

# From City site to research archive....

Andrew Westman  
Liz Shepherd

## Introduction

AT THE END of 1991 the Museum of London's two archaeological departments were merged into a single archaeological service for the whole of London. Previously the Department of Urban Archaeology (DUA) had operated in the City of London and the Department of Greater London Archaeology had operated outside the City. With other colleagues we were responsible over the last 3-4 years for developing and supervising an important part of the DUA's post-excavation work, especially the compilation of archive reports using stratigraphic site records. In this article we take the opportunity to look back at some aspects of this work.

The DUA began operating as an archaeological rescue unit in the City in the autumn of 1973. The 'Square Mile' is not only the site of the Roman and medieval city but rates as one of the busiest and richest financial centres of the modern world. Physical redevelopment still frequently entails archaeological excavation, financed largely, and since 1983 almost exclusively, by private and public sector developers themselves. The DUA's own efforts matched these financial resources to the perceived archaeological need. The 'Big Bang', or deregulation of the Stock Exchange in the autumn of 1986, signalled a huge boom in the City's redevelopment and consequently in the DUA's rescue work. This boom lasted until mid-1990, when a general economic recession threw everything quickly into reverse, drastically curtailing archaeological work in London as elsewhere.

The DUA had quickly become well known for its site recording system, suited to the deep and complex stratification of archaeological sites in the City, and of course this system, suitably streamlined, continues to be used. The DUA's post-excavation work is less well known but was equally characteristic. This aimed at building a comprehensive research archive, interpreting and making accessible all data from all sites the DUA investigated. The research archive is made up of 'archive reports', dealing with the stratigraphic, finds and environmental data from particular sites. Data already processed and in this research archive could then be used to put together reports for wider publication, being selected on a thematic, period or topographical basis.

The kind of report we dealt with presents an account mainly of the stratigraphically-determined sequence of events in the history of a site. Sometimes called a structural report, this account is derived from and refers fully to all the stratigraphic site records, is illustrated,

dated as far as possible and summarised for cataloguing purposes. It corresponds to a 'site narrative' in the terms of *Management of Archaeological Projects*, with the important addition that its constituent interpretations and the evidence for them are also systematically indexed and cross-referred.

## Sites and site recording

Any method of analysing site records and compiling a report depends on the recording system used on site, which in turn should reflect the prevailing site conditions. Typically, the stratification of long and densely occupied urban sites is deep and complicated. Intensive occupation and rebuilding means that many successive foundations, cellars, pits and other intrusive features have cut into their predecessors, truncating or obliterating them. An historical build-up of the material remains of a city is countered by a tendency to dig deeper and larger foundations, basements and services.

Horizontal deposits, structures and cut features survive only in a highly fragmentary form, being chopped up into islands of strata by later intrusions. Different areas of a site may not be excavated at the same time. The connections between one part and another may not be understood even if they are visible simultaneously. Their significance and interrelationships may depend on what went before, the remains of which are yet to be excavated or the existence of which is to be deduced. Much of the history of a site is anyway a matter of interpretation, the evidence for which cannot be analysed on site or during excavation. In short neither the supervisor directing excavation of a city site nor anyone else can expect to understand fully all that she or he sees while excavation proceeds.

The DUA's recording system does not merely compensate for these conditions, however, but actually capitalises on them, encouraging subsequent analysis of the records that can be as systematic as their initial recording. For this purpose the most relevant operating principles of the recording system are as follows: (1) contexts, the basic units of record, are generally recorded one at a time and are drawn in plan individually, (2) the order of recording and of excavation is determined stratigraphically, if possible, and this order can be verified and demonstrated by overlaying the individual plans of successive contexts, (3) contexts are defined relatively easily and they have interpretative meaning, (4) the same people

i. English Heritage, 1991 *Management of Archaeological Projects*

record contexts as excavate them, and (5) a site supervisor checks these records promptly, while excavation proceeds, and is thereafter primarily responsible for further assessment and interpretation of them.

Importantly, principles (1), (2) and (5) make it easy for a matrix or stratigraphic sequence diagram of contexts to be compiled while excavation is in progress. These relationships can always be reassessed later, using the plans of individual contexts, and reinterpreted, if necessary.

A large proportion of contexts on a typical urban site are cuts, recorded individually in plan. Frequently their original contents have been replaced by some later infill, and the level from which they were originally dug has been truncated, leaving much to be deduced or reconstructed: principles (1), (2) and (3) allow all this to be done later.

Principles (4) and (5) encourage excavators making records on site to think about what they're doing: they're bound to make stratigraphic decisions, and test these decisions, continually. In fact the recording system prompts them to record their own wider interpretations on the same pro forma sheets as they record more factual observations, while scrupulously distinguishing these from each other.

