

## STRATIGRAPHIC ANALYSES AND THE COMPUTER

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It is a theme of this article that computers should not be used in the site analysis of archaeological stratification, on philosophical and practical grounds. This research which takes place during the excavating period should result in the elucidation of the stratigraphic sequence for the site and is a prime responsibility of the excavator (the person supervising and compiling the records of the daily work). As an observational task, the recording of stratification is a method of reporting on the events of the past by the study of their physical remains. The introduction of a sophisticated sorting device into this essentially human occupation would be anathema, for the quality of such reporting depends on a person's intuition and undivided attention to his stratigraphic problems. An excavation (and its comprehension) is subject to constant change; the excavator should not be bound by a preconceived program or the necessity to allocate time for consultation with a computer. There is also reason to believe that the on-site use of computers may impede recording by acting, not as an aid, but as an excuse for postponing decisive thought in stratigraphic analyses. Finally, in this technologically complex era, a guiding maxim may be found in the contention that 'the archaeologist is digging up, not things, but people' (Wheeler 1956:13).

These philosophical objections may be debatable; the practical ones are more clear-cut. Excavation by the stratigraphic method is a matter of isolating the layers or stratigraphic units and removing these deposits by hand. Work carried out on this basis will probably never produce the quantity of stratigraphic data needed to justify the expense of computer analyses. The site at Lower Brook Street, Winchester, excavated 1965-71 with a daily personnel of some fifty people, can claim to be one of the most complicated sites in Britain. It produced some sixteen layers a day.

Another Winchester excavation, Southgate 1971, a small but complex area, had a total of only 406 layers upon its completion after a five-week season. If it is beyond the ability of archaeologists to analyse such small quantities of stratification, we may be justified in spending more on facilities for training excavators, but not on computerized sorting of stratification on the site.

Computers then should be confined to the post-excavation period where the quantity of the material, e.g., pottery, suits the quality of the machine. But as these studies are ultimately founded on a site's stratigraphy, the excavator must ensure that his stratigraphical house is in order. A step in this direction may come from recent methodological developments in Winchester which make the synthesis of stratigraphic information, and the diagrammatic illustration of a stratigraphic sequence, a relatively simple manual task. At the same time, the programming of a stratigraphic sequence as presented by the Harris-Winchester matrix may also be an easy job. An efficient use of this system, however, does have some implications for areas of current stratigraphic recording practices. Outlined below, these include the role of objects in stratigraphic analyses, stratigraphic as opposed to functional notation and interpretation, the numbering of stratification, and basic stratigraphic recording requirements.

#### The Role of Objects in Stratigraphic Analyses

There exists a general misconception in archaeology that objects are synonymous with stratification and that the study of artefacts will produce the stratigraphic sequence for a site. Wheeler (1956:70) argued against this misunderstanding, but disregard for a site's natural stratification is probably still the rule rather than the exception. It will suffice, in this article, to assert that objects have no role in the site analysis of stratification.

No find can dictate or change the position of a layer in its stratigraphic sequence, despite the find's contribution to the absolute dating of the layer. If this latter assertion is denied, the study of artefacts from a site would be typologically but not stratigraphically valid, for the finds would take precedence over the sequence of stratification.

The debate of finds and strata continues. Wheeler, for example, is not averse to using objects in what was, and is, a strictly stratigraphic argument (A and B of Fig.1).

