

# SEQUENCES IN PREHISTORIC REMAINS.

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[with plates xxxi to xxxiii.]

The conveniently vague term, "prehistoric," has been generally thought to excuse our ignorance, and to render further inquiry needless because it would be inconclusive. To attain to a broad division into widely distinct periods and styles, such as palæolithic and neolithic, was perhaps a tolerably safe venture; but the utmost that has been yet attempted is a division into a few well-marked varieties, as Mousterien, Acheullien, etc., or Mykenæan, Dipylon, Hallstattian, etc., for later ages. It has been, perhaps, the result of careless and incomplete observation and registration of discoveries, that the habit has arisen of defining only large periods without subdivisions, and describing a period by the name of a locality, which conveys no idea of relation to other periods.

But it may be said that in dealing with ages before any written record of years no reference to time or dates is possible. In the narrowest sense this may be true. Yet the main value of dates is to show the sequence of events; and it would matter very little if the time from Augustus to Constantine had occupied six centuries instead of three, or if Alexander had lived only two centuries before Augustus. The order of events and the relation of one country to another is the main essential of history. Indeed, the tacit commonsense of historians agrees in treating the periods of great activity and production more fully than the arid ages of barbarism, and so substituting practically a scale of activity as the standard rather than a a scale of years.

It would be, therefore, no fallacy to portion out the past by the ratio of events rather than by the seasons; and to measure history by the stages of thought and action of man rather than by inanimate celestial motions. In this truest sense, then, we may have a possibility of reducing the prehistoric ages to a historical sequence, and defining them as readily as historic times. If some scale and ratio of human activities can be adopted, we may measure the past by means of it as definitely as we do by years B.C.

Supposing our information were complete, it is clear that we might, for instance, assign one degree in an arbitrary scale for every hundred objects of man's past that have survived to our time, and so obtain a reasonable series of "sequence dates"—as we may call them—for any period hitherto unmeasured. Such sequence dates would have varying relation to a scale of years in different parts of the scale, but would be, at least, a reasonable system of denoting the past, which would give that power of exact expression in commonly understood terms, which is

the necessary basis of any scientific treatment. The sequence dates of one country would have to be correlated to those of another country by discoveries of connections; but it would at least be a great gain to be able to express such a relation in a simple system of dating instead of some elaborate definition of a period named from one place being equivalent to the earlier or later part of a period named from some other.

So far we have only been looking at the desirable, without any statement of the practical; and sequence dates in prehistory may seem to be merely a "pious wish." Yet this abstract view of the matter has arisen from a very practical treatment of a large mass of material, out of which it has grown.

The most practical scale of sequence dates in Egypt, and perhaps in most other prehistoric civilisations, is the proportion of burials. The number of burials in each century will, of course, vary with the population; yet so does the importance of a country vary, and also our interest in it, to some extent. Nothing can be so readily ascertained as the proportions of burials if our researches are fairly spread, and if we find each cemetery to be largely overlapping others in relative age. For the period covered by a series of overlapping cemeteries the number of tombs may be taken as a most rational basis of sequence dates. Thus each unit of dating represents an equal number of persons above a certain low standard of wealth and culture. If, then, we could treat a large number of tombs—a thousand or more—which had no blank periods between them, and arrange them in their original order, we should have a rational basis for sequence dates; they might be divided into units of twenty tombs, for instance, and so broken up into fifty equal divisions; then any fresh tomb like some other in the scale could be simply and exactly defined as being of some sequence date, such as 23 or 38, as the case might be.

Further, every product could be dated in its relation to others, by saying that it began in, say, 18 S.D. and went out in 25 S.D. This would be just as valuable for a relative history of a civilisation as being able to write 5400 to 4800 B.C. for the age of some weapon or ornament. This result is what we have actually attained from such an amount of material as I have suggested above; and this system is from no abstract view, but has been really worked out. I now turn to the methods for extracting such results.

