

THE FORM, LIFE AND CONSERVATION OF MUD-BRICK BUILDING

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This paper explores the conservation of buildings in mud-brick, with particular regard to ethics and the integrity of methods; it compares what may be architecturally sound with what is aesthetically and historically acceptable.

Attention is then given to the various forms which mud-brick building takes, the formation of the basic material, its lifespan, and the causes of its deterioration. Review is then made of the methods available for its restoration and conservation.

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Let us, as an intellectual exercise, attempt to combine the basic principles of conservation theory with the special characteristics and difficulties that flow from the use of mud, or unbaked earth.

Conservation is concerned with maintaining the fabric the past has left us. That fabric exists in many senses, two of which are of prime importance to the conservation architect - the outward aspect, and the physical material.

To the planner and sociologist another aspect is of prime concern - the use and the user. Sociologically, a mosque no longer used as a place of worship is historically dead, though architecturally it may be unchanged. That same mosque, however, might retain its outward aspect, so remaining validly conserved so far as the sociologist, town planner and architect are concerned. But nevertheless, through some disaster it might have collapsed and been replaced in concrete block rendered over to simulate exactly the original, with all its detail. To the archeologist the fabric of the building has disappeared - the original vital evidence is no more: and so archeologically, the mosque is dead. Thus the significance of conservation must change with a changing viewpoint.

From the heated debates on conservation and restoration a number of conventions, codes and guidelines are emerging, and from these a key thread that can be drawn is integrity. This relates not only to the actual materials of which the building is made but to its spaces and shapes and to the uses and methods of working of all its components. It may be architecturally clever to wrap an old building in some new synthetic guise; it may be economically effective to insert seven floors behind a facade that apparently presents three storeys to the world; it may be convenient to remove an entire structure and replace it with a replica made in new materials; but all these actions raise questions of doubt as to the integrity of handling a structure. The architect who takes any such action must first have honestly and satisfactorily answered such doubts. Once destroyed,

an ancient fabric can never be re-created: it may be reproduced, but a reproduction is merely a reproduction.

There is a school of thought which regards old buildings as historic material, valid in their own right and venerable for this reason alone. By the values of this present age this is a philosophy which cannot be gainsaid. It therefore follows that any venerable piece of building fabric has an intrinsic worth which depends solely upon its origin, and it equally follows that a simulation of that fabric with intent to deceive is misleading and historically dangerous. A new dimension has entered architecture with this concept - morality based on the intrinsic worth of earlier material which therefore has a priority over added or inserted material.

The more difficult problem arises when adapting an older building for new uses, where it is necessary to make amendments and adjustments. One cannot date-mark a void and it is difficult to complete a damaged wall, vault or column in dissimilar materials and so identify new work. Problems of this sort tax and reveal the skill of the designer. The qualities perhaps most to be sought in these circumstances are sympathy and honesty: sympathy of response to the existing work and honesty in the handling of the new in relation to the old.

Honesty is, of course, a word which has had much currency in architectural criticism. It was an underlying precept of the functionalist philosophies of the modern movement where the principles of clear expression of the material and of the function it performs became the guideline to the aesthetic. While honesty is fundamental in work of conservation and re-use, it now takes on another rather special aspect, suggesting not only honesty in the expression of the material itself but historical honesty in expressing truthfully the period of work.

Where a building is to be retained, it is fundamentally good practice to preserve and enhance every possible part of the structure and to retain, so far as is possible, the original relationship of its component parts. In architectural terms it must always be remembered that the quality of a building derives not only from the physical structure of which it is made, but from the contained and defined space within it and the shapes and aspects of the spaces left between it and other buildings. Thus, to take down a street building, leaving only its facade standing, while grafting a new

structure on to the back of the facade, is the antithesis of conservation so far as the building itself is concerned. The structural integrity of the building and all its internal shapes and spaces will have been destroyed and, so far as the original evidence goes, the building will have been virtually eliminated. However, that very same act of preserving the street facade, regardless of whatever stands behind it, may, in itself, be an important act of conservation in terms of the street and so, in townscape terms, may be entirely justified although the building itself has effectively ceased to exist.

In this initial instance, let us take the viewpoint of the simple architectural conservator. The principles to which he will work generally include the following fundamental criteria:

retention of shape, colour and detail of the structure so that it looks outwardly as similar to the original as may be:

continuance of the use of the structure in a manner compatible with the original:

sympathetic alteration, with due cognizance and record of historic fact:

retention of the historic surroundings so far as this may be achieved in order to satisfy the need for a sympathetic environment:

provision of an accurate factual record of the structure as found and of the alterations made to it:

the use, so far as possible, of reversible techniques which have been proven by time and experience:

avoidance of conjecture:

demonstration of the nature of the alterations, amendments or insertions:

the employment of materials which, if not identical to those replaced, will be similar in behaviour and will be long-lasting.

The philosophy, in other words, is to provide buildings that are not deceptive, are fit for their purposes and continue the ethic and features of the historic construction.