This system generates comprehensive records whose orderly form opens them easily to interrogation at any later time. A practical effect is that archaeologists need do on site only what they must do there and can defer until later other processes of analysis and interpretation, with an efficiency that has become an absolute necessity in the physical conditions of modern redevelopment and the modern building industry. A corollary is that many of the deferred processes are still indispensable to making the original records properly understandable and accessible.

### The research archive

Just as the stratification of a typical individual site is highly fragmented, so is the archaeology of a city, on a larger scale. Modern redevelopment determines the boundaries and timing of a rescue excavation, and all stages in the history of a site are unlikely to be understandable in isolation. In this respect, as others have said before, an entire city is rather like a single archaeological site: understanding individual fragments of a city benefits from, and may require, the systematic gathering and analysis of other fragments. For example, Roman strip buildings may be found in one modern site and their backyards in an adjacent site, or a medieval religious house and its cemetery may be excavated at different times, and so on.

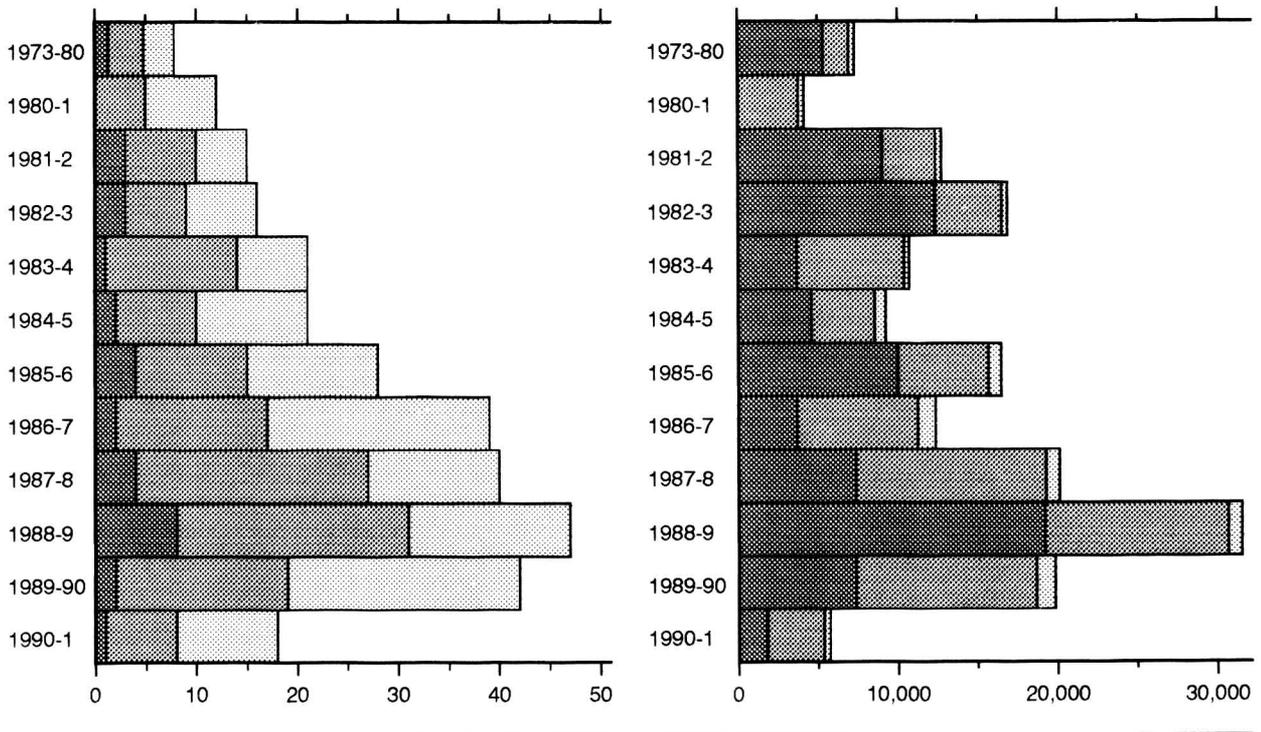


Fig. 1 LEFT: number of sites investigated per year. RIGHT: number of contexts recorded on site per year. Dark tone: large sites (more than 1500 contexts); light tone: small sites (less than 150 contexts); medium tone, sites in between. Work on a few sites was amalgamated or ran intermittently from year to year. Figures for 1973-80 are an annual average and figures for later years are annual totals.

For connected reasons, therefore, the DUA not only developed a relatively rigorous system of site recording but also adhered to the aim of building up a research archive<sup>2</sup>. This form of archive was put forward originally as a kind of way station between site work and formal publication, in the Frere Report<sup>3</sup>, a principle endorsed by the Cunliffe Report<sup>4</sup> and *Management of Archaeological Projects*.

The DUA's archive contains a twofold archaeological product comprising, firstly, all original site records, finds and environmental material in a 'site archive' and, secondly, the results of all subsequent analysis of these records, finds and material in a 'research archive'. These archives correspond, in the terms of the Frere Report, to Levels II and III respectively of the four levels through which information about a site passes, from the state of knowledge before excavation begins to wide publication of the results.

