CONSERVATION ON ARCHAEOLOGICAL EXCAVATIONS

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With particular reference to the Mediterranean area

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EXCAVATION AND CONSERVATION

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> "The things he [the excavator] finds are not his own property, to treat as he pleases, or neglect as he chooses. They are a direct legacy from the past to the present age, he but the privileged intermediary through whose hands they come; and if, by carelessness, slackness or ignorance, he lessens the sum of knowledge that might have been obtained from them, he knows himself to be guilty of an archaeological crime of the first magnitude. Destruction of evidence is so painfully easy, and yet so hopelessly irreparable."
> (H. Carter and A. C. Mace, *The Tomb of Tutankhamun*, Vol. 1 (1924): 124)

The conservation of archaeological material must begin in the field; planning for conservation needs must therefore start when the excavation is first proposed. This obvious statement needs repeating; although excavation and other archaeological techniques have developed immensely in the past fifty years, the standards of conservation of excavated material have not generally improved to the same extent. The two must, of course, be considered together if the maximum information is to be retrieved and if the finds are to be preserved and accessible for future generations.

1. Archaeological conservation of sites and objects

It is taken as axiomatic here that the authority to excavate carries with it the responsibility to conserve and publish the results of the excavation. But the responsibility for conservation should not be delegated to specialist staff after the excavation is over for two reasons, one practical and the other technical. In practical terms, the supply of qualified conservators (especially those willing to work on excavated material) cannot meet the present demand; on a technical level, some of the remedial conservation work carried out after the excavation would be unnecessary if proper measures of preventive conservation were taken on site. For both excavation aims and conservation needs to be satisfied, the two must be reconciled in the field at the moment of excavation.

The actual moment of excavation is crucial on two counts: first, for the fullest possible observations by the excavator as to the context of the find and its associated material; and second, for the potentially disastrous consequences of the lack of environmental control over finds that are chemically or mechanically unstable. These two concepts, *archaeological context* and *environmental control*, are perhaps the very

essence of sound excavation procedure; inadequate attention to either results in that idea of destruction which is often held to be characteristic of excavation. (Conservation too can be destructive, for instance in removing corrosion products from an object; as with excavation, the degree of control and documentation are all-important.) The raw material of archaeology is, almost by definition, non-renewable and only close attention to these two concepts – and the leaving of "witness" areas for control purposes – can make undeserved the label of "destruction."

Moreover, the ever-growing field of archaeometry (the application of chemical and physical analysis to archaeological material) depends for its best results on material with good archaeological context and in a state as similar to its excavated condition as possible.

The importance of "context" brings together two aspects of conservation on excavations which terminology and tradition have tended to separate. As to terminology, the products of excavation are either left on site or removed elsewhere, reflecting the distinction between immovable and movable cultural property. The term "archaeological remains" is useful for material still in context but not after its removal to a museum. The words "antiquities" and "monuments" are often inappropriate when applied universally. Instead "objects" can be used for portable items that are removed from a site and "the site" for remains left *in situ*.

The conservation of archaeological objects, on the one hand, and of archaeological sites, on the other, tend to be different specializations, each with its own practitioners, technical literature and methods of training. The term "archaeological conservation" should refer to both rather than, as often, only to objects.

Accepting the object/site terminology, it has to be recognized that many "immovable" remains (e.g., kilns, mosaics, stelae, temples) are in fact removed from a site for reasons perhaps of security, threatened destruction, "better" display or illegal sale. The loss of context caused by the removal of "immovable" objects, as with movable ones, represents a loss of information for which only the fullest possible documentation can compensate. It also leads to problems in the display of the objects in their new setting, usually requiring some form of re-creation of context. One of the purposes of archaeological conservation must surely be to minimize the loss of information suffered when the excavation process separates objects and the site from which they have come.

In summary, then, archaeological conservation is concerned with both sites and objects. In the event of excavation, its techniques are applied to excavated remains during and immediately following their exposure. This is field archaeological conservation, as distinct from laboratory archaeological conservation.

2. Conservation on excavations

The proper conservation of structures and objects during an excavation is best assured by having a professional conservator as a full-time member of the excavation team (see Chapter 2). This ideal is rarely achieved, however, for lack of qualified conservators.

