

CHRONOLOGY OF UBAID TOMBS FROM KASHKASHOK II

—Examination of tomb and pottery sequences—

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1. Introduction

This article deals with the Ubaid and post-Ubaid tombs from Tell Kashkashok, tell No. II in northeastern Syria (Fig. 1). The site was excavated in 1987, 1988 by the expedition team from Tokyo University [Matsutani 1991]. It was revealed that the mound of Kashkashok II had been used as a cemetery throughout the Ubaid and post-Ubaid periods (Fig. 2). Although about one hundred tombs (of which sixty-three were registered) were excavated, over two hundred tombs may have been dug. While those that were well-preserved and clearly recognizable as tombs were assigned registration numbers, others remained unnumbered. The former tombs had funerary objects and/or were in good condition. All of the tombs — registered and unregistered — were spread throughout the mound in a fairly uniform density [Koizumi 1991].

On the assumption that each tomb might have been dug to a certain depth in the moderate mound, I felt that the base level of a tomb could reflect the surface level from which it had been dug. Although the speed of soil accumulation on the tell would have varied, the rate might have been almost regular through a certain unit of time. Therefore the base level of a tomb can be used to order each tomb chronologically. My purpose here is to seriate the tombs, to correlate the seriation with that of pottery, and to establish a chronology for the Ubaid tombs in Kashkashok II. As the first one has been tentatively attempted in other papers¹⁾ [Koizumi 1992; 1994], I shall here refine the analysis and complete the chronology.

2. Methods

Let us now look at the method of determining the 'relative level' and ordering the tomb sequence.

1) Layer

Kashkashok II has been eroded between the north and west side of the mound by flooding of the Wadi al Aweiji, a tributary of the Khabur. The rapidity of the flooding can be seen on the north of Kashkashok III, a nearby mound south of Kashkashok II (Fig. 1). On Kashkashok II the following cultural sequence has been distinguished: starting with the Hassuna period in the natural layer, it is followed by the Ubaid and post-Ubaid periods, a cemetery, and then subsequent periods, such as Islam, when several pits were dug through the previous layers.

From a section of Kashkashok II, we suggest that soil accumulation on the mound may have occurred in a regular pattern. During the first part in the Hassuna period it may have been even and moderate. Then, after much alternating episodes of accumulation and erosion, the mound grew evenly over most of its surface with greater than average increase on and/or around the center of the mound, and less than an average on the periphery. It is possible, then, that the soil and rubbish were deposited gradually in conformity with the moderate surface of the previous layer²⁾.

Accumulation continued in a similar manner after the Hassuna occupation. Around the time Level 2b

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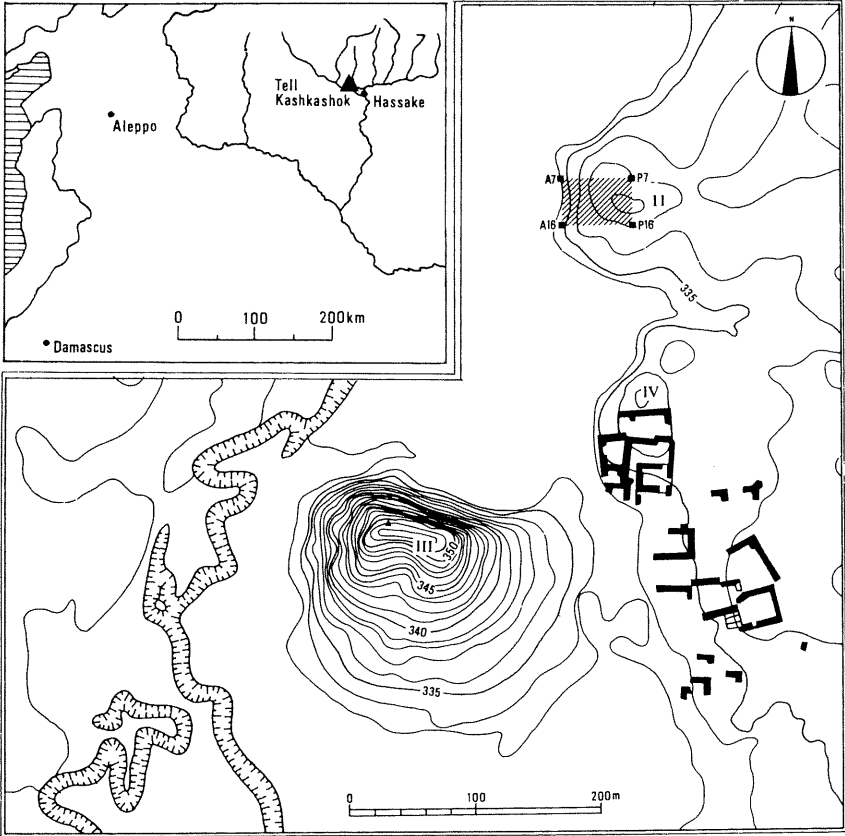
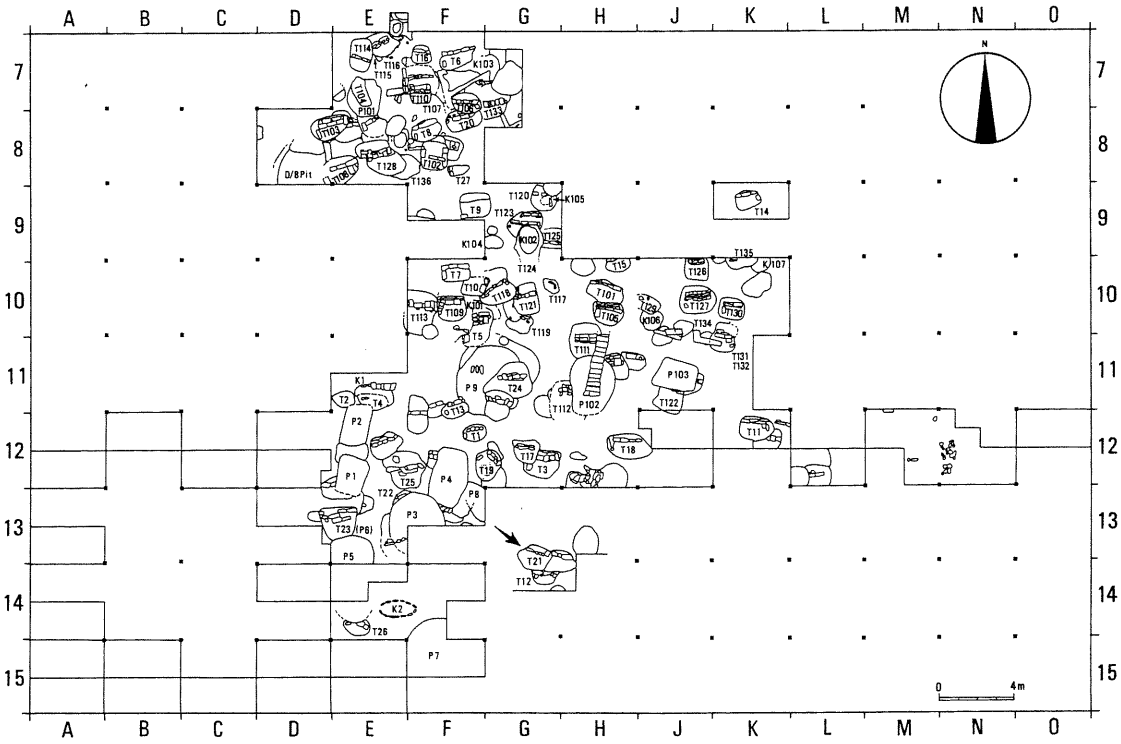


Fig. 1 Map of Tell Kashkashok
Revised and additional drawing of [Matsutani 1991: PLs. 53, 54]



was formed on the mound, however, the degree of erosion had become intense. For example, it appears that T113, a tomb subsequent to the Ubaid, and P3, a Islamic pit, were both dug from Level 2a. This stratigraphic anomaly may have resulted as follows: originally the features belonged to different layers, post-Ubaid and Islam, which were subsequently heavily eroded. It is difficult to observe a correlation in time scale between T113 and P3. It is possible, therefore, that, while Level 2b may be an occupation surface from which several tombs may have been dug, or an eroded Ubaid one, Level 2a is an eroded surface pertaining to Islam and beyond. In fact, it has been observed in the northwestern part of the mound that Level 2a destroyed parts of Level 2b and other levels, and was deposited around the time that the latter were eliminated.

It can therefore be suggested that the accumulation of soil and rubbish, including artifacts, may have continued gradually and was consistent with each previous occupied surface in respective phases; strata which are found with tilted surfaces may have lain in conformity with the contours of a preexisting basin of deposition [Harris 1989: 31]. The process may have been virtually continuous from natural layer to Level 2b. Although the speed of accumulation may have been diverse on various parts of the mound (faster on the center and slower on the periphery) the increase in accumulation would have been consistent through time, so that the mound formed a tell-shape. Hence, it is proposed that the surface of Kashkashok II may have been moderate in each phase, although some parts of the mound were deposited or depressed more progressively than others.

2) Tomb structure

Most of tombs at Kashkashok II are uniform in structure. In the first stage of construction the tomb was dug vertically, like a shaft tomb. Then, it was extended horizontally southwards to make a burial chamber; the vertical shaft gave access to the lateral burial chamber. Following inhumation, its entrance, mostly at the north side of the chamber, was closed by a mud-brick wall. Finally the shaft was sealed with a layer of clay to the top of the shaft. The shaft, especially portions adjacent to the burial chamber entrance, is often packed with solid clay blocks, each about 5–10 cm in diameter (Fig. 3).

Now let us consider which point of the tomb is available for chronological analysis and comparison. Indeed, it is difficult to determine from which layer each tomb shaft was originally dug due to the poor state of tomb preservation. But evidence indicates that some Kashkashok II tombs were dug from Layer 2a, while others were dug from Layer 2b (Fig. 4). They were dug to an average depth of more than 1 m and reach near to or the natural soil. Most often the burial chamber is the best preserved portion of the tomb plan. In particular, the base of the burial chamber is recognized on almost all *in situ* tombs. Therefore, the base of the burial chamber provides reliable information for chronology, because of its position and the approximate uniformity in chamber depth.

Combining this speculation with the previous assumption, I propose that the tomb may have been dug to a certain depth on the conformable surface which continued to be moderate in each phase despite some irregular places. Consequently the base level of the chamber could reflect the surface one from which it might have been dug. I suggest, thereby, that the level of the former can be used to order each tomb on a time scale. The level could be easily transformed into a 'relative level' of the tomb and compared with others that may represent its relative location in the accumulated layers.