An individual site, no matter how small or large, would normally give rise to at least one archive report, the structural report, analysing and interpreting all the stratigraphic records from that site. Specialist and other reports may be compiled about a site but all will refer to the structural report. After thorough analysis, demonstrated by compilation of reports forming a research archive, all the original contents of a site archive are more easily open to reinterpretation later, perhaps in the light of greater knowledge.

Reports on individual sites form the bulk of the research archive, but neither sites nor their respective reports are independent entities. This is true both of the structural history of sites and of the analysis and interpretation of finds and environmental material which, even more than site records, must be analysed and interpreted on a city-wide basis.

### A system for compiling reports

In the DUA's early years most of the responsibility for compiling a report was placed on the shoulders of whichever individual member of the field staff had been appointed to supervise an excavation. The arrangements made to provide advice and help were relatively informal, however valuable such advice and help were. By 1986, however, a new site was starting every one to two weeks throughout the year, on average, with subsequent reports to be completed at an equivalent rate (Fig. 1).

New arrangements were necessary to promote consistency and standards. Consistency in the principles, organisation, layout and terminology of reports makes them more usefully comparable and also easier to compile and to understand. Consistency is indispensable to indexing and to drawing conventions. Reports were compiled by many staff with different kinds of experi-

ence and ability. Their work and that of many different specialists required coordinated timetabling.

By 1986 a mountain of archaeological data was being produced. The characteristics of these data had not changed in themselves, and the basic aims and methods of stratigraphic analysis and reporting were already established. The site recording system was published in 1980 and recently brought up to date<sup>5</sup>, and methods of analysis and reporting using stratigraphic site records were codified in 1987 and 1990<sup>6</sup>.

We considered that our main task as post-excavation supervisors was to remove mystery and luck from post-excavation work, making it less a haphazard matter of individual flair and idiosyncrasy and more methodical and cost-effective.

While excavation continued, a site might be assigned to a post-excavation supervisor who would see the site at first hand, could give advice about recording and would think ahead about the reporting process.

When excavation ended a 'debriefing' and brief appraisal of the products of site work — stratigraphic and other site records, finds and environmental material — served to clarify the aims, scope and priorities of post-excavation work. Nearly every project originated as 'rescue', however, and until recently the archaeological aims of any particular project were not usually expressed fully or explicitly in a 'research design' at an early stage. Its archive report was usually assumed to conform in scope to the established model. This didn't always have to be so, of course, even if one could afford it.

A site supervisor would come off site ideally with a full complement of checked records, including a Site Plan (connecting the site externally to the Ordnance Survey national grid and datum, as well as locating all archaeological data recovered internally, to a uniformly high degree of accuracy) and a complete stratigraphic sequence diagram of contexts (or site matrix). They would also have plenty of ideas. We would tell them at once to set their ideas aside for the time being, especially all notions to do with specific dating.

Producing a brief Interim Report at this stage could help an author to question assumptions and could be used directly to assess the results of excavation and reassess the aims and the scope of a report.

Analysing all site records can sometimes look like a daunting amount of work, but the system automatically breaks this down into manageable small tasks, and the normally serial and additive organisation of a report also helps. A post-excavation supervisor should be in a position to provide information and advice to a site supervisor actually compiling a report, to check batches of work, give encouragement and generally exercise quality control.

2. J. Schofield 1986 (ed) *DUA Archive Guide*

3. Department of the Environment 1975 *Principles of Publication in Rescue Archaeology*

4. Council for British Archaeology & Department of the Environment 1982: *The publication of archaeological excavations*

5. Museum of London, 1990 *Archaeological Site Manual*

6. Museum of London, 1990 *DUA Archive Report Manual*



The apparatus of a report includes such elements as Site Location (based on the Site Plan already mentioned), Background to the Investigation (explaining the research design and archaeological aims of a project), Site Conditions and Method of Work (describing the circumstances of work on site that may have affected stratigraphic excavation, finds recovery or environmental sampling, and warning a user of a report of any abnormalities), Bibliography, Abstract and so on. The core parts of a report are the Archaeological Sequence, followed by a Synthesis and Index.

### **The Archaeological Sequence: contexts, subgroups and groups**

The Archaeological Sequence is a framework for organising and presenting the evidence for the history of a site contained in the recorded contexts, with analytical description and explanation to appropriate levels of interpretation and degrees of detail.

Contexts are the essential ingredients of a sequence, and a sequence is constructed of progressively larger building blocks of these. Contexts are arranged firstly in 'subgroups' and then subgroups are arranged in 'groups', so that every context is in a particular subgroup and every subgroup is in a group. These terms are meant to be utilitarian and interpretatively neutral, like the word 'context' itself. Each kind of building block takes an appropriate form in a report, using diagrams, lists, tables, plans, other drawings and text, as necessary.

