

A POSSIBLE ETHIC FOR THE CONSERVATION
OF TIMBER STRUCTURES

Bernard Fielden

The Venice Charter of 1964 is the accepted basis for conservation of architecture, whilst the lesser known Murray Pease report of 1966 deals with conservation of works of art. Conservation is such a rapidly developing field that in some respects neither of these documents go far enough; nevertheless, they must be respected and followed as an invaluable basis for all conservation work.

Wood presents some special problems because it is an organic material, unlike stone, brick, concrete or metals - the other major structural materials. It is food for fungi and insects. It is actively affected by relative humidity, which causes it to expand and contract; moreover, excessive moisture robs it of its compressive strength. It is therefore extremely vulnerable to decay if it is not kept in a proper environment. The resistance to decay in different types of wood varies widely, but under good conditions wood with a medium rating will last over a thousand years. Under bad conditions, especially where ventilation is inadequate or a poorly maintained building has a leaking roof or other defects allowing water to penetrate, the working life of wood can be short indeed.

Where timber is very plentiful, wood as a building material can form massive log walls, as in the magnificent examples from Kiji in USSR, or can be used in framed construction, which has produced breathtaking examples of the carpenter's skill, such as Japanese temples and pagodas, the trussed roofs of Gothic churches or cathedrals, the arched ribs of the Sala della Regione in Padova and Vicenza, as well as many bridges and the hammer beam arched trusses of Westminster Hall and Eltham Abbey in Britain, to mention but a few examples. However, it is in the vast numbers of timber framed houses, barns and other domestic buildings that some of the most difficult conservation problems are likely to be met.

As a structural material, wood is strong in both compression and tension. Framed buildings are more nearly statically determinate than masonry structures. They depend crucially upon the strength of their joints, many of which have to transmit tension. Unfortunately, the joints are most vulnerable to dampness, and to fungus attack followed by beetle attack.

Defects in wooden structural members, whether at the joints or elsewhere, are more critical to a structure's load bearing capacity than in the case of the other primary building materials.

The universal methodology of conservation requires that objects of any kind should be fully inspected and documented before any intervention is made. The initial inspection should define the object, which in the case of a building includes its setting, and should deal with it as a whole. Such a superficial inspection can indicate what further investigation is necessary. The first requirement of a building is "firmness", that is, it must stand up and resist all types of loadings. However, we must not forget

"commodity" and "delight" as well. With a timber frame building, the more sophisticated the design, the more vulnerable it is to decay. As the joints are so vital, after the initial inspection it may well be decided that it is necessary to strip the external plaster and remove internal finishes in order to be assured that the structural condition is sound enough to merit conservation. Whether this detailed inspection is sufficient excuse for total removal of the external plaster in order to reveal the timber framework, is a question outside this particular discussion, as many other values, besides the purely architectural ones of structural integrity, must be considered. The point is, however, that no valid practical proposals can be submitted for approval until "firmness" and structural integrity have been assured.

The detailed inspection must not ignore historical or archaeological evidence. It is essential that adequate funds be provided for this first stage of any conservation work as experience shows that full investigation saves greater costs at later stages.

To make valid proposals for approval by a competent authority, the objective of the conservation work must be defined and the method of presentation of the object made explicit.

During all conservation treatments, the following standards of ethics must be rigorously followed :

1. the condition of the object, and all methods and materials used during treatment, must be clearly documented;
2. historic evidence should be fully recorded and must not be destroyed, falsified, or removed;
3. any intervention must be the minimum necessary;
4. any intervention must be governed by unswerving respects for the aesthetic, historical and physical integrity of cultural property.

Inventions should :

- a. be reversible, if technically possible; or
- b. at least not prejudice a future intervention whenever this may become necessary;
- c. not hinder the possibility of later access to all evidence incorporated in the object;
- d. allow the maximum amount of existing material to be retained;
- e. be harmonious in colour, tone, texture, form and scale, if additions are necessary, but be less noticeable than original material, while at the same time being identifiable;
- f. not be undertaken by conservator/restorers who are insufficiently trained or experienced, unless they obtain competent advice. However, it must be recognized that some problems are unique and have to be solved from first principles on a trial and error basis.

The presentation of the object at least must not detract from the "messages" contained within the object, at best should clarify and make more comprehensible these "messages" without any distortion or manipulation. The archaeological and structural evidence must be assessed; alternative proposals for conservation must be discussed, and above all no one must form premature conclusions. All aspects must be considered by a multidisciplinary team subject to the structural imperative of "firmness".

