Dealing with architectural fragments

Association of Diocesan and Cathedral Archaeologists
Guidance Note 3

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Contents

Cover: a fragment from medieval St Paul's Cathedral, dug up at an unknown time during the 19th century. It is elaborately carved and has traces of paint. This came from an expensive screen or tomb, which is otherwise unknown (Andy Chopping/MOLA)

1. Introduction and background

This ADCA guidance note considers the ways in which collections of 'architectural fragments', in this case specifically pieces of carved stone architecture from medieval to early modern times from cathedrals and parish churches (whether from excavations or pieces just lying around) might be better recorded, evaluated for their significance, stored and catalogued. Architectural fragments may include structural elements of a building in brick, wood or metal; but this note is concerned with those of stone. The principles of recording, storage and display however can be considered for pieces in these other materials.

This note forms advice to all those who care for both cathedrals and parish churches; but it is useful to mention a guideline already produced for cathedrals, *Cathedral inventories: recording architectural fragments*, Advisory Note 2 issued by the Cathedrals Fabric Commission for England (CFCE) in 2001, also written by Richard K Morris. This will be called 'CFCE Advisory Note 2' here. Among other things, this note set out the statutory background and requirements for the adequate cataloguing of architectural fragments for the Inventory of a cathedral, a requirement which was formulated in the 1990s. The thinking behind the principles, policies and recording methods in Advisory Note 2 are applicable to the care and management of all instances of architectural fragments, down to those held in the smallest chapel; and they are followed here, with some developments and further suggestions. Most of the more practical points regarding the conservation, storage, marking and recording of archaeologically-excavated 'architectural fragments' were described by a working party of the Council for British Archaeology (CBA) in 1987. The present guidance note seeks to complement and add to the advice in those two guidelines.

There have been many published studies of groups of architectural fragments from specific sites (cathedrals, hospitals, monasteries, colleges, parish churches); some examples are listed in the bibliography. This guidance note is not specifically about how to analyse and publish collections of architectural fragments, but about their basic cataloguing, storage and display. But the work outlined here is the necessary first step which might lead to, or which might itself suggest, publication of some kind. Some first thoughts about a policy for reduction in the number of stones in a collection, if required, are also put forward.

The cataloguing of fragments which we propose here can be called an *inventory*. In a cathedral, the record will be part of the required Inventory, or a supporting document to that Inventory. This inventory of architectural fragments should be thought of as an active resource, a survey of the material from which needs of space, personnel and budgetary requirements can be calculated. It is assumed that all records will be generated with computer access and storage in mind. At the same time, the subject of architectural styles has its own sometimes specialist vocabulary – terms like arris, capital, lierns and so on. This should not put off the amateur or inexperienced recorder. We recommend that any recorder uses and accepts the definitions of these terms in any recent (post 1986) volume of the *Buildings of England* series, by Nikolaus Pevsner from 1951 and these days by his successors in their revisions of those volumes. In all the volumes there is an illustrated architectural glossary at the back. The papers by R K Morris (see bibliography) further clarify the terminology.

This note is aimed at archaeologists who advise cathedrals and parish churches in England and Wales, and the church administrators (cathedral chapters or parish councils) that they advise. It concerns architectural fragments which are kept at the church or in church-administered stores.

Some groups of stones are kept by museums, and they will have their own though similar procedures. Museums also hold pieces which are excavated on archaeological sites, such as buried churches and monasteries. There should be no difference in the standards of cataloguing and storage, or in the methods of study, between fragments held by churches and those held in museums. When stones from a large ecclesiastical site have been recovered at different times over the last 200 years, the site may be represented by stones housed at the church and in a museum. In this case, if a publication is planned, they should be studied together.

Some churches have already drawn up a policy for assessing architectural fragments that are removed from the structure. Churches without such a policy and which have collections of architectural fragments are encouraged to develop a policy. Such a policy should be approved by the relevant Fabric Advisory Committee (for a cathedral) or Diocesan Advisory Committee (for a parish church).

2. Why keep and study architectural fragments?

Medieval and Tudor mouldings were first accurately recorded in Britain by John Carter in the 1790s; in the 19th century there was much analytical study of churches, especially cathedrals. By the early 20th century it was accepted that study of mouldings, by themselves, could clarify and even propose the building periods of a church (e.g. in the work of Alfred Clapham). The subject has developed in the last thirty years. Richard K Morris (many articles from 1973 listed in Morris 1996) has shown the potential of many little-regarded lapidary collections held by cathedrals. A widening interest in mouldings analysis has also been encouraged by the increase in archaeological recording, and new methodologies have been developed, including the use of computers. Scientific advances allow much more precise identification of building stone sources than was possible even twenty years ago. In recent years there has been an increased amount of study and publication of fragments from archaeological excavations, usually on sites which are now secular developments, and paradoxically some long-buried churches and monasteries have now been more minutely examined than their standing counterparts. We can use the knowledge and experience gained to improve the custodianship of the many fragments which lie around in our churches.

What are architectural fragments?

Architectural fragments are from parts of a church which have carved decoration, both inside and outside. Thus they can be parts of arches, piers, doorways, windows, screens, tombs and monuments. External embellishments include crockets, finials and parapets. They are loose architectural fragments which have been removed from the church building during a reconstruction project in the past, or they have fallen off the building in decay, or they are often found within walling reused as rubble.