Contexts are usually placed in a subgroup if they are directly related to each other stratigraphically and if they are interpreted as representing a single phase of activity. This interpretation should be explicit in accompanying text, and is eventually embodied in the Index partly in processual terms ('construction', 'use' and 'disuse' and their equivalents and combinations).

For example, a series of contexts which were directly connected stratigraphically might be put into four consecutive subgroups: (1) make-up dumps and a ground surface on top of them, (2) a pit dug from from this surface, with its lining and a primary fill surviving in it, (3) a secondary fill, the latest fill within the pit, marking its last use, and (4) further make-up dumps sealing the infilled pit, marking its disuse and levelling up of the ground in preparation for the next activity. Of course the same contexts could be interpreted differently and the subgroups redefined so that, in this example, (1) and (2) were merged and the primary fill in (2) separated from preceding construction of the pit, or alternatively (3) and (4) could be merged. Other possibilities can be envisaged.

A subgroup can be thought of as a unit of interpretation, at a suitably low level, rather than as a mere collection of units of record (Fig. 2 LEFT). Dating and other information that derives from its constituent contexts can be applied to the subgroup as a unit, as this should not be subdivided later nor subsumed into another subgroup.

Subgroups are identified, starting at the beginning of every line of successive contexts on the sequence diagram and moving methodically up the sequence. The numbering of contexts, as primary units of record, is without any interpretational significance. This diagram can be annotated to show how subgroups are interpreted.

Naturally the correspondence between what survives on a site to be recorded in the shape of successive contexts and what original events and phenomena these contexts represent is rarely simple. The very strong definition of some contexts may be highly misleading if, for example, they embody the effects of some post-depositional process: 'dark earth' (a very recognisable, homogeneous kind of deposit, apparently of late Roman and sub-Roman date) is a problematic case. On the other hand it hardly needs to be said that many events will be quite unrepresented in the site record, or will be represented only by implication: the most important task is to recognise at least the absence of chunks of a site's history, such as would be caused by robbing of *in situ* building materials for reuse or wholesale truncation of pre-existing strata by cellars and sewers.

A sequence diagram of contexts contains, to use a theatrical metaphor, many entrances but few exits. The retention of features in use, or simply survival *in situ* but not in use, is usually understandable only by examining spatial relationships recorded 3-dimensionally, on single context plans with spot heights, and by plotting in plan those contexts recorded originally only in section. For this reason, the more complicated subgroups at least are drawn in outline by the author of a report, both to test and to demonstrate an interpretation (Fig. 2 RIGHT).

This is an outline plan at a scale of 1:20 showing a subgroup as a whole, traced from the plans drawn on site of individual contexts. Making this plan serves as a check on the spatial connection and sequence of these contexts, and can be used later suitably reduced to build a plan of a group.

Unlike a subgroup, which is narrowly defined, a group relates its constituent subgroups to each other and excludes other subgroups in a much more interpretative way. A group may conveniently embrace the evidence for a feature such as a building, a structure less substantial than a building, an open area (a garden, yard, cemetery, or an area opened up between demolition of one building and construction of the next), a waterfront (its extensions and renewals), a road and its roadside ditch, and so on. This could be many phases in duration, represented by subgroups in succession, but would not necessarily extend over the whole site.

An individual group appears in a report on a plan (Fig. 3 TOP), in a sequence diagram (Fig. 3 BOTTOM), is discussed in accompanying text, as necessary, and its constituent subgroups and their contexts are all cross-referred in the Index. Both plan and text show what the constituent subgroups of the group are taken to represent, at a higher level of interpretation than that appropriate to