To this problem could be added the archeological factor of authenticity. Architecturally it may be satisfactory to replace an eroded stone with a new one, a worm-eaten timber with a new-sawn baulk, and a lime-washed mud brick pier with concrete blocks rendered and painted. Archeologically it is not. The replaced material is archeologically a fake. It cannot be submitted to analytical tests now or in the future when unthought-of techniques may be applied to answer questions as yet unmarked.

To these criteria must be added one other which we might describe as emotive.

In England, about a hundred years ago, a group of eminent architects, conservers and painters, formed an important society - for the Protection of Ancient Buildings. Their thesis was that a building should preserve its outward appearance, including the venerable evidence of its age and history. Their work was a consequence of the wholesale reconstructions and remodellings which resulted from Victorian English prosperity and affected major historic buildings throughout the land. As a result of this reaction to wholesale renewal there has grown up a school of conservation which works towards repair rather than replacement and seeks to conserve even weathering and plant growth, in order to retain the quality and character of the structure.

In the face of the wholesale alteration of great historic buildings, the founder of the Society, William Morris, lamented, "...alas for the English feeling of reverence, of which we hear so much; alas for those who come after us, whom we shall have robbed of works of art which it was our duty to hand down to them uninjured and unimpaired." His emotive call set a spirit abroad among those who wished to conserve the quality of things past: that spirit aims to keep the outward appearance of buildings as they were when new, and their outward appearance after a period of use. This is an important factor.

When these thought processes are applied to the problems of unbaked earths some rather special considerations emerge.

Firstly, there is the simple problem of size or scale.

Unbaked earths have been used on a colossal scale in the most primitive of conditions and structures. Much of the work to which they have been applied is primarily in the

vernacular. While it may be no less important for that, the very processes of vernacular building often suggest the use of simpler building techniques and the operation of more rapid processes of decay in consequence.

Any technique of conservation which is to help significantly must be capable of being applied on a large scale. Sheer scale must not daunt the conservator, since part of the quality of historic building in unbaked earths is the overwhelming sense of mass, of contiguity with base material and, at its extreme, of an environment where the whole of man's being is moulded by the 'clay of Mother Earth'. Perhaps no other material can be so all-embracing. The city wall, the road surface, the walls, the roofs and domes, everything in such a community may be made of this one material. If the special quality of the place is the universality of it, then this total use becomes in itself part of the task of the conservator.

Secondly, the rapidity of erosion in the material makes it transient. No mud-brick building remains in pristine condition for long unless it is in a virtually waterless and wind-free situation. In practical terms, therefore, the quality of mud-brick building depends either upon a weatherproof skin material or upon frequent renewal of the mud coating. The use of a weather resistant skin disguises much mud-brick architecture. In northern Europe, a region frequently believed devoid of unbaked-earth construction, the disguise is frequently an external rendering or lime-wash coating coupled with stone base-courses and wide-eaved roofs. In consequence the buildings are not recognised for what they are and conservation becomes essentially a matter of maintaining the outer skin. The technical problem, therefore, frequently becomes a matter of dealing with cements and lime-based products applied to an unstable or weak substrate. Where the skin is not self-supporting it usually fails due to the differential movement between it and its background. Cracks in the outer material allow water entry and decay occurs by the removal of slabs or lumps of the external coat. The bond between coat and wall is often weakened by the emergence of salts carried out of the earth wall to its surface by moisture movement. This phenomenon occurs primarily in situations where the damp-proof course is omitted, and this, of course, means almost all historic buildings. Attempts to strengthen the bond between external skin and the wall involve mechanical bondings, the use of keying, stone nodules or even pieces of wood linking the two materials physically. Efforts to strengthen the base material itself by the introduction of cements into the earths

have never been widely adopted. Another method of protection has relied upon surface coatings of a weak or flexible nature, such as paints and, particularly, lime-washes. These protections have always been widely used but depend for their success upon frequent renewal.

Both protections, rigid and flexible, have offered decorative possibilities to builders; and therefore conservation has had much to do with replacing and repairing these decorations. These techniques are, however, secondary and separate by comparison with the regular method of finishing a building constructed of unbaked earths; that is by a rendering of mud itself.

The special merit of mud as a finish to a building of unbaked earths is its compatibility with the substrate, though this is not always total, particularly if wetness and/or salinity are markedly different when the outer layer is applied or if, as may happen, different proportions of clays are contained in the brick-earths used for the wall and the render. Generally the behaviour of the coating and the base material will be the same and failure due to differential movement is rarer.

The snag is in the weakness of the render itself in terms of weathering. The act of applying the wet material, squeezing it under hand pressure, smoothing it and making the surface even, tends to align the micaceous plates in the clays which form part of the earths. The fibrous binders also tend to be aligned by the same actions, so that the material becomes denser and physically more coherent. This makes it more waterproof, of course, and ensures also that the surface bonds to the substrate. A similar process is applied to flat roofs, where the same material forms an effective short-term waterproofer. After heavy or prolonged exposure to rains such roofs are rolled, simply to compact the surface once again after the physical separation of the particles has been increased by the introduction of water between them. The contraction on drying is never as great as the expansion under the pressures of capillary action, so the roof surface and the render become softer and more friable upon prolonged exposure to cycles of wetting and drying. The softened material can be eroded easily and thereafter the normal processes of physical decay set in.

