Crypt Archaeology: an approach

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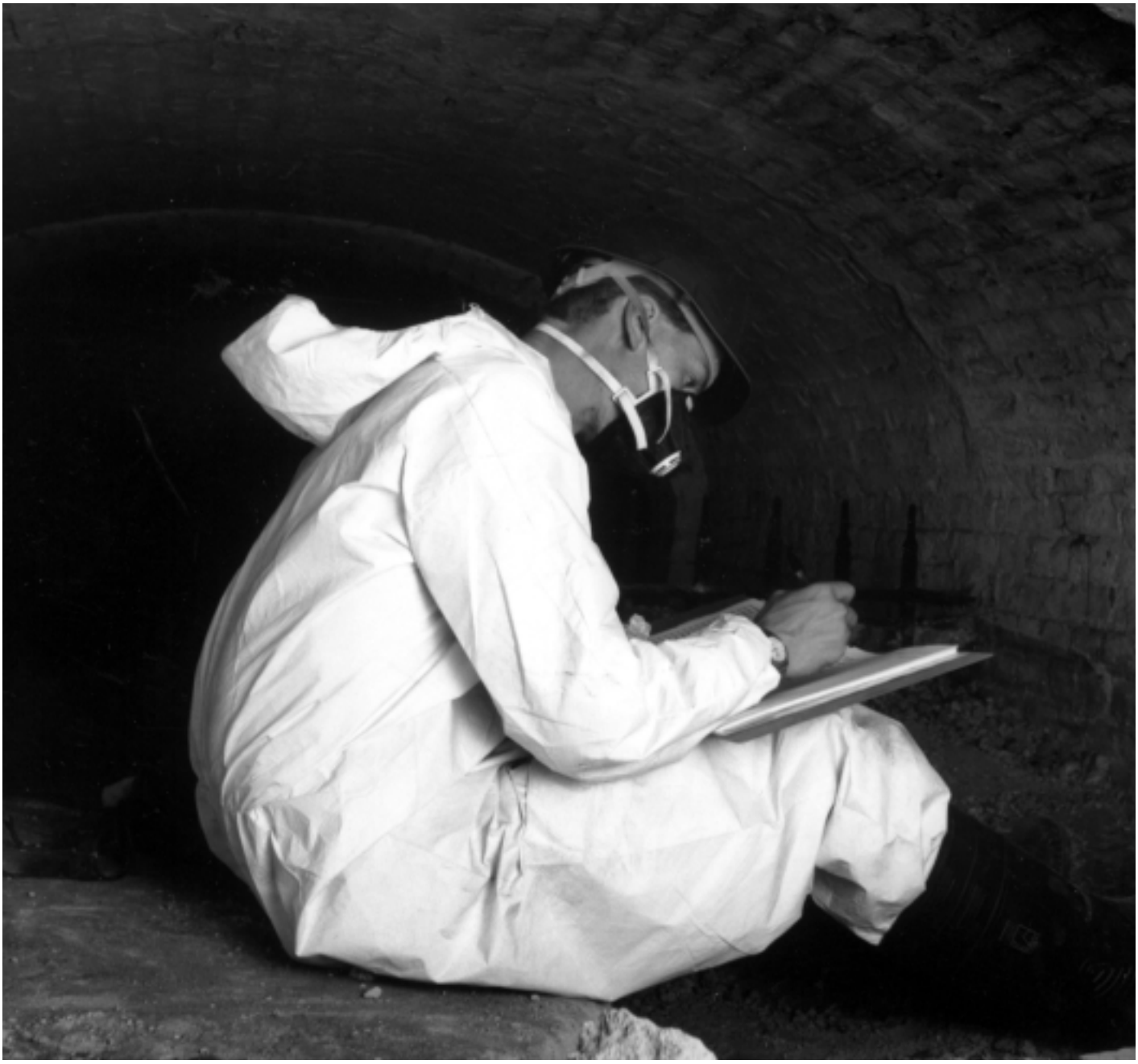

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Contents

Introduction

In the autumn/winter of 1995/6, it was proposed to convert the crypt beneath a post-medieval church in London into a centre to provide facilities for homeless young people. Feasibility and other studies were carried out and a project design for excavation of the crypt and its subsequent conversion agreed. The scheme was ultimately abandoned due to the withdrawal from the scheme of the main user group, nevertheless, the experience gained during the lead up to the proposed project involved archaeological assessment and evaluation of the crypt, as well as adjacent gardens, and the formulation of a project design for the excavation of the crypt. This experience and previous and subsequent involvement with other crypt projects inform this paper.

Church crypts across the country are seen as potential sites for a range of developments. While the majority of those affected are post-medieval in date, this paper is also relevant to crypts containing intra-mural burials from all periods and contexts. Proposed developments can include cafes, museums, musical facilities, and space for the installation of services and other facilities. Church crypts can also be affected by minor works such as alterations to services and installation of lift shafts. With so much development and reuse pressure on this important archaeological resource, it is worth disseminating some of the understanding gained above and considering some of the particular challenges involved with crypt archaeology. While this paper focuses on crypts within England and Wales, most of what follows is also relevant in Scotland and Northern Ireland.

Consideration of issues relevant to deciding which crypts, if any, should be subject to different levels of archaeological mitigation are discussed by Reeve (1996, 1998) and Reeve and Cox (1998) and it is not the purpose of this paper to repeat the messages of those contributions. Suffice to say that all archaeological resources must be subject to assessment, evaluation and appropriate mitigation, in terms of the criteria set out in PPG 16 (1990) and PPG 15 (1994). Similar regulatory and legal procedures, both ecclesiastical and civil, exist for Northern Ireland and Scotland and these must be adhered to as appropriate. In addition, any proposed mitigation must be justified in terms of current national and local research frameworks and criteria. Archaeology, approached with a 'record everything you see' strategy is not considered appropriate. All archaeological projects should be lead by, and target, a framework of research issues. It should not, however, need stating that post-medieval and earlier church crypts and vaults, and those outside the jurisdiction of the Church, are potentially valuable archaeological resources. This has been particularly so since the