3) 'Relative level'

The base level can be transformed into the 'relative level' as follows. First, a point 't' located at the cross of major and minor axes in the burial chamber is fixed; from the point a base level 'h(t)' is determined. This point 't' is chosen for the base level because there is no other accurate, intact position to provide a

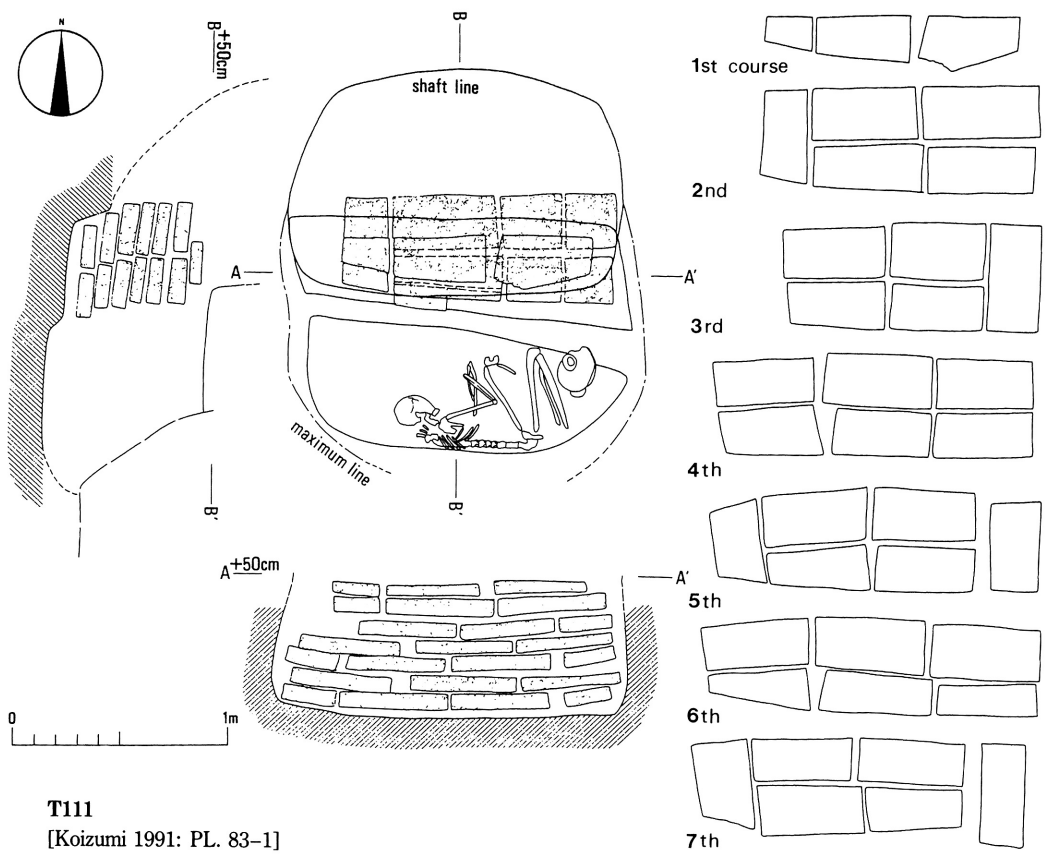
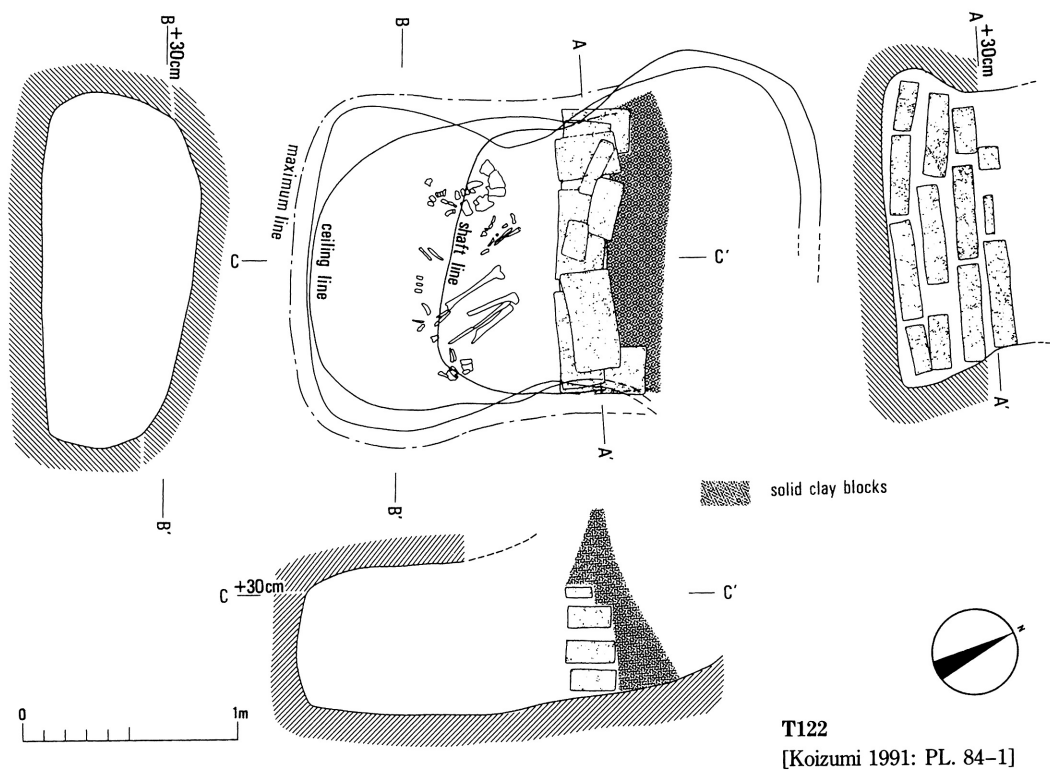


Fig. 3 Structure of Tomb

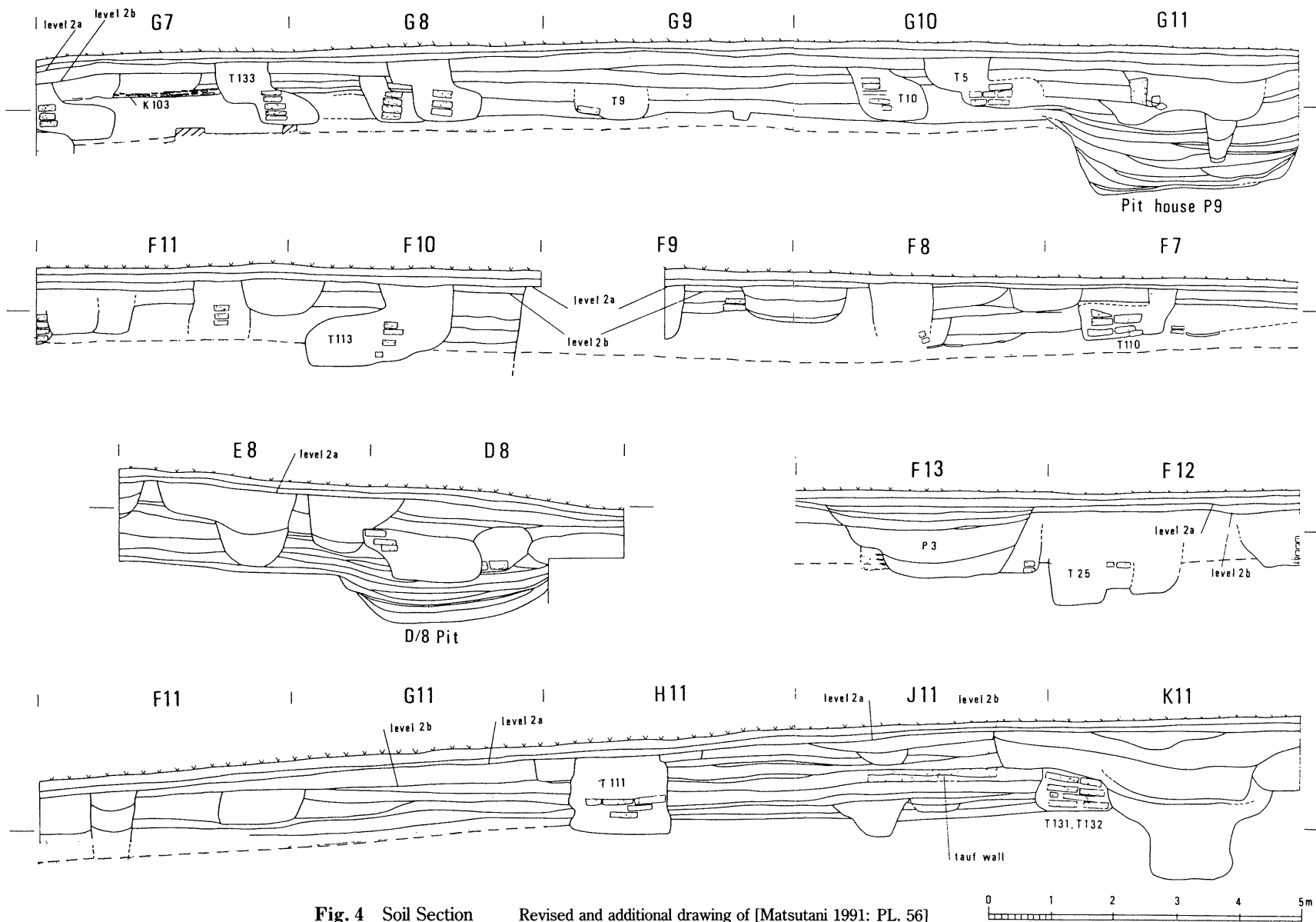


Fig. 4 Soil Section Revised and additional drawing of [Matsutani 1991: PL. 56]

‘base level’ of the burial chamber, owing to poor preservation conditions. It is also the most available and indigenous data in the excavated tombs.

The data of the levels of the natural layer and Level 2b at the point ‘t’ are extracted according to a location model (Fig. 5). Top levels of the natural layer $[hn(x1), hn(x2), hn(y1), hn(y2)]$ at points $[x1, x2, y1, y2]$ where lines from the point ‘t’ cross perpendicular to each side of 4×4 m square can be restored through drawings of vertical sections³⁾. Provided that lengths from ‘t’ to ‘x1, x2, y1, y2’ are $lx1, lx2, ly1, ly2$ respectively, a surface level for the natural layer at point ‘t’ $[hn(t)]$ is hypothetically deduced as $hn(x)$ and/or $hn(y)$:

$$hn(x) = \frac{lx1 \times hn(x2) + lx2 \times hn(x1)}{lx1 + lx2} \dots \textcircled{1}$$

$$hn(y) = \frac{ly1 \times hn(y2) + ly2 \times hn(y1)}{ly1 + ly2} \dots \textcircled{2}$$

If the degree of slope in a north-south direction does not differ from that in an east-west direction, and if the surface is linear both $hn(x)$ and $hn(y)$ would express the same value. But as the surface is actually slightly quadratic or cubic, we have to smooth the uneven surface by calculating a mean of ① and ②:

$$hn(t) = \frac{hn(x) + hn(y)}{2} \dots \textcircled{3}$$

Similarly a height for Level 2b at point ‘t’ can be acquired:

$$h2b(t) = \frac{h2b(x) + h2b(y)}{2} \dots \textcircled{4}$$

Based on ③ and ④, a ‘relative level’ at point ‘t’ is suggested as the transformed level, that is the level as it is relatively located in the accumulated soil above the natural layer:

$$H(t) = \frac{h(t) - hn(t)}{h2b(t) - hn(t)}$$

When a value of $H(t)$ is high, the base level of the tomb is higher from the natural layer level, and when the value is low, the base is nearer to the natural layer. If $H(t)$ is less than 0, the base level of the tomb is under the bedrock. On the other hand if $H(t)$ is greater than 1.0, the base level of the tomb would have been above Level 2b.

3. Analysis I

1) Ordering I

According to the above method, the values of $H(t)$ are ordered from smaller to larger (Fig. 6). Several observations derive from this ordering. We call the cluster pattern ‘Graph I’. It pertains to a set of analysis which will be followed in this paper.

First, ‘relative levels’ for tombs dug from Level 2b (T117⁴⁾, T10, T125, T129) show even values ($+0.3437 \sim +0.4301$), and these tombs aggregate in one cluster [T117–T5] or a second [T129–T107] located above the former on Graph I. Therefore, tombs belonging to the cluster [T117–T5] could have been dug simultaneously from Level 2b. This assumption is also based on the fact that among four tombs of the cluster T117, T10, and T125 were dug from Level 2b. The high correlation between the cluster [T117–T5] and tombs belonging to Level 2b represents a significant hypothetical ‘relative level’; a particular cluster on Graph I can be equated to tombs assigned to a nearly simultaneous stage at Kashkashok II.

