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NIPPUR, SACRED CITY OF ENLIL, SUPREME GOD OF SUMER AND AKKAD*

McGuire GIBSON**

The importance of the Mesopotamian holy city, Nippur (Fig. 1), is reflected even today in the great size of the mound, Nuffar (Fig. 2), located between Baghdad and Basra in southern Iraq. Nippur was one of the

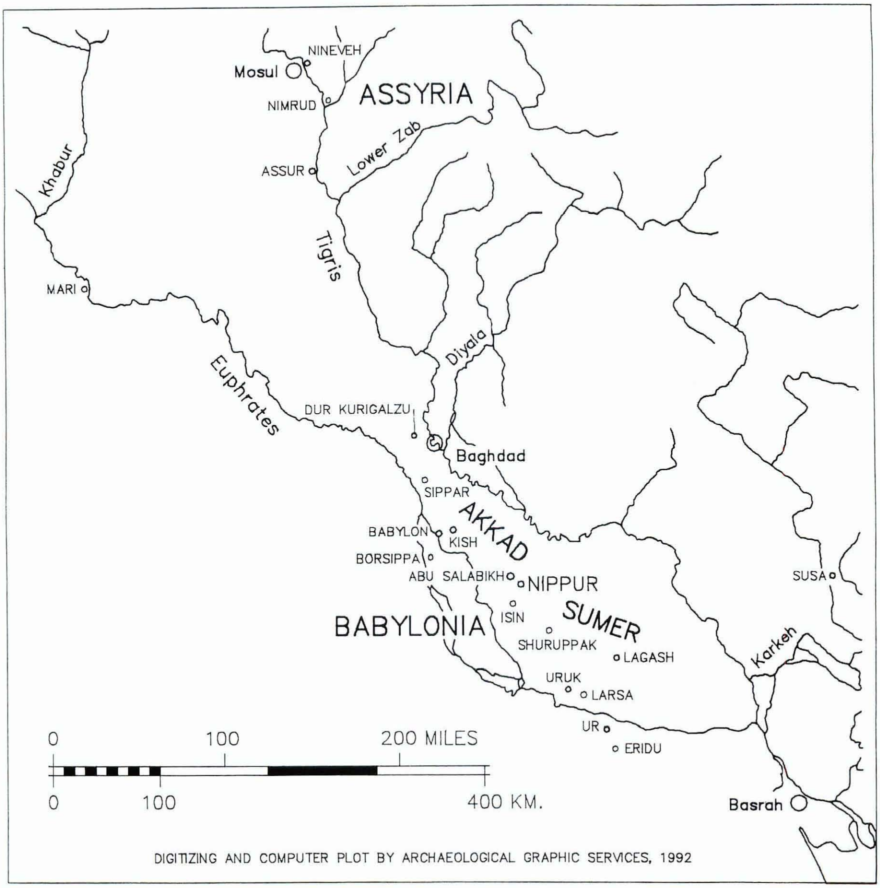

Fig. 1 Map of ancient Mesopotamia.

* This article is a revision of a lecture delivered at the Middle Eastern Culture Center, Tokyo, on September 25, 1992. I wish to thank His Imperial Highness, Prince Takahito Mikasa, for his invitation to address the Center. I also must express my gratitude to The Japan Foundation and to Professor Hideo Fujii of Kokushikan University, Tokyo, for inviting me to Japan for a most stimulating and enjoyable visit.

** The Oriental Institute, the University of Chicago

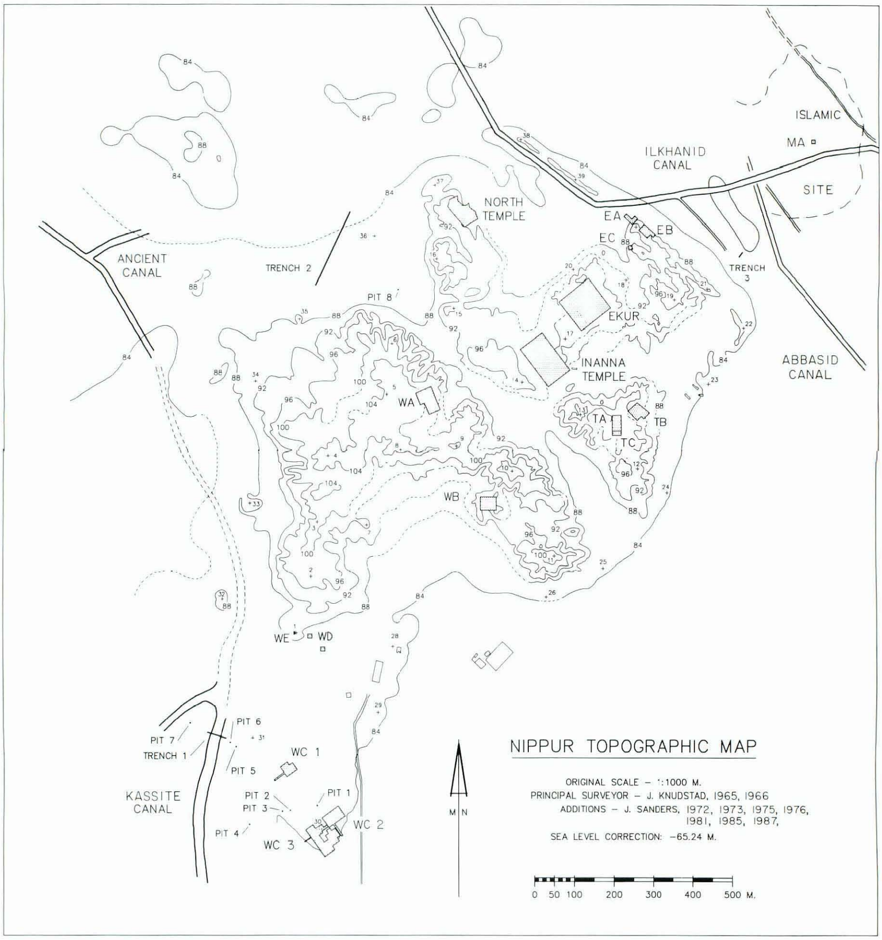

Fig. 2 Plan of Nippur, with excavation areas indicated. Tablet Hill is the mound with Trenches TA, TB, and TC.

longest-lived sites, beginning in the prehistoric Ubaid period (c. 5000 B.C.) and lasting until about A.D. 800, in the Islamic era [Gibson 1992].

From earliest recorded times, Nippur was a sacred city, not a political capital. It was this holy character which allowed Nippur to survive numerous wars and the fall of dynasties that brought destruction to other cities. Although not a capital, the city had an important role to play in politics. Kings, on ascending the throne in cities such as Kish, Ur, and Isin, sought recognition at Ekur, the temple of Enlil, the chief god of the Mesopotamian pantheon (Fig. 3). In exchange for such legitimization the kings lavished gifts of land, precious metals and stones, and other commodities on the temples and on the city as a whole. At the end of successful wars, rulers would present booty, including captives, to Enlil and the other gods at Nippur. Most important, kings carried out for the city elaborate construction and restoration of temples, public administrative buildings, fortification walls, and canals. Even after 1800 B.C., when the Babylonians

Fig. 3 Photograph of Ekur, the ziggurat of Enlil at Nippur.

made Marduk the most important god in southern Mesopotamia, Enlil was still revered, kings continued to seek legitimization at Nippur, and the city remained the recipient of pious donations. The city underwent periodic declines in importance [Gibson 1992] but rose again because its function as a holy center was still needed. The greatest growth of the city (Fig. 2), which occurred under the Ur III kings (c. 2100 B.C), was almost matched in the time of the Kassites (c. 1250 B.C.) and in the period when the Assyrians, from northern Iraq, dominated Babylonia (c. 750–612 B.C.).

The strength of Mesopotamian religious tradition, which gave Nippur its longevity, can be illustrated best by evidence from the excavation of the temple of Inanna, goddess of love and war. Beginning at least as early as the Jemdet Nasr Period (c. 3200 B.C.), the temple continued to flourish as late as the Parthian Period (c. A.D. 100), long after Babylonia had ceased to exist as an independent state and had been incorporated into larger cultures with different religious systems (Persian, Seleucid, and Parthian empires). The choice of Nippur as the seat of one of the few early Christian bishops, lasting until the city's final abandonment around A.D. 800, was probably an echo of its place at the center of Mesopotamian religion. In the Sasanian Period, 4th to 7th Centuries, A.D., most of the major features of Mesopotamian cultural tradition ceased, but certain aspects of Mesopotamian architectural techniques, craft manufacture, iconography, astrology, traditional medicine, and even some oral tradition survived, and can be traced even today not just in modern Iraq but in a much wider area.

The origins of Nippur's sacred character cannot be determined absolutely, but some suggestions can be made. The city's special role was derived, I would suggest, from its geographic position on an ethnic and linguistic frontier. To the south lay Sumer, to the north lay Akkad; the city was open to the people from both areas and probably functioned as an arbiter in disputes between these potential enemies. The existence of the frontier can be demonstrated from texts as early as the Early Dynastic III period (c. 2600 B.C.), when Sumer was the dominant cultural entity. In tablets from Shuruppak, a city 45 kilometers southeast of Nippur, more than 95% of the scribes had Sumerian names, while the rest had Akkadian names. In contrast, at Abu Salabikh, 12 kilometers to the northwest of Nippur, literary and other scholarly texts were written in equal numbers by Sumerian and Akkadian scribes [Biggs 1967]. But, Biggs notes that in the preparation of administrative texts at Abu Salabikh there was a greater representation of Sumerian scribe names, about 80%. This fact may indicate that although Akkadians were deeply involved in all aspects of life in the area just north of Nippur, government affairs may have remained predominantly the preserve of Sumerians in the pre-Sargonic period. For Nippur, we do not know as yet what percentage of scribes had Akkadian names in Early Dynastic III, but Biggs [1988] has suggested that the percentages at Nippur would be more like those of Shuruppak than like those of Abu Salabikh. I would suspect, however, that the percentages for non-governmental texts were closer to those at Abu Salabikh, with a good number of Akkadian scribes in evidence.

As is the case with the world's other holy cities, such as Jerusalem, Mecca, and Rome, Nippur was a vibrant economic center. Besides the economic benefits derived from gifts and on-going maintenance presented by kings and rich individuals, there was probably a continuing income from pilgrims. Nippur was the center of an agricultural district, with much of the land in the possession of temples. The temples produced manufactured goods, predominantly textiles and finished items, some of which were meant for export. But the temples were only part of the economic picture [Maekawa 1987]. Even though it was more dominated by religion than other towns, Nippur, like them, had a mixed economy, with governmental, religious, and private spheres (see, e.g. Westenholz [1987]). Steadily accumulating evidence indicates that the public spheres were closely integrated, with final control in the hands of government officials (see esp. Maekawa [1987]).

The work-force for much of the large-scale manufacture was probably connected with the major institutions, especially the temples. As in most countries until modern times, the temples in Mesopotamia had an important function as social welfare agencies, including the taking in of widows and orphans who had no families or lineages to care for them [Gelb 1972]; temples also were the recipients of war prisoners, especially those from foreign lands, who worked in agricultural settlements belonging to temples or in other temple service [Gelb 1973]. Such dependent people probably worked for generations in the service of one temple as workers and soldiers (guruš/erin), rather than as slaves (sag) [Gelb 1973: 94–95].

All institutions, whether the governor's palace, a government-sponsored industry, or a temple, were not just buildings and not just abstract bureaucratic hierarchies or economic establishments, but were social organizations within a broader social network. As happens in most societies, large institutions in ancient Mesopotamia tended to be dominated by families, lineages, and even larger kinship groups and I would argue that it is this web of kinship that furnishes the long-term, underlying continuity for civilizations, making it possible to reassemble the pieces even after disastrous collapses. For Mesopotamia, the role and power of such kinship organizations is best observed ironically in the Ur III Period, the most centralized, bureaucratized period in Mesopotamian history. The abundance of records of administrative minutiae allows the reconstruction not just of the administrative framework, but of the social network underlying and imbedded within it. The best reconstruction of such a kin-based organization within an institution is Zettler's [1992] work on the Inanna temple. One branch of the Ur-me-me family acted as the administrators of the temple, while another dominated the governorship of Nippur and the administration of the temple of Enlil.

It is important to note that the Ur-me-me family remained as adminstrators of the Inanna temple from some time within the Akkadian period to at least as late as the early years of the Isin dynasty. Thus, while dynasty replaced dynasty and the kingship of Sumer and Akkad shifted from city to city (Akkad to Ur to Isin) the family remained in charge of the Inanna temple.

From the listing of members of two and three generations as minor figures on the temple rolls, it is clear that it was not just the Ur-me-me family that found long-term employment within the temple's economic and social structure. Through the continued association of families with the institution, not only were generations of people guaranteed a livelihood, but the institution was guaranteed a cadre which would pass on the routines that made the institution function. The temple could add key personnel not only through a kind of birth-right (family or lineage inclusion), but also through recruitment; important individuals within the institution's administration would have acted as patrons not just for nephews, nieces, and more distant relatives but also for unrelated persons. By incorporating clients of its important men and women, an institution could forge linkages with the general population in the city as well as in the supporting countryside and in other cities; these recruits, in taking up posts within a temple, a municipal establishment, the royal bureaucracy, or in a large family business, would ensure that the patron had loyal adherents.

We know from cuneiform texts found at Nippur and elsewhere that the temples, rather than controlling the cities through a "Temple Economy," as was proposed earlier in this century, were under supervision by a king or a royally appointed governor, even in the Early Dynastic III period (c. 2600 B.C.) [Foster 1981; Maekawa 1987]. In the Akkadian period (c. 2300 B.C.), the temples of Inanna and Ninurta seem to have been under very close control of the governor, but the ziggurat complex, dedicated to Enlil, appears to have been more autonomous, reporting directly to the king in Agade [Westenholz 1987: 29]. During the Ur III period (c. 2100 B.C.) at Nippur, the administrator of the Inanna temple had to report to his cousin, the governor, on the financial affairs of the temple, and even had to go to the governor's storehouse to obtain the ritual equipment for specific feasts of the goddess [Zettler 1992]. The situation was much the same in the Isin-Larsa period, with texts from one agency (presumably the governor's office) recording distribution of goods to several temples; it is unfortunate that a recent article [Robertson 1992] revives, again, the notion of "temple economy" to cover these transactions.

The characteristics of administration and support that can be reconstructed from texts for a few temples at Nippur must be assumed to have been operative in the rest of Nippur's temples. The relationship of those temples to governmental institutions and to private entities and individuals is only beginning to be worked out. To reconstruct life in ancient cities one cannot rely on written documents alone, since they do not cover the entire range of ancient activity. Often, crucial insights can be obtained by the correlation of non-inscribed evidence, for instance the repeated co-occurrence of a set of artifacts in one type of find-spot. Especially valuable are correlations that illustrate human adaptations to natural environmental conditions. When one can bring texts into such correlations, truly innovative syntheses can be made. Whenever possible, documents must be viewed in their archaeological contexts, treating them as an extraordinarily informative class of artifacts to be studied in relationship to all other items. When such relationships are studied, a much more detailed picture emerges. Although that procedure would appear to be self-evidently valuable, it is rare that texts have been treated in this manner. At Nippur, we have made a concerted effort to combine all kinds of information in our interpretations of the site, and we think that we have made some important discoveries by so doing.

Nippur has been the focus of major excavation since 1889 when the University of Pennsylvania opened the first American expedition in the Middle East. Finding the site a rich source for cuneiform tablets, that expedition continued to excavate at Nippur until 1900 [Hilprecht 1903; Peters 1897]. The main achievements of the expedition were to locate the ziggurat and temple of Enlil and to recover more than 30,000 cuneiform tablets of extraordinary literary, historical, grammatical, and economic importance. More than 80% of all known Sumerian literary compositions have been found at Nippur. Included were the earliest recognized versions of the Flood Story, parts of the Gilgamesh Epic, and dozens of other compositions. It was these Sumerian works, plus an invaluable group of lexical texts and bilingual (Sumerian/Akkadian) documents that allowed scholars to make real progress in deciphering and understanding Sumerian. As important in historical terms are royal inscriptions from all periods, especially those of the Kassite Dynasty which ruled Mesopotamia from about 1600 to 1225 B.C. More than 80% of our knowledge of this dynasty has come from Nippur texts. In a special category of Nippur texts are the business archives of the Murashu family, merchant bankers who controlled vast commercial and agricultural interests under the Achaemenid Persian kings (c. 500 B.C.) [Stolper 1985].

For almost a half-century after the University of Pennsylvania left the site, Nippur lay unexcavated. In 1948 the University of Chicago initiated a Joint Expedition to Nippur with the University of Pennsylvania. It was felt at that time that although Nippur had been inundated by a sea of dunes since the 1920's, the information to be gained, especially on Sumerian culture, justified the extraordinary expense and difficulty caused by those dunes. A stated goal of the new excavations was to establish an archaeological context for the extraordinary artifacts, especially the tablets, that the earlier expedition had found. When the University of Pennsylvania withdrew from the expedition in 1952 it was succeeded by the American Schools of Oriental Research until 1962. The University of Chicago has continued its commitment to the site to the present day, and the last season of work in the winter of 1990 constituted the nineteenth campaign since 1948.

For the first three seasons of modern work, 1948–52, excavation was concentrated on the area of the ziggurat and the adjacent mound called Tablet Hill (Fig. 2). The early Pennsylvania excavators gave the name Tablet Hill or The Scribal Quarter to that mound in the belief that all or most of the scribes at Nippur had lived in that one part of the site. Although many important tablets were found in Tablet Hill, a study of all the records of the old Pennsylvania expedition shows that even more texts were found in the southern end of the West Mound. Recent excavations have proven that tablets, including school texts, probably are to be found in every part of the site. Because it had more than a hundred temples [Berhnardt and Kramer 1975] as well as governmental offices and numerous private businesses, it is not surprising that written records are to be found all over Nippur. But, so far, Sumerian literary texts do appear to be more highly concentrated at Tablet Hill.

The Joint Expedition's work in Trenches TA and TB on Tablet Hill yielded a valuable sequence of houses with artifacts *in situ*. This sequence, especially the pottery, dating from the Akkadian through the Achaemenid period (2300–500 B.C.) became a standard of reference for all of Mesopotamia [McCown and Haines 1967].

While working on Tablet Hill, the expedition began to make exploratory trenches at numerous locations in the eastern half of the site. In one of these trenches, R.C. Haines exposed the North Temple [McCown *et al.* 1978], dedicated to a god/goddess as yet unidentified (Fig. 2). More important, another trench encountered the temple of Inanna [Zettler 1992], goddess of love and war, one of the most important deities in the Mesopotamian pantheon. For ten years (Seasons 3–8, 1953–62) the expedition concentrated on this one area, and exposed seventeen rebuildings of the temple, one upon another, dating from the Jemdet Nasr Period (c. 3200 B.C.) until the Parthian Period (c. A.D. 100). As with other temples built of unbaked mudbrick, when the Inanna Temple began to age, it was demolished and a new, larger, more elaborate building was constructed upon its ruins. This long sequence of temples, especially the earliest ten (3000–2200 B.C.) with their thousands of artifacts (statues, reliefs, stone bowls, cylinder seals, and pottery), has furnished yet another standard of comparison for all other Mesopotamian sites

[Hansen 1965; Porada *et al.* 1992].

In 1964, Chicago, by then the sole sponsors of the Nippur expedition, signed a revised agreement with the Iraqi government, promising to continue excavating on a long-term basis. It was decided that the ziggurat area should once more be the focus of research, since that is the most important single structure at Nippur. This focus required the re-excavation of a large Parthian fortress that Pennsylvania had exposed partially in the 1890's. After recording the fortress, the expedition was supposed to demolish it so that the Sumerian levels around the ziggurat could be exposed fully. The 9th and 10th Seasons (1964–67) were expended in excavating the fortress, but when the task was finished, the expedition was not permitted to remove the remains to continue its proposed program because the fortress was judged to have value for tourism.

For five years, the site lay neglected. In 1972, when I became director of Nippur, I instituted a new program, meant to bring to light not just the religious aspects of the city, but its governmental and private sectors as well. I wanted to investigate the city's origins and history, the function of various parts, and the relationship of the city to its region and its environment. I proposed to examine the city walls, put trenches into parts of the site that had never been sampled, and also try to fill gaps in the Mesopotamian sequence (especially the Akkadian and Kassite Periods), and examine the later periods (Sasanian and Islamic) that had rarely been excavated systematically in Mesopotamia. Very important in our work was a commitment to linking archaeological to epigraphical data and an attempt to understand the ecological and social systems of ancient Nippur. We also introduced a new, up-to-date method of excavation, recording, and analysis of material. And we proposed to bring to the archaeology of the historical periods of Mesopotamia some of the techniques and theoretical viewpoints, called the "New Archaeology," that had been developed for prehistoric sites elsewhere. Such an approach was new to Mesopotamia, as it was to the historical ranges of most other parts of the Near East. Now, twenty years later, these methods and viewpoints have become commonplace not just in Iraq, but in the area as a whole.

To carry out our new program, we turned away from the eastern mounds, which were considered to be the more religious side of the city, and began to work on the West Mound, which had not been touched since 1899. Our first operation, WA (=West Mound, Operation A) was located in the bottom of a huge pit left by Pennsylvania (Fig. 2). Here, that expedition had found a large villa of Parthian data (c. 100 A.D.), and, in nearby locations, the Murashu archive and a group of Kassite administrative tablets. We thought we had a chance to expose, eventually, not only buildings that might relate to the Murashu family, but also a Kassite administrative building. Very soon we realized that we had come down upon yet another sequence of temples (Fig. 4), dating from at least the Ur III (c. 2100 B.C.) to the Neo-Babylonian period (c. 600 B.C..). We worked here for three seasons, having great difficulty because of the continual movement of dunes into our excavations, and were able to expose only a part of successive levels of a very large and important temple. We could not identify the deity venerated there. We assumed that this sequence of buildings would be much older than the lowest level we reached at that time (Ur III) and that it would rival the Inanna Temple in importance if conditions made it possible to carry the excavations to conclusion.

In Area WB, toward the south end of the West Mound (Fig. 2) we did, in fact, discover a totally unexpected Kassite administrative building, a badly destroyed palace (c. 1250 B.C.). This building (Fig. 5), half the size of the Kassite royal palace at Dur Kurigalzu near Baghdad, was the governor's palace, according to tablets found there [Gibson 1978a]. We know from other cuneiform documents, found by the old Pennsylvania expedition in the area to the south of WB, that the administrative center of the city and the province was located in this area from at least the Akkadian Period (c. 2300 B.C.) to the 7th Century B.C. The existence of governmental buildings in this part of the city must explain the great number of tablets found in this part of the site by the old Pennsylvania expedition.

Fig. 4 Photograph of WA, with niched-and buttressed outer walls of sequence of temples in background, sand dune above.

Directly below the Kassite palace in Area WB was an Old Babylonian house (c. 1750 B.C.) owned by a family of bakers, who used the front half of the building as an office and shop and the space outside for the baking of bread and meat [Gibson 1978a]. Texts found in the house show that the family baked on contract for the city administration, temples, and individuals. On the floor of the building we found dozens of objects left in place—pottery, a bread oven, grinding tools, cuneiform tablets, and other items. The debris on the last occupation floor gave the impression that the occupants had left suddenly, expecting to return soon, but never did. In time, sand drifted over the artifacts on the floor, and the walls of the house were eroded by rain and finally collapsed. This dramatic instance of sudden abandonment brought into clear focus evidence of similar breaks in stratigraphy in other Old Babylonian contexts on the site. We realized that there had been a crisis in the history of the city that had resulted in a total, or almost total, abandonment. The cessation of dated texts at around 1720 B.C., noticed by earlier excavators but not discussed [McCown and Haines 1967: 74–76], had to be correlated with the archaeological evidence. I knew that there was a similar halt in dated texts at other sites in Babylonia (e.g., Ur, Larsa, Isin) during the reign of Samsuiluna, and I knew that only those cities lying along or close to the river's western branches, such as Babylon, Kish, Sippar, Borsippa, and Dilbat, continued to produce dated texts. I began to suggest in lectures, as early as 1973–74, that there may have been a general catastrophe in Babylonia at that time, due to a major environmental crisis, probably the shifting of water away from the main branch of the Euphrates that had passed through Nippur. Elizabeth Stone, in an important restudy of Tablet Hill [Stone 1977; 1987], summarized the available evidence for the crisis and abandonment at Nippur. Hermann Gasche [1989: 109–43] subsequently laid out the evidence, in very graphic form, for a general collapse of central and southern Babylonia during the period.

The catastrophic abandonment of the heart of Babylonia, with a subsequent formation of dunes, was not to be reversed until about 1300 B.C., when irrigation water was brought back to the center of the country by the Kassite dynasty. As the Kassites began to revive Nippur and the other cities, they must have done a kind of archaeology to allow them to identify individual buildings. Only such a procedure can

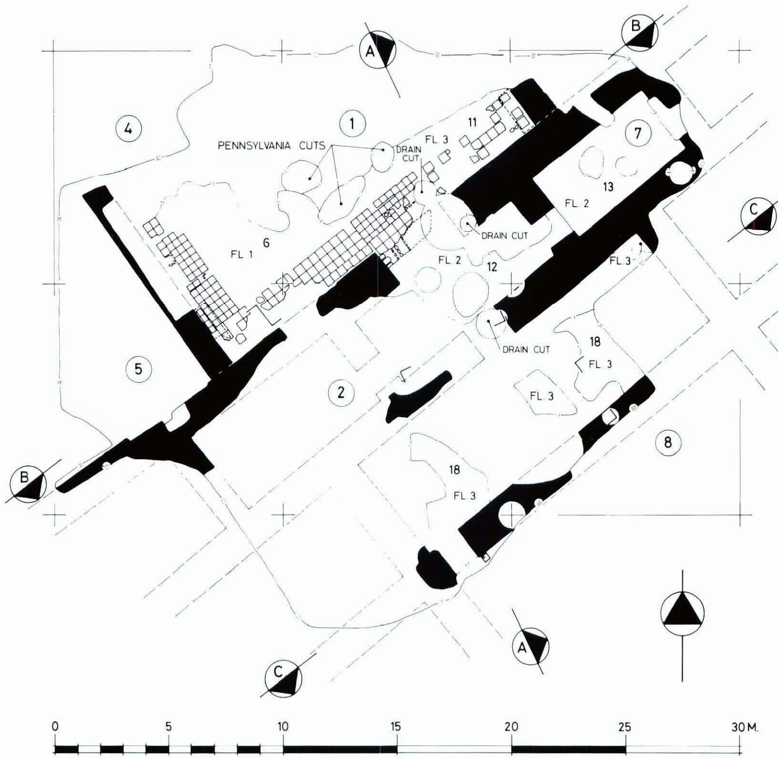

Fig. 5 Plan of remnant of Kassite governor's palace, 13th Century B.C.

explain how, after hundreds of years of abandonment, the Kassites could have placed their versions of the Inanna Temple, the North Temple, the temple in WA, and other buildings, over their Old Babylonian predecessors. The reconstruction by the Kassites of this holiest of cities on so grand a scale and with such care for detail is consistent with that dynasty's deliberate efforts to revive other aspects of ancient Mesopotamian culture, such as a resurrection of the long-dead Sumerian language and literature.

Our appreciation for that effort of reconstruction was heightened by work we carried out on the lowest parts of the site. In our 13th Season of excavation, 1975, we began to investigate Area WC in the southernmost corner of the city (Fig. 2). We had noticed that a ridge, appearing on an air photograph of the site (Fig. 6), seemed to coincide with a corner of the city wall on a Kassite map that had been found at Nippur by the University of Pennsylvania (Fig. 7). This city plan shows the ziggurat complex, Ekur and Ekiur, "the canal in the middle of the city," and a number of city gates, as well as measurements along sections of the city wall. I was already convinced that Samuel Kramer [1956] had been correct in arguing that the Kassite map represented the entire city, not just the eastern half, as other scholars have thought [Fisher 1905]. Miguel Civil, our expedition epigrapher, in conducting a new study of the map, showed me that the measurements along the walls made sense only if the entire city were represented and if the map were oriented as I present it here.

The correct orientation of the map was proven by the cutting of trenches WC-1 and WC-2 (Fig. 2)

Fig. 6 Air photograph of Nippur, with ziggurat at right center, city wall visible as dark corner at lower left and Kassite canal (="Euphrates") farther left.

across the ridge at the southern corner of the site, where we found evidence of a city wall more than 14 meters in thickness [Gibson 1978b: 118–20]. There is difficulty in overlaying the ancient plan on the topographical plan of the site (Fig. 8), however, because of inaccuracies in the angles of the city wall as given by the Kassite scribe; if Ekur and the southern corner of the city (Area WC) are aligned, many of the other features are skewed and if the river Euphrates is laid over the Kassite canal that we excavated to the west of WC, another set of features is then skewed. Even with the difficulty in alignment, however, the similarity of detail in both maps is obvious. By excavation, we also determined that an ancient canal west of WC-1 was Kassite in date and it lay approximately where the Euphrates is located on the ancient map.

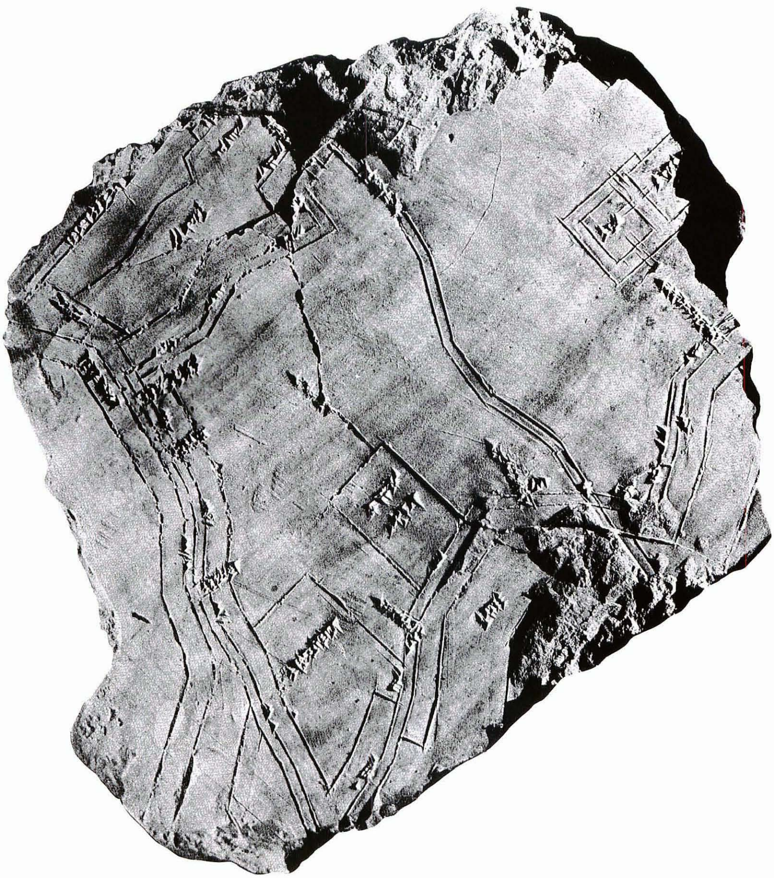

Fig. 7 Ancient map of Nippur, Kassite period (courtesy Hilprecht Sammlung, Jena).

We even located what must be the Birdu canal, which branches off from the Euphrates at the western corner of the city. In a long trench at the northwest of the mound, we discovered at four meters below the present plain level many thousands of Kassite pottery vessels embedded in greenish clay, laid down in conditions that our soil specialist interpreted as ponded water. This area on the ancient map is marked *ḫirtum*, which can be translated "moat," that is, an area of ponded water. In summary, I can say that we have been able to verify Kramer's interpretation of the map by a combination of archaeological, geomorphological, and philological evidence.

While we worked for three seasons on the southern end of the mound, exposing private houses of several periods just inside the city wall, the dunes that had hampered our excavations on the high mounds began to retreat rapidly towards the east. This phenomenon allowed us to carry out investigations of the city wall east of the ziggurat (Areas EA, EB, EC) and a very important operation, TC, at the end of the TA

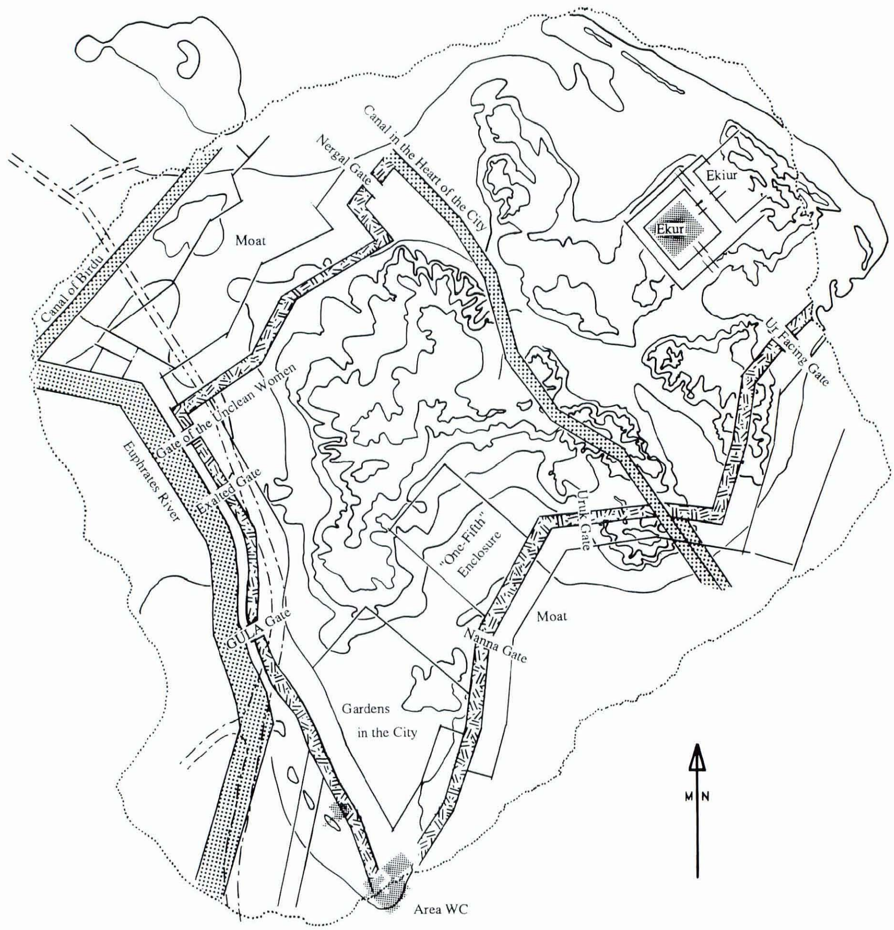

Fig. 8 Overlay of ancient Nippur map on modern topographic plan of site. Lack of exact fit is created by inaccuracies in angles on ancient map. (Drawing by Augusta McMahon).

trench on Tablet Hill (Fig. 2). In Area TC, we were able to prove that not only had there been a crisis and abandonment of Nippur during the Old Babylonian period, but also a second crisis in the period after the Kassite occupation. James A. Armstrong, in an outstanding example of archaeological excavation and reasoning [Armstrong 1989], proved that the original excavations from 1948 to 1952 had involved a misunderstanding of the stratigraphy. When correctly reassembled, the evidence clearly shows sharp breaks in pottery traditions not only in the Old Babylonian period but also in the post-Kassite period. And in both periods of abandonment, dunes invaded the site, just as they have done in the past hundred years. The abandonment at the end of the 2nd Millennium meant that there was the necessity for a second revival of Nippur, which seems to have taken place in the 8th Century B.C., reaching its peak under Assurbanipal in the late 7th Century. The breaks in the pottery sequence, which reflected the abandonments, had been somewhat apparent in a table in the original publication of Tablet Hill [McCown and Haines 1967: Table II] but were made indistinct by the confusion of stratigraphy. Armstrong's revision of that table, now nearing completion, will illustrate very graphically the two gaps in occupation of the city. We cannot state, absolutely, that the entire city was abandoned each time; there is a possibility that the ziggurat and the Enlil temple may have survived with a small staff that could derive water from wells and could have been supplied with food from the irrigated areas to the west. In future, we hope to investigate the problem in the ziggurat area.

By 1989, with most of the sand off the site, we decided to return to Area WA to reopen the investigation of the sequence of temples that we had found in the early 1970's. In the years that we had been working on the lower parts of Nippur, we had achieved several of our objectives, such as sampling unexcavated parts of the city through surface collection of sherds and soundings; we have not yet uncovered any industrial areas except the bakery of Area WB and some areas of pottery production of various periods, but we do have a better idea of the history of occupation of the city as a whole; we have also examined the city walls in Areas WC, EA, EB, EC (Fig. 2); and, by the inclusion of environmental specialists on the expedition since 1972, we have made significant strides in understanding the environment both in modern times and in antiquity (e.g., Brandt [1990]).

Our first step in reopening work on the high mound in 1989 was to make a sizable excavation of Sasanian and Islamic levels in Area WG, just to the southwest of Area WA. With this operation we achieved yet another of our long-range goals, the systematic investigation of the last two periods of occupation at Nippur. The excavation of this area was also meant to give us room to expand Area WA toward the location of the Murashu archive. At the same time, we sank a deep pit (WF) in the southern end of WA, in order to expose levels that would make possible a revision in our understanding of the transition from the Early Dynastic to the Akkadian period.

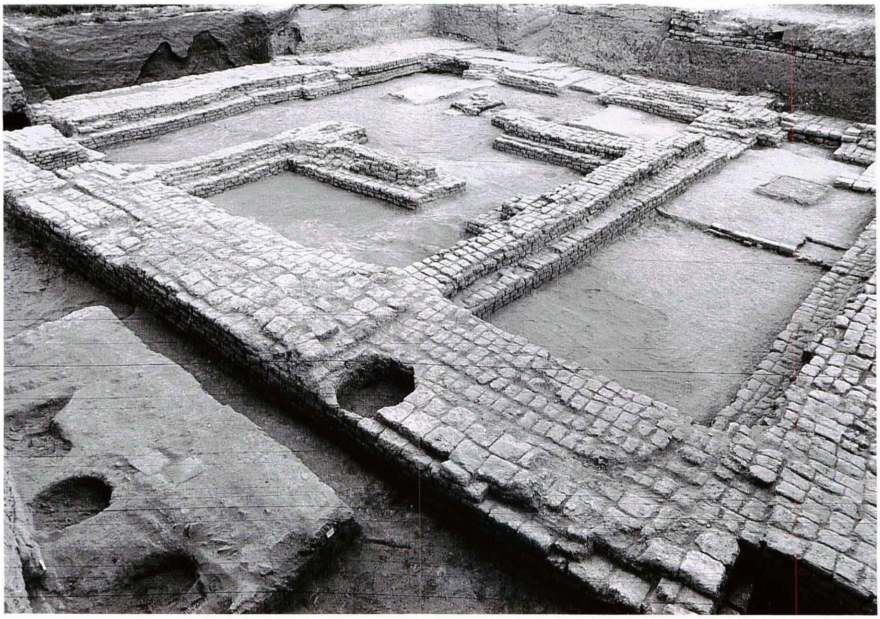

Fig. 9 Photograph of temple in Area WA, 1990. Kassite level.

In the winter of 1990 we resumed excavation on the temple sequence in Area WA. Although we did not expose the entire temple at any level, we were able to gain enough information to hazard an estimate that the latest (Neo-Babylonian, c. 600 B.C.) building was probably about 100 meters by 40 meters in size. In addition, although only the bottoms of the walls of the 7th Century and Kassite (13th Century) levels remain (Fig. 9), we were able to recover enough artifacts in these buildings to identify the deity to whom this temple is dedicated. On floors, and buried in the plaster on walls, we found several figurines of dogs (Fig. 10). We also found fragmentary figurines of human beings in attitudes of pain; for instance one with his hand to his throat, another with one hand to his head and one to his stomach (Figs. 11–12). Knowing that the dog was the special symbol of Gula, the goddess of medicine, we began to hypothesize that this was her temple, even though there are very few mentions of a Gula Temple in Nippur tablets. The identification was made positive by the finding of a small fragment of a lapis lazuli disc with the incription *a-na* ^{d}*Gu-la* "to Gula." Muhammad Ali Mustafa, an Iraqi scholar, had

Fig. 10 Figurine of dog from WA temple.