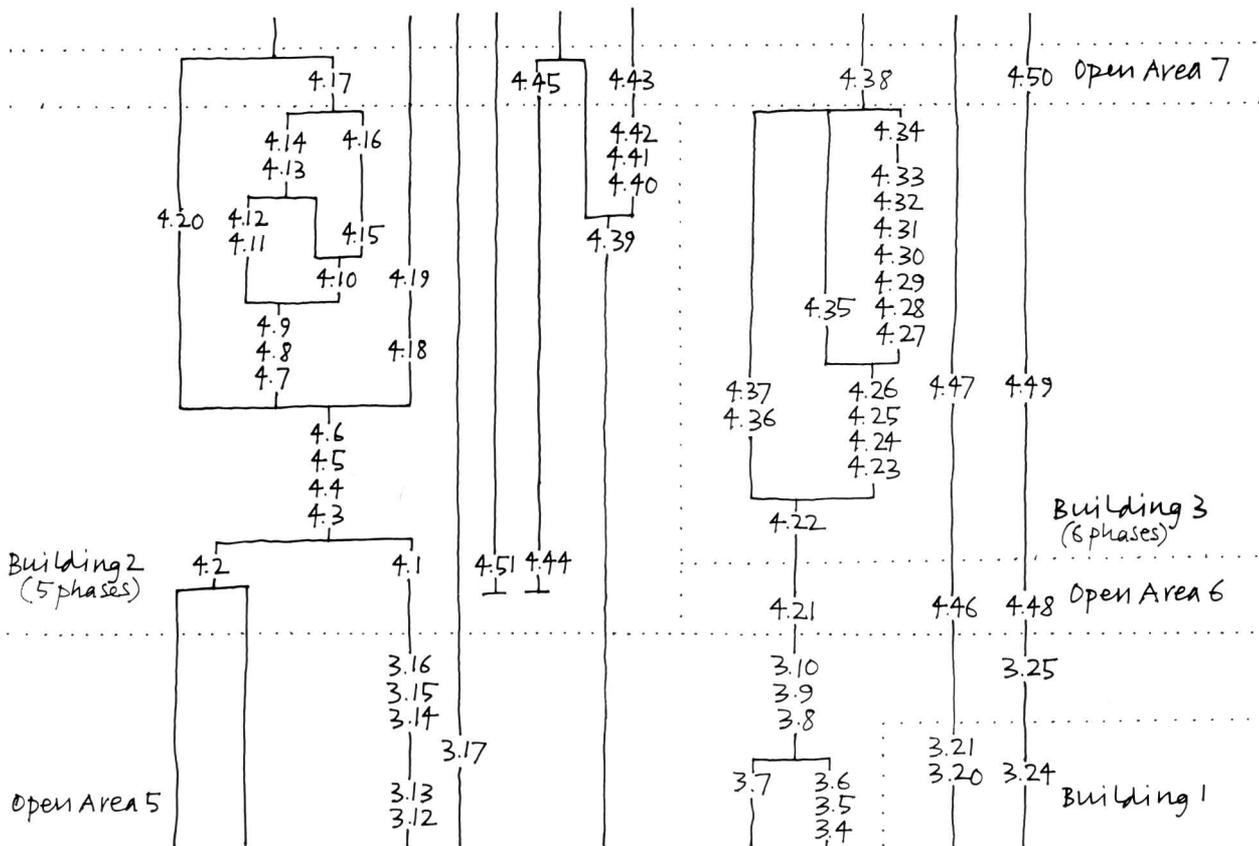
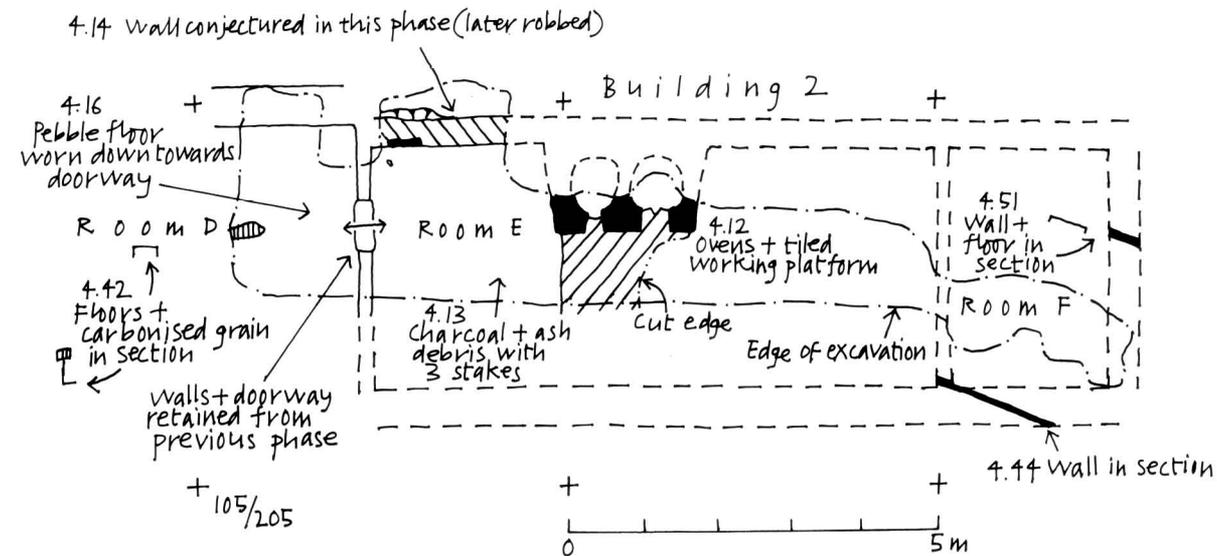


Fig. 3 TOP: typical plan at 1100, showing part of a group. This is based on the plans of constituent subgroups but is more interpretative, like a snapshot view of the site at a particular time.