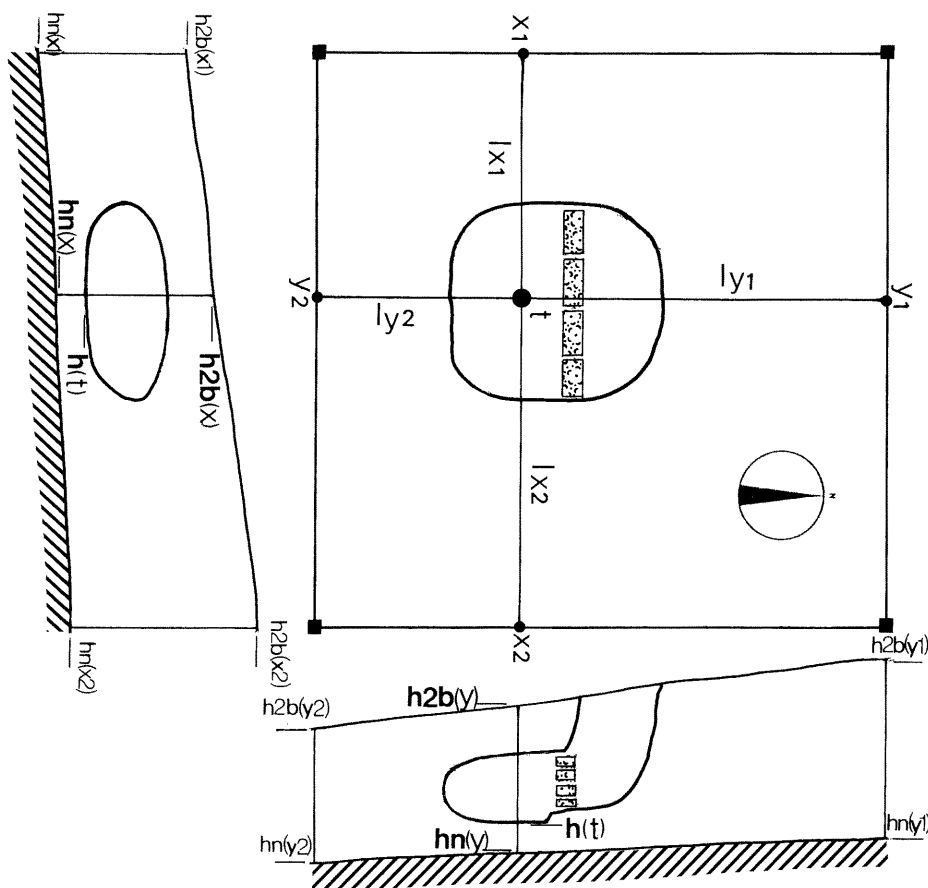


Fig. 5 Model of 'Relative Level'

Second, each cluster of tombs, except for some examples, is connected with previous and later ones by a constant degree of increase, which means that the progressive rate of soil-accumulation and tomb-formation at the site would be almost regular through several stages or phases. This observation for Graph I provides further backing for the above assumption that the accumulation of soil and rubbish and tomb formation may have continued gradually in conformity with each previous occupied surface (first assumption).

Third, tombs in a cluster are sometimes located close to each other (Fig. 8); for example, clusters [T19, T24], [T101–T105], [T119–T123], and [T117–T5]. This observation fits the hypothesis that contemporary tombs in one cluster might be located near each other. In addition, tomb distribution would have moved from the southwestern to western area on the tell, as time progressed.

2) Extraction

Further observations are proposed inconsistent with the above. Level 2a could be an eroded surface, not an occupied one as mentioned previously. There are six tombs in the level (T5, T113, T116, T133, T135, T137⁵). The 'relative levels' of these tombs show more uneven values ($-0.6091 \sim +0.3846$) and a much wider variation than in Level 2b. Of the six tombs only two (T133, T137) are in the same cluster group [T132–T9] on Graph I. It is easily seen that other tombs in the cluster (T132, T118, T9) show no evidence of being dug from Level 2a. Thus, there is little correlation between some tombs which seem to have been excavated from Level 2a and a particular cluster.

The difference in correlation between Level 2a and Level 2b is suggested by additional evidence:

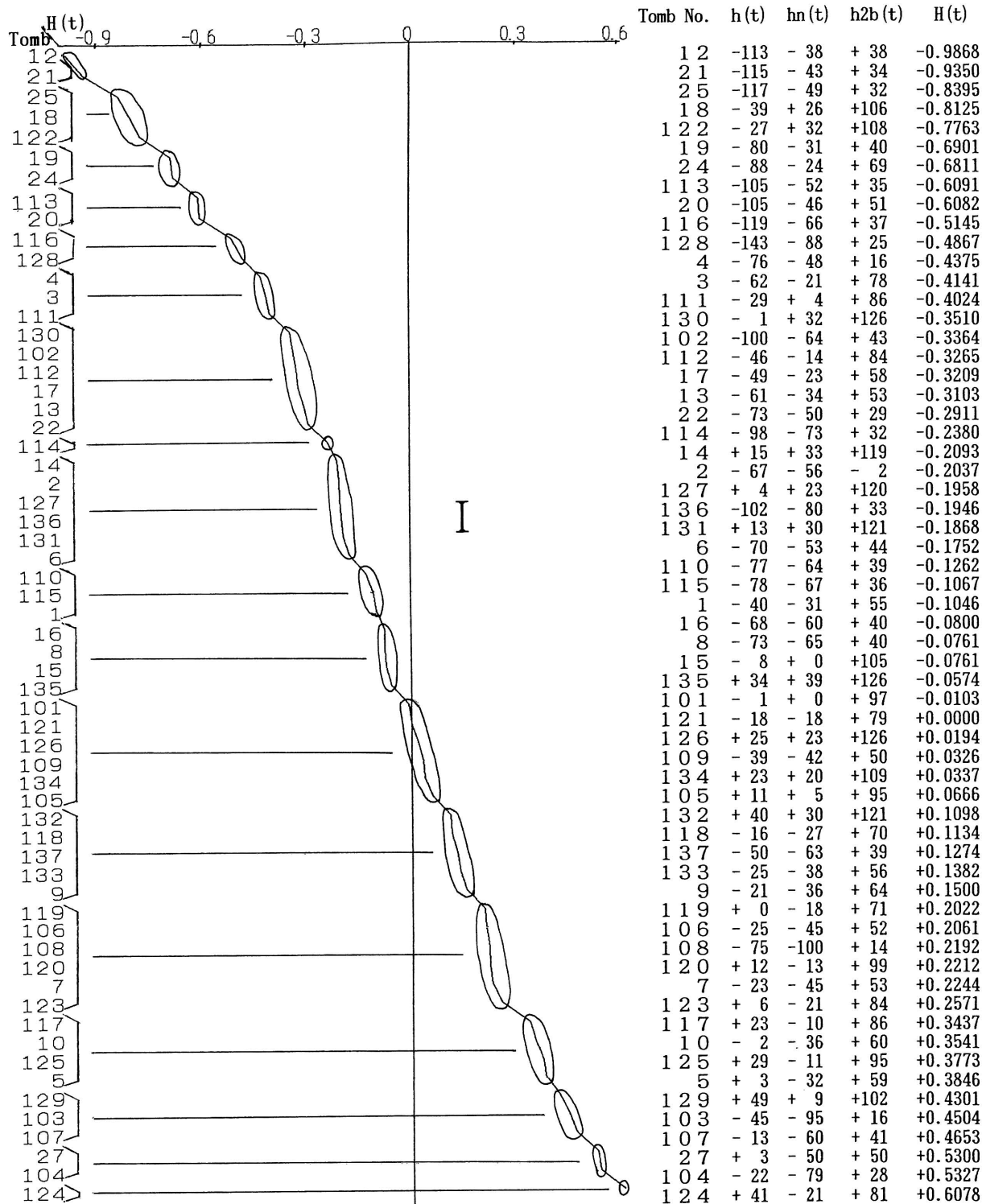


Fig. 6 Graph of Ordering I

although an eroded surface, Level 2a, was certainly formed after the occupational surface of Level 2b, all values of 'relative levels' for tombs apparently dug from the former, except for T5, are located below those of the latter on Graph I. This inconsistent situation lead us to a propose that the uniform tomb depth during an earlier time (first assumption) could have changed into an uneven and varied one after Level 2b had been formed. It may be assumed, therefore, that most tombs belonging to Layer 2a would have been excavated much more deeply than before (second assumption).

The temporary assumption concerning tomb depth provides a further stage in analysis: because the tombs assigned to Level 2a or later would not have been dug as consistently as those of the previous phases before or around Level 2b, the former must be discriminated from the latter. To avoid mixing both groups, it is necessary that the samples which are inadequate for the 'first assumption' are extracted from those suitable for it in the search for a chronology of the tombs.

We also find some tombs with distinctive structures next to common ones having a brick wall in the burial chamber. The unusual tombs which have wing bricks on either or both sides of the brick wall belong to Level 2a not Level 2b (T137), and/or sometimes cut other tombs assigned to Level 2a (T109, T110). Moreover, no such tomb belonging to Level 2b might have cut one with wing bricks. Hence, we can surmise that no tomb having a mud-brick wall accompanied with wing bricks could be assigned to a phase earlier than the end of Level 2b. It is, therefore, reasonable to consider such tombs as counterparts of a group that should be distinguished from other normal tombs as well as those belonging to Level 2a, and to discuss them in the same category of extraction in the following analysis of tomb chronology.

(1) Tombs dug from Level 2a or cutting such ones:

T5, T109, T110, T113, T114, T116, T128, T133, T136, T137.

(2) Tombs with wing bricks:

T18, (T25)⁶⁾, T102, T108, T109, T110, T137.

4. Analysis II

Based on the above reasoning, I extracted both tomb types and made another graph (Fig. 7). This Graph II consists of one cluster pattern concerning those tombs which have not been abstracted by the extraction procedure, Graph II(a), and another one regarding the extracted tombs, Graph II(b).

1) Ordering II(a)

Several observations, most of which have already been recognized in the Ordering I, are clearly visible on Graph II(a). The significance of the 'relative level' is more clearly confirmed in the second ordering process. The cluster [T117–T5] on Ordering I is revised into one [T117–T125], which introduces a more definite correlation between the cluster [T117–T125] and tombs belonging to Level 2b. On the basis of this correlation, it may be assumed that the relationship between one cluster on Ordering II(a) and one group of tombs dug simultaneously can be synchronized.

The accumulation of soil and rubbish and tomb formation have been hypothetically considered to progress gradually (first assumption). An inclination of cluster pattern above a value of T4 [H(4)] on Ordering II(a) is almost regular, in spite of intentionally extracting data unsuitable for analysis. It may be guessed, then, that the accumulation of soil and rubbish and tomb formation on the tell continued at a regular and gentle rate per phase, after tombs forming the cluster [T4–T111] had been dug.

