The Laws of Archaeological Stratigraphy

Edward C. Harris

World Archaeology, Vol. 11, No. 1, Early Chemical Technology (Jun., 1979), 111-117.

Stable URL:
http://links.jstor.org/sici?sici=0043-8243%28197906%2911%3A1%3C111%3ATLOAS%3E2.0.CO%3B2-H

World Archaeology is currently published by Taylor & Francis, Ltd..

Your use of the JSTOR archive indicates your acceptance of JSTOR’s Terms and Conditions of Use, available at http://www.jstor.org/about/terms.html. JSTOR’s Terms and Conditions of Use provides, in part, that unless you have obtained prior permission, you may not download an entire issue of a journal or multiple copies of articles, and you may use content in the JSTOR archive only for your personal, non-commercial use.

Please contact the publisher regarding any further use of this work. Publisher contact information may be obtained at http://www.jstor.org/journals/taylorfrancis.html.

Each copy of any part of a JSTOR transmission must contain the same copyright notice that appears on the screen or printed page of such transmission.

JSTOR is an independent not-for-profit organization dedicated to creating and preserving a digital archive of scholarly journals. For more information regarding JSTOR, please contact support@jstor.org.
The laws of archaeological stratigraphy

Edward C. Harris

Archaeological stratigraphy, as a science, should be based upon a series of fundamental laws or axioms. Such laws are related to stratification which is the physical state in which the features and deposits of archaeological sites are found. All sites, to a greater or lesser degree, are stratified. By errors in recording, individual deposits or artefacts may become unstratifiable as their stratigraphic contexts have been lost. This not uncommon occurrence in no manner alters the assertion that there is no such thing as an unstratified archaeological site. All such sites are subject to the laws of archaeological stratigraphy, two of which are most often recognized:

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 of the order in which they were laid down. (Hume 1975: 68).

The two laws noted here are that of 'superposition' and 'strata identified by fossils', as discussed by Rowe (1970). Any other laws of archaeological stratigraphy are seldom, if ever, mentioned in archaeological texts.

The 'law of strata identified by fossils' was invented by William 'Strata' Smith from his studies of geological stratification in Britain. This law is based upon his observations that each stratum contained fossils which are peculiar to itself. Such characteristic fossils could thus be used to identify the stratum in locations where it could not be recognized, for example, by its lithology. The nature of the fossils is related to their evolution through natural selection by which one form of organism gives way to another in successive epochs. This irreversible pattern of change is partly preserved in the strata of geological formations.

The application of this geological law in archaeology may be questioned for two reasons. On one count, it relates to strata which may be replicated in diverse parts of the world. Archaeological strata, by contrast, are unique deposits in time, space and composition. Artefacts cannot therefore be used to identify strata in the sense implied.
by this law. In the second instance, it is unlikely that inanimate archaeological artefacts have evolved through natural selection.

These points may be debated and archaeologists who advocate the application of this law should give a fuller account of their reasoning. It will not be further discussed in this paper as it is considered to be of secondary, rather than primary, importance in the study of archaeological stratification. This is because archaeological stratification may exist without artefacts. Furthermore, it should be studied and recorded in the first instance without regard for the remains which may or may not be found in its deposits.

In this paper the primary laws of archaeological stratigraphy will be discussed. They may be applied to archaeological stratification without regard to the artefactual content of the given body of strata. This view is in direct opposition to the idea that

\[\ldots\] 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. Without a stratigraphic sequence, the cultural remains of the strata cannot be contrasted except in a general typological context.

If the ‘law of strata identified by fossils’ is set aside, the only other law of archaeological stratigraphy which is usually stated in archaeological texts is the ‘law of superposition’. Because of its apparent simplicity, it is often presented by analogy. Sometimes it is in the guise of disposed letters building up in a waste-paper basket, while on one occasion Sir Isaac Newton was buried in a shower of apples. The efficacy of these analogues is not questioned, but they are unfortunately presented in lieu of a direct statement of the law of superposition, rather than as graphic illustrations of a secondary nature.

The law of superposition is therefore set down below in a more direct scientific statement. Two other laws, namely, the ‘law of original horizontality’ and the ‘law of original continuity’ are also presented. These three laws are of course adapted from geological sources. A fourth axiom, the ‘law of stratigraphical succession’, is an archaeological invention (Harris and Reece 1979). The relationship of these laws of archaeological stratigraphy will then be briefly discussed.