Mouldings are rare in Anglo-Saxon churches, and the earliest Norman buildings only had rudimentary mouldings; they evolved rapidly after about 1150, reaching a pinnacle of complexity and variety in the early 14th century: after that date, there was a trend towards greater uniformity. Romanesque architecture was reliant on small multi-purpose elements, which could be flexibly employed. As methods of transport and hoisting improved through the Middle Ages, there was a tendency to use ever-larger blocks of stone. Later, improved design

process meant that it was possible to cut composite elements incorporating separate mouldings for a single purpose. The great majority of architectural fragments in church collections date from the 12th to the 17th centuries. Recording principles outlined here can, with some provisos, also be applied to classical and Georgian buildings of later centuries.

What can architectural fragments tell us?

Architectural fragments can tell us many things. Study of them includes the following objectives:

- To promote knowledge of the plan and elevation of the building and its dating, and of its fittings and monuments.
- To inform about the architectural style and decoration of a building, and about its architects and craftsmen. The stone may have one or more layers of paint, often in microscopic amounts (in crevices, when the stone has been exposed to the elements); the tooling of the stone (how it was finished) and its geology are also aspects which can contribute to its allocation to a building, a construction phase or a period.
- To inform about how a building was constructed, its relationship with similar buildings in the region and its wider context.
- To give practical assistance in the repair of the building through providing knowledge of moulding profiles, geological stone types etc and to assist in the conservation of the building (and any conservation plan when written). Thus a collection of fragments, fully documented, can assist in the management and repair of a church.
- To identify lost phases in a building or even lost buildings. Architectural fragments can reconstruct the building sequence of a whole demolished site, such as a buried monastic complex.
- When enough loose architectural fragments survive from an architectural feature, to reconstruct it either in reality (put the pieces together) or by graphic means. It may be possible to use this information to reconstruct vanished parts of a cathedral or church in conjunction with pictures of its former state and/or the results of archaeological intervention.
- Fragments can also supply information about undocumented interventions and reconstruction work, and as such form part of the wider history of the church's post-medieval alteration and conservation.

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Here are three examples from a single site, medieval St Paul's Cathedral in London. They show some of the important insights to be gained about this long-demolished building, and show some of the characteristics of moulded stones which are encountered.

Fig 1a

Fig 1b

Fig 1c

Fig 1 three examples of 12th-century architectural fragments from St Paul's Cathedral: a, voussoir (arch stone) with elaborate foliage; b, painted voussoir with chevron and flower carving; c, a volute capital (photographs by Ron Baxter)

Fig 1a shows a voussoir or arch stone with elaborate foliage, of the middle of the 12th century. On the bottom edge is a diamond-shaped flower; the beaded stems behind interweave, and have leaves. The stone is a fine oolitic limestone, possibly from Caen in Normandy. Related work of this distinction is found at Reading and St Albans Abbeys.

Fig 1b shows a stone from a large vertical jamb or possibly an arch, also of the mid 12th century. The face is carved with a single unit of frontal chevron. The inner edge is carved with a square octofoil flower with fluted petals. The stone bears significant traces of red and yellow paint. The good survival of paint suggests that either this feature was internal (not exposed to the weather) or it was taken down and the pieces used as rubble not long after it was erected.

Fig 1c shows a slightly later decorated piece, known as a volute capital from its design, popular between about 1170 and 1200. Its presence at St Paul's suggests that either a large project such as the nave, then in building for some decades, was subjected to changes in its

details over its long period of construction; or it could derive from an unknown building or part of the cathedral.

3. Basic recording and detailed recording

We distinguish here between *basic recording*, a basic catalogue which is a management document; and *detailed recording*. The latter may be employed if there are resources and an intention to make the collection more available to students and researchers, either in person or making enquiries (e.g. via the internet). Detailed recording is required if the architectural fragments are to be analysed and published, or if they are to be part of a significant public exhibition or display, in a museum or at the church. There may also be cases where detailed recording can be used to create a *substitute archive*; allowing the reburial, reuse or disposal of less important items, when space is at a premium. All recording should have the long-term future of the stones in mind.

Basic recording

The first step is an initial scan to allow basic quantification to be carried out, including the flagging of conservation and storage requirements, Health & Safety issues and the creation of a general idea of the assemblage's importance and storage status: an example of such questions might be 'are the stones available for inspection?' (i.e. not piled up), or 'where are all the pieces?'). At this point inappropriate material, such as plaster casts, can be put aside for separate recording. If a collection is to be catalogued by specialists, they can quote for the work at this point. It should be possible for a specialist to give a quotation for writing a catalogue without moving any of the architectural fragments, though it is vital that the specialist sees all the architectural fragments to be catalogued.

The second step or stage is a written catalogue. This should have fields that can be placed on a simple database (though desirable, this is not vital with smaller assemblages). Some form of pro-forma sheet is very helpful for this purpose. We do not wish to lay down the law about the form of this; an example, the sheet used at York Minster, is given below as Appendix 1. This derives from the model described in detail by R K Morris in the guidance note for cathedrals of 2001 (CFCE Advisory Note 2).

The principle is that there is one sheet for each architectural fragment. If a piece is broken up, the separate parts should be given the same number but with a suffix i.e '67, [3 of 5 pieces]'. Although in general each stone should be numbered, there are two possible exceptions especially when the architectural fragments are numerous. First, if blocks of ordinary ashlar (hewn blocks of masonry wrought to even faces and square edges and laid in horizontal courses with vertical joints) are being kept, then they can be grouped under one number as long as they are nearly identical. If however some had a distinguishing feature, such as different tooling, then a new category should be created and assigned its own number. Second, identical pieces, e.g. voussoirs (parts) of an arch, may be grouped together. Where such grouping can be carried out without any ambiguity, it is always worthwhile, if only that the more compact stacking may save storage space.