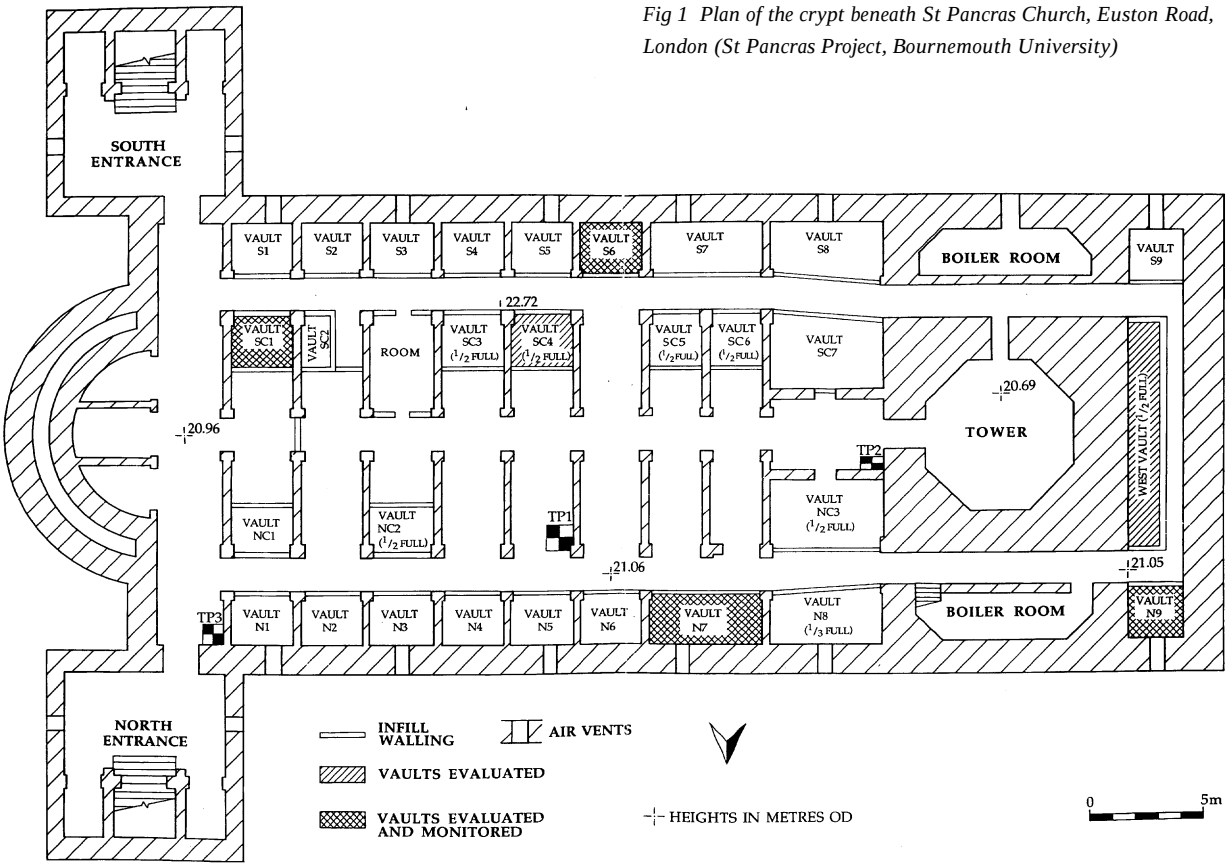

Fig 1 Plan of the crypt beneath St Pancras Church, Euston Road, London (St Pancras Project, Bournemouth University)

contribution made to British archaeology by the Christ Church, Spitalfields project (Reeve and Adams 1993, Molleson and Cox 1993, Cox 1996a).

For the purposes of this paper a 'crypt' is generally a vaulted structure or space beneath a church or mausoleum containing a series of discrete enclosed areas of similar or differing sizes enclosing large numbers of burials. They can fall within or without the jurisdiction of the Anglican Church and can date from medieval and post-medieval contexts. An example is shown in Figure 1. They are all vulnerable to development pressures, whether urban or rural.

This paper details an approach to the various stages necessary to address crypt archaeology: desk based assessment, evaluation and mitigation by excavation where it is deemed an appropriate response. Also considered are aspects of an appropriate specification for the survey and excavation of a church or non-church crypt containing a large number of post-medieval inhumations with associated legible coffin plates. Prior to any such works, project specifications must be prepared and made available to support applications for approval such as a faculty petition to the Diocesan Advisory Committee (DAC), English Heritage (EH) and that of the Local Planning Authority (LPA). Specifications should conform to MAP 2 (1991) as far as is appropriate, *Standards and guidance* of the Institute of Field Archaeologists (IFA), and guidance notes supplied within any given region by the local government or other curatorial agency.

The complete archaeological excavation of a post-medieval crypt is an unusual project having only been undertaken once in the UK, beneath Christ Church, Spitalfields in the early 1980s. Since then much has changed in terms of archaeological research agenda and frameworks, scientific methodologies (particularly at the sub-macroscopic level) and health and safety regulation. A further consideration is our increased awareness of the psychological implications of undertaking potentially traumatising work.

Health and safety issues are dealt with separately in this paper (see pages 16–19 (health and safety)) because they merit specific and detailed consideration when dealing with the excavation of an intramural burial context. Documentation should be produced for approval by (in England and Wales) the relevant Local Government Environmental Heath Department (EHD) and the Health and Safety Executive (HSE). Health and safety in funerary archaeology is discussed in detail by Kneller (1998).

The legal position

Any programme of archaeological investigation should begin by ensuring that the client has dealt appropriately with all planning and development control issues and legal matters. The legal position in England, Wales and Scotland for the excavation of human remains per se is discussed in Garratt-Frost 1992. There are no subsequent amendments to the statutory position presented for England and Wales that materially affect this type of excavation (Garratt-Frost pers comm). A more detailed look at the Scottish position is set out by Hogie (Historic Scotland 1997). Table 1 lists current civil and ecclesiastical legislation and regulation affecting the excavation of human remains, associated structures and sites.

Table 1 Current legislation relevant to the excavation of crypts and burial grounds in England and Wales (Adapted from Garratt-Frost (1992) and Reeve (1996). Key legislation and regulation is in bold)

1847	Cemeteries Clauses Act
1857	**Burial Act (S.25)**
1884	Disused Burial Grounds Act
1906	Open Spaces Act
1913	Ancient Monuments Consolidation Act
1955	Inspectorate of Churches Measure
1963	Cathedrals Measure
1964	**Faculty Jurisdiction Measure**
1968	Pastoral Measure
1969	Redundant Churches and other Religious Buildings Act
1972	Local Government Act (S.214 and schedule 26)
1977	Local Authorities Cemeteries Order
1978	Inner Urban Areas Act
1979	Ancient Monuments and Archaeological Areas Act
1980	Local Government, Planning and Land Act
1981	**Disused Burial Grounds (Amendment) Act**
1983	**Pastoral Measure (S.65 and schedule 6)**
1988	Housing Act
1990	Town and Country Planning Act
1990	Planning (Listed Building and Conservation Areas) Act
1990	**Planning Policy Guidance Note 16**
1991	Care of Churches and Ecclesiastical Jurisdiction Measure
1991	Care of Cathedrals Measure
1992	Faculty Jurisdiction Measure
1994	**Planning Policy Guidance Note 15**
1994	**Ecclesiastical Exemption (Listed Buildings and Conservation Areas) Order**

The law and related regulation and codes of conduct also govern aspects of health and safety. In keeping with the Health and Safety at Work Act (1974), subsequent amendments and regulations and CDM regulations (1994), a detailed health and safety policy risk assessment and detailed methods statement (for all tasks) should be prepared for the approval of the relevant Environmental Health Department and the Health and Safety Executive. The amount of detail involved in the production of this document should not be underestimated and a substantial and detailed document will result. Table 2 lists health and safety legislation and regulation relevant to crypt and funerary archaeology.

Table 2 Relevant health and safety legislation and regulation

1974	**Health and Safety at Work Act**
1980	**Control of Lead at Work Regulations**
1992	Management of Health and Safety at Work Regulations ACOP
1992	Workplace (Health, Safety and Welfare) Regulations ACOP
1992	Provision and Use of Work Equipment Regulations
1992	**The Manual Handling Operations Regulations**
1992	**The Personal Protective Equipment at Work Regulations**
1994	**The Control of Substances Hazardous to Health Regulations**
1994	Management of Health and Safety at Work (Amendment) Regulations
1994	**Designing for Health and Safety in Construction** – a guide for designers on the Construction, Design and Management regulations, Health and Safety Commission

The legislation and regulation governing the excavation of a crypt potentially containing human remains is extremely complex and it is recommended that expert advise is sought. All relevant permissions, approvals, licenses and faculties must be obtained at the appropriate stage of the investigation. It is not intended to advise what is likely to be relevant to crypt archaeology in this paper as each case will have very specific requirements and general advise can be misleading if adopted uncritically.

Desk Based assessment

As always, the first step in devising an appropriate archaeological mitigation strategy is the production of a desk-based assessment of the archaeological potential of the site. The site should encompass the curtilage of the church with a buffer zone appropriate for the particular area. This should follow criteria set out by the Institute of Field Archaeologists (1999) and, in London, English Heritage (1992 and 1998). There is nothing exceptional in the methodology employed for crypts though consultants and contractors should familiarise themselves with the nature of primary documentation relating to the past use of churches and particularly their parishioners. Particularly attention should be paid to such historical documents as vestry minutes, parish registers, and architectural drawings and documents relating to phases of alteration and expansion of the church and crypt. At this stage it is extremely important that some estimate is made of the socio-economic status of the sample interred within the crypt, the period of burial and the number of interments. Particular care should be given to evaluate the level of documentation that survives pertaining to individuals as this will help determine the value of the skeletal material to archaeological and other sciences.

A site visit to the crypt and vaults is crucial in order to gain an indication of the condition, completeness and integrity of the archaeology and any predetermining factors influencing further works. This could elucidate evidence for robbing, dumping, environmental variables and structural safety not evident in historical or other documentation. In exceptional cases, such a visit, when combined with documentary evidence, can provide sufficient information to inform appropriate mitigation for a site.

