
5 The laws of archaeological stratigraphy

Archaeological stratigraphy must be based upon a series of fundamental axioms or laws. All archaeological sites, to a greater or lesser degree, are stratified. Through errors in recording, individual deposits or artefacts may become unstratified, as their stratigraphic contexts have been lost. By the use of arbitrary levels in unwarranted situations, the stratified nature of a site can be summarily destroyed. If an archaeological site can be excavated, then it is a stratified entity, even if there is only a single deposit on the top of bedrock. As they are composed of stratified deposits, archaeological sites are a recurring phenomena, although the cultural content and the character of its soils will change with its location.

All archaeological sites are therefore subject to the laws of archaeological stratigraphy, two of which have been most often recognized:

All archaeological techniques grow out of two rules so simple that many a lecture audience thinks them funny. They are: (1) If soil layer A covers level B, B was deposited first, and (2) each level or stratum is dated to a time *after* that of manufacture of the most recent artefact found in it. These are the laws of stratigraphy, and in theory they are never wrong. The ground is made up of a series of layers, some deposited by man and others by nature, and it is the excavator's job to take them apart in the reverse order in which they were laid down (Hume 1975: 68).

Geologically, these are the laws of 'superposition' and 'strata identified by fossils' (Rowe 1970). Until the last decade, no other laws of stratigraphy have appeared in archaeological texts (Harris 1979b).

The application of these geological laws without revision in archaeological stratigraphy may be questioned for two reasons. On one count, these laws relate to strata which were usually solidified under water and may cover many square miles. Archaeological strata, by contrast, are unsolidified, of limited area and of diverse composition. In the second instance, artefacts

cannot be used to identify strata, in the sense implied by geological laws, if only because they have not evolved through natural selection. Geological laws are no longer suitable for most archaeological purposes and must be augmented by our own standards.

In the absence of little archaeological precedence, a set of four basic laws for archaeological stratigraphy is proposed below. The first three laws are adapted from geology. A fourth axiom, the 'Law of Stratigraphic Succession', is from an archaeological source (Harris and Reece 1979).

Law of Superposition

The Law of Superposition is of first importance in the interpretation of the stratification. It assumes that the strata and features are found in a position similar to that of their original deposition.

The Law of Superposition: In a series of layers and interfacial features, as originally created, the upper units of stratification are younger and the lower are older, for each must have been deposited on, or created by the removal of, a pre-existing mass of archaeological stratification.

Because archaeological stratification may exist without artefacts, this law may be applied to archaeological stratification without regard for its artefactual content. This view is in opposition to the prevailing idea that:

the observation of superposition has virtually no archaeological significance unless the cultural contents of the deposition units are contrasted (Rowe 1970: 59).

The determination of superpositional relationships is of first importance in archaeological stratigraphy, as they define the interfacial relationships between the features and deposits of a site. The stratigraphic sequences of archaeological sites are made by the analysis of the interfaces between strata, not from a study of the soil composition of the strata or objects contained therein.

In archaeological stratigraphy, the Law of Superposition must also take account of interfacial units of stratification (Harris 1977: 89) which are not strata in a strict sense. These interfacial units of stratification may be seen as abstract layers and will have superpositional relationships with strata which lie above them or through which they were cut or 'lie above'.

The Law of Superposition is a statement about the depositional order between any two strata. Since it only relates to any two units of stratification, it can make no declaration about the detailed position of strata in the stratigraphic sequence of a site. The law is simply a statement about the physical relationships of superimposed deposits, i.e. one lies on top of or underneath another, and is therefore later or earlier. By recording superpositional relationships, the archaeologist amasses a body of data which will be of assistance in determining the stratigraphic sequence of the site.

In an archaeological context, the Law of Superposition may sometimes be applied to situations in which it is used in a relative sense. As intimated by Martin Davies (1987) in an excellent paper on the archaeology of standing structures, we must occasionally determine which way is 'up' in order to apply this law. The plaster of a ceiling, for example, is below the laths and ceiling joists, in an absolute sense, but it is stratigraphically later than both. In this instance, the archaeologist knows that the builder was 'working upside down', in terms of superimposition: he can therefore deduce which way is up and apply the Law of Superposition accordingly.