The first step is to form a *corpus* of drawings, each class of objects by themselves. For practical purposes it is well to work only from pottery to begin with; for it is less likely to be intentionally copied from earlier examples than work which is in more valuable material, and it is much less likely to be handed down from generation to generation than are the weapons of metal or carving in hard stone. In countries where pottery is insufficient, in variety or quantity, then other objects must be taken into consideration. It seems best in such a *corpus* to denote each class of pottery or objects by a letter (an initial letter of the class, if possible); and then all the forms by numbers added to that letter, as H 16 for the hanging stone vase No. 16, D 73 for the decorated pottery No. 73.

It is preferable to spread all the types over not more than 99 numbers in each class so as to avoid three figures; where there is much difference between types one or more numbers may be left blank for marking later discoveries of intermediate forms; where there are many subvarieties of a type letters may be added, as P 28a, P 28b, P 28c; thus if the type cannot be exactly distinguished, P 28 alone can be used for it. The *corpus* of prehistoric Egyptian pottery contains 917 forms.

Having, then, a full *corpus*, numbered in a systematic order, the contents of every grave should be registered in this notation. And then a card catalogue of graves should be made, each grave-group being written on a narrow slip $\frac{1}{4}$ inch wide. Practically the slips are best ruled in columns for different classes of pottery; each column wide enough to take in the number of types in any one grave. Actually the slips are 7 inches long, ruled in ten columns, for the prehistoric Egyptian. About 900 slips have been used together, representing the best graves selected from among over 4,000.

The next work is to place these as far as possible in the original order of the graves. For this there are five methods, based on the following considerations:—

1st. Actual superposition of graves or burials; but rarely found.

2nd. Series of development or degradation of form; very valuable if unimpeachable.

3rd. Statistical grouping by proportionate resemblance; the basis for classifying large groups.

4th. Grouping of similar types, and judgment by style; giving a more detailed arrangement of the result of the 3rd method.

5th. Minimum dispersion of each type, concentrating the extreme examples.

We will now illustrate these methods as applied to usual prehistoric objects.

1st. Later interments in tumuli will be invaluable for proving the relative order of age. The superposition in caves and in lake deposits is equally valuable; and the common consent in the sequence of stone, bronze, and iron may render the deposits of those successive ages equivalent to local superposition. This evidence gives a basis of broad divisions, which serve to prove the order of sequence from early to late, and prevent our mistaking it for late to early. As we shall see, it is starting from such broad divisions that we refine to lesser periods.

2nd. A series of changes of gradual growth or decay in form and style of a single type, where they are all of one locality and unquestionable in their connection, is of the highest value. It enables a long period to be ranged in approximate order, and serves as a scale for noting the rise or disappearance of other types. Thus contemporary graves, which may not contain this fluctuating type, can be classified into the series, and so take their true place. When a series of one type is arranged, and all the slips containing it are placed in order, then when a fresh slip is to be placed in the series each type on it is looked for in the series, and the first and last example noted. (This is conveniently done by laying

a pen nib pointing forward from the first example, and another backward from the last.) When each type on the card thus has its beginning and end in the series marked, it is easy to see that the card ought to be placed after all the beginnings and before all the endings of the types. Often it does not so fall, and we find that the range of one type must be extended at one end or other so as to include the new card in the series. Thus new material is built into a series already marked out by the development of some one type.

3rd. A large group of graves may not contain any already datable material, but may fall between two more definite classes. Such in Egypt are some hundreds of graves which are later than the cups with white line decoration and earlier than the series of wavy-handled jars. The cards of these graves are then to be marked with the proportion of types of pottery that they have in common with the class best-known at either the beginning or the end of the series, those with types most like those of a terminal class coming naturally nearest to that class. This statistical sorting by resemblance to some definite class is the only way to break up a large indistinct mass. Thus graves of the early iron age should be sorted according to their proportion of objects in common with late bronze age graves.

4th. When a general statistical sorting has thus broken up a mass into vague stages, the next step is to refine this by grouping together similar types that come near each other, and so improve the order by more individual evidence. Thus, for instance, fibulæ might be roughly classed by the proportions of pottery types that were found with them; but the similarities of form would enable them to be put more exactly into order. Or decorated vases could be more closely arranged by designs, after their general distribution was vaguely settled statistically.