The decision to undertake excavation of a site should reflect that it has the potential to fulfill criteria set out in PPG 16 (Nov, 1990), Reeve 1996, and Reeve and Cox, 1998. For this site-type, these should include the following:

- the material survives in good, complete and, preferably, uncontaminated condition
- the sample of discrete inhumations is statistically useful
- abundant and relevant associated historical documentation exists
- a significant proportion of coffins observed during the evaluation have surviving breast and / or end plates with legible biographical information
- the sample is homogenous in terms of ethnicity and period of interment, or alternatively, large enough

to be split into meaningful biological samples which would be statistically useful. It is worth considering here that the c400 documented individuals recovered from Christ Church (not an homogenous sample), when broken down into sub-sets and taking preservation into account, were too small to be statistically significant for some analyses.

Crypt Evaluation

It is not the purpose of this paper to dwell on methodologies for evaluation in depth as this will be fundamentally dependent upon the construction and configuration of the crypt. It is important to stress that evaluation must ensure that following a preliminary assessment of the possible macro- and micro-environments within the crypt, each different environmental type should be subject to evaluation as the surviving character and preservation of the archaeology can vary enormously in response to what appear to be both major and minor variables.

To stimulate ideas about possible approaches to crypt evaluation, it is useful to discuss briefly the scenario within St Pancras Church, Euston Road, London. This crypt was subdivided by three aisles (Fig 1) each with a varying number of enclosed vaults of one of two sizes and which were either half full, and partly walled and capped off (Fig 2), or full and completely walled in (Fig 3). In the two outer aisles, the vaults each had an external wall and those at each end had two outer walls. Of these, every alternative vault had an air vent leading to the garden of the church. Some vaults had no external wall. A further variable was that a small number of vaults had been linked into heating flues. Consequently it was possible to identify a number of vault types, each with distinctive physical and environmental characteristics, and each of which was evaluated in the quickest, least environmentally disruptive and unobtrusive way as possible. Employment of a 2% evaluation strategy has no merit in this context. Having selected a number of different types of vault based upon such criteria, the method employed in 1996 for the full vaults was to

Figure 2 Half full vault beneath St Pancras Church, Euston Road, London (Philip Crabbe, Natural History Museum, London)

Figure 3 Full vault beneath St Pancras Church, Euston Road, London (Philip Crabbe, Natural History Museum, London)

remove three bricks from near the top of the enclosing wall and examine the contents using an industrial endoscope linked to a video recorder. Half-full vaults were evaluated by removing part or all of the capping and excavating down to the top of the coffins, all that could be seen at that stage was recorded as were observations of rates of visible degradation of both organic and inorganic materials occurring during the evaluation. Sealed coffins were not opened for health and safety reasons and because the faculty for the evaluation did not grant such permission. Macroscopic evaluation of the condition of materials in one of each vault type suggested that, not surprisingly, conditions were dramatically worse in the vault linked to the heating ducts and generally good elsewhere.

Mitigation during evaluation for research into formation processes, taphonomy and diagenesis

All archaeological projects should fit into current research frameworks and interests. Some of these can only be facilitated by measures implemented during the evaluation phase of a project. In the case of crypts, it is relevant to discuss an area of archaeological science that can be advanced by the adoption of an appropriate recording and sampling strategy. In order to determine proper scientific and archaeological responses, it is essential to involve other specialists at this stage.

In a developing academic discipline such as archaeology, an unusual type of excavation should be viewed as important and as an opportunity. They can potentially

Figure 4 Environmental monitoring probes (St Pancras Project, Bournemouth University)

generate areas of interest that have hitherto not arisen or have been neglected. The major questions generated by the Christ Church Project were those relating to preservation of materials, taphonomy, bone diagenesis and formation processes, in both cultural and environmental terms. In order to further this area of enquiry, in anticipation of the proposed excavation, four of the evaluated vaults at St Pancras, and one of the aisles (as a control), were equipped with a range of environmental monitoring probes prior to resealing (Figs 4 and 5). Insect traps and sterilised organic samples (ie wood and textiles) were also inserted into the vaults. Environmental parameters within the vaults and crypt were recorded electronically every two hours for one year. It was anticipated that the resulting data would inform archaeological science of a range of parameters pertinent to preservation and taphonomy. Monitored parameters were as follows:

- temperature
- relative humidity
- oxygen
- methane
- carbon monoxide

Figure 5 Environmental monitoring probes in-situ (St Pancras Project, Bournemouth University)

Subsequent microbial analysis of the sterilized materials, and entomological evidence would have also provided important information (Cox and Kneller, in preparation.). It will not always be possible to install environmental monitoring equipment into a crypt prior to its full excavation for either time or financial reasons. Where this is possible, the potential gain for archaeological science is enormous. If time permits, grant aid could be sought for a research driven approach from the research councils. It should be noted that at St Pancras, the PCC paid for the environmental monitoring as part of their response to archaeological mitigation.

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Survey of the crypt structure

Prior to excavation it is essential to undertake the first phase of a detailed survey of the fabric of the crypt. This should record the archaeology of the building, particularly any modifications undertaken since any original or subsequent design drawings. If architectural drawings exist, these can be utilized, providing they are checked for accuracy. The first phase of the survey should record all that is visible prior to dismantling any infill walls to the vaults. The second phase of works should be undertaken once the crypt has been excavated. Structural evidence should also be recorded, as appropriate, during the excavation. Building survey and recording will be a phased and possibly on-going process in such circumstances. Recording should be to standards recommended in IFA Standards and guidelines (1999), PPG 15 (1994) and in Greater London, English Heritage Guidelines (1998).

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Crypt Excavation

Preliminary works

What follows is based upon the author's (MC) experience with several crypt proposals and is designed to inform and raise awareness rather than to prescribe. Each crypt must ultimately be considered in its own context and in light of specific research objectives that can potentially be realised. Cursory discussion is given to those issues that pertain to all archaeological fieldwork projects with specific consideration being given to the particular. As always, prior to commencement of excavation a number

of preliminary measures are necessary and these are discussed below. Before the excavation of human remains, it will be necessary to advertise the intention to exhume in accordance with whatever legislation applies to the particular circumstances. All appropriate approvals, permissions, licenses and faculties must be obtained from the appropriate authorities.

Site screening, accommodation and security

The excavation of human remains, particularly where soft tissue might survive and where remains are relatively recent always attracts public and media interest. As a consequence and in order to comply with relevant legislation (e.g. Burial Act 1857, S25) and the Home Office licence (if one applies), it is necessary to enclose the working area within a secure compound of approximately four metres in height. Discrete but thorough security systems must be designed and access to the site must be strictly limited to approved personnel.

Additional facilities

Mechanical/hydraulic lifting equipment and ramps should be available as appropriate. A temporary cold lighting system should be installed in the crypt as should appropriate heating and ventilation systems.

Staff appointment and staffing structure

The selection of qualified and appropriate staff is crucial to the successful completion of any project and particularly to the excavation of a post-medieval crypt containing human remains. It should be considered that most (though not all) archaeologists do not find the excavation of ancient skeletons from earth graves to be difficult. Such a task is generally considered acceptable because of the distance from the present in both time and physical condition. It is likely that in most crypts, preservation and completeness will be variable as a result of individual micro-environments within the crypt, and other unknown variables. At least a small percentage of the interments will have some surviving soft tissue; some may have surviving clothing. These factors remove the distance between the archaeologist and the deceased person as does the known identity and comparatively recent date of death and burial of the sample (Bashford and Pollard 1998). Further to this, the processes of autolysis and putrefaction which cause the ultimate skeletonisation of human remains, are physically repulsive to many people with the exception of forensic scientists, forensic archaeologists, medically trained personnel and mortuary assistants. Those intending to engage with such projects could usefully note that acquisition of an understanding of the biochemical processes involved with putrefaction and autolysis makes them easier to deal with. A recent UK crypt excavation saw the reburial of *c* 30% of coffins without opening simply because the archaeologists were not prepared to be exposed to soft tissue. This loss of scientific information is unacceptable and unnecessary.