The moving of stone is usually required, but should be avoided if possible to cut down on abrasion to the stone and strain for the cataloguer. Blocks of stone are heavy and can therefore

be dangerous. Be very careful when moving stones. Do not bend down to lift stones, but keep your back straight and bend your knees. If necessary a large stone can be moved about on a floor by placing it on a mat. Make sure that stones do not move unexpectedly; use props with care. Always plan carefully what you are going to do before moving a stone.

The moving of stone is usually required, but should be avoided if possible to cut down on abrasion to the stone and strain for the cataloguer. It is recommended that to minimise double handling the cataloguer should endeavour to garner as much *obvious* information as possible and set this down in an easily retrievable structured form. To ease corrections, a soft pencil should be used and the sheets should only be inked in at the end of the process.

All the architectural fragments in the inventory should be photographed. We recommend the use of automatic digital cameras in any catalogue, particularly for purposes of dissemination. Be aware however that some curators are concerned about archive permanence of digital images and may require use of film at the same time. To this end conventional film photographs can be processed and digitised at the same time; this readily-available service ensures that there is complete parity between the digital and film-based image. While greater photographic skill is required to use film cameras, the resulting images share the advantages of digital flexibility with archive permanence. How best to archive digital photographs is currently being discussed in several different parts of the museum and archive professions, and there is not yet widespread agreement. We therefore suggest that the fragments recorder discuss what to do with the appropriate archive holder. It is vital that there is a link of some kind in the documentation between the recording sheet and an image of the fragment. Some method of recording the number of the piece (a chalk board or plastic numbers) should be incorporated into the image, but not too close (and not leaning on the piece).

We recommend twelve basic pieces of information should be gathered for each stone, and can form the basis of a record form if one is being devised:

1. A number. We call this the stone inventory number.
2. A brief description with measurements.
3. Any special characteristics (paint, marks, lettering).
4. The possible original purpose of the stone (vault, doorway, monument).
5. A drawing or photograph. If a photograph (either on film or a digital image), a print should be attached to the record or a set of prints stored with the records.
6. Conservation requirements (if these have not been met, or describing what has been done).
7. Condition: especially if fragmentary or friable. Any warnings about weight or other safety considerations can be put here.
8. The inventory number of any obviously associated items (i.e. the fragments of a particularly fine tomb). This is not meant to be either final or comprehensive but gives the cataloguer a chance to clearly set out any such noticed relationships where information already exists. This forms a useful starting point in any later analysis. These associations must be cross-referred on all sheets.
9. Provisional identification of the stone's geology. At the very least, the cataloguer should simply mention any item (i.e. imported marble) that departs from the prevalent building stone in the assemblage.
10. Name or initials of cataloguer and date of record.
11. Any information about provenance, anecdotal or written; the source to be fully described (older labels may survive).
12. Some lines should be provided for any second opinions by visiting specialists, i.e. important corrections, recommendations (display? discard?), with name (not initials) and date.

Further fields can be added, for instance (13) a suggested date for the piece on stylistic or other grounds; (14) where the stone is kept, i.e. shelf number.

This basic record should be reviewed at intervals and the architectural fragments counted. See section 4 below for marking the fragments.

Records of conservation of stones (for instance specialist cleaning and conservation of ancient paint) are not covered in this note, but if required they usually follow the same general structure as the form just described.

Special arrangements will be made when stones, either from excavation or from repairs on the building, are to be donated to a museum. This note does not address the question of who will own the stones once they are transferred. A church administrator should discuss this with the potential host museum before any transfer is arranged; museums generally prefer to have outright title to their collections so they can care for them properly, but church authorities may have other views. In any case, a transfer of architectural fragments (as of any other part of the church's possessions) would need either a Faculty from the Chancellor of the Diocese in the case of a parish church or permission from the Cathedrals Fabric Commission for England in the case of a cathedral, before it can take place.

When a fragment has come from an archaeological excavation in or around the building, the record sheet should include a site code to identify the excavation (allocated at the time) and the *context* number, i.e. the layer, wall or fill number from which the excavated stone derives; using the *provenance field* (11). The context no. should be written on the recording sheet. All this information should survive on the original labelling (if deteriorated, this should be renewed). Any numbering systems for stones used by the excavators should also be recorded.

Immediate storage and study purposes are best served by a reversible (i.e removable) system of labelling. The site code and context number (a permanent marker on a plastic label) is attached to the stone with plastic-based string. Labels are however prone to getting detached, particularly when the fragment is being moved, and a more permanent method is required in the long term. When the fragment is to remain at the church we recommend that the church establishes a simple catalogue, and that the number of the fragment within that catalogue is placed permanently on the fragment (see below on marking). It is then important that the church retains a record of the excavation and the context for each fragment. If there has been an excavation, this can be provided by the excavator so that a copy of the record is also held with the excavation records. More than one copy of a record, whether in paper or digital form, is always a good idea.

Detailed recording: typestones

In most cases, it is advisable for a church to engage a professional who has experience in recording moulded stones. What follows is an outline of the procedures, so that those commissioning work understand what is required.

The main aim in initial analysis is the recognition of the *typestone*. The typestone is a generally accepted concept; the best example of a particular moulding, but the definition is stretched to cover any moulding that has any additional and unique characteristic that needs to be isolated out (i.e. a different arch curvature)

The typestone can be a physical entity, but some researchers prefer to define the typestone as an ideal moulding reconstructed as a composite from several fragments. Such an ideal is then assigned a unique identifying number. Additional identical examples of the same moulding (for instance of a vault rib already identified as a typestone) are called *duplicates.* Once recognised, these require no additional recording other than curatorial information (dimensions etc).