In contrast, below H(4) on Ordering II(a) there is a tendency towards an increase in 'relative level' at a regular rate different from that above H(4). The cluster pattern below H(4) shows a much steeper increase than in the previous Ordering I. This may be due to the fact that the excavations have

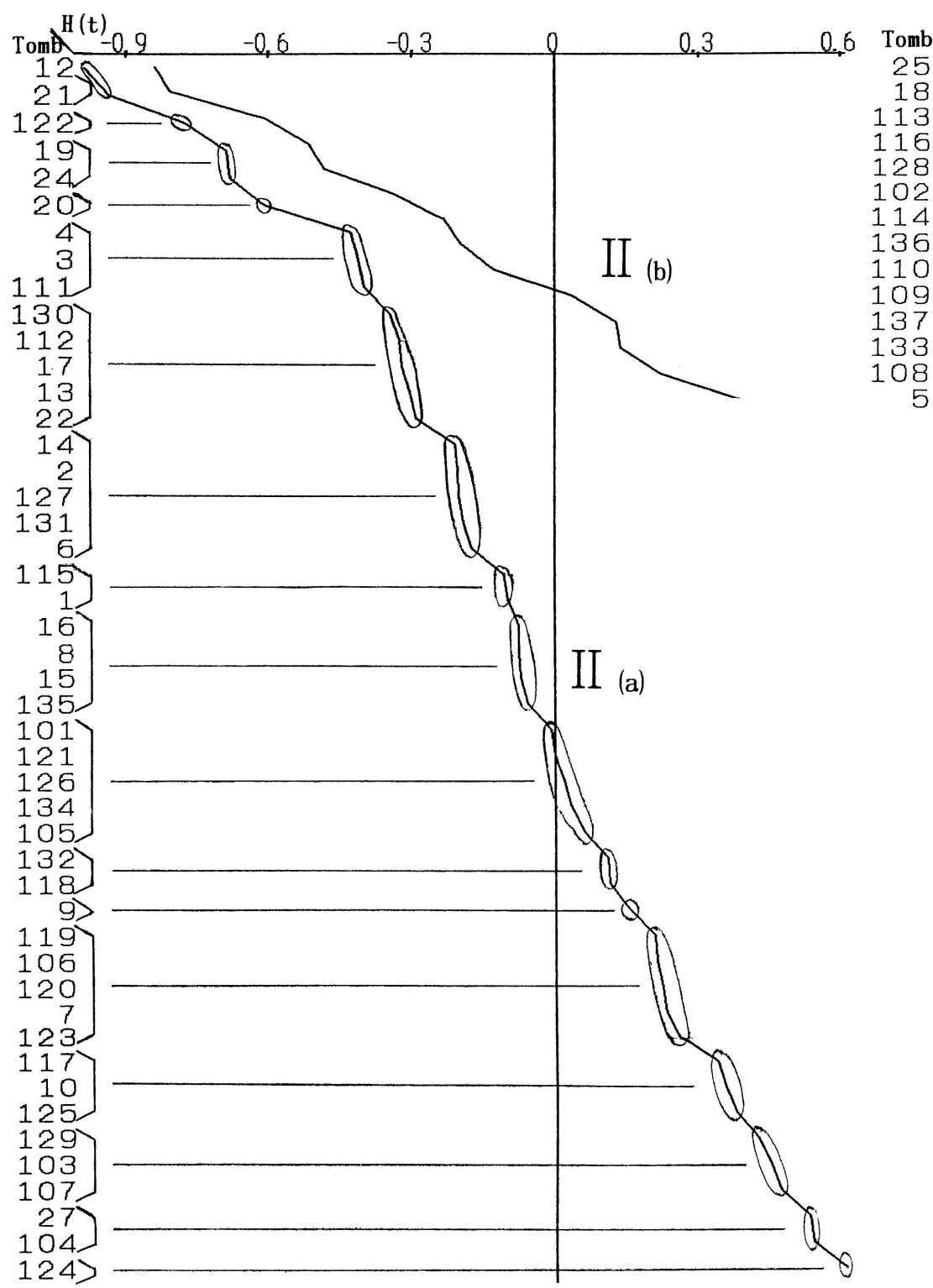


Fig. 7 Graph of Ordering II(a), II(b)

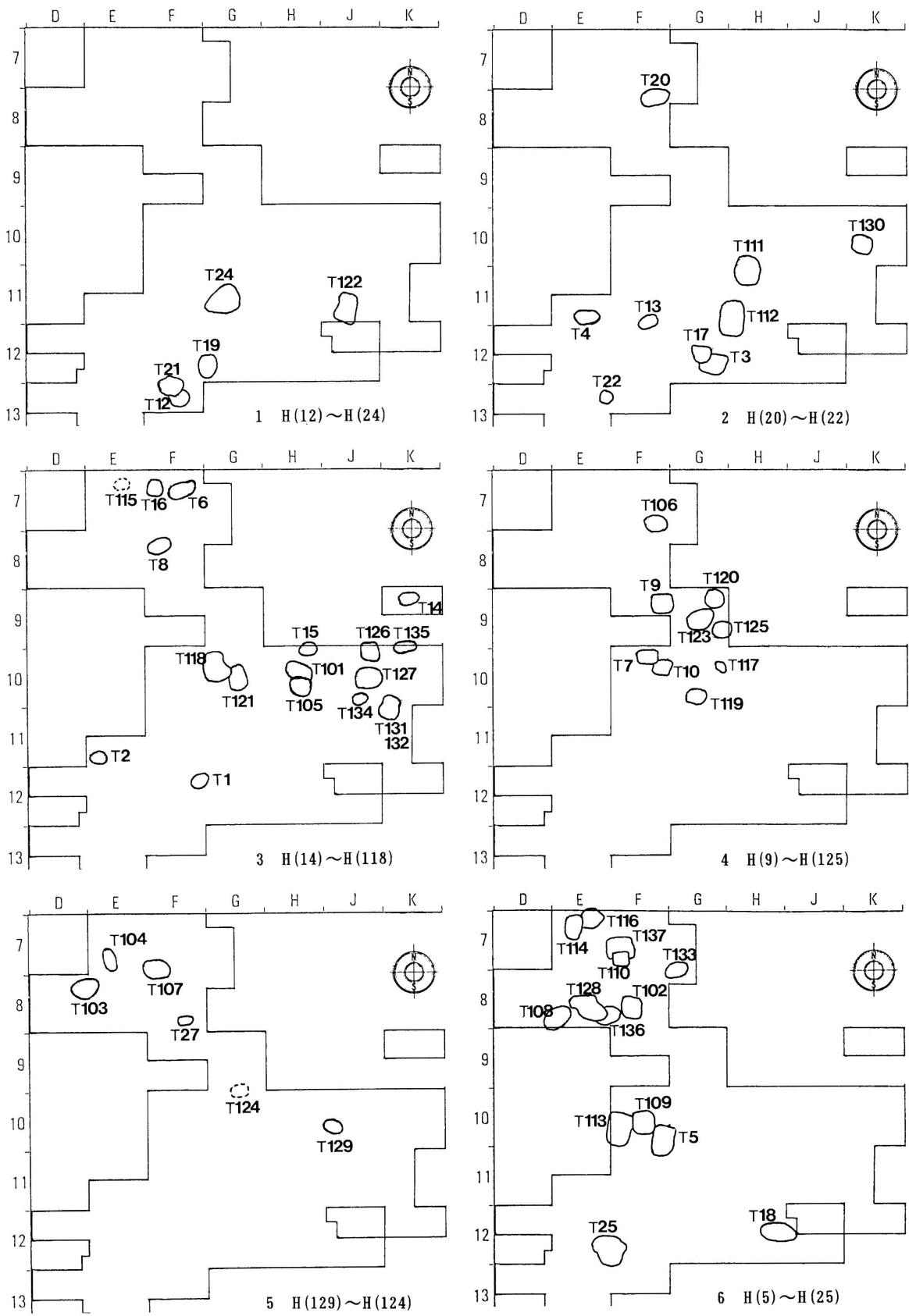


Fig. 8 Distribution of Tombs

concentrated on the western slope, while most of tombs below H(4) are located on the southwestern slope, and tomb distribution was moved through time from the southwestern to western slope on the tell. It is possible, then, that, if we get data as yet undiscovered in the southwestern, the steeper inclination below H(4) would almost equal the gentler one above it.

The spatial distribution of the tomb cluster on Ordering II(a) has been treated as a mildly separated group on the ground (Fig. 8). A set of clusters from [T12, T21] to [T19, T24] is concentrated in the southwestern area (southern on the excavated map); [T20] to [T130–T22] near the southwestern; [T14–T6] to [T132–T118] in the western; [T9] to [T117–T125] in the western and near the northwestern; [T129–T107] to [T124] in the northwestern. This tendency of changing cluster patterns can indicate tomb distribution moving gradually from the southwestern to northwestern parts on the tell (southern to northern parts on the excavated map).

Those revised observations are summarized as follows: the ‘relative level’ becomes significant in this study, one cluster on Ordering II(a) can be equated to a group of simultaneously dug tombs, the accumulation of soil and rubbish may progress gradually at a regular rate, the digging of tombs may continue at almost the same pace, and the spatial distribution of tombs can move from the southwestern to northwestern areas through time.

2) Ordering II(b)

There is another ordering graph which shows a cluster pattern of tombs extracted from mother groups due to reasons outlined above-Level 2a and wing bricks (Fig. 7). It concerns fourteen tombs. In contrast to Ordering II(a), Ordering II(b) provides very different characteristics for the cluster pattern of ‘relative levels’. Therefore, I am going to analyse and consider aspects of Ordering II(b) that have not been applied to Ordering I or II(a): overlapping relationship and location of wing bricks.

(1) Overlapping

At the first of Ordering II(b) in detail, I analyse some tombs which have been known to cut others in the Kashkashok cemetery. Four overlapping relations can be recognized on Ordering II(b).

earlier→ later
 T113 → T109
 T116 → T114
 T136 → T128
 T137 → T110

When comparing the relationship between these tombs with an increase or decrease of each ‘relative level’ [H(t)], several observations can be made.

⇒Positive correlation: ‘relative level’ of an earlier tomb is less than later one.

$$T113 \Rightarrow T109: H(113) = -0.6091 < H(109) = +0.0326$$

$$T116 \Rightarrow T114: H(116) = -0.5145 < H(114) = -0.2380$$

➡Negative correlation: ‘relative level’ of an earlier tomb is greater than later one.

$$T136 \Rightarrow T128: H(136) = -0.1946 > H(128) = -0.4867$$

$$T137 \Rightarrow T110: H(137) = +0.1274 > H(110) = -0.1262$$

The observation on Ordering II(b) shows that, in the case of positive correlation, T109 and T114, overlapping T113 and T116 respectively, have a higher chamber base than T113 and T116. On the other hand, in the case of negative correlation, T128 and T110, overlapping T136 and T137 respectively, have a

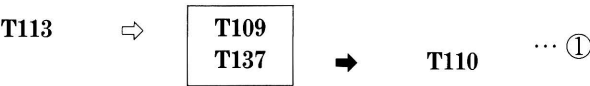
lower chamber base than T136 and T137. The negative relationship gives us distinct evidence that the later tombs were dug to a deeper level than ever cutting the previous tombs. Moreover, it is also notable that the ‘relative levels’ of T136 and T137 which are earlier tombs in the negative correlation are greater than those of T113 and T116 which are earlier ones in the positive. This might be treated as a clear distinction between both correlations.

In addition, a regular and steeper inclination of Ordering II(b) is thought to reflect the situation that the tombs were distributed at a constant rate within the investigated area as and when the area would be extended, and that there is evidently less data for Ordering II(b) than for Ordering II(a). It is likely, then, that fewer tombs were dug on the southwestern slope after tombs of Ordering II(b) had been made.

When we combine this evidence with the overlapping relationship mentioned above, it can be said that, as more and more earlier tombs were dug on the mound, later tombs might have to be planned in accordance with the narrow space or limited circumstances resulting from such a high density and to avoid many previous ones which occupied the area near by. Therefore, an actual overlapping of a tomb in positive correlation could have occurred earlier than another in a negative one; a phase when T109 and T114 were dug might have been older than that of T110 and T128. It may be inferred, then, that location on the time scale is different between the positive and negative correlation groups, although clarification is still needed to determine whether later tombs (T109, T114) overlapping earlier ones in the former group are older or younger than earlier tombs (T136, T137) overlapped by later ones in the latter group.

(2) Location of wing bricks

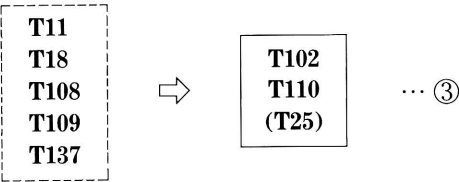
I shall now sort according to location the tombs which have a brick wall accompanied with wing bricks. At first, these tombs are roughly classified into those with wing bricks located in a chamber and those in a shaft (Fig. 9). As T109 and T137 have wing bricks in their chambers, they can be assigned to the same group. Their overlapping relationship might be as follows.



This resemblance in location of wing bricks enables other overlapping examples to be correlated.