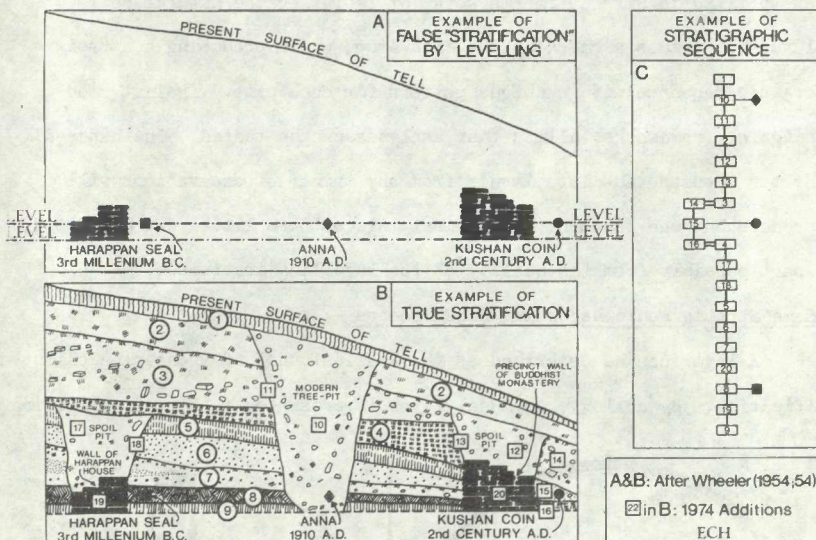


Fig.1

His drawing was once used in repudiation of a certain method of recording in vogue in the Middle and Far East (Wheeler 1947:44-7). The coins are clearly part of the stratigraphic argument, but it is very unlikely that anyone, no matter what his stratigraphic predilections, would equate this group to the same phase. If the metal objects were replaced by coarse potsherds of uncertain

date and the walls unnamed, Wheeler's diagrams would not be as 'self-explanatory' as once maintained (Wheeler 1956:70). In fact, the confirmation of his hypothesis would lie beyond the 'example of True Stratification' because the section must, as in C, be transposed into a true stratigraphic sequence. In this state it can be more validly compared with those stratigraphic sequences built automatically by levelling. The difference between C and a sequence made by levelling lies in the far less arbitrary compilation of the former. The method, exemplified in Sir Mortimer's work, of isolating the natural soil layers, provides a check on the excavator, while producing a stratigraphic sequence with a unique pattern for each site. Against such singular frameworks, all further analyses can be tested. One hundred, or ten thousand absolute levels from any number of excavations will produce but one pattern, and against this pattern little can be tested, apart possibly from the quality of the levelling instrument.

#### Some Stratigraphic Recording Requirements

A layer can be described as the smallest unit of archaeological stratification. By analogy, an ideal layer is presented in Fig. 2, a drawing of

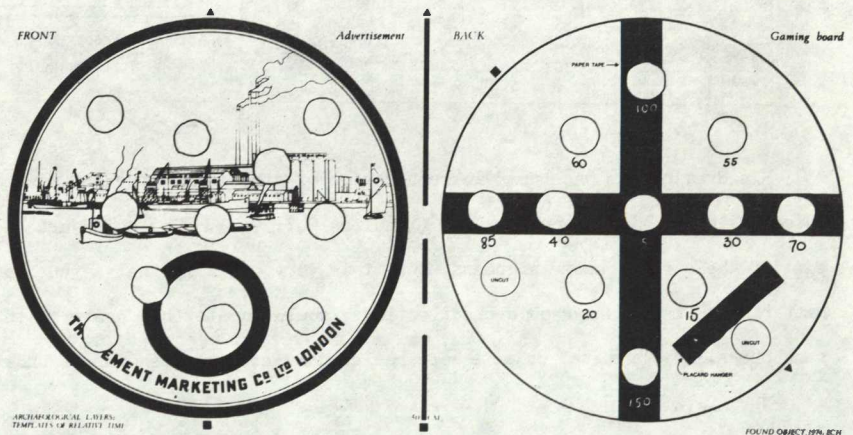


Fig.2

an old advertisement placard which came into secondary use probably as part of a game. This layer is ideal in that we have its complete circumference. The missing evidence, a result of later human activities, is contained within the layer's borders. A section being made, the shape of the layer can be presented and reproduced as a unit for any occasion.

Like the placard, any layer has three dimensions, length, width, and height or thickness. Various combinations of these give a layer an area and a volume. As stratification is the result of layers accumulating upon each other over the years, every layer also has a time dimension. The same applies for the placard though as yet its precise date is unknown. Indeed, in the words of Professor Piggott: 'Any enquiry into the past which does not reckon with the dimension of time is obviously nonsense' (1959:51). These four dimensions apply even if the layer only has a negative expression, e.g., the actual pit, without the infilling layers that mark its disuse. Such layers, shown as lines in plan and section, have an area, a volume and a temporal value in the stratigraphic scheme.