Typestones should be recorded comprehensively, usually with individual photography or drawn profiles, and kept. A robust 1:1 record of the typestone on drawing film or acetate allows safe and accurate comparison with other mouldings without the need for additional moulding drawings (if necessary the duplicate stone can be rested directly on the typestone drawing). Even a novice can make a direct trace of a well-preserved moulding using a fine permanent marker, but the pattern of damage may make such recording impractical. A *decorator's profile gauge* is sometimes employed. The entire profile should be recorded including unworked and joint faces. To avoid very large drawings, only the moulding proper need be recorded as a 1:1 record: a measured sketch (on the reverse of the recording sheet) can in such instances record the other parts of the full profile. Brass rubbing crayon and normal plain paper produce satisfactory records of tooling marks in most circumstances, but photography should be used for the publication of such marks. *Masons' marks* can be recorded without the need for photography.

The reader will however notice the demerits of a 'pure' silhouette record – 'where is the detail *within* the outline?' This detail can be provided via orthogonal photography. In principle, such images require compensating lens in studio conditions. Useable results can however be gained using a 3X zoom lens at a distance of not less than two metres (the larger the stone the greater the distance required). It is important that the camera faces the element as squarely as possible to create an orthogonal view. Employed in such projects as the reconstruction of the Frauenkirche in Dresden, the practicality of this technique relies on digitisation, allowing direct insertion and manipulation of images in CAD packages.

If orthogonal photography is carried out succesfully, it may be possible to forgo the creation of silhouette drawing, but a sketch of the elevation should still be made on the reverse of the recording sheet to allow any type of information not apparent in the photograph to be recorded.

How do we date the typestones? There is a large scholarship on the stylistic dating of mouldings. Mouldings can often be dated broadly to within 50 years and occasionally a 25-year span can be suggested. In many cases it would be more meaningful to give a *first-occurrence* date: some patterns remained popular for hundreds of years, or were even revived.

Dating can be achieved by other means. Tooling marks can allow broad date spans to be established (see Appendix 2) although regional variation has to be borne in mind. Building stone is by itself rarely closely datable, though the history of stone exploitation can be illuminated by study of datable architectural fragments.

Paint and marks

The extent and character (different colours) of paint should be noted; there may be marks on the stone (from the mason or the quarry: Alexander 1996) or attached matter which tells us about the construction process (lead in grooves between stones or wooden dowels). Fragments should be examined in a strong raking light; when they are already in storage, a torch will assist. Paint and marks are of great interest but do not of themselves confer typestone status. They should be recorded or at least flagged up on the records if possible.

Careful inspection of clean stones is required. As well as signature marks, various other types of marks may occur, some are numerals or are otherwise connected with control and assembly. These are important because they are usually hidden in standing buildings and can only be seen on architectural fragments. The coarser marks can be recorded as rubbings alone (see above). Where clarification of light marks is required, the rubbing can be augmented in line as necessary. Such a record can be entirely satisfactory as the basis of publication drawings, but photography may also exceptionally be used.

Geological sampling

Each typestone established in the group should be sampled by a qualified geologist (subject to clearance by any authority which should be consulted as the stones will be affected). There are various factors to be taken into account here. All samples should at the very least be large enough to serve as specimens that can be examined by hand lens and binocular microscope; thin-sectioning and examination with a petrological microscope may also be carried out and photomicrographs prepared. For these reasons it may be advisable to take more than one sample, but clearly any original dressed surfaces should not be damaged. It may be adequate to compare the samples with a relevant reference collection, but other more elaborate techniques such as compositional characterisation could also be employed; this technique has been used in France to allow close source identification (Holmes 1994, 25).

4. Marking

A mark or identity label (usually a number) on the stone is the main defence against identity loss. The historical value of a stone is severely diminished if we do not know where and when it was discovered or added to the collection. A system of storage should be designed which includes the numbering of bays, shelves and boxes or other containers; and this information should be on the record sheet. Storage conditions are of vital importance to marking: no mark can survive long on a stone stored outside or one subject to abrasion. Internal storage is to be preferred, but not always possible. Marks in sheltered locations will survive best.

All the architectural fragments should be marked with the stone inventory number. The number should be written on a surface which is preferably not one which has decoration or carving on it. If architectural fragments have to be stored outdoors, this marking must be durable. So-called indelible or waterproof ink, by itself, will disappear in weeks on architectural fragments stored outside.

During the inventory process, temporary marks are easily applied with soft B or 2B pencil; pencil has the advantage of working through dust and dirt.

When stones have been produced from an archaeological excavation in or around the church, they will normally have three further pieces of information given to each stone by the excavating team. These are (1) the sitecode, a unique combination of letters and numbers assigned to that particular excavation; (2) the number of the layer or context within the excavation where the stone was found; (3) an accession number to identify the piece. Some archaeologists and museums prefer to put all these pieces of information on the stone in a permanent manner. With a large collection from a single church, this can be time-consuming; and it is not necessary if the collection has been gathered over decades, even more than a century, from many sites as the church was rebuilt or repaired. If the collection of fragments is to be kept at the church or cathedral, a simple numbering system within a single catalogue may be sufficient. If such a simple catalogue is used, and only a single number is put on a stone, the catalogue documentation must identify if possible where the stone was found and when, including the sitecode and context information as above.