BOTTOM: typical simplified sequence diagram showing subgroups put into groups and placed, if feasible, in phase with each other. Subgroups are renumbered definitively by group, setting out the sequence in a logical order according to both stratigraphic relationships and interpretation.

subgroups alone, notably including also conjectured and retained elements, using simple drawing conventions.

Every group is drawn in plan at a scale of 1:100, using the Site Plan (which is normally at this scale) as a base plan and covering ideally all the site. The plan of a group is derived from the plans of its constituent subgroups but is more interpretative, corresponding to a snapshot view of the site at a particular time. A group may not extend over the whole site, of course, but several groups can be put on the same plan if they are interpreted as contemporary.

Numbering of groups and subgroups, unlike numbering of contexts, is not only for convenient reference back to the primary evidence but also sets out the constituents of an Archaeological Sequence in order. Group numbers begin with 1 (natural strata in most cases). Subgroups in Group 1 are numbered 1.1, 1.2, 1.3, etc; in Group 2, 2.1, 2.2, 2.3, etc; and so on.

This composite numbering progresses according to the logic of both the stratigraphically-determined sequence and the interpretative placement of subgroups and groups in phase with each other. Ideally, a lower composite number always comes before a higher number everywhere in the sequence. Consecutive composite numbers may, however, be in the same phase.

Complicated stratification invariably leaves the author with interpretational choices which sometimes may be quite difficult. Correlating subgroups between stratigraphically separate strands can only be done, firstly, by considering their functions and spatial relationships. One has to work methodically from the beginning to the end of a sequence: progress is incremental, interpretations depending on what happened before, and sometimes on what is in evidence only later, as when repairs are made to a building or its materials are robbed, obliterating direct evidence of its previous state. Often stratigraphically isolated subgroups are 'in phase' with each other only by implication and, if doubt persists, one should allow such subgroups to 'float' upwards in a sequence as far as possible.

**The Synthesis: a view of land use through time**

A narrative history, more fluent than the Archaeological Sequence and incorporating all other pertinent archaeological evidence available, especially specific dating information, forms a distinct part of a report, the Synthesis.

The Synthesis does not repeat the original evidence, whether stratigraphic or dating, but constitutes a fully interpreted account of the history of a site, in chronological order, with ample references back to primary evidence. These references are mainly to the numbered groups and subgroups, of course, allowing a user easy access to the author's detailed reasons for interpretation of any given element of the structural sequence and to the reasons for ascribing a specific date to any part of it. A Synthesis can include explicit references back to

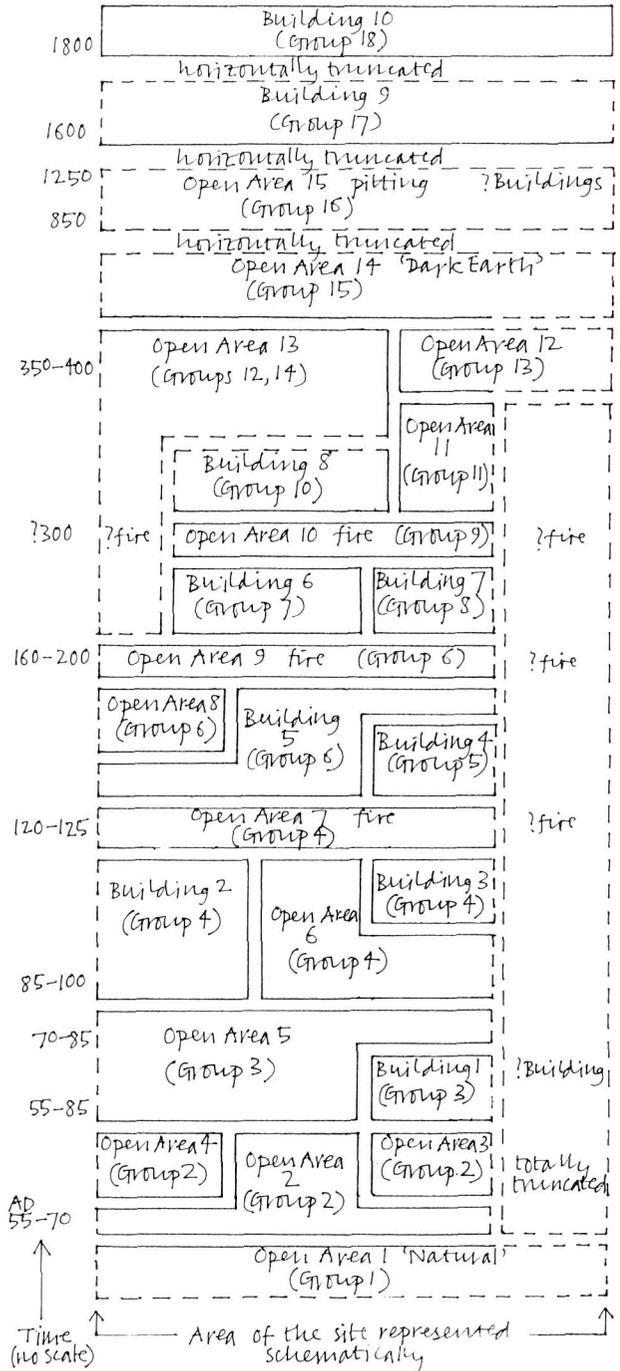


Fig. 4: typical Land Use Diagram, with dates added. A blank on this diagram, implying complete absence of data, would be filled conjecturally if possible. This diagram can thus show features such as buildings and open areas when they are thought to have existed even though direct evidence for them may have been entirely removed by later robbing or truncation.

questions posed in the research design, referenced interpretations of finds and environmental data, and comparative information from other sites and sources.