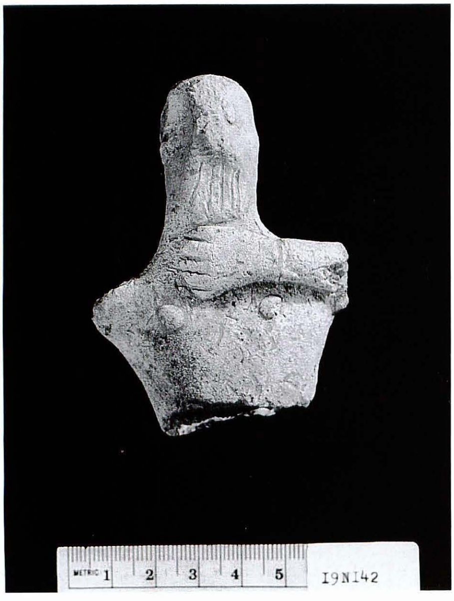

Fig. 11 Figurine of person in pain, from WA temple.

Fig. 12 Figurine of person in pain, from WA temple.

excavated a small Kassite mound near Dur Kurigalzu, where he had discovered dozens of similar figurines [Mustafa 1947]. On some of his animal figurines there were prayers to Gula, making certain the association of such figurines with the goddess.

We had been assuming since 1973 that the WA temple, being so large, might be dedicated to Ninurta, who is the second most important god at Nippur. It may be proven in future that the temple of Gula lies beside a large temple dedicated to Ninurta, but it is more likely that the part of the WA temple that we have thus far exposed is only the Gula section of the temple of Ninurta, since Gula was the wife of Ninurta from the Old Babylonian period onwards. The situation in WA may, then, be the reverse of what has been found at Isin, where Gula, the chief deity of that city, shared her temple with Ninurta [Hrouda 1981: 200]. At least one other scholar, A. Westenholz [1987: 97–98], has argued that the Ninurta temple is to be located in the West Mound.

Our plan to continue excavation of the Gula Temple in the winter of 1991 was cancelled by the Gulf War. We still hope to spend several years exposing the temple systematically, level by level, until we reach the earliest one. We wish to examine not just the temple but also the area around it, to try to put it in its urban context. And we will be conducting analyses of soil and floral and faunal remains that can expand our knowledge of the environment of ancient Mesopotamia. In the early levels, we know that the temple will not be dedicated to Gula, whose name appeared only at about 2,000 B.C.; the early versions of the temple probably will be dedicated to a Sumerian counterpart, Bau or another of the goddesses of medicine.

If we can carry out our program, we may gain important new information on Mesopotamian medicine, on its practitioners the *asu* and the *asipu,* as well as on their relationship to the temple. We know that the *asu* was something like a modern doctor, making diagnoses, prescribing remedies, and recording the results. We also know that the *asipu* was a magician, performing rituals and giving potions. We do not know how the two professions related to Gula or to her temple. Perhaps the Mesopotamians dealt with illness as many people do today. They went to the doctor for a cure. If that didn't work, they tried alternative medicine—a faith healer or a folk healer. Maybe at the same time, they went to the temple to leave a figurine or obtain a figurine and say a prayer.

In their attitude toward medicine, as in other things, I would suggest that the ancient people of Nippur and of Mesopotamia in general, rather than having "mythopoeic minds" [Frankfort 1946], were only a little less complex than we are and probably just as sensible. As is the case with most people, the ancient Mesopotamians had contradictory aspects to their personalities, being religious when it was called for but forgetting religion in most situations. In my understanding of written records, the ancient Mesopotamians, even those at a religiously dominated city such as Nippur, were in most aspects of life very pragmatic and extremely rational in working out problems. They were the inventors of many procedures that still underlie modern life, e.g. in commerce and law. Their art objects show an ability to objectify reality, but there are also artifacts, such as figurines of monsters, that express superstition and fear. They could express lofty ideas of justice and mercy, but punish with severity, and even carry out acts of senseless brutality. And besides great art and literature, they could create riddles and jokes and probably pornography.

As a culture, ancient Mesopotamia must be recognized as a tremendously resilient and strong tradition. In a harsh and demanding environment, Mesopotamians created the world's first civilization and sustained it for more than three thousand years. That culture was, in fact, so elaborate, changing, and elastic an adaptation that it could be maintained even when major states collapsed. Nippur, its spiritual center, was probably more intimately involved in that continuation of tradition than most other sites. The city is, then, an extraordinarily important focus for sustained research and deserves continued excavation well into the future, even though there has already been a century of archaeological research on the site.

Mesopotamian Chronological Table***

Ubaid	5000–3500 B.C.
Uruk	3500–3100 B.C.
Jemdet Nasr	3100–2900 B.C.
Early Dynastic I–III	2900–2350 B.C.
Akkadian	2350–2100 B.C.
Ur III	2100–2000 B.C.
Isin-Larsa	2000–1800 B.C.
Old Babylonian	1800–1600 B.C.
Kassite	1600–1150 B.C.
Post Kassite	1150–1000 B.C.
Early Neo-Babylonian	1000–625 B.C.
Neo-Babylonian	625–539 B.C.
Achaemenid	539–331 B.C.
Seleucid	331–125 B.C.
Parthian	125 B.C.–A.D. 226
Sasanian	226–637
Islamic	637–1500
Ottoman	1500–1918

*** Dates are approximate and have been rounded off in most periods.

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UBAID POTTERY FROM KASHKASHOK II — TYPOLOGY AND CHRONOLOGY —

Tatsundo KOIZUMI*

1. Introduction

The following article concerns the Northern Ubaid Pottery from Tell Kashkashok, tell No. II in northeastern Syria. The Kashkashok site was excavated in 1987, 1988 by the expedition team from Tokyo University. I took part in the last season and had the opportunity to investigate the Ubaid and post-Ubaid[1)] pottery, most of which were funerary objects from the cemetery in the tell. The pottery vessels were complete enough to be classified according to vessel shape. In a previous report [Koizumi 1991], vessels were classified into twenty-one forms according to the author's original scale, patterns of decoration were described for each example, and brief comparisons with pottery from other sites were made. In this paper, we shall define our particular typology, explain its merits, variables and classification, make comparative analyses using a particular method, and present some interpretations arising from our approach. Our goal here is to propose a reliable chronology for the Ubaid pottery in Kashkashok, which reflects distinctive patterns of changing modes in the shape, design, and technology in northern Mesopotamia, and at the same time represents notable features of regional variation in forms and/or attributes around the fifth millennium B.C.

When considering problems concerning current research into Ubaid pottery, some points about the Northern Ubaid are particularly relevant. Substantial studies in Ubaid pottery chronology began around the 1950s, principally on the basis of stratigraphic information from Tepe Gawra. In 1949, A.L. Perkins proposed that, although both Northern and Southern Ubaid cultures, deriving from an identifiable origin, had formed one culture complex, they pursued their own courses and developed into separate cultures in the subsequent period [Perkins 1949: 198–99]. She also stressed the twofold division of the Northern Ubaid [Perkins 1949: 72–73]. J. Oates, using stratigraphic evidence from Eridu, designated al 'Ubaid phases' 1–4 in southern Mesopotamia in which these changes are gradual and at no point is there a sudden break in style [J. Oates 1960: 39–40]. P. J. Watson assumed a correlation in time scale between the Northern and Southern Ubaid, basically accepting the chronological framework of J. Oates and the view of Perkins [Watson 1965]. E. Porada suggested a correlation between North and South on the basis of artifacts including, among others, pottery and stamp seals [Porada 1965]. For a long time these chronological outlines have served as a basic framework for the relative chronology of the Northern Ubaid [Akkermans 1988a: 131].

From the 1970s, a number of surveys on the Ubaid Period have been carried out in northern Syria, which have expanded our knowledge in that region. Excavations at Yarim Tepe III demonstrated that the Ubaidian layers directly overlay the final horizons of the Halaf culture and ushered in the beginnings of the subsequent culture in the northern variant of the latter [Bader, Merpert, and Munchaev 1981: 60]. The excavations at Tell Leilan provided the first northern Mesopotamian ceramic sequence to be analyzed in a quantitative fashion, which demonstrated a marked trend towards continuity and gradual change in ceramic

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styles [Schwartz 1982: 336, 338; 1988: 162]. Research at Tell Brak revealed that there was no identifiable break between the Late 'Ubaid and Uruk pottery, and three shards from the fill in the Eye Temple deposits suggested the possibility of an early route of contact with the south via the Euphrates and the Khabur [J. Oates 1987a: 193–94]. Excavations at Tell Hammam provided not only strong similarities in technological development of pottery production, but also local independent developments in rim and decoration typology between this site and other sites [Akkermans 1988a: 129]. Akkermans established a sound chronological scheme for the Northern Ubaid and 'Late Chalcolithic' periods [Akkermans 1988a: 131; 1988b: 216–27, 310–21].

Surveys of Tell Aray 1 and Tell Abd el-Aziz suggested, on the basis of analysis of particular pottery types, that these areas in northwestern Syria were influenced more by the Northern Ubaid than the Halaf, and that the former caused substantial changes to the indigenous tradition of pottery production [Tsuneki 1992: 89]. Excavations at Tell 'Abr proposed it as a possible industrial center for the manufacture and distribution of Ubaid ware around the site [Hammade and Koike 1991: 686]. Many other surveys concerned with the Northern Ubaid pottery have been reported in recent years which have yet to be interpreted in the Northern Ubaid context.

The chronological framework of the Northern Ubaid has been renewed and revised [Schwartz 1982; 1988; Dunham 1983; J. Oates 1987b; Akkermans 1988a; 1988b; Porada, Hansen, and Dunham 1992], as new evidence, mentioned above, has been accumulated. At the same time, however, it has been recognized that the relative chronology is complicated by some factors of material distributions and strategy [J. Oates 1987b: 473–74]. Firstly, with reference to regional variation, the northern Ubaid pottery types in the upper Balikh valley suggest independent development in shape and decoration [Akkermans 1988a: 129; 1988b: 226], although those in the Jarrah River, a tributary of the Khabur, indicate close affinities with those from the northern Iraq sites [Schwartz 1982: 281]. Secondly, functional distributions of material objects may lead to recovery bias, as differences in pottery types may reveal differences in function within the context in which they are situated [Schwartz 1982: 340; J. Oates 1987b: 473]. Lastly, the limited number of materials recovered from sites leads to spurious parallels; moreover it is often difficult to distinguish between one material in situ, the direct result of a particular usage, and another from artificial fill, disturbed by a later period or phase [J. Oates 1987b: 473].

The research approach suggested in this paper proposes to solve these problems. The region or site may show similarities with others as well as having its own independent features. The former may be used for comparative analysis; the latter should establish identity and explain regional variation. The approach, thus, should consider independent development along a tributary with a cluster of several sites. The category 'tributary cluster' would be useful to describe regional identity. The approach would, moreover, be reliable for wider, bolder comparisons with other areas, for example, across northern Mesopotamia and Syria, and even including the south.

In order to solve the problems of functional distribution, the approach should first pursue separate analyses for each context: residence, work shop, cemetery, etc. A particular context is selected as the basis for a principle sequence, and then others are each examined. A quantitative approach towards pottery typology and technology should, given the limited information available, be sufficient to reflect the integrated entity composed of many fragments. It should be applied to a context where materials can securely be classified promoting more reasonable expectations of the integrated entity, thus providing a reliable background for the analysis.

2. Site information

Before describing the method the relevant site information will be presented (Fig. 1).

Tell Kashkashok is situated on the west bank of Wadi al Aweiji, a tributary of the Khabur in northeastern Syria. The complex site consists of four tells of which Kashkashok, tell No. II was excavated. This tell, located northeast of the tell complex area, is about 100 m in diameter and about 5 m above the alluvium. The low mound is eroded on the west side, which consequently forms a steeper slope than the east. A wheat field now covers the surface on the mound. Two seasons of excavations showed that the mound was first occupied in the Hassuna Ia period, used as a cemetery in the Ubaid and subsequent periods, and thereafter utilized in the Islamic and later periods. The stratigraphic layers of the tell were designated Layer 1 to 4, with the surface layer cultivated by villagers. Over one hundred tombs belonging to Layer 2 have been excavated in this mound, sixty-three of which have been registered. We found eighty-six nearly complete pottery vessels during the two seasons, eighty of them from the registered tombs, three from one registered pit (P 103), and the rest from locations that might have been votive deposits, unrelated to certain features in Layer 2. Here we shall focus on the eighty-six nearly complete pottery vessels.

As the analyses in this paper are concerned with pottery vessels found with little stratigraphic information, comparison with other sites is necessary. Therefore, we shall try to relate 'forms' classified

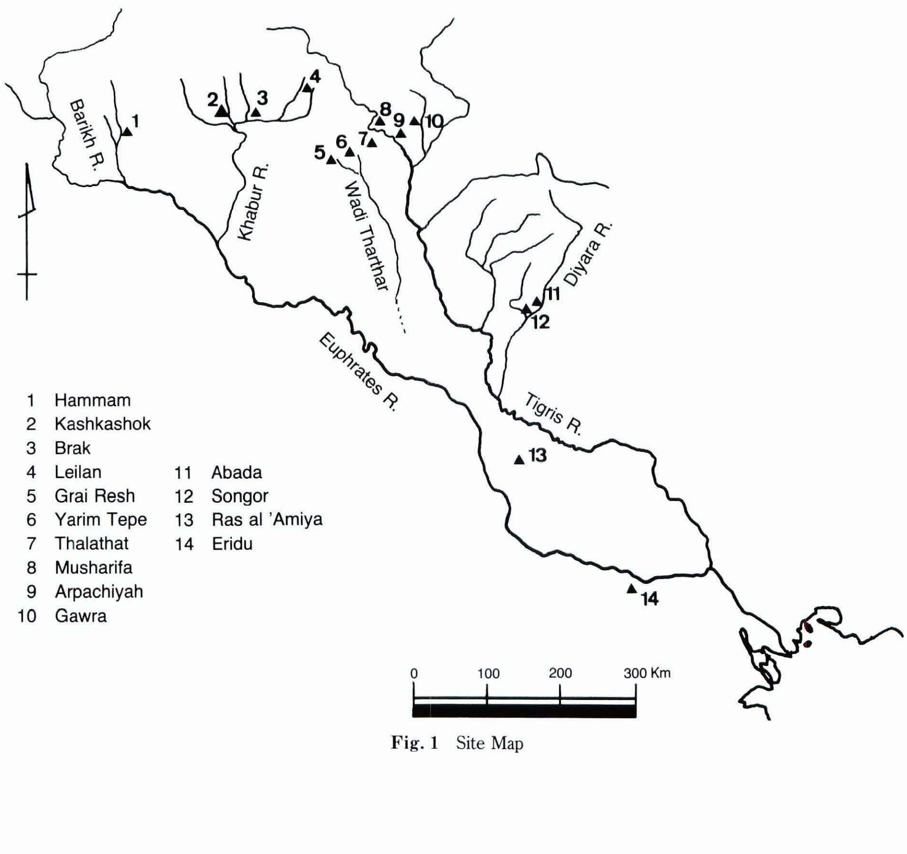

Fig. 1 Site Map

in an original typology to those from other sites in Northern Mesopotamia and Syria. The context from which these samples are derived should be considered: residence, public space, cemetery, workshops, etc. In the following, we briefly explain the location of each site and the context in which the pottery was found.

Tell Hammam, situated on the east bank of the Balikh, is a huge-mound, measuring about 500×450×45 m. Excavations, which the University of Amsterdam, led by M.N. van Loon, have undertaken on the east slope of the tell, have revealed that an accumulation of debris can set up a stratigrapic and pottery sequence at the site [Akkermans 1988a: 109]. Tell Leilan is located on the north side of the confluence of the Jarrah River, a tributary of the Khabur, and Wadi Qatrani. The site comprises the acropolis, measuring about 600×300×15 m, and the 'Lower Town', demarcated by the city wall, which was not inhabited until the late third millennium [Schwartz 1982: 7]. In 1979 Yale University, conducted by H. Weiss, excavated a step trench, designated Operation 1, on the northwest slope of the mound, revealing stratigraphic units consisting of temporally discrete deposits resulting from human activity; most of architectural remains were of a domestic character [Schwartz 1982: 13–19; 1988: 163]. Tell Brak is situated on the west bank of the Jaghjagh River, a tributary of the Khabur. The site is a huge mound, measuring about 830×550×40 m. During excavations, which D. Oates has directed since 1976, deep soundings in Area CH on the south slope of the tell show the gradual transition from Late Ubaid pottery to Early Uruk within a well-stratified sequence of occupation levels [J. Oates 1987a: 194]. Grai Resh is located at the southern foot of the Jebel Sinjar. The large tell, measuring about 300×200×20 m, was excavated by S. Lloyd in 1939. Excavations on the saddle between two main eminences and on the east slope indicate nine principal building levels which encompass the gradual transition from Northern Ubaid pottery to Uruk pottery [Lloyd 1940: 13–15].

Yarim Tepe is located along the Jubara Deresi stream at the south foot of the Jebel Sinjar. The site consists of five tells one of which, Yarim Tepe III, is situated on the west bank of the stream. The southern part of the tell merges with the north-western part of Yarim Tepe II where a seven-meter thick Halaf cultural layer was found during previous expeditions. Yarim Tepe III is the largest of the five tells, measuring about 200 m in diameter and rising 10 m above the plain. In 1977 excavations by a Soviet expedition team, directed by R.M. Munchaev, began on the southern slope of the mound and revealed a single cultural layer, belonging to the Ubaid period, which included up to four building levels [Bader, Merpert, and Munchaev 1981: 55–56]. Telul eth-Thalathat, located along a Wadi flowing into the Tigris at the northern foot of the Jebel Ibrahim, consisting of four tells among which Telul eth-Thalathat II is the lowest, measuring about 100×60×7 m. Since 1956 excavations carried out at the southern center of the mound, and the eastern and western sides of the slope, have revealed sixteen strata with architecture and constructions[2)] [Fukai, Horiuchi, and Matsutani 1970: 1–7].

Tall Arpachiyah, a single mound measuring about 67×67×5.5 m, is situated on the east bank of the Tigris. In 1933 M.E.L. Mallowan excavated several areas of the tell. Excavations of the Ubaid cemetery on the low-lying west-southwest slope of the mound indicate that the graves can be grouped into early graves and late graves according to the levels in which each grave was located [Mallowan and Rose 1935: 6–8]. Tepe Gawra, measuring about 120×120×22 m, is situated on the east bank of the Khosr River, a tributary of the Tigris. This huge tell was excavated by E.A. Speiser and C. Bache since 1930. The excavations, mainly in the northeast portions of the mound, revealed a stratigraphic sequence of occupation and pottery types from Late Halaf to Northern Ubaid and Gawra periods, which have enabled the ceramics to be seen in their own right without being unduly obscured by foreign parallels [Speiser 1935: 9; Tobler 1950]. This consistent sequence of stratigraphic accumulations has provided the core for the chronology of the Northern Ubaid and Gawra (post-Ubaid) periods.

3. Methods

Leaving aside the contextual information from which comparable examples come, let us now look at the method of the analysis. In order to pursue changing modes of shape, design, and technology for the Ubaid and post-Ubaid pottery vessels from the tombs in Kashkashok, it is first necessary to classify pottery vessels (typology), next to extract variables from the classified vessel forms, and then to order the attributes on a meaningful time scale (chronology).

1) Typology

Sampling

The pottery vessels of concern here were uncovered from Ubaid and post-Ubaid tombs in the cemetery. Most of the vessels were in situ and complete, enabling us to get more reliable information for the reconstruction of past surroundings of Kashkashok, than residences or other features would permit. Admittedly we deal with a limited samples of the mound, but they are located, as funerary objects, in a particular context—tombs. As a result, although the samples are much fewer than the total population of buried pottery under study, the sampling fraction allows us to estimate the probable representation of the rest of the pottery within a consistent context. It may be said that sampling units consisting of funerary objects in an unequivocal context, as at Kashkashok, can provide important evidence for approaches such as typology and chronology.

Definition of typology

One must be able to replicate and verify typology. The structure should always be consistent with strategy and practice. If other researchers work with same body of pottery vessels, they 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 techniques [Sinopoli 1991: 46]. Furthermore, it is proposed that the typology is necessary to reconstruct potsherds into one complete form and to discriminate a particular 'form' from intermediate 'types'. In the present study, classification and analysis has been carried out on complete, or nearly complete, vessels, which provides a much more reliable typology and chronology than that possible with potsherds. Potsherds, for example, consisting of rim parts or base parts represent only a portion of the complete vessel and provide limited evidence for function, although technological information can be gained even from such potsherds. 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 on the same logical consistency as with a complete vessel. In such cases, a potsherd considered as an artifact sample should be classified as part of one complete vessel form or identified with a form which is as similar as possible, and the variables or attributes of the sample would be analyzed within the particular context of the complete sample.

Classifying a vessel, ambiguous in terms of 'type', as a certain 'form' is also important; 'type' is a combination of many possible variables used for classification, while 'form' represents one variable—shape—selected from them. 'Type' may have several aspects which can be typologically definited, but 'form' may have a more limited unequivocal meaning. Although at first, we can not always assign samples to a particular type, these vessels may be classified adequately to a proper form within a certain range of shape. The range should be determined on a quantitative scale so that the category can be easily reconstructed on the same scale by other researchers. The 'form' classification is necessary for the following analysis which requires a consistent framework of grouping and the distinctive boundary of each vessel.

Variable selection

Considering the merits mentioned above for vessel classification, it is necessary that the shape of complete vessels be chosen as the prime variable for classification and the other variables—manufacture, decoration, temper, surface treatment—be supplementary in determining the order of attributes extracted from these forms for further analysis. The first step in classifying pottery vessels requires the selection of variables useful for the purposes of the typology [Adams and Adams 1991: 189]. The variables should also reflect, to a greater or lesser degree, conscious decisions on the original potter's part [Sinopoli 1991: 43], in which some purpose might be included in the process of vessel production. Two variables are proposed to fulfill such requirements: the orientation of the end of vessel wall and the profile of the vessel body.

The former means the gradient (a) at the end of vessel wall-that is, the angle between the horizon and the tangent at the end of the vessel's core line (Fig. 2). This variable represents the degree to which the mouth of the vessel opens and includes three quantitative attributes—closed, vertical, opened—that can be relatively ordered on the degree scale. Further attributes are added for detailed classification; the ratio between height (h) and diameter (r) of the vessel, which is useful for comparing samples and clustering them into particular categories:

A.	Sharply Closed End	: $a<60$[3]
B.	Closed End	: $60\leqq a<85$
C.	Vertical End	: $85\leqq a<95$
D.	Slightly Opened End	: $95\leqq a,\ r/2\leqq h$
E.	Opened End	: $95\leqq a,\ r/4\leqq h<r/2$
F.	Widely Opened End	: $95\leqq a,\ h<r/4$

Considering the degree to which the end of "vessel wall" is closed or opened, "Jars" are said to be a particular variant of the form "Sharply Closed vessel" (mentioned below) from which many kinds of jars are developed with turned ends of bodies—necks (Fig. 2). If a "bowl" has a gradient of less than sixty degrees at the point where the turned end meets the body, it is called a "jar."

The latter variable (body profile) means the degree to which the profile of the body is curved, and consists of three principle attributes: out-turned, straight, incurved. It is assumed that in cross section the body line is a composite of these three lines. There is actually one profile with a simple straight or curved line, for example, "Deep plate" or "Hemispherical bowl," and another revealing a complex situation with the joining different principle lines, "Cup-like vessel." In the former, the simple profile or contour is composed of a smooth straight or incurved line, while in the latter the different lines are connected at certain points, forming one combined body line, out-turned and incurved, straight and incurved, or others[4]. In the pottery from Kashkashok, 'two' variant lines are connected at one point on the body profile with "the upper line" above and "the lower line" below. It could also be said that, during production, the potter's conscious determining of the shape of vessel body is actually reflected in the act of joining those different profile lines. It would appear, therefore, that this point is not only a convenient one to explain the shape of the body profile, but also a practical one on which the potter intended to put his hand. The mutual combinations between "the upper lines"—out-turned, straight, and incurved—and "the lower lines"—out-turned, straight, and incurved—provide nine shapes. Additionally, when considering whether the joint is smoothed or carinated, eighteen shapes are possible (Fig. 3). The nine patterns observed on the

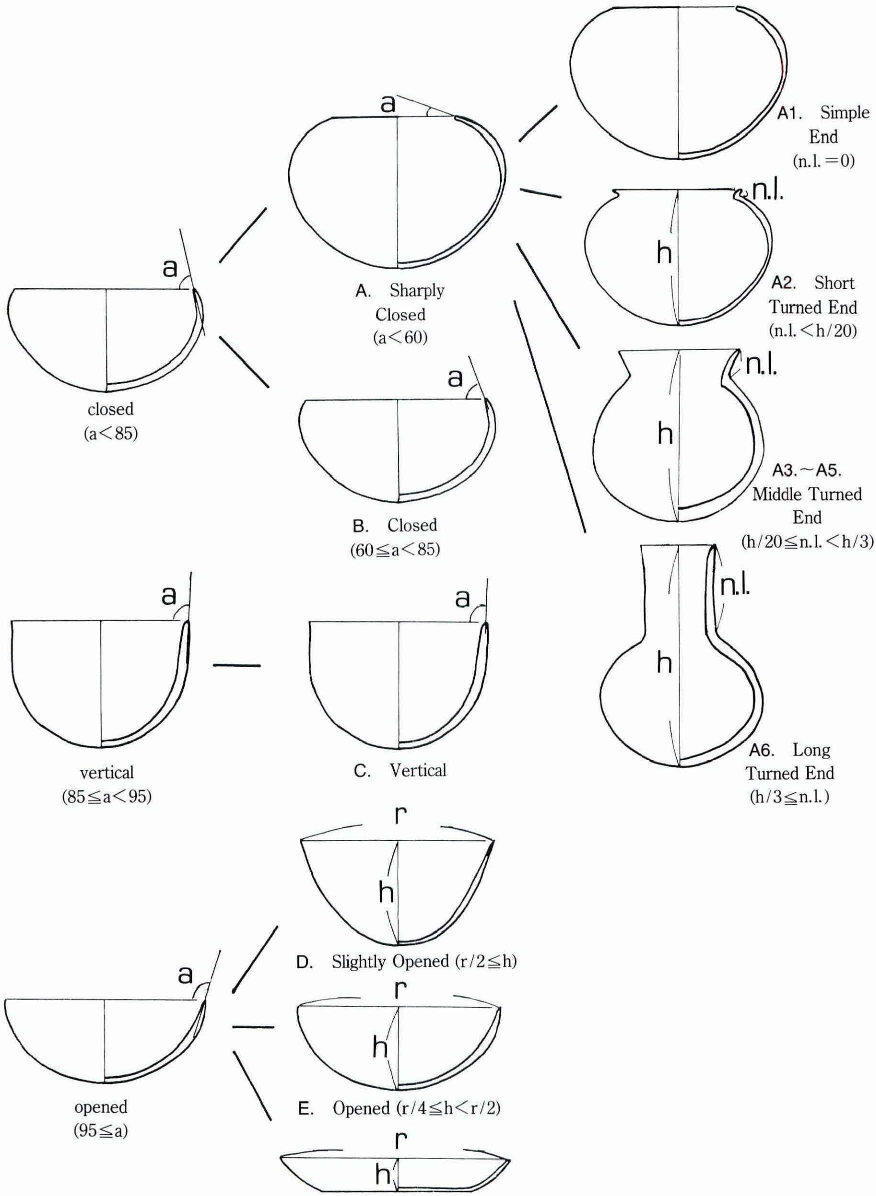

Fig. 2 Orientation of vessel wall ends

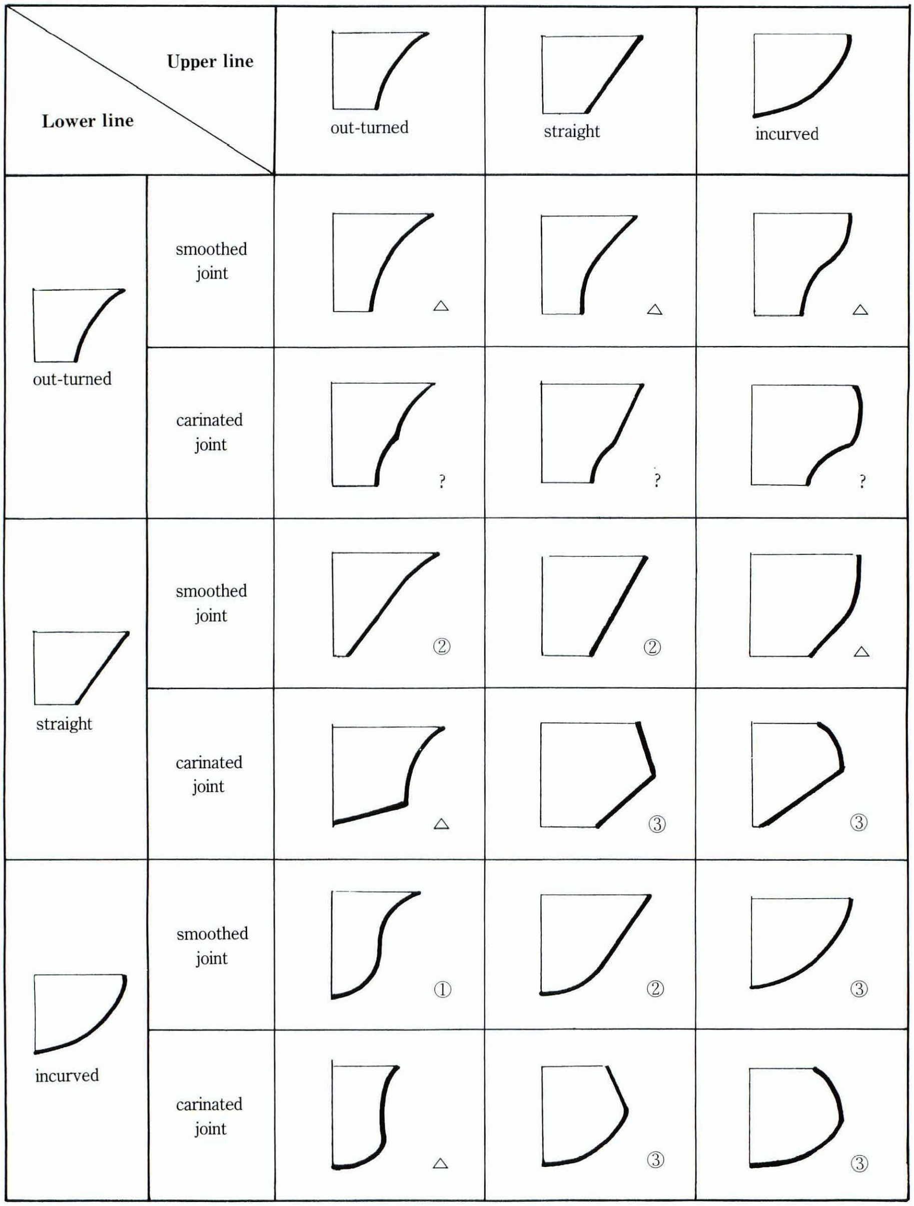

Fig. 3 Combinations of upper and lower lines

① S-shaped Profile ② Straight Profile ③ Incurved Profile △ Possible Forms (Other sites) ? Uncertain

Kashkashok vessels are among these. Furthermore, these patterns are integrated into the following 'three profiles' which may well be considered as representing the main outline of the body shape (Fig. 4).

The fundamental outline of "form" is theoretically seen as a combination of the two variables: the orientation of vessel wall at the end and the profile of the body. The former may have "A" to "F" attributes associated with a round or flat base variant, resulting in twelve shapes; the latter may result in the eighteen shapes mentioned above. Although the combination of both the 12 and 18 shapes could produce 216 patterns in theory, parts of them may be used as real forms (Fig. 5). As there is little advantage in using a complicated table for the typology, it is proposed that the "A" to "F" attributes of the orientation variable and the "1" to "3" attributes of the profile variable be the basis for the following classifications. While the former variable is, of course, a quantitative one measurable on a numerical scale (degree), the latter is a qualitative one measurable on an ordinal scale (profile line). It is really as a classificatory process in determining one pottery form, therefore, that, when an attribute is chosen from the six ones in the former variable, another supplementary attribute is selected from the three in the latter variable[5).

The attribute selections for the typology need more detailed sub-variables in the "A" group of the "degree" variable. Jar vessels are the most common pottery in the "A" group and have more variants for the end of the vessel wall or the neck than the "B-F" group. The end or neck sub-variable really represents the prime characteristic of the vessel form, which can adequately determine the shape. When the end of vessel in the "A" group has been divided into simple or turned, the turned end can be sub-divided into short, middle, and long according to the length of the turned end (e.l.) (Fig. 2). Furthermore, although the short turned end is not considered to be a neck, the middle and long turned end is regarded as a jar neck. The middle turned end, hence, can be sorted into several necks mostly according to the angle

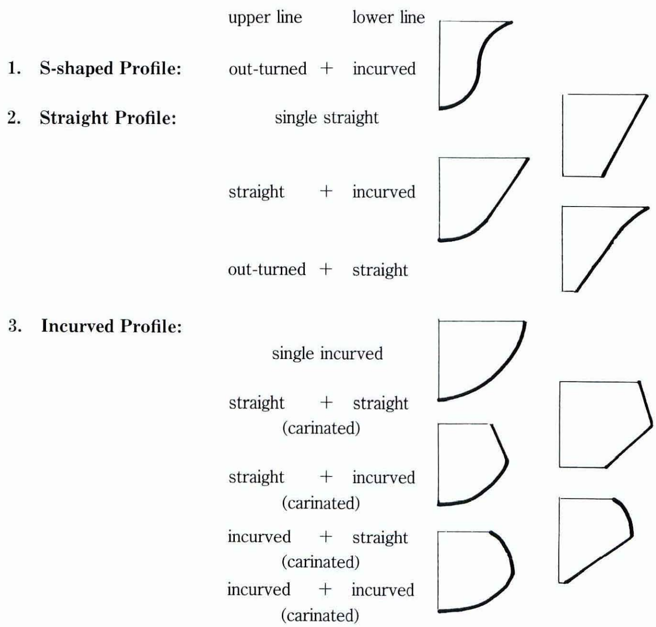

Fig. 4 "Three Profiles" composed of nine patterns

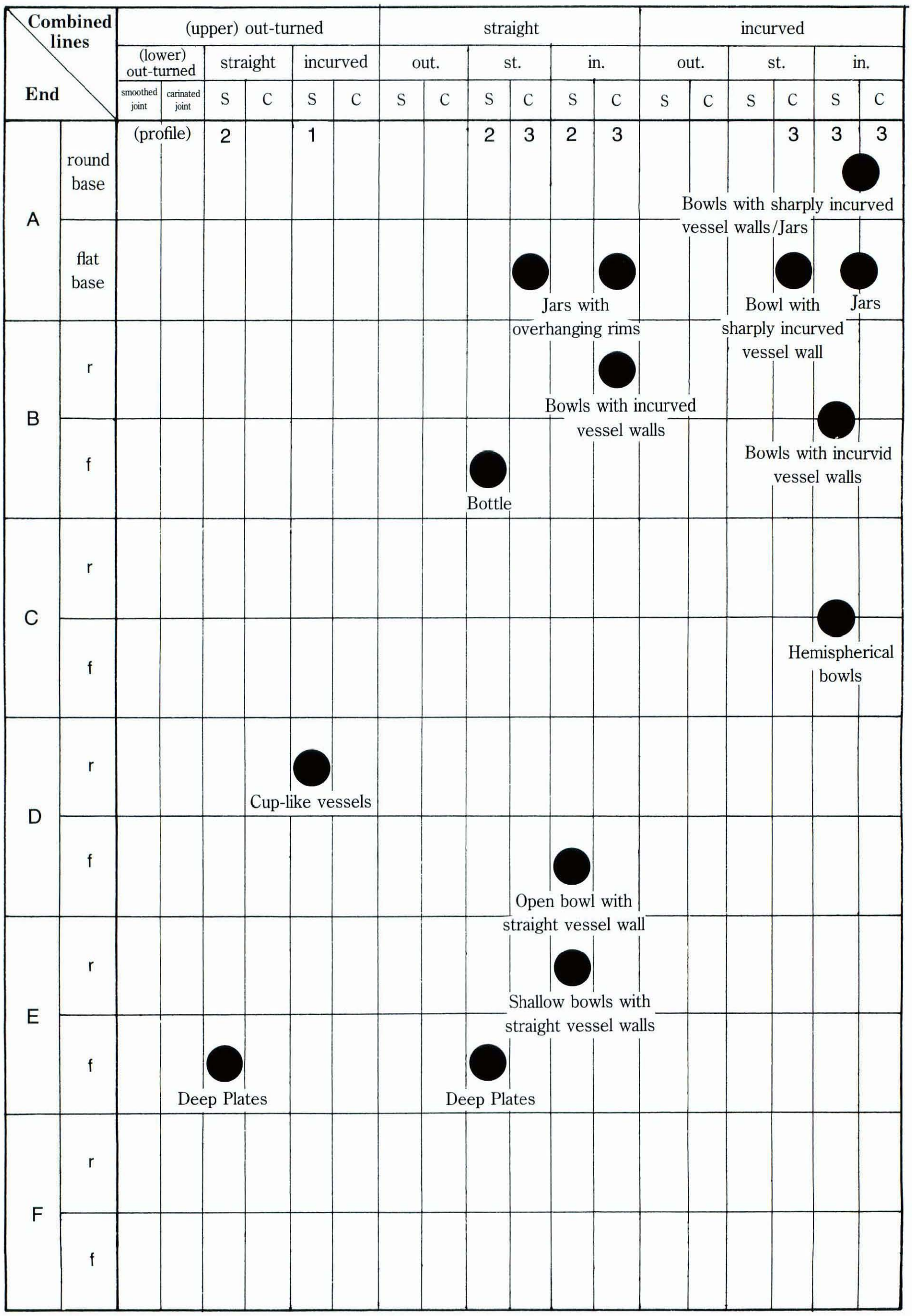

Fig. 5 Total combinations of "End" and "lines"

between the neck core line and the vessel core line at the joint (n.a.: neck angle): simple, everted, and collared (the last neck is always connected with an overhanging rim):

A1. Simple End : e.l. $=0$
A2. Short Turned End : e.l. $<h/20$
Middle Turned End : $h/20 \leqq$ e.l. $<h/3$
A3. Simple Neck : $60<$ n.a. $\leqq 120$
A4. Everted Neck : n.a. $\leqq 60$
A5. Collared Neck (overhanging rim) : n.a. $\leqq 120$
A6. Long Turned End : $h/3 \leqq$ e.l.

The simple neck (from the middle turned end jars) has a straight or splayed rim. The everted neck is sharply bent and the collared neck, with its overhanging rim, is straight or vertical with a protruding rim.

The profile of the body of the "A" group can be assigned to the "Incurved Profile" from the three profiles, but not to the "S-shaped Profile" nor "Straight Profile." The "Incurved Profile" for the "Simple Neck (A3)" may be subdivided into four variants according to the body shape:

3a. Oval Profile : b.h $\geqq$ m.d (b.h.: body height; m.d.: maximum diameter; m.d.l.: maximum diameter location)
3b. Heart-shaped Profile : b.h $<$ m.d, 2/3 (b.h.) $\leqq$ m.d.l.
3c. Globular Profile : b.h $<$ m.d, 1/3 ((b.h.) $\leqq$ m.d.l. $<$ 2/3 (b.h.)
3d. Flask-shaped Profile : b.h $<$ m.d, m.d.l. $<$ 1/3 (b.h.)