Lastly, 5th. There must be sought the minimum dispersion of each type. It is clear that if we had a series of graves put really in the original order, any disturbance of that would be likely to spread the ranges of some of the contents. Hence the order which gives the shortest ranges of the types is probably the truth. Of course the ranges are not of the same length. Some types—especially the more simple forms—range over many centuries; other types—especially peculiar and complex decorations—were perhaps only made for a few years, or even for a single furnace load.

When we come to search the extreme instances—early and late—of each type, it is seen that they can be shortened up and concentrated until a point comes where there is tension between two types, and the card must contain either the first example of one type or the latest of another. Which is to give way is determined by seeing whether the extension of one type or the other will be most in accord with similar types related to these.

Thus finally the collection of card slips—each representing a grave—is reduced to the nearest approximation to the original order of the graves. When that is done the total slips are divided into equal groups—in the Egyptian case 900 slips were divided into 50 groups of 18 slips each—and the boundaries of the groups may be slightly modified so as to include the boundaries of well-marked types just within

a group. These groups are then to be numbered, and these numbers are the sequence dates of the groups. For the prehistoric Egyptian I have formed 50 groups, and leaving 29 stages for earlier groups that may be found, and 19 stages at the other end for later connections with historic times, I have numbered the groups used from 30 to 80. In the practical working the doubt about the position of a type rarely extends to 10 stages, and that only in case of rare types but little known; for ordinary well-known types a change of 3 or 4 stages is seldom caused by revision, and often a change of a single stage would distinctly upset the arrangement for the worse. The scale of fifty stages is therefore none too detailed. We know nothing yet of the years covered by these fifty stages; but looking at the number of graves in relation to those of the historic age, and the changes of style, we can hardly suppose it to be less than a thousand years, very possibly double that. The presumption of slower changes and fewer graves in more barbaric times would lengthen rather than shorten the estimate.

Then the lists of the range of each type can be drawn up, stating between what limits of sequence dates it is found. Such a division in stages and such a list of ranges is useful for working purposes at earlier parts of the proceedings, especially if many hundreds of graves have to be dealt with.

In dating any class of objects, such as spears, adzes, fibulæ, combs, etc., the process is to look out the age or the range of age of each of the graves in which such objects are found; such a list will run somewhat thus:—S.D. 43, 52, 47, 46, between 37 and 51, 42, between 49 and 60, and so on. Here the graves with badly defined age, as 37 to 51, and 49 to 60, do not affect the result, as the other examples all fall within those limits, and we can date the object as varying from 42 to 52 in sequence date. Sometimes we only have badly defined graves as evidence, and find such ranges as 26 to 49, 33 to 70, 42 to 60; here all we can say is that it must be from 42 to 49, and may extend farther.

On thus working out the sequence dates of the prehistoric Egyptian we can trace the course of that barbaric civilisation. Remembering that 30 to 80 is the range that we are dealing with, we can say that the finest serration of straight flint knives and lances is at 32 and extends down to 43 (see Fig. 5) in common use, and was kept up as grand specimens to 65. The forked lances with a wide fork (32 to 43) precede those with narrow cleft fork (38 to 61), and those with a definite tang for hafting go as late as 70. The curved knives with rounded butt are the earliest, beginning about 39; they are followed by the sickle-shaped knives at 45 to 65; and the very regular surface flaking on wide flat knives does not come in before 57, and becomes coarse by 65, continuing down to 78, and thus on into the early historic flaking. The large triangular flakes with partly worked edges were not very early, beginning about 41, and large ones ending at 61, while smaller flake knives last on to the end. The square-ended flake begins at 63, and lasts on till it is the main type in the early historic times.

Of the slate palettes (see Fig. 2) the rhombs and well-formed animals are the earliest, from 31 to 40 or so. The fish and turtle forms begin at 36 and become

degraded by 50, lasting on in very rude shapes to the end. The bird slates begin mainly at 44, and become degraded at 60, while the plain squares run from 37 to 70, when they were ornamented with border lines on to 80.