Various methods of marking stones, with varying degrees of permanence, are generally used. We recommend that the following is adopted as a standard:

1. Base layer of Acryloid B72 (acrylic resin); we recommend pre-diluted Paraloid B72 Fixative (see link below for one supplier). Allow it to dry. The solvent is flammable so take precautions and allow adequate ventilation.
2. On top of base layer, white titanium dioxide pigment (from artists' materials shop) mixed with B72 is painted on. Allow it to dry.
3. Number inscribed with a pen with a nib or a very small artist's brush, using a carbon black ink. Do not use felt-tip pens of any variety because their ink contains a solvent which could go through the B72. Allow it to dry.
4. Final layer is a coat of B72 over the numbers and white area that has been painted on the stone. Allow it to dry before moving the stone into storage.

The area of the 'label' (i.e. all four layers) should be as small as possible, allowing for reading of the number.

Acryloid B72, also known as Paraloid B72, is a durable and non-yellowing acrylic polymer used for consolidating wall paintings and fragile wood. To obtain supplies, search on the web; one company is Conservation by Design, www.conservation-by-design.co.uk.

5. Storage and conservation

Moulded or architectural fragments are durable objects and most building stones do not require special storage conditions such as a specific level of humidity or temperature. Of all classes of archaeological finds, they are the most durable; this is illustrated by tracery fragments excavated before World War I at Torre Abbey, Devon, which can be recorded and understood after nearly a hundred years of outside exposure. But outdoor storage is not ideal. The most damaging circumstance is when stones are allowed to get alternately wet and dry. Asides from simple erosion of soluble surfaces, wet stones, particularly absorbent limestones will be damaged by frost. Vegetation and moss may not be directly harmful, but will retain moisture, heightening the possibility of frost damage and encourage organic attack of surfaces. Absolute dryness may also cause some limestones to gradually exfoliate (spall).

Architectural fragments are also heavy and take up space. But they should not be discriminated against on that account. They should be treated as museum objects, as valuable examples of past technology and art.

Facilities will depend upon local circumstances. The important principles are to put the architectural fragments on shelves, either of wood or metal, in a dry place; if possible to keep them from accumulating dust and dirt; and they should be on the shelves in some kind of order, so they can be easily examined and taken individually for study, display or cleaning (Fig 2).

Fig 2 the 'historic collection' of medieval and classical (Inigo Jones) architectural fragments in the south triforium of the present St Paul's cathedral. The shelving dates from the 1930s

Generally it is acceptable to store stone directly on shelves. For more protection, for instance for small or fragile objects, foam sheeting can be used; but this should be a polyethylene foam such as Plastazote – other types degrade over time. If there is space, pallets on the floor are a good idea, to avoid damp.

The problems caused by dust, abrasion and humidity extremes can be easily averted (at least with smaller stones) by simple packaging. This is the norm in archaeological units and introduces several advantages, including safer and easier handling. Such archaeological experience shows that even fragments excavated and immediately packaged in the most minimal manner (newspaper in a cardboard box) survive in far better condition after several years than larger unpackaged items from the same site. Heavy-duty perforated plastic bags will allow several small items to be stored in a normal supermarket cardboard box. This system does not allow direct recognition on the shelves, but the researcher will have access to the inventory, which will provide photographs and a record of the number, also written on the box. While it may not be practical to package larger items, this should always be seen as a desideratum (in museums, individual custom-made boxes are normal for sculpture). We do not recommend bubble-wrap in contact with the fragment.

Architectural fragments should be guarded against theft, particularly if they are displayed in the church or an outside area such as cloisters. They should not however be concreted together into interesting heaps.

Old fragments may require conservation, that is cleaning and consolidation, particularly if they are to be displayed in the church (see next). When surface grime or mortar is carefully removed, areas of paint or marks may be seen. If conservation is contemplated, the church must seek advice from a professional conservator, as techniques are being developed, and damage can easily be done by the unwary.

6. Publication and access

Architectural fragments are part of the history of the church building. They are often works of art. They tell us a lot about how ancient buildings were conceived, designed and constructed; and about architectural fashions in the past. Because they have these virtues or significances, we should make efforts to go beyond basic stewardship of the fragments – keeping them dry and safe, and with some form of catalogue so we understand them – to two forms of wider dissemination: publication, and access to the stones themselves for study and appreciation.

Publication can take several forms, depending on the extent and importance of the collection, or sometimes on the uses to which the collection is being put in the management of the church itself. We will not go into the subject here, but just mention the main possibilities:

(a) a complete catalogue of the collection, often written by an authority on the buildings of the period. This will usually be the result of a co-operation between the church and a commercial publisher. Alternatively a catalogue is often produced as the result of an individual's post-graduate study of a particular collection or part of it.

(b) a study which reconstructs a particular architectural feature of the church such as a reredos, altar or tomb. This is usually an article in an archaeological or architectural journal. Occasionally, a history of the building over many centuries may be attempted on the basis of architectural fragments, with drawings and photographs demonstrating the history of the building over long periods. A history of a parish church or a cathedral will be enhanced by inclusion of study of fragments from the building(s).

(c) a study arising from archaeological excavation. This is usually part of an excavation report produced by an archaeological organisation which has worked on the church or its surroundings. This can also inform how the church presents lost parts of its structure to the public and its congregation. Many such archaeological studies have now been published by cathedrals and parish churches, as they develop their sites. A study of this kind is often required when elements are to be reburied in the ground, as in the case of the west window at York Minster (Phillips 1999).