For either or all of these reasons, a crypt excavation may occasionally cause some or considerable distress to some members of the workforce. Any crypt excavation team should include members with either a forensic or medical professional background, but any of the team might experience some exposure to scenes that are outside the realms of normal expected experience and may suffer from Post Traumatic Stress Disorder (PTSD) to variable degrees. Post Traumatic Stress Disorder and archaeology is discussed in detail by Thompson (1998). Apart from the moral considerations, all employers have a duty of care in respect of devising a safe system of work for employees. In respect of stressful working environments the legal position asserted in *Walker v Northumberland CC* (1994) should be considered as should those of subsequent legal judgments.

Before recruiting staff, advice should be sought from a specialist in PTSD. Selection of appropriate personnel for such work thus reducing the likelihood of them experiencing PTSD, can be enhanced via specialist selection processes which might include a questionnaire and specific interview techniques. It is crucial that specialist advice is followed and that suitably experienced psychologists are involved in the selection process. Appropriate working practices should be adopted to minimize stress to the workforce. Psychologists should monitor this area of staff health during the project; this could help to inform future protocols. PTSD is discussed further below.

A further aspect of health and safety that is intrinsically involved in staff appointment is that it is essential that at least a small group of the work-force have had primary vaccinations against smallpox (variola major) as children and that they have a subsequent scar indicating that the vaccination was successful. Given the small but significant risk of exposure to pathogens as a result of crypt excavation, it is recommended that in depth consideration is given to the issue of involving those with compromised immunity in such excavations. This includes pregnant women and those that are HIV positive (see Young 1998 and Kneller 1998 for further details). This is an extremely difficult area to deal with as the line between 'due care' and possible discrimination is very thin. Specialist advise should be sought on this subject. Reflecting the small risk of exposure to anthrax spores it is recommended that anyone who is allergic to antibiotics is vaccinated against anthrax before commencing work.

It is essential for staff to include those with the following skills and expertise:

- project management
- health and safety (including waste disposal)
- media management
- archaeological excavation and recording (including good photographic skills)
- conservation of artefacts and ecofacts
- finds management
- biological anthropology
- biomolecular archaeology
- forensic science / archaeology / pathology
- plant and wood remains
- IT / GIS
- building survey and recording

Sub-contract:

- labourers
- funeral director
- professional scientific photographer
- historian / genealogist
- trauma counsellor

Depending on the size and configuration of the site, and time and resource constraints of a project it might be advisable to use several small cohesive teams who work together throughout the project. A team supervisor should lead each of the teams, one of whom should be a biological anthropologist, preferably with field skills. If possible, one individual should have forensic and or mortuary experience and, ideally, that person would also have had an effective primary smallpox vaccination as a child. It is also essential that funerary undertakers should be appointed in anticipation of the need to take responsibility for the immediate reinterment of any completely preserved human remains, as should a trauma counsellor.

Aims and objectives

Excavation of a post-medieval crypt is an unusual event in UK archaeology and provides a unique opportunity to archaeological, forensic and clinical sciences, genealogists, historians and many other researchers, to progress scientific and historical methods and understanding. As such, when a crypt-based project seems likely to proceed, prior to the final submission of proposals and project designs to the appropriate authorities, a seminar should be held facilitating wide discussion of research aims and objectives amongst those scientific and academic communities with appropriate research interests. This will ensure that the potential offered by the rare opportunity is maximised and that time exists for appropriate funding to be sought.

The purpose of crypt excavation is threefold. It is an essential preliminary to conversion of a crypt for whatever purpose. Archaeologically, it provides an invaluable opportunity to excavate a (usually) post-medieval burial / mortuary context under controlled scientific conditions. Further, it has the potential to yield a sample of human skeletons of known identity, sex and age at death plus their associated material culture. Apart from the material recovered from Christ Church, Spitalfields in the mid-1980s, such a sample will be unique and of international importance to the scientific community. This matter is discussed further in Reeve and Cox (1998).

Any project design should aim to maximise the inherent potential of such an archaeological resource. It is essential that the workforce tackling this project is appropriate to such sensitive and important work and that their well being is considered paramount.

Methods

Archaeological recording strategy

Recording levels, unless stated otherwise, should conform to IFA guidelines (1999), English Heritage Guidance Papers (1992b and 1998) or other regional guidance papers as applicable. In unusual situations appropriate modifications may be made. Data should also be recorded electronically at an appropriate scale to permit use of GIS and / or other graphics software to construct three-dimensional records of the vaults and their contents.

The photographic record should be made on two levels, the first is that to be taken by the archaeologists with a full record of black and white print and colour slide. Fully automatic cameras will be necessary as it is not be possible to accurately focus manual cameras wearing appropriate health and safety equipment (see below). A digital camera would be useful to allow the creation of a project website.

Each context, coffin and interment should be photographed as should each breast- or end-plate (Fig 6). While this is primarily undertaken to ensure that the archive should be sufficiently detailed it may also prove important for any descendants with an interest in their ancestors. The difficulties inherent in photography within a crypt environment are not to be underestimated. They include high dust levels, inadequate lighting, confined space and limitations imposed by personal protective equipment. It is recommended that a professional scientific photographer should visit the site at frequent intervals to procure a record of specific items and deposits. These should include all unusual or well preserved artefacts and ecofacts, such as dentures (Fig 7)

and textiles, and unusual and interesting skeletal features. Key architectural features should also be recorded and 'working scenes' should be photographed (Fig 8). The rational behind this strategy is to ensure that a high quality photographic record survives both for the archive and for publication purposes. A video record of the excavation could be made. Time-lapse photography provides a useful record of methodologies.

Figure 6 Breast plate recorded during the evaluation of St Pancras Church, Euston Road, London (St Pancras Project, Bournemouth University)

Figure 7 Dentures recovered during the clearance of part of the churchyard of St Nicholas' Church, Bathampton (AC Archaeology)

A unique site code should be agreed with the local museum service and local sites and monuments record office. Because of the high dust levels anticipated during any crypt excavation, unless a computer with 'touch' controls (ie not a conventional keypad) is available, the written record should be firstly made as paper records with subsequent computerisation of key elements.

The format of all recording forms should be considered with great care as each crypt will be unique and it is probable that each site has particular recording requirements not common to others, and certainly ones that differ from 'normal' archaeological sites. The coffins and human remains could be recorded on forms adapted from those used at Christ Church, Spitalfields. Separate forms should be used for the outer case, lead shell and wooden inner coffin components. If the coffin and coffin furniture types prove to be uniform, or of limited variability, throughout the crypt then taxonomies can be created and further refinement and simplification of the recording system can take place, both as the excavation progresses and in light of those already published.

Reflecting current research interests in taphonomy and diagenesis (for further details see Haglund and Sorg 1997; 2001), forms need to be devised to facilitate appropriate levels of recording for the preservation / condition of the anticipated range of materials. Each inhumation (cadaver or skeleton) should be given a unique context number. The skeleton or cadaver recording form should require a high level of detailed recording including the presence / absence and level of preservation of, as appropriate, soft tissue and / or each skeletal element and an accurate description of its condition at the time of recovery.

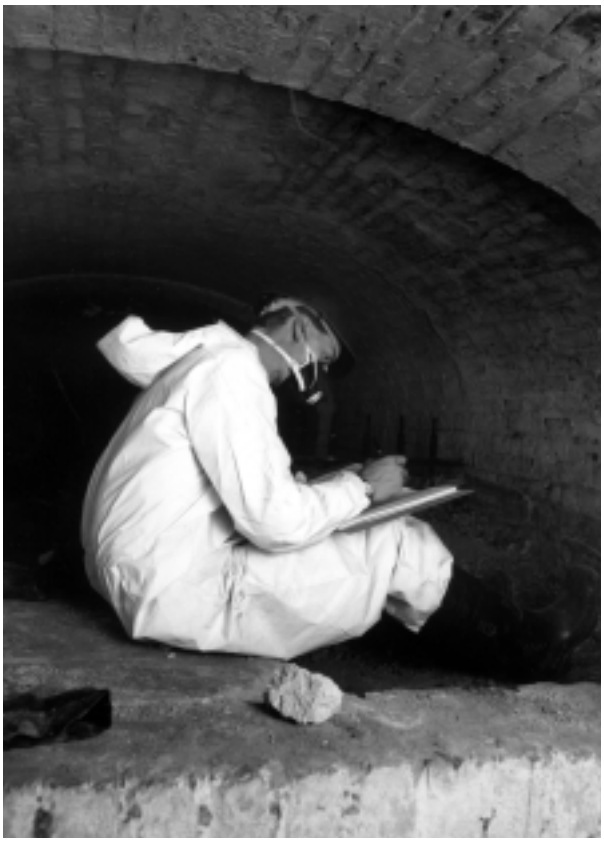

Figure 8 Working scene during the evaluation of St Pancras Church, Euston Road, London (St Pancras Project, Bournemouth University)

Maximising the use of space

Where a crypt comprises a large number of small vaults it is recommended that each should be completely excavated before moving on to the next. Where small teams are used, a number of vaults can be excavated contemporaneously without compromising the recovery of fragile artefacts and ecofacts from each. Excavation should proceed in a logical sequence ensuring that entry/exit routes remain free and that sanitising spoil can be moved out as it is recovered (Fig 9).