The combination of one attribute among the "A" end of vessel wall (Sharply Closed End) as sub-variable and another attribute which is the "3" profile (Incurved Profile) with the sub-variable of the body shape (3a to 3d) can produce a particular "form" (Fig. 6).

As well as the "A" group, the "B" to "F" attributes of the degree variable may also be combined with the "1" to "3" attributes of the body profile variable (Fig. 7). Under this classification, the "D" (Slightly Opened) and the "E" (Opened) attributes are subdivided into two variants according to the base shape: round base and flat base[6].

As the forms mentioned above are composed of simple shapes excluding appendages or attachments such as handles, lugs, ledges, and others, it is necessary to take into account "other complicated forms" with particular additional structures: vessel with handle, vessel with lug, ledged vessel, spouted vessel, double-mouthed vessel, offering stand, and others. We will consider these other forms composed of complicated structures as well as the simple forms.

2) Chronology (comparative analysis)

The variables, explained above, were selected for the typology or classification of pottery vessels in the hope of achieving more accurate recognition and reliable identification of the pottery forms. In the procedure and process of constructing the classification an effort has been made to be logically consistent in terms of satisfying the aims of the exercise: replicability, verifiability, and availability. Once the typological classification is established, the next step is 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 can be said, truly, that as one variable is selected to determine more precise classification, another aims to reveal a more reliable chronology, as with the attributes. It is reasonable

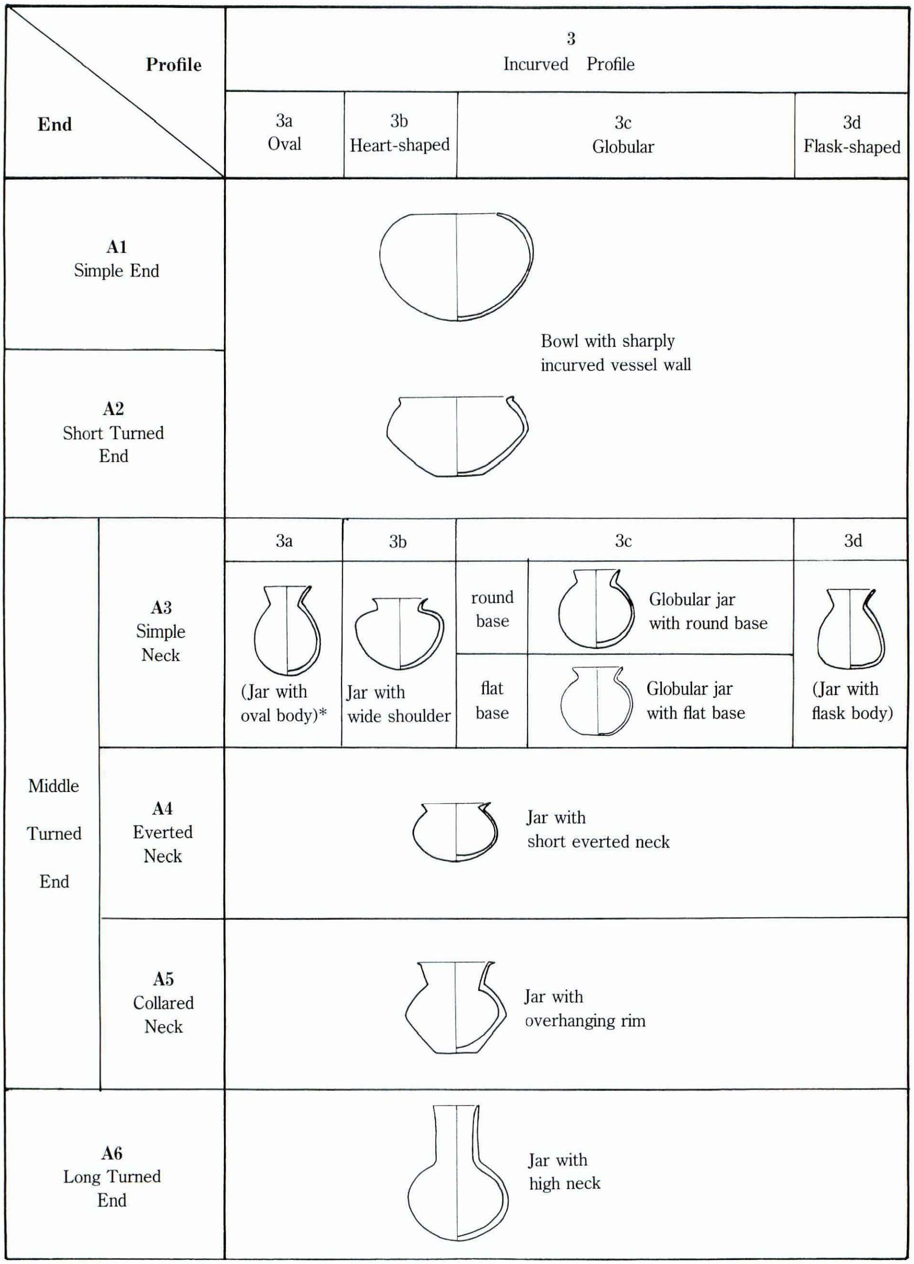

Fig. 6 Forms of "A" group

* Forms enclosed by round brackets have not been found from Kashkashok

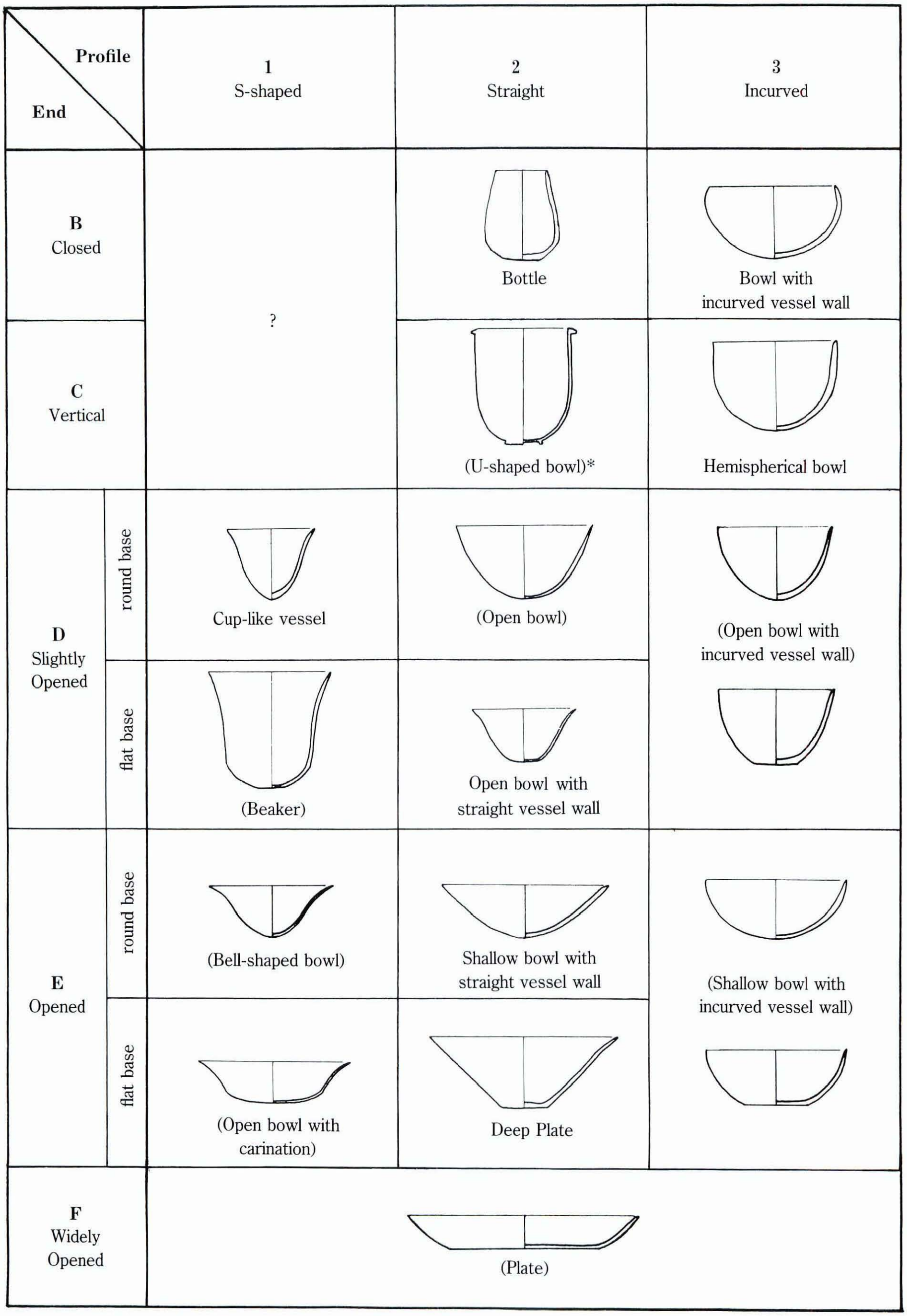

Fig. 7 Forms of "B"～"F" groups

* Forms enclosed by round brackets have not been found from Kashkashok

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 only slightly overlap with the latter. Therefore, the former should be considered as the first process towards reaching our goal and the latter the next one. To avoid both of them being taken as one without due consideration, the procedure of determining another variable or attribute is needed in the search for notable patterns. The attributes in certain variables which have been used for the classification of vessel forms are examined as a prime factor for comparison. The attributes, which can reflect some changing modes in morphological characteristics, are also selected for comparative analysis. Ideally the attributes meaningful for classification would also be helpful for comparison. Both objectives, however, should be clearly separated to prevent ambiguity. The two groups of attributes, employed for different purposes, should be ordered on two respective scales: typology and chronology. We, therefore, need to prepare another step in the analysis to accomplish the chronological goals.

As no stratigraphic information was available at Kashkashok during the excavations, it is presumed that either an intrinsic sequence or an extrinsic sequence may be used to rearrange vessel forms on the time scale. A frequency seriation concerned with each form is best for an intrinsic sequence[7]. However the numbers are insufficient for statistical analysis (we have only eighty-six samples and only about ten, at most, examples for each form) and the length of time each vessel was in use can not be securely determined; therefore, it is necessary that an extrinsic sequence, consisting of comparisons with examples from other sites, be applied. In this analysis certain attributes, which appear to be sensitive to temporal change, should be abstracted from one site context in Kashkashok.

The comparative analysis includes selection of a site context, abstraction of attributes, arrangement and standardization of them, comparison between them and those of Kashkashok, seriation of the latter, and combination of them into a particular form. First, from the several types of contexts found in other sites (cemetery, residence, public space, and others), a cemetery context is clearly the most reliable for relative comparisons with the Kashkashok. The context at Tell Arpachiyah, thus, is considered to resemble that of Kashkashok and to be adequate for comparison. Second, after selection of the site context, variables are carefully observed in order to find changing modes in the pottery vessels found at Arpachiyah. As mentioned above, it is necessary to select variables for the analysis which differ from those previously established for classification. Certain attributes, sensitive in revealing changing processes on morphological or other characteristics, are, then, extracted from these variables. Third, the abstraction of attributes leads to an arrangement of them, where with sufficient these attributes can be ordered into a stratigraphic sequence within the site. When information is lacking, evidence of stratigraphic relations can be taken from other sites where the excavations have been executed under a recognized stratigraphic sequence, and support the original sequence mostly consisting of attributes gathered from the burial context of Arpachiyah. The sequence of attributes in one context supplemented by that from other contexts forms the standard for the following analysis. This sequence can be made up of a single attribute or a cluster of many attributes.

Fourth, according to the standard sequence of attributes or clusters within a certain vessel form, comparisons between these attributes and those of Kashkashok are made for each vessel form. This comparative analysis is founded on the assumption that the sequence of changing attributes for shapes is closely related within the same context; it may be possible to synchronize some of the morphological or technological changes of vessel form with Northern Ubaid sites. Fifth, during the comparative analysis, the attributions extracted from the vessel form found at Kashkashok which comparable to those at other sites are seriated into a sequence within Kashkashok. This seriated order of attributes makes a prime sequence of form, suitable to the standardized ordering established above. Finally, the seriated order of attributes or clusters can be identified with the chronological sequence of particular examples; those attributes into which a vessel has been separated are combined into one vessel form. The combination process of attributes or clusters is supplemented by other information: technological characteristics and design motifs.

4. Analysis

Having described the methodological aspect of the analysis, let us now turn to the comparison of each form. In this chapter, I use the following abbreviations of book titles from which a number of plates or figures and comments are cited in the analysis:

M & R: Mallowan and Rose 1935;
Tb: Tobler 1950;
Ak: Akkermans 1988b or 1988c;
Sw: Schwartz 1988;
F, H & M: Fukai, Horiuchi, and Matsutani 1970;
Eg: Egami 1958;
Og: Oguchi 1987;
Ot6: J. Oates 1986;
Ot7: J. Oates 1987a

The heading of each section gives the name of each vessel form (or modified form) which has been described in the previous report [Koizumi 1991]. The combination of one variable (orientation of the end) and another variable (profile line), enclosed by square brackets, is described for each "form." The vessel figures cited in this paper are to scale (1/4); the each number enclosed by round brackets refers to the original plate number of the above report (Figs. 8 to 22).

1) Bowls with sharply incurved vessel walls

[A1 or A2: Sharply Closed, Simple End or Short Turned End+ 3: Incurved Profile]
(Fig. 8: PL. 86-1~4)

This form is identical to the "pot" or the "jar without neck." The end of the vessel body is sharply closed and the rim is simple. The gradient at the end of vessel wall—that is, the angle between the horizon and the tangent at the end of the vessel's core line—is less than sixty degrees. In profile the body is roundly curved, and either carinated or not. The analysis of this form is added to that of the following form.

2) Bowls with incurved vessel walls

[B: Closed End+ 3: Incurved Profile]
(Fig. 8: PL. 86-5~14)

This form is a variation of "Hemispherical bowls." The end of the vessel body is slightly closed. The gradient at the end of vessel wall is equal to or greater than sixty degrees, but less than eighty-five. The rim is almost simple. The body is round in profile.

Specimens similar to these forms are known from Arpachiyah (Bowls with Wide Mouths and Rounded Bases, and Bowls with Wide Mouths and Flat Bases). The round base, which is frequent among examples from "deep levels" or "main graves," is replaced by the flat base in examples from "late graves" or "related deposits." We shall call the former levels or graves as 'early phase' and the latter graves or deposits as 'late phase' in the following analysis. The ratio of round bases to the total number of the bases in the early phase is 7/7 〔M & R: Figs. 26–1, 2, 27–4, 28–1, 30–4, 34–7, 39–9〕, and that of the round base and the flat base in the late phase is 3/7 〔M & R: Figs. 26–3, 28–4, 29–3〕 and 4/7 〔M & R: Figs. 31–1, 7, 8, 39–2〕 respectively, with a flat example from an uncertain phase 〔M & R: Fig. 41–17〕. The simple rim is common in the early (5/7) and the late phases (4/7), and the flat rim is prevalent in the late phase (2/7) 〔M & R: Fig. 31–7, 8〕, as is the out-turned rim (3/7) 〔M & R: Figs. 31–7, 8, 39–2〕. Two pieces with combinations of flat and out-turned are also in the late phase. Although carinated vessels are not popular in either phase, carination located at a higher position on the vessel wall is found in the early phase 〔M & R: Figs. 26–2, 27–4〕.

Although a few examples from other sites indicate a change in base shape similar to that at Arpachiyah, some from Tepe Gawra (Bowls with contracted rims) show similar patterns of change to the vessel form under analysis. From Strata XVII to XV the round base is popular 〔Tb: PLs. CXXI–100, CXXIV–126, 127〕 but in Strata XIII the flat base also comes into fashion 〔Tb: PLs. CXXVII–172, CXXVIII–191〕 as does the ring base 〔Tb: PL. CXXVII–173〕. A similar tendency for the appearance of a flat base in the Later Northern Ubaid phase has been suggested 〔Porada, Hansen, and Dunham 1992: Fig. 11–1〕. It can be observed from the examples of Gawra that the flat or beveled and the out-turned or outrolled rims, rather than the simple, appear in the slightly later phase (Gawra XIII) 〔Tb: PLs. CXXVII–172, CXXVIII–183, 191〕. The tendency towards changing rim shape through phases is also perceptible in the other sites: simple in Hammam IVA (Thick-walled plain-rim bowls) 〔Ak: PL. 72–57, 58〕, Leilan VIa (Closed Inverted Lip rims) 〔Sw: Fig. 69–1～3〕, and Thalathat XIV (Bowls with the rims sharply curving inward; Bowls with globe-like shapes) 〔F, H & M: PL. 77–6, 17〕; flat or out-turned in from Hammam IVC (Closed bowls) 〔Ak: PL. 81–165, 166〕, Leilan VIb (Closed Slightly Inverted Concave Beaded rims) 〔Sw: Fig. 66–1, 5〕, and Thalathat XIII (Glass-shaped vessels) 〔F, H & M: PL. 71–21〕, although there are several pieces with a "bead rim" in Hammam IVA and IVB (Pots with outrolled lips) 〔Ak: PLs. 73–73, 78–146〕 and others with out-turned rim in Thalathat XIV 〔F, H & M: PLs. 76–21, 77–18〕. The change in location of carination on the vessel wall is found in examples reported from Hammam, Leilan, Thalathat, and Gawra. The sharp carination located higher up on the vessel wall is popular in the earlier phase 〔Ak: PL. 72–61, 62; Sw: Fig. 69–2, 3; F, H & M: PL. 75–8, 9; Tb: PL. CXXI–100〕 and the gentle carination, located at a lower position, is more common in the later phase 〔Ak: PLs. 81–166, 82–170; Sw: Figs. 64–1, 66–1; F, H & M: 40; Tb: PL. CXXVII–168〕.

The vessels from the other sites, which are similar to "Bowls with sharply incurved vessel walls" and "Bowls with incurved vessel walls" from Kashkashok, have a few patterns of change related to morphological features: base, rim, and carination. These patterns also visible on examples from the other sites permit comparative analysis with patterns in Kashkashok. The seriation is based on the comparison of materials from a similar context to that of Kashkashok (cemetery one at Arpachiyah) supplemented by stratigraphic data from other sites. A useful arrangement of attributes taken from examples at other sites, and compared with those from Kashkashok, is as follows:

	earlier phase	later phase	further later phases
Base:	round	flat	(ring)
	PL. 86–1, 2, 3, 6, 8, 12, (13, 14)	86–5, 7, 10, 11, (4, 9)	
Rim:	simple	flat or out-turned	outrolled
	PL. 86–1, 2, 3, 6, 8, 10, 11, 12	86–5, 7	86–4
Carination:	high-located	low-located	
	PL. 86–2, 3	86–4	

This sequence of changing attributes is seriated into the combined one below (Fig. 8).

earlier phase		later phase	further later phases	
high carination	round base + simple rim	flat base + simple or flat rim	flat base + outrolled rim	
PL. 86–2, 3	86–1, 6, 8, 12	86–5, 7, 10, 11	86–4	
			(86–9)	(86–13, 14)

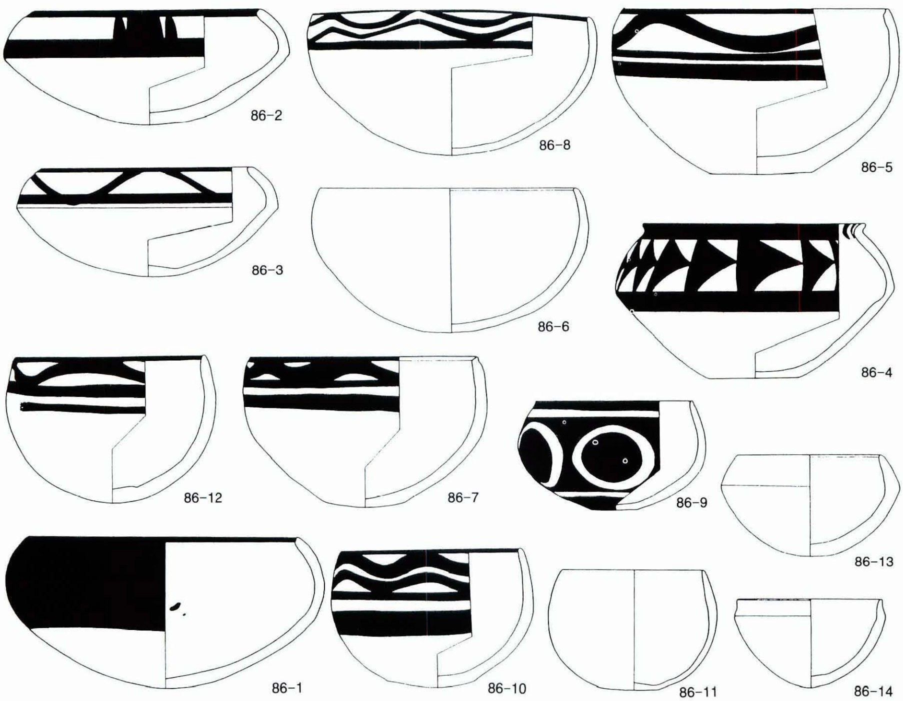

Fig. 8 Bowls with sharply incurved or incurved vessel walls

The combinations of tapered rim and highly-located carination (PL. 86–13) and out-turned rim and highly-located carination (PL. 86–14) are distinctive in the chronological sequence. The former is found in vessels in a tomb at Gawra IX (Deep bowl with a round base and sloping shoulders contracting to a flat rim) [Tb: PL. CIII–2], Brak (Late Uruk fill) [Ot6: Fig. 4–81], Hammam VB (Bowl with an incurving rim at a sharply cut angle) [Ak: PL. 103–70], and Leilan V (Stratum 47–46) [Sw: Fig. 58–13]; the latter is comparable to pieces from Brak (Late Uruk fill) [Ot6: Fig. 4–79] and Hammam VB [Ak: PL. 104–75]. These examples are restricted to the Late post-Ubaid phases, except for the Leilan specimen. Vessels with similar shapes have been reported from earlier phases (Ubaid) at the sites, but these examples can be distinguished from PL. 86–13, 14 by their surface treatment. In the former the surface is mostly smoothed and in the latter it is scraped. The technological difference between them can be assigned to a changing mode in pottery production, which might have been prevalent in northern Mesopotamia during the Late Ubaid to Terminal Ubaid. Considering the evidence mentioned above, PL. 86–13, 14 found at Kashkashok can be roughly designated to the further later phases.

PL. 86–9 is outstanding among the "Bowls with incurved vessel walls," because of the manner of its production and painting. This vessel appears to have been made by a combined technique of ring-building and a slow turning on the tournette. The inner base of the vessel is thumb-pressed to a diameter of about 1.0 cm, and the inner surface of the lower body is treated by parallel finger striations. A negative motif design covers the entire outside surface: a horizontal row of six circles between plain bands drawn by the way of leaving a reserve of body. Although negative painting is popular in the later northern Ubaid phase, the production using a slow-turning device (wheel) corresponds to a far later phase (Terminal Ubaid). More detailed comments of this technological feature will be described later in this paper.

3) Hemispherical bowls

〔C: Vertical End+ 3: Incurved Profile〕

(Fig. 9: PL. 87–1～7)

This form is roughly hemispherical in shape. The end of the vessel wall rises vertically. The gradient at the end of the vessel wall is equal to or greater than eighty-five degrees, but less than ninety-five. The rim is generally tapered, but in a few examples it is beveled (PL. 87–1), flat (PL. 87–3), or slightly grooved (PL. 87–4). This form is usually round in profile and has a flat base.

A vessel form similar to "Hemispherical bowl" of Kashkashok is found at Arpachiyah (Bowls with Wide Mouths and Round Bases; Bowls with Wide Mouths and Flat Bases). Comparable vessels are round base in the early phase 〔M & B: Figs. 29–7, 30–1, 2, 39–10〕, and flat or round in the late phase 〔M & R: Figs. 28–2, 30–3, 5, 31–3〕. The ratio of round bases in the early phase is 4/4 and that of flat and round in the late phase is 3/4 and 1/4 respectively. The rim is mostly simple (early: 3/4, late: 3/4) except that flat rims occur in both phases 〔M & R: Figs. 29–7, 30–5〕. The last example is a single piece found in the late phase (1/4), slightly carinated in lower body. Change in rim shape and carination is less noticeable than that of base for this vessel form excavated at Arpachiyah.

Similar examples to "Hemispherical bowls" have been found at Hammam, Leilan, Thalathat, and Gawra. Base shape is generally round in the earlier phase, Thalathat XIV 〔F, H & M: PL. 74–15〕 and Gawra XVII 〔Tb: PL. CXXI–93〕, but the flat base also appears in the later phase, Thalathat XIII 〔F, H & M: PL. 71–14〕 and Gawra XIII 〔Tb: PL. CXXVIII–184, 187〕[8)], although a larger vessel used as a burial urn (Burial 6) with a round base has been reported from Leilan VIb (Stratum 57) 〔Sw: Fig. 65–3〕. In these sites rims of comparable forms are diverse. That at Hammam is mostly simple but a "bead rim" is also common in Period IVA to VB 〔Ak: PLs. 73–79, 79–148, 86–219, 93–280, 99–23, 105–81〕. At Leilan both simple and flat rims are frequent throughout Period VI (Open Flat rims; Open Simple rims) 〔Sw: Figs. 63–3, 4, 67–1, 5〕. Examples of simple rims are common in Gawra XVIII to XII 〔Tb: PLs. CXXI–93, 96, CXXVII–175, CXXXIII–245〕, but those with out-turned rims also appear in Gawra XIII 〔Tb: PL. CXXX–207, 208〕. Similar vessels, with slight carination near the base, occur less frequently than non-carinated vessels in Hammam IVA and Thalathat XIII 〔Ak: PL. 69–23; F, H & M: PL. 71–17〕. Examples, in which carination is abrupt and located higher on the vessel, have been reported from Hammam VA and Gawra XI 〔Ak: PL. 99–28; Tb: PL. CXLIV–382〕.

Specimens similar to "Hemispherical bowls" found at Kashkashok show a changing pattern in base shape: round in the earlier phase and flat in the later phase. This sequence, however, is less prominent than in "Bowls with incurved vessel walls." Other variables, such as rim and carination, differ too greatly to be representative of a changing mode in vessel shape. In addition, comparable shapes, assigned to the

Early Northern Ubaid phase, are painted with distinct motifs [J. Oates 1987b: 482; Porada, Hansen, and Dunham 1992: 90], whereas "Hemispherical bowls" at Kashkashok are rarely decorated. It has also been noted that a scraping technique has often been applied to the lower body of this form, which differs from the previous forms. A comparison between the base attribute at Kashkashok and others is as follows (Fig. 9).

	earlier phase		later phase
Base:	round		round/flat
		PL. 87-,3, 4, 5, 6	87-1, 2, 7

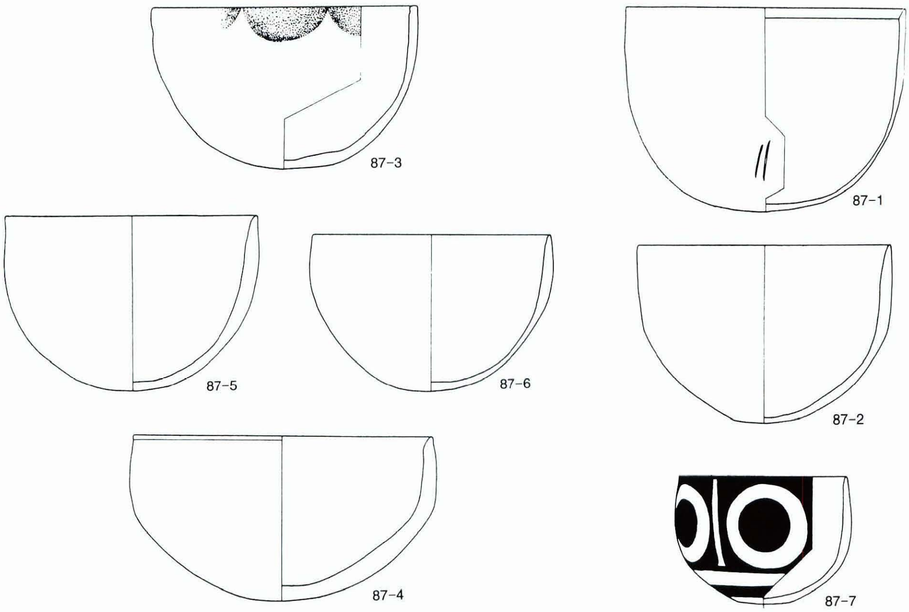

Fig. 9 Hemispherical bowls

PL. 87-1 shows a notable tracing of the surface: the lower body near the base is scraped with two tracing lines possibly made by a scraping tool such as a flint scraper. This scraping technique is reminiscent of the "Flint-scraped bowls" found at Göksun in central Anatolia [Brown 1967: 132, Fig. 5]. The negative painting, which is seen on the outside of PL. 87-7, is characteristic of the Late Northern Ubaid phases.

4) Cup-like vessels

[D: Slightly Opened End+ 1: S-shaped Profile, with Round Base]

(Fig. 10: PL. 87-9~11)

This form is a variation of "Bell-shaped bowls." Whereas "Bell-shaped bowls" have a round base, "Cup-like vessels" have a rather pointed one. In addition, the latter appear to have a longer height-to-rim-diameter ratio: the height is approximately one and half times the radius of the rim. Flaring rims, slightly S-shaped profiles, and thin vessel walls are characteristic of both forms.

A comparable form, which has been found in the early phase at Arpachiyah, is a squat in proportion having a height which is less than half the diameter of the rim (Bowls with Wide Mouths and Round Bases) [M & R: Fig. 29–1, 2, 4]. The vessel form is similar not to "Cup-like vessels," but to "Bell-shaped bowl." The rim tapers slightly and the base is round. Such variables as proportion, rim, and base have only one attribute for each variable respectively; squat, tapered, and round. The cluster of these combined attributes represents "Bell-shaped bowls" in the early phase at Arpachiyah. Painted motifs on the form found at Arpachiyah also show a remarkable pattern with a number of running patterns between two solid horizontal bands beneath the rim, and a single horizontal band near the base. In particular, the latter decoration always appears on the lower part of the vessel near the bottom, whatever motifs are decorated on the upper part beneath the rim [M & R: Fig. 29–1, 2, 4].

A vessel form comparable to "Bell-shaped bowls" or "Cup-like vessels" is also known from other sites. A similar vessel with both squat and tall bodies in Hammam IVA (Flaring plain-rim bowls with S-shaped profiles) [Ak: PL. 68] and Gawra XIX–XVII [Tb: PLs. CXX–83, 87, CXXI–91], but with a tall body only in Hammam IVB-C (Cup-like vessels) [Ak: PLs. 77–127, 128, 83–179, 180] and Gawra XVII [Tb: PL. CXX–84, 85]. Additionally, an example of the former has been reported from Leilan VIa (Open Pinched rims) [Sw: Fig. 67–9] and the latter from Thalathat XIII (Bowls with S-shaped cross sections) [F, H & M: PL. 71–13]. The rim is usually tapered or slightly tapered. Single horizontal bands near the base are decorated on the squat body specimens found at Gawra XIX–XVII, but not on the tall body at the same site. The latter has a bolder and simpler design than the former. There is a clear tendency for painted motifs to change from more complicated to bolder.

It is assumed, therefore, that with regard to "Bell-shaped bowls" or "Cup-like vessels," the sequence for the changing mode of shape and motif is the following. The vessel form in the previous stage of the earlier phase is squat (or tall) in proportion and has a single horizontal band near the base, but a tall variety without this motif prevails in the subsequent stage or phase; while this combined pattern of squat proportion and single painted band near the base can be assigned to Ubaid 3a, another pattern of tall proportion and bold design can be assigned to Ubaid 3b and Ubaid 4. The "Bell-shaped bowl with single painted band near base" is a distinguishing ceramic feature of the Early Northern Ubaid phase (Ubaid 3a) [J. Oates 1987b: 482; Porada, Hansen, and Dunham 1992: 90]. At the same time, the "Cup-like vessel" or "simple cup" is also an index marker for Ubaid 3b and Ubaid 4 [J. Oates 1987b: 482; Ak: 223]. The comparison of these results with examples found at Kashkashok is given as a combination of attributes (Fig. 10).

	further early phase	early phase	late phase
Proportion:	squat	tall	tall
	+	+	+
Painting:	single band near base and/or complicated motif	bold motif	bold motif
		PL. 87–9, 10	87–11

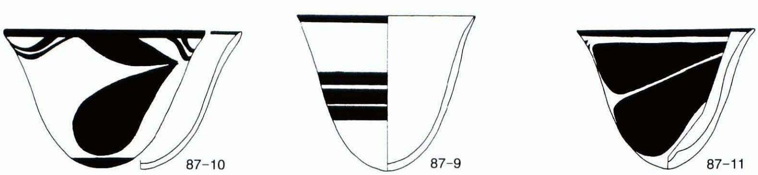

Fig. 10 Cup-like vessels

Painted motifs on cup-like vessels recovered at Kashkashok are designed on the outside. Two water drops are prominent among them (PL. 87–10, 11). Although PL. 87–10 is similar to specimens found at Eridu VI–VII [Safar, Mustafa, and Lloyd 1981: Fig. 78–9, 12], the combination of a slightly squatter proportion than PL. 87–9, 11 and a solid-painting of the base reminds us of the squat body and single band near the base[9]. On the other hand, PL. 87–11 has a bolder, more geometric design and a distinctive technological feature in that the surface treatment on the inside of the base suggests use of a slow turning device as with PL. 90–7; the lower outside of the vessel wall is scraped. Furthermore, PL. 87–9 has three horizontal bands with narrower intervals between them, similar to a specimen found at Hammam IVB [Ak: PL. 77–127]. These comparisons using the combined attributes place dispose PL. 87–9, 10 in the subsequent stage of the earlier phase and PL. 87–11 in the further later phase (Terminal Ubaid).

5) Open bowls with straight vessel walls

[D: Slightly Opened End+ 2: Straight Profile, with Flat Base]
(Fig. 11: PL. 87–8)

This form is an opened bowl with straight sides. The end of vessel wall is slightly opened, and the gradient at the end of vessel wall is equal to or greater than ninety-five degrees. The height is greater than half the diameter of the rim. In profile, the body line is mildly carinated at the middle. The base is flat. The analysis of this form is added to the next form.

6) Shallow bowls with straight vessel walls

[E: Opened End+ 2: Straight Profile, with Round Base]
(Fig. 11: PL. 87–12, 13)

This bowl form also has an opened mouth and straight sides. The end of vessel wall is slightly more opened than in the previous form. The gradient at the end of the vessel wall is equal to or greater than ninety-five degrees and the height is equal to or greater than a quarter of the rim's diameter, but less than half. The rim is simple. The base is rounded.

The forms of "Open bowls with straight vessel walls" and "Shallow bowls with straight vessel walls" are two varieties of an open bowl with straight profile. The following analysis, therefore, will deal not only with the former variety or form, but also with the latter. The two forms are included in one category, "with straight side," because the variable of the body profile—straight or incurved—is more discriminating than that of the height-to-rim-diameter ratio—$h \geqq r/2$ or $h < r/2$. In this paper, hence, "Open bowls with straight vessel walls" and "Shallow bowls with straight vessel walls" are sorted into one cluster within which an analysis will be done, rather than "Open bowls with straight vessel walls" and "Open bowls with incurved vessel walls" would be.

Most vessels similar to "Open bowls with straight vessel walls" found at Arpachiyah have a slightly deeper body than "Shallow bowls with straight vessel walls" in that the height is greater than half the diameter of the rim (Bowls with Wide Mouths and Rounded Bases; Bowls with Wide Mouths and Flat Bases) [M & R: Figs. 27–2, 31–2, 4, 38–2, 39–7], though a few examples where the height is equal to or less than the diameter of the rim are shallow [M & R: Figs. 27–5, 29–5]. Both forms are concentrated in the early phase; most of them have flat or slightly flat bases [M & R: Figs. 27–5, 29–5, 31–2], except for one which is round [M & R: Fig. 38–2]. Only one piece in the late phase has a flat base [M & R: Fig. 31–4]. The rim in all these forms is simple or tapered.

Specimens comparable to "Open bowls with straight vessel walls" or "Shallow bowls with straight vessel walls" have been reported from other sites: Hammam (Flaring plain-rim bowls), Leilan (Open Simple rims; Open Flat rims), Thalathat (Shallower bowls with large opening of mouths; Deeper bowls with large opening of mouths), and Gawra (Bowls with round bases; Sub-variety of bell-shaped bowls). These vessels mostly have the large body height to rim diameter ratio of the former form [Ak: PL. 68–5, 12; Sw: Fig. 62–5; F, H & M: PL. 76–12, 13; Tb: PLs. CXX–88, CXXI–89, 90]. A cluster of the vessel forms is roughly divided into two varieties, the first with a slightly flat base and the second with a slightly pointed base. The former variety has an inverted-trapezium profile the shortest side of which is gently rounded. Vessels with a similar profile have been observed at Gawra below XVIII, XIII, XII [Tb: PLs. CXXI–99, CXXVII–177, CXXXIII–240] and Thalathat VIII to VIIa [Eg: Fig. 54–5]. On the other hand, the latter variety has an inverted-triangular profile with a rounded summit. Pieces similar to this variety have been found at Gawra XVIII, below XII, XII [Tb: PLs. CXXI–89, CXXXIII–238, 239]. Related forms have also been recovered at Hammam IVA [Ak: PL. 68–5, 7, 12], Leilan VIa,VIb [Sw: Figs. 62–5, 67–10], and Thalathat XIV [F, H & M: PL. 74–11, 17]. As these pieces are without bases, it is estimated on the degree of curvature of the profile that they would have had a slightly pointed or round base.

No distinctive pattern of change in rim or base through some phases can be observed in vessels similar to the "Open bowls with straight vessel walls" nor the "Shallow bowls with straight vessel walls." However, at Arpachiyah while a slightly flat base is characteristic of the early phase, a flat base continues to occur through the early and late phase [M & R: Fig. 31–2, 4]. The evidence does not really fit the case of Gawra where slightly flat bases are found in Strata below XVIII to XII; but, it is comparable with PL. 87–8 from Kashkashok (Fig. 11).

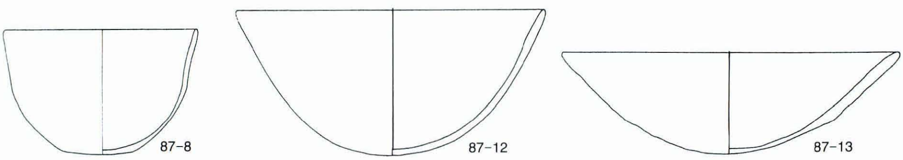

Fig. 11 Open or Shallow bowls with straight vessel walls

PL. 87–12 is elaborately burnished on both sides; a similar example has been recovered at Gawra XIII [Tb: PL. CXXVII–174]. Species comparable to PL. 87–12 in shape, however, are also known from Gawra XI [Tb: PL. CXLIV–372, 373]. These vessels resemble one another in their combination of shallow body and simple rim; the resemblance is not seen in the former example from Gawra XIII. At Gawra XIA there are some notable trends: burnished surface, coarser fabrics, thicker vessel walls, and large pebble temper. These characteristics are found in PL. 87–12 from Kashkashok. The gray or black burnished surface, moreover, is often seen at Hammam VB [Ak: 313]. The upper exterior of PL. 87–13 is completely finger-pressed and the lower exterior is crudely scraped. PL. 87–13 has aspects comparable to "Platters" found at Brak (level 9) [Ot6: Fig. 1–1, 2]: lower exterior crudely cut, coarsely handmade, brown paste, and chaff temper. The "Platters," however, have flat bases. PL. 87–12, 13 are, hence, assigned to the post-Ubaid phases in northern Mesopotamia.