Law of Original Horizontality

The Law of Original Horizontality assumes that strata, when forming, will tend towards the horizontal. This is determined by natural forces, such as gravity, and results in one deposit succeeding the other in a horizontal order of superposition. This law was originally applied to deposits formed by sedimentary processes under water, but may be used for dry-land deposits. It is defined for archaeological purposes in this way:

The Law of Original Horizontality. Any archaeological layer deposited in an unconsolidated form will tend towards a horizontal position. Strata which are found with tilted surfaces were originally deposited that way, or lie in conformity with the contours of a pre-existing basin of deposition.

The application of the Law of Original Horizontality in archaeological stratigraphy must consider both dry-land conditions and man-made limits to areas of deposition. Man-made 'basins of deposition' are formed by walls or features such as ditches, which alter the conditions of deposition of unconsolidated soils. It may also be advantageous for archaeologists to think of this law as relating to 'original states of deposition' under natural circumstances,

the strata tending towards a horizontal plane, since many deposits on our sites have been laid down by natural forces.

If, on the other hand, a basin of deposition is a ditch, then the first filling strata will originally have had *tilted* surfaces. If horizontal surfaces are found at these levels, a reason should be sought. This may be due to a change in the conditions of deposition: flooding, for example, would partly negate the influence of the ditch. As the filling of the ditch progresses, the deposits would gradually approach the horizontal, the basin of deposition itself becoming less vertical with the formation of each successive deposit. At these upper levels, the surfaces may again be tilted and another cause, such as the re-cutting of the ditch, must be found.

The Law of Original Horizontality relates only to strata and the act of deposition. Its application, however, should guide archaeologists to look for significant interfacial features (see Chapter 7), as indicated by the directional change in the disposition of strata. It may also be applied in a relative sense to standing structures. There are a number of buildings and gun emplacements at Port Royal, Jamaica, now partly buried in dunes, which were tilted at least 15 degrees off the horizontal by the earthquake of 1907, but which remain intact.

Law of Original Continuity

The Law of Original Continuity is based on the limited topographical extent of a deposit or an interfacial feature. A deposit will naturally end in a feather-edge, or in a thicker section, if it abuts the side of the basin of deposition. If any edge of the deposit, as found today, is not a feather-edge, but a vertical face, then a part of the original extent or continuity has been destroyed. An archaeological version of this law is as follows:

The Law of Original Continuity: Any archaeological deposit, as originally laid down, or any interfacial feature, as originally created, will be bounded by a basin of deposition, or may thin down to a feather-edge. Therefore, if any edge of a deposit or interfacial feature is exposed in a vertical view, a part of its original extent must have been removed by excavation or erosion, and its continuity must be sought, or its absence explained.

The occurrence on archaeological sites of many types of interfacial features attests to the usefulness of this law. It is also the basis on which stratigraphic correlations can be made between now separate parts of an original deposit.

This correlation is made on stratigraphic grounds, without regard for the artefactual content of the deposits. The parts of the strata must be correlated by their soil composition and by their similar relative positions in the stratigraphic sequences on either side of the intrusive feature.

Devised for geology, the Law of Original Continuity related to horizontal strata. In the archaeological context, it may be expanded in two ways. The first is its application to interfacial features which are considered to be units of stratification, such as ditches. If such a feature appears in a vertical view, a part of its original extent may be assumed to have been destroyed. Provided that the continuation of the ditch can be located, the two parts may be correlated. The strata filling the separated parts of the ditch may also be correlated.

In the second instance, the law may be applied to upstanding strata, such as walls. Few walls in a stratigraphic context survive to the level of their original wall plates. Some of the original vertical continuity will have been destroyed and a sectional view of such walls is exposed in plan. Like the pit, whose limits mark the extent of the destruction of existing strata, the line which marks the limit of the truncation of a wall should be treated as an interfacial unit of stratification, subject to the Law of Original Continuity.

The Laws of Superposition, Original Horizontality and Original Continuity refer to the physical aspects of strata in their accumulated state, as stratification. They allow the archaeologist to determine stratigraphic relationships which exist on a site and to make the required stratigraphic correlations.