The contributions in this volume, in recognizing this lack, describe some basic principles of conservation in the field with which archaeologists should be familiar. These basic principles should be relevant to the conduct of almost any excavation. For those carried out underwater the principles are similar but methods are often different. These have been fully described in a recent publication (UNESCO 1981).

The need for a single approach to all aspects of archaeological conservation has become increasingly apparent during the last fifteen years. During this period archaeology worldwide has been characterized by a remarkable increase in:

- the number of archaeological sites threatened with destruction;
- the number of survey and excavation programmes undertaken to meet this threat;
- the number of practising excavators;
- the exchange of field techniques and personnel across previously isolated period and area specialisms; and
- the quantity and sophistication of archaeometric analyses of excavated material.

These developments – which have also provoked important advances in archaeological theory – have resulted in a greater awareness of conservation issues in archaeology. As far as excavation is concerned, certain ideas remain basic – the uniqueness of each site, the need consequently to document every step of the investigation and the responsibility to conserve in some way the results of the excavation. Despite the use of systematic sampling techniques, there has been an enormous increase in the quantity of finds requiring conservation and also in the number of excavated sites to be preserved – those that escape destruction because of their obvious importance in addition to those excavated for research or display purposes where there is no immediate threat of destruction. In this connection, a further phenomenon of recent years in addition to those noted above is the marked increase in the number of visitors to archaeological sites.

In these circumstances, planning of conservation action is subject to the selection of priorities which in turn depend on national or local policies. Nevertheless, the reconciliation of excavation and conservation needs is a common objective, and the following principles are worth recalling.

2.1 Planning conservation before excavation

Three general principles can be stated under this heading:

(1) That the funds obtained for an excavation project are sufficient also for conservation and publication needs (staff, facilities, materials, printing, etc.). Some budgets and grants for excavation acknowledge that post-excavation analysis and publication costs may be higher than those of the fieldwork. But the recurrent costs of site-maintenance and storage of finds – responsibilities that are in practice often divided between two different agencies – also have to be calculated and budgeted for. In some cases, no facilities exist for post-excavation maintenance, a situation that should strongly influence policies in the field. For movable objects this means that the "first aid" treatment given them in the field may be the only conservation that they receive.

For remains *in situ* this should generally mean a policy of conservation by backfilling of the excavated area. In any case, the sum to be allocated to conservation cannot be forecast until arrangements for future maintenance of the excavated site and finds have been made.

(2) That sufficient is known of the local environment to plan for foreseeable conservation requirements at the site. There will always be the unexpected discovery that calls for emergency action, for instance the waterlogged deposit on an otherwise "dry" site. But, in general, preventive conservation can be planned in advance (see also Rose 1975) by studying the site's local environmental variables, for example its temperature and relative humidity (RH), extent of shade, predominant wind direction and frequency, frost occurrence, soil characteristics and groundwater level. These should be investigated during the reconnaissance visit to the site for planning excavation strategy, made ideally at the same time of year as that in which the excavation will take place. The data collected may well prove valuable also for ecological interpretation of the site and should be published anyway as an aid to future workers in the area.

(3) That sufficient is known of the site's cultural material to ensure its successful conservation. Although specific find circumstances cannot be predicted, all members of the team should be aware of the materials likely to be found. For example, for the excavation of an early church site the team should be prepared for preventive conservation of painted wall-plaster and/or mosaics. Flexibility in implementing conservation policies is also necessary; for instance the individual treatment and packing of sherds necessary under certain temperate conditions would not be feasible for the bulk quantities of sherds on a Middle Eastern tell-site. With the increasing mobility of excavators between climates and continents, familiarity with the local environment and cultural material is all the more important if "conservation disasters" are to be avoided.

The frequent necessity for emergency excavations at short notice does not make these principles irrelevant but, on the contrary, all the more important. An adequate fund for emergency excavations should be a standard budget entry, while accumulated experience of the local environment and cultural material reduces the impact of an emergency when it arises. It is precisely because conservators are unlikely to be available for such rescue operations that excavators should have a knowledge of preventive conservation measures.

2.2 Conservation during excavation

The moment of excavation can easily be disastrous for archaeological remains. Their deterioration since being abandoned will have almost ceased, leaving them in a near-equilibrium with their immediate environment. When exposed by excavation they are subjected to abrupt change in their ambient temperature and RH and in their access to light and oxygen. The excavator's aim must be to minimize environmental shock to the remains during their uncovering and recording, and, for movable objects, during their packing and transport to a store.