7) Deep plates

[E: Opened End+ 2: Straight Profile, with Flat Base]

(Fig. 12: PLs. 88, 89–1～4)

This form is similar to the "large basin" or "shallow bowl with flat base." The body sides are nearly straight and open widely. The gradient at the end of the vessel wall, and the ratio of height to rim diameter is roughly equal to that of "Shallow bowls with straight vessel walls." The bases of both forms, however, are distinctly different: one (Deep plates) has a flat base, and the other a round base. The rims of "Deep plates" are slightly tapered and out-turned; on the whole, the base is rather thinner than the vessel wall. A thick base is the exception (PL. 89–4). One of the most notable characteristics of "Deep plates" is the pattern of designs painted on the inside. The commonest design consists of a broad, sweeping band with three contiguous scallops.

A vessel form comparable to "Deep plates" has been reported from Arpachiyah (Large Basins with Flat Bases) [M & R: Fig. 32], only in the late phase. This form usually has a straight or slightly out-turned profile with a narrow base. The thickness of the sides is equal to or greater than that of the base; the base is flat or slightly flat. Sweeping bands are painted on the inside except for an undulating motif between horizontal bands which is painted on the outside.

Similar examples have been found at Hammam (Very wide bowls), Leilan (Open Pinched rims), Thalathat (Shallower bowls with large opening of mouths), and Gawra (Bowls with straight sides and flat bases). The profile and the thickness of these vessels, in particular, provide useful information on changing modes of shape through time (phases). At Gawra XVIII there is a specimen which has straight sides, a wide flat base, and a uniformed thickness of the vessel wall and base [Tb: PL. CXIX–77]. At Gawra XIII a standardized form, also been reported at Arpachiyah, has been found; the vessel form is straight in profile with a narrow base and a uniformly thinner vessel wall and base than the above example [Tb: PL. CXXVII–179]. In addition, characteristic pieces appear at Gawra XIA [Tb: PL. CXLI–328, 330]; these vessels have almost straight body sides with a slightly out-turned upper wall near the rim, a base, wider than the example from Gawra XIII but not as wide as that from Gawra XVIII mentioned above, and a base thicker than the vessel wall[10]. Some fragments suggesting a sequence of changing attributes related closely to that observed at Gawra are recognizable in Hammam, Leilan, and Thalathat. Vessels which have been reported from Hammam IVC and Thalathat XIII have nearly straight body sides and a narrow base (estimated) the thickness of which is equal to or less than that of the sides [Ak: PL. 84–188; F, H & M: PL. 71–4, 6, 8]. Other specimens found at Hammam VA (Coba bowls) and Thalathat VIIb, VIIa have a slightly wider base than the previous examples; this base is rather thicker than the vessel wall [Ak: PL. 99–25, 26; Eg: Figs. 51–1, 53–7].

The motif painted on the inside is remarkable: sweeping bands, scallops, or sweeping bands with scallops. These painted designs seem to be representative of each site where those examples have been uncovered, rather than indicative of temporal change. The sweeping bands are seen at Arpachiyah [M & R: Fig. 32], the scallops at Leilan VIb (later Ubaid phase) [Sw: Fig. 63–9] and Thalathat XIII, IXa [F, H & M: PL. 71–4, 5, 7], and the sweeping bands with scallops[11] at Gawra XIII [Tb: PL. CXXVII–179].

The above analysis suggests a standardized arrangement of changing attributes and comparison with those from Kashkashok:

	earlier phase	later phase	further later phases
Profile:	straight side	nearly straight side	slightly out-turned or straight side
	+	+	+
	wider base	narrow base	slightly wider base
	PLs. 89–1 (89–3)	88–1, 2, 3, 89–2 (88–4)	
Thickness:	side = base	side ≧ base	side < base
	PLs. 89–1, 3	88–1, 2, 4, 89–2	89–4

According to arrangement and comparison, the vessels from Kashkashok can be seriated into the following sequence in which the changing attributes of the examples are combined together (Fig. 12).

earlier phase		later phase	further later phases	
straight side	(nearly straight)	nearly straight	nearly straight	nearly straight
+	+	+	+	+
wider base	slightly narrow	narrow	very narrow	very narrow
+	+	+	+	+
side=base	side=base	side≧base	side>base	side<base
			(scraped surface)	
89-1	89-3	88-1, 2, 3, 89-2	88-4	89-4

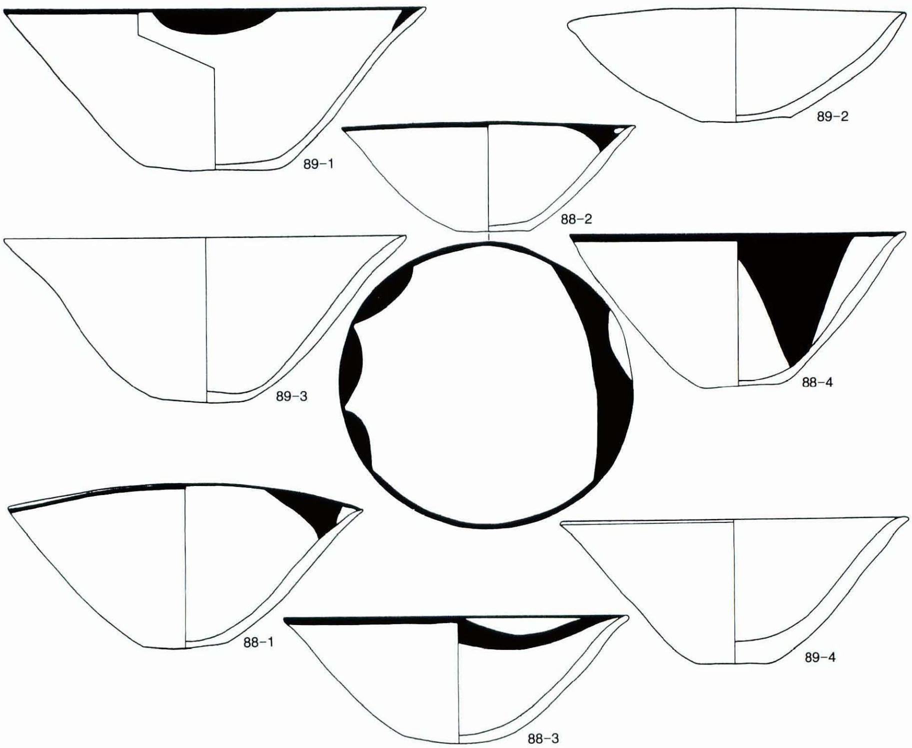

Fig. 12 Deep plates

PL. 89-3 closely resembles PL. 89-1 in profile and thickness attributes. The base of the former is, however, slightly narrower than that of the latter. PL. 89-3 can be placed at a particular position in this sequence table. PL. 88-4 is roughly scraped on the outside of the lower body, which distinguishes it from a cluster of PL. 88-1, 2, 3. Since this example, moreover, has a much narrower base than PL. 89-1 and 3, PL. 88-4 can be placed in that category on the above sequence.

PL. 89-4 is closely related to the so-called "Coba bowls," the most characteristic shape in Hammam VA [Ak: 304]. The "Coba bowls" and PL. 89-4 have several points in common: straight sides and flat base, coarse surface scraped near the base, plant temper, and brown-orange (reddish brown) color [Ak: PL. 99-24~27]. "Coba bowls" have been proposed as distinctive Early Uruk pottery [J. Oates 1987b:

482] and as "proto-Beveled rim bowls" [Ak: 317; Sw: 73]. In addition, PL. 89–4 has the narrowest base of all the examples of this form in Kashkashok. In Kashkashok it has been observed that with "Deep plates" there is a remarkable tendency for the base change from wider to narrower through phases, which is opposite to that which occurs in other sites. The phenomenon is thought to be the result of different contexts: burial in the former site and non-burial in the latter sites. This assumption is confirmed by the evidence at Gawra: while the vessels from non-burial contexts show the tendency for the base of the form to widen between Stratum XIII and XI as described above, the examples from a tomb belonging to Stratum IX [Tb: PL. CIII–5] have a rather narrow base.

8) Jars with wide shoulders

[A3: Sharply Closed, Middle Turned End and Simple Neck+ 3b: Incurved Profile, Oval Body]
(Fig. 13: PL. 89–5)

This jar form has somewhat wide and flat shoulder. The middle turned end of the body forms a medium-sized neck that tapers to the rim; the neck length is equal to or greater than one-twentieth of the height, but less than one-third. In profile the body line is heart-shaped; the body height is less than the maximum diameter of the body. The maximum diameter is located just above two-thirds of the body height. The base is slightly pointed (Fig. 13).

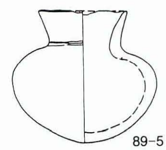

Fig. 13 Jar with wide shoulder

Similar vessel forms have never been reported from other sites in northern Mesopotamia except for Tepe Gawra. Specimens with pointed bases comparable to the "Jars with wide shoulders" have been found at Gawra XV, XIA, XI (Jars with flat or sloping shoulders) [Tb: PLs. CXXVI–157, CXLIII–355, CXLVII–419].

9) Globular jars with round bases

[A3: Middle Turned End, Simple Neck+ 3c: Incurved Profile, Globular Body, with Round Base]
(Fig. 14: PL. 89–6～14)

This jar has a globular body with round base. The ratio of neck length to height is similar to that of "Jars with wide shoulders." The neck rises straight to a simple, slightly-tapered rim. In profile the body is nearly globular: the body height is less than the maximum diameter, which is located about midway on the vessel, at a point between one-third and two-thirds of the height. In profile the body, however, appears rather ovoid than the form mentioned below. Necks of this form range from long (PL. 89–9, 10, 11), to middle (PL. 89–7, 12), to short (PL. 89–6, 8, 13). The length of long necks is equal to or greater than half of the neck's diameter, and that of the middle, equal to or greater than one-third and less than half, and that of the short, less than one-third.

A similar form has been recovered at Arpachiyah. Specimens with long necks (Bottles) [M & R: Figs. 35–1, 2, 39–4] and with short necks (Bellied Vases with Short Necks and Rounded Bases) [M & R: Figs. 33–6, 7, 35–5] have been found in the early phase; the frequency ratios of the former and the latter are the same, 3/6. On the other hand, only one piece with a short neck has been reported from the late phase [M & R: Fig. 41–20]. Body carination is absent, except for one piece with a short neck [M & R: Fig. 40–3].

Vessels similar to this form are known from Thalathat (Globular jars with the short necks flaring slightly outward), Gawra (Jars with globular bodies and round bases), and so forth. Those with long necks have been reported not only from the earlier phase, Thalathat XIV [F, H & M: PL. 73–2], but also from the later phases, Gawra XIII, XII [Tb: PLs. CXXXI–215, CXL–312, 317]. Other examples with short necks have been found both in the earlier phase, Thalathat XIV [F, H & M: PLs. 72–21, 73–6] and Gawra below XVII–XV [Tb: PLs. CXXII–105, 106, CXXVI–150, 155], and at the later phases, Thalathat XIII, VIIb/a [F, H & M: PL. 77–8; Eg: Figs. 51–14, 54–3] and Gawra below XII–XI, IX [Tb: PLs. CXXXIX–310, 311, CXL–313, CXLII–352, 354, CXLVII–418, 421]. Since no distinctive trend nor pattern can be seen, it may be said that "Globular jars with round bases" were in used from through the earlier to later phases, without any notable change in morphological features.

However, some vessels from Kashkashok, defined by a combination of specific detailed attributes, stand out. PL. 89–9, 10, with a combination of longer neck and rather pointed base, is similar to a specimen found at Gawra below XII [Tb: PL. CXL–317]. These vessels may also resemble the "Jar with oval body," with a body height equal to or greater than the maximum diameter of the body. Although this vessel form has not been found at Kashkashok, the form has been reported from Arpachiyah (early phase) [M & R: Figs. 35–9, 40–6] and Gawra XVI [Tb: PL. CXXVI–159]. This "oval" form is restricted to the Early Northern Ubaid phase. In addition, the inner base of PL. 89–6, 14 show traces of the use of a slow-turning wheel in production. Since such traces have not been observed on other "Globular jars with round bases," these two examples are probably from a further later phase such as the Terminal Ubaid with respect to this technological attribute (Fig. 14).

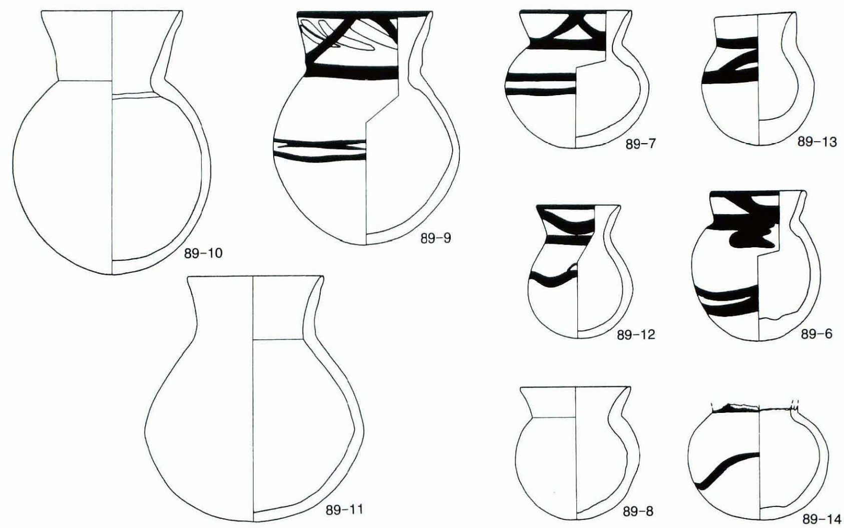

Fig. 14 Globular jars with round bases

10) Globular jars with flat bases

[A3: Middle Turned End, Simple Neck + 3c: Incurved Profile, Globular Body, with Flat Base]
(Fig. 15: PLs. 89–15～17, 90–1～4)

This jar form also has a globular body. The ratios of neck length to height and of body height to maximum body diameter are similar to those of the form described above. In profile the body is also globular: the maximum diameter of the body is located midway up the jar, as with the above form. The neck of this form ranges from long (PL. 89–15, 16) to short (PL. 90–3, 4), as in the above form. The neck length of the long variety is equal to or greater than half of the neck's diameter, and that of the short variety, less than one-third. This form (Globular jars with flat bases) is clearly distinguishable from the above one in its flat base.

A comparable form is known from Arpachiyah. Vessels with long necks have been reported from the early phase (Bottles) [M & R: Figs. 35–4, 6, 40–2, 4], and those with short necks (Vases with High Necks and Flat Bases; Vases with Wide Mouths, Angular Shoulders or Bellies, and Flat Bases; Large Jars with Flat or Rounded Bases and Pronounced Bellies) [M & R: Figs. 33–5, 36–6, 37–2, 3, 39–3] as well as long ones [M & R: Fig. 36–4, 5] from the late phase. While the examples with long necks show no carination of the body in either phase, those with short or middle neck have a sharply or gently carinated body [M & R: Figs. 34–3, 37–5]. A combination of short or middle neck and carination for "Globular jars with flat bases" is, therefore, restricted to the late phase. This attribute, carination, is not observed in the "Globular jars with round bases."

Pieces similar to "Globular jars with flat bases" have been found at Thalathat and Gawra (Jars with globular bodies and flat bases). The short neck variety of this form is more common in both sites; this variety has been recovered from Thalathat XIV, VIIb, VIIa [F, H & M: PL. 72–13; Eg: Figs. 51–9, 12, 53–2] and Gawra XVIII, XV, below XII, XIA [Tb: PLs. CXXII–103, 104, CXXVI–151, CXXXVII–289, CXLIII–358]. The presence of vessels with short necks, hence, ranges from the earlier phase to the further later phases (Terminal Ubaid or Early post-Ubaid). There is no conspicuous evidence for periodic changes in this variety. It is notable, however, that the examples found at Gawra blelow XVIII, XVIII are funerary objects from graves (Squat Jars) [Tb: PL. CXXII–103, 104, 108]. These have slightly splayed, short necks and carinated bodies and, except for rim shape, resemble the "Jars with short everted necks." Comparable vessels have been reported from Brak XIV, XIII [Ot7: Fig. 3–4, 5], though their base and carination are uncertain. It is not easy, therefore, to place those vessels comparable to "Globular jars with flat bases" in a particular sequence of changing attributes (Fig. 15).

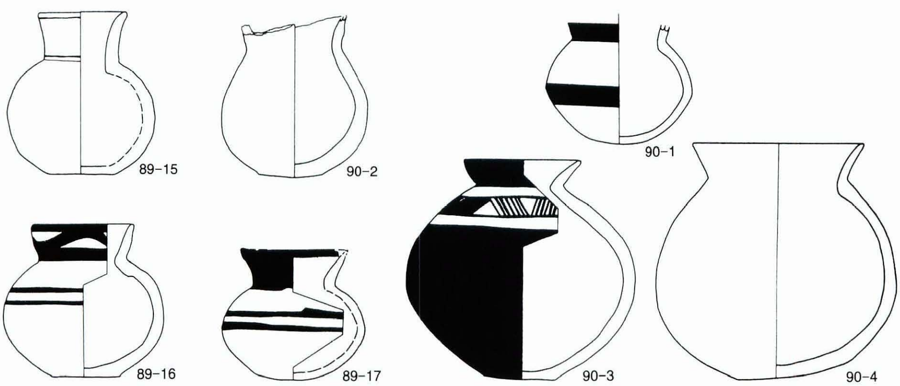

Fig. 15 Globular jars with flat bases

In spite of the difficulty in placing these pieces in a sequence some form excavated from Kashkashok are of particular interest. PL. 89–15, 16, with splayed, longer necks, are similar to vessels from the early and late phases at Arpachiyah [M & R: Figs. 35–4, 36–4, 5]. PL. 90–3 has a narrow neck and splayed rim, which is similar to pieces from Abada II (Type 4: Necked jars) [Jasim 1985: Fig. 177–h] and Songor A (Form a: Small vase-like jar) [Kamada and Ohtsu 1991: Fig. 4–1, 2]. PL. 90–4, with its wide mouth and short neck, is comparable to specimens found at Gawra XII, XIA [Tb: PLs. CXXXVII–293, CXLII–354], though the latter have a round base.

11) Jars with short everted necks

〔A4: Middle Turned End, Everted Neck+ 3: Incurved Profile〕

(Fig. 16: PL. 90–7～9)

This jar form has a sharply everted rim at an angle of less than sixty degrees. The ratios of neck length to height and of body height to maximum body diameter, and the location of the maximum diameter, are similar to the above forms. The short neck ends in a tapered rim which is straight or slightly out-turned. In profile the body is the same as "Globular jars," with a rounded base.

Comparable examples are known from both early and late phases at Arpachiyah. All of these vessels are sharply or gently carinated in the middle of the body. Sharply carinated vessels (Bellied Vases with Short Necks and Rounded Bases) 〔M & R: Fig. 34–4〕 and gently carinated ones (Large Jars with Flat or Rounded Bases and Pronounced Bellies) 〔M & R: Figs. 37–1, 41–19〕 have been reported from the early phase, but in the late phase only the sharply carinated pieces occur 〔M & R: Figs. 33–1, 2, 3, 4, 34–2〕. Carination changes from gentle or sharp one in the early phase to sharp in the later phase. The neck, however, varies from straight to slightly out-turned in both phases; this attribute does not seem to change through phases. One exceptional specimen was restored from fragments found in the Tepe House level, TT3 〔M & R: 71, Fig. 40–5〕. It has a ring base and a burnished outer surface.

Pieces similar to "Jars with short everted necks" have been found at other sites. Those which have globular bodies, but are not carinated, and ring bases are known from Gawra IX (Ring-based pots) 〔Tb: PL. CXLVI–409〕 and Tell Musharifa I–III 〔Og: 54, Fig. 14–12〕, although the neck of the latter is more out-turned than the former. A similar specimen has also been recovered from Brak (Beautifully burnished Early Uruk jars) 〔Ot7: Fig. 3–10〕.

Some distinctive features in a change in body profile can be observed: examples in the earlier and later phases, as at Arpachiyah, have carinated bodies, changing to globular bodies without carination in the further later phases (Early post-Ubaid and Late post-Ubaid), as at Gawra, Musharifa, and Brak. The arrangement of these changing attributes is as follows (Fig. 16).

	earlier phase	later phase	further later phases
Profile:	sharply or gently carinated	sharply carinated	globular
			PL. 90–7, 8, 9

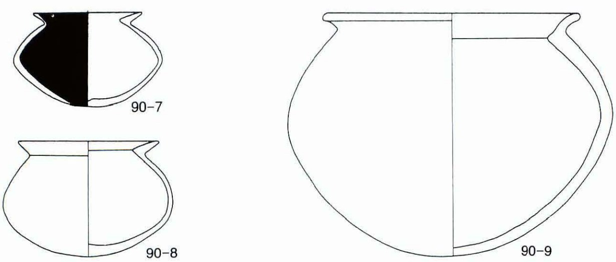

Fig. 16 Jars with short everted necks

Except for the base, PL. 90–9 is comparable to the above piece found at Musharifa I–III. Although another example found at this site [Og: Fig. 14–25] is not the "Jars with short everted necks" form but one of the "Globular jars with round bases," this specimen is closely related to PL. 90–9. In addition, the combination of finely burnished surface, vegetable temper, and reddish brown or pale brown to orange color is common to PL. 90–8, 9 and the specimen from Brak (Early Uruk) mentioned above. Both vessels from Kashkashok, thus, are closely related to the "burnished red ware" from Brak (Early Uruk) [Ot6: 251], or "red-slipped burnished pottery" from Hammam VA [Ak: 312–13]. PL. 90–7, with a roughly scraped surface, instead of a burnished one, shows signs on the inner surface of the base of having been produced by a slow turning device (wheel). PL. 90–7 may then be placed in the further later phase (Terminal Ubaid or Early post-Ubaid).

12) Jars with overhanging rims

[A5: Middle Turned End, Collared Neck and Overhanging Rim + 3: Incurved Profile]
(Fig. 17: PLs. 90–5, 6, 10~15, 91–1, 2)

This form is a variation, with protruded rims, of "Globular jars," including "Jars with carinated bodies." It is characterized by an overhanging rim which sticks straight out from a straight neck. The ratios of neck length to height and of body height to maximum body diameter are identical to the above forms. The body profile is also closely similar: globular or slightly carinated. The base is either round, slightly flat, or flat.

Similar examples have been reported from Arpachiyah. The end of the rim protrudes in the early phase (Vases with Wide Mouths, Angular Shoulders or Bellies, and Flat Bases) [M & R: Fig. 36–8], but in the late phase the protrusion almost disappears or is slightly bent [M & R: Figs. 33–9, 36–3, 7]. A sharply carinated body and flat base are common in both these phases. Therefore, the rim attribute can indicate a changing mode in morphology.

Vessels similar to "Jars with overhanging rims" are known from Leilan (Closed Tall-necked rims), Thalathat (Jars with flat bases, globular bodies, and sharp flections between the neck and the body), Gawra (Jars with flat, overhanging rims), and others. While a piece reported from Thalathat XIV [F, H & M: PL. 73–3] has a protruded rim, that from Thalathat XIII has a slightly bent one [F, H & M: PL. 72–1]. The subsequent Layers (VIIb, VIIa) provide specimens with faintly protruded rims [Eg: Figs. 51–15, 53–1]. The last three examples have round bodies without carination, and flat or slightly flat bases. At Gawra, pieces with distinctly protruded ends have been reported from Strata XV, XIII, below XII [Tb: PLs. CXXV–148, 149, CXXX–212, CXL–315], though other pieces with faintly protruded or slightly bent rims come from Strata XIII, below XA, XA, X [Tb: 143, PLs. CXXXI–214, CXLVII–424, CXLVIII–431, 433]. In particular, since both one from Stratum below XII [Tb: PL. CXL–315] and another from Stratum below XA [Tb: PL. CXLVIII–431] are funerary objects, the tendency towards change in the protruded rim, from distinct to faint, may have applied within the burial context. Vessels among those found at Strata XIII, below XII, X [Tb: PLs. CXXXI–214, CXL–315, CXLVII–424] have sharply carinated bodies, but others have globular ones without carination. The base of these vessels at the site is mostly round, with one exception which is flat [Tb: PL. CXXXI–214]. While Specimens found in Leilan VIa (Stratum 58) have distinctly protruded [Sw: Fig. 68–2, 3], those at Leilan VIb (Stratum 52a) have faintly protruded ones [Sw: Fig. 66–9]. Moreover, specimens reported from the Early Uruk phase (Early Uruk structures) at Brak [Ot7: 196–97, Fig. 3–12] and the Late Uruk phase (level 9) [Ot6: Fig. 2–14, 15], though with corrugated necks, and Musharifa I–III [Og: Fig. 14–5, 6] have faintly protruded or slightly bent rims, and round or slightly round bodies. From Hammam comparable pieces have been reported (Bead-rim angle-necked jars) [Ak: PLs. 73–82, 83, 95–290, 291, 102–60, 61, 103–62~64]. These jars are rarely found at Hammam IVA, but become more common in Hammam IVC–IVD [Ak: 210, 214]. All of them have faintly overhanging (outrolled) rims, which is different from the other examples above. A flaring beaded rim, moreover, is very rare at Hammam [Ak: 225].

The protruded rim of "Jars with overhanging rims" changes from distinct in the earlier phase (Northern Early Ubaid) to faint or slightly bent in the later phases (Northern Late Ubaid and subsequent phases). At the same time, a change in body profile is recognizable, from sharply carinated in the earlier and later phases to slightly carinated or round in the further later phases. The arrangement of these changing attributes, which are extracted from pieces found at other sites including Arpachiyah, and comparisons with those of Kashkashok are the following:

	earlier phase	later phase	further later phases
Rim:	distinct	faint	
	PLs. 90–14, 91–1	90–6, 10, 11, 12, 13, 15, 91–2	
Body:	carinated	slightly carinated	round
	PLs. 90–5, 14, 91–1	90–6, 10, 11, 91–2	90–12, 13, 15

The examples found at Kashkashok, with a combination of these ordered attributes, are seriated below (Fig. 17).

earlier phase	later phase	further later phases
distinct rim	faint rim	faint rim
+	+	+
carinated body	slightly carinated body	round body
(90–5) 90–14, 91–1	90–6, 10, 11, 91–2	90–12, 13, 15

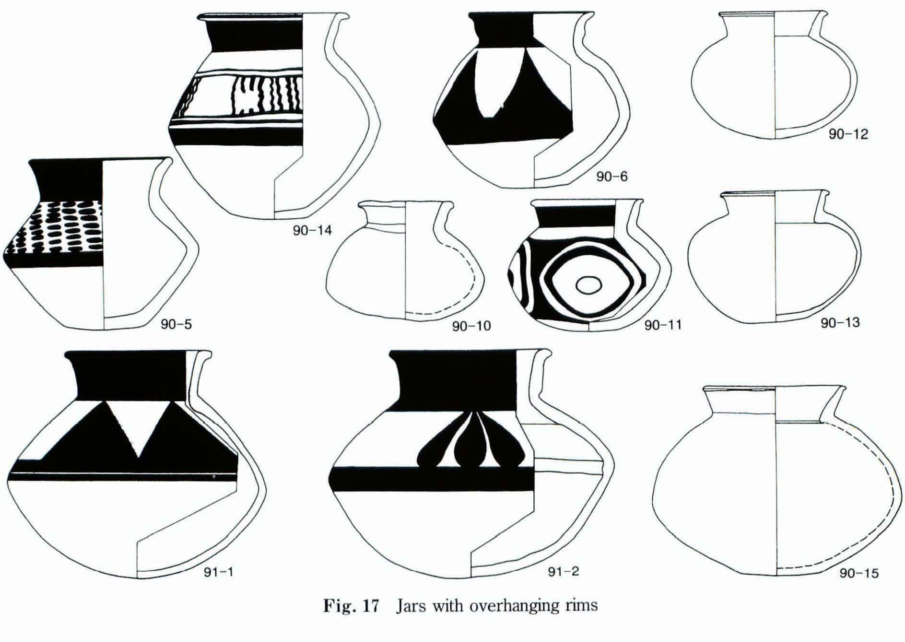

Fig. 17 Jars with overhanging rims

PL. 90–5 with a gray paste and a sharply carinated body is clearly distinguishable from other vessels with a red, reddish brown, or brown paste and rather gently carinated or round body. Examples comparable to the vessel in shape and painted designs are known from Arpachiyah TT 7 or earlier (Squat vases with high-splayed neck and egg stippling design) [M & R: Fig. 64–6, 9, 10]. A similar piece has also been reported from a Ubaid grave at Tell Songor A (Form d: Small carinated jar) [Kamada and Ohtsu 1991: Fig. 4–5], and has the same shape and paste as PL. 90–5. In addition, PL. 90–15 is remarkable for the burnished surface which is not found on the other vessels.

13) Jars with high necks

[A6: Long Turned End+ 3: Incurved Profile]

(Fig. 18: PL. 91–3, 4)

This jar form has a conspicuous long neck. The long, turned end of the body forms the long neck: the neck length is equal to or greater than one-third of the height. The long neck ends in a simple rim with a slight outward curving. In profile the body is globular. The base is round, or slightly flat.

Only one specimen comparable to this vessel form has been recovered in the early phase at Arpachiyah (Tall vase with an abnormally high funnel-like neck and splayed rim) [M & R: Fig. 39–11], and has a splayed neck, globular body, and flat base. Other examples have also been reported from Gawra and Thalathat. Among those from Gawra, one vessel from Stratum XVII has a straight neck and a round base (Jars with high necks) [Tb: PL. CXX–81], another from Stratum XIII a slightly splayed neck and a round base [Tb: PL. CXXXI–219], and a third from Stratum XII has a splayed neck and a flat base (Bottles) [Tb: PL. CXL–321]. Other example found at Thalathat VIIb have a slightly splayed neck and a flat base (a long-necked pot) [Eg: Fig. 53–4]. While no remarkable pattern of change in this vessel form is detected at Arpachiyah, a slight tendency may be observed at Gawra: a combination of straight neck and round base in the earlier phase (XVII) changes to a slightly splayed neck and round base in the later phase (XIII), and a more pronounced splayed neck and flat base in the subsequent phase (XII). On the basis of this changing pattern for this combination of attributes, the above specimen found at Thalathat may be equated with the end of the later phase and the beginning of the subsequent phase. This combination sequence, however, does not seem to be applicable to the vessels found at Kashkashok. These vessels should, therefore, be compared individually with other examples which have several other similar features.

PL. 91–4 is comparable to the above example reported from Arpachiyah (early phase) in its slightly outward curving neck and slightly flat base and to those from Gawra XVII, XIII in the smooth surface of the neck. On the other hand, PL. 91–3 is similar to the previous specimen from Thalathat VIIb in the uneven surface of the long neck. Those comparisons may place PL. 91–3, 4 as follows (Fig. 18).

14) Jars with single loop handle

[Other complicated form]

(Fig. 19: PL. 91–5～7)

This jar form has a handle. Without a handle, it is the same as "Globular jars." The base of this form is flat or slightly flat. The comparative analysis of the form will be added to that of the following form.

15) Jars with two loop handles

[Other complicated form]

(Fig. 19: PL. 91–8, 9)

This is another jar form with a handle. The shape without a handle is the same as "Globular jars." The most prominent feature is the loop handles which are attached from the neck to the shoulder, as if

	earlier phase	further later phase
Surface treatment:	smoother surface	uneven surface
	PL. 91-4	91-3

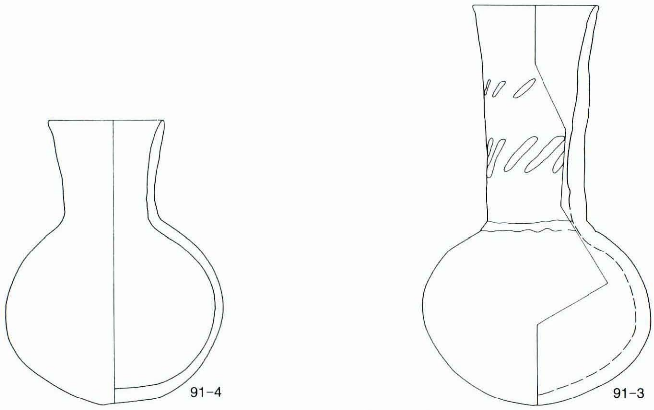

Fig. 18 Jars with high necks

utility were not a concern. The neck is straighter than in "Globular jars," but not as straight as "Jars with short everted necks." The rim is simple or tapered. The base is flat.

Vessels similar to "Jars with single loop handle" or "Jars with two loop handles" have not been reported from Arpachiyah, but those with lug handles are found (Lugged Vases/late phase) [M & R: Fig. 34-1, 5, 6]. All of them have four lugs perforated horizontally. As for other sites, pieces comparable to "Jars with single loop handle" have been found at Gawra XIII [Tb: PL. CXXXI-223], and those similar to "Jars with two loop handles" at Gawra XVI, XIII [Tb: PLs. CXXVI-153, CXXX-213]. Furthermore, the latter form seems to a closely resemble vessels from Hammam IVA, IVB [Ak: PLs. 74-95, 79-156] and Thalathat XIV [F, H & M: PL. 78-1, 2, 3]. It can be observed, however, that PL. 91-8, 9 are different from those examples in some respects. First, the former vessels, from Kashkashok, have far smaller handles than the latter (all examples from other sites), which might have been rarely used. In fact no distinct trace of use has been found on the loop handles of the former, in contrast to those of "Jars with single loop handle." In addition, "Jars with two loop handles" have a rather sharply everted rim at an angle of less than ninety degrees, resembling "Jars with short everted necks." The pieces found at other sites, however, have less strongly-everted rims at an angle of greater than ninety degrees. Finally, the painting on this vessel form is remarkable: a single undulating line between horizontal bands on the neck and running zigzags around the shoulder. A larger, geometric motif composed of interweaving triangles and semicircles runs around the vessel, between the smaller zigzag on the shoulder and a single solid band near the base. This is the most graceful design pattern found at Kashkashok. A comparable design has been reported form Leilan VIa [Sw: Fig. 68-13], but the geometric motif composed of interweaving triangles and semicircles of this example is not as symmetrical as that of Kashkashok: one end of this geometric unit is rather thicker than the other. A more outstanding difference between them is the size of the motif: that of Kashkashok is several times larger than that of Leilan. Since the motif found at Leilan VIa has been compared with "running petal patterns" at Ras al 'Amiya [Stronach 1961: 118, PLs. XLV-8, LIV-8; Schwartz 1982: 269], PL. 91-8, 9 may be assigned to a further developed stage of this motif design, which is subsequent to that of Ras al 'Amiya through that of Leilan VIa.

The comparative analysis may enable the vessels from Kashkashok to be placed into the following (Fig. 19).

	earlier/later phase	further later phase
Handle:	large	small
	PL, 91–5, 6, 7	91–8, 9

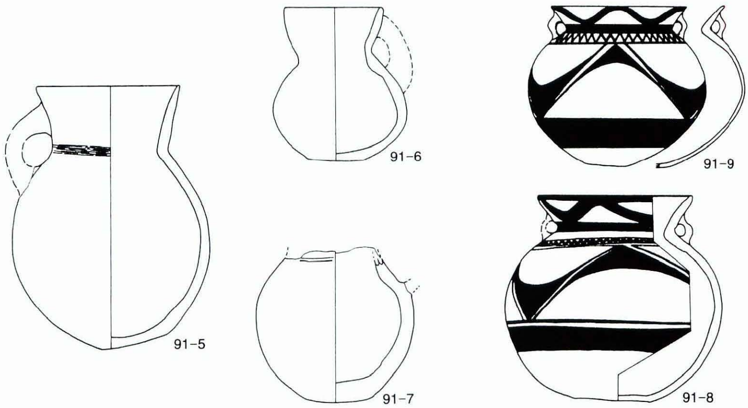

Fig. 19 Jars with single or double loop handles

16) Jars with nipple lugs

〔Other complicated form〕

(Fig. 20: PL. 91–10)

This jar form has a lug, but is otherwise identical to "Globular jars," with a somewhat thicker profile. The edge of the rim is flattened and the base is round. Three groups of two nipple lugs are attached on the shoulder; each lug has a diameter of around 1.0 cm.

The nipple lugs attached on PL. 91–10 are comparable to those on vessels reported from Musharifa I–III 〔Og: Fig. 14–19〕 and Hammam VB 〔Ak: PL. 108–103〕, though the latter two examples have no neck. The shape of PL. 91–10, without nipple lugs, is the same as "Globular jars with round bases"; it is comparable to pieces with shorter necks which have often been found the later phase in Northern Ubaid sites. PL. 91–10, thus, can be placed in the later phase.

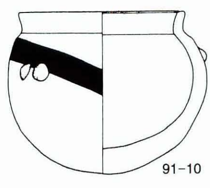

Fig. 20 Jar with nipple lugs

17) Bottles

〔B: Closed End+ 2: Straight Profile〕

(Fig. 21: PL. 92–1)

This vessel is a form of bowl which the wall curves slightly inwards. The gradient at the end of the vessel wall is greater than sixty degrees, and less than eighty-five. The slightly out-turned side rises to a simple rim. In profile the vessel is nearly straight. The base is flat. As similar examples are rare from other sites, it is difficult to compare PL. 92–1 with them.

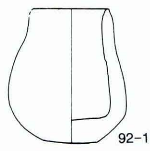

Fig. 21 Bottle

18) Small pottery

〔Other form〕

(Fig. 22: PL. 92–2～13)

This form is identical to miniature pottery. Both the height and the maximum diameter are less than 9.0 cm. The shapes of this form fall into the various forms of pottery classified above, irrespective of size. The commonest shape is "Globular jars" (PL. 92–2～10), mostly with flat or slightly flat bases, straight and short necks, and simple rims. Exceptions include a rather longish neck (PL. 92–10) and faintly overhanging rim (PL. 92–9). Other small pottery vessels include a "Jar with single loop handle" (PL. 92–11), a "Jar with pierced rim" or "Ledged jar" (PL. 92–12), and a unclassified bowl (PL. 92–13). The "Ledged jar" will be independently described and analysed later.

Similar vessels have been found at Arpachiyah (Miniature Pottery), consisting of globular jars 〔M & R: Figs. 41–6, 8, 15, 42–1〕, a bowl with an incurved vessel wall 〔M & R: Fig. 43–7〕, a shallow bowl 〔M & R: Fig. 42–2〕, and a deep plate 〔M & R: Fig. 42–7〕. It is uncertain whether these small vessels are from the early or late phase, although two examples with globular bodies and a round or flat base belong to the early phase 〔M & R: Fig. 41–8, 15〕. It is, therefore, difficult to detect any tendency towards change among the small vessels. Similar pieces from Gawra, however, are identical to globular jars: splayed neck and sharply or gently carinated body in the earlier phases (below XVIII–below XVII) 〔Tb: PL. CXXIII–115, 116, 119〕.

Since no vessel found at Kashkashok is similar to the small globular jars with splayed neck from Gawra, it might be said that PL. 92–2～8 fit the later phases (Late Northern Ubaid or Terminal Ubaid). PL. 92–9, moreover, fits the further later phase (Early post-Ubaid), judging from a combination of faintly protruded rim and round body without carination, as seen in "Jars with overhanging rims."

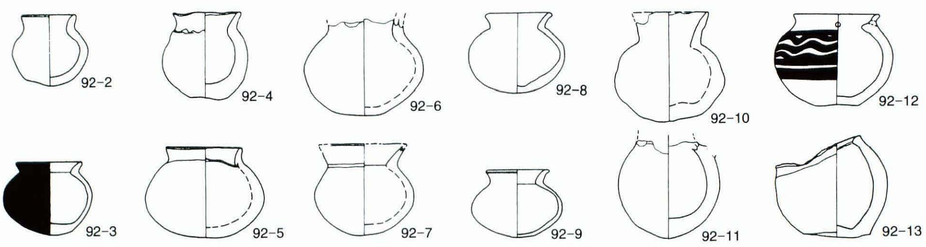

Fig. 22 Small pottery

19) Ledged jars

〔Other complicated form〕

(Fig. 22: PL. 92–12)

This form has a ledged rim. The shape is similar to "Globular jars with flat bases." The end of the body seems to be separated into the inner ledge and the outer neck which is pierced and out-turned. The four pierced holes are symmetrically arranged.