In geological circumstances, the accumulated order of the stratification may be equated to the deposition of the strata through time, the one deposit giving way to the next in the stratigraphic column, like a deck of cards. This immediate correlation between stratification and stratigraphic sequences is due to the great extent of geological deposits and to the small size, in comparison, of the sample taken at a given location. Such simple, unilinear, deck-of-card sequences are the exceptions to the archaeological rule.

Law of Stratigraphical Succession

Most archaeological sites have multilinear stratigraphic sequences, which are the result of the limited extent of archaeological strata, and the presence of upstanding strata and other interfacial features. The latter creates new basins of deposition within which separate sequences accumulate. These characteristics of archaeological stratification work against a simple correlation between the order of the stratification and that of the stratigraphic sequence.

In addition, geology has not given archaeology any methods by which the complex stratigraphic sequences of our sites can be demonstrated in a straightforward manner. For this reason alone, the recent criticisms of the first edition of this book (Farrand 1984a,b; Collcutt 1987) are so much noisy water under a well-founded bridge.

It is now an accepted fact that the Harris Matrix provides archaeology with a method by which stratigraphic sequences can be diagrammatically expressed in very simple terms. But in order for the method to work, it was necessary to introduce the Law of Stratigraphical Succession (Harris and Reece 1979) to complement the Laws of Superposition, Original Horizontality, and Original Continuity:

The Law of Stratigraphical Succession: A unit of archaeological stratification takes its place in the stratigraphic sequence of a site from its position between the undermost (or earliest) of the units which lie above it and the uppermost (or latest) of all the units which lie below it and with which the unit has a physical contact, all other superpositional relationships being redundant.

In order to illustrate the Law of Stratigraphical Succession, the idea of the Harris Matrix and that of the 'stratigraphic sequence' must now be introduced. It is also necessary to have an understanding of these notions, because much in the following chapters relates to them.

The Harris Matrix and stratigraphic sequences

The background to the Harris Matrix, which was invented in 1973, can be found in the first edition of this book. The Harris Matrix is the name given to a printed sheet of paper which contains a grid of rectangular boxes (Fig. 8). The name has no other connotation, mathematical or otherwise: it is simply a format for exhibiting the stratigraphic relationships of a site. The resulting diagram, which is often called a 'matrix' in shorthand, represents the stratigraphic sequence of the site. A 'stratigraphic sequence' is defined as 'the order of the deposition of layers and the creation of feature interfaces through the course of time' on an archaeological site.

A stratigraphic sequence is created by the interpretation of the stratification of a site according to the Laws of Superposition, Original Horizontality and Original Continuity. The stratigraphic relationships thereby discovered are translated according to the Law of Stratigraphical

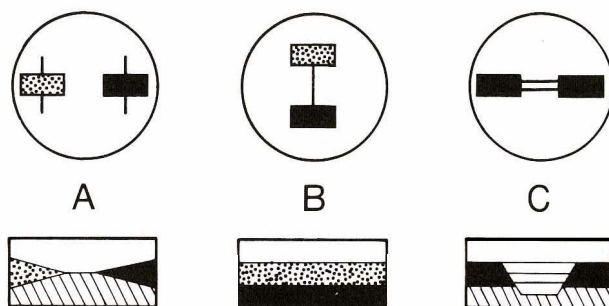


Fig. 9 The Harris Matrix system recognizes only three relationships between units of archaeological stratification. (A) The units have no direct stratigraphic connection. (B) they are in superposition; and (C) the units are correlated as parts of a once-whole deposit or feature interface.

Succession on to a Harris Matrix sheet to form the stratigraphic sequence. The matrix system admits to only three possible relationships between two given units of stratification. In Fig. 9A, the units have no direct stratigraphic (physical) relationship; in Fig. 9B, they are in superposition; and in Fig. 9C, the units are correlated (equated by the = sign) as separate parts (given different numbers in the field) of a once whole deposit or feature interface. Using this method during an excavation (Fig. 10), a sequence can be built up on paper as the work progresses. At the end of the excavation, the archaeologist should be in possession of the stratigraphic sequence for the site (e.g. Fig. 11).