Sanitising spoil

The recent archaeological evaluation of a crypt (Cox unpubl) demonstrated that, as expected from the Spitalfields project, in the 1850s coffins were partly covered with spoil prior to sealing the vaults. This is likely to be the case with all crypts reflecting legislation governing the closure of crypts (Burial Act 1852).

Spoil, used as a sanitising layer, should be removed archaeologically taking care to recover material of dating or intrinsic value as well as material from coffins or their contents. The evaluation of a site should inform whether systematic sieving of this material is appropriate. Exactly what evidence from this spoil should be retained is dependent upon specific research objectives and the nature of the matrix – some can represent waste from local industrial processes. However, samples should be retained from individual vaults to inform environmental analysis. Spoil from individual vaults must be stored separately for health and safety reasons.

The burial containers and contents

It was apparent at Christ Church, Spitalfields that the circumstances and mode of deposition of coffins can vary enormously. The evaluation of vaults within a crypt will inform about such matters in individual cases. In some crypts, unlike at Christ Church, each layer of coffins might be separated by iron bars (Cox unpubl), a factor which is important in terms of preservation and condition of deposits. In vaults containing burials that post-date 1815, all burials should be in multiple shell (two or three) coffins with a lead component. Such coffins may be anticipated to weigh more than a quarter of a ton (Reeve & Adams 1993). In such cases, it is practical that, where possible, the majority of the coffins should be recorded *in situ*, each component being dismantled and sampled after recording. The uppermost layer of coffins within vaults may require a different approach if

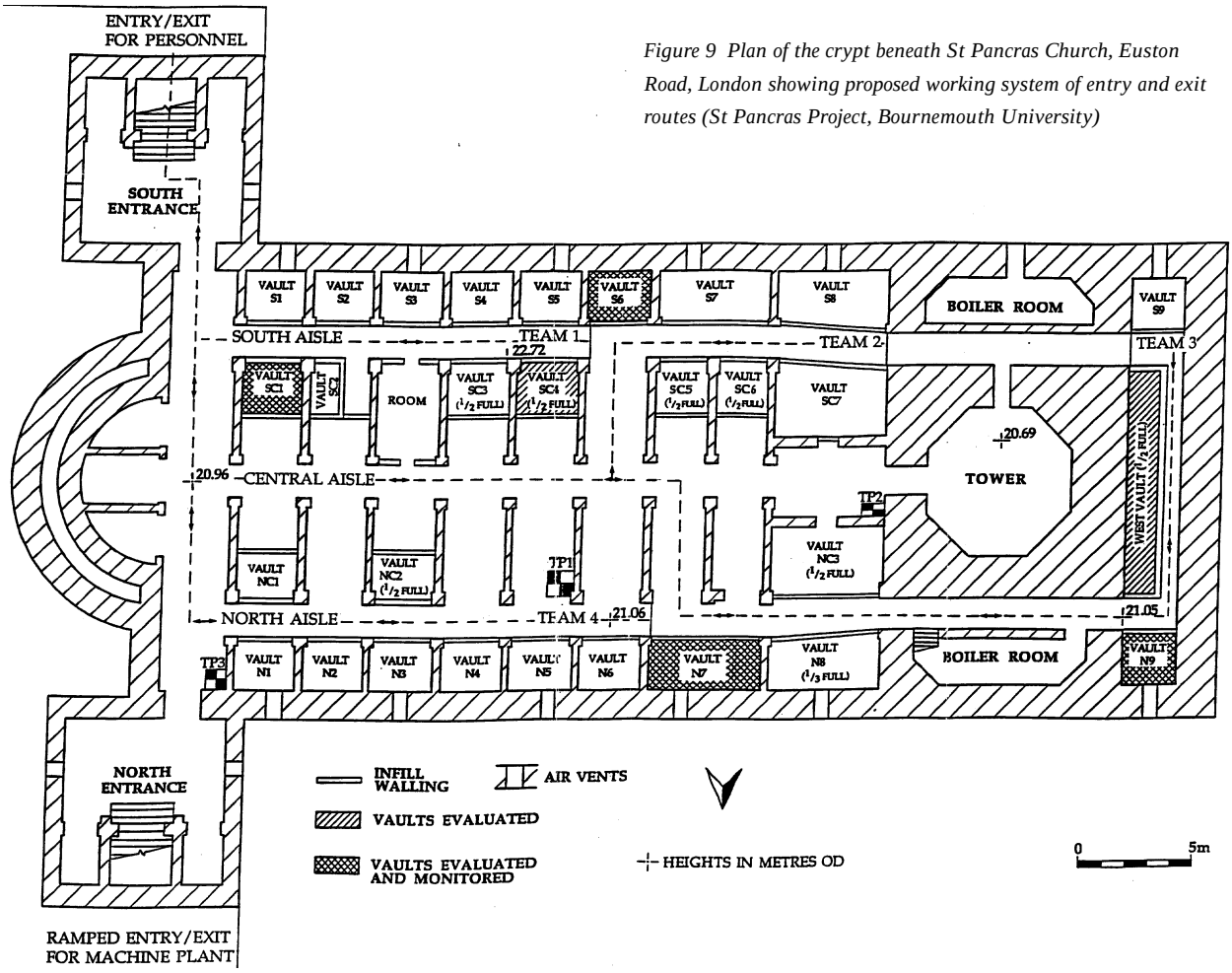

Figure 9 Plan of the crypt beneath St Pancras Church, Euston Road, London showing proposed working system of entry and exit routes (St Pancras Project, Bournemouth University)

headroom is restricted. An appropriate alternative, such as hydraulic lifting gear, should be considered for such cases. At lower levels, it may also be necessary to remove coffins from the vaults prior to recording and dismantling. In such cases some form of hydraulic lifting gear may also be needed.

It is known from Christ Church (Reeve pers comm) and the recent evaluation (Cox unpubl) that once coffins are exposed to the air, decay processes rapidly effect both organic (Fig 10) and inorganic materials. Experimental working practices undertaken during the St Pancras evaluation indicated that the most effective working practice was to expose limited areas of the coffins at a time, recording each before exposing a further area. Where coffins are sealed within a vault via a front wall (see Fig 2) it is sensible to dismantle the front walls of the vaults a coffin's depth at a time coinciding with recording and removing each layer of coffins. This retains the spoil around the lower coffins for as long as possible, inhibiting decay. Each component of each coffin should be fully recorded as described above. Should the range of construction methodology, design and decoration prove to be limited, as it might in crypts in use for a short period of time, a taxonomy should be created and recording can be accordingly simplified or modified. A representative sample of multiples should be retained and recorded, normally an example of each type that survives in good condition.

Samples of wood, textile, metal and other materials should be taken and subject to appropriate passive first aid, being retained for assessment and traditional archaeological analysis (as well as taphonomic considerations). Again, if the range of typologies proves to be restricted this policy may be modified accordingly. As long as an adequate range and quantity of material is retained and conserved, the remainder can be adequately recorded and discarded as appropriate. However, all inscribed breast- and end-plates should be retained for both archaeological, genealogical and ethical reasons, as should all human remains.