In the use of metals, gold and silver are commonest about 42 to 46, which is, perhaps, the age of most prosperity and foreign connections, when the decorated and later styles of pottery were coming into use. Copper was used from the earliest age, 30, when only a few simple types of cups in one kind of pottery were made (see Fig. 6). Harpoons and small chisels came in about 34, needles about 48, adzes for wood-work about 52, while a large square chisel and plain square axe blade only appear at 78. Foil and bands seem to have been made before wire was hammered out. In weapons the disc-shaped mace head is the earlier (Fig. 5) and disappears when the pear-shaped mace came in, which lasted into early history.

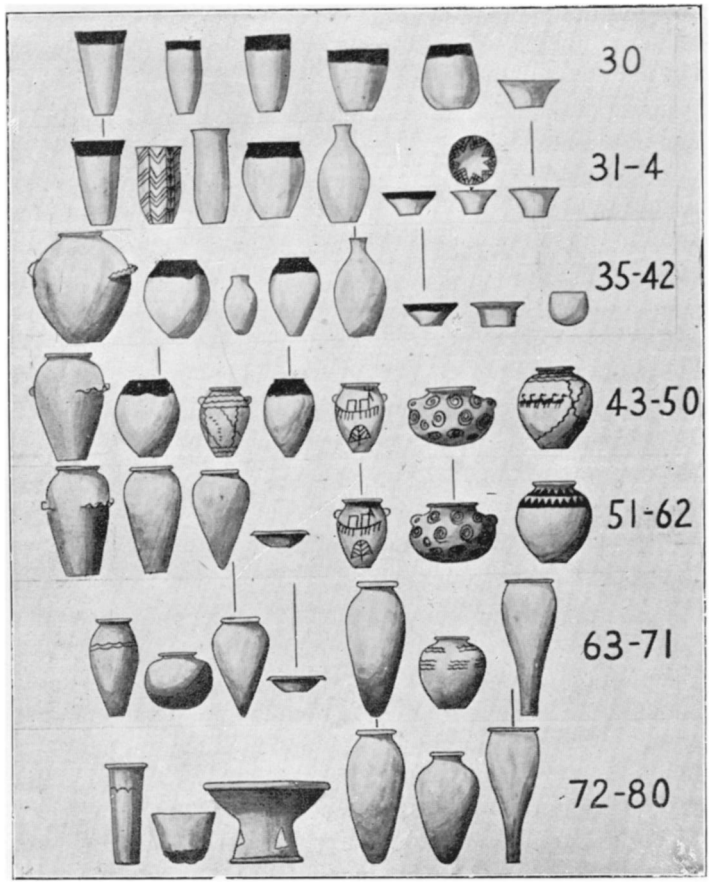
Thus this chaos of over nine hundred types of pottery, hundreds of stone vases, weapons and tools of flint and of copper, ivory work, and beads, extending over many centuries, perhaps one or two thousand years, has now been reduced by this system to an orderly series, in which we can not only state exactly the relative order of the objects, but also the degree of uncertainty and the extent of range which belongs to each object. We have here a new and exact method for dealing with all those vague ages as yet unfathomed, and for extracting all that is possible about their history. Prehistoric archæology has made another step toward becoming an exact science. And now the responsibility of those who excavate is tenfold increased, as the extent of their care and exactitude will more than ever restore or ruin the history of the past.

*Illustrations of Sequence Dates in Prehistoric Egypt.*

Fig. 1. Types of pottery of seven successive stages, the sequence dates of each being at the right. In each stage are shown forms which are peculiar to that stage, together with two forms which pass through into an adjacent stage. Thus the pottery of each stage may be regarded as what would be most typical and important in a tomb of that period. It will be readily seen how impossible it would be to invert the order of any of these stages without breaking up the links between them. Thus if there be sufficient variety of pottery in any tomb its true position in sequence with others is exactly fixed, and it cannot be displaced without stretching the range of some of the types of pottery. At the left ends of the five lower rows is the wavy-handled type, in its various stages ; the degradation of this type was the best clue to the order of the whole period.