Comparable vessels are known form Arpachiyah (Deep Jars with Rounded Base and Ledge on the Inside below the Rim/late phase) 〔M & R: Fig. 38–1〕, Gawra XIII 〔Tb: PL. CXXX–210〕, and Thalathat XIV, XIII, X (Jar with ring-shaped projection inside the neck) 〔F, H & M: PLs. 72–2, 75–5, 11; Eg: Fig. 55–6〕. In particular, those from the last site have been recognized as dominant in Stratum XIV, though also found in Strata XIII, XII 〔F, H & M: 40〕. Therefore, PL. 92–12, the one example found at Kashkashok, can be fitted into the early and later phases in the Northern Ubaid period.

5. Interpretations

After defining and establishing the original typology, we have analysed the vessels from Tell Kashkashok mainly to establish a relative chronology. Before revealing the results, we stress again that the procedure for the comparative analysis applied here consists of three main parts. The first process is analysis: selection of site 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 separated attributes into one whole vessel form, and if needed, a supplementary description of detailed examples.

The remarkable patterns of changing attributes for particular forms, reported from Kashkashok, have been recognized through the comparative analysis. The shape attributes include rim (simple, flat, out-turned, outrolled/distinct, faint), neck (long, short/straight, out-turned), body profile (round, gently carinated, sharply carinated), and base (round, slightly flat, flat). Distinctive combinations of attributes, represented as vessel forms, develop into slightly different ones according to changes of shape attributes with technological and/or design changes. An outline of the chronological conclusions is shown in figure 23.

The above table indicates distinctive tendencies of change in morphological modes in the Kashkashok forms and the identity of the site. Since the notable trends in the site have been compared with the context of other sites, the former principally reflects the latter. A mere description of the tendencies which have been observed at Kashkashok is not sufficient for the interpretive stage which follows. Therefore, we shall consider not only the outstanding forms and attributes, but also the rare or absent forms and attributes, some of which are known from the other sites.

1) Relative chronology

Forms

The chronological table is helpful in determining the time duration of the Kashkashok pottery: the phase in which the earliest pottery is found, and that of the latest; the duration of the phase in which the pottery vessel occurs. The earliest forms or examples are "Bowls with sharply incurved vessel walls" [A1, A2+3] (PL. 86–2, 3), "Cup-like vessels" [D+1, r] (87–9, 10), "Deep plates" [E+2, f] (89–1, 3), "Jars with overhanging rims" [A5+3] (90–5, 14, 91–1), and "Jars with high necks" [A6+3] (91–4). The latest forms or examples are "Bowls with incurved vessel walls" [B+3] (86–13, 14). It is estimated from the comparative analysis that the earliest vessels belong to the Early Northern Ubaid phase (Ubaid 3b), and the latest to the Late post-Ubaid (Gawra or Uruk) phase. Other vessel forms or examples, of course, are assigned to the time between these phases.

However, there are several forms useful as phase indicators, which have not been recognized at Kashkashok. With regard to the earlier phase, we can demonstrate that, although the "Bell-shaped bowl" is a remarkable form of the previous stage of the Early Northern Ubaid phase (Ubaid 3a), this form has not yet been recovered at Kashkashok. The "bell-shaped bowl with single band near base," in particular, has been reported from a burial context at Arpachiyah (early phase) [Mallowan and Rose 1935: Fig. 29–1, 2, 4], and from other contexts at Gawra XIX–XVII [Tobler 1950: PLs. CXX–83, 87, CXXI–91]. This distinct motif (single band near base) is also painted on "a sub-variety of bell-shaped bowls" from Gawra XVIII, below XVII (graves) [Tobler 1950: PLs. CXX–88, CXXI–89, 90] and appears only in the VIa Strata

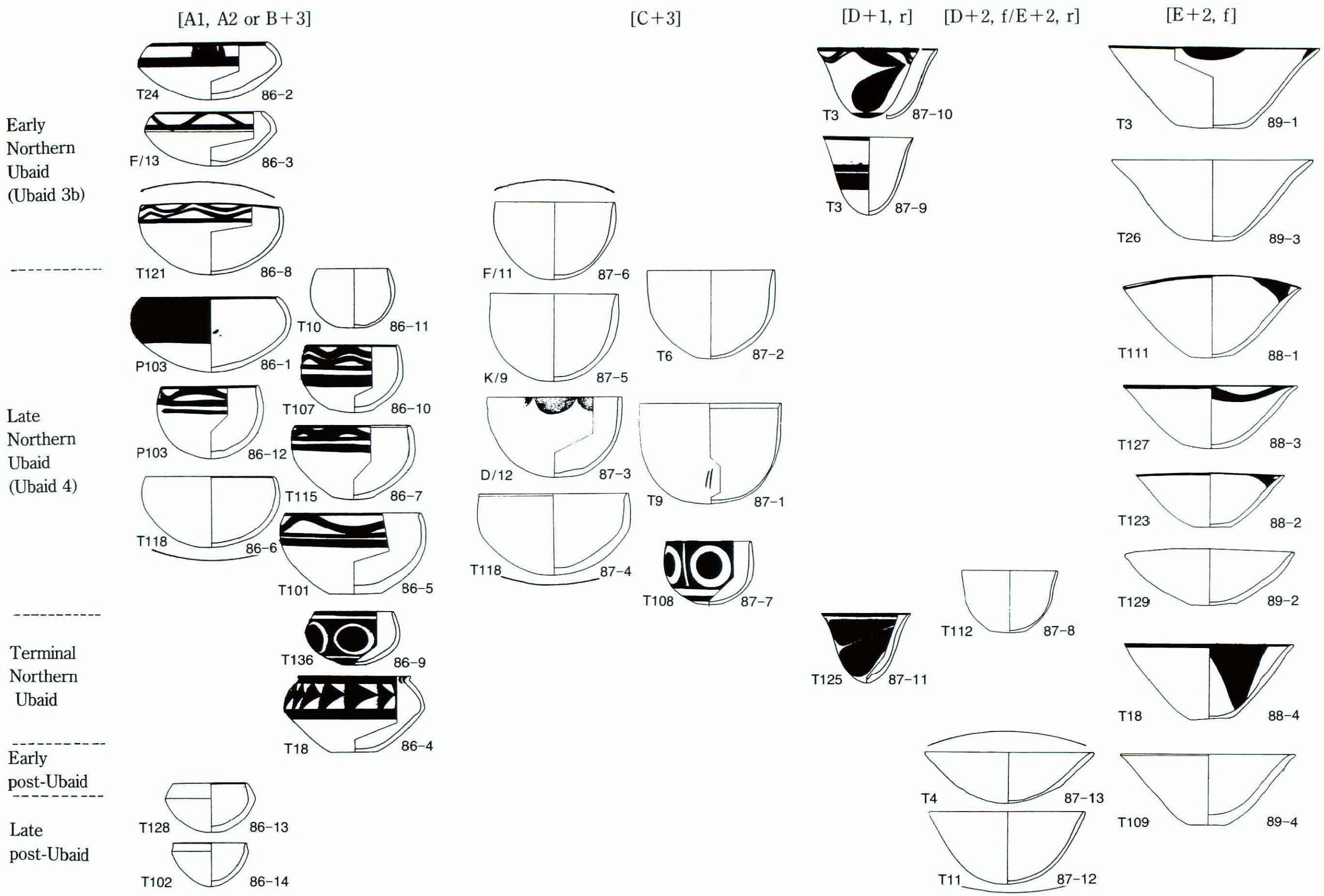

Fig. 23 (1) Chronological Table of Ubaid and post-Ubaid pottery from Kashkashok II (Scale 1:8)

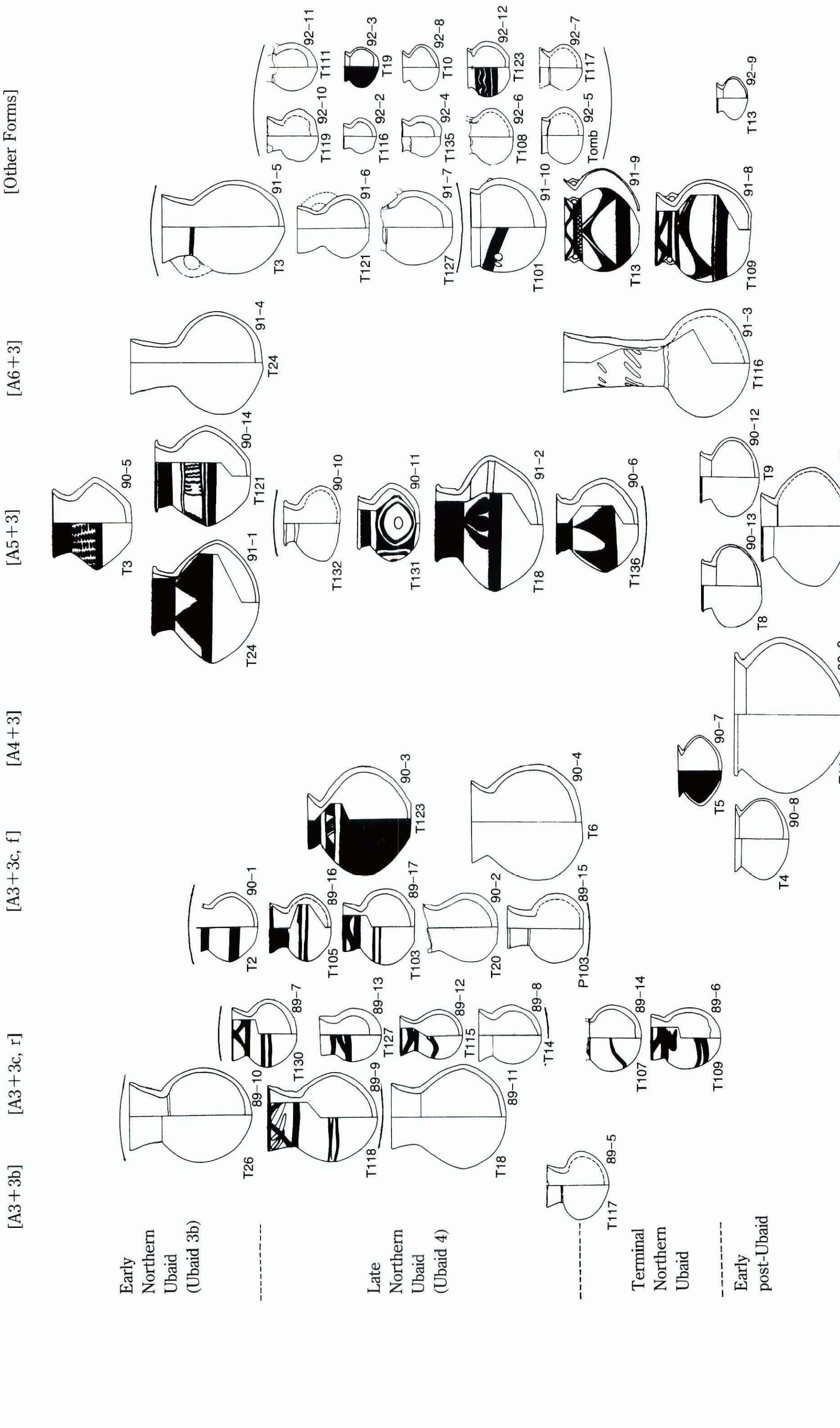

Fig. 23 (2) Chronological Table of Ubaid and post-Ubaid pottery from Kashkashok II (Scale 1 : 8) at Leilan [Schwartz 1988: 74]. At the same time, some examples similar to "Open bowls with straight vessel walls" [D+2, f] or "Shallow bowls with straight vessel walls" [E+2, r] have a distinctive painted pattern: "triangles connected by cross-hatched bands" on the form mentioned above from Gawra XVIII, below XVII [Tobler 1950: PL. CXXI-89, 90], and "triangles bisected by an impaled ladder pattern" on "Deep Bowls with Round Base" from Arpachiyah (early phase) [Mallowan and Rose 1935: Fig. 38-2]. Comparable examples have been found at Thalathat XIV [Fukai, Horiuchi, and Matsutani 1970: PL. 74-11, 17], and Hammam IVA [Akkermans 1988b: PL. 68-5]. The fact that these distinctive forms, or forms with certain painted designs have never been recovered at Kashkashok, therefore, indicates that the earliest phase of the site can be assigned to the subsequent stage of the Early Northern Ubaid phase (Ubaid 3b).

Another notable form, for non-existence at Kashkashok, is "tortoise vessels." Several pieces similar to this form has been reported from Brak (Ubaid level) [J. Oates 1987a: 193-94], Gawra XVII [Tobler 1950: PL. CXXIII-113], Songor A (grave 1) [Kamada and Ohtsu 1991: Fig. 5-P13], Ras al 'Amiya [Stronach 1961: PL. LVI-3], Abada I [Jasim 1985: Fig. 192], and Eridu XIII-VIII [Safar, Mustafa and Lloyd 1981: 155, Fig. 82-9]. These examples are mostly restricted to the earlier stage of the Early Northern Ubaid phase (Ubaid 3a). On the other hand, there are some sites where not yet have been found any "tortoise vessels" as well as Kashkashok: Leilan, Arpachiyah, Thalathat, and Hammam. For the regional variation, the vessels are known from Brak, but not from Leilan in the Khabur; those from Gawra, but not from Arpachiyah in the Tigris. From the point of view for contexts, in addition, the specimens at Songor A has been uncovered from the burial context, but no examples from the cemetery at Arpachiyah nor Eridu. The comparisons let us assume that the "tortoise vessels" form is an indicator for the earlier part of the Early Northern Ubaid phase, though there is still left a problem for explaining the situation that no examples have been found from any early graves at Arpachiyah. A solution has yet to be done.

With reference to the later phase, there are no examples similar to the "Wide flower pots" from Brak (level 10, 7) [J. Oates 1986: Fig. 3-44, 45] or the "flat-based bowls" from Gawra XI-IX [Tobler 1950: 155, PL. CXLIV-367～371]; nothing resembling the "corrugated vessels" from Brak (level 12-9) [J. Oates 1986: 251, Fig. 2-14～18; Fielden 1981: PL. 4-32, 33] or from Leilan V (46-47) [Schwartz 1988: Fig. 60-5]; no examples related to the true "Casserole" or "Platters" of Brak mentioned above. From the evidence, the latest phase of Kashkashok can be attributed to the Early post-Ubaid phase, although this proposal contradicts previous beliefs; this analysis is based on pieces from non-burial contexts.

In respect to the duration of pottery distribution, we distinguish several distinctive patterns: some forms continue from the earlier phase to the later phases; others are concentrated within a certain phase; the rest appear, at intervals, in several phases. The first pattern includes "Bowls with (sharply) incurved vessel walls" [A1, A2, B+3], "Hemispherical bowls" [C+3], "Deep plates" [E+2, f], "Globular jars with round bases" [A3+3c, r], "Globular jars with flat bases" [A3+3c, f], and "Jars with overhanging rims" [A5+3]. Almost all the forms span several phases without any break. This group is composed of three Bowls and three Jars that have been found with no distinct inclination to either side: twenty-nine pieces belong to the Bowl forms, and twenty-six pieces to the Jar forms. The second pattern includes "Shallow bowls with straight vessel walls" [E+2, r] and "Jars with short everted necks" [A4+3]. Both forms are concentrated in the further later phase corresponding to the Early or Late post-Ubaid phase. The last pattern includes "Cup-like vessels" [D+1, r] which will be described as a functional variation below.

Attributes

A number of distinctive attributes in Kashkashok pottery are suitable for dating purposes: production technology, surface treatment, tempered materials, and painted motifs or technique. The method of pottery manufacture is a particularly good device for arranging the elements of each example or form on a time scale. The use of a turning device during the process of treating the surface or painting a motif is often seen in the Northern Ubaid: many examples display parallel finger striations on the rim surface and circular bands or simple repetitive filling patterns on the exterior surface [Akkermans 1988b: 186; Nissen 1989: 248]. Almost all the pottery from the Early and Late Northern Ubaid phases, however, is hand-made, not wheel-made using a fast turning or throwing wheel. Coil- or ring-building is usually applied when constructing a vessel wall, which might sometimes be accompanied by the use of a slow turning device for securing a certain shape. The combined manufacturing process of building a vessel wall by a coiling or ringing technique and securing shape by a slow turning device can be suggested from the Terminal Ubaid pottery of Kashkashok as well as Gawra XIIA, XII [Tobler 1950: 146; Porada, Hansen, and Dunham 1992: 93]. At a further later phase, the Late post-Ubaid, the manufacturing technique of building a vessel changes: the shape is thrown from a lump of clay by using a fast turning wheel, though true examples are rare in the phase [Akkermans 1988c: 289; Schwartz 1988: appendix 3]. Evidence for the use of a fast turning wheel has not been recovered from the tombs at Kashkashok, which indicates that a latest phase at this site (to which the pottery as funerary objects belongs) may be regarded as the end of the Early post-Ubaid phase or the beginning of the Late post-Ubaid phase. Some examples, however, appear to have been made by a combination of ring-building and a slow-turning device (PLs. 86–9, 89–6, 14, 90–7). The inner base of the pottery vessels is generally thumb-pressed with a diameter of about 1.0 cm, and the inner surface of the lower bodies is traced by parallel finger striations. The fact that no joints between the clay rings is seen on the lower bodies confirms the suggestion that a combined technique of pottery manufacture was applied to those examples, unlike others from Kashkashok which often show the joints on the lower bodies.

The surface treatment of the pottery is also a useful indicator of some phases. The scraping technique is seen at many sites in northern Mesopotamia, especially from Leilan VIb to V, IV [Schwartz 1988: 73, 75] and from Hammam IVC to VA [Akkermans 1988b: 194–95; 1988c: 297], representing the Late Northern Ubaid to Early and Late post-Ubaid phases. At these sites, scraping using a hard instrument is observed on the exterior surface of the lower body or near the base; furthermore, the technique is widely distributed from southeastern Anatolia to northern Syria and Mesopotamia, along the extension of the Northern Ubaid culture [Brown 1967: 132; Schwartz 1988: 73]. This distinctive treatment in the Late Northern Ubaid and subsequent phases enables the placing of similar examples from Kashkashok within these phases. In this paper, some vessels have been arranged sequentially according to form by applying supplementary distinctive attributes (PL. 86–13, 14, etc.), others can be confirmed or rearranged by using that attribute positively: matching it with a previous seriation (PLs. 86–11, 89–5, 6, 90–7, 92–5) and providing useful information on an unclear sequence which is enclosed by large round brackets in the figure 23 (PL. 87–3, 5, 6: Hemispherical bowls [C+3]; PL. 89–12, 13: Globular jars with round bases [A3+3c, r]; PLs. 89–16, 17, 90–2, 3: Globular jars with flat bases [A3+3C, f]). The latter information enables samples to be assigned to the Late Northern Ubaid or subsequent phase.

Burnishing is a conspicuous technique among surface treatments. Vessels with a burnished surface are characteristic of Gawra XIA, XI, XA [Tobler 1950: 152, 155] and Hammam VB [Akkermans 1988c: 297], but rare in the cemetery at Arpachiyah [Mallowan and Rose 1935: 71–72]. The outstanding technique seen in "Red burnished ware" seems to be restricted to the Early post-Ubaid phase. Some similar examples from Kashkashok may confirm or rearrange the position of these vessels in each sequence, as with the previous attribute. Some vessels are suitable for the comparative sequence: PL. 92–9 (Small pottery). Moreover, PL. 91–3 (Jar with high neck) and PL. 91–8 (Jar with double loop handles), which have been faintly ascribed by the analysis above, probably equate to the Early post-Ubaid phase[12].

The tempered materials are manifold in the sites and in all phases or periods in northern Mesopotamia; the detailed description of temper materials sometimes gives us diverse groups to which the pottery vessels concerned may be assigned. There is, however, only one remarkable trend towards straw and grit temper from the Late Northern Ubaid phase. In particular, a rapid change from mineral temper to vegetable temper has been observed at the beginning of Hammam IVC [Akkermans 1988b: 189]; moreover, another gentler change from vegetable temper to mineral temper (lime or calcite) occurs around the end of Hammam VA and the beginning of Hammam VB [Akkermans 1988c: 292]. The former trend towards straw and grit temper is also known from Leilan VIb and Brak XXII–XX (Late Ubaid), which may have been succeeded to "Chaff faced or tempered vessels" in the post-Ubaid (Uruk) phases [Fielden 1981: 105, Fig. 4; J. Oates 1987a: 196–97; Schwartz 1988: 72, appendix 3].

At Kashkashok too, the same tendency towards straw and grit temper is easily observable, though a single temper is visible in exceptional samples. In one group of straw temper, some vessels belong to the Early Northern Ubaid phase (PLs. 89–3, 90–14, 91–4) and others to the Terminal Ubaid or the Early post-Ubaid (PLs. 90–8, 9, 12, 13, 91–8, 9, 92–9). According to the positive application of the temper attribute for sequential position, specimens belonging to an uncertain phase might therefore be ascribed to either the Early Northern Ubaid phase, or the Terminal Ubaid or Early post-Ubaid phase: the former includes PLs. 86–1, 87–3?, 89–10, and the latter PLs. 86–11?, 87–13, 89–5, 90–6, 92–5, 7, 8. A second group with only grit-temper, moreover, is recognized in the following forms: Hemispherical bowls [C+3] (PL. 87–7), Shallow bowls with straight vessel walls [E+2, r] (87–12), Jars with overhanging rims [A5+3] (90–15), and uncertain (92–13). The first three examples are the most distinctive respectively of all examples in each form. These vessels are distinguished by several attributes: PL. 87–7 negative painting, PL. 87–12 burnished surface and blackish color, PL. 90–15 finely burnished surface. However, there is a problem in the application of the distinctive attribute (grit temper) to rearrange samples that have already been seriated in the sequence by the comparative analysis above: the first in the Late Northern Ubaid phase, but the last two in the post-Ubaid phases. It is, thus, not as easy as the previous attributes to rearrange both the vessels in the same phase, because the time difference between the former and the latter is fairly long. Furthermore, vessels with several kinds of temper (combined temper) are associated within the same tomb, for example straw tempered and grit tempered: PLs. 90–9 and 87–12 (T11); 92–11 and 92–13 (T111). Such evidence stresses the point that temper attribute is less valid for making clear distinctions between several phases.

The last attribute concerns painted motifs or technique. With some exceptions the painted vessels of Kashkashok appear in almost all forms. The most common design is a curvilinear pattern between horizontal bands. Undulating bands or hanging semicircles characterize the Northern Ubaid painted pattern. At the site too, there is a trend towards bold painted motifs which include some geometrical patterns. Unpainted pottery has also been reported: Open bowls with straight vessel walls [D+2, f], Shallow bowls with straight vessel walls [E+2, r], Jars with wide shoulders [A3+3b], Jars with high necks [A6+3], and Jars with single loop handles. These vessels are not concentrated within a certain phase but occur occasionally through several phases.

2) Regional variation

The most distinctive forms of the pottery found at Kashkashok, in comparison to other sites, are "Jars with short everted necks" [A4+3] and "Jars with double loop handles," which are particularly important in certain phases. PL. 90–8, 9 of the former group closely resemble in shape and ware the "Red burnished ware" from Tell Brak on the same tributary, the Khabur. This vessel shape is also very common at Tepe Gawra and Tell Musharifa in the Tigris valley. At the first site "Ring-based pots with globular bodies and sharply angled, flaring rims" seems to have been most popular between Strata X to IX [Tobler 1950: 158]. According to the time difference between the Khabur (Early post-Ubaid) and the Tigris (Late post-Ubaid or Gawra), it is suggested, therefore, that one attribute of surface treatment (red burnishing) may have been connected with another, that of distinctive shape (short everted neck), around the Khabur tributary region[13], resulting in the production of "Jars with short everted necks" (with a red-burnished surface). This particular shape, then, would be distributed into the neighboring region, the Tigris valley.

The next form, "Jars with double loop handles" has, on the previous analysis, also turned out to be characteristic of the Terminal Ubaid. The vessel form includes one morphological trend in the degeneration of double loop handles from the Early Northern Ubaid (Ubaid 3a) which have been seen at Hammam IVA and Thalathat XIV, and a second in the trend towards a larger painted geometric motif composed of interweaving triangles and semicircles developed from the Early Northern Ubaid, which may have origin in the Southern Ubaid 3a as at Ras al 'Amiya. The special assignment of this form of combination of shape and design to the northern chronological table has yet to be examined more carefully.

In addition, among those meaningful attributes useful in constructing a sequence of changing shapes concerning "Bowls with sharply incurved vessel walls" [A1, A2+3] and "Bowls with incurved vessel walls" [B+3], is a set relation between outrolled rim and low-located carination (PL. 86–4). The combination of these two characteristic attributes first appears in Hammam IVC, IVD [Akkermans 1988b: PLs. 86–216, 93–281], though the "bead rim" or outrolled rim is a common trait throughout the Hammam IV sequence; the bead rims probably constitute a ceramic trait which is basically Syrian [Akkermans 1988b: 208, 221]. A similar form is also found in Leilan VIb (Stratum 52a) [Schwartz 1988: Fig. 66–1] and in Gawra XII [Tobler 1950: PL. LXXIX–f]. PL. 86–4, thus, seems to represent an intermediate stage of development between the combination of outrolled or bead rim and low-carination in "Bowls with (sharply) incurved vessel walls" and may have been distributed from the Balikh tributary to the Tigris valley through the Khabur tributary in the Terminal Ubaid phase. Similar vessel forms may have developed into ones with "Closed Slightly Inverted Concave Beaded" rims at Leilan V (Strata 52–45) [Schwartz 1988: Fig. 59] and the "Casserole" at Tell Brak (Level 10, 9) [J. Oates 1986: Fig. 1–3, 4] in the Khabur region.

In contrast, many forms have never been recovered at Kashkashok, in particular the "Beaker." No similar form has yet been seen at the site, though examples have been reported from both the early and late phases in Arpachiyah [Mallowan and Rose 1935: Figs. 31–5, 6, 33–10, 36–1, 2]. In non-burial contexts, comparable specimens are known from Gawra XIII, XII [Tobler 1950: PL. CXXIX], Thalathat XIII [Fukai, Horiuchi, and Matsutani 1970: PL. 71–19], LeilanVIb (Stratum 57) [Schwartz 1988: Fig. 63–1], and Brak XXI (Late Ubaid) [J. Oates 1987a: Fig. 3–14]; all these belong to the Late Northern Ubaid phase. No example, furthermore, has been reported from Hammam [Akkermans 1988b: 225]. From this evidence we suggest that, while the Kashkashok site is situated in one region where "Beakers" were intentionally excluded from burial objects, Arpachiyah is located in another where this vessel form was consciously selected as a burial good. It is possible, therefore, that this conspicuous difference in selecting a certain form as a funerary object could also indicate a regional variation between the Khabur and the Tigris.

At the same time, the absence of a certain attribute can also be described as a useful indicator of regional variation. There are no find of ring bases in the Kashkashok tombs or related contexts. A trend towards the use of the ring base, however, appeared in Stratum XIII at Gawra, becoming popular in the subsequent phase (Stratum XII) [Tobler 1950: 140, 146]; some vessels with ring bases have been found in graves in Stratum XII [Tobler 1950: PL. CXXXIV–248, 250]. Ring bases are rarely found at Leilan VI and Hammam IV, with no increase in the base in the succeeding periods [Schwartz 1988: 51, 55, 75; Akkermans 1988b: 226; 1988c: 310]. At Brak too, no conspicuous ring base trend has ever been recognized from the Ubaid to post-Ubaid periods; however, small ring bases are characteristic of the later

ED deposits [J. Oates 1986: 260, Fig. 4]. There is, moreover, no sample of a ring base at Arpachiyah, except for one vessel from TT 3 [Mallowan and Rose 1935: 71]. This information on the presence of ring bases leads us to propose the difference between the Khabur or Balikh tributary and the Tigris valley, though the absence of ring base at the Arpachiyah cemetery may be considered as a difference of time.

The attribute of painting motif or technique is as important as the forms. Although the undulating or related patterns are the most popular among Kashkashok, other notable painting patterns are also seen: water drops, triangles or related patterns, and circles. In particular, the last design is very interesting for its negative motifs: a horizontal row of six circles (PLs. 86–9, 87–7) and a concentric circle (PL. 90–11). These motifs seems to be closely related to examples reported from Tell Brak XXII–XX (Late Ubaid) [J. Oates 1987a: Fig. 2]. If the use of a symbol such as the decorative motif of the human eye suggests an existence of a cult [D. Oates 1987: 176; Porada, Hansen, and Dunham 1992: 96], it could be assumed that the Kashkashok species had a special meaning for some kind of ritual in the Later or Terminal Ubaid phase. The ritual or cult network would have had connections in the Khabur region consisting of Tell Brak, Tell Kashkashok, and so forth. A proper interpretation, however, has yet to be executed, because of the little information at this stage.

3) Functional variation

"Deep plates" are one of the most common vessel forms found as funerary objects in Kashkashok[14]. Vessels resembling "Deep plates" [E+2, f] are distinctive in other burial contexts [Akkermans 1988b: 225; Porada, Hansen, and Dunham 1992: 90]. This form is often associated with burial urns, graves or tombs. While some related to burial urns were used as lids to cover the urns [Jasim 1985: 114–15, Fig. 164], others related to graves or tombs were buried as funerary objects in the graves or tombs [Mallowan and Rose 1935: 46, Fig. 32; Tobler 1950: PL. CIII–5]. This latter custom is popular at Kashkashok. Evidence of the association between this vessel form and graves or tombs as burial goods has rarely been reported from other sites in non-burial contexts: Hammam, Leilan, Thalathat, and Gawra. It is assumed, therefore, that "Deep plates," as funerary objects, are related to burial customs characteristic of the Northern Ubaid culture.

In addition, similar vessels have been found from Ubaid graves in Tell Songor A (Form j: Large open bowl with flattish base and straight sides; Form k: Large open bowl with flattish base and slightly out-turned sides) [Kamada and Ohtsu 1991: Fig. 7], but these examples have slightly round bases. Furthermore, at Eridu, instead of "Deep plates," "Shallow bowls" are very common as tomb goods [Safar, Mustafa, and Lloyd 1981: 158]. Many kinds of motifs are painted on the everted and flattened rim of these "Shallow bowls." Some of the designs are comparable to those (scallops or sweeping bands) painted on the inner surface of "Deep plates" which have been found at the Northern Ubaid sites. This evidence supports the suggestion proposed above.

On the other hand, no example of "Double-mouthed jars" has been uncovered from any tombs or related contexts at Kashkashok. This form is known from other sites: Gawra XIII, XIA–IX [Tobler 1950: PLs. CXXI–221, CXLIII–356, CXLVIII–434], Thalathat XIV, III [Fukai, Horiuchi, and Matsutani 1970: PL. 75–19; Egami 1958: Fig. 50–5], and Leilan VIb (Stratum 52a) [Schwartz 1988: Fig. 66–11]. All these vessels are excavated only from non-burial contexts; specimens similar to this form have been reported from the area outside the cemetery at Arpachiyah [Mallowan and Rose 1935: Fig. 41–18]. In addition, at Kashkashok similar pieces have been found from a feature (Pit 5, fill) belonging to Layer 1, and from debris at the southwestern edge of the mound (PL. 94–11, 14). This accumulated evidence strongly indicates that, although different from "Beakers," the "Double-mouthed jars" were used in ancient daily life. Thus, while the presence or not of the latter form may show differences between contexts, it does not show regional diversity among the tributaries or valleys.

Among the vessel forms found as funerary objects, furthermore, one is remarkable for its long temporal distribution: "Cup-like vessels" [D+1, r] are found from the Early Northern Ubaid phase (PL. 87–9, 10) and the Terminal Ubaid phase (PL. 87–11). This evidence of continuity of vessel forms through various phases suggests the hypothesis that "water drops" motifs similar to those painted on the surface of PL. 87–10, 11 may have been inherited from the earlier to later phases. While the normal manufacturing technology of ring-building has been applied to the former vessel, a combined technology of ring-building and slow-turning device has been applied to the latter. If discrimination between production technologies were useful in distinguishing phases, the painted motifs on the former variant of the form might have been intentionally transferred to the latter variant. A few other motifs could be viewed as providing similar proof of the transference of an earlier trend or fashion: negative circles (from PLs. 87–7 to 86–9), sweeping bands (PL. 88–1, 2, 3 to 88–4), and triangles (PLs. 91–1 to 90–6). This surmised inheritance leads us to believe that a certain motif painted on a particular vessel may have been selected as a kind of symbol or representation.

A similar situation has been reported from the Gawra tombs: the painted bowls, which are identical in shape and decoration with a bowl from Stratum XIIA [Tobler 1950: PL. CXXXIII–235], were discovered in tombs (G36–68, G36–150) belonging to Stratum XI or XIA; the bowls express either later imitations or carry-overs of a type which is characteristic of earlier strata [Tobler 1950: 79–80]. The former conjecture seems to fit the situation at Kashkashok. This distinctive tendency towards inheriting motifs from earlier phases has been observed especially in the burial context at Kashkashok and Gawra within which vessels with characteristic motifs have been found as funerary objects. It can be assumed, therefore, that the phenomenon of functional variation might lead to the long temporal distribution of certain forms or motifs.

6. Testing results

1) Set relations

Having described the characteristics which the pottery forms or examples represent themselves, now let us turn to the situations in which they are located. 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. This association or set relation of vessels belonging to different forms enables us to examine the reliability of the relative chronology which has been analysed above. The association leads 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:

Early Northern Ubaid:	T3 (PLs. 87–9, 10, 89–1, 90–5, 91–5?)		[A5+3]			[D+1, r]	[E+2, f]
	T24 (PLs. 86–2, 91–1, 4)	[A1+3]	[A5+3][A6+3]				
	T26 (PL. 89–3, 10)	[A3+3c, r]					[E+2, f]
	T121 (PLs. 86–8?, 90–14)		[A5+3]	[B+3]			
Late Northern Ubaid:	T101 (PLs. 86–5, 91–10)			[B+3]			
	T108 (PLs. 87–7, 92–6?)				[C+3]		
	T111 (PLs. 88–1, 92–11)						[E+2, f]
	T115 (PLs. 86–7, 89–12)	[A3+3c, r]		[B+3]			
	T118 (PLs. 86–6, 87–4, 89–9?)	[A3+3c, r]		[B+3]	[C+3]		
	T127 (PLs. 88–2, 91–7?)						[E+2, f]

T123 (PLs. 88–2, 90–3, 92–12?) 〔A3+3c, f〕 〔E+2, f〕

(Late or Terminal) T117 (PLs. 89–5, 92–7) 〔A3+3b〕
T10 (PLs. 86–11, 92–8) 〔B+3〕

Terminal Northern
Ubaid: T18 (PLs. 86–4, 88–4, 89–11?, 91–2?)
〔A2+3〕 〔A3+3c, r〕〔A5+3〕 〔E+2, f〕
T136 (PLs. 86–9, 90–6?) 〔A5+3〕 〔B+3〕

Early post-Ubaid: T4 (PLs. 87–13, 90–8) 〔A4+3〕 〔E+2, r〕
T11 (PLs. 87–12?, 90–9) 〔A4+3〕 〔E+2, r〕
T116 (PLs. 90–15, 91–3, 92–2?) 〔A5+3〕〔A6+3〕

The result confirms the previous seriation based on comparative analysis. Tombs with funerary objects ascribed to different phases are as follows:

T6: Late Ubaid (PLs. 87–2)/Late Ubaid～Early post-Ubaid? (90–4)
T9: Late Ubaid (PLs. 87–1)/Early post-Ubaid (90–12)
T13: Terminal Ubaid (PLs. 91–9)/Early post-Ubaid (92–9)
T107: Late Ubaid (PLs. 86–10)/Terminal Ubaid (89–14)
T109: Terminal Ubaid (PLs. 89–6, 91–8)/Early post-Ubaid (89–4)

The latter examples should be further analysed to clarify the situation, although all the evidence points to slight differences in phases between the vessel forms in the tomb. These tombs with vessels that are ascribed to various phases should be analysed in relation to the tomb's structure and chronological setting.

2) Overlapping

Furthermore, it is necessary to verify the above results because of the overlapping relationship between tombs. The information is as follow (from later>earlier):

T7: (no finds)
>T10: Late～Terminal Ubaid (PLs. 86–11, 92–8)
>T118: Late Ubaid (PLs. 86–6, 87–4, 89–9?)
>T121: Early Ubaid (PLs. 86–8?, 90–14)

T17: (no finds)
>T3: Early Ubaid (PLs. 87–9, 10, 89–1, 90–5, 91–5?)

T109: Terminal Ubaid～Early post-Ubaid (PLs. 89–6, 91–8, 89–4)
>T113: (a bone object)

T114: (a lapis lazuli bead)
>T116: Early post-Ubaid (PLs. 90–15, 91–3, 92–2?)
>T115: Late Ubaid (PLs. 86–7, 89–12)

T128: Late post-Ubaid (PL. 86–13)
>T136: Terminal Ubaid (PLs. 86–9, 90–6?)

T131: Late Ubaid (PL. 90–11)
>T132: Late Ubaid (PL. 90–10)

T133: (no finds)
>T106: (no finds)
>T20: Late Ubaid (PL. 90–2)

T110: (no finds)
>northern tomb: Terminal Ubaid～Early post-Ubaid (PL. 92–5)
>T107: Late～Terminal Ubaid (PLs. 86–10, 89–14)

All the evidence of overlapping tombs, lacking contradictory associations, would be suitable for the comparative analysis mentioned above, which provides assurance and confidence. All the problems concerning the relative sequence of the tombs, nevertheless, have yet to be solved.

7. Conclusions

Several consequences arise from the interpretations discussed above. First, it is proposed that the pottery vessels recovered form the tombs and related contexts at Tell Kashkashok range from the Early Northern Ubaid phase (Ubaid 3b) to the Late post-Ubaid phase (Late Uruk or Gawra). No distinctive break can be observed; the development of morphological or other attributes is gradual and without any abrupt changes.

Second, regarding regional variation, the Khabur tributary or region to which the Kashkashok site belongs can be separated from the Tigris and Balikh tributaries or regions. The former region represents an independent variety not only in the presence of some pottery forms and painted motifs, but also in the absence or rarity of others, that might produce a kind of social boundary within which the material culture as seen in assemblages were unified under a certain pattern or meaning.

Last, the burial context of Tell Kashkashok has provided, as expected, not only the reliable sequence for a relative chronology and the evident distribution for a regional or tributary variation, but also the important suggestion of functional characteristics: votive form and inherited motif. In particular, other comparable examples for explaining the inheritance of certain motifs should be collected together, and their purpose must be carefully inferred. At the same time, a tomb chronology has to be constructed, and then, compared with the pottery chronology.

Nevertheless, there are some problems in using the distinctive attributes, the material and technological aspect of the Northern Ubaid culture, to clarify the social and economic aspect of this culture. For example, the method of vessel manufacture by using a turning device, which might be combined with the ring building method and applied as a way of fixing a certain shape, is not a prime factor or independent parameter for explaining cultural development, but a representation of a changing mode derived from progress, where some phenomena are described. There remains for us an important theme: the connection during the process of development between the complexity of the production and the complexity of the society[15]. The stage when the device was introduced into pottery production, moreover, may possibly differ between sites or regions (tributary). The reason for the introduction of the new technology may have come from some social or economic demands: it is not necessary for those demands to have occurred simultaneously in the diverse regions, unless there was anything to attract the different sites or regions. The attractive substance has yet to be clarified.