Rarely can the environment of a whole excavation or one trench be closely controlled during excavation. Rescue excavation of deposits in the cellars, basements

or crypts of standing buildings may fortuitously be buffered from external climatic changes. If the RH inside a sealed tomb is measured, the time of its being opened can be chosen so as to minimize stress to the tomb contents. Attempts to control conditions on an open site have been made (e.g., Weaver 1973) but the costs of complete enclosure will usually be prohibitive. Otherwise climate control on site depends on selecting the optimum local conditions for exposing the find, using the environmental data previously collected and experience of the site's "environmental behaviour" (e.g., changing levels of RH in a trench as it deepens and the sun/shade ratio changes). The method and materials for packing sensitive and fragile objects will also vary according to the environment in which they were found. A description of this should be included with the standard details of context on their accompanying labels.

The moment of excavation can cause a conflict of priorities unless both conservator and excavator appreciate the other's concerns. Too rapid a removal of the object for preliminary stabilization may mean that its context is never fully understood; too long an exposure of the object in non-ideal conditions may affect its state of preservation for later analysis. Alternatively, the excavator may be under pressure to continue excavating sooner than allowed by the conservator's concern for the safe removal of an object. The finding of compromise solutions that fulfil both aims forms the basis of field archaeological conservation. Similar compromises are made when the lifting of larger objects has to be done without sacrificing intact deposits in their vicinity, and when protecting excavated remains from one season to the next.

The main methods of between-season site protection are:

- backfilling with earth of the whole excavated area or selected trenches;
- fencing the site to keep out livestock and the less determined sightseer;
- embankment and drainage systems to keep excess water runoff out of the excavated area;
- consolidation and capping of walls;
- covering of remains with protective sheeting of natural or synthetic materials; and
- erection of temporary roofs.

The choice of methods, either singly or in combination, will vary, of course, according to local requirements. Compromises need to be made when the recommended protective measures interfere with the future excavation strategy (e.g., consolidation of walls which are to be removed the following season; intrusion into unexcavated deposits of supports for protective roofs; additional costs in time and labour in re-clearing temporarily backfilled trenches). Although protective measures appear costly if not planned in advance, the alternative is quite unacceptable: the irretrievable loss of information about partially excavated features through leaving them exposed to destructive agencies from one season to the next.

Measures designed for site protection between seasons may in turn affect the preventive conservation of finds when work is resumed. Any protective covering of fragile remains will modify their environment for better or worse. The misuse of

protective sheeting, for instance, can create conditions for the growth of micro-organisms, whereas a well-designed temporary roof over the excavated area is usually beneficial for controlled excavation work.

Protection by re-burial of remains requiring specialist treatment is generally to be recommended. However, even a short exposure may have accelerated the rate of deterioration, and the specialist intervention should be made as soon as possible.

Such protective measures as these should also improve site security – the safety of standing structures and trenches during work in them, the safe disposal of excavated soil and debris, and the security of the site and finds from vandalism and theft. In this last context, the employment of a guard may be as necessary during the excavation season as after it.

2.3 Conservation after excavation

For successful conservation action after excavation, good communication among archaeologists, conservators, curators, architects and site custodians is particularly important. Among them they must agree on a policy that ensures:

- the investigative cleaning, stabilization and safe storage of objects; and
- the consolidation, protection and guarding of the remains on the site.

In both cases, the conservation measures will be either preventive (active maintenance) or remedial (cleaning and treating to reduce the rate of deterioration). Rarely will restoration be carried out, and only for display purposes – the identifiable completion of lacunae on objects and the anastylosis of dismembered monuments on sites.

Whereas the objects from all excavations need continuing conservation, only some of the sites from which they come will be preserved. Some are unavoidably destroyed by construction works; others do not merit visible preservation and should be consolidated and backfilled. None at all deserve to be abandoned after excavation to inevitable destruction by natural and human agents.

For those sites that are selected for permanent exposure and presentation to the public, a conservation policy is needed that considers together the objects and the site. This is the easier if a single authority is responsible for both, and if the opportunity is taken to establish a site museum adjacent to the excavated site. The most important and valuable finds can, and perhaps should, still be displayed in a central museum; but the administrative and educational advantages of site museums are many. Conservation work for both objects and site is centralized under one roof, and the finds stored and displayed in the museum are more easily related by visitors to their original contexts.