Conservation in these circumstances can consist either of renewal of the render as frequently as necessary to keep the surface in repair or of obtaining an additive which waterproofs the surface, without visually impairing the

building. In earlier times bituminous compounds were used, but without success, except in the short term, due to the leaching out of the volatile oils. Modern technology has produced oil-derived materials, such as silanes and other silicone waxes, which will repel water and might, therefore, seem useful. Their high cost and transience have generally made them unattractive candidates in a field where the essence of the buildings is mass and initial cheapness. As no other significant, large-scale material has come available, the conclusion must be that the only effective method of repair and conservation is the traditional technique of replacement of like with like.

This policy itself introduces a problem. It is one that William Morris, fortunately for him, did not have to face. When a mud-rendered building is repaired with a mud render, the entire face is new - the old has disappeared. There is no avoiding the issue: it is simply a matter of making the best of it. Decorative features must be remodelled, mouldings and strong-courses replaced and surface decorations re-applied. This, in its train, brings forward the problem of spontaneity in treatment. Simply, the question is - does one slavishly copy what went before or attempt alternatively to create another art-work in the spirit of the original?

The answer lies with the conservator, and his judgement in the special circumstances of the time.

The third consideration embraces change. Change is inevitable. Even where the building survives the surroundings may unavoidably change. Even when the surroundings also survive, they, in their turn, must meet with the outer world on some boundary; and in the buildings themselves there must be amendment or alteration to accommodate changing use, changing technology or changes in life and living patterns. We no longer expect to use earth closets or live by candlelight. Some essential alterations in the use of buildings affect the materials used. Electric lifts cannot be installed on mud-brick lift shafts, and air conditioners make unsightly additions to the profile of traditional buildings. Perennially we face the discordancies of television aerials, wires and poles, and aluminium windows. The mud surfaces of roads which were self-repairing throughout the centuries are no match for the motor car. They are re-surfaced with asphalt and their sidewalks are covered with pre-cast concrete slabs.

These continual problems are not peculiar to mud brick but they may be particularly intractable in terms of mud-brick conservation. If the ethic of the conservation involves the retention of the whole environment as a living and working entity, then such problems loom large in the mind of the architectural conservator.

In many circumstances it is the admixture of later and earlier techniques which is specially inimical to the very qualities which the conservator may be trying to retain. Imagine a village of domed mud-brick houses where some few were perfectly preserved, among a phalanx of cubic structures built of concrete block, of tarmac roads, of posts and wires. However successful the conservation of any individual building, the environmental effect is disastrous. Acceptable living standards have to be achieved, despite the introduction of modern equipment, if a successful transition to contemporary life is to be made: and the special problem of unbaked earth is its universal application and high rate of wear.

The fourth consideration relates to the simple discipline of recording.

A distinctive visual quality of the use of unbaked earths is its plasticity. Surfaces are rarely true and even. Straight lines are remarkable rather than the rule and the tendency to batter walls (slope them back) and round off corners is as inevitable as it is attractive. The material therefore gives its own soft quality to the architecture in addition to inducing weathering details that give typical local character. A record of these softnesses, rounding-outs and unevennesses demands special techniques which fortunately are now available through the recently-developed science of photogrammetry. The records made by these processes are sufficient to allow the recorded building to be re-created. The labour of identifying its features precisely has been enormously reduced.

So where have these considerations left us, as architectural conservators of buildings and communities faced with the problems of unbaked earths.

With the exception of recording techniques, there is no technical advance which dramatically simplifies our problems. There is no material that can be injected into or sprayed on to great areas of mud-brick to preserve it for long periods. The available materials are all expensive or impractical. So conservation must depend upon the traditional techniques of renewal. That way lies archeological certainty, and safety.

In terms of building techniques, certain simple precautionary techniques are self-evidently necessary, particularly the use of modern methods of damp-coursing. These apart it seems that in the present state of knowledge our endeavours are best concentrated on creating the political and economic conditions which encourage the owners of these buildings to look after them, to repair them by the time-honoured methods, to value them and to carry out work upon them with no less skill and care than previous generations. With the community, meanwhile, must lie the equal problem of protecting and conserving the outer spaces - roads, street-surfaces, neighbouring buildings, and all those manifold aspects of the surroundings that control the quality of a place. The conservation of the planned environment is frequently more important in the case of mud-brick and vernacular buildings than in the case of more robust and durable types of construction. So the climate of conservation must be created in the political field as well.

The key to success lies perhaps with pride. If a community can feel pride in its buildings, particularly its humbler buildings, it will value them. So let the climate of good sense for the conservation of mud-brick buildings include economic and practical help, the use of traditional methods and a recognition that the quality of the environment which these structures represent is significant and should be a matter of pride.