Without full inspection and documentation this essential process of evaluation cannot be effective. In the evaluation the following values should be considered :

Cultural Values

- a. documentary
- b. historic
- c. archaeological and age
- d. aesthetic
- e. architectural
- f. townscape
- g. landscape and ecological

Use Values

- a. functional
- b. economic
- c. social
- d. political

Emotional Values

- a. wonder
- b. identity
- c. continuity

In architectural conservation, problems often arise because the utilization of the historic building, which is economically and functionally necessary, must also respect cultural values.

The cost of conservation may have to be allocated partially to each of the above separate values in order to justify the total to the community. There may be conflicts between some of the values. In certain cases, archaeological values will predominate. In other cases, artistic or historical considerations will prevail, while in yet other practical and economic considerations may modify the scope of conservation. Sound judgement based upon wide cultural preparation and mature sensitivity give the ability to make correct value assessments, and resolve contradictions in a creative way.

A programme for conservation has to be realistic, but must also be guided by sound theory; otherwise it will not achieve its objectives. The theory exists to check whether the possible and practical proposals are valid, or whether they should be revised.

In conserving historic buildings, we have the great responsibility of either preserving or destroying cultural property, but we must remember that nothing can last forever, there is no "final solution" and sometimes a timber structure must be deemed to be beyond repair. If it is beyond repair, the design can be reproduced, using traditional techniques.

We have seven descending degrees of conservation : prevention, preservation, consolidation, restoration, reproduction, reconstruction, re-evaluation (or adaptive use), which are described as follows.

Prevention of Deterioration (or Indirect Conservation). Prevention entails protecting cultural property by controlling its environment, thus preventing agents of decay and damage from becoming active. Neglect must also be prevented, as timber buildings are extremely vulnerable.

Therefore, prevention includes control of relative humidity, temperature and light, as well as measures to prevent fire, arson, theft and vandalism. In the industrial and urban environment, it also includes measures to reduce atmospheric pollution, traffic vibrations and ground subsidence due to many causes, particularly the abstraction of water.

Preservation. Maintenance, cleaning schedules and good management aid preservation. Repairs must be carried out when necessary to prevent further decay and to keep cultural property in the same state. Regular inspection of cultural property is the basis of preservation, being the first step in preventive maintenance and repair. Preservation deals directly with cultural property. Damage and destruction caused by humidity, chemical agents, and all types of pests and microorganisms must be stopped in order to preserve the object or structure.

Consolidation (or direct Conservation). Consolidation is the physical addition or application of adhesive or supportive materials into the actual fabric of cultural property, in order to ensure its continued durability or structural integrity.

With buildings, when strength of structural elements has been so reduced that it is no longer sufficient to meet future hazards, the consolidation of the existing material is necessary and new materials may have to be added. However, the integrity of the structural system must be respected and its form preserved. No historical evidence should be destroyed. Only by first understanding how a historic building as a whole acts as a "spatial environmental system", it is possible to make adjustments in favour of a new use, introduce new techniques satisfactorily, or provide a suitable environment for objects of art.

The utilization of traditional skills and materials is of essential importance, as these were employed to create the object or building. However, where traditional methods are inadequate, the conservation of cultural property may be achieved by the use of modern techniques which should be reversible, proven by experience, and applicable to the scale of the project and its climatic environment. In buildings made of perishable materials such as wood, mud, brick or rammed earth, traditional materials and skills should be used for the repair or restoration of worn or decayed parts.

Finally, in many cases it is wise to buy time with temporary measures in hope that some better technique will evolve, especially if consolidation may prejudice future works of conservation.

Restoration. The object of restoration is to revive the original concept or legibility of the object. Restoration and reintegration of details and features occur frequently and are based upon respect for original material, archaeological evidence, original design and authentic documents. Replacement of missing or decayed parts must integrate harmoniously with the "whole", but must be distinguishable on close inspection from the original so that the restoration does not falsify artistic or historic evidence.

Contributions from all periods must be respected. All later additions that can be considered as "historical document" rather than merely a previous restoration, must be preserved. When a building includes superimposed work of different periods, the revealing of the underlying state can

only be justified in exceptional circumstances : when the part removed is widely agreed to be of little interest and when it is certain that the material brought to light will be of great historical or archaeological value, and when it is clear that its state of preservation is good enough to justify the action. Restoration also entails superficial cleaning, but with full respect for the patina of age.

Reproduction. Reproduction entails copying an extant artifact, often in order to replace some missing or decayed, generally decorative, parts to thus maintain its aesthetic harmony. If valuable cultural property is being damaged irretrievably or is threatened by its environment, it may have to be moved to a more suitable environment. A reproduction is thus often substituted in the former location in order to maintain the unity of a site or building.

Reconstruction. The use of new materials for reconstruction of historic buildings and historic town centres may be necessitated by disasters such as fire, earthquake, or wars, but reconstruction must be based upon accurate documentation and evidence, never upon conjecture.