**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.

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

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

The Law of Stratigraphical Succession: any given unit of archaeological stratification takes its place in the stratigraphic sequence of a site from its position between the undermost of all units which lie above it and the uppermost of all those units which lie below it and with which it has a physical contact, all other superpositional relationships being regarded as redundant.

The law of superposition is of fundamental importance in the recording of the stratification of archaeological sites. It assumes that the strata and features are found in a position similar to that of their original deposition. It thus allows the archaeologist to determine the relative order in which the units of stratification were created. In other words, it gives a direction to the physical sequence of the stratification of a site. The law holds true even when, for example, the digging of a pit or ditch brings about a type of vertical displacement in the subsequent depositional order of a site: the lowest deposit in a pit which lies over a much earlier stratum is still later than that stratum.

The law of superposition is a statement about the depositional order between any two strata or groups of strata. Since it only treats of any two units of stratification, the law makes no declaration as to the detailed position of strata in the stratigraphic sequence of a site. The law is a statement about the physical relationships of superimposed deposits, i.e. the one lies on top of or underneath another. It is by the recording of such superpositional relationships that the archaeologist assembles a body of data from which the stratigraphic sequence of the site may be determined.

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 a type of abstract layer and will have superpositional relationships with strata which lie above them or through which they were cut or 'lie above'.

The tenets of the law of superposition are derived partly from the notion of the law of original horizontality. This law assumes that unconsolidated strata, whether deposited under water or on dry land, will tend towards an horizontal aspect. This is determined by natural laws, such as gravity, and results in classic accumulations of strata, the one succeeding the other in a more or less level order of superposition. The law was originally applied to deposits formed by sedimentary processes under a body of water. It has yet to be substantially revised to take account of strata which form upon the dry land.

The direct application of this law in archaeological stratigraphy must therefore consider both dry land conditions and man-made limits to the areas of deposition. Such man-made 'basins of deposition' are formed by walls and features like ditches and may alter the conditions of deposition of unconsolidated strata. It may be more advantageous for archaeologists to think of this law as relating to 'original states of deposition', most of which tend towards a horizontal plane. The extent to which a deposit will have a horizontal surface depends upon natural forces and the shape of the existing basin of deposition.

One may assume, for example, that if a basin of deposition is a ditch that the first
infilling strata will originally have 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 basin of deposition, on the character of the deposits. As the infilling of the ditch progresses, the deposits would gradually approach the horizontal, as the basin of deposition itself becomes less vertical with the formation of each successive deposit. At these later levels, the surfaces may again be tilted and a cause, such as the re-cutting of the ditch must be found.

The law of original continuity is related to the law of original horizontality in so far as any deposit will have a given geographical extent, as seen in plan. According to the law of original continuity, a deposit will naturally end in a feather-edge or in a thicker edge if it abuts the side of the basin of deposition; these are views of a deposit in section. The law concludes that if any part of the deposit can be seen in a sectional exposure then a part of its original extent or continuity has been removed.

The occurrence on archaeological sites of many forms of interfacial features, in conjunction with stratification partly destroyed by their creation, attests to the usefulness of this law. It is also the basis on which stratigraphic correlations may be made between two or more separated parts of an original single deposit. This type of correlation is made on a strictly stratigraphic reasoning, without regard for the artefactual content of the given deposits. The given parts of the strata to either side of the feature must be equatable by soil composition and in their respective stratigraphic positions.

As originally devised, the law of original continuity was 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. A ditch is an example of this type of interfacial unit. If such a feature appears in a sectional 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 separate parts may be correlated as stratigraphically equal. The infilling strata of the separated parts of the ditch may also be correlated. In another 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. Most of their 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 pre-existing strata, the line which marks the limit of the truncation of a wall should be treated as an interfacial unit of stratification.

The laws of superposition, original horizontality, and original continuity thus refer to the physical aspects of strata in their accumulated state. They do not relate such strata to their respective positions in the stratigraphic sequence of the site, i.e. to their order of separate deposition through time. They allow the archaeologist to determine the superpositional relationships (e.g. fig. 1A) which exist on a site and to make stratigraphic correlations where required.