Fig. 2. Having dated all the pottery types, it is possible to date all other objects by their association with pottery. Thus it is possible to trace the history of the slate palettes. The forms of these slate palettes, used for grinding face paint, are very varied. The rhomb is the earliest type, but died out by 37, except in rude forms, which lasted till 47. Quadrupeds are well worked at first, but become rough by 40, and rarely recognisable later on. Fishes and turtles begin at 36, become rude by about 50, and were ovals and discs by 70. Birds only begin at 46, and double birds at 38 ; they also become very rude before the end of the period. The squares begin at 37 ; but at 67 notched borders appear, and from 70 to 80 line borders.

Figs. 3, 4. The genealogies of some forms of pottery from beginning to end of the whole

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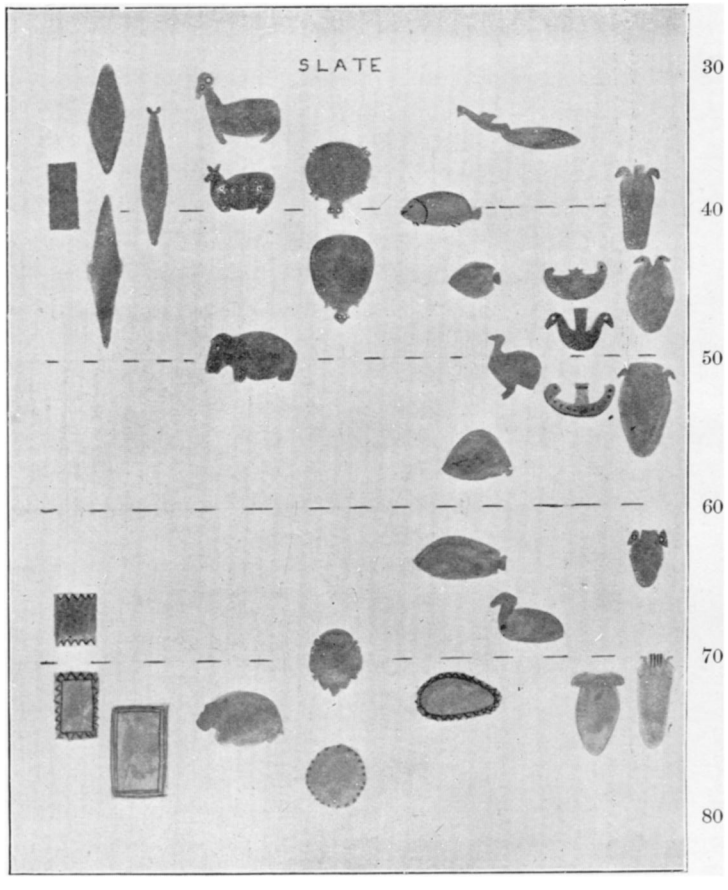


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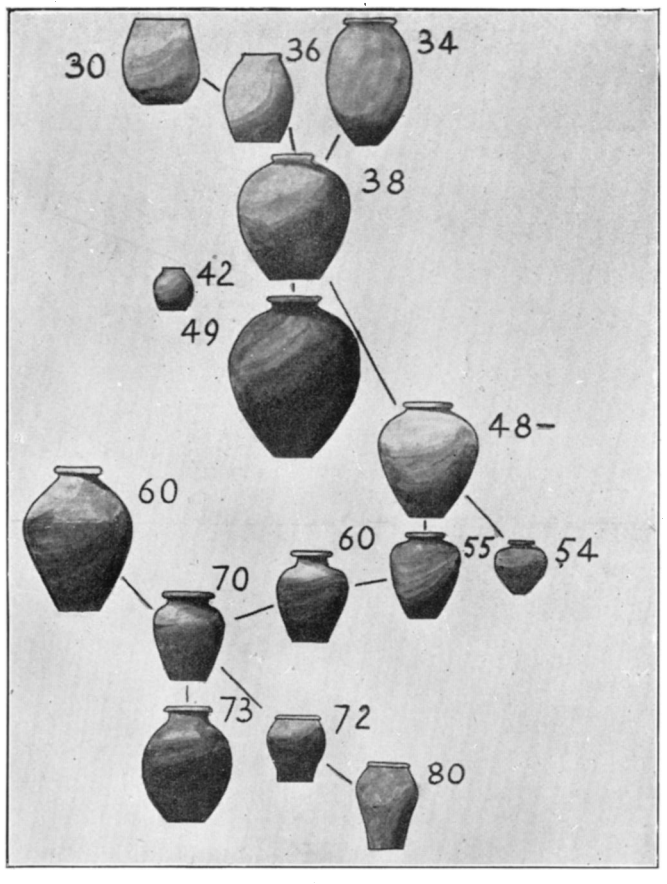