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Notes

1) The "post-Ubaid" period is paralleled to the "Uruk" period in southern Mesopotamia; the former period included slightly different cultural elements from the southern "Uruk". Although in a pervious report [Koizumi 1991] the term "Uruk" was applied to the period that was the subsequent one to the Northern Ubaid period, which is contemporary with the southern Uruk period, the former term will alternate with the "post-Ubaid" in this paper. The term "Uruk" applied in the previous paper really represents the cultural assemblages of the "post-Ubaid" period in northern Mesopotamia; it is considered, however, that the latter term expresses the contents more precisely, in order to prevent the situation that both periods of northern and southern might be hastily mistaken for the same.
2) The excavated stratigraphy is so diverse that we are going to apply a sequence, XIV to I.
3) Of course, such gradient degrees are conveniently given in the expectation of better representing the degree to which the mouth of the vessel opens. It is, therefore, possible that another gradient degree might be set up for much better results.
4) The point of jointing can be regard as "corner" or "inflection" point: the former is an abrupt change in the orientation of a vessel wall and the latter is the change in the direction of curvature of two parts of the vessel [Rice 1987: 217–19].
5) It is true that this variable is qualitative, not quantitative, at this stage, but is would be a more precise measurement for "the state of the body's profile".
6) Ring base or others could be considered as variants of the variable, but here only two variants are selected because of their presence in the Kashikashok example.
7) For example it is suggested that a tomb chronology may be constructed by its "relative level", that is a level of the tomb's bottom relative to others. I will deal with more detailed contents for this sequence.
8) A specimen with flat base, did indeed appear in Gawra XVIII as well as one with a round base, but the proportion of the former to the latter is very small in an early phase such as Gawra XVIII.
9) The distinctive motif is usually restricted to the Ubaid 4 phase, but I dare suggest from the comparative analysis that the example needs to be compared not only in deisgn respect, but possibly in "form" or "combination of form and design".
10) The "bowls with flat bases and expanding sides" at Gawra XIA [Tobler 1950: PL. CXLI–328, 330] and "flat-based open bowls" at Brak (Early Uruk fill) [J. Oates 1987a: 194, Fig. 3–9] might have developed into the wide "flower pot" [J. Oates 1985: 176–77; Porada, Nissen, and Dunham 1992: 96].
11) Similar examples have been recovered at Tell Abada I (earlier Ubaid phase) in middle Mesopotamia [Jasim 1985: Fig. 164–a, b, g].
12) Nevertheless, it could also be proposed that the burnishing technique was distributed in the Late Northern Ubaid phase, because many pieces with burnished surfaces have been found in northern Ubaid sites.
13) As the definitive combination of sharply everted rim and red burnished surface has also been reported from Grai Resh VI–IX [Lloyd 1940: 19, Fig. 7–11] and Sakce Gözü IVA [du Plat-Taylor, Seton-Williams, and Waechter 1950: 96], the precise origin of the combination should be researched with careful consideration for cross-dating of the stratigraphic relation.
14) The "Jars with overhanging rims" are also distinguishable from other vessel forms: the form has characterstic painted motifs on the body that have rarely been observed on others; the form is rarely associated with "Deep plates" in the same tomb, except of PLs. 90–5 (T3) and 91–2 (T18).
15) This assumption has been suggested [Nissen 1989: 248, 253–54 (discussion)]. Furthermore, we need strategies beyond orthodox chronology which approach developing modes of pottery production responding to the changing demands of society [Akkermans 1988a: 129], and socio-political developments transpiring in a particular region which relate to the dynamics of interregional economic or social network [Schwartz 1982: 349, 351].

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INCISED AND EXCISED DESIGNS OF THE NINEVITE 5 POTTERY

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I. Introduction

The outline of the transition of the incised designs in the Ninevite 5 Period is comparatively clear, because the variety, the change (variation) and the complexity of the incised designs expressed on the incised ware found in the Ninevite 5 Period are smaller than that of the painted designs in the same period. This is particularly evident from the results of stratigraphical excavations at Tell Mohammed Arab [Roaf 1983; Roaf and Killick 1987]. According to the research results of Tell Mohammed Arab, the incised designs are roughly classified into the Early Incised style (the Painted and Early Incised Period) and the Late Incised and Late Excised style (the Late Incised and Late Excised Period). Incidentally, the painted ware was found from the strata of the Painted and Early Incised Period, but none from the Late Incised and Late Excised Period. Some of the incised designs of the Early Incised style with simple incisions, such as ribbed, layered and notched band, are regarded as the oldest features of the incised ware in the Ninevite 5 Period on the basis of the fact that the incised ware with these incisions were excavated from the earliest phase of the Painted and Early Incised Period. There are many kinds of simple styled incisions (simple motifs) shown on the incised ware excavated from the latest two phases of the Painted and Early Incised Period. On the other hand, incised designs of the Late Incised and Late Excised Period are more complicated and more minute than those of the Painted and Early Incised period. Most of the excised designs of the Late Incised and Late Excised Period are basically composed of vertical or horizontal gouging motifs, and are usually combined with incised motifs.

This paper follows the chronological order of the Ninevite 5 Period established by Roaf and Killick during their research at Tell Mohammed Arab [1987], i.e. the Painted and Early Incised Period when the incised ware appeared and flourished, incised ware with a heavy and complicated motif and excised ware appearing in the Late Incised and Late Excised Period, and incised designs evolving into those of the Incised Taya IX type (Late ED III, Leilan Period II).

There is a possibility that more periods existed, i.e. a period between the Painted and Early Incised Period and the Late Incised and Late Excised Period, and a period between the Late Incised and Late Excised Period and the Taya IX Period. Details of these blank periods, however, are still unknown. Furthermore, it is not clear how the incised ware and excised ware of Tell Leilan Periods IIIc, IIId and II in the Khabur Area related to those of the Mosul Area. The present author will examine in this paper several questions unanswered on the above vague periods. Accordingly, he will mainly discuss the transition between incised and excised designs of incised and excised wares, as well as the mutual relationship of the painted, incised and excised designs.

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II. Methodology

1. Incised and excised design elements

The detailed classification of incised design elements has been carried out by other scholars. This is summarized as below.

Chiyonobu classified the specimens of incised ware from Tell Thalathat [Fukai et al. 1974]; Killick compared the incised design elements of specimens from Tell Mohammed Arab with those of Tell Thalathat [in press]; and Rova classified all specimens of incised and excised wares which had been reported [1988].

Therefore, the classification of incised design elements here is according to their detailed study instead of my re-classification.

2. Composition and classification of the incised and excised designs

As many design elements are common to those of Ninevite 5 period, the basic classification of incised and excised designs in this paper follows the classification used by Numoto in classifying the painted designs in the last issue but one [1991]. That is, all designs of each specimen of incised and excised ware were illustrated in the form of a belt in order to show clearly the combination of design elements and whole layout of designs.

The specimens of incised and excised designs of incised and excised ware examined here were taken from Nineveh, Tells Thalathat, Mohammed Arab, Billa, Kutan, Rijim, Fisna, Karrana 3, Jigan, Thuwaij, Chagar Bazar, Brak, Leilan and other tells in the Eski-Mosul and the Khabur Areas. Among these specimens, those which are considered to carry typical and characteristic design patterns were selected. Basically, similar design patterns were drawn in one sketch. Incised and excised fragments of their whole design layout unknown were excluded from this examination. Some of the specimens show unclear details in incised or excised designs because of their vague original drawings. Drawing technique depends on excavators. For example, there are two ways of drawing the groove line; one is drawn with single line, the other is drawn with double lines. The technical difference in the precise method of incising or excising seems to be important. However, the details of incised and excised designs are not known according to the observation of original drawings[1]. Consequently, in this paper, more emphasis has been put on the composition and layout of incised and excised designs than on incising or excising technical method.

III. Types and shapes of the incised and excised wares, and positions of incised or excised designs (Fig. 6)

Most of the incised and excised designs are found on fine grey ware, but there are very few specimens found on the other types of ware[2].

The types of incised and excised pottery are roughly classified into carinated bowl (Type 1), footed bowl (Type 2), lugged jar or jar (Type 3), large jar (Type 4) and potstand. In addition to the above, there is a great possiblility that other types of pottery existed, though complete specimens of those have been rarely excavated and it is not known what types existed.

Incised and excised designs are mainly found on small- to medium-sized vessels. The painted designs are usually found on large-sized vessels, but there are very few examples of incised and excised designs found on large-sized vessels[3].

It is natural that the shapes of above-mentioned ware had evolved according to the chronological changes (Fig. 6). For example, most of the carinated and footed bowls in the Painted and Early Incised

Period always have carinations on their bodies, while similar specimens are very few in the Late Incised and Late Excised Period [Killick in press; Numoto 1989]. Furthermore, the number of footed bowls decreased in the Late Incised and Late Excised Period compared with the Painted and Early Incised Period. On the contrary, bowls with no foot began to appear in the Late Incised and Late Excised Period. As to the shape of the base of bowls, from the Late Incised and Late Excised Period to the Taya IX Period/the Late ED III Period, flat base took place of round or pointed bases.

The classification of incised and excised zones on vessels (incised and excised positions) also follows that of the painted design zones in the Numoto's last issue but one [1991: 86, 87]. That is: Zone A=neck (for jars only); Zone B=upper part of body; Zone C=lower part of body; Zone D=foot and pedestal (Fig. 6).

Most of the incised designs of Type 1 and Type 2 of the Painted and Early Incised Period are located on Zone B, and a few specimens have incised designs on Zone C[4].

Incised and excised designs of Type 3 are divided into two kinds: one has incised designs in both Zones B and C (Nos. 72–74), the other in Zone B only. The former is commonly found in the specimens of the Late Incised and Late Excised Period.

None of specimens have incised and excised designs on Zones A and D except one specimen of engraved jar reported from Nineveh (No. 79) which has excised designs in Zones A and D. This fact indicates that the incised and excised designs were usually not arranged on Zones A and D of Type 3 in the Ninevite 5 Period[5]. On the other hand, jars with incised designs on Zone A are commonly found in specimens of the Taya IX Period.

IV. Characteristics of incised and excised designs (Figs. 1–5)

1. Classifications of incised design elements

Incised design elements of the Painted and Early Incised Period and the Late Incised and Late Excised Period are roughly classified as follows:

1. Horizontal belt motif: one element is incised horizontally in the form of a belt.
   The Painted and Early Incised Period: notched band (Nos. 1–5, 8–13, 15–34), feather-like band (herringbone) (Nos. 6, 14, 16, 35B), dotted line (straight or wavy) (Nos. 9, 11, 12, 25, 30–32), impressed triangle (Nos. 10, 23, 30–32), zigzag line (Nos. 34, 35, 39–43, 45–47, 49, 50, 52), running chevrons (multiple zigzag lines) (Nos. 14, 15, 28, 37) etc.
   The Late Incised and Late Excised Period: chevron combination (combination of zigzag lines) (Nos. 81–91) etc.
2. Vertical belt motif: one element is repeated vertically.
   The Painted and Early Incised Period: herringbone or feather band (Nos. 17, 18, 33, 48, 53, 55, 56), chevron etc.
   The Late Incised and Late Excised Period: chevron combination (Nos. 109, 110, 147, 149–151C) (combination of zigzag lines) etc.
3. Figure motif: there are two types; one is one element repeated horizontally, the other is two or three elements repeated alternately.
   The Painted and Early Incised Period: triangles (elongated, equilateral, right angled, inverted) filled with dots or lines (Nos. 7, 8, 20, 21, 26, 27, 29, 34, 35B, 36, 40–45, 55), butterfly (filled with dots or lines) (Nos. 39, 49–54), lozenge filled with dots (No. 33), circle (Nos. 24, 35B) etc.
   The Late Incised and Late Excised Period: triangles (elongated, equilateral, right angled, inverted)

filled with lines (Nos. 96–100), lozenge filled with lines (Nos. 93–95) etc.

4. Naturalistic motif: bird and/or gazell. There are few examples (Fig. 6, No. 7).

As discussed later, most of the incised designs are always combined with two or three above-mentioned design elements. Some typical design elements of the Painted and Early Incised Period, such as notched band, zigzag line and dotted line, are found in the specimens of the Late Incised and Late Excised Period. Incised design elements of the Painted and Early Incised Period are relatively simple in style, while those of the Late Incised and Late Excised Period are complicated by the combination of multiple lines.

Elements composing "figure motif", such as triangle, lozenge and butterfly, are basically common to painted design elements. Specimens of "naturalistic motif" are very few, some specimens have been reported only from Nineveh [Thompson and Hamilton 1932: Pls. 58–16, 60–35–38; Thompson and Mallowan 1933: Pl. 63–1].

2. Classifications of excised design elements (Figs. 2–4)

Excised design elements are roughly classified into three categories: 1. the excised motif which is assumed to have belonged to the Early Excised Period; 2. excised motifs which are commonly found in the specimens of the Late Incised and Late Excised Period; 3. excised motifs which are typical in the Khabur Area. Details are as follows:

1. Excised motif of the Early Excised Period: it is characterized by the thin vertical motif. This motif is generally called "grooved" [Schwartz 1985] (Nos. 57–62).
2. Excised motifs of the Late Incised and Late Excised Period: the most typical design element in this period is a thick gouged motif, which is subdivided into three types, i.e. vertical, horizontal and slanting (Nos. 113–152). These excised motifs are mainly combined with incised motifs, but some examples are combined within excised motifs. There are many specimens with basically vertical excised motifs. All specimens on which these excised motifs are arranged are elaborately made.
3. Excised motifs of the Khabur Area: the most characteristic excised motifs are represented by ones arranged on the excised ware from Tell Leilan Period IIId. The characteristic feature of the excised motif is that zigzag excisions are combined with scratched lines, i.e. so-called "hatched zigzag", "step pattern" and "slashed zigzag" [Schwartz 1985; Weiss and Calderone in press] (Nos. 165–176). Compared with specimens of the Late Incised and Late Excised Period, excised designs of these specimens are not adaped to the regular pattern.

3. Other design elements

Design motifs are patched on the body (applique). There are subdivided into two groups; one is a thin vertical motif, the other is a circular motif. The former specimens came from Tell Leilan Period IIIc (Nos. 63–66), and the latter specimens have been found from Nineveh and Tell Thuwaij [Thompson and Mallowan 1933: Pl. 63–7; Numoto inpress: Fig. 21–34] which are considered to have belonged to the Late Incised and Late Excised Period. Both motifs are combined with incised motifs.

V. Composition and layout of incised and excised designs (Figs. 1–5)

1. The Painted and Early Incised Period (Fig. 1)

The compositions of incised designs can roughly be classified into the horizontal division patterns (Groups 1–3) and the panel patterns (Group 4). The horizontal division patterns are divided into three groups.

Furthermore, the Group 1 pattern is subdivided into five classes. Details are as follows:

Group 1: This group is a combination of notched band elements divided into five types:

1a. This pattern is combined with only notched band motifs (including feather pattern) (Nos. 1–6). There are two kinds of notched bands; one is which right-up notches repeated successively, the other is successive left-up notches. When multiple notched bands are found on the same body, these two types of notched bands are always placed alternately. This fact is regarded as one of the incising rules governing in this period, and feather elements are a typical example according to this rule.

The motifs of notched or feather bands are always found on the top of ridges or ribs. They are never found on the flat surface in this period. This is also assumed to be one of the incising rules in this period.

1b. The compositions of design patterns are: the uppermost part of Zone B has a basically horizontal belt element, while the lower part of Zone B has notched bands (Nos. 7–19). The main design element of this design patterns is considered to be a horizontal belt element.

Specimens with many notched bands are found in carinated bowls or jars with a wide Zone B (Nos. 12, 13, 15–19), on the contrary, similar specimens are very few in footed bowls of which Zone B is relatively narrow (No. 7).

Some specimens of carinated bowls has no designs on the lower part of Zone B (No. 11). This may indicates that there was a chronological variation within this period.

1c. The compositions of design patterns are: the upper and lower parts of Zone B have notched bands, and one element is repeated successively on the middle part of Zone B (Nos. 20–22). This design pattern is basically the same as that of Group 1d mentioned below.

1d. There are two types of this design pattern: one is composed of notched bands and other motifs (one element repeated successively) placed horizontally and alternatly (Nos. 23–27), the other is the same design composition as Group 1c (Nos. 28, 29). These design patterns are found in relatively many of carinated bowls.

1e. The design patterns are composed of notched bands and two different motifs (each element repeated successively and respectively). There are two types: one is composed of simple motifs (a dotted wavy line and impressed triangles) (Nos. 30–32), the other is composed of figure motifs (lozenges and triangles) (Nos. 33–35B); and all of the former design patterns are found in carinated bowls and footed bowls.

In terms of similarities of types of design elements, the above-mentioned design patterns of Groups 1b-1e can be classified as follows:

a. Combinations of figure motifs (triangle and lozenge) (Nos. 7, 8, 20, 21, 26, 27, 29, 33–35B).
b. Combinations of impressed triangle motifs (Nos. 10, 23, 30–32).
c. Combinations of dotted motifs (dotted line, dotted wavy line, dotted chevron) (Nos. 9, 11, 12, 19, 25, 30–32).
d. Combinations of chevron motifs (multipule zigzag lines) (Nos. 13–15, 17, 28).
e. Combinations of herringbone or feather motifs (Nos. 16–18, 22, 33).

Group 2: Design patterns are composed of horizontal belt motifs (defined in IV-1. Classifications of incised design elements of this paper). These patterns are divided into two types: one is a single belt pattern of horizontal belt motif (2a, No. 36); the other is horizontal belt motifs repeated up to down within the zone (2b, Nos. 37, 38). The latter design patterns are composed of simple design elements.

Specimens of repeated motif belts are numerous in carinated bowls with wide Zone B. There is no specimen in this period which have a pattern with only figure motifs (horizotal belt pattern) repeated up to down. This indicates that such design pattern is not suitable for the rules governing incised designs in this period.

Group 3: The design patterns are composed of combinations of two different horizontal belt motifs (Nos. 39–48). The most characteristic point is that upper, or upper and lower parts of Zone B have zigzag lines (Nos. 39–42, 45–47). These zigzag motifs are regarded as additional, or minor design, and unsuitable for the main design element on a whole design layout. Consequently, these minor design elements are labelled as "sub-design element" from now on[6].

The feature of design pattern of specimen No. 48 is different from those of other specimens. Its design pattern is composed of a horizontal element (dotted zigzag line) and vertical elements (vertical herringbone). This design composition is common to that of Group 1b.

Group 4: The design compositions are panel patterns (4a, Nos. 49–53), or patterns of two different motifs placed alternately (4b, Nos. 54–56, 35C). Butterfly motifs are mostly found in the panel patterns, and there are many butterfly motifs found in specimens of Tell Kutan [Bacholet in press].

The most typical panel patterns are specimens of Nos. 49, 52 and 53, of which design compositions are basically identical with those of painted designs, as will be discussed later.

Most of the notched bands combined with Groups 1b-1e patterns are thought to be "sub-design element" instead of being main design element in a whole design layout. They are assumed to be zone borders, and/or a "fill-in" for a blank space.

2. **The Early Excised Period** (Fig. 2)

The Early Excised Period between the Painted and Early Incised Period and the Late Incised and Late Excised Period has been established by Roaf and Killick [1987: 222]. As discussed later, the present author assumed, based on their design features and characteristics, that pottery collections from levels 7 and 8 of Tell Thuwaij and periods IIIb and IIIc of Tell Leilan belong to the Early Excised Period [Numoto in press; Schwartz 1985; 1988]. Consequently, specimens examined here are mainly taken from these stratigraphical levels.

The most typical design element in this period is a vertical grooved motif (Nos. 57–62), and Roaf and Killick have set up the Early Excised Period based on the presence of this motif [Ibid]. Other characteristic design elements of this period are elongated triangle with a column-dots (Nos. 67, 72) and multiple-lined chevron motifs (Nos. 70, 76) [Schwartz 1988]. The majority of the design elements and design compositions found in the specimens of this period are similar to those of the Painted and Early Incised Period (Groups 1–3). Actually, some of the specimens included in the Painted and Early Incised Period are considered to belong to this period. For example, specimens found from Graves at Tell Chagar Bazar (Nos. 40, 43, 55) may belong to this period.

The compositions of design patterns are roughly classified into three types: combinations with excised elements; combinations of incised elements only; combinations with applique motifs. The characteristics of design patterns are as follows:

Group 5: This type is the most characteristic design pattern in this period which is composed of thin vertical excised motif (grooved) and horizontal incised motif (one element being repeated horizontally) (Nos. 57–62). All of these specimens are found on Zone B of carinated bowls.

There are two types of design compositions: one is panel-like pattern, such as three to five grooved motifs in one design unit (Nos. 57–60); the other is grooved motifs which are densely arranged on the Zone B (Nos. 61, 62). These specimens always have horizontal incised motifs of "sub-design element" (dotted wavy line, notched band, chevron) on the upper space of Zone B. The most common "sub-design

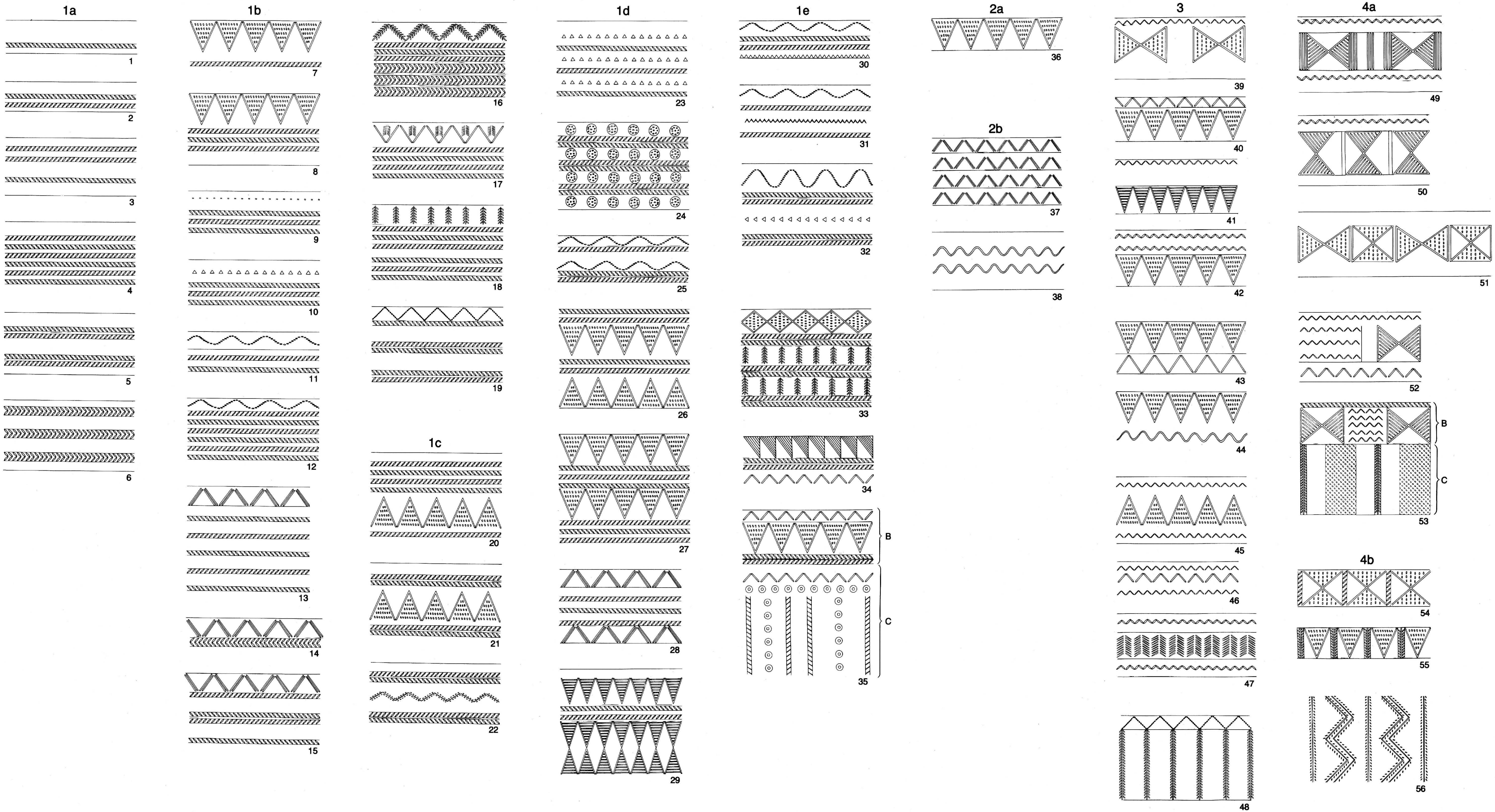

Fig. 1 Incised Design Patterns of the Painted and Early Incised Period

Table 1. List of Fig. 1

Group	No.	Site	Type	Zone	Literature
Group 1a	1	Mohammed Arab	Type 2	Zone B	Killick 1986: Fig.4-8
	2	Fisna	Type 2	Zone B	Numoto 1988: Fig.15-13
	3	Rijim	Type 1	Zone B	Bielinski in press Fig.11-12
	4	Rijim	Type 1	Zone B	Bielinski in press Fig.7-1
		Thalathat	Type 1	Zone B	Fukai et al. 1974: Pl.47-11
		Thalathat	Type 1	Zone B	Fukai et al. 1974: Pl.47-15
		Thalathat	Type 3 or 4	Zone B	Fukai et al. 1974: Pl.57-1
		Kutan	Type 3	Zone B	Bachelot in press
	5	Thalathat	Type 2	Zone B	Fukai et al. 1974: Pl.49-1
		Kutan	Type 1	Zone B	Bachelot in press
		Leilan	Type 1	Zone B	Schwartz 1988: Fig.43-11
	6	Kutan	Type 1	Zone B	Forest 1987: Fig.9
		Kutan	Type 1	Zone B	Bachelot in press
		Rijim	Type 3	Zone B	Bielinski in press Fig.8-1
		Nineveh	Type 3(small jar)	Zone B	Thompson and Hamilton 1932: Pl.58-23
Group 1b	7	Thuwaij	Type 2	Zone B	Numoto in press: Fig.25-89
	8	Thalathat	Type 2	Zone B	Fukai et al. 1974: Pl.57-29
		Thalathat	Type 1	Zone B	Fukai et al. 1974: Pl.57-30
		Kutan	Type 3	Zone B	Bachelot in press
	9	Fisna	Type 1	Zone B	Numoto 1988: Fig.19-96
	10	Thalathat	Type 2	Zone B	Fukai et al. 1974: Pl.57-36
		Leilan	Type 2	Zone B	Schwartz 1988: Fig.43-10
	11	Thuwaij	Type 1	Zone B	Numoto in press: Fig.25-94
	12	Chagar Bazar	Type 1	Zone B	Mallowan 1936: Fig.18-4
		Leilan	Type 2	Zone B	Schwartz 1988: Fig.43-12
	13	Thalathat	Type 1	Zone B	Fukai et al. 1974: Pl.47-9
		Thalathat	Type 1	Zone B	Fukai et al. 1974: Pl.57-8
	14	Thalathat	Type 1 or 2	Zone B	Fukai et al. 1974: Pl.57-16
	15	Leilan	Type 1	Zone B	Schwartz 1988: Fig.47-5
	16	Thalathat	Type 3	Zone B	Fukai et al. 1974: Pl.51-19
	17	Leilan	Type 3	Zone B	Schwartz 1988: Fig.47-4
	18	Thalathat	Type 3	Zone B	Fukai et al. 1974: Pl.51-18
	19	Nineveh	Type 3(small jar)	Zone B	Thompson and Hamilton 1932: Pl.58-24
Similar example		Leilan	Type 1	Zone B	Schwartz 1988: Fig.48-1
Group 1c	20	Leilan	Type 1	Zone B	Schwartz 1988: Fig.47-3
	21	Nineveh	Type 1	Zone B	Thompson and Hamilton 1932: Pl.58-11
	22	Nineveh	Type 3(small jar)	Zone B	Thompson and Hamilton 1932: Pl.58-25
Similar example		Thalathat	Type 2	Zone B	Fukai et al. 1974: Pl.49-10
Group 1d	23	Thalathat	Type 1 or 2	Zone B	Fukai et al. 1974: Pl.57-34
	24	Leilan	Type 1	Zone B	Schwartz 1988: Fig.47-1
	25	Chagar Bazar	Type 1	Zone B	Mallowan 1936: Fig.18-2
	26	Thuwaij	Type 2	Zone C	Numoto in press: Fig.24-87
	27	Chagar Bazar	Type 1	Zone B	Mallowan 1936: Fig.18-5
	28	Thalathat	Type 2	Zone B	Fukai et al. 1974: Pl.49-7
	29	Kutan	Type 3 or 4	Zone B	Bachelot in press
Similar examples		Thalathat	Type 3	Zones B,C	Fukai et al. 1974: Pl.57-23
		Thalathat	Type 1	Zone B	Fukai et al. 1974: Pl.57-10
		Thalathat	Type 1	Zone B	Fukai et al. 1974: Pl.57-11
		Kutan	Type 1	Zone B	Bachelot in press
Group 1e	30	Thalathat	Type 2	Zone B	Fukai et al. 1974: Pl.57-35
	31	Leilan	Type 2	Zone B	Weiss and Mayo in press: Fig.6-2
	32	Leilan	Type 1	Zone B	Schwartz 1988: Fig.43-4
		Durdara	Type 1	Zone B	Spanos 1988: Abb.11-2
	33	Thalathat	Type 1	Zone B	Fukai et al. 1974: Pl.47-8
	34	Kutan	Type 3	Zone B	Forest 1987: Fig.9
	35	Kutan	Type 3	Zones B,C	Forest 1987: Fig.9
Group 2a	36	Chagar Bazar	Type 1	Zone B	Mallowan 1936: Fig.18-3
		Chagar Bazar	Type 1	Zone B	Mallowan 1936: Fig.18-7
		Chagar Bazar	Type 3	Zone B	Mallowan 1936: Fig.19-4
		Chagar Bazar	Type 2	Zone B	Mallowan 1936: Fig.18-8
Group 2b	37	Thalathat	Type 1	Zone B	Fukai et al. 1974: Pl.57-9
	38	Kutan	Type 2	Zone B	Bachelot in press
		Thalathat	Type 1 or 2	Zone B	Fukai et al. 1974: Pl.57-21
Group 3	39	Thalathat	Type 2	Zone B	Fukai et al. 1974: Pl.49-9
	40	Chagar Bazar	Type 1	Zone B	Mallowan 1936: Fig.18-1
	41	Kutan	Type 1	Zone B	Bachelot in press
	42	Thalathat	Type 1	Zone B	Fukai et al. 1974: Pl.57-28
	43	Chagar Bazar	Type 3	Zone B	Mallowan 1936: Fig.19-2
	44	Leilan	Type 3	Zone B	Schwartz 1988: Fig.47-6
	45	Nineveh	Type 1 or 2	Zone B	Thompson and Mallowan 1933: Pl.58-8
	46	Kutan	Type 1	Zone B	Bachelot in press
	47	Kutan	Type 2	Zone B	Bachelot in press
	48	Rijim	Type 1	Zone B	Bielinski 1987: Fig.4
Group 4a	49	Fisna	Type 1	Zone B	Numoto 1988: Fig.19-97
	50	Kutan	Type 1	Zone B	Bachelot in press
	51	Thalathat	Type 2	Zone B	Fukai et al. 1974: Pl.57-32
	52	Kutan	Type 2	Zone B	Bachelot in press
	53	Kutan	Type 3	Zones B,C	Forest 1987: Fig.9
Group 4b	54	Kutan	Type 2	Zone B	Bachelot in press
	55	Chagar Bazar	Type 2	Zone B	Mallowan 1936: Fig.18-6
	56	Nineveh	Type 1 or 3	Zone C	Thompson and Hamilton 1932: Pl.60-39

element" is a dotted wavy line.

Within these specimens, the most remarkable example of design patterns are Nos. 59 and 60. The space between two design units (consisting of grooved motifs) of Zone B of No. 59 is filled with

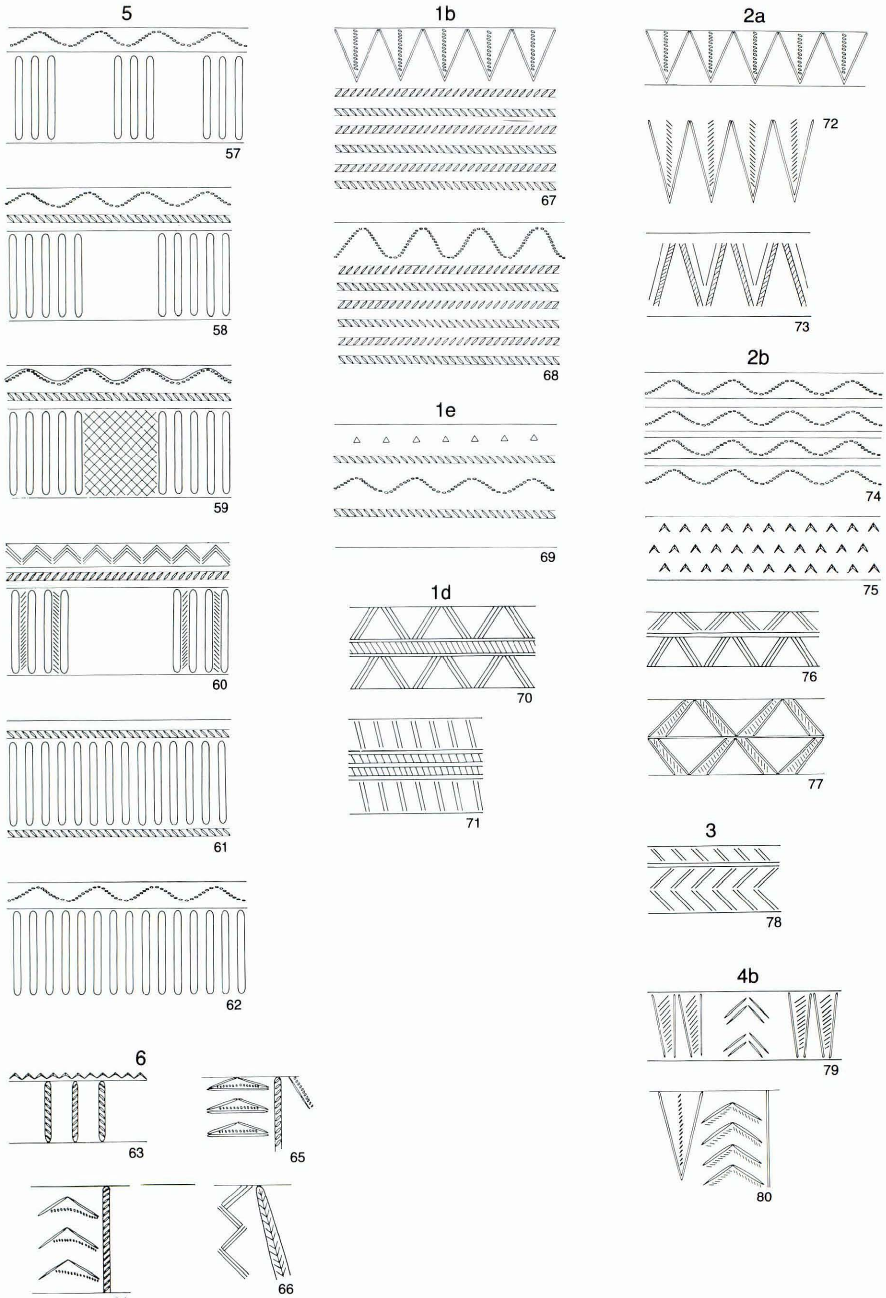

Fig. 2 Incised and Excised Design Patterns of the Early Incised Period

Table 2. List of Fig. 2

Group	No.	Site	Type	Zone	Literature
Group 5	57	Leilan	Type 1	Zone B	Schwartz 1988: Fig.39-5-7
		Brak	Type 1	Zone B	Oates 1986: Fig.5-99
		Thuwaij	Type 1	Zone B	Numoto in press: Fig. 23-83
		Siyana	Type 1	Zone B	Ball in press: Fig.12-1
		Hawa	Type 1	Zone B	Ball et al. 1989: Fig.21-28,30
		Jessary	Type 1	Zone B	Numoto 1990: Fig.15-160
	58	Brak	Type 1	Zone B	Oates 1986: Fig.5-98
	59	Siyana	Type 1	Zone B	Ball in press: Fig.12-4
	60	Raqa'i	Type 1	Zone B	Schwartz and Curvers 1990: Fig.25-14
Similar example		Brak	Type 1	Zone B	Oates 1986: Pl.1
	61	Nineveh	Type 1	Zone B	Thompson and Hamilton 1932: Pl.58-13
	62	Thuwaij	Type 1	Zone B	Numoto in press: Fig. 23-78
		Durdara	Type 1	Zone B	Spanos 1988: Abb.11-1
Group 6	63	Leilan	Type 2	Zone B	Schwartz 1988: Fig.43-5
	64	Leilan	Type 2	Zone B	Schwartz 1988: Fig.43-3
	65	Leilan	Type 2	Zone B	Schwartz 1988: Fig.43-2
	66	Leilan	Type 2	Zone B	Schwartz 1988: Fig.43-1
Group 1b	67	Thuwaij	Type 1	Zone B	Numoto in press: Fig. 23-60
	68	Thuwaij	Type 1	Zone B	Numoto in press: Fig. 23-69
Group 1e	69	Thuwaij	Type 1	Zone B	Numoto in press: Fig. 23-63
Group 1d	70	Leilan	Type 1	Zone B	Schwartz 1988: Fig.39-4
		Leilan	Type 3	Zone B	Schwartz 1988: Fig.32-10
	71	Leilan	Type 1	Zone B	Schwartz 1988: Fig.32-6
Group 2a	72	Leilan	Type 2	Zone B	Schwartz 1988: Fig.43-8
	73	Leilan	Type 1	Zone B	Schwartz 1988: Fig.39-3
Group 2b	74	Thuwaij	Type 1	Zone B	Numoto in press: Fig. 23-66
	75	Leilan	Type 2	Zone B	Schwartz 1988: Fig.40-2
	76	Leilan	Type 1	Zone B	Schwartz 1988: Fig.32-12
	77	Leilan	Type 3	Zone B	Schwartz 1988: Fig.41-2
Group 3	78	Leilan	Type 1	Zone B	Schwartz 1988: Fig.32-11
Group 4b	79	Leilan	Type 1	Zone B	Schwartz 1988: Fig.40-3-6
		Brak	Type 1	Zone B	Oates 1986: Fig.5-103,104
	80	Leilan	Type 1	Zone B	Schwartz 1988: Fig.43-6
		Brak	Type 1	Zone B	Oates 1986: Fig.5-102

cross-hatched incision, while the spaces between two grooved motifs of Zone B of No. 60 are filled with notch-like incisions. These characteristics are common to that of excised design pattern in the Late Incised and Late Excised Period, as discussed later.

Group 6: This design pattern is composed of applique motifs patched in a vertical belt form (Nos. 63–66). All specimens are from Tell Leilan Period IIIb. There has been no example reported from the Mosul Area yet. The designs of these specimens are found on Zone B of carinated bowls.

As for composition of design pattern of specimen No. 63, three of thin vertical motifs are applied in one design unit. The feature of this design layout is similar to that of the design compositions of Group 5 pattern (Nos. 57–60). Specimens Nos. 64 to 66 are fragments. It is difficult, therefore, to know the whole design layouts from them. Only to infer that specimens Nos. 64 and 65 are composed of vertical repetition of triangular motifs. In the case of specimen No. 66, it seems to be composed of vertical multiple-lined chevrons. The characteristic of design layouts of these specimens is that design is basically arranged on vertical.

The compositions of design patterns of other specimens are almost identical with those of specimens of the Painted and Early Incised Period. They are classified as follows:

a. Group 1b–Nos. 67, 68
b. Group 1d–Nos. 70, 71
c. Group 1e–No. 69
d. Group 2a–Nos. 72, 73
e. Group 2b–Nos. 74–77
f. Group 3–Nos. 78
g. Group 4b–Nos. 79, 80

The most remarkable items among the foregoing specimens are discussed as follows:

In the case of specimens Nos. 67 and 68, the spaces between two notched bands are deeply gouged (like excised band), while those of the Painted and Early Incised Period are usually gouged shallow. The notched band motifs of specimens Nos. 70 and 71 are relatively incised shallow. The design layouts of specimens Nos. 79 and 80 are basically a vertical design. The design combinations of elongated triangle with a column-dots motif and multiple-lined chevron motif, such as design of specimen No. 79, are mostly found in Zone B of carinated bowls with short everted rim (Fig. 6, No. 12).