(d) specialist studies may be undertaken of details on a small group of stones, or even one stone, for instance a stone bearing ancient paint or historic atmospheric pollution. This kind of study will appear in a specialist scientific journal. Individual pieces of sculpture, even when damaged and partial, may also merit individual publication.

(e) a study may be necessary to assist in presentation of the building as a visitor centre. This is likely not only at former monastic sites, which are in the main now country houses, but also at the major churches, and at managed ruins.

(f) if a Conservation Management Plan is to be written about a church or cathedral, then the loose architectural fragments should be considered as part of that plan (Clark 1999; 2001). It might be advisable, and sometimes necessary, to write a Conservation Management Plan about a collection of architectural fragments by itself. This would be necessary if the collection is to form part of a display for which funding is being sought.

All of these types of publication should be illustrated with photography and drawings to bring out the qualities of the fragments. We give one example here, of the kind of drawing necessary and to be encouraged (Fig 3).

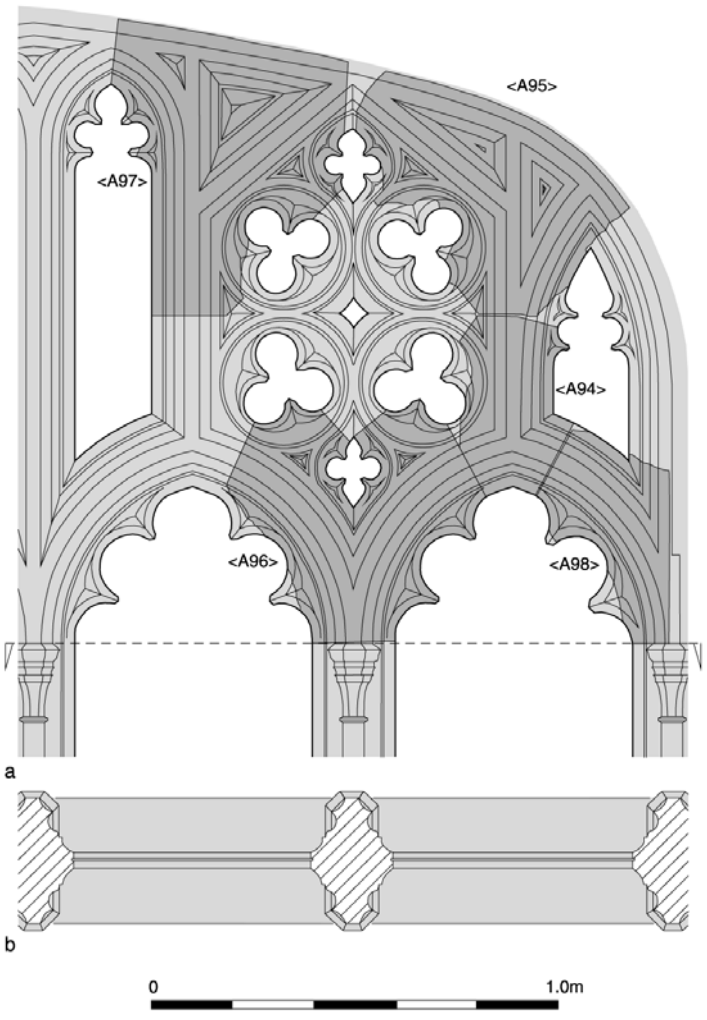

Fig 3 Reconstruction of half of a bay of tracery in a cloister arcade of the late 14th century at Merton Priory in south-west London. Although there have been archaeological excavations on the priory site, these pieces came from another excavation on the site of Henry VIII's Nonsuch Palace a short distance away. Though pieces from parish churches and chapels may be simpler, the principles of measurement and reconstruction from these fragments are the same. Drawing by Mark Samuel, based on the work of Terry Ball (see also Miller and Saxby 2007)

The authors of any of these studies should ensure that the church receives copies of the published work. The commissioning authority should ensure this, particularly when an author or cataloguer is a sub-contractor. When the church has supported the research or publication financially, then this sponsorship should be recorded in the study with appropriate acknowledgement. Copies of any publication or catalogue should be lodged with the Diocesan Archive, and with the local Historic Environment Record (HER).

Besides publication, the church should be prepared to make the collection of fragments (which is hopefully housed in a single place) accessible to enquirers, both academic researchers and, ideally, the general public. A designated area or store where the architectural fragments can be studied would be useful. When the church has a large and numerous collection of fragments, it will be prudent to display some of the better examples, but keep the remainder in a reserve collection store (preferably on or adjacent to the church itself). Having such a store, and thinking about public or scholarly access, is beyond the scope of this note. A parish or cathedral wishing to investigate this should discuss it with their architect and the appropriate church planning body (the Diocesan Advisory Committee or the Fabric Advisory Committee).

Architectural fragments are often the only visible evidence of parts of the historic building in former times, or of buildings no longer visible above ground at all. They are powerful reminders of the past of the place. Some of them will be works of art. They will often deserve display, perhaps in part of the church or an adjacent room or building. This is to be encouraged, but requires professional advice on design, presentation and security.

7. Significance and criteria for retention

All architectural fragments should be retained if possible. It is recognised, however, that some collections are large and comprise many duplicate items. Conservation and repair projects, particularly on large churches and catherals, will generate many architectural fragments which have been removed. We have to discuss how to assess the significance of architectural fragments, and thereby establish criteria for retention, if that becomes an issue.