Based on ①, it may be conjectured that the group of tombs with wing bricks in a chamber [T11⁷, T18, T108, T109, T137] would have been formed earlier than those with wing bricks in a shaft [T102, T110, (T25)]:



In detail it is indicated that, although T18 has a wing brick in its chamber, the joint to the brick wall appears less tight than that of others; T18 seems to be comparable to a more primitive form — a tomb accompanied only by a brick wall in a chamber (Fig. 9–1). Thus, T18 is better assigned to the previous group in location of wing bricks than that consisting of T11, T108, T109, and T137.

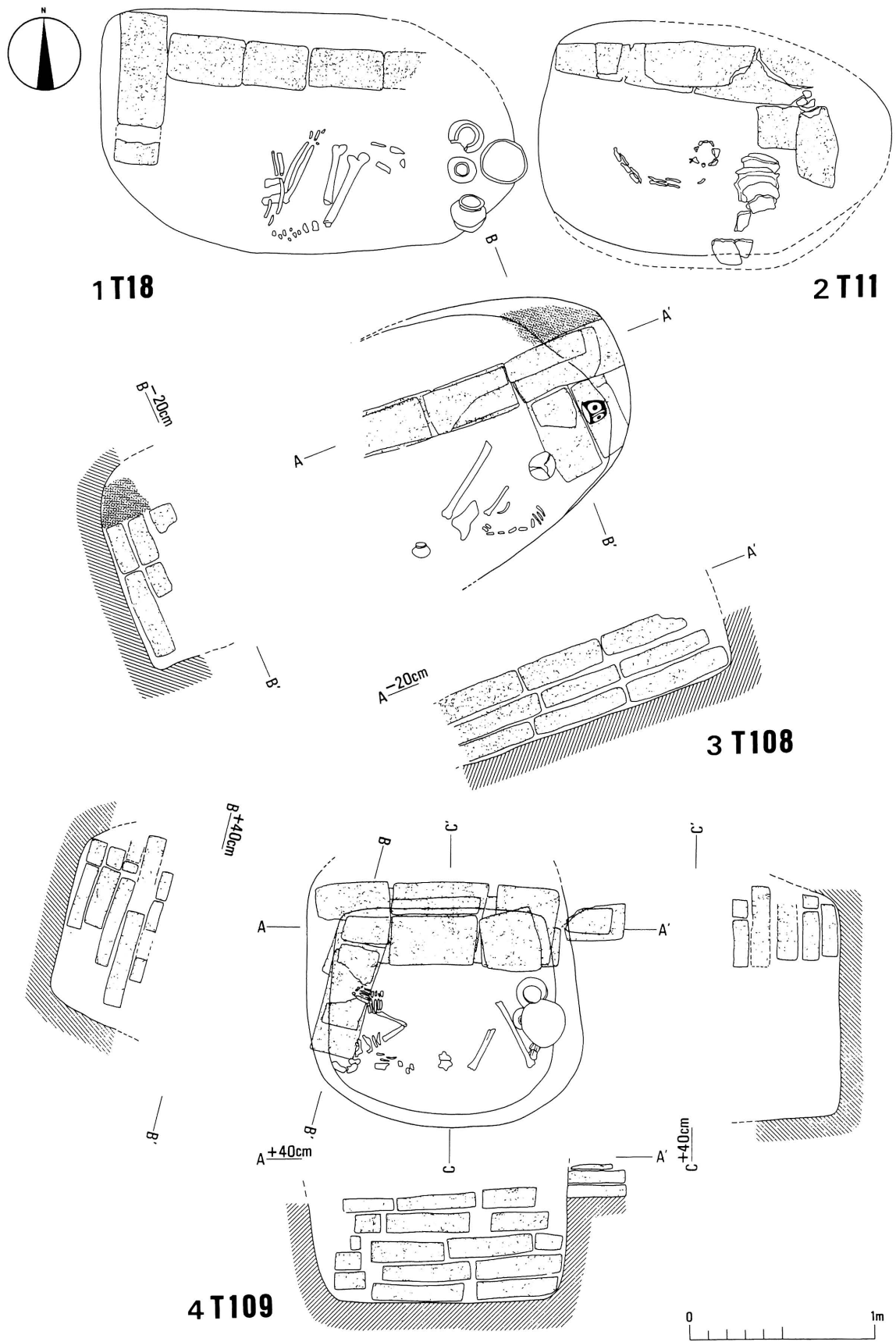


Fig. 9 (1) Wing Bricks

[Koizumi 1991: PLs. 80-3, 79-4, 81-2, 82-1]

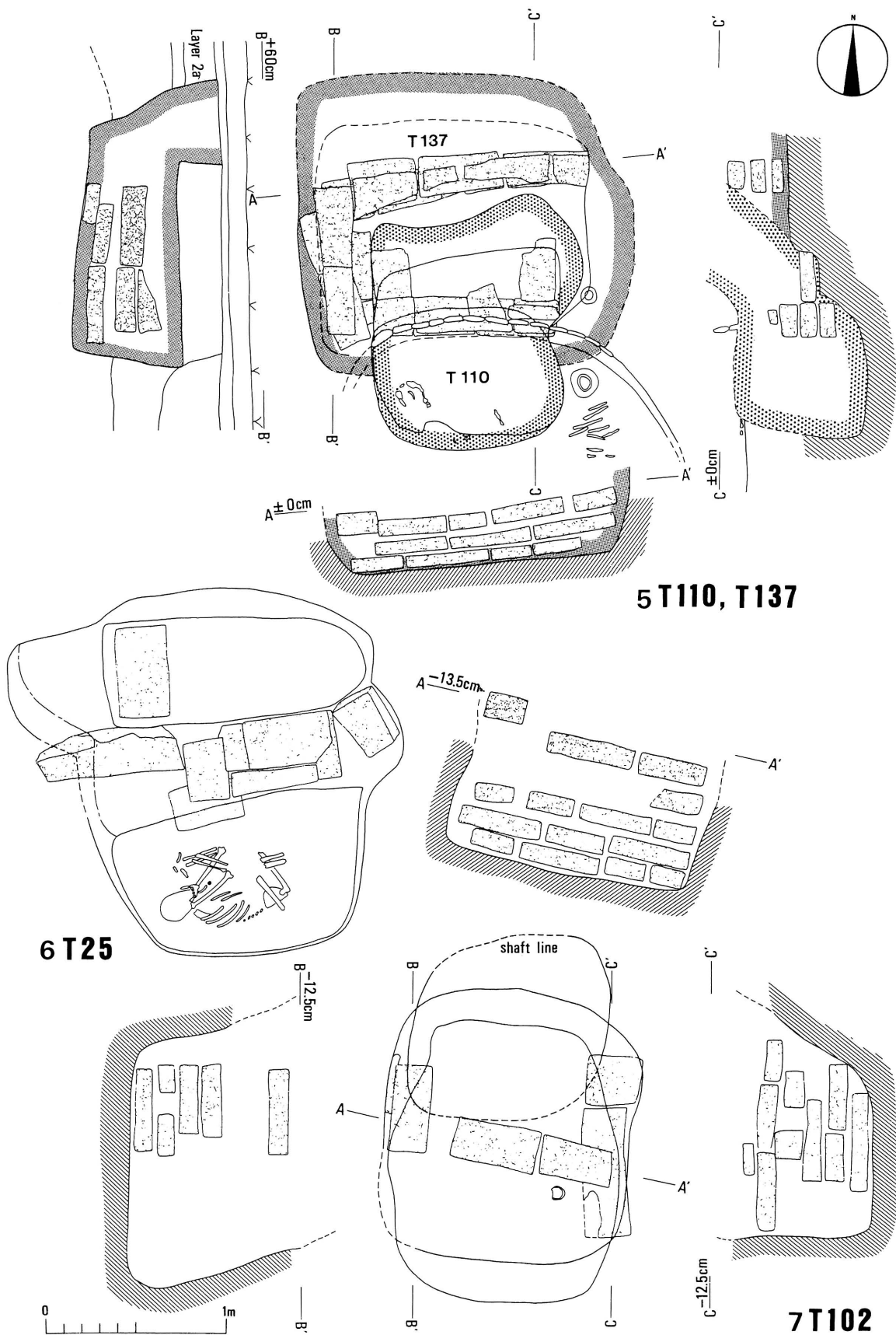
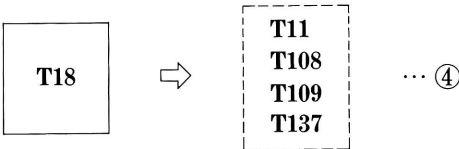
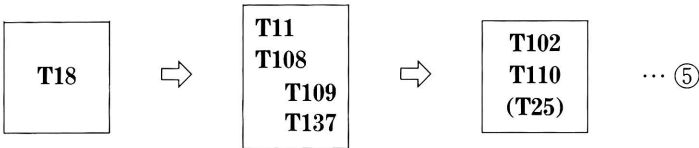


Fig. 9 (2) Wing Bricks

[Koizumi 1991: PLs. 82-2, 80-6, 81-1]



Furthermore, while in T11 and T108 wing bricks seem to be attached to the main brick walls at the eastern sides (Fig. 9–2, 3), in T109 and T137 wing bricks are joined at the western edge of the brick walls (Fig. 9–4, 5). Here, it is not clear whether the former wing bricks would have been attached or joined to the main brick, because both bricks remain in only a few courses. It is better, therefore, that the difference between the former (T11 and T108) and the latter (T109 and T137) in location of their wing bricks is delineated as a slight variation within an identified group in chart ③ or ④. The observation combined with both ③ and ④ provides us with the following sequence.



(3) Summary

By seriating the tombs in respect of their overlapping relationship and location of wing brick, the tombs in Ordering II(b) have been tentatively classified into three groups (see ⑤). At the last of Ordering II(b), I have organized the classification by combining the rest of the overlapping examples.

Seeing that in chart ① T137 and T110 are separated into two stages on location of wing bricks, the negative correlation (⇒) may be extended over the two stages. If this is assumed, T128 which is a later tomb in another negative correlation could be assigned to the third group with T102 etc. On the other hand, since the positive correlation (⇨) for actual overlapping is treated as earlier than the negative one, T114 in the former might be placed in an earlier stage than T110 and T128 in the latter, although it is not certain how far the tomb can be traced back on the time scale. It is also suggested that, as T113 is overlapped by T109 which belongs to the second group consisting of tombs with wing bricks in the burial chamber, T113 may be attributed to an earlier stage than that group. Furthermore, from chart ② it can be conjectured that, unless T114 were associated with a certain stage or phase, T116 cannot be assigned one, and that, because there is no useful information about the assignment of T136 to a fixed chronological position, the tomb can be said only to have been made before T128.

All the analyses mentioned above have led us to a revised sequence of tombs⁸⁾ (Fig. 10).

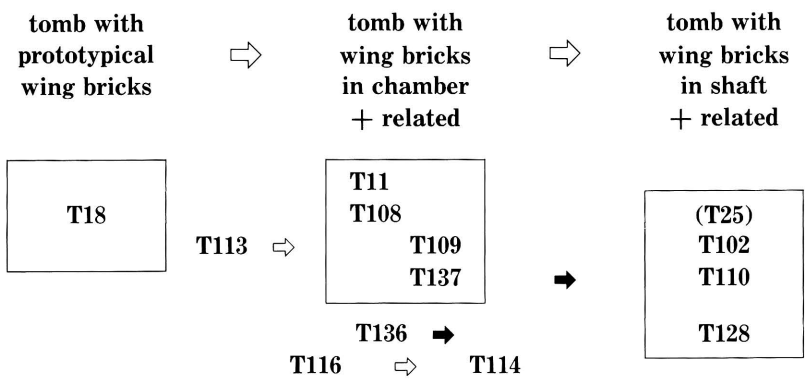


Fig. 10 Tentative Sequence of Tombs Concerning Ordering II(b)

5. Sequences

Having analysed Ordering II(a) and II(b), let us now turn to the correlation between the tomb sequence into which the two orderings will be integrated and the pottery sequence which is based on classification and seriation of the pottery vessels as funerary objects buried in the tombs in Kashkashok II⁹⁾. In this section I am going to summarize both the sequences.