Such a strategy would, of course, have to accommodate appropriate levels of separate sampling for progressing our understanding of diagenesis and taphonomy, and formation processes (as discussed above). In any vaults where it has been possible to monitor the burial environment, levels of recording of factors reflecting preservation and condition should be extremely thorough. Further, samples of such materials as wood, textiles, metals, plant remains, insects and human remains, should be collected specifically for microbial and other analyses relating to taphonomy and preservation. In the case of human remains samples should include, as appropriate, bone, skin, hair, nails, adipocere, other soft tissue and coffin liquor. A reduced, but nonetheless comprehensive recording and sampling strategy could be undertaken in respect of all other vaults.

Figure 10 An outer wooden coffin cracking as a result of desiccation during the evaluation of St Pancras Church, Euston Road, London (St Pancras Project, Bournemouth University)

Above all, sampling and recording strategies have to be adaptable and realistic; precise requirements should be agreed with the curator, and any researchers with an interest in the project, prior to commencing the excavation. Above and beyond that, they should be flexible facilitating both trimming down as taxonomies are developed, but also adding to, in unusual circumstances.

Wood and metal to be discarded should be dealt with as considered appropriate by the EHD. Lead and iron can ultimately be sold for recycling subject to clarifying issues of ownership. It is likely that such materials as coffin padding, mattresses etc, wet waste, and soiled overalls, masks and gloves would be disposed of as clinical waste. This is discussed further below.

The treatment of human remains

Introduction

Where coffins survive intact or in good condition, it is possible that an evaluation will fail to directly inform as to the condition of the human remains. In such cases, it seems probable that the condition of most of the human remains will vary from completely skeletonised to some with varying amounts and types of surviving soft tissue (see Figs 11 and 12). Susan Young (pers comm and Young 1998) has been involved in the clearance of over 20 crypts since 1985. In her experience there is no reliably consistent correlation between the condition or type of coffin and the preservation of human remains. Soft tissue and textiles may be most likely to be preserved in sealed lead coffins but can also survive elsewhere including in wooden coffins in earth burials (see *ibid* for further details). In light of Young's experience and the Spitalfields Project (Reeve and Adams 1993), it seems likely that in most crypts the majority of the individuals will be skeletonised but that some individual burials will retain soft tissue. The condition and completeness of the human remains will vary enormously.

Figure 11 Soft tissue surviving at Christ Church, Spitalfields (Christ Church, Spitalfields Archaeological Project. R Janaway, University of Bradford)

Figure 12 Desiccated soft tissue surviving at Christ Church, Spitalfields (Christ Church, Spitalfields Archaeological Project. S Young, London)

A consideration for short-, medium- and long-term conservation and storage of human bone is that most bone recovered from crypt contexts has a higher level of organic matrix, particularly collagen, than most earth burials. Consequently it should not be stored in an area with low relative humidity to avoid the bone drying out too quickly and degrading. A cool, well ventilated store is essential; in conditions which are too humid and warm, mould and fungal growth will occur. Unfortunately, the author cannot offer more precise guidelines here as this area of human bone conservation and storage has yet to be researched and there is nothing in the literature on this subject.

Although the Institute of Field Archaeologists (Technical Paper **13**, McKinley and Roberts 1993) produced guide-

lines for the excavation of human remains, these relate primarily to the excavation of skeletons from earth graves. No guidelines or protocol exist for the excavation of crypt material, or where soft tissue survives. This paper sets out a protocol that seems appropriate in light of the Spitalfields experience and that experienced by archaeologists involved with the recent dead elsewhere (e.g. Boyle and Keevill 1998; Bashford and Pollard 1998).

Apart from the archaeological potential of the resource, there are two over-riding duties of care to consider. The first has to be to the workforce and this is discussed below (Health and safety). Secondly, there is a duty of care in respect of the human remains being disturbed. Our treatment of the dead is considered by sociologists and anthropologists to reflect the needs and concerns of the living. Archaeologists should treat the dead with all due care and reverence, at all stages of an excavation and subsequently (Cox 1996b). A further consideration in this respect is that some of the interred may have surviving descendants who may take a considerable interest in the remains of their ancestor(s). By necessity, in such an unusual area of archaeology and one which generates considerable uncertainty as well as moral and ethical dilemmas, any protocol may change during an excavation.

Skeletonised remains

It is anticipated that the majority of those interred within a crypt are likely to survive as skeletal remains. In such cases, the skeletons should be treated according to IFA Technical Paper **13** (1993), with appropriate sampling strategies (ie samples should be taken of residual material from the region of areas such as the stomach, gut, kidneys and gall bladder for evidence of diet, intestinal parasites and 'stones'). Selection of the workforce for a crypt excavation should include human bone specialists to ensure that any unusual or important pathologies or anomalies are recorded in depth *in situ* and that all bones, however small (such as inner ear bones) are recovered where they survive. In addition the involvement of personnel who have either mortuary, forensic or anatomical experience will ensure that appropriate people are available to handle, record and sample cases where soft tissue survives.

Soft tissue

Several strategies are possible for dealing with interments with surviving soft tissue. Examples follow:

INTACT REMAINS

If the remains are intact, ie with all or extensive soft tissue (particularly skin) surviving then it is recommended that the remains should be reinterred once they have been fully recorded. In such cases it is the author's (MC) view that no attempt should be made to remove any clothing except what can be recovered without disturbance to (ie undressing) the human remains (*contra* Janaway 1998). Samples of fabric should be taken for analysis and all clothing should be fully recorded. Similarly, artefacts such as prostheses and jewellery that can be removed without disturbance should be, but those which cannot should remain. If, however, even limited sampling of textiles and removal of associated artefacts seems to be an act of desecration to the archaeologists, then no samples should be taken (this issue is discussed by Janaway 1998). It is imperative to balance scientific inquiry with both respect for the dead and the personal feelings and emotional well-being of the workforce.

While site guidelines should be drawn up in advance of commencement of work, and all those involved made fully aware of the implications of such before being appointed, a flexible approach is advocated as human reaction to such situations cannot be reasonably predicted. Activities some would consider as legitimate to scientific inquiry are tantamount to desecration to others. Furthermore, feelings and attitudes can change as a consequence of the individual's or group's particular or collective experiences during the excavation period. Neither overt or insidious pressure should be put upon individuals to engage in or witness tasks involving human remains that they consider to be inappropriate.

After recording by archaeologists, funeral directors would normally attend such cases. The remains should be removed by them from the original coffin into a body bag and then a modern coffin. The remains should then be interred in an agreed cemetery. It is the view of the author (MC) of this paper that to cremate the dead where it can reasonably be inferred that they would have objected to such treatment of their mortal remains is inappropriate (Cox 1996b).

SOME SURVIVING SOFT (OR DESICCATED) TISSUE

Where soft tissue survives in part, in whatever condition (e.g. 'wet' or desiccated) after recording *in-situ*, the remains should be removed from the coffin in an appropriate container and removed to the finds processing laboratory for whatever means of sampling, recording and skeletonisation (the removal of soft or adipoce tissue) is appropriate. Samples of soft tissue, hair etc should be retained for a range of chemical and biological analyses, subject to appropriate health and safety measures (discussed below).

BORDERLINE CASES

It is not unusual for human remains in lead coffins in particular to exhibit differential survival of soft tissue. Where this occurs, such remains should be dealt with as is considered reasonable and appropriate by the work-

force. First though, all remains should be recorded *in situ* as described above.

Facilitating biomolecular analysis

At all stages of any excavation and subsequently, the archaeologists should wear such clothing, and take appropriate measures as necessary, to prevent both contamination of and between the human remains. This is to ensure that material suitable for such specialist analyses as DNA are not contaminated (see below, Brown and Brown 1992, Brown 1998, Brown 2000 for a detailed consideration of this issue). If sampling for DNA is anticipated the following guidelines are suggested:

- appropriate protective clothing (double-gloves, disposable over-suit and shoes, head covering and full face masks) should be worn to prevent contamination of burials by archaeologists
- gloves should be changes after dealing with one interment, before handling remains from another
- at present, it seems that DNA survives best and free from contamination in teeth and small robust bones. Rather than treat the all the skeletons in a way ensured to prevent contamination from excavation through to curation (expensive and impractical) it is recommended that two teeth (canine teeth are simple in shape, free from both fissures and [usually] attrition and caries, and easily removed) are removed after having been recorded *in situ* for disease and non-metric traits. Similarly, two metatarsals or metacarpals, or other robust, intact and small bones, should be similarly recorded before being removed. The samples should not be cleaned in any way but placed into suitably sized and sterile screw top plastic containers and frozen (*c*-20 degrees centigrade)
- Samples can also be valuable for the study of DNA and other bio-chemical markers of various diseases and their associated microbia (e.g. leprosy, tuberculosis). In such cases it is necessary to preserve samples of bone exhibiting lesions of the disease in question. Further to that, where it is likely that a particular disease, such as tuberculosis, was prevalent within the sample, a sample bone should be retained from each individual in the same way as described above (a rib would be appropriate for tuberculosis). A non-pathological specimen should be retained. These should be fully recorded *in situ* and then removed and stored as described above. For analysis of bio-chemical markers, freezing is not usually necessary.