Architectural fragments can have four types of value , the first three of which they share with standing monuments and historic buildings:

- historical: principally the history of the building from which they come, but sometimes there is also national and regional identity and importance to consider
- informational: research value for the historian
- aesthetic, educational, worthy of display and explanation
- the architectural fragments might be of use to architects in the restoration of surviving medieval buildings, that is by providing original moulding designs to be imitated.

An assessment of a collection of architectural fragments can be made for the cathedral or parish church by a qualified specialist. While an assessment to pick out the better architectural fragments, for instance for display, can be a summary document, any assessment which

contributes to a strategy for disposal or dispersal (see further section 9 below) must be accompanied by a basic catalogue of all the architectural fragments.

8. Procedures for disposal

First considerations

If the church administrator decides to cut down its collection of architectural fragments, then there should be a written Stone Disposal Policy.

Implementation of a Stone Disposal Policy must be undertaken in the confidence that nothing of significance will be lost in the process. To ensure this, discussions should be held with relevant qualified persons e.g. the Cathedral Archaeologist, the Diocesan Archaeological Adviser, members of the FAC or DAC.

Before undertaking any disposal (or 'dispersal'), the church administrative body must ensure that the regulations for such matters by the appropriate monitoring or regulatory bodies are being followed.

The considerations which would inform policies for stone retention or disposal will depend on the nature, date, significance of the particular church itself. Guidance in assessing the importance of the various things to consider may be found in the church's Statement of Significance.

The considerations that should inform the implementation of a Stone Disposal Policy can be defined as follows.

Architectural fragments crucial for the study of the structure, either as unique or as representative pieces, should be kept.

Architectural fragments which are replicated on the standing structure *may* nonetheless be retained to allow ease of access for study.

The possibility that future studies may employ techniques that are currently undreamed of requires us to keep options open by maintaining a representative sample of architectural fragments. Representative of what? Categories might include: characteristic mouldings, mason's marks, setting-out marks, fixing and filling technologies (cramps/mortars/plasters/fillers), tooling, previous repairs (e.g. 'piecing in'), weathering (including differential weathering of original and replaced stone), chemically treated stone, geological stone types.

The potential of architectural fragments for educational (e.g. for school visits) and display purposes (including for fund-raising) must be evaluated alongside the other criteria.

Architectural fragments may be kept to be available as examples for modern masons and carvers.

Practicalities

Assessment for disposal should take place when a job, or a major self-contained stage within an overall job, is complete, so that it can be certain which are the best and/or critical examples that should be kept.

It may be desirable to augment the Architectural Fragment inventory with selected records of those architectural fragments of historical or archaeological interest which are nonetheless to be disposed of under the terms of the Stone Disposals Policy. In this case we recommend that such architectural fragments are given inventory numbers, described like the others and photographed, but it is noted in the documentation that they have been disposed of, by what method (reburial, sale, donation to a museum or educational service) and the date of disposal (month and year).

If disposal is being contemplated, we recommend the following hierarchy of methods: that is, those near the top of the list are preferred to those near the bottom. Only move down the list if you have considered and discounted the possibility in question. The hierarchy is:

- reburial on site (but only in disturbed ground, not in undisturbed ground - which includes all burials, of whatever date)
- offering the architectural fragments to a museum (with documentation)
- reburial somewhere else, but in a place where the architectural fragments could theoretically be recovered at a future date
- offering the architectural fragments for an educational purpose

Acknowledgements

The protocol for the implementation of a stone disposal policy is based on one drawn up for York Minster by Dr Richard A Hall FSA MIFA, Cathedral Archaeologist for the Minster. The recording form used at York Minster is here reproduced at Appendix 1, by kind permision of Dr Hall and Dr Kate Giles. The authors thank the following for comments and advice: Helen Ganiaris, Teresa Heady, Richard K Morris, Allie Nickell, Kathryn Stubbs and Rob Whytehead.

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Appendix 1: recording form used at York Minster

Note on use by Kate Giles: the photograph of the stone is put in a plastic wallet with the form, not stuck to the form, but on the back facing outwards.

01 INVENTORY NO.		**17/**		**Total no. of stones if grouped**			
02 OTHER NOS.							
03 TYPE							
ARCADE		VOUSSOIR/SPRINGER/COLUMN/PILASTER CAPITAL/BASE/SHAFT/PEDESTAL					
DOOR		JAMB/ARCH/VOUSSOIR/LINTEL/TYMPANUM/ARCHITRAVE/PEDIMENT					
WINDOW		JAMB/MULLION/TRANSOM/TRACERY/FRAME/RERE-ARCH /SILL/SPLAY/ARCHITRAVE					
VAULT		RIB/WALL-RIB/BOOS/CELL/SPRINGER/RESPOND/SHAFT					
EXTERIOR		BUTTRESS/PLINTH/PARAPET/PINNACLE/COPING/GARGOYLE/ GUTTER/STRINGCOURSE/BALUSTRADE					
FITTING		SIDE-SHAFT/PINNACLE/CANOPY/NICHE/HERALDRY/OTHER SCREEN/SHRINE/FONT					
UNKNOWN		CAPITAL/CORBEL/ABACUS/STRINGCOURSE/HOODMOULD/ LABEL-STOP/HEADSTOP/BASE/PEDESTAL/SHAFT/ANNULET/ BLOCK/ASHLAR					
SCULPTURE		STATUE/EFFFIGY/CAPITAL/CORBEL/TYPANUM/PEDIMENT					
04 LOCATION							
05 MATERIAL		SANDSTONE/LIMESTONE/MARBLE/OTHER					
06 DATE		ANGLO SAXON		PERPENDICULAR			
		ROMANESQUE		RENAISSANCE			
		EARLY ENGLISH		CLASSICAL			
		GEOMETRIC		GOTHIC REVIVAL			
		DECORATED					
07 PROVENANCE		**ORIGINAL LOCATION**					
08 DIMENSIONS		**SKETCH DIMENSIONS**					
09 COMPLETENESS		**COMPLETE OR INCOMPLETE/ALMOST COMPLETE/ FRAGMENT**					
10 CONDITION		**SOUND OR BROKEN/FISSURED/WORN/FRAGILE**					
11 DESCRIPTION **PAINT** **SETTING OUT** **TOOLING** **SOCKETS** **METALWORK** **MORTAR**		**LIMEWASH**		**PAINT**			
		ON BED		**ON MOULDINGS**			
		BOASTER	**CLAW**		**PUNCH**	**DRAG**	
		BARS	**HINGE**		**GLAZING**	**OTHER**	
		IRON			**LEAD**		
					OTHER		
12 COMMENTS							
RECORDS MADE		**DATE**	**RECORDER**				
		PHOTO NO		**DWG NO**			