1) Tomb sequence

As mentioned above, the tomb sequence consists of Ordering II(a) and II(b) which have been analysed separately.

With regard to the tombs, some overlap others (Fig. 2). Those tombs are as follow each with its 'relative level' (positive correlation: from earlier \Rightarrow later; negative correlation: from earlier \Rightarrow later):

T12 : -0.9868 \Rightarrow T21 : -0.9350	T101 : -0.0103 \Rightarrow T105 : +0.0666	T107 : +0.4653 \Rightarrow T137 : +0.1274 ... ⑤ \Rightarrow T110 : -0.1262
T20 : -0.6082 \Rightarrow T106 : +0.2061 \Rightarrow T133 : +0.1382 ... ①	T121 : +0.0000 \Rightarrow T118 : +0.1134 \Rightarrow T10 : +0.3541 \Rightarrow T7 : +0.2244 ... ③	T113 : -0.6091 \Rightarrow T109 : +0.0326
T3 : -0.4141 \Rightarrow T17 : -0.3209	T132 : +0.1098 \Rightarrow T131 : -0.1868 ... ④	T136 : -0.1946 \Rightarrow T128 : -0.4867
T115 : -0.1067 \Rightarrow T116 : -0.5145 ... ② \Rightarrow T114 : -0.2380		

Among the fifteen overlapping examples¹⁰⁾ some have a positive correlation (\Rightarrow) and others a negative correlation (\Rightarrow). In the case of the former, including those analysed in Ordering II(b) [T116 \Rightarrow T114, T113 \Rightarrow T109], the 'first assumption' that the accumulation of soil and rubbish and tomb formation on the tell could have progressed at a regular and gentle rate per phase might apply; the correlation between tomb and its 'relative level' is positive. It should then be ascertained for the latter case-negative correlation. Since two tombs have been mentioned in Ordering II(b) [T137 \Rightarrow T110, T136 \Rightarrow T128], I consider other overlapping relationships. Besides those described in the previous section, other tombs need to be tested so that any overlapping can be defined and correctly placed in the sequence.

①T106 \Rightarrow T133

As T133 was dug from Level 2a, the situation that the chamber base of T133 is deeper than that of T106 fits the 'second assumption' that the later tombs might have been dug to a deeper level cutting the previous tombs. This overlapping relationship, therefore, is adequately attested in spite of the negative correlation.

②T115 \Rightarrow T116

T116, dug from Level 2a, was overlapped by T114, which has been described as a positive correlation. T115, cut by T116, is less well preserved in plan and physical remains than the others; funerary objects in T115 are dispersed rather more randomly than those in other tombs. It can, thus, be said that the tomb may have been disturbed in the process of making T116 and as a consequence provided less reliable information for comparative analysis than others¹¹⁾.

③T10 \Rightarrow T7

T7 has a brick wall with a brick pillow attached vertically in much the same as wing bricks [Matsutani 1991:

PL. 79–5]. Usually brick pillows and wing bricks could be distinguished, but T7 shows an intermediate or equivocal position between them: the pillow which would have been the same size as one brick of the main wall is attached to it at the western side. This suggests that the brick of T7 might have functioned both as pillow for the dead and reinforcement for the structure which may well be regarded as a prototype of wing bricks¹²⁾. Because T7 can, then, be attributed to a group of tombs with mud-brick walls accompanied with wing bricks, its overlapping relationship may be suitable for the ‘second assumption’, despite the negative correlation.

④T132 ➔ T131

The overlapping relationship is a most distinctive case [Matsutani 1991: PL. 35–2]. T132 was dug under part of a *tauf* that was at a higher level and might be ascribed to the Hassuna period. Another tomb, T131, then cut into the floor of T132’s burial chamber, making the stratigraphic analysis of the *tauf* and the tombs a real puzzle. T132’s chamber base has not been well preserved and the inhumed body not remained in the burial chamber. It can be guessed, therefore, that T132 might have lost the original base of the burial chamber when it was overlapped by T131; T132 would have had too little space to keep the physical remains in the chamber.

⑤T107 ➔ T137

T137 with wing bricks in the chamber was cut by T110 with wing bricks in the shaft, mentioned in [4–2 Ordering II(a)] and fits the ‘second assumption’ that later tombs might have been dug to a deeper level cutting the previous tombs. Evidence that T137 was dug from Level 2a and has wing bricks also makes the negative correlation adequate for the ‘second assumption’.

Considering the above results of overlapping relationships, the analysed Ordering II(a) and II(b) should both be integrated into one seriation. The combined tomb sequence is now tentatively given (Fig. 11). Tombs are arranged from earlier (left side) to later (right side).

12	122	19	20	4	130	14	115	16	101	132	9	119	117	129	27	124	18	11	(25)
21		24		3	112	2	1	8	121	118		106	10	103	104			108	102
				111	17	127		15	126			120	125	107				109	110
					13	6		135	134			123						137	128
					22				105									113, 116, 136,	114

Fig. 11 Table of tentative tomb sequence

2) Pottery sequence

In a previous paper [Koizumi 1993], I classified pottery vessels from the tombs in Kashkashok II (typology), extracted variables from the classified vessel forms, and ordered the attributes on a meaningful time scale (chronology). A brief summary follows.

First, based on the fact that the pottery vessels of concern were located as funerary objects, in a particular context —tombs—, and that most of the vessels were *in situ* and complete, I defined an original typology which would be logically consistent in terms of satisfying the aims of the exercise: replicability, verifiability, and availability [Koizumi 1993: 23]. Other researchers working with same body of pottery vessels should be able to reproduce the same classification using the same criteria, and through typology should be able to express the defining variables and to support and justify their use through analyses using statistical techniques¹³⁾ [Sinopoli 1991: 46]. It is proposed that, since a cluster of morphological elements integrated into one complete shape or form is very important in assuming typology and chronology, the classification of complete vessels should intrinsically include the possibility and flexibility that, even if artifacts are nothing but potsherds, the process of classification and further analysis would proceed with the

same logical consistency as with a complete vessel.

Therefore, the typology would be necessary in order to discriminate a particular ‘form’ from intermediate types on a quantitative scale so that the category can be easily reconstructed by other researchers, and allow them to go to the next step in comparative analysis. This requires a consistent framework of grouping and the determination of a distinctive boundary for each vessel, and the reconstruction of potsherds into one complete form in terms of morphological shape [Koizumi 1993: 23–24]. In the typology two variables, orientation of the end of the vessel wall and profile of the vessel body, were proposed to fulfill such requirements so that the selection of variables would be useful for the purpose of the typology [Adams and Adams 1991: 189], and that the variables should also reflect, to a greater or lesser degree, conscious decisions on the original potter’s part [Sinopoli 1991: 43]. “A” to “F” groups were classified, according to the variables. Among these fourteen forms were established as recognized forms from Kashkashok II, accompanying “other complicated forms” with some appendages or attachment [Koizumi 1993: Fig. 6, 7].

Once the typological classification was established, the next step was to analyse vessel forms according to certain meaningful criteria, on occasion to search for patterns or determine chronological relationships [Adams and Adams 1991: 208; Sinopoli 1991: 65]. It is possible, indeed, that the variable or attribute, which has been useful in recognizing one pattern-classification-, may also adequately represent another pattern-chronology-, but we often find that the former may slightly coincide with the latter. Hence, the former should be considered as the first process towards reaching my goal and the latter the next one; it is necessary to prepare another step in the analysis to accomplish the chronological goals [Koizumi 1993: 31–32].

The procedure for the comparative analysis described in the previous paper consists of three main parts. The first process is *analysis*: selection of the context (cemetery), abstraction of variables and attributes from each vessel form, arrangement of changing attributes on a stratigraphic sequence extracted from other sites, and further standardization. The second is *comparison*: comparison between changing attributes from other sites and those from Kashkashok. The third is *synthesis*: seriation of the latter linked with the ordering of the former, combination of the separate attributes into one whole vessel form, and if needed, a supplementary description of detailed examples [Koizumi 1993: 53]. An outline of the chronological conclusions is shown in figure 12 [Koizumi 1993: Fig. 23].

In addition, the chronological sequence of pottery forms should be examined by the contexts in which they are located: set relationships and overlappings. As the Kashkashok site is a cemetery, some vessels are associated with each other within the same tomb, others are buried as the sole funerary object. The association led to two results: while some vessels found in the same tomb are ascribed to the same phase, others are ascribed to different phases. The tombs of the former case are the following [Koizumi 1993: 61–62 (partly revised)]:

Early Northern Ubaid	: T3, T24, T26, T121
Late Northern Ubaid	: T101, T108, T111, T115, T118, T123, T127
Terminal Northern Ubaid	: T18, T136
Early post-Ubaid	: T4, T11

Tombs with funerary objects ascribed to different phases are as follows: T6 (Late Northern Ubaid~Early post-Ubaid?), T9 (Late Northern Ubaid~Early post-Ubaid), T13 (Terminal Northern Ubaid~Early post-Ubaid), T107 (Late Northern Ubaid~Terminal Northern Ubaid), and T109 (Terminal Northern Ubaid~Early post-Ubaid). The latter examples should be further analysed to clarify the situation, although most of the evidence points to slight differences in phases between vessel forms in the tombs. These tombs

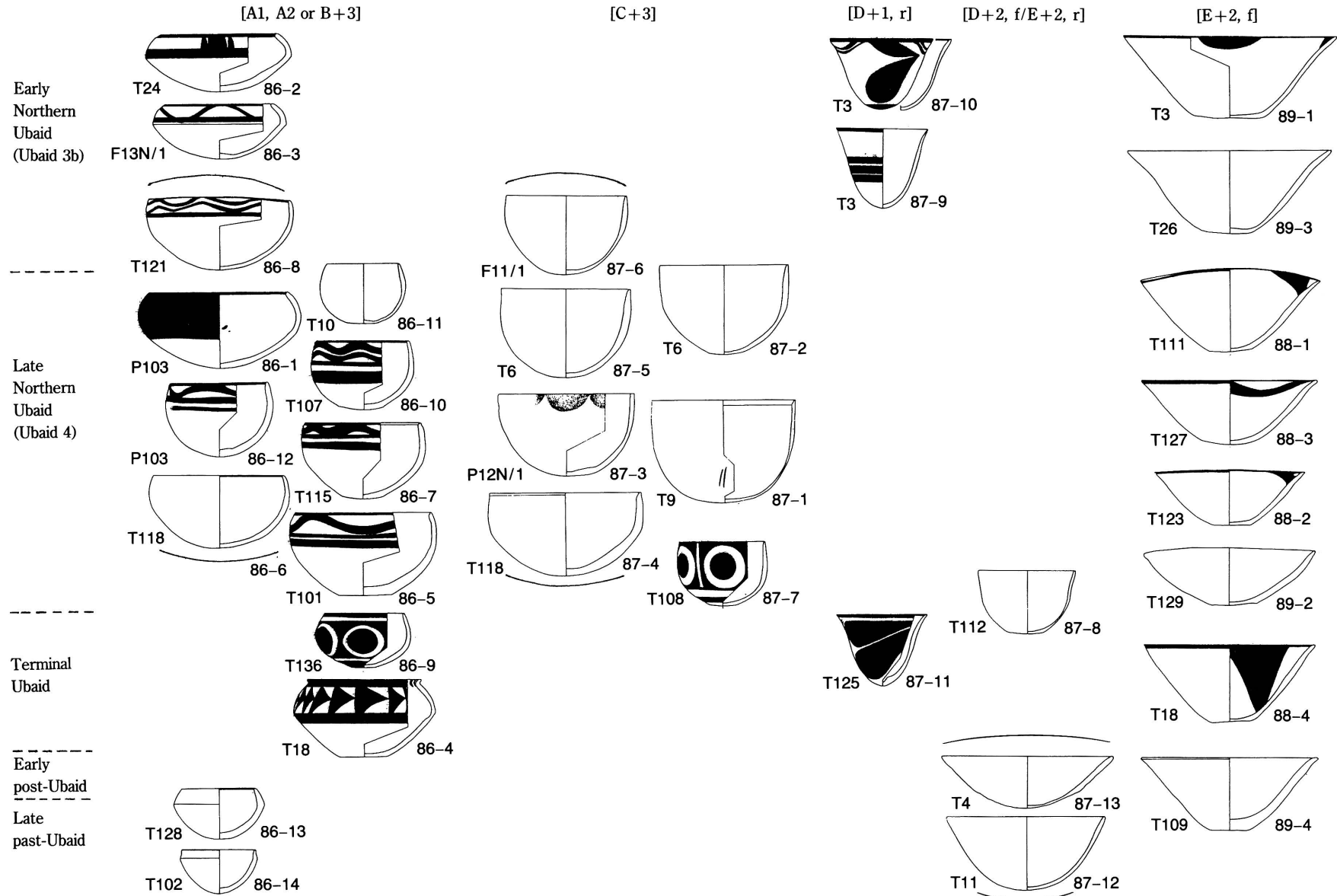


Fig. 12(1) Table of Tentative Pottery Sequence (Scale 1:8)