Diagnostic bones, and those which are time consuming or difficult to identify once lifted or if damaged, such as rib four, the hyoid, carpals and fingers and toes, should be labelled and bagged (not plastic) separately as lifted. Care should also be taken to recover finger and toe-nails and hair where they survive as they have the potential to offer dietary information via isotope analysis. The human remains should then be removed from the coffin in an appropriate container to the finds processing laboratory.

Finds and samples

All artefacts and ecofacts should be cleaned if and as appropriate. They should be marked, counted, weighed and identified as specified in IFA *Standards and guidance* (1999), English Heritage *Guidelines* (1992, 1998) or as specified in the *Museum of London Standards for the Preparation of Finds to be permanently retained by the Museum of London* (1992) or other appropriate guidelines. First-aid conservation measures should be applied (passive where possible) and the artefacts should be stored and labelled in appropriate containers and stores. Ecofacts and bulk samples should be dealt with similarly and in line with current IFA *Standards and guidance*.

Human bones should similarly be cleaned and stored in an appropriate manner. Human bone should not be washed except in exceptional circumstances (ie where it is covered by 'wet' coffin liquor). McKinley & Roberts (IFA technical Paper **13**, 1993) set out appropriate methodologies for lifting and storage. Key points are that where bones are to be curated in the medium or long-term, all bones should ultimately be marked with both the site code and individual context number, and key bones bagged separately (in strong sealable acid-free paper bags – plastics are not appropriate for crypt material which is not 'dry'). The post cranial bones should then be packed in specially designed acid free boxes as should the skulls; within such boxes, individual elements should be wrapped and supported by appropriate acid-free packing material.

Human remains, finds and samples and the archive (paper and electronic) should be removed from site at least weekly, and human remains and sensitive finds deposited in a humidity and temperature controlled store / laboratory.

A programme of post excavation analysis of the human remains should begin as soon as the material has been removed from site. This is to ensure that data is not lost due to subsequent deterioration during storage. While it is well known which conditions are conducive to the long-term storage of dry bone from earth burials, appropriate and optimum conditions for crypt material are not understood.

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Health and safety

Paul Kneller

It is imperative that discussion with the local Environmental Health Department (EHD) and the Health and Safety Executive (HSE) begins as soon as such a project is envisaged. Documentation including a detailed risk assessment must be produced for approval by the EHD and the HSE prior to the commencement of work. The challenges of a crypt excavation are complex and many of the solutions are expensive and this has resourcing implications. It is essential to ensure that all potential problems are recognised and resolved before the project is resourced and excavation begins.

The author (1998) provides a useful and detailed overview of health and safety in church archaeology and the reader is referred to that for further information. As stressed in that publication, it is essential that all current legislation and regulation be adhered to and specialist advise sought. Each separate task (e.g. lifting heavy weights and dismantling lead coffins) should be subject to an individual risk assessment and this assessment should be used to instruct the team on the safest approach to each. A brief overview of the most serious hazards involved with crypt archaeology is described below along with the steps likely to be taken to resolve them.

Personal protective equipment (PPE)

The general level of PPE that is likely to be required is as follows (Fig 13)

- washable safety footwear
- disposable over-suits
- gloves
- hard hats
- safety glasses where appropriate
- a face mask system with air filtration to PP3 standard

Views have been sought on the viability of using cotton overalls but no sterilising system seems to be acceptable or practical.

Waste disposal

The disposal of material from site is an important health and safety, particularly a public health issue. Such materials are likely to include building rubble, waste wood, liquid waste and waterlogged material, lead, other metals and soft tissue from human remains. Some categories will have to be dealt with as clinical waste. Disposal of clinical waste can only be undertaken by licensed institutions such as hospitals and is extremely expensive. Such costs must be projected facilitating adequate resourcing for a project. Arrangements with a local hospital must be made for the disposal of such waste. Each of these areas of waste must be addressed individually and an appropriate solution found.

Lead has a scrap value as does wrought iron, and can be sold as such after appropriate disinfection. The sanitising spoil from each vault should be stored separately until after each is completely excavated after which it can be mixed (assuming no associated biological hazards). This material should then be put into skips along with dismantled masonry. Such materials should be disposed of to licensed sites by local operatives.

Materials soaked in body liquor, which are not retained for analysis and/or conservation, such as the inner

Figure 13 Personal protective equipment at a level appropriate to the excavation of a crypt (Bournemouth University)

coffins, mattresses and other padding, and outer wood should be treated with a formaldehyde solution and then treated as domestic waste. The concentration of formaldehyde solution is critical as it must be strong enough to disinfect but not so strong as to cause problems in use.

The disposal of liquid waste should be performed initially by collection. Little is known about the biochemistry of body liquor. Consequently, samples should be taken, treated with formaldehyde and then analysed for heavy metal content. This should provide important information that may allow the liquid to be disposed of in the normal foul sewer system. Other samples could be taken for biological analysis if an appropriately licensed institution is able to do so. Depending upon the results of both analyses, liquid waste such as this may have to be disposed of as clinical waste. As quantities cannot be predicted before an excavation, it is recommended that a contingency fund should be allocated for this specific purpose. Soft tissue removed from individuals with differential survival of soft tissue must be disposed of as clinical waste, as must such items as used personal protective equipment.

Movement of heavy materials and coffins

It is possible that in some crypts at least the upper levels of coffins in vaults will have to be moved intact to facilitate an adequate level of recording. The weight of these coffins in confined spaces with restricted headroom will mean that a careful assessment of manual handling operations and requirements must be undertaken. Mechanical aids will be required and the most appropriate system selected. It is clear that some type of conveyor / winch system will be required for the movement of large amounts of rubble, lead etc, particularly where stairs are present.

Post traumatic stress disorder

Post traumatic stress disorder arises from being confronted with situations / scenes which are outside the realm of 'normal' human experience. While 'normal' is to some extent defined culturally, there are variable levels of tolerance in individuals at different times. It is presently believed that circa 4–5% of those exposed to stressors may suffer medium- to long-term problems as a result. Further, current research into this condition suggests that each individual has a 'trauma' threshold, which can be reached and breached by events which on their own might not be considered serious (Kerry Young pers comm). The opening of sealed coffins and anticipating what may be inside, as well as exposure to dead bodies and putrefying human remains may be significant stressors for some individuals.

Experience gained from those who work in body recovery operations e.g. ambulance drivers and air crash investigators (Thompson and Solomon 1991; Thompson 1993; Thompson *et al* 1994; Thompson 1998) suggests that the following working practices be adopted:

- all staff are fully appraised of the overall rationale behind the project before it begins
- staff short-listed on grounds of qualifications and experience are interviewed by experienced counsellors and appraised of the psychological issues
- a small group of individuals who are specially selected and / or experienced are involved in opening sealed coffins
- the workforce have daily informal debriefing sessions
- the workforce spend non-work time in each others' company
- debriefing sessions take place, possibly weekly, under the guidance of appropriately qualified counsellors
- all staff are aware of the symptoms of PTSD
- the working environment is conducive to open discussion and acknowledgment of human responses to emotive situations
- the positive aspects of the project are continually reinforced both during and after completion of the project

Infectious disease

A major health and safety concern is the possible exposure of operatives to microbial agents, whether bacterial, viral or fungal. Discussion with a wide range of specialists and the statutory agencies (ie EHD and HSE) is essential to determine a safe system of archaeological practice within the specific crypt burial environment. It should be noted here that some EHDs seem not to be aware of their obligations in respect of operations that involve disinterment of the dead. In such cases, polite perseverance is recommended as ultimately, failure to observe current legislation is the legal responsibility of the operator.