This narrative Synthesis is punctuated by subheadings that refer in the first place, not to groups and subgroups, but to what these mean as episodes and features in the history of a site, using certain indexing terms: 'Building', 'Open Area', 'Waterfront', 'Road', 'Structure' (less substantial than a building or waterfront) and so on. Each kind of episode or feature is numbered in serial order, their constituent groups, subgroups and contexts being indexed accordingly, and they also appear in their own form of sequence diagram, a Land Use Diagram (Fig. 4). This diagram can show the passage of time realistically, if necessary, but can show spatial relationships only schematically. Plans show spatial relationships more realistically, of course.

Site-wide plans, preferably as drawn already to show groups but including several groups at once if necessary, illustrate the Synthesis: they are rather like slices cut horizontally across the Land Use Diagram.

Information for specific dates, from interpretation of ceramics, glass, coins, tree rings and so on, can be applied to the stratigraphic sequence as a succession of *termini post quos* for successive subgroups. At its simplest a dating table, or matched list of subgroups and TPOs, should throw up anomalies and suggest refinements which the Synthesis can include. These considered dates can be applied to the Land Use Diagram.

The DUA's practice was always to separate quite firmly, on the one hand, analysis of the stratigraphic record and construction of a relative sequence of events based on that, and on the other hand, analysis of datable artefacts and samples and construction of a more specific chronology. This was not only an expedient division of labour but it discouraged false assumptions and unproven assertions about date, allowing due weight to be given to different kinds of evidence and averting circular reasoning.

Sometimes, however, even the simplest relative sequence is impossible to deduce from stratigraphic records alone if, for example, a site contains only truncated features cut into natural strata: a preference for the specific dating evidence would then be made clear in a suitably annotated stratigraphic sequence diagram.

Graphics specialists as well as finds and environmental specialists, and a post-excavation supervisor, can give advice to an author: making drawings is an integral part of analysing the record. We usually tried to speak of authors 'compiling reports', rather than 'writing up', for precisely this reason. There was not a literary task and a report is not a work of literature. We do not mean that an author's written text is unimportant, but it must do the same job as the drawings: convey information and an interpretation with economy and clarity. The most important words are always an author's own, in the first person, explaining her or his reasoning.

A report should reflect all that an author has done. Users of reports are expected to consult the Abstract, Index or Synthesis first. If they go further they will want to see an author's 'working out', which is therefore at least as important as the 'solution', especially if there is no single, obvious solution. Problems must not be hidden or even minimised: they may prove fruitful. An archive report is probably the best place to lay such problems out, examine them honestly and present alternatives, as necessary.

Sometimes we found that we had to discourage authors from repeating themselves, or else encourage them to express their reasoning at all. Few authors (nor we!) are so naturally well-organised that they say exactly what they should, when they should, in compiling a report. The clear framework of an Archaeological Sequence provides several ready-made places in which to store ideas and questions as they arise. For example, large ideas can come to mind when one should be dealing simply with contexts: these ideas can be collated for consideration later at the level of the group. Conversely, doubts about the accuracy of the stratigraphic sequence as recorded ought to be dealt with at the level of contexts and subgroups.

Stratigraphy is always discerned with less than perfect objectivity and contexts are not always well defined. The questions of interpretation that arise are exactly what we want to see aired in a report. Stratigraphic