[Koizumi 1993: Fig. 23 (partly revised)]

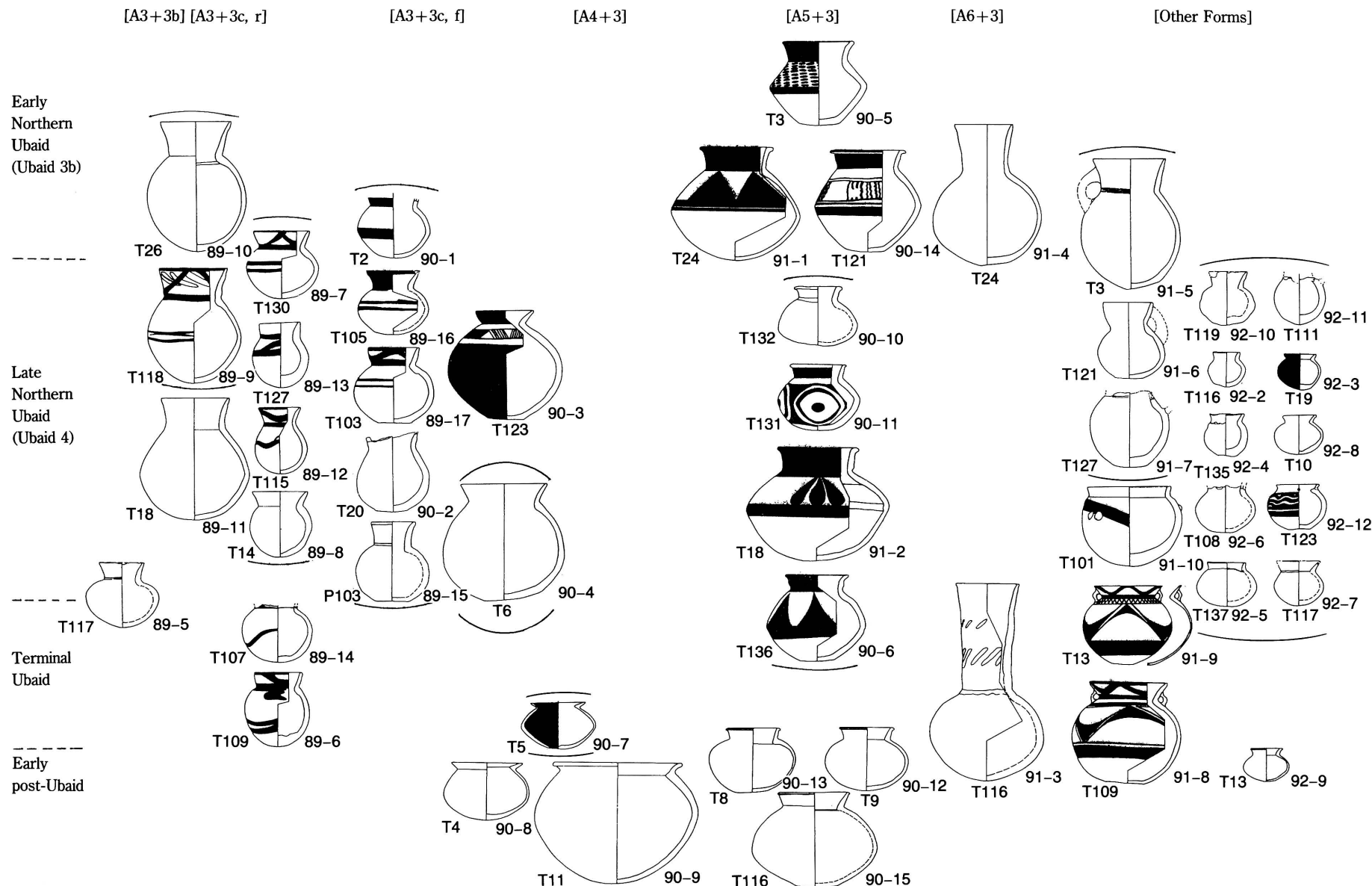


Fig. 12(2) Table of Tentative Pottery Sequence (Scale 1:8) [Koizumi 1993: Fig. 23 (partly revised)]

with vessels being ascribed to various phases should be examined in subsequent comparisons.

Furthermore, it was necessary to verify the above results because of the overlapping relationship between tombs. The information has been shown on [5-1) Tomb sequence]; all evidence of overlapping tombs, lacking contradictory associations, would be suitable for the comparative analysis mentioned above, which provides assurance and confidence [Koizumi 1993: 62-63].

6. Examination

Having briefly described the tomb sequence and the pottery sequence, I am going to compare and examine both sequences through the following procedure. In terms of each tomb or tomb cluster on the former sequence, the duration of the phase to which each pottery form on the latter sequence is assigned can be verified. Since some tombs have no funerary object, the comparative verification that the order of the tomb cluster is cross-checked by the time span of the pottery form would be reliable. Each tomb or tomb cluster is to be attested by the time range of pottery vessel forms as its funerary object (Fig. 13). The tomb clusters are ordered from earlier (up) to later (down) on a vertical axis. Each number in the figure, referring to the original plate number of the pottery vessel in the previous report or paper, is arranged from earlier (left) to later (right) on a horizontal axis; a number or item enclosed by round brackets means that the particular pottery or other artifact could be assigned to either earlier or later phase; an item enclosed by angle brackets refers to its phase being uncertain.

The examination leads to several results which will be verified in each tomb or cluster of tombs. Here, I examine the results with respect to whether the tomb or tomb cluster in the tomb sequence is suitable for the pottery sequence.

1) Tombs suitable for the pottery sequence

Many tombs adequate for the pottery sequence are summarized below. With regard to tombs in each phase, those on upper line refer to securely confirmed results through the set relationship of vessels within the same tomb [5-2) Pottery sequence] and those on lower line refer to probable confirmations through the sole funerary object available for chronological seriation:

Early Northern Ubaid	: T24, T3 T20
Late Northern Ubaid	: T127, T115, T101, T118, T123 T130, T112, T14, T2, T135, T105, T132, T119
Terminal Northern Ubaid	: T18, T136 T117, T125
Early post-Ubaid	: T11, T114
Late post-Ubaid	: — (T25), T102, T128

The results indicate that several tomb clusters, including a few tombs which have shown the reliability of the chronological sequence, proved suitable for the procedure using the tomb sequence in this paper and that such clusters would be probably confirmed as reliable items on the chronological seriation. In particular, the cluster [T117-T125] of which all the tombs were dug from Level 2b is definitely identified with the Terminal Northern Ubaid phase, because most vessels belonging to the cluster are securely assigned to that phase (89-5, 92-7, 92-8, 87-11). Moreover, T114 and (T25) are assigned to the Early to Late post-Ubaid phases, since funerary objects of the former are beads including one lapis lazuli bead,

	Early N.U.	Late N.U.	T.N.U.	Early p-U.	Late p-U.		Early N.U.	Late N.U.	T.N.U.	Early p-U.	Late p-U.
[T12,	<no finds>					[T132,			(90-10)		
T21]	<no finds>					T118]	(86-6, 87-4, 89-9)				
[T122]	<no finds>					[T9]		87-1		90-12	
[T19,		(92-3)				[T119,			(92-10)		
T24]	86-2, 91-1, 4					T106,	<no finds>				
[T20]	(90-2)					T120,	<no finds>				
[T4,				90-8	(87-13)	T123]		88-2, 90-3	(92-12)		
T3,	87-9, 10, 89-1,					[T117,			(89-5, 92-7)		
	90-5 (91-5)					T10,		86-11	(92-8)		
T111]	(bead)	88-1	(92-11)			T125]				87-11	
[T130,	(89-7)					[T129,		89-2			
T112,		(87-8)				T103,	(89-17) + (beads)				
T17,	<no finds>					T107]		86-10		89-14	
T13,			91-9		92-9	[T27,	<no finds>				
T22]	<no finds>					T104]	<jar>				
[T14,	(89-8)					[T124]	<no finds>				
T2,	(90-1)					[T18]		89-11	(91-2)	86-4, 88-4	
T127,	(89-13, 91-7)	88-3				[T11,				90-9	(87-12) + (bead)
T6]		87-2	(90-4)			T108/		87-7	(92-6)		
[T115,	(89-12)	86-7				T109,				89-6, 91-8/89-4	
T1]	<no finds>					T137]			(92-5)		
[T16,	<beads>					[T113,	<bone>				
T8,				90-13		T116,			(92-2)	91-3	90-15
T15,	<no finds>					T136,			(90-6)	86-9	
T135]		(92-4)				T114]					(beads)
[T101,		86-5, 91-10				[(T25),					(beads)
T121,	90-14 (86-8, 91-6)					T102,					86-14
T126,	<no finds>					T110,	<no finds>				
T134,	<no finds>					T128]				(mace head)	86-13
T105]	(89-16)										

(1)

(2)

Fig. 13 Cross-checking Table of Tomb and Pottery Sequences

and the latter one copper bead wrapped with gold and one copper seal [Koizumi 1991: 79]. Other clusters may be considered as well for confidence and suitability (see below for the details).

2) Tombs with possible inherited funerary objects

It is possible that the funerary objects in some tombs of the tomb sequence may represent residual or inherited artifacts.

T121: in the same cluster as T101 whose position in the chronological seriation has been reliably confirmed and as T105 whose position has been slightly confirmed. Therefore, with a fact that artifacts buried in T121 (PLs. 86–8, 91–6) are around Late Northern Ubaid, T121 might be situated in the Late Northern Ubaid phase. Although comparative analysis of the other artifact (PL. 90–14) presented in a previous paper indicated an Early Northern Ubaid phase, the pottery vessel may be residual.

T10: in the same cluster as T117 and T125 which have also been testified as reliable tombs on the pottery sequence. Moreover, this cluster is identified with the tomb group which might have been dug from Level 2b [4–1 Ordering II(a)]. Thus, T10 is ascribed to the Terminal Northern Ubaid phase. Its funerary object (PL. 86–11) would, then, have been assigned to a later phase than analysed. This vessel might correspond to the Terminal Northern Ubaid phase as an inherited piece in which another vessel of T10 (PL. 92–8) may be situated.

T129: in a cluster immediately above the previous one [T117–T125] on the tomb sequence. Therefore, T129 may be assigned to a later phase. Although one funerary object (PL. 89–2) in T129 has been equated with the Late Northern Ubaid phase, it would have belonged to the Terminal Northern Ubaid phase as T129 dug from Level 2b is Terminal Northern Ubaid and the vessel probably a residual artifact.