FIG. 3.

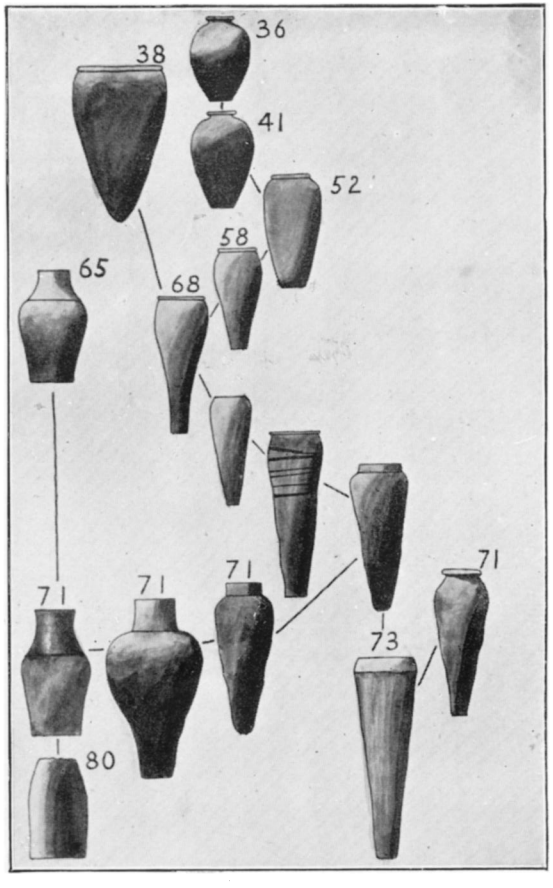


FIG. 4.

FIGS. 3, 4.—The genealogies of some forms of pottery from beginning to end of the whole period. These forms pass through two or three different fabrics showing that form is more important than material.