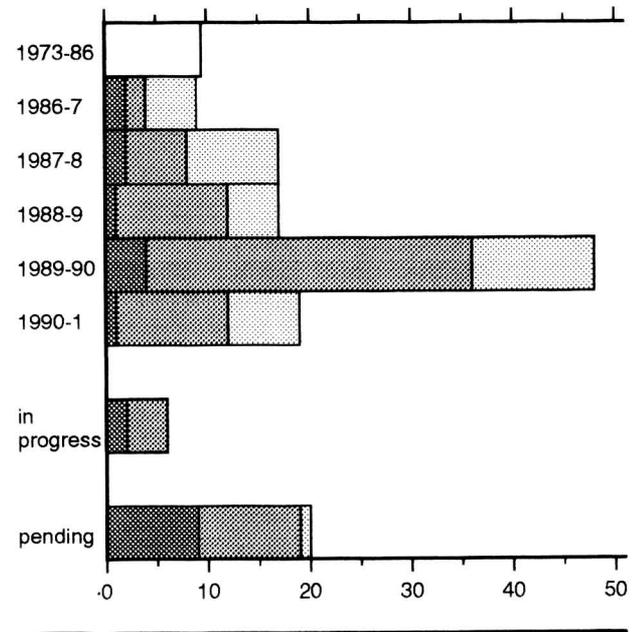


Fig. 5: number of archive reports completed per year (large, medium and small sites as in Fig. 1). Figures for 1973-86 are an annual average (for sites of all sizes) and figures for later years are annual totals. 'In progress' excludes small sites. 'Pending' means reports begun after 1986 and interrupted since then.

relationships can always be reinterpreted, provided evidence exists and reasons are given: an author can present the sequence as originally recorded (which will always stay unchanged in the site archive) next to the reinterpreted sequence (which will always be in the research archive) and make an explicit comparison.

In the same way an author can relegate contexts that are interpreted as spurious, the result perhaps of over-recording, and can impute contexts, for which some evidence exists in the original record although they were not defined as such on site.

Ideally work would be organised in three main stages, making subgroups, then making groups and finally incorporating these and provisional dating into a Synthesis, facilitating orderly progress (Fig. 5).

This bar chart shows the number of archive reports completed per year, and should be compared with Fig. 1, showing incoming work.

### Publication

These reports were never intended to be published in full in the conventional way, which would have been prohibitively expensive and, moreover, unnecessary. As components of a research archive they are all publicly accessible, in a passive and centralised form of publication. More active and disseminated forms of publication have hitherto been selective, thematic, topographical or city-wide in scope, 'developer reports' about an individual site for a donor or sponsor, an Annual Review of work, or simply by way of cataloguing the contents of the research archive.

The Abstract of a report, or a draft for it, also appeared in print in the annual *Excavation Round-up* in the pages of this journal and, edited, in other period journals and in an archive catalogue<sup>7</sup>.

After publication of initial, major thematic studies, and with so much more material accumulating, the DUA decided to aim at publishing more promptly in a Museum series, *London Archaeological Reports*, dated, illustrated structural sequences of individual sites. In other words, short reports of which the Synthesis in an archive report is a draft.

Simple, one may say, but whoever is compiling an archive report then has a greater burden placed on their shoulders. A significant part of a report — drawings, diagrams and dating tables as well as the text of a Synthesis — must be put in a fit state to be published with as little extra effort and expense as possible, although not to be underestimated. To the extent that parts of an archive report are made publishable in this way, more coordination is needed of all the work necessary to produce them.

### Ingredients of success

The system we describe, like the site recording system, was the fruit of long development. This development

continues, for there is always room for improvement. No improvement could be made, however, without taking some other factors into account which, however important to success, are unfortunately not easy to control: (1) the experience, ability and diligence of individual authors of reports, (2) the fallibility of computers and software, with costs of failure and a need for maintenance that are easily underestimated, (3) the dispersal of staff and equipment in far-flung premises, hindering communication and supervision, and (4) up to date and accurate financial accounting, to go no further.

We, and colleagues who preceded us, have expended a great deal of ingenuity in what may seem an excessively technical task. We have always been conscious of the importance of the human factor in this work. The system described here may seem to have been too structured and programmatic, yet it was essentially permissive: it was meant to liberate people from having to reinvent all the basics for themselves, allowing them to exercise imagination, and ensuring fair access to and consistency in their work.

Sometimes the very word 'archive' seems capable of deadening the soul. At best, a research archive sounds as if it were archaeology's whited sepulchre. This would be to assume that the system we describe was an end in itself. This was unlikely to be so, however, in at least four immediately important ways: (1) good assessment of future sites depends on information in the research archive, (2) site supervisors, having compiled a report, can ensure that better site records are made in future, (3) finds, environmental and other specialists depend on the research archive (using, for example, the Index of the phased sequence), and (4) the system culminates, potentially, in formal, active publication of the Synthesis of a report.

The material and intellectual investment in the post-excavation processes represented by the research archive and its component reports has meant that further research and publication should be easier and cheaper. A good report depends above all on the individual doing the job. That job is not unlike the work of excavation and recording on site in that it is often exacting and sometimes tedious, but site work is almost never done alone and is usually a very visible collective effort. A research archive is also a collective effort, on a longer time scale and with a wider view, and we hoped that this would become more obvious as its component reports were compiled.

### Acknowledgements

We thank Cath Maloney for supplying many of the statistics on which Figs. 1 and 5 are based, and Tony Dyson, Francis Grew, Friederike Hammer and Taryn Nixon for reading and commenting on an early draft of this article. The opinions expressed and any mistakes or omissions are our own.

7. Museum of London, 1987 *DUA Archive Catalogue*