T107: in the same cluster as T129 described above, suggesting that T107 may be of a similar period to the tomb group attributed to the Terminal Northern Ubaid phase. T107 has two funerary objects; from the pottery comparison above, one (PL. 86–10) is thought to be Late Northern Ubaid and the other (PL. 89–14) Terminal Northern Ubaid phase. T107 is, therefore, assigned to the latter phase rather than the Late Northern Ubaid. Additionally it is possible that the buried piece (PL. 86–10) may have been inherited from the previous phase.

T108: in the same cluster as T11 confirmed as Early post-Ubaid. The funerary objects in T108 are, however, situated in the Late Northern Ubaid (PLs. 87–7, 92–6). T108 and T11 distinctly resemble each other in location of wing bricks, and both the tombs compose one tomb group despite certain phase differences of the funerary goods. The chronological dating of a tomb, of course, is better determined by structure and/or overlapping relationships rather than the contents such as pottery vessels. Then, these objects in T108 might be residual artifacts.

T109: in the same cluster as T11 as above. T109 is also similar to T11 in the location of wing bricks, although the latter is slightly different in the way the wing bricks are joined. Artifacts buried in T109 span the Terminal Northern Ubaid to Early post-Ubaid phases; the former ones (PLs. 89–6, 91–8) may have passed into the following phase where the latter (PL. 89–4) is situated as inherited pieces.

T116: in an uncertain cluster in the tomb sequence, but the tomb is probably Early post-Ubaid in that T116 was cut by T114 which is Early post-Ubaid. In addition T116 was dug from Level 2a, so that it can not be earlier than the Terminal Northern Ubaid. T116 also has funerary objects (PLs. 92–2, 91–3, 90–15) which span the Terminal Northern Ubaid to Early post-Ubaid phases. The vessels (PLs. 92–2, 91–3) belonging to the Late to Terminal Northern Ubaid might have passed as residuals into the following phase as another vessel (PL. 90–15) belongs to the Early post-Ubaid phase.

3) Tombs to be moved into a later phase

There are also some tombs which need to be extracted from the tentative tomb sequence because, when compared to other tombs within the same cluster, they are in the wrong position in the sequence.

T4: with two pottery vessels one of which (PL. 90–8) is Early post-Ubaid and the other (PL. 87–13) Early to Late post-Ubaid. These vessels are very similar to those of T11 (PLs. 90–9, 87–12) belonging to the Early post-Ubaid phase. T4 could, then, be adequately assigned to the same phase as T11 on the basis of the funerary objects. As other tombs of the cluster [T4–T111] are definitely from a different phase to that of T4, the latter should be extracted from the tomb cluster and revised into its correct position in the sequence.

T111: with two pottery vessels and one bead. One of the vessels (PL. 88–1) is Late Northern Ubaid and the other (PL. 92–11) Late to Terminal Northern Ubaid, while the bead is around Early Northern Ubaid [Koizumi 1991: 79]. It can be said, therefore, that the funerary goods of T111 are different to those of other tombs within the same tomb cluster [T4–T111], and that T111 may be equated to the later phase, the Late or Terminal Northern Ubaid.

T13: with two pottery vessels of which one (PL. 91–9) is Terminal Northern Ubaid and the other (PL. 92–9) Early post-Ubaid. The former vessel in particular closely resembles a vessel from T109 (PL. 91–8) which is assigned to the Terminal Northern Ubaid phase. The artifacts from other tombs of the cluster [T130–T22] to which T13 is belonging are so different in time scale from the above two vessels of T13 that the latter can not be incorporated into the cluster with the other tombs. Therefore, T13 fits more comfortably into the Early post-Ubaid phase, particularly if the vessel (PL. 91–9) is considered to have been residual from the Terminal Northern Ubaid phase.

T6: with two pottery vessels one of which (PL. 87–2) is Late Northern Ubaid and the other (PL. 90–4) Late Northern Ubaid to Early post-Ubaid. Both artifacts are different from others in the same cluster [T14–T6]. T6 could, then, be assigned to the later phase, but be said only to be likely from the Late Northern Ubaid to Early post-Ubaid phases.

T8: has one pottery vessel (PL. 90–13) which is Early post-Ubaid, although another tomb, T135, in the same cluster [T16–T135] has an artifact (PL. 92–4) belonging to around the Late Northern Ubaid phase. Comparable vessels to that from T8 are found in T9 (PL. 90–12) and T116 (PL. 90–15), which are Early post-Ubaid. T8 could, then, be equated to the Early post-Ubaid phase.

T9: with two pottery vessels one (PL. 87–1) Late Northern Ubaid and the other (PL. 90–12) Early post-Ubaid. The cluster consists of a single tomb. Other clusters situated below and above [T9], in which several tombs are ascribed to the Late Northern Ubaid phase, indicate that the cluster or tomb should be assigned to the later phase, the Early post-Ubaid. The revised assignment is also indicated by the vessel (PL. 90–12) which is similar to specimens from T116 as mentioned above.

4) Tombs suitable only for the tomb sequence

T7 : [5–1)–③]

T133: [5–1)–①]

T113: [4–2)–(3)]

T137: [4–2)–(2)]

T110: [4–2)–(2)]

5) Tombs suitable only for the pottery sequence

T26: has no distinctive characteristics for the tomb sequence, but has remarkable funerary objects (PLs. 89–3, 89–10). These artifacts are Early Northern Ubaid [Koizumi 1993: 41–44].

T19: in the same cluster as T24 which has been confirmed as Early Northern Ubaid by both the tomb and pottery sequences. But an artifact of T19 (PL. 92–3) spans the Late to Terminal Northern Ubaid phases. It is still to be clarified which sequence should have priority in determining the chronological position of T19: in the case of tomb one, the artifact would be rearranged into an earlier phase, or in the case of pottery one, T19 might be moved into a later phase. Here, with the fact that T19 is located on the southwestern part of the tell, the former seems to be slightly adequate.

T131: is not suitable for the tomb sequence described above [5–1)-(④)]. The tomb, however, has a single funerary object (PL. 90–11) which may be assigned to the Late to Terminal Northern Ubaid phases [Koizumi 1993: 47–48].

T103: situated in a cluster [T129–T107], although the tomb is inconsistent with above results on the grounds that it was not dug from Level 2b and had no artifact ascribed to the later phase [6–2) T129, T107]. T103 has a vessel (PL. 89–17) suggestive of the Early to Late Northern Ubaid phases [Koizumi 1993: 44–45]. T103 may be from an earlier phase than the former tombs where there is little chance that the artifact could be a residual or inherited piece¹⁴⁾.

T5: dug from Level 2a, but showing no particular structural element, level nor any overlapping relationship. The only clue to its chronological situation is the pottery (PL. 90–7) assigned to the Terminal Northern Ubaid to Early post-Ubaid phases [Koizumi 1993: 46–47]. This information from the pottery sequence may help to place T5 in a suitable position in the comparative sequence.

6) Uncertain tombs

Other tombs are not suitable for any above comparisons. These have no distinctive features such as tomb structures, nor level, and no finds such as funerary objects:

T12, T21, T122, T17, T22, T1, T16¹⁵⁾, T15, T126, T134, T106, T120, T27, T104, T124.

7. Conclusions

Having analysed, considered, and examined the tomb (cluster) sequence, I propose several conclusions (Fig. 14). In each phase the tomb cluster is ordered from earlier to later. Tombs enclosed by square brackets mean that they have been identified to a certain cluster, and a group of such clusters is confirmed to a certain phase; one cluster includes a few tombs and another a single tomb. Other tombs enclosed by round brackets indicate that the situation in each phase is so unequivocal that the tomb cannot be compared

Early N.U.	[T24] [T20] [T3] (T26)
Early to Late N.U.	(T103) (T19)
Late N.U.	[T130, T112] [T14, T2, T127] [T115] [T135] [T101, T121, T105] [T132, T118] [T119, T123]
Late to T.N.U.	[T111] (T131) (T6: to E.P.U.)
T.N.U.	[T117, T10, T125] [T129, T107] [T18] [T136]
T.N.U. to Early p-U.	(T5) (T7) (T113) (T133)
Early p-U.	[T116] [T11, T108/T109, T137] (T4) (T8) (T9) (T13) (T114)
Late p-U.	[(T25), T102, T110, T128]

Fig. 14 Chronological Sequence of Tombs from Kashkashok II

exactly with the confirmed one enclosed by square brackets, but that the former can be assigned to the same phase of the latter.

There are reliable correlations of tombs in the chronological sequence, although less so for tomb-clusters. It can be said that the chronological sequence of tombs from Kashkashok II has been confirmed by the above process of tomb analysis, and examination of the tentative tomb and pottery sequences.

Acknowledgments

I would like to express my gratitude to Professor Toshio Matsutani, Tokyo University, and Associate Professor Ken Matsumoto, Kokushikan University, who greatly helped me research the Ubaid tombs and made many important suggestions. Acknowledgment is also due to Dr. Norah Moloney who kindly improved the English manuscript. This study was supported in part by the Waseda University Grant for Special Research Projects.

Notes

- 1) These are in Japanese, and this paper will summarize and expand them.
- 2) Because the excavated area of Kashkashok II is restricted to the western and southwestern sides of the mound (Fig. 1), a limited area on the tell could have been affected by restricting influences, accumulation and erosion, under specific circumstances, which would lead to the distinctive site formation — moderate slope.
- 3) When it is difficult to get one level of natural layer and/or Level 2b at point 't' from drawings of vertical sections, a reasonable level has been restored in conformity with a recognized and confirmed one. So, there are excluded tombs in which no level of natural layer nor Level 2b has been restored: T11, 23, 26.
- 4) In the previous report I took only examples in which the shaft and chamber are clearly connected, but here I use another one with a possible connection (T5, T117).
- 5) Although in the report the tomb was described as "Tomb just north of T110", I assign a serial number (T137) for it in this article.
- 6) In the excavation report, T25 was described as a tomb having a brick wall accompanied with wing bricks in its shaft, although the location of wing brick needs to be checked in more detail for the unequivocal position. Therefore, in this paper I drew the tomb with round brackets.
- 7) Although T11 has not been used for Ordering I owing to its unrestored levels of natural layer and Level 2b, the tomb can be analysed as an example of a tomb accompanied with wing bricks.
- 8) Since tombs T5 and T133 dug from Level 2a have shown no remarkable overlapping relationship nor wing-brick location, both the tombs are not described here in the analysis of Ordering II(b).
- 9) It has been tentatively established as an extrinsic sequence [Koizumi 1993].
- 10) In a previous report [Koizumi 1991], although I applied one correlation [T119 < T121] besides the fifteen overlapping examples, it is not used in this paper because of insufficient reliability of the overlapping relationship which is still to be confirmed.
- 11) If T114, mentioned as an example of positive correlation, were a child's tomb due to the smaller burial chamber and funerary objects — beads, the tomb would have been one of a variety with deeper bases, not an example of 'first assumption'; it might well have belonged to the negative correlation.
- 12) The situation can be compared to T105 where some kind of clay soils are used as adhesive material to connect the brick wall and the wing brick [Koizumi 1994: PL. 10–5].
- 13) A frequency seriation for each form is best for an intrinsic sequence. However the numbers are insufficient for statistical analysis; we have only eighty-six samples and only about ten, at most, examples for each form.
- 14) As T103 has beads around the arm of its inhumed body, it might possibly be a female tomb. If it were, the tomb could be explained by the location in the cluster consisting of tombs dug from Level 2b (T129, T107); T103 might have been made in lower depth than the first assumption mentioned above with a residual artifact around the time when those tombs were dug. But there is little possibility to test this new hypothesis.
- 15) T16 has physical remains of a child and a necklace consisting of many beads. Moreover, the location on the northwestern area could mean its phase being Early post-Ubaid (Fig. 2). From the above consideration of T114 (note 11), it may be assumed that both the tombs would have been Early post-Ubaid. Such appearance of child tomb in the cemetery as they might have reflected the growth of social complexity after the Ubaid culture, although it has yet to be explained.

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