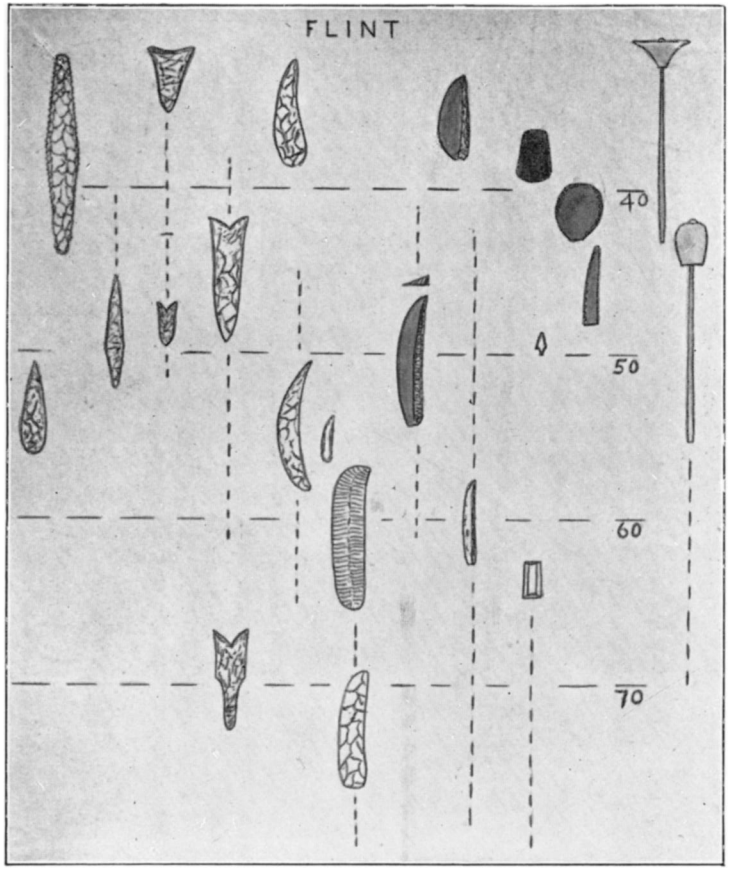


FIG. 5.—In the earliest graves the notching of the saw edge is delicate and regular, but the surface flaking is not in any pattern. The fine ripple flaking with regular ridges, on the face, belongs to the middle period of 57 to 66. The knives begin curved with rounded butt, become long and sickle-shaped, then wide and flat with straight edges, and lastly rough and thick. The forked lances are wide and flat-ended at first, then deepen to a V groove, and lastly have tangs.

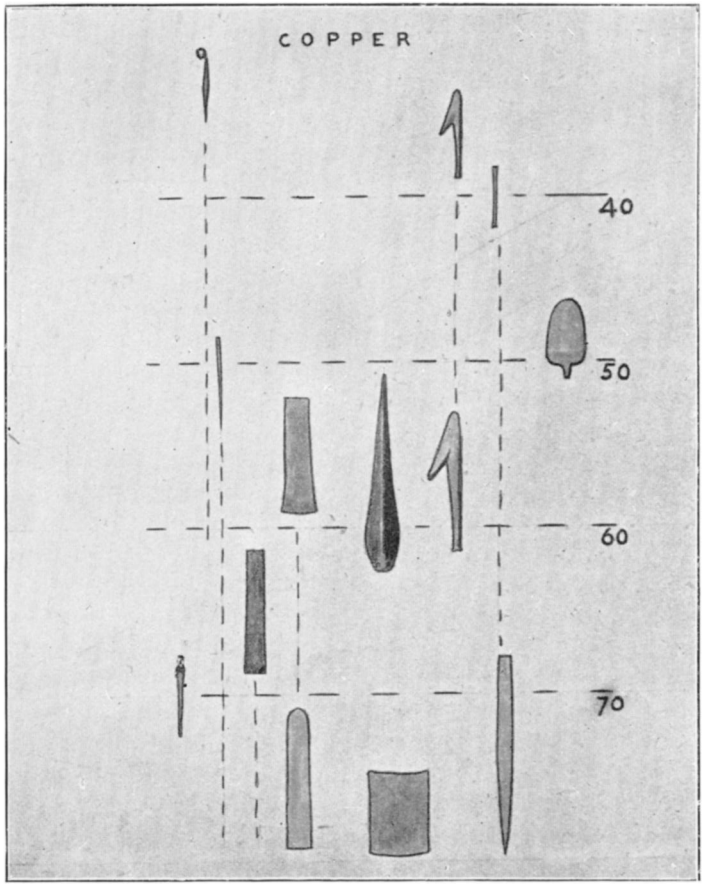


FIG. 6.—The copper tools begin with small pins to fasten the skin cloaks. Then harpoons modelled on the forms carved in bone. Small chisels appear at 38; wide adzes for wood work at 52, rounded at the top in 78; and a deep, stout chisel and simple axe at 78. Thus metal is found in the oldest graves known; it becomes varied in use by about 50, and further improved at the end of the period.

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Fig. 5. The history of flint-working can be traced in the same way as that of the slates. In the earliest graves the notching of the saw edge is delicate and regular, but the surface flaking is not in any pattern. The fine ripple flaking with regular ridges, on the face, belongs to the middle period of 57 to 66. The knives begin curved with rounded butt, become long and sickle-shaped, then wide and flat with straight edges, and lastly rough and thick. The forked lances are wide and flat-ended at first, then deepen to a V groove, and lastly have tangs.

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In all of these series of changes in slates and tools we see a regular progression, yet this dating results solely from the pottery with which they were found; and thus this regularity of results is the strongest proof of the true and solid basis of the classing by sequence dates