The establishment of site museums (UNESCO 1978, 1982) should be considered seriously only if (a) the excavated remains merit presentation to the public; (b) the site is easily accessible by road; (c) the security of the collections is guaranteed; and (d) if laboratory facilities are adequate for basic conservation and research purposes. Security and facilities for monitoring the condition of the collections are also essential for

any temporary storage building used during excavations. In fact, if planned in advance, conversion of a temporary store and dig-house used during the excavations into a site museum can be a very practical and low-cost undertaking.

The decentralization of many tasks from a central museum to local or site museums is all the more advisable as the quantities of excavated material increase. The pressure on storage space in a central museum sometimes results in the discarding of "surplus" material, most commonly sherds, bones and lithic implements. If there is insufficient storage space for all stratified material, then it should be identified and disposed of in such a way that it is retrievable. This material is as historically unique as the site from which it came, and future research may well require different questions to be asked of it. As more local and site museums are established, the need to dispose of carefully excavated material should be less frequent.

Centralized systems of inventorying can also be simplified. If the registration numbers given to finds by the excavator are treated as their unique identifying numbers, and duplicates of the excavation inventories are deposited in the site museum which stores the finds, there is no need for any museum to re-register them according to its own system. Alternatively, the district or site museum itself issues to the excavator before fieldwork a range of accession numbers (and even blank registration cards) to be assigned to objects as they are found during excavation. The same numbers should be used for reference by conservators who receive the objects for treatment.

Post-excavation maintenance is more than "passive conservation" because of the continuing need to make use of the resources being conserved. Total protection is incompatible with total use; if objects are to be handled for study and publication, and if the site is to be explored by visitors, maintenance will always be an active task, one that may itself contribute to research. For example, routine consolidation of a wall may provide new information about its construction and the context of associated finds made during excavation. Here again, an approach that treats together the conservation, study and display of both sites and objects offers considerable advantages.

3. Excavation and conservation: the problem of regulation

Effective conservation on excavations would seem to have three ingredients:

(1) *Attitude*, i.e., general recognition that excavation without conservation is destruction. This is a question of accepting the moral duty to conserve and publish the results of an excavation.

(2) *Training*, i.e., adequate instruction in the principles of preventive conservation. This is a question of including the deterioration of materials and its prevention in the training syllabus of archaeologists (and the principles of archaeology in the training of conservators).

(3) *Regulation*, i.e., sufficient control to ensure that conservation and excavation standards are maintained. This is a question of making formal or informal agreements which define the responsibilities of the various parties.

It is easier to control standards if excavations are regulated by some central body. If not, standards depend on the attitude and training of the excavator, and the only regulation of his work is through the approval or otherwise of the archaeological community.

In the majority of countries, however, an official archaeological service exists and is in a position to control standards by regulation. For its own projects, standards are under its own control; for other excavations that it must authorize, it usually makes a bilateral or multilateral agreement with other parties which define the conditions on which an excavation permit is granted.

The form of agreement used by national archaeological services varies in detail, but many are based to a greater or lesser extent on a single document: UNESCO's Recommendation on International Principles applicable to Archaeological Excavations, adopted by the General Conference in 1956. Many of the principles there laid down had their origin in turn in the Final Act of the International Conference on Excavations held in Cairo in 1937 (International Museums Office 1940). The force of a Recommendation lies in the fact that the principles are adopted, after detailed study, by the supreme organ (the General Conference) of an international organization to which the majority of states belongs. It is designed to influence national legislations by laying down a course of conduct that is internationally acceptable. A Recommendation is therefore persuasive, in inviting Member States to take any legislative or other steps necessary to apply its principles, whereas a Convention is coercive.

This form of regulation manages to retain the flexibility that is needed if national legislations are to take account of local conditions. However varied those conditions, the intention of the 1956 Recommendation is clear that the responsibilities for conservation on excavations must be defined and not left to chance (see in particular paragraph 21 of the Recommendation, Appendix 1). If there are now suggestions that the Recommendation is in need of revision, this principle is likely to receive all the more emphasis (Chapter 11).

Given an adequate degree of regulation according to internationally acceptable principles, sufficient attention to preventive conservation in archaeology training courses and regular achievement of the obligation to conserve and publish, excavation may continue to be an effective and responsible technique for the investigation of human history.

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