Appendix 2: dating architectural work by the tooling marks on the stones

Mark Samuel

Plain ashlar blocks and unadorned structural elements enormously outnumber proper mouldings in any excavated assemblage. Such material is usually regarded as useless to the archaeologist; it can however provide certain types of information, such as masons' marks or construction marks, and can even be dated broadly by tooling marks.

Marks left by iron tools can however be recorded on brass rubbing paper or normal typing (computer) paper. The pattern of toolmarks is, if anything, clarified in these records, especially in examples where the surface is somewhat deteriorated. With experience, it is possible not only to recognize the marks of particular tools but even to see distinctive patterns created by the need of the mason to work from one direction. These may be clear enough to allow the cross-relationship of items that do not share common mouldings. This technique can play an important role in distinguishing building campaigns. More importantly, the toolmarks can be broadly dated through their association with mouldings.

The study of medieval stone tooling is well advanced on the Continent (Bessac 1993, Rockwell 1993) but, in Britain, the lack of an agreed terminology is hindering study. It is however accepted that surface finish changed throughout the medieval period and that types of tooling can be associated with datable mouldings. A summary (Samuel 2001) of some of the developments observed in south-east England is reproduced here in a modified form. It applies to the area of the Limestone Belt from which many stones were widely exported to other regions.

c1066–1225

Diagonal tooling is considered characteristically 'Norman' but it is often difficult to distinguish 'striated' surfaces created by adzes from those created by wide chisels or *boasters*, and the latter were probably used more than is recognised (Stocker 1993, 23). Distinctive lens-shaped dents are diagnostic of the adze, which was used to quickly dress the beds or jointing surfaces between dressings. The boaster was more likely to be used on visible surfaces where control was more important.

The striations are always diagonal on ashlars. Execution improves steadily throughout this period and by the 1180s moulding surfaces were often polished, although adjacent facets continued to be striated. The boaster also began to be used for joint surfaces to allow thinner tidier joints. The size of blocks of stone became larger, requiring the use of the block and tackle.

c1225–75

In this period the sharply serrated clawtool or *gradine* makes an appearance throughout Europe. The boaster continued to be used for most purposes, but striations on ashlar become vertical. The claw tool was used for finishing visible surfaces and mouldings, particularly on the harder limestone fragments, while the boaster remained in favour for softer limestones.

Mortar keying on joints was often carried out with regularly spaced blows of a *jadd pick* or *racer*.

From about 1180 to 1300, Purbeck marble was highly popular, though rarely as a structural building stone. Its hardness and brittleness meant that it had to be cut with a completely different set of tools to those used on other stone of the Limestone Belt. The punch and the bush hammer create distinctive marks that cannot be confused with others. Surfaces were brought to a high polish with vinegar (acetic acid).

c1250–1300

As above, but fine surfaces were sometimes created by careful paring with a sharp curved chisel edge. Clawtools are used on beds on joint surfaces, which often show signs of polishing to improve fits. Elaborate keying channels were often cut into the joints of tracery to allow lead to be poured into the joint

c1300–1400

Coarse *combs* or *french drags* were adopted in this period to finish external surfaces on the softer limestones. Heavy widely-spaced tines were used for coarse dressing-down of bedding surfaces after clawtooling. Combs with finer, closely-spaced tines were used to finish visible surfaces. In the best late medieval work, fine combs were specially shaped to fit parts of mouldings such as casement hollows.

The saw-like clawtool gave way to the toothed *boaster* or *bolster*: The thick blade was sharpened at an obtuse angle to create a cutting edge almost square in section. This edge was cut with regular nicks to create a distinctive toothed mark with excellent keying properties. Highlights were removed with the comb. The earliest occurrence is in the mid 13th century at Lambeth Chapel. By the mid-14th century, it was prevalent. The point, *punch* and the bush hammer had been used in the specialist trade in *Purbeck marble* (see above) but were adopted for the dressing of Kentish ragstone to permit fine dressing of this stone. Channeling for lead eventually disappears. Mortices for tiebars of iron may however be seen.

c1400–1540

Precision steadily improves. The toothed bolster remains the standard means of finishing joint surfaces, which were then fine-combed when extreme closeness of fit was desired (ie tomb monuments). For the first time, good building stones other than marble might be left unpainted (in the cases of Caen or Magnesian stone); a polish was created using miniscule combs. Coarser combs were intentionally used where the intention was apply paint (more friable stones, such as those from the Upper Greensand series, eg, *Reigate* stone were usually painted).

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