Approaches to Residuality in Urban Archaeology

Alan Vince

Residuality and Urban Archaeology

One of the main justifications for working on the finds (in the broadest sense of the term) from urban archaeological strata is the potential they seem to offer for providing close control on chronology and a low incidence of post-depositional transformations (Cowgill et al 1987, Crowfoot et al 1992, Egan & Pritchard 1991, Grew & de Neergaard 1988). Assemblages from some of the Thames waterfront excavations in the City of London could be dated within very close limits and were internally consistent with their depositional dates. For example, these sites showed that in the later 12th and 13th centuries the changeover from one dominant pottery source to another, long used to give a relative chronology to inland stratigraphy in the City, took place abruptly (Vince 1985). The smooth lentoid curves produced by analysing pottery from these inland sequences were clearly the result of blurring of the original pattern by a myriad of processes.

By 1991, when HBMC agreed to fund a major programme of post-excavation analysis based on the results of c.50 excavations which had taken place in Lincoln between 1972 and 1987, the seriousness of the effect of residuality on the conclusions reached by a whole range of specialists working on finds from urban excavations was recognised. The post-excavation team at the City of Lincoln Archaeology Unit therefore was faced with a large problem. These 50 or so excavations offered the potential to study the archaeology of the entire city as a single site and to study some of the major themes in urban archaeology using a sizable body of data (Figs 1 & 2). These aims and objectives were listed in the Project Design submitted to HBMC and were designed to take advantage of the extensive geographical and chronological spread of the data at the expense of microstudies which could be carried out with better results through research excavation under more ideal circumstances at some later date.

The themes were:

Theme One: The extent of settlement in Lincoln and its suburbs through time and the development of major foci;

Theme Two: The study of spatial patterning within the town and its suburbs;

Theme Three: The examination of Lincoln’s hinterland and its trading contacts and the way in which changes in their extent and shape are related to the fortunes of the town itself (Vince 1991).

How exactly these themes could be studied using the data at our disposal was considered on a case-by-case basis. For example, a different approach is required when dealing with coins, which are usually datable and found in small numbers, than that required when dealing with animal bones, which can only be dated by their stratigraphic context and occur in vast quantities. These approaches can be summarised under four headings.

Professional Judgement

Most archaeological finds researchers are used to making judgements about the coherence of the assemblages they are studying by comparing the site narrative or basic stratigraphic record with the character of the finds themselves. At Beverley, for example, the presence of vivianite on iron objects recovered from aerobic deposits was used as an indication that these finds were redeposited as a result of disturbance of waterlogged deposits which underlay these late layers (Armstrong et al 1991). Many Romano-British artefacts are clearly datable and therefore can be identified as residual when found in post-Roman strata. Our approach to a number of these classes of artefact was to supply our specialists with a database giving the period and deposition date of the context in which the finds were found. These specialists also received a site narrative and sketch plans showing the location of the major features mentioned in the text. This gave sufficient data for the specialist to be able to relate the finds to the stratigraphic data and then to utilise this evidence in his or her report. This approach did, however, stretch the patience of specialists who were dealing with finds from hundreds of different contexts and from each site. Whereas it is quite reasonable to expect someone to try to understand the stratigraphic context of, say, less than one hundred individual finds it is a quite different matter once this task is multiplied by a factor of ten.

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Figure 2: Lincoln Excavations 1972-87 - Size of computer data files (KB) for selected data types.

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<tr>
<th>Area</th>
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Figure 3: Lincoln Excavations 1972-87 - Number of computer records for selected data types.

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Classification of Context Type

The approach which we adopted to the study of all finds from the Lincoln excavations was to make a basic archive record for every find, or group of finds. For pottery this basic record consisted of the number of sherds of each Common Name group (and, where clear, the form also) from each context. For animal bone the basic record was a fragment count. However, whereas the pottery basic record was sufficiently detailed to allow a considerable amount of subsequent analysis to take place the fragment count for animal bone was clearly insufficient. We could tell our animal bone specialists how many fragments a particular deposit contained (and this itself might be enough reason to exclude the material from further analysis) but we could not say what condition these bones might be in (which itself might be an indication of a mixed or residual assemblage) nor the size of the fragments (which would, of course, have been meaningless without some indication of what species were present). Since to create a basic record of this level of detail was ruled out on grounds of value for money (much of the recorded data would have ended up being redundant) another approach was required.