There are three basic recording requirements for any reasonable stratigraphic analysis: every layer must have a set of stratigraphic relationships with those layers which pre- or post-date it; a section of every deposit should be drawn and a plan, if only in outline, must be made of each layer. The section and plan of a layer function as a template. Set by the first requirement into proper relationship, a series of these layer templates can be so arranged so as to make the reconstruction and re-excavation of the site possible. An 'inexact science' is said to be the lot of archaeology (Wheeler 1946:127).

This is not an apt description for excavation, even though it may be correct for the functional, cultural and historical interpretations of a site. Excavation, founded on the physical phenomenon of stratification, ought to be an extremely exact science: 'the geologist can objectify his rock' (Wheeler 1946:127); the task of the excavator is no different. The establishment of a group of basic requirements in recording stratification could contribute to these ends.

#### Stratigraphic and Functional Notation

The notation of stratigraphic material during excavation has in the past been confused with that of functional notation. In Fig.1, for example, Wheeler has only numbered the deposits of soil with layer numbers. The walls and pits are so designated, but these descriptions are functional interpretations of layers or stratigraphic units. This primary separation of the stratification by such notation is ultimately inefficient and introduces unneeded numerical complexities into stratigraphic recording. While it accepted that every layer should be functionally defined, the rule should be interpretation, but not enumeration, of the stratigraphic unit into a functional category during the recording on the site. Efficient stratigraphic notation requires that only one single series of whole numbers, assigned as layers, is in use on any site, without regard for its size or complexity, during excavation. The numbering of functional groups should take place after excavation when the site has been divided into its phases and periods of development, during the period of publication preparation. Numbering these walls, pits, features and so forth at that time, from earliest to late, would produce a logical reading pattern in the final report. The single layer series would numerically simplify the recording of stratification and is a requirement for the method of stratigraphic notation discussed below.

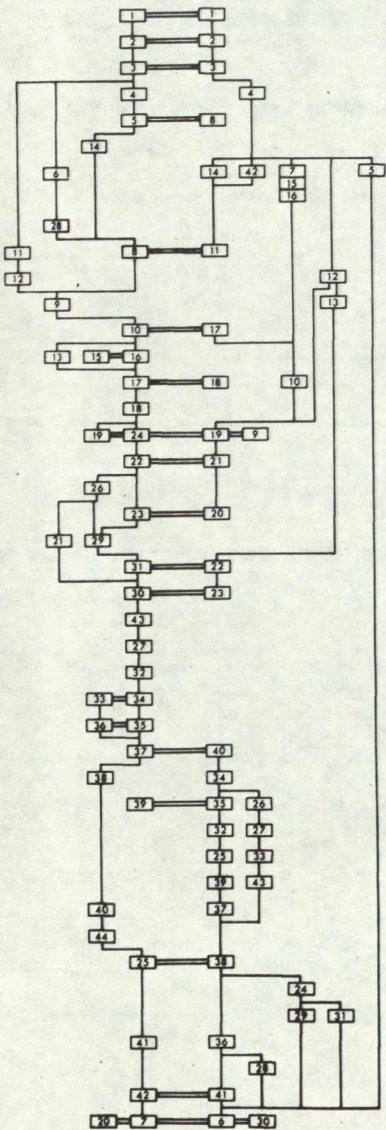


Fig.4: Assize Courts North 1971

This system is based on the assumption that a layer either pre- or post-dates, is contemporary with, or has no definable relationship with, another or other layers.

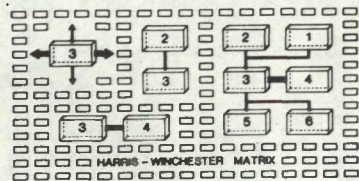


Fig. 3

The relationships expressed in Fig.3 are: layers 1 and 2 are later than 3 which is contemporary with 4; layers 5 and 6 are earlier than 3, but have no other relation with each other, as is the similar case between 1 and 2. With the stratigraphic data retrieved by excavation, a stratigraphic sequence diagram, such as that in Fig.4 of a site at Winchester, can be built up for an entire site.

This method may make the preparation of sites for publication more systematic, while also being of aid to the researcher who must use a computer, but who must ultimately test his studies against the

stratigraphic sequence of the excavation as determined by the excavator.

Acknowledgements

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