The characteristic features in the Early Excised Period are summarized below:

1. Excised motif (grooved) and elongated triangle motif with a column-dots or dashes are thought to be new design elements which first appeared in this period.
2. Compared with the Painted and Early Incised Period, vertical design layouts increased.

3. The Late Incised and Late Excised Period (Fig. 3)

The features of incised and excised designs of this period are denser and more complicated than those of two previous periods. As a rule, combinations of multiple-lined design elements make the design patterns heavy and dense. The most characteristic point of the design patterns in this period is that excised motifs are used as a design element.

The design patterns can roughly be classified into two groups: one is composed of only incised motifs (Group 7); the other is composed of excised and incised motifs (Group 8). The former design pattern is basically the same as those of the Painted and Early Incised Period. Most of the specimens examined here were taken from tells at the Mosul Area.

Group 7: This design composition consists of incised design elements, and the composition of design patterns are divided into horizontal belt patterns (7a) and panel patterns (7b).

7a. The design patterns are composed of horizontal incised design elements (Nos. 81–105, 151B). The rule governing the design compositions of these specimens are almost identical with that of design patterns of Groups 1b-1e, 2a, 2b and 3 of the Painted and Early Incised Period discussed earlier. These design compositions are classified as follows:

   a. Groups 1b-1e–Nos. 83–85, 89, 90, 99, 100
   b. Group 2a–Nos. 103, 104
   c. Group 2b–Nos. 86, 87, 101, 105
   d. Group 3–Nos. 81, 82, 88, 91–98, 102

   With regard to these design compositions, the following points are remarkable.

   All of these design patterns are found on Zone B of Types 1 to 3 (carinated and footed bowls, and jar). The features of notched bands in this period are different from those of the Painted and Early Incised Period; that is, incision of notches are always more shallow than that of two previous periods, and a notch is close to a line or a dash in its shape. There are few examples in which only notched band motifs are repeated as a design composition. Furthermore, use of notched band in this period are less frequent than in the Painted and Early Incised Period. This motif is mainly used as "sub-design element" in this period.

   Specimens which have "sub-design element" are mostly found on the carinated and footed bowls. The most common horizontal incised design element is a multiple-zigzag-lined motif which is always used as a main design element of a vessel (Nos. 81–91, 151B). There are a lot of examples of figure motifs (butterfly, triangle and lozenge) filled with slanting lines in this period. On the other hand, figure motifs filled with dots, which are very common in the Painted and Early Incised Period, are rarely found in this period.

7b. The design composition is the panel pattern, which is identical with above-discussed Group 4a pattern of the Painted and Early Incised Period (Nos. 106–112, 146B).

   As mentiond above, the rule governing the panel arrangement is that two or three different panels are repeated alternately right to left. Design compositions of these specimens closely resemble those of the Painted and Early Incised Period (Group 4a). Another characteristic

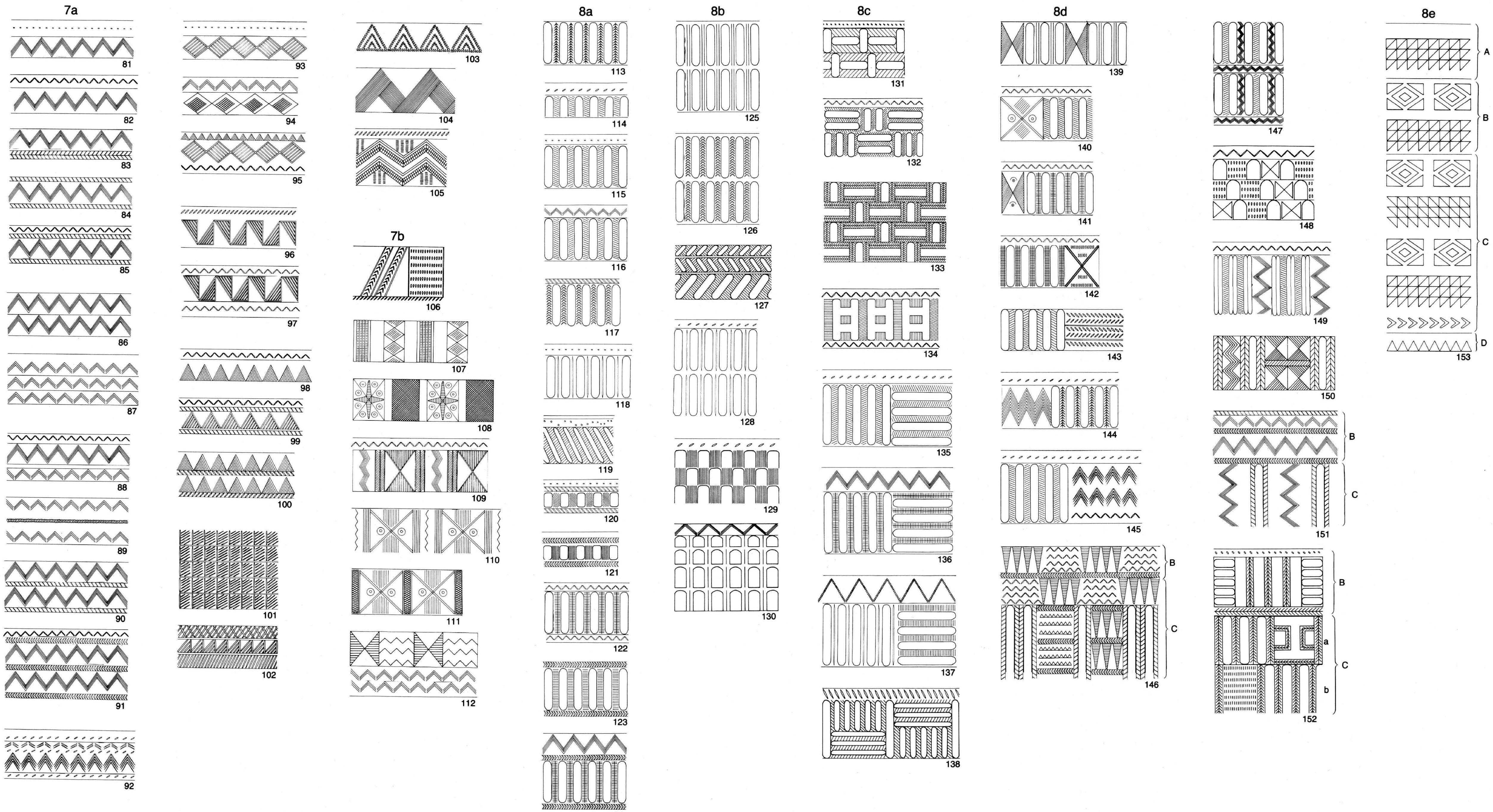

Fig. 3 Incised and Excised Design Patterns of the Late Incised and Late Excised Period

Table 3. List of Fig. 3

Group	No.	Site	Type	Zone	Literature
Group 7a	81	Mohammed Arab	Type 1	Zone B	Killick in press: Fig.7-8
	82	Mohammed Arab	Type 1	Zone B	Killick in press: Fig.7-11
		Mohammed Arab	Type 2	Zone B	Killick in press: Fig.7-1
	83	Billa	Type 1	Zone B	Speiser 1933: Pl.52-1
		Jigan	Type 1	Zone B	Ii and Kawamata 1984/85: Pl.24-75
	84	Jigan	Type 3	Zone B	Ii and Kawamata 1984/85: Pl.24-79
	85	Mohammed Arab	Type 1	Zone B	Killick in press: Fig.7-11
	86	Mohammed Arab	Type 1	Zone B	Roaf 1983:Fig.4-02
	87	Mohammed Arab	Type 2	Zone B	Killick 1986: Fig.4-3
	88	Mohammed Arab	Type 1	Zone B	Killick in press: Fig.7-14
	89	Billa	Type 1	Zone B	Speiser 1933: Pl.52-7
	90	Mohammed Arab	Type 2	Zone B	Killick in press: Fig.7-5
	91	Billa	Type 3	Zone B	Speiser 1933: Pl.70
Similar examples		Billa	Type 3	Zone B	Speiser 1933: Pl.71
		Nineveh	Type 2	Zone B	Thompson and Hamilton 1932: Pl.60-2
		Nineveh	Type 1	Zone B	Thompson and Mallowan 1933: Pl.62-20
	92	Jigan	Type 2	Zone B	Ii and Kawamata 1984/85: Fig.31-7
	93	Mohammed Arab	Type 1	Zone B	Killick in press: Fig.7-9
		Jigan	Type 1	Zone B	Ii and Kawamata 1984/85: Fig.31-5
	94	Billa	Type 1	Zone B	Speiser 1933: Pl.71
	95	Mohammed Arab	Type 2	Zone B	Roaf 1983:Fig.4-03
	96	Mohammed Arab	Type 2	Zone B	Killick in press: Fig.7-3
	97	Mohammed Arab	Type 1	Zone B	Killick in press: Fig.7-12
		Nineveh	Type 2	Zone B	Thompson and Hamilton 1932: Pl.60-3,7
		Billa	Type 2	Zone B	Speiser 1933: Pl.70
	98	Nineveh	Type 2	Zone B	Thompson and Hamilton 1932: Pl.60-8
	99	Mohammed Arab	Type 2	Zone B	Killick in press: Fig.7-4
	100	Nineveh	Type 1	Zone B	Thompson and Hamilton 1932: Pl.58-12
Similar example		Billa	Type 3	Zones B,C	Speiser 1933: Pl.71
	101	Mohammed Arab	Type 1	Zone B	Killick in press: Fig.7-15
	102	Thuwaij	Type 1	Zone B	Numoto in press: Fig.21-30
	103	Billa	Type 2	Zone B	Speiser 1933: Pl.70
	104	Mohammed Arab	Type 1 or 2	Zone B	Killick in press: Fig.7-7
	105	Nineveh	Type 1 or 2	Zone B	Thompson and Mallowan 1933: Pl.62-9
Group 7b	106	Billa	Type 3	Zone B	Speiser 1933: Pl.53-1
	107	Billa	Type 2	Zone B	Speiser 1933: Pl.70
	108	Nineveh	Type 2	Zone B	Thompson and Hamilton 1932: Pl.60-15
	109	Mohammed Arab	Type 1	Zone B	Killick 1986: Fig.4-9
	110	Billa	Type 2	Zone B	Speiser 1933: Pl.50-2
	111	Billa	Type 2	Zone B	Speiser 1933: Pl.70
	112	Billa	Type 3	Zone B	Speiser 1933: Pl.71
Group 8a	113	Jigan	Type 1 or 2	Zone B	Ii and Kawamata 1984/85: Fig.31-4
	114	Jigan	Type 1	Zone B	Ii and Kawamata 1984/85: Fig.31-6
	115	Jigan	Type 1	Zone B	Numoto 1992b: Fig.6-61
	116	Jigan	Type 1 or 2	Zone B	Ii and Kawamata 1984/85: Fig.24-76
	117	Leilan	Type 3	Zone B	Schwartz 1988: Fig.39-1
	118	Jigan	Type 1 or 2	Zone B	Ii and Kawamata 1984/85: Fig.24-70
	119	Mohammed Arab	Type 1	Zone B	Killick in press: Fig.8-7
		Mohammed Arab			Roaf and Killick 1987: Fig.5
	120	Mohammed Arab	Type 1	Zone B	Killick in press: Fig.8-9
	121	Nineveh	Type 2	Zone B	Thompson and Mallowan 1933: Pl.62-2,3
Similar examples		Nineveh	Type 1 or 2	Zone B	Thompson and Hamilton 1932: Pl.60-4,5,10,14
	122	Mohammed Arab	Type 1	Zone B	Killick in press: Fig.8-8
Similar examples		Billa	Type 2	Zone B	Speiser 1933: Pl.70
		Nineveh	Type 2	Zone B	Thompson and Mallowan 1933: Pl.62-13
	123	Jigan	Type 3	Zone B	Numoto 1992b: Fig.3-37
	124	Mohammed Arab	Type 3	Zone B	Roaf 1983:Fig.4-07
Group 8b	125	Billa	Type 2	Zone B	Speiser 1933: Pl.71
	126	Thuwaij	Type 1(large size)	Zone B	Numoto in press: Fig.28-120
	127	Mohammed Arab			Roaf and Killick 1987: Fig.5
	128	Jigan	Type 2	Zone B	Ii and Kawamata 1984/85: Fig.31-3
	129	Mohammed Arab	Type 1	Zone B	Killick 1986: Fig.4-10
		Nineveh	Type 2	Zone B	Thompson and Hamilton 1932: Pl.60-41
Similar example		Chagar Bazar	Type 3	Zone B	Mallowan 1936: Fig.19-1
	130	Mohammed Arab	Type 3	Zone B	Killick 1986: Fig.4-5
Group 8c	131	Mohammed Arab	Type 1	Zone B	Killick in press: Fig.8-10
	132	Billa	Type 1 or 2	Zone B	Speiser 1933: Pl.71
	133	Yarimjah	Type 3	Zone B,C	Thompson and Mallowan 1933: Pl.58
	134	Mohammed Arab	Type 2	Zone B	Killick in press: Fig.8-4
		Jigan	Type 2	Zone B	Numoto 1992b: Fig.3-36
	135	Jigan	Type 2	Zone B	Ii and Kawamata 1984/85: Fig.31-2
Similar example		Billa	Type 2	Zone B	Speiser 1933: Pl.70
	136	Jigan	Type 2	Zone B	Ii and Kawamata 1984/85: Pl.24-65
	137	Jigan	Type 2	Zone B	Ii and Kawamata 1984/85: Pl.24-63
	138	Mohammed Arab	Type 3	Zone B	Killick 1986: Fig.4-4
Similar example		Billa	Type 3		Speiser 1933: Pl.71
Group 8d	139	Jigan	Type 1 or 2	Zone B	Ii and Kawamata 1984/85: Pl.24-71
	140	Billa	Type 1	Zone B	Speiser 1933: Pl.71
	141	Nineveh	Type 2	Zone B	Thompson and Mallowan 1933: Pl.62-21
	142	Billa	Type 1	Zone B	Speiser 1933: Pl.71
	143	Leilan	Type 3	Zone B	Schwartz 1988: Fig.41-1
	144	Nineveh	Type 2	Zone B	Thompson and Mallowan 1933: Pl.62-19
	145	Jigan	Type 2	Zone B	Ii and Kawamata 1984/85: Fig.31-1
	146	Mohammed Arab	Type 3	Zones B,C	Roaf 1983: Pl.2-94
	147	Jigan	Type 2(Foot)	Zone D	Ii and Kawamata 1984/85: Pl.24-82
	148	Mohammed Arab	Type 1	Zone B	Killick in press: Fig.8-5
	149	Jigan	Type 1 or 2	Zone B	Ii and Kawamata 1984/85: Pl.24-68
	150	Mohammed Arab			Roaf and Killick 1987: Fig.5
	151	Mohammed Arab	Type 3	Zones B,C	Roaf 1983: Fig.4-11
	152	Mohammed Arab	Type 3	Zones B,C	Killick in press: Fig.8-3
Group 8e	153	Nineveh	Type 3	Zones A to D	Thompson and Hamilton 1932: Pl.55-5

point of these specimens is that many vertical design elements are arranged.

Group 8: The design pattern is composed of excised motifs (thick gouged motif), which is generally called "panel design" [Thompson and Mallowan 1933]. They are roughly classified into five types (Groups 8a, 8b, 8c, 8d, 8e). The characteristic feature within these types of design patterns is that a space between two excised motifs are always filled with fine incisions, such as vertical lines, slanting lines, horizontal lines, herringbone, feather, stitch-like lines. Furthermore, most of the specimens with panel designs on Zone B of carinated bowls have "sub-design element" on the upper side, or both sides of the panel design.

8a. This excised design pattern is the most common in the Late Incised and Late Excised Period. Most of the design compositions are basically vertical excised motifs repeated successively (Nos. 113–118, 120–124). Only one specimen has combination of slanting excised motifs (No. 119).

All of these specimens have designs on Zone B, and most of these designs are combined with "sub-design element" (Nos. 113–124). With regard to the characteristics of types of "sub-design element", motifs of zigzag line, dotted line and feather band are numerous, and notched band are rarely found.

8b. This design pattern is basically the same as Group 8a pattern. The design compositions are: Zone B is divided into two to four small horizontal zones, and vertical or slanting excised motifs are arranged successively in the small zones (Nos. 125–130).

Many specimens of this pattern are found on Zone B of medium-to large-sized bowls and jars, since the specimens of Zone B with wide space can easily divided into small zones. It is assumed that this design pattern is not suitable for specimens of small-sized vessels or Zone B of narrow width. It is the same in painted designs [Numoto 1991; 1992a].

8c. This excised design pattern is composed of vertical excised motifs and horizontal excised motifs (Nos. 131–138). The design compositions are sub-divided into following three types:

1. A vertical excised motif and a horizontal excised motif are placed alternately right to left, and up to down (Nos. 131–133). In the case of specimen No. 131, two or three excised motifs make one design unit. Design of specimen No. 132 covers densely all the space of Zones B and C of a jar.
2. This excised design pattern is characterized by the ladder-like motif. The design composition is that two horizontal excised motifs are arranged on the space between two vertical excised motifs, and they are repeated successively (No. 134).
3. The design pattern is a panel pattern composed of two types of excised panel: one panel with four or five vertical excised motifs and another panel with four or five horizontal excised motifs are placed alternately (Nos. 135–138, 152B). Design pattern of specimen No. 152Ca is also common to this pattern. These panel patterns are also mainly found on medium-to large-sized bowls and jars. The reason for this is identical with that of Group 8b pattern discussed above.

8d. The design composition of this group is that a panel with vertical excised motifs and a panel with incised motifs are placed alternately right to left. There are many examples that one unit consists of three to five vertical excised motifs (Nos. 139–145, 152Cb). Some specimens with one vertical motif are also found (Nos. 148, 150, 151).

As specimen No. 143 came from Tell Leilan period IIIc, it is thought to have belonged to the Early Excised Period; but the features of this excised design are very similar to those of the Late Incised and Late Excised Period. Consequently, this specimen is included in this group. This panel pattern is characterized by the combination of a panel with notched band motifs and a panel with vertical excised motifs. There is no example similar to this panel pattern. This may indicate a characteristic feature of chronological difference or a regional variation.

Design layout of specimen No. 148, which is identical with that of Group 8b pattern, is basically a horizontal division. The whole design layout of specimen No. 151 closely resembles that of specimen No. 35 of Group 1e, i.e. the design composition of Zone B is horizontal division, while the Zone C is vertical division.

Design compositions of this group are basically common to that of specimens Nos. 59 and 60 of Group 5 discussed above.

8e. This design pattern is characterized by the engraved motif (No. 153) (Fig. 6, No. 79). There is only one specimen, which came from Nineveh [Thompson and Hamilton 1933: Pl. 55–5]. The design is arranged over the whole surface of the jar. There are very few examples which have designs on Zones A and D in this period. It is, therefore, assumed that this specimen has distinctive feature within the specimens of this period.

The characteristic design composition of this specimen is that Zones B and C are horizontally divided into small zones, and engraved panel motifs and engraved design elements (one element repeated horizontally) are repeated alternately up to down. The design elements of lower part of Zone C and Zone D are thought to be "sub-design element".

4. **The Leilan Period IIId** (Fig. 4)

This period is regarded to be chronologically parallel to the Late Incised and Late Excised Period [Roaf and Killick 1987]. As this has not been confirmed by stratigraphical excavations, it is not clear how this period is related to the Late Incised and Late Excised Period. The present author assumed that this period is a later period than the Late Incised and Late Excised Period based on the pottery and design features, as discussed later.

Specimens examined here were mainly taken from Tell Leilan Period IIId, and the other specimens are from tells at the Khabur and the Mosul Areas. These design patterns are assumed to have been based on those of excised design patterns in the Late Incised and Late Excised Period mentioned above, but their features are slightly different from those of the Late Incised and Late Excised Period.

The design patterns are roughly classified into the excised style and the incised style: the former is combination of excised motif and incised motif (Group 9), the latter is combination of incised motif only (Group 10).

Group 9: The design pattern is composed of excised motifs. They are divided into four types as follows:

9a. The design composition is mainly based on vertical excised motifs, which is identical with those of Groups 8a and 8b patterns in the Late Incised and Late Excised Period (Nos. 154–164).

The variety of incised design motifs, with which fill the space between two vertical excised motifs, is smaller than that of Groups 8a and 8b patterns. That is, simple incised motifs, such as horizontal, vertical and slanting lines, are commonly found; but motifs, such as feather and herringbone are rarely found. Furthermore, specimens which have "sub-design element" are less than those of Groups 8a and 8b patterns. The whole layout of this design pattern is simpler than those of Group 8 pattern, and it is far from the elaborate design pattern.

9b. The design pattern is composed of thin vertical excised motifs (grooved) (Nos. 165–171). The characteristic feature of design composition is that one unit consisting of several thin vertical excised motifs and another unit consisting of several excised motifs (vertical or horizontal zigzag excised lines, slanting excised band and excised arrow-head motif) are repeated alternately (Nos. 165–169). Among them, the most typical design patterns are specimens Nos. 168 and 169 which are called as "hatched vertical or horizontal zigzag patterns" [Weiss and Calderone in

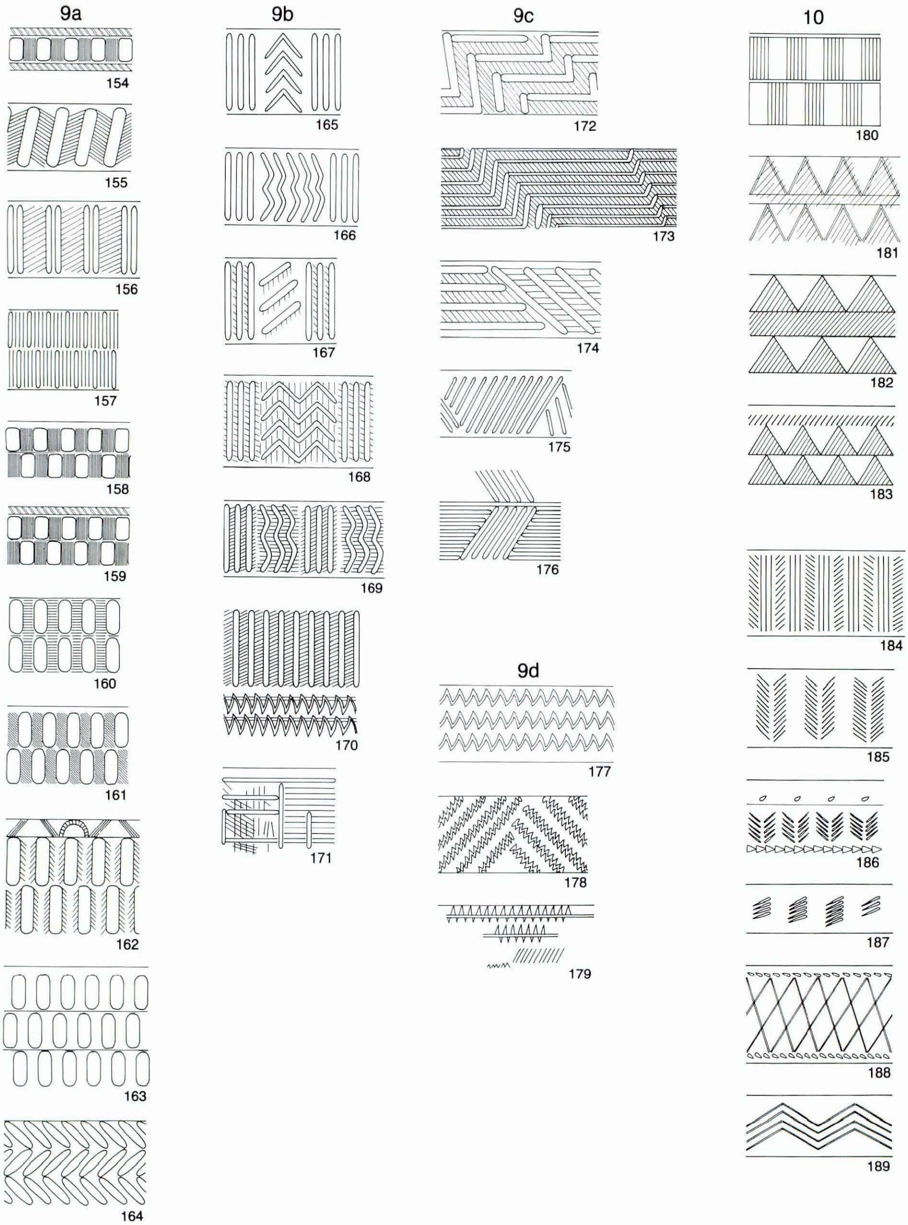

Fig. 4 Incised and Excised Design Patterns of the Leilan Period IIId

Table 4. List of Fig. 4

Group	No.	Site	Type	Zone	Literature
Group 9a	154	Raqa'i	Type 1	Zone B	Curvers and Schwartz 1990: Fig.21-4
		Leilan	Type 1	Zone B	Weiss and Calderone in press: Fig.9-3,4
Similar example		Brak	Type 1	Zone B	Oates 1986: Fig.5-96
	155	Hamidiya	Type 1	Zone B	Eichler et al. 1990: Tafel 33-4,7
	156	Hamidiya	Type 1 or 2	Zone B	Eichler et al. 1990: Tafel 34-32
	157	Hamidiya	Type 1	Zone B	Eichler et al. 1990: Tafel 33-9
	158	Raqa'i	Type 1	Zone B	Curvers and Schwartz 1990: Fig.21-1
		Hamidiya	Type 1	Zone B	Eichler et al. 1990: Tafel 33-8
		Leilan	Type 2	Zone B	Schwartz 1988: Fig.31-11
		Atij	Type 1	Zone B	Fortin 1989: Fig.24
	159	Hamidiya	Type 1 or 2	Zone B	Eichler et al. 1990: Tafel 33-2
Similar examples		Hamidiya	Type 1 or 2	Zone B	Eichler et al. 1990: Tafel 33-12
		Arbit	Type 2	Zone B	Mallowan 1937: Fig.25-5
		Leilan	Type 1 or 2	Zone B	Schwartz 1988: Fig.31-14
	160	Leilan	Type 1	Zone B	Weiss and Calderone in press: Fig.9-1
	161	Leilan	Type 1	Zone B	Weiss and Calderone in press: Fig.9-2
	162	Brak	Type 1	Zone B	Oates 1986: Fig.5-97
	163	Leilan	Type 1 or 2	Zone B	Schwartz 1988: Fig.31-154
		Hamidiya	Type 1	Zone B	Eichler et al. 1990: Tafel 33-6,10
Similar example		Atij	Type 1	Zone B	Fortin 1989: Fig.24
	164	Leilan	Type 2	Zone B	Schwartz 1988: Fig.32-2
Group 9b	165	Leilan	Type 2	Zone B	Schwartz 1985: Fig.6-3
		Hamidiya	Fragment		Eichler et al. 1990: Tafel 34-29
	166	Leilan	Type 1	Zone B	Weiss and Calderone in press: Fig.9-8
	167	Hamidiya	Type 1	Zone B	Eichler et al. 1990: Tafel 33-5
	168	Leilan	Type 1	Zone B	Schwartz 1988: Fig.31-5
		Leilan	Type 2	Zone B	Weiss and Calderone in press
	169	Leilan	Type 1 and 2	Zone B	Schwartz 1988: Fig.31-2,4,7
		Brak	Type 2	Zone B	Oates 1986: Fig.5-95
		Hamidiya	Type 1 or 2	Zone B	Eichler et al. 1990: Tafel 33-15,16
		Raqa'i	Type 1 and 2	Zone B	Curvers and Schwartz 1990: Fig.21-8,9
		Thuwaij	Type 3	Zone B	Numoto in press: Fig.20-13
	170	Billa	Fragment		Speiser 1933: Pl.71
	171	Raqa'i	Type 1	Zone B	Curvers and Schwartz 1990: Fig.21-17
Group 9c	172	Arbit	Type 2	Zone B	Mallowan 1937: Fig.25-4
		Atij	Type 2	Zone B	Fortin 1989: Fig.24
		Hamidiya	Type 1 or 2	Zone B	Eichler et al. 1990: Tafel 33-11
		Raqa'i	Type 2	Zone B	Curvers and Schwartz 1990: Fig.21-6
		Brak	Type 1 or 2	Zone B	Oates 1986: Pl.3
	173	Mohammed Arab	Type 2	Zone B	Killick 1986: Fig.4-7
	174	Raqa'i	Type 2	Zone B	Curvers and Schwartz 1990: Fig.21-2
	175	Raqa'i	Type 1 or 2	Zone B	Curvers and Schwartz 1990: Fig.21-3
	176	Thuwaij	Fragment		Numoto in press: Fig.20-18
Group 9d	177	Leilan	Type 3	Zone B	Weiss and Calderone in press: Fig.9-5
	178	Thuwaij	Type 3	Zone B	Numoto in press: Fig.20-19
	179	Mohammed Arab	Type 2	Zone B	Killick in press: Fig.7-6
Group 10	180	Atij	Type 1	Zone B	Fortin 1989: Fig.24
	181	Raqa'i	Type 3	Zone B	Curvers and Schwartz 1990: Fig.21-12
	182	Atij	Type 3	Zone B	Fortin 1989: Fig.24
	183	Leilan	Type 1	Zone B	Weiss and Calderone in press: Fig.9-12
	184	Raqa'i	Type 3	Zone B	Curvers and Schwartz 1990: Fig.21-16
	185	Atij	Type 1	Zone B	Fortin 1989: Fig.24
	186	Jigan	Type 2	Zone B	Numoto 1992: Fig.1-9
	187	Jigan	Type 2	Zone B	Numoto 1992: Fig.1-8
	188	Jigan	Type 1 or 2	Zone B	Numoto 1992: Fig.1-16
	189	Atij	Type 2	Zone B	Fortin 1989: Fig.24

press]. These design patterns have scratched incisions between the excised motifs. On the other hand, design patterns of specimens Nos. 165 and 166 are composed of excised motifs only, which are regarded as the older style than that hatched zigzag pattern [Ibid].

Most of these specimens were found at the Khabur Area, but some specimens were found at tells of the Eski-Mosul Area[7]. Specimen No. 170 came from level 6 of Tell Billa, and its design pattern is composed of thin vertical motifs and horizontal zigzag excised lines. This design composition is basically common to that of Group 9a.

9c. The design pattern is composed of a horizontal excised motif and a slanting excised motif (Nos. 172–176). The most common and typical are specimens Nos. 172 and 173, and their design patern is generally called "lined zigzag or step pattern" [Schwartz 1988]. Specimen No. 173 came from Tell Mohammed Arab Period 3 (the Late Incised and Late Excised Period). Its design is more elaborate than those of the specimens from the Khabur Area (No. 172). The most characteristic feature of this design pattern is that designs are densely arranged all over the Zone B, as if filling a blank space. This is assumed to be one of the rule governing the arrangement of the designs in this period. The composition of this design pattern is completely different from those of the horizontal belt patterns and panel patterns. It is, therefore, concluded that this design pattern is a peculiar to this period.

The common feature to both Groups 9b and 9c is that there are few specimens with "sub-design element", because most of these design patterns are not divided into horizontally like those of Group 9a. With regard to the rules governing the arrangement of designs, no strict rules are found in comparison with those of Groups 8 and 9a.

Similar examples to this design composition (as a prototype of this design pattern) are not found in the specimens of the Painted and Early Incised Period. Judging from this, it is presumed to be a new design pattern first appearing in this period.

9d. The design pattern is composed of excised or incised zigzag lines (Nos. 177–179). Designs of specimens Nos. 177 and 178 are found on Zone B of jars. The design layout of specimen No. 177 is basically a horizontal, while specimen No. 178 is basically a slanting design.

Group 10: The design pattern is composed of incised motifs only. They are roughly classified into two types as follows:

10a. The design composition is that Zone B is horizontally divided into small zones and one or two different elements are arranged successively in the small zones (Nos. 180–183). This design composition is identical with that of Group 7a in the Late Incised and Late Excised Period. In the case of design pattern of specimen No. 180, a panel consisting of vertical lines and a blank panel are repeated alternately. This pattern is similar to those of specimens Nos. 158 to 162 of Group 9a.

10b. There are two types of design patterns: one is a vertical incised element repeated successively (Nos. 184–187); the other is an incised element repeated horizontally in the form of a belt (Nos. 188, 189). All of the incised elements found in these specimens have simple style.

The design composition of specimen No. 186 closely resembles that of specimen No. 92 of Group 7a in the Late Incised and Late Excised Period. However, such characteristic of design compositions and incised design elements in this group are not found in those of the Late Incised and Late Excised Period. Among these specimens, it has been proved by stratigraphical excavations that specimens Nos. 186 to 188, which came from levels 4 and 5 of Tell Jigan Area C [Numoto 1992b], can be placed in the later period than the Late Incised and Late Excised Period. However, it is not clear whether these specimens belong to the same period as those of the Khabur Area.

5. Taya Period IX (Leilan Period II) (Fig. 5)

Late Incised Ninevite 5 ware is presumed to have turned into Incised Taya IX ware [Roaf and Killick 1987: 224]. Specimens examined here were mainly taken from tells in the Mosul Area. Most of the incised designs are found on jars (Types 3, 4), while bowls with incised designs are very few.

Compared with the Late Incised and Late Excised Period, the shapes of each type of vessel (Types 1–4) changed greatly (Fig. 6). For example, the shape of bottom of carinated bowl had changed into flat style, and all of the bowls (Type 2) have no foot on their bottoms, i.e. their shape of bottoms are always flat.

Similarly, the features of positions of incised designs in each vessel (Types 1–4) are different from those of previous period. For example, incised designs of bowls are always found only in their upper part of Zone B. In the case of the incised designs of jars, there are very few examples in previous period which have designs in Zone A. In this period, however, there are many specimens which have designs in Zone A.

The most characteristic point of the design patterns in this period is that excised motifs, which are used as a main design element of design patterns in the previous period, are not found.

The most common and characteristic incised design element found in this period is a combing motif (motifs incised or combed with a comb-like tool). The majority of the incised design compositions are basically a horizontal belt patterns (compositions of one element repeated horizontally) mentioned below.

Group 11: The compositions of incised designs are sub-divided into seven types based on the differences of varieties and combinations of incised design elements (one element repeated horizontally) as follows:

11a. This design pattern is the most simple style among the design patterns of Group 11 which is mainly composed of horizontal linear motifs. There are three types of design patterns: 1. combinations of double horizontal dotted lines or double horizontal waving dotted lines (Nos. 190, 191); 2. combination of a feather-like motif (No. 192); 3. composition of repetition of circular motif (No. 193).

These designs are mainly found in the upper part of Zone B (upper part of rim) of small bowls and in the space between neck and shoulder of small-to medium-sized jars. Accordingly, there are large blank spaces always found on the bodies of these vessel (most of these vessels are plain ware).

11b. There are two types of design patterns: one is composed of a notched band only (No. 194); the other is composed of a notched band and combing dots motif which is assumed to be incised by piecing with a comb-like tool. (Nos. 195, 196).

11c. This design pattern is characterized by a motif, which has a design unit consisting of four or five horizontal short lines, repeated successively (Nos. 197–199). This motif is assumed to have been incised with a comb-like tool.

As design patterns of specimens Nos. 198 and 199 are composed of notched bands, their design compositions are basically the same as those of specimens Nos. 195 and 196 of Group 11b.

11d. This design pattern is composed of horizontal combing lines and horizontal combing wavy lines (Nos. 200–203). The design composition is identical with that of Group 7a in the Late Incised and Late Excised Period. This design is mainly found in Zone A of jars. In this group, simple combing lines with specimen No. 203 shows old features compared with other specimens.

11e. The design pattern is composed of combing lines and notched bands (Nos. 204–206). Specimens with combing lines are mostly found in large-sized jars.

11f. This design pattern has multiple-lined chevron motif (multiple zigzag lines). There are two types: one with multiple zigzag lines only (No. 207); the other with combinations of multiple zigzag lines and horizontal design elements (Nos. 208, 209). The design compositions are identical with those of Group 7a. Design patterns of this group are simplified relative to those of Group 11g specimens, and show the old features[8)].

11g. This design pattern has triangle motifs filled with slanting lines (Nos. 210–213). All of these design patterns are found on large-sized jars.

Most of the design patterns of Groups 11c, 11d, 11e, 11f and 11g are found on jars. This indicates that these design patterns are not suitable for bowls or small-sized vessels.