The re-erection of fallen stones to create an accurate and comprehensible version of the original structure is a special type of reconstruction called anastylosis.

Moving entire buildings to new sites is another form of reconstruction which is justified only by overriding national interest. However, it entails some loss of essential cultural values and the generation of new environmental risks. In some countries wooden buildings are designed to be demountable and movable.

Re-evaluation. The best way of preserving buildings is to keep them in use, a practice may involve what the French call "mise en valeur", or modernization and adaptive alteration.

Adaptive re-use of buildings, such as utilizing a mediaeval convent in Venice to house a school and laboratory for stone conservation, or turning a fine timber barn into a domestic dwelling, is often the only way that historic and aesthetic values can be made economically viable. It is also often the only way that historic buildings can be brought up to contemporary standards by providing modern amenities. Adaptive re-use of timber framed buildings in historic town centres occurs frequently with the objective of preserving townscape and emotional values.

In practice, interventions may involve some loss of a "value" in cultural property, but are justified in order to preserve the objects for the future. Conservation involves making interventions at the various scales given above with levels of intensity which are determined by the physical condition, the causes of deterioration, and the probable future environment of the building under treatment. Each case must be considered individually and also as a whole, taking all values into account.

As has been outlined above, the theory of conservation postulates that any intervention be the minimum necessary; be reversible if possible or at least not prejudice future interventions; and retain the maximum of original material. Traditional methods should be used wherever possible and new techniques should only be used where proved.

The respective roles of architectural conservators and craftsmen need clarification. Craftsmen by their training provide invaluable skills, but the possession of these skills may tend to blind them to the objectives of conservation, one of which is to preserve the maximum amount of existing material. It has been found that craftsmen prefer to use their skill in renewing rather than repairing and this is dangerous. Sadly, because of faulty education, many craftsmen hate history, but it has also been found that if they realize the "continuity" that exists in their trade and appreciate the skill of past performers, they begin to appreciate historic values. Their skill needs directing into the right channels and here the architectural conservator has a real role.

For successful conservation of wooden buildings there must first be inspection and documentation; then structural analysis and preparation of alternative proposals. These proposals should define the objective of the work, so that everyone's efforts are directed towards the same goal; they should also outline how the building is to be presented. Due to the nature of the material in the conservation of timber structures, the ethic imposed by considerations of structural integrity, stability and durability generally takes precedence over other values.

RESUME

UNE ETHIQUE POSSIBLE POUR LA CONSERVATION DES STRUCTURES EN BOIS

La conservation du bois en tant que matériau organique pose un problème particulier. Proie pour des champignons et des insectes, vulnérable à l'humidité, le bois est menacé de désintégration s'il n'est pas conservé dans un milieu adéquat.

La méthodologie universelle de conservation exige que tout objet devrait être examiné, structurellement, avant toute intervention. L'examen détaillé ne doit ignorer ni les structures historiques ni les structures archéologiques.

Pendant la phase d'évaluation, doivent être prises en considération les valeurs culturelles (documentaires, historiques, archéologiques, architecturales...), les valeurs fonctionnelles (économiques, sociales, politiques), et les valeurs émotionnelles (beauté, identité, continuité).

Dans la conservation des constructions historiques, notre responsabilité, qui est grande, réside dans le choix de préserver ou de détruire le bien culturel, car la "solution finale" n'existe pas.

Il existe sept degrés de conservation : prévention, préservation, consolidation, restauration, reproduction, reconstruction, ré-évaluation.

La prévention consiste à protéger le bien culturel de son environnement et à prendre des mesures de protection. La préservation consiste à contrôler régulièrement pour empêcher toute destruction. La consolidation est l'application de supports supplémentaires au bien culturel pour assurer sa durabilité ou son intégrité structurelle. La restauration consiste à faire revivre le concept original de l'objet, en respectant le matériau initial, la structure archéologique ou le caractère authentique. La reproduction d'un bien culturel, qui est endommagé et doit être conservé dans un milieu plus approprié, est parfois nécessaire quand il faut maintenir l'unité d'un site ou d'un monument. La reconstruction doit reposer sur un document historique. Cependant, le déplacement de monuments entiers, autre forme de reconstruction, ne peut être justifié que par l'intérêt national. La ré-évaluation consiste à mettre en valeur le monument en l'utilisant.

Cependant, en pratique, les interventions de transformation signifient quelquefois la perte de la valeur du bien culturel, qui n'est justifiée que par le but de préserver les biens pour l'avenir.

Les restaurateurs en architecture et les artisans, dans leur rôle respectif, ne doivent pas oublier que l'objectif de la conservation est de préserver le maximum de matériaux existants. C'est le rôle du restaurateur de guider l'artisan dans la recherche des valeurs historiques.