In many geological instances, the accumulated order of the stratification may be directly equatable 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 correlation between the stratification and the stratigraphic sequence is mainly due to the great extent of many geological deposits and to the small size, in comparison, of the sample taken at a
given locality. Such unilinear sequences seldom make up the stratigraphic sequence of an archaeological site.

Most archaeological sites probably have multilinear stratigraphic sequences, as shown in two recently published examples (Harris 1975: figs 28 and 29). These sequences are a result of the very limited extent of most archaeological strata and of upstanding strata and interfacial features on archaeological sites. The latter two create new basins of deposition within which separate sequences accumulate. These characteristics of archaeological stratification work against the direct correlation between the order of the stratification and that of the stratigraphic sequence. The laws of superposition, original horizontality, and original continuity must therefore be complemented by the 'law of stratigraphic succession'.

In particular, the relationship between the law of superposition and the law of stratigraphic succession may be discussed by reference to figs 1 and 2. In fig. 1A, the various superpositional relationships between the strata shown on the plan are exhibited. Unit 10, for example, lies over and touches units 1–3 and 8–9, while unit 5 is above units 1, 3 and 4. All of the superpositional relationships shown in fig. 1A are placed in a single diagram in B. The latter could be described as an abstract, multi-dimensional section, but it is not an illustration of the stratigraphic sequence of this hypothetical site. By the application of the law of stratigraphic succession, the superfluous superpositional relationships are deleted from fig. 1B. Figure 1C is thus the stratigraphic sequence of the site.

The manner in which the stratigraphic sequence is the order of the deposition of the strata though time may be seen in fig. 2. In this diagram, the accumulated deposits of the plan in fig. 1A are separated from one another in an order which reflects their successive deposition. At a given spot on an archaeological excavation, it may thus be possible that stratigraphic excavation, i.e. the removal of strata 'in the reverse of the order in which they were laid down' (Hume, op. cit.), is equatable to the definition of stratigraphic sequence of the site. However, the notion of stratigraphic excavation is

---

*Figure 1* The superpositional relationships of the plan are shown in A and B. Diagram C is the stratigraphic sequence of this hypothetical site.
derived from the law of superposition and is applicable only if the units of stratification have direct superpositional relationships, namely, that they physically touch one another. On most archaeological sites which have multilinear stratigraphic sequences, the final determination of the order in which many of the depositions were laid down will depend upon the comparison of the cultural remains found in the given strata. That determination will thus be a question of date rather than of sequence.

In other words, the primary object of a study of archaeological stratification is to place the units of stratification, the layers and the features, into their sequential order. The stratigraphic sequence can and should be constructed without reference to the artefactual contents of the strata. There are therefore at present four laws of archaeological stratigraphy which are of primary significance in this non-artefactual analysis: the laws of superposition, original horizontality, original continuity and stratigraphic succession. Once the stratigraphic sequence of the site has been built, it is itself of fundamental significance in the contrasting and comparison of the cultural remains found in its strata. By the analysis of those remains, the stratigraphic sequence may
be divided in phases and periods, each containing a number of units of stratification. The units, phases and periods may then be dated by reference to the cultural and chronological import of the contained remains. It is here that laws such as 'strata identified by fossils' may be of some application in the science of archaeological stratigraphy.

The archaeological literature however shows that the more strictly stratigraphic aspects of the study have been virtually ignored in comparison to the efforts placed upon the study of archaeological artefacts. This trend should be reversed and a balance sought between the two complementary studies, that of the strata and that of the artefact.

Acknowledgements

I wish to thank James Graham-Campbell, University College London, Frances Lynch, University College of North Wales, and Alan Thorne, Australian National University for their discussions of some of the matters contained in this paper.

5.xii.1978

University College
London

References


Abstract

Harris, E. C.

The laws of archaeological stratigraphy

The science of archaeological stratigraphy is based upon a series of laws or axioms. Several of these laws are discussed in this paper and have been adapted previously from geological sources. A new law of archaeological stratigraphy, as devised in archaeology, is presented. These laws and the study of archaeological stratigraphy have been neglected in recent decades during which time archaeologists have relied almost entirely on vague notions of the law of superposition. The subject of archaeological stratigraphy should be re-examined, particularly as regards its fundamental tenets and axioms.