As a means of retrieval for internal use, every context group identified in the database was given at least one interpretative keyword from a restricted word list - for example, 'pit', 'robber trench', 'gully' or 'makeup'). Kate Steane and I used these keywords to classify deposits into what we took to be an order of their likely usefulness for animal bone studies. Thus, an assemblage of animal bones from the fill of a robber trench might be expected on average to be more likely to contain residual, mixed material than an assemblage of animal bone of similar size from a rubbish pit. We tested our classification by looking at the overall ratio of animal bone fragments to pot sherds for different classes of deposit, taking as our hypothesis that rubbish deposits should correlate with the frequency of animal bone fragments. At this level of analysis our model appeared to work, but individual features might well have a fill of refuse even if they were also interpreted as a robber trench. As we were to note on site after site, it is actually impossible to predict that a particular deposit would contain refuse simply by looking at its stratigraphic interpretation. Land reclamation deposits are the most obvious example of this duality. One stratigrapher might interpret a deposit as a response to the problem of refuse disposal and code it as 'dump' whilst another might take the same evidence and code it as 'make-up'. Our problem, of course, was that in our original system we had not distinguished between the interpreted function of a deposit and the interpreted origin of the material which made up that deposit. Furthermore, to take this sort of analysis any further would have required more detail than was actually present in the site records.

In the end we combined the evidence of stratigraphic interpretation with data derived from analysing the basic pottery record. Several comments can be made based upon our initial attempts to use stratigraphic interpretation as a means of selection of animal bone for further study.

i) Classification using controlled word-lists is essential for the efficient assessment and analysis of large stratigraphic data sets and, since any urban excavation archive might one day be required to become part of a larger data set, this actually means that virtually every urban excavation archive must contain sufficient data to allow classification to take place.

ii) We must make a distinction at the post-excavation stage between the functional interpretations of a deposit (soil profile, make-up, rubbish pit fill, for example), the interpretations of the origin of the deposit (river silt, redeposited sand, primary refuse, constructional debris and so on) and the identification of post-depositional transformations (erosion, soil formation, horticulture, root and animal disturbance).

iii) The relationship between a deposit's function and its content is complex and itself worthy of study. For example, at what point in a settlement's development does the disposal of rubbish lead to its being used as land-fill in preference to redeposited natural deposits? Does the incidence of refuse, or the circumstances in which it was disposed of, correlate with intensity of occupation, or the practice of certain crafts and industries, or was it simply random choice?

Stratigraphic interpretation alone therefore is seen in Lincoln as being the first stage in a process of increasingly detailed study of a site sequence. The next stage usually involves the study of pottery.

Pottery Assemblages as a Guide to Residuality

Using the basic archive record of the pottery from the Lincoln excavations it is possible to undertake some quite sophisticated analysis, providing a clear and accurate model of the succession of pottery sources and forms is known. From the Anglo-Scandinavian period until the end of the medieval period the range of pottery forms in common use was
Figure 3: The diagram shows successive pottery from successive phase of the site. The black histograms show the date range of the entire collection and the graphs show the date range of the collection excluding Samian ware. (LUB = land use block. Horizontal scale is date in twenty year time brackets, vertical scale is frequency of pottery.)
limited and the most common pottery sources were sequential. It is therefore possible to say with some certainty whether two sherds found in the same assemblage could have been in contemporary use. If they could not have been used together then the assemblage is mixed, although at this stage in analysis it is not possible to say what the cause of this mixing might have been. Given data on the sequence of pottery types by Jane Young, Kate Steane and I were able to calculate the percentage of pottery sherds of particular periods within each assemblage and from this to divide the assemblages into three groups: those with heavily mixed assemblages which are presumed to have had a complex taphonomy; those with relatively coherent assemblages in which the majority of sherds might have been in contemporary use and, thirdly, groups which consist mainly of contemporary material but with some residual pottery. We then used the presence of contemporary assemblages of pottery, as defined above, to modify selection procedures for animal bone study based on stratigraphic interpretation (Fig.3).