Group 12: The design patterns are classified into panel patterns (Nos. 214, 215D) and design patterns which have combinations of lozenge motifs filled with lines (Nos. 216, 217). The former pattern has only two specimens: design pattern of specimen No. 214 is based on two types of design elements repeated alternately; and specimen No. 215D, which is a part of pedestal of a footed bowl, has a combination of

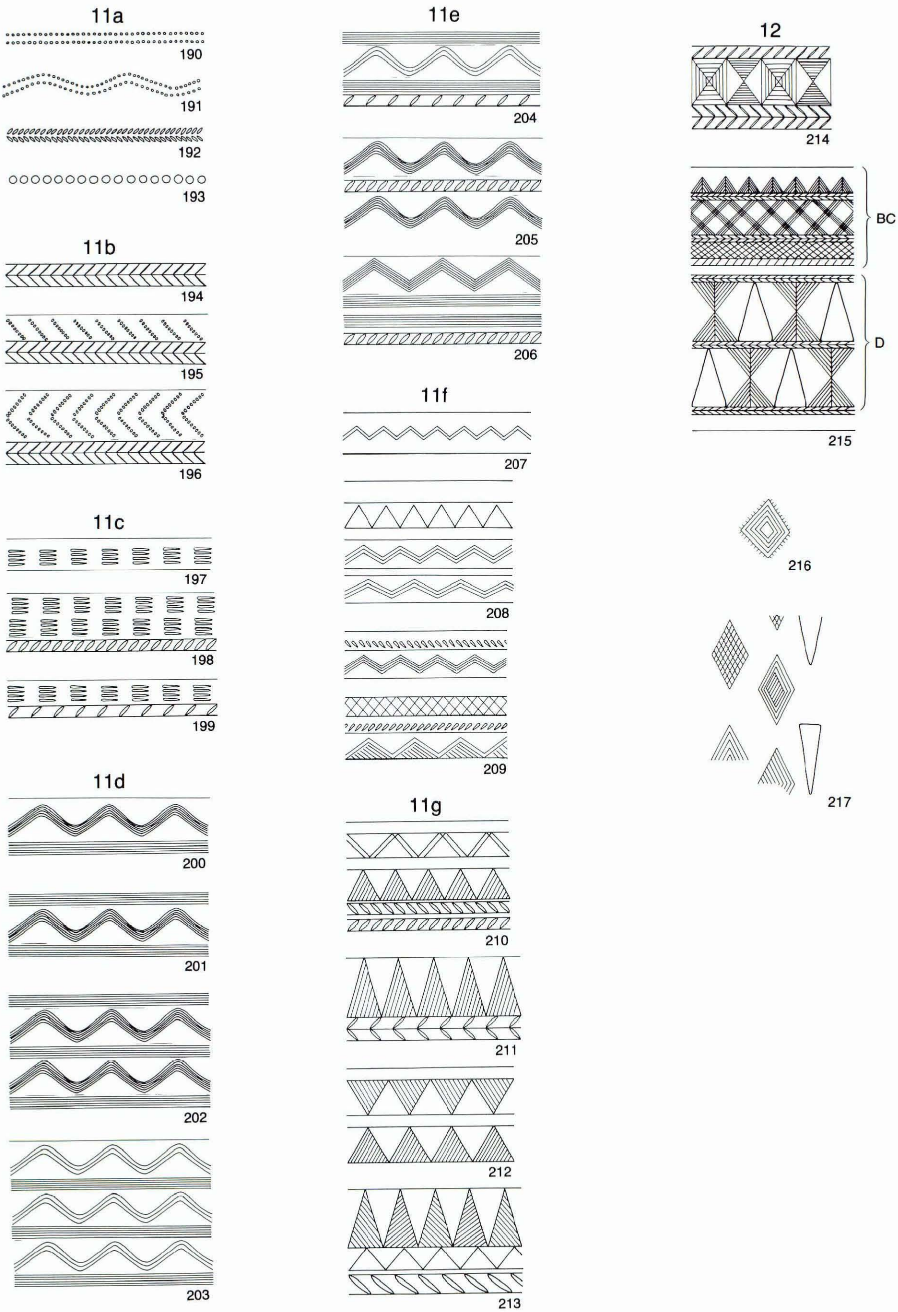

Fig. 5 Incised Design Patterns of the Taya IX Period

Table 5. List of Fig. 5

Group	No.	Site	Type	Zone	Literature
Group 11a	190	Jigan	Types 1 and 3	Zone B	Ii and Kawamata 1984/85: Figs.20-1,22-5,27-3,11
	191	Jigan	Type 1	Zone B	Ii and Kawamata 1984/85: Fig.27-2
	192	Fisna	Types 1 and 3	Zone B	Numoto 1988: Figs.22-164,24-188,41-2
	193	Taya	Type 1 or 3	Zone B	Reade 1968: Pl.84-13
Group 11b	194	Taya	Type 2	Zone B	Reade 1968: Pl.84-9
		Fisna	Types 1 and 3	Zone B	Numoto 1988: Figs.24-186,195,42-7,8
	195	Taya	Type 1 or 3	Zone B	Reade 1968: Pl.84-12
Similar examples		Jigan	Type 1 or 3	Zone B	Ii and Kawamata 1984/85: Fig.10-140
		Billa	Type 1 or 3	Zone B	Speiser 1933: Pl.54-8
	196	Fisna	Type 4	Zone B	Numoto 1988: Fig.24-196
		Hawa	Fragment		Ball et al. 1989: Fig.22-7
Group 11c	197	Taya	Type 3 or 4	Zone B	Reade 1968: Pl.84-3
	198	Fisna	Type 3	Zone B	Numoto 1988: Fig.24-187
	199	Fisna	Type 4	Zone B	Numoto 1988: Fig.24-189-191,197,200
Group 11d	200	Jigan	Type 4	Zone B	Ii and Kawamata 1984/85: Fig.10-139
	201	Fisna	Type 4	Zone B	Numoto 1988: Fig.24-198
		Hawa	Type 4	Zone B	Ball et al. 1989: Fig.22-2,6
	202	Taya	Type 4	Zone B	Reade 1968: Pl.85-20
Similar example		Hawa	Type 4	Zone B	Ball et al. 1989: Fig.22-8
	203	Jigan	Type 4	Zones A,B	Ii and Kawamata 1984/85: Figs.10-166,25-8
Group 11e	204	Fisna	Type 4	Zone B	Numoto 1988: Fig.24-201
Similar example		Hawa	Type 4	Zone B	Ball et al. 1989: Fig.22-5
	205	Fisna	Type 4	Zone B	Numoto 1988: Fig.24-202
Similar examples		Fisna	Type 4	Zone B	Numoto 1988: Fig.24-199
		Hawa	Type 4	Zone B	Ball et al. 1989: Fig.22-1,3
	206	Taya	Type 4	Zone B	Reade 1968: Pl.84-2
Similar example		Jigan	Type 4	Zone B	Ii and Kawamata 1984/85: Fig.11-173
Group 11f	207	Jigan	Type 3	Zone B	Ii and Kawamata 1984/85: Figs.20-10,21-7
	208	Jigan	Type 4	Zones A,B	Ii and Kawamata 1984/85: Fig.10-167
Similar example		Jigan	Type 3	Zones A,B	Ii and Kawamata 1984/85: Fig.22-4
	209	Fisna	Type 4	Zones A,B	Numoto 1988: Fig.21-134
Group 11g	210	Jigan	Type 4	Zones A,B	Ii and Kawamata 1984/85: Fig.11-170
	211	Taya	Type 4	Zone B	Reade 1968: Pl.84-1
		Billa	Type 4	Zone B	Speiser 1933: Pl.55-4
	212	Fisna	Type 4	Zone B	Numoto 1988: Fig.24-204
	213	Fisna	Type 4	Zone B	Numoto 1988: Fig.24-205
Group 12	214	Taya	Fragment		Reade 1968: Pl.84-4
	215	Taya	Bowl with pedestal	Zones B,C,D	Reade 1973: Pl.75-b
	216	Fisna	Type 3	Zone B	Numoto 1988: Fig.43-27
	217	Jigan	Potstand		Ii and Kawamata 1984/85: Fig.11-172

vertical incised motifs and triangular openings arranged alternately[9]. The latter pattern has also only two specimens: specimen No. 216 has only one incised design element on its shoulder (Zone B) of a jar; design pattern of specimen No. 217, which is found on a fragment of foot or pedestal, is incised elements arranged irregularly.

In addition to the specimens examined above, six specimens of paticular incised design have been reported from Tell Jigan Area A [Ii and Kawamata 1984/85: Pl. 34–201–206]. These incised designs are regarded to have been arranged by "cylinder seal"–like tools, and not by incising tools [Ibid: 117]. These design compositions are the same as those of Groups 11f and 11g. All design elements found in these specimens are horizontal belt patterns (one element repeated horizontally) such as triangle filled with slanting lines, notched band, cross-hatched band, lozenges.

VI. The outline of changes of the incised and excised designs

1. Changes of the incised design elements

Here, some points worthy of discussion as mentioned above will be considered.

As for linear (horizontal) design elements, such as impressed triangle, dotted wavy line and herringbone motifs, they are commonly found in the Painted and Early Incised Period and the Early Excised Period, but almost none are found in the Late Incised and Late Excised Period. On the other hand, the linear elements consisting of multiple lines, such as chevron or zigzag lines, are commonly found in the Late Incised and Late Excised Period. Simple motifs, which are common in the Painted and Early Incised Period, are not used as a main design in the whole layout of a vessel in the Late Incised and Late Excised Period.

There are differences between the features of notched bands of the Painted and Early Incised Period and those of the Late Incised and Late Excised Period. The former specimens are always arranged on the top of ridge or rib, and their notches are usually deep; while many of the latter specimens are mainly arranged on a flat surface, and their notches are more shallow than those of the former specimens, and their shapes are scratched. This suggests that incised design elements have changed according to the transition in the shape of the vessels.

As for figure motifs (triangle, lozenge, butterfly), it seems that the motif of triangles filled with many dots in the Painted and Early Incised Period has turned into ones filled with a column-dots or dashes in the Early Excised Period [Schwartz 1988: 49]. And then, in the Late Incised and Late Excised Period, it is presumed to have varied to the triangles filled with slanting lines. As a rule, most of the figure motifs of the Painted and Early Incised Period are commonly filled with many dots, while most of the Late Incised and Late Excised Period are filled with slanting lines.

The majority of the incised design elements of Taya IX Period are similar to those of the Late Incised and Late Excised Period, it is, therefore, concluded that the style of these elements are thought to have succeeded to those of the Late Incised and Late Excised Period. The most common incised design element within Taya IX Period is a combing wavy line. Although this element is not found in the Late Incised and Late Excised Period, similar type to this element is thought to be multiple zigzag line. Generally speaking, the multiple zigzag line is assumed to have evolved to the combing wavy line.

Other characteristic design element in Taya IX Period is a large rope-like notched band which is usually found on the ridge of shoulders of jars. Similar examples to this design element are found in potstands of the Painted and Early Incised period and the Late Incised and Late Excised Period (Fig. 6, Nos. 89, 90). This suggests that the occurrence of this design element can date back to the Ninevite 5 Period.

2. Changes and common features of the layout of incised and excised designs of each type of ware (Fig. 6)

The present author has made the genealogical diagram (Fig. 6) using samples which mainly show the whole layout of incised and excised designs. As has already been mentioned before, it is not clear whether the relationships have existed between excised wares of the Late Incised and Late Excised Period and of Tell Leilan Period IIId.

All the design patterns of each type of ware (Types 1–4) are classified into horizontal belt patterns and panel patterns. Horizontal belt patterns of the Painted and Early Incised Period had been succeeded upto Taya IX Period. Panel patterns consist of incised design only in the Painted and Early Incised Period, while in the Late incised and Late Excised Period, they are classified into two types: one is composed of incised design only, the other is combinations of incised and excised designs.

The discussion here mainly concerns the features and changes of the incised and excised designs of Types 1 to 4 vessels, each of which is listed and described in due course.

Type 1 (carinated bowl): This type of bowl has no carination on its body, which are commonly found in and after the Early Excised Period. Most of the designs are arranged only in Zone B throughout those periods. Design patterns of Groups 1 to 4 found in Type 1 vessel of the Painted and Early Incised Period are the same as those of Types 2 and 3 vessels in the same period. There is no peculiar design pattern found in Type 1. On the other hand, most of the vertical grooved patterns (Group 5) of the Early Excised Period are mainly found in Type 1 vessel (Nos. 13, 14). It is, therefore, assumed that this design pattern is one of the peculiar design patterns in this vessel type. Design patterns of the Late Incised and Late Excised Period (Groups 7, 8, Nos. 15–24) are also identical with those of Types 2 and 3 vessels of the same period. However, it is assumed that vessel of Type 1 is too small to arrange elaborate designs comparing with those of Types 2 and 3 vessels, there are very few specimens with elaborate design found

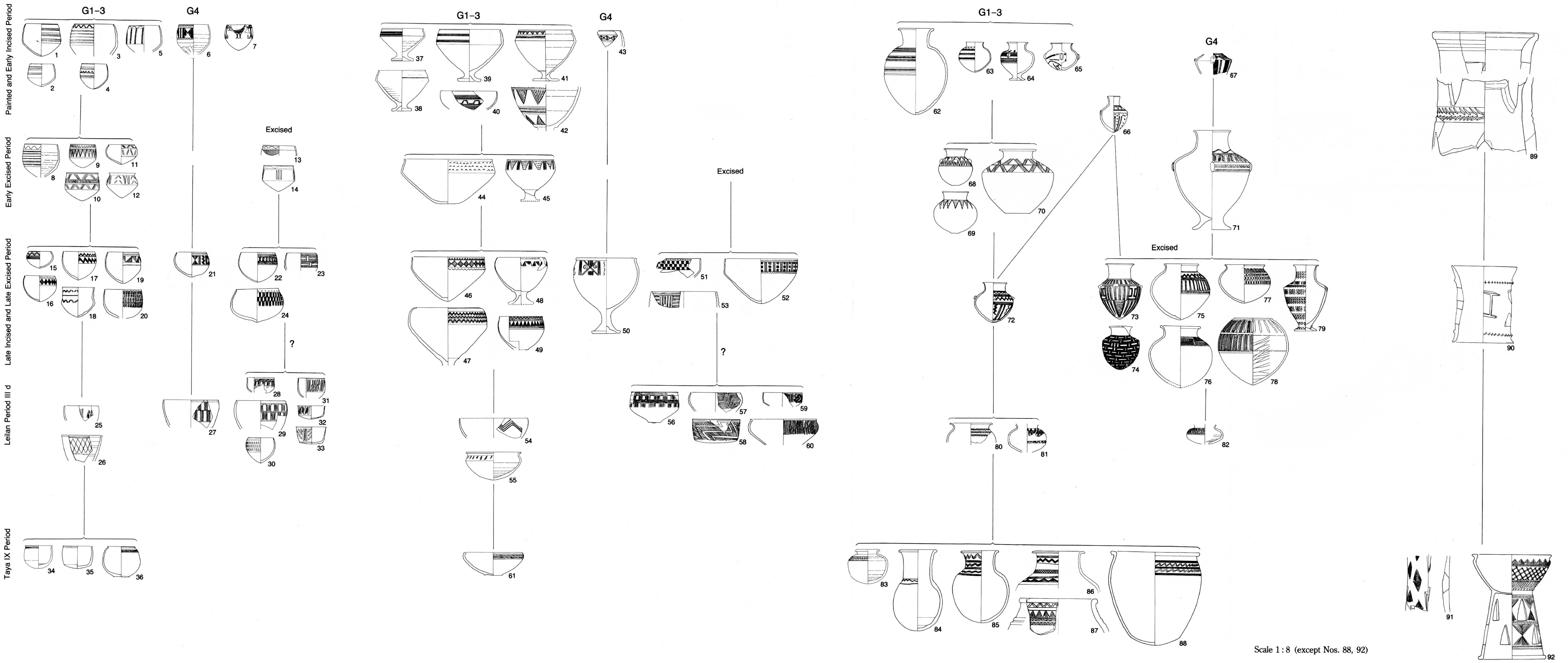

Fig. 6 Changes of the Design Patterns of Incised Excised Wares

Table 6. List of Fig. 6

No.	Site	Type	Measurements(cm)	Literature
1	Kutan	Type 1, Incised	RD: 9.8	after Forest 1987: Fig.9
2	Rijim	Type 1, Incised	RD: 7.1	after Bielinski in press Fig.11-12
3	Thalathat	Type 1, Incised	RD: 11.8	after Fukai et al. Pl.47-9
4	Nineveh	Type 1, Incised	RD: 7.8	after Thompson and Hamilton 1932: Pl.58-11
5	Rijim	Type 1, Incised	RD: 8.8	after Bielinski 1987: Fig.4
6	Fisna	Type 1, Incised	RD: 9.0	Numoto 1988: Fig.19-97
7	Nineveh	Type 1, Incised	RD: 9.3	after Thompson and Hamilton 1932: Pl.58-16
8	Thuwaij	Type 1, Incised	RD: 10.0	Numoto in press: Fig. 23-69
9	Chagar Bazar	Type 1, Incised	RD: 7.2	after Mallowan 1936: Fig.18-1
10	Leilan	Type 1, Incised	RD: 9.5	after Schwartz 1988: Fig.39-4
11	Leilan	Type 1, Incised	RD: 8.0	after Schwartz 1988: Fig.32-12
12	Leilan	Type 1, Incised	RD: 8.0	after Schwartz 1988: Fig.40-4
13	Thuwaij	Type 1, Excised	RD: 9.7	Numoto in press: Fig. 23-78
14	Leilan	Type 1, Excised	RD: 8.8	after Schwartz 1988: Fig.39-7
15	Billa	Type 1, Incised	RD: 6.8	after Speiser 1933: Pl.52-1
16	Mohammed Arab	Type 1, Incised	RD: 9.0	after Killick in press: Fig.7-9
17	Mohammed Arab	Type 1, Incised	RD: 9.5	after Roaf 1983: Fig.4-02
18	Billa	Type 1, Incised	RD: 9.6	after Speiser 1933: Pl.52-7
19	Mohammed Arab	Type 1, Incised	RD: 9.2	after Killick in press: Fig.7-12
20	Mohammed Arab	Type 1, Incised	RD: 11.0	after Killick in press: Fig.7-15
21	Mohammed Arab	Type 1, Incised	RD: 9.0	after Killick 1986: Fig.4-9
22	Mohammed Arab	Type 1, Excised	RD: 10.0	after Killick in press: Fig.8-9
23	Mohammed Arab	Type 1, Excised	RD: 9.0	after Killick in press: Fig.8-10
24	Mohammed Arab	Type 2, Excised	RD: 9.8	after Killick 1986: Fig.4-10
25	Atij	Type 1, Incised	RD: 10.0	after Fortin 1989: Fig.24
26	Jigan	Type 1, Incised	RD: 11.7	Numoto 1992b: Fig.1-16
27	Atij	Type 1, Incised	RD: 16.5	after Fortin 1989: Fig.24
28	Leilan	Type 1, Excised	RD: 8.0	after Weiss and Calderone in press: Fig.9-4
29	Raqa'i	Type 1, Excised	RD: 15.0	after Curvers and Schwartz 1990: Fig.21-1
30	Hamidiya	Type 1, Excised	RD: 7.5	after Eichler et al. 1990: Tafel 33-6
31	Leilan	Type 1, Excised	RD: 8.0	after Weiss and Calderone in press: Fig.9-8
32	Hamidiya	Type 1, Excised	RD: 8.0	after Eichler et al. 1990: Tafel 33-4
33	Hamidiya	Type 1, Excised	RD: 9.0	after Eichler et al. 1990: Tafel 33-5
34	Fisna	Type 1, Incised	RD: 8.1	Numoto 1988: Fig.41-2
35	Jigan	Type 1, Incised	RD: 8.8	after Ii and Kawamata 1984/85: Fig.20-1
36	Taya	Type 1, Incised	RD: 8.4	after Reade 1968: Pl.84-12
37	Fisna	Type 2, Incised	RD: 12.5	Numoto 1988: Fig.15-13
38	Mohammed Arab	Type 2, Incised	RD: 14.0	after Killick 1986: Fig.4-8
39	Thalathat	Type 2, Incised	RD: 18.7	after Fukai et al. 1974: Pl.49-1
40	Thalathat	Type 2, Incised	RD: 17.0	after Fukai et al. 1974: Pl.49-10
41	Thuwaij	Type 2, Incised	RD: 16.3	Numoto in press: Fig.25-89
42	Thuwaij	Type 2, Incised	MD: 21.2	Numoto in press: Fig.24-87
43	Thalathat	Type 2, Incised		after Fukai et al. 1974: Pl.57-32
44	Leilan	Type 2, Incised	RD: 26.6	after Schwartz 1988: Fig.40-2
45	Chagar Bazar	Type 2, Incised	RD: 14.0	after Mallowan 1936: Fig.18-6
46	Mohammed Arab	Type 2, Incised	RD: 22.0	after Roaf 1983: Fig.4-03
47	Mohammed Arab	Type 2, Incised	RD: 20.0	after Killick 1986: Fig.4-3
48	Mohammed Arab	Type 2, Incised	RD: 14.0	after Killick in press: Fig.7-3
49	Mohammed Arab	Type 2, Incised	RD: 13.0	after Killick in press: Fig.7-4
50	Billa	Type 2, Incised	RD: 18.7	after Speiser 1933: Pl.50-2
51	Nineveh	Type 2, Excised		after Thompson and Hamilton 1932: Pl.60-41
52	Mohammed Arab	Type 2, Excised	RD: 21.8	after Killick in press: Fig.8-4
53	Jigan	Type 2, Excised	RD: 20.0	after Ii and Kawamata 1984/85: Fig.31-2
54	Atij	Type 2, Incised	RD: 21.0	after Fortin 1989: Fig.24
55	Jigan	Type 2, Incised	RD: 16.0	Numoto 1992b: Fig.1-8
56	Arbit	Type 2, Excised	RD: 14.0	after Mallowan 1937: Fig.25-5
57	Atij	Type 2, Excised	RD: 15.0	after Fortin 1989: Fig.24
58	Arbit	Type 2, Excised	RD: 14.0	after Mallowan 1937: Fig.25-4
59	Brak	Type 2, Excised	RD: 12.0	after Oates 1986: Fig.5-95
60	Leilan	Type 2, Excised	RD: 20.0	after Schwartz 1988: Fig.31-7
61	Taya	Type 2, Incised	RD: 17.0	after Reade 1968: Pl.84-9
62	Rijim	Type 3, Incised	MD: 19.2	after Bielinski in press Fig.8-1
63	Nineveh	Type 3, Incised	MD: 12.7	after Thompson and Hamilton 1932: Pl.58-24
64	Thalathat	Type 3, Incised	MD: 10.3	after Fukai et al. 1974: Pl.51-18
65	Thalathat	Type 3, Incised	MD: 10.0	after Fukai et al. 1974: Pl.49-18
66	Kutan	Type 3, Incised	MD: 8.5	after Forest 1987: Fig.9
67	Kutan	Type 3, Incised	MD: 10.8	after Forest 1987: Fig.9
68	Chagar Bazar	Type 3, Incised	MD: 10.2	after Mallowan 1936: Fig.19-2
69	Chagar Bazar	Type 3, Incised	MD: 13.0	after Mallowan 1936: Fig.19-4
70	Leilan	Type 3, Incised	MD: 21.6	after Schwartz 1988: Fig.41-2
71	Leilan	Type 3, Excised	MD: 23.2	after Schwartz 1988: Fig.39-1
72	Mohammed Arab	Type 3, Excised	MD: 11.8	after Roaf 1983: Fig.4-11
73	Mohammed Arab	Type 3, Excised	MD: 12.3	after Killick in press: Fig.8-3
74	Yarimjah	Type 3, Excised	MD: 15.0	after Thompson and Mallowan 1933: Pl.58
75	Mohammed Arab	Type 3, Excised	MD: 18.4	after Roaf 1983: Fig.4-07
76	Mohammed Arab	Type 3, Excised	MD: 19.6	after Killick 1986: Fig.4-4
77	Mohammed Arab	Type 3, Excised	MD: 16.5	after Killick 1986: Fig.4-5
78	Thuwaij	Type 1, Excised	MD: 21.0	Numoto in press: Fig.28-120
79	Nineveh	Type 3, Excised	MD: 16.7	after Thompson and Hamilton 1932: Pl.55-5
80	Leilan	Type 3, Excised	RD: 12.0	after Weiss and Calderone in press: Fig.9-5
81	Raqa'i	Type 3, Incised	MD: 11.5	after Curvers and Schwartz 1990: Fig.21-12
82	Thuwaij	Type 3, Excised	MD: 11.2	Numoto in press: Fig.20-13
83	Fisna	Type 3, Incised	MD: 13.1	Numoto 1988: Fig.42-8
84	Jigan	Type 3, Incised	MD: 15.0	after Ii and Kawamata 1984/85: Fig.20-10
85	Jigan	Type 3, Incised	MD: 17.0	after Ii and Kawamata 1984/85: Fig.25-8
86	Fisna	Type 4, Incised	RD: 16.0	Numoto 1988: Fig.21-134
87	Jigan	Type 4, Incised	RD: 24.7	after Ii and Kawamata 1984/85: Fig.11-170
88	Taya	Type 4, Incised	MD: 56.0	after Reade 1968: Pl.85-20
89	Thuwaij	Potstand	MD: 31.2	Numoto in press: Fig.24-88
90	Mohammed Arab	Potstand	MD: 19.7	after Roaf 1983: Fig.4-04
91	Jigan	Potstand	MD: 13.3	after Ii and Kawamata 1984/85: Fig.11-172
92	Taya	Bowl with pedestal	H: 62.6	after Reade 1973: Pl.75-b

RD: Rim Diameter; MD: Maximum Diameter; H: Height in Type 1 vessel. Within the specimens of Type 1 in Leilan Period IIId, there are few examples which have horizontal belt patterns (Nos. 25, 26) (Group 7a, Nos. 81–91) and panel patterns (No. 27) (Group 7b, Nos. 106–112), which are common in the Late Incised and Late Excised Period. This phenomenon is common to all vessel types of Leilan Period IIId. Specimens of Type 1 vessel of Taya IX Period have only simplified design patterns (Nos. 34–36).

Type 2 (footed bowl): After the Late Incised and Late Excised Period, bowls with no foot nor carination on their bodies had greatly increased. Most of the specimens have designs only in Zone B, throughout those periods. Some specimens which have designs in both Zones B and C are also found (No. 42).

Design patterns (Groups 1–4) found in Type 2 vessel of the Painted and Early Incised Period are the same as those of Types 1, 3 and 4 vessels of the same period. In the Late Incised and Late Excised Period, since the Zone B (upper part of body) in this period is wider than that of the Type 2 vessel of the Painted and Early Incised Period, there are many examples of elaborate panel patterns (Groups 7b, 8c, 8d) (No. 46–52) found in Type 2 vessel compared with those of Type 1 vessel of the same period. This fact shows that Zone B has enough space for incising and excising so that potters could display their incising and excising skills to the full. The same phenomenon is recognized in painted designs [Numoto 1991: 143]. With regard to specimens of Leilan Period IIId (No. 56), excised panel patterns (Group 9a) are mostly found in vessels of Type 2 with upright rim (Zone B), while there are very few specimens in vessels of Type 2 with rounded rim (Zone B). This indicates that gouging of vertical motifs are easier to arrange on upright surface than rounded surface. Furthermore, this suggests that within the same type of vessels, designs are different depends on their shapes.

Type 3 or 4 (lugged jar or large jar): With regard to shapes of jars, there is no great difference between the specimens of the Painted and Early Incised Period and those of the Late Incised and Late Excised Period. Many specimens of Type 3 vessel in the Painted and Early Incised Period have designs only in Zone B, but there are some which have designs in both Zones B and C (Nos. 65–67). Design compositions of Zone C of these specimens are basically a vertical design. There are very few specimens of the Painted and Early Incised Period which have horizontal design patterns on Zone C of Type 3 or 4 vessels. In the Late Incised and Late Excised Period, most of the specimens of Zone C have basically a vertical design patterns with vertical excised motifs (No. 73) (Group 8d, Nos. 146, 151, 152). The common feature to both the Painted and Early Incised Period and the Late Incised and Late Excised Period is: when horizontal belt or panel patterns are found on Zone B, the designs of Zone C are always vertical designs (Nos. 66, 67, 72). This is thought to be one of the rules governing the incising and excising.

In the Early Excised Period, there is no example which has design patterns of Groups 5, 6 and 3 (Fig. 2, Nos. 79, 80) in Types 3 and 4. Specimens of hatched zigzag patterns found in Types 3 and 4 of Leilan Period IIId are fewer than those of Types 1 and 2 (Nos. 31, 57–60).

There are some types of jars, such as bucket shaped large jar (No. 88), newly appeard in Taya IX Period, and the variety of jars became greatly wide compared with the Ninevite 5 Period (previous periods). As mentioned above, there are very few specimens which have designs on Zone A of jars in the Ninevite 5 Period. On the contrary, designs of jars in this period are mainly arranged on Zones A and B, though slightly on Zone C. The majority of the design compositions of jars are horizontal belt patterns (Groups 11c-11g). Besides, designs are often found on large-sized jars (Type 4) in this period.

As mentioned above, there is no peculiar design pattern found to the types of vessels. The design patterns are common in all types of vessel. This indicates that arrangement of incised and excised designs has not so strict rules as that of painted designs which differs according to the difference of vessel types [Numoto 1991; 1992a].

With regard to incised and excised designs of the same type of vessels in different sizes, characteristic features are slightly different from that of painted ware. That is, elaborate painted designs are more found on large-sized vessels than on small-sized vessels [Numoto 1992a: 132], while elaborate incised and excised designs are often found on small-sized vessels. In particular, there are many examples of small-sized jars with elaborate incised and excised designs (Nos. 72–74).

VII. Relationship among incised, excised and painted designs (Fig. 7)

The present author will discuss here whether incised designs were derived from painted designs or suddenly appeared as a new design pattern. Accordingly, first of all, specimens of similar design pattern of painted ware and incised ware in the Painted and Early Incised Period were selected, and then, the differences and common features of design patterns within these specimens were examined.

The relationship of incised, excised and painted designs are briefly summarized in Fig. 7. Incised ware is not thought to have existed in the Transitional Period. Incised ware is assumed to have belonged to the Intermediate Period, but it has not been confirmed yet. It may be noted that the Intermediate Period has been established by the present author [Numoto 1991].

Painted design patterns of the Transitional Period have been classified into five patterns (P1–P5) in the last issue but one by the present author, as follows [Ibid]:

P1. One element repeated successively.

P2. One element drawn horizontally in the form of a belt.

P3. Zone B being divided into two or three small horizontal zones, and one or three different elements being drawn successively in the small zones.

P4. A pattern assumed to comprise two or three design elements and units drawn alternately.

P5. A pattern of panel design by the vertical division of Zone B into rectangular sections.

It is examined here which types of incised design patterns are related to these types of painted design patterns. In order to do so, specimens of the incised design patterns in the Painted and Early Incised Period which are similar to each painted pattern (P1–P5) were selected first. Then, specimens of typical painted design patterns in the Painted and Early Incised Period belonging to these painted patterns (P1–P5) were illustrated.

The design compositions common to painted patterns and incised patterns are discussed below. Patterns P1 to P3 are horizontal design patterns, details of their patterns are different but they can be regarded to be basically the same design pattern. Incised specimens of Group 2a are common to painted pattern P1 (Nos. 13, 14); incised specimens of Groups 1a and 2b are common to painted pattern P2 (Nos. 17–19); incised specimens of Groups 1b to 1e and 3 are common to painted pattern P3 (Nos. 22–25). Patterns P4 and P5 are also regarded to be basically an identical design. They are common to incised specimens of Group 4 (Nos. 28, 29, 34, 35).

The above-mentioned similarity between painted design patterns and incised ones indicates that incised design compositions were definitely derived from painted design compositions of the Transitional Period. Furthermore, it suggests that painted ware and incised ware existed side by side in the Painted and Early Incised Period[10].

How did incised and excised design patterns of the Late Incised and Late Excised Period relate to the foregoing painted and incised design patterns? Positions of these incised and excised patterns of each type of vessel are almost the same as those design patterns of the Painted and Early Incised Period. With regard to incised design patterns, the following points should be noted:

Specimens of incised pattern of Group 7 are similar to patterns P1 and P2 (Nos. 39–41). Similar examples of pattern P3 are also found in specimens of incised pattern of Group 7 (Nos. 42, 43). And, specimens of the incised patterns of Groups 7b and 7d are common to the pattern P5 (Nos. 49–51).

There is no design pattern among the patterns P1 to P5 immediately similar to excised design patterns. They are, however, common to patterns P4 and P5, in case the excised motif regarded as one design element. Accordingly, specimens of excised patterns of Groups 5, 8a and 8b are common to pattern P4 (Nos. 33, 45–48), as well as specimens of excised pattern of Group 8c are common to pattern P5 (Nos. 52–54).

The above-mentioned similarities on the rules of design compositions suggest that incised and excised design patterns of the Late Incised and Late Excised Period were immediately derived from design patterns of the Painted and Early Incised Period. The most remarkable fact is that design composition of panel pattern (P5) is the most typical design pattern among the painted ware which had been succeeded to the design compositions of excised ware. In the Late Incised and Late Excised Period, the rules governing the incising and excising are based on those of painting of the Painted and Early Incised Period. For example, painted designs are densely drawn all over the vessel surface, and repeating panels and design elements are arranged right to left and up to down alternately. Specimens of incised and excised design patterns with "sub-design element" are also considered to have been derived from painted and incised design patterns of the Painted and Early Incised Period. It seems that horizontal lines of painted designs correspond to notched band, grooved horizontal line, ridge or ribbed lines of the incised designs.

VIII. Regional variation of incised and excised designs

Differences and common features between incised and excised wares of the Mosul Area and of the Khabur Area will be discussed here. There is no major difference between the specimens of the Painted and Early Incised Period of the Mosul Area and those of the Khabur Area (mainly pottery of Tell Leilan Periods IIIa, b). There are, however, clear differences between the specimens of these two areas in the Late Incised and Late Excised Period [Roaf and Killick 1987: 224][11]. Is it sure to be any clear regional variations between the incised and excised wares of the Mosul Area and of the Khabur Area? The following remarkable points should be discussed:

As has already been mentioned before, specimens of panel patterns with elaborate incised and excised designs (Groups 8c, 8d) of the Late Incised and Late Excised Period are not found in those of Leilan Period IIId. However, two examples similar to such panel patterns are found on incised and excised jars from Tell Leilan Period IIIc which are presumed to have belonged to the Early Excised Period (Fig. 3, Nos. 117, 142) [Schwartz 1988: Figs. 39–1, 41–1]. This similarity indicates that Leilan Period IIIc overlaps chronologically with the Late Incised and Late Excised Period; and there is no major regional variation between the incised and excised design patterns of the Mosul Area and those of the Khabur Area.

The present author has placed most of the pottery collection of Leilan Period IIId at the later period than the Late Incised and Late Excised Period discussed before. However, there are few occupation levels which contain pottery of Leilan Period IIId at tells of the Mosul Area. Tells Thuwaij levels 1 to 3 and Jigan Area C levels 4 and 5 are assumed to belong to Leilan Period IIId; but specimens of peculiar shaped bowls (Fig. 6, No. 55), which are never found in Leilan Period IIId, are often found from levels 4 and 5 of Tell Jigan Area C [Numoto 1992b: Fig. 1–8–11]. With regard to the most common design patterns of Leilan Period IIId, such as step or hatched zigzag patterns, there are no specimens found in Tell Jigan. It cannot be concluded that these differences immediately show the regional variation, as it may indicate a chronological difference.

In the Early Excised Period, the particular features are found in specimens of the Khabur Area as

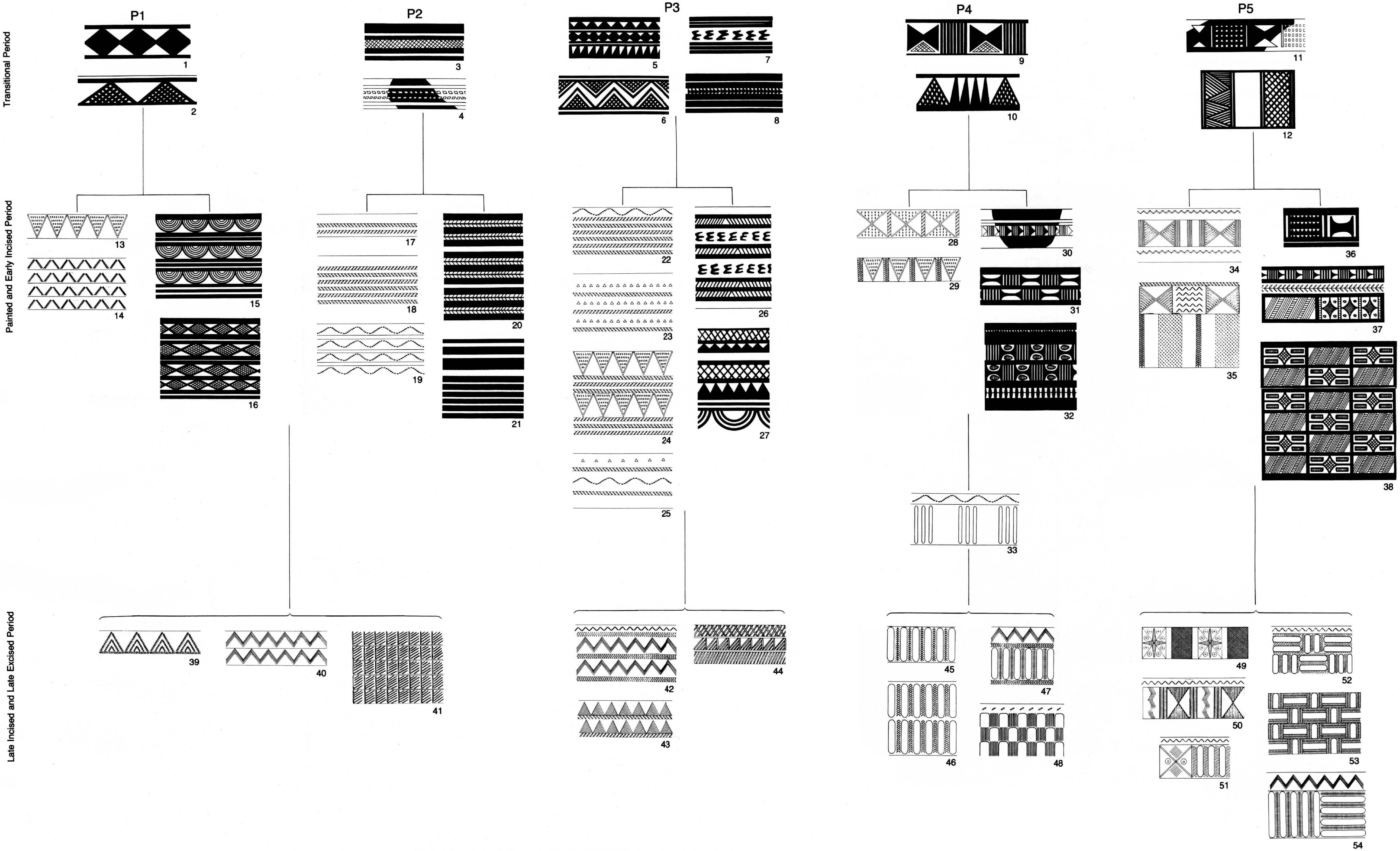

Fig. 7 Relationship among Incised, Excised and Painted Design Patterns

Table 7. List of Fig. 7

No.	Site	Type	Zone	Literature
1	Karrana 3	Type 2	Zone B	Wilhelm and Zaccagnini 1991: Fig.A-1
2	Fisna	Type 2	Zone B	Numoto 1988: Fig.16-58
3	Fisna	Type 2	Zone B	Numoto 1988: Fig.16-49
4	Jigan	Type 2	Zone B	Numoto 1992b: Fig.4-48
5	Nineveh	Type 1	Zone B	Thompson and Hamilton 1932: Pl.53-11
6	Nineveh	Type 1	Zone B	Thompson and Mallowan 1933: Pl.54-4
7	Nineveh	Type 1	Zone B	Thompson and Hamilton 1932: Pl.53-1
8	Chagar Bazar	Type 1	Zone B	Mallowan 1937: Fig.25-1
9	Fisna	Type 1	Zone B	Numoto 1988: Fig.16-21
10	Jigan	Type 1	Zone B	Numoto 1992b: Fig.4-46
11	Fisna	Type 2	Zone B	Numoto 1988: Fig.16-50
12	Fisna	Type 3	Zone C	Numoto 1988: Fig.17-70
13	Specimen is identical with that of No.36 in Fig.1			
14	Specimen is identical with that of No.37 in Fig.1			
15	Nineveh	Type 2	Zones B,C	Thompson and Hamilton 1932: Pl.54-4
16	Nineveh	Type 2	Zones B,C	Thompson and Hamilton 1932: Pl.54-6
17	Specimen is identical with that of No.2 in Fig.1			
18	Specimen is identical with that of No.4 in Fig.1			
19	Specimen is identical with that of No.74 in Fig.2			
20	Kutan	Type 3	Zones B,C	Bachelot in press: Type 15
21	Kutan	Type 2	Zones B,C	Bachelot 1987: Fig.7
22	Specimen is identical with that of No.12 in Fig.1			
23	Specimen is identical with that of No.23 in Fig.1			
24	Specimen is identical with that of No.27 in Fig.1			
25	Specimen is identical with that of No.69 in Fig.2			
26	Kutan	Type 3	Zones A to D	Forest 1987: Fig.8
27	Kutan	Type 3	Zones B,C	Bachelot 1987: Fig.7
28	Specimen is identical with that of No.54 in Fig.1			
29	Specimen is identical with that of No.55 in Fig.1			
30	Billa	Type 2	Zone B	Speiser 1933: Pl.69
31	Thalathat	Type 2	Zone B	Fukai et al. 1974: Pl.48-1
32	Nineveh	Type 2	Zones B,C	Thompson and Hamilton 1932: Pl.56-1
33	Specimen is identical with that of No.57 in Fig.2			
34	Specimen is identical with that of No.49 in Fig.1			
35	Specimen is identical with that of No.53 in Fig.1			
36	Nineveh	Type 1	Zone B	Thompson and Hamilton 1932: Pl.53-14
37	Thalathat	Type 3	Zone B	Fukai et al. 1974: Pl.51-7
38	Thalathat	Type 2	Zones B,C	Fukai et al. 1974: Pl.48-19
39	Specimen is identical with that of No.103 in Fig.3			
40	Specimen is identical with that of No.86 in Fig.3			
41	Specimen is identical with that of No.101 in Fig.3			
42	Specimen is identical with that of No.91 in Fig.3			
43	Specimen is identical with that of No.100 in Fig.3			
44	Specimen is identical with that of No.102 in Fig.3			
45	Specimen is identical with that of No.113 in Fig.3			
46	Specimen is identical with that of No.126 in Fig.3			
47	Specimen is identical with that of No.124 in Fig.3			
48	Specimen is identical with that of No.129 in Fig.3			
49	Specimen is identical with that of No.108 in Fig.3			
50	Specimen is identical with that of No.109 in Fig.3			
51	Specimen is identical with that of No.140 in Fig.3			
52	Specimen is identical with that of No.132 in Fig.3			
53	Specimen is identical with that of No.133 in Fig.3			
54	Specimen is identical with that of No.136 in Fig.3			

below:

Pottery assemblage from level 4 of Tell al-Raqa'i is considered to be of the same period as Tell Leilan Period IIIb/early IIIc [Schwartz and Curvers 1992: