevent these places being at risk.

It is true to say that the more recent the building, the more likely it has been identified as being significant for its architectural value and quality. The role architectural organisations – such as the UIA internationally or national architectural organisations – are playing in the selection of 20th-century buildings for registers is indicative of this. For those buildings that have been identified for their architectural significance it also follows that they have been selected for protection due to their ability to have successfully performed their intended function or successfully accommodated an early change of use. They are also likely to retain much of their original fabric, and that the survival of this original fabric is an important part of their significance. This is what Andrew Saint, Professor of architectural history at Cambridge University, describes as a process of natural selection for more recent buildings (Saint, in Macdonald 1996). This realisation led to the idea that it was important to consider the building's performance both technically and in fulfilling its intended use when English Heritage considered its selection of post-war buildings for listing.

Without recognition there is no conservation action, and without conservation action, what has been identified as the building's significance may not be possible to protect. In addition to a lack of recognition for 20th-century buildings, in practical terms there is a lack of experience in both identifying the issues and finding appropriate practical solutions. There are as yet no repair techniques that have been developed to accommodate conservation aims; this is a critical issue. We are poorly resourced in terms of knowledge, skills and funding to cope with some of these problems.

For buildings of this period it is, therefore, important that we address the practical and technical issues at the same time that we are engaged in the identification and protection stages. This has been well recognised in Europe and North America. English Heritage's experience has shown that it is important to be able to respond to the technical challenges at the time of listing. This was found to give the building owners more confidence in the listing process. This also led English Heritage to commission a large research project to examine the problems associated with mosaic cladding of concrete buildings to assist in addressing the problems at the Metropolitan Cathedral in Liverpool, discussed above. Two conferences were also held in London that focussed almost entirely on the practical issues. Organisations like DOCOMOMO have also been actively engaged in trying to find practical solutions to some of the issues discussed in this paper. Their technical committee has also run a series of technical seminars and published papers on various topics.

Despite the described practical problems associated with buildings from the more recent past, the fact that the design and construction processes for mid-century modern buildings are still in living memory offers the potential to understand them in a way that has not been possible before. The architect may still be able to explain the building's *raison d'être*, the construction process, why certain materials and methods were selected, maintenance expectations and so on. It is important, therefore, to maximise this potential. Statutory heritage bodies have been requesting that where possible the original architect be consulted or involved in major conservation works – not always successfully.

It is interesting to hear about experiences where the original architect has been involved in the conservation of his own building. The creator tends naturally to take an evolutionary approach, both to the building itself and in terms of his own design development, and one that is primarily aesthetics based. This in itself has resulted in some interesting debates on some projects in the UK. John Allen, an English architect who has conserved a number of buildings from the 1930s to the 1950s, has concluded that (Allan, in Macdonald 1996) '...even when the original designer is available for guidance the best adaptation may be derived from the original design rather than from its author'. Allan is Berthold Lubetkin's biographer and was the architect for the adaptation of the Grade-1 listed Penguin pool designed by Lubetkin in 1934. This comment was prompted by the Heritage Officer's rejection of the first scheme for this project (designed by Allen and Lubetkin) on the grounds that it was 'not in the spirit of the original design' (Allen, in Macdonald 1996). Allen agreed with the Heritage Officer's comments on the basis that the proposal reflected a later

The Metropolitan Cathedral of Christ the King in Liverpool, England (Photo: S. Macdonald)

design motif of Lubetkin's and did not marry well with the very simple geometry of the original design. The final scheme was initiated in the mid-1980s and was one of the first key conservation projects of a listed building from this period.

Conclusions

As more places are statutorily protected and the demands of conservation practice are applied to them as part of their repair, collective experience will grow. Ideas will no doubt change as we understand more about these buildings, the materials of which they are made, and the associated decay mechanisms – and as we challenge the repair options to meet conservation aims. Attitudes to conservation are constantly reassessed and redefined according to the cultural climate, but are also influenced by changing technology.

There has been a tendency to treat 20th-century buildings differently from those from earlier periods and adopt a slightly different philosophical approach. Now we have left the 20th-century there may be an artificial but important psychological break that will enable the conservation of places from the more recent past to be approached with the same regard for their fabric as earlier heritage places. Perhaps now we have crossed this barrier, '20th century' will be considered less recent and therefore less likely to be identified as a category of places that are considered to be 'at risk'.

Conservation is about managing change. How that change is managed depends on the current level of knowledge and the community's support for conserving the place rather than on significance itself. The challenge is to help communities recognise the value of recent cultural heritage to make certain that there is enough political support to ensure that it is the significance of the place that guides change.

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Susan Macdonald
Assistant Director, NSW Heritage Office
Locked bag 5020
Parramatta NSW 2124, Australia
Email: macdons@heritage.nsw.gov.au

The Alexandra Road Housing Estate in London during the large-scale concrete repair programme in 1998. Attempts to rectify earlier poor repairs and address later problems were difficult to carry out without resulting in a blotchy looking building instead of the sleek, high quality concrete finish of the original concrete. (Photo: S. Macdonald)