Difficulties arise, however, if the Law of Stratigraphical Succession is not applied in the process of making the sequence. This is because the sequences are often thought to represent all the physical relationships, as in Fig. 12B. These diagrams represent the relative sequence of the units of stratification *through time*; they are not meant to show the compressed relationships which obtain, for example, in a section. As they mark the stratigraphic development of the site through time, only the most immediate relationships in the relative sequence are significant. The Law of Stratigraphical Succession provides the axiom by which the significant relationships are determined. Thus Fig. 12C represents the stratigraphic sequence of this imaginary site, with the superfluous relationships shown in Fig. 12B being removed.

The primary object of the study of archaeological stratification is to place the units of stratification, the layers and the features, into their relative sequential order. The stratigraphic sequence can and should be constructed without reference to the artefactual contents of the strata. The four laws of

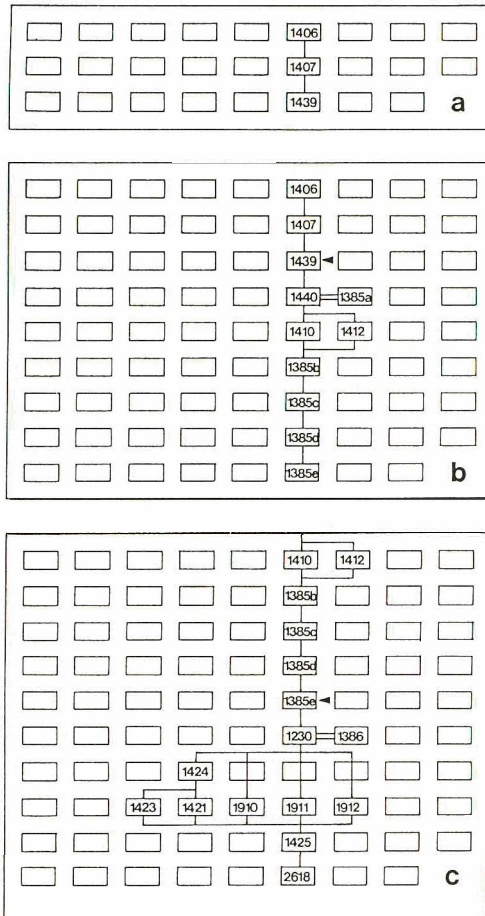


Fig. 10 The creation of a stratigraphic sequence on a HarrisMatrix sheet which was made as the excavation progressed on the SalmansweilerHof at Konstanz in Germany in the early 1980s (from Bibby 1987; courtesy of the author).

archaeological stratigraphy are of primary significance in this non-artefactual analysis. Having discussed these general axioms, the next two chapters are devoted to an examination of the two non-historical elements which comprise all archaeological stratification.