For Roman pottery a different approach had to be adopted; many of the common pottery fabrics used in Roman Lincoln had a very long life and most seem to span a long period. Changes in pottery sources really do seem to have been slow and gradual so that identifying residual pottery really requires a study of pottery forms as well as fabrics and has to be based more on the relative frequency of pottery types within an assemblage. For the animal bone assessment Maggi Darling and Barbara Davies produced a division of the Roman pottery fabrics into four major periods: first century, late first to second century, late second to third century and late third to fourth century. However, this classification had to leave out a large part of each assemblage which consisted of sherds of fabrics which could only be broadly dated.

This study was quite adequate for the purposes of animal bone selection but left a high potential untapped. The solution to this problem was presented by Paul Tyers who wrote a computer programme which allowed the combined dating evidence from any assemblage consisting of items with an earliest and latest possible date to be portrayed as a graph (this routine, plotdate is written in perl script and runs on our Unix server). Maggi Darling and Barbara Davies then took each fabric/form combination found in the Roman pottery of Lincoln and assigned an earliest and latest date to the type, based on a standard stratigraphic analysis of the pottery sequence. This lookup table was then used to transform the data set from any stratigraphic assemblage so that it could be compared to see exactly what differences there were between contemporary assemblages. The results were a revelation. They show that assemblages that contain almost the same range of pottery types and would have been given the same terminus post quem based on the presence/absence of pottery types could actually be distinguished and grouped in meaningful ways. For example, if the stratigrapher suggests that group X on an excavation was formed by the levelling and reworking of earlier stratigraphy this can be tested using plotdate by superimposing the plotdate graphs of the two sets of pottery. Similarly, the hypothesis that isolated deposits were derived from the same original refuse can be tested. This data can then be compared with the evidence derived from sherd links which may be able to confirm the relationship of the deposits. In this way, the way in which a site’s stratigraphy was built up can be repeatedly modelled and tested.

Site Formation Processes

The importance of site taphonomy for the interpretation and study of finds became very clear at Lincoln once we began to study industrial and craft waste. Jane Cowgill has examined the stratigraphic position of several types of industrial waste, mostly from ferrous and non-ferrous metalworking, and has found that in many cases it is extremely likely that instead of an industry being practised over a long period of time, as had originally been thought, the waste came onto the site at a single stage in the site’s history and was then incorporated into later deposits through the standard processes of pit-digging, building construction and terracing. This re depositional sequence can be established if a physical relationship can be demonstrated between the earlier and later deposits (if, for example, the earlier deposits were actually cut by later pits). Even so, without actual structural evidence for furnaces or smithing floors there is no obvious way of telling whether the original deposition indicates on-site metalworking or whether the waste was brought onto the site as hardcore but even this study shows that the analysis of even extremely well-stratified waste fragments could be extremely misleading unless the taphonomy of the waste has been studied.

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Conclusion

Although I have emphasised the problems of dealing with residuality and the ways in which the Lincoln database could be upgraded this should not detract from the immense value of our database as a testing ground for models of site formation and approaches to the study of residuality. The entire database is ‘live’ and a copy will be lodged on a computer at Lincolnshire Archives, which is attached to Lincoln City and County Museum, the repository for the finds (and animal bone) archive. The data exist and are accessible, the finds (or records of them) exist and within 18 months three volumes of site reports will be in print, giving access to this vast archive to researchers unfamiliar with the sites. Given the scale of most urban excavations and the conditions under which they are now being carried out it may be that our best hope for understanding urban site formation comes from continued quarrying at this old source rather than the increasingly mythical ‘future excavations’ which form the subject of many a pious hope at the end of an inconclusive site report.

Acknowledgments

The Lincoln Post-Excavation team has included both staff of the City of Lincoln Archaeology Unit and external specialists. It would be difficult to acknowledge individually all those within this team (let alone those outside of it) who have contributed to our thinking or approaches to the study of residuality. Nevertheless, certain people’s contributions stand out. They include: Jane Cowgill, Maggi Darling, Barbara Davies, Keith Dobney, Annie Milles, Kate Steane, Tim Williams and Jane Young. Last but not least, without Paul Tyers’ software, plotdate (c), we would not have had the ability to analyse our pottery assemblages.

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