Human remains, particularly cadavers, have the potential to pose infectious hazards to those who handle them (Healing *et al* 1995). However, the use of appropriate protective clothing and the observance of *Control of Substances Hazardous to Health* regulations should protect handlers. In the UK, five diseases (smallpox, cholera, plague, relapsing fever and typhus), are statutorily

notifiable under the *Public Health (Control of Diseases) Act* 1984. Where a crypt is to be excavated, it is crucial that liaison takes place with the Advisory Committee on Dangerous Pathogens.

The excavation of human remains from a crypt context will almost certainly occasionally include dealing with remains with surviving soft tissue. Organisms responsible for plague, cholera, typhoid and tuberculosis are unlikely to survive long in a buried cadaver *(ibid)*. However, the risks posed by anthrax and smallpox are less easily defined.

Anthrax

Anthrax can form highly resistant spores affected by moisture, temperature, and pH *(ibid)*. Such spores can survive in dry aerobic conditions. A recent paper (Redmond *et al* 1998) suggests that spores can remain viable for at least 80 years in a context where no special precautions had been taken. It seems likely that anthrax spores might be located at sites where animal products were handled but that generally, it was not a common cause of death after the end of the eighteenth century. Humans are moderately resistant to anthrax that can be cured with the use of penicillin *(ibid)*. Vaccination against anthrax is possible though undesirable as it can cause unpleasant side effects. It is generally not possible to know if any of those interred within a crypt was an anthrax victim, but the possibility remains that some might have been. Further to this, coffin padding might include animal by-products (ie horse hair), as could sanitising spoil and these present a possible risk. For this reason, it is recommended that only those who are tolerant of penicillin, or its alternatives, should be employed on crypt excavations.

Smallpox

For a full discussion of smallpox and funerary archaeology see Young (1998). Smallpox is considered to be eradicated worldwide. Britain has been relatively free of the disease since 1935 with the last case being in 1978. Although compulsory vaccination ceased in the 1950s, some were vaccinated in the early 1960s with very few vaccinations taking place by the early 1970s *(ibid)*.

It is always going to be probable that some of those interred within a post-medieval crypt will have died from smallpox. Such a case was recognised at Christ Church, Spitalfields (Reeve and Adams 1993). The risk to health exists where previously infected inhumations within a crypt will have surviving skin with scabs (the site where the virus might survive). Although the chance of this occurring is minimal, the potential risk to public health is so great that general working practice must accommodate such an eventuality. Furthermore, a contingency plan for dealing with a cadaver showing evidence of smallpox must be in place.

Following discussions with smallpox expert Dr Susan Young, the Centre for Applied Microbiology and Research (Porton Down), an EHO and the HSE, a protocol for dealing with this issue was drawn up in 1995a (Cox unpubl). As a guide:

- where possible, prior to excavation death certificates should be obtained (for those dying after July 1837) in order to recognize those dying of smallpox prior to opening their coffins. Exceptionally parish registers state the cause of death. Relevant records should be checked prior to the commencement of work
- a core sub-group of archaeologists must have had a vaccination against smallpox in childhood – to be verified by a scar
- this sub-group should receive instruction in identifying situations where expertise should be requested
- sealed coffins should be opened ONLY by the sub-group, NO other member(s) of the team should be present in the crypt at such times
- operatives should be double-gloved when opening coffins
- if skin survives, a nominated specialist should be called in to inspect the remains
- in the event of a suspicious find those exposed would be re-vaccinated and placed under medical supervision for 21 days
- a protocol should be established with the London Communicable Diseases Surveillance Centre for the analysis of tissue in the unlikely eventuality of smallpox scabs being found
- during this time the crypt would be sealed
- a specialist should attend such cases and if skin survives samples should be taken for analysis, the remains should then be bagged and removed for immediate cremation
- the spoil from each vault would be stored separately until the vault is completely excavated after which time (assuming no smallpox event) the spoil can be disposed of as non-clinical waste

While the likelihood of either smallpox or anthrax presenting a practical problem during a crypt excavation is considered remote, the implications of recruiting individuals to such projects who have inadequate or damaged immune systems must be considered. This is a difficult and complex issue. While discrimination must be avoided the health of individual employees (ie those with compromised immunity) must be protected.

Females should be advised of the potential risk should they be or become pregnant during the excavation (pregnant women have reduced immunity). Those who are HIV positive would also be at increased risk.

Lead oxide

Regular blood tests of staff demonstrated that lead poisoning was a major problem during the excavation of the crypt beneath Christ Church, Spitalfields (Reeve and Adams 1993). This arises from the availability of lead oxide after coffins are disturbed or opened and moved with consequent inhalation and ingestion. The PPE described above is of a standard (face masks with PPE3 filters) to ensure that lead oxide can neither be inhaled nor ingested.

Flexibility

While a thorough and extensive health and safety protocol must be produced and approved by the EHD before excavation commences it is possible that unforeseen areas requiring effective solutions will arise during the course of the project. Equally, some proposed solutions may prove impractical and require an alternative strategy. The key to successful management of health and safety issues in such a project is continued liaison and negotiation with the relevant EHD, as the enforcing authority. Crucial to the success of a project is the ability of all systems to be modified as necessary.

Post-excavation Historical Research

A programme of historical research should take place at the assessment stage of the project in order to inform any evaluation and subsequent excavation. A further programme of detailed and targetted historical research should take place after the excavation is complete, to address specific research objectives determined by the nature, extent and condition of materials and human remains recovered form the site. Such historical research could be structured to consider research into the following areas:

- the use of the crypt as a place of burial and subsequent usage
- funerary practice
- the environmental and socio-economic history of the parish
- local and regional environmental conditions, including climate, sanitation, diet, water supply and epidemics
- portraits of those interred should be sought
- biographical information relating to individuals interred within the crypt. This should include information on:
    - familial groups and relationships
    - addresses through life
    - father's occupation
    - education; occupation
    - spouse(s)
    - children
    - health
    - place and cause of death
    - diet

It is paramount that only qualified and experienced historians should undertake historical research. The risks in not following such advise are discussed by Cox (1995b).

Artefact, ecofact and sample analyses and curation

It is beyond the scope of this paper to consider post-excavation processes in any detail. Suffice to say that standard procedures should be followed including assessment, analyses, archiving and publication at a variety of levels in line with current IFA *Standards and guidance* (IFA Ferguson and Murray 1997; English Heritage 1998; Walker 1990) and codes of conduct. Prior consultation with appropriate specialists is crucial, but particular attention should be paid to the scientific potential of the human remains and other materials, ensuring that contamination from living people and between the dead is avoided as far as is reasonably possible. Appropriate storage of biological materials should be ensured in order not to compromise their scientific potential, facilitating a wide range of analyses by researchers. Conservation methods altering the bio-chemical state of materials should be avoided where possible. Where this is unavoidable, it should not be undertaken before samples are taken for biomolecular analysis.

Publication

The most appropriate mode of publishing the results of major archaeological projects is currently under discussion and it is no longer the straightforward issue

of yesteryear with the wide range of electronic and other options available. Whichever mode is selected from the dissemination of results to other archaeologists and interested academics, it should not be forgotten that such high profile projects with immediate human relevance will attract a wider range of interested parties than may normally occur with archaeological projects. Dissemination of information at a more popular level should also be considered. Public interest in such projects may merit the production of a popular account of any future crypt excavation as it has in the past (e.g. Cox 1996a).

Conclusion

This paper has set out to make recommendations for the specific context and materials encountered in an archaeological approach to crypt clearance. It is not exhaustive, nor prescriptive, but is intended to act as guidance for the design and execution of crypt projects. It is important to note that at several places in the text, interested parties are referred to appropriate specialists (ie legal, psychiatric, health and safety, anthropological and archaeological science) for specific and up-to-date advice on crucially important matters. Above all, it is the wish of the authors that this advice in particular, will be heeded in order to ensure that a professional approach to such complex projects will prevail and that the scientific and historical potential of crypt archaeology is realised.

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