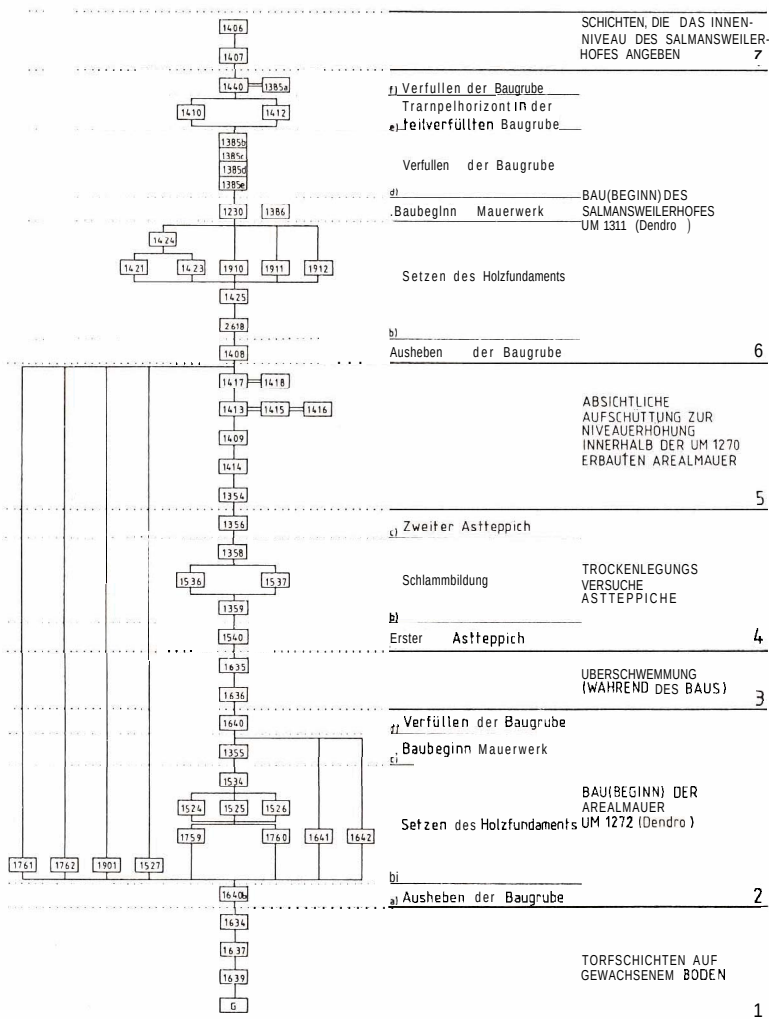


Fig. 11 The stratigraphic sequence of a part of the Salmansweiler Hof at Konstanz which has been divided into phases. Phase 1 consists of peat layers on natural soil, while Phase 6 represents a new building period around A.D. 1290 (from Bibby 1987; courtesy of the author).

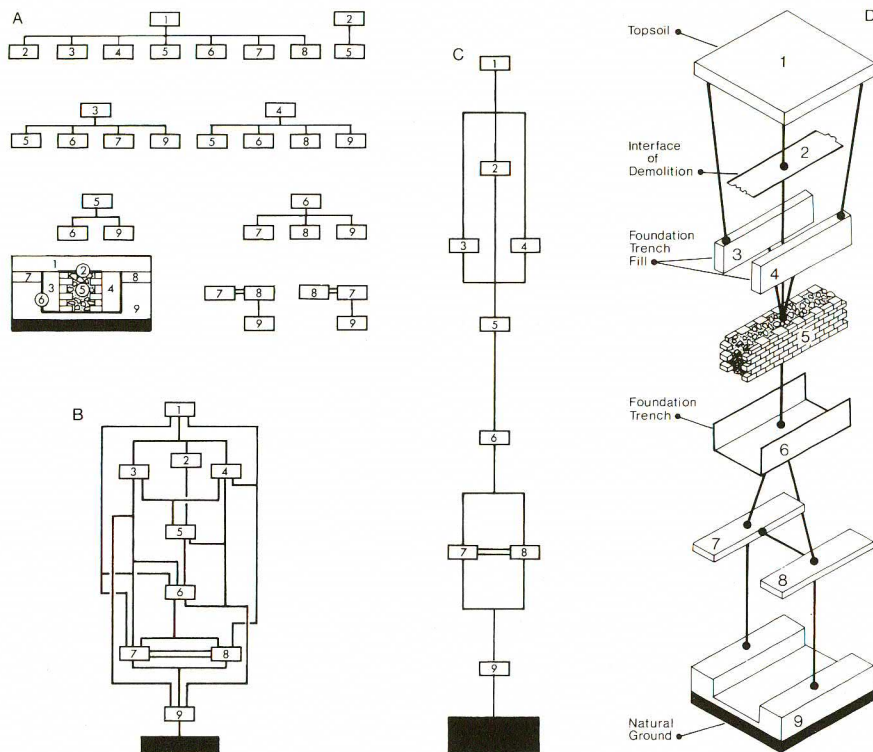


Fig. 12 The compilation of a stratigraphic sequence. In (A) all the superpositional relationships are shown in the section and in the Harris Matrix form. (B) A matrix rendition of a section, which is clarified into a stratigraphic sequence in (C), according to the Law of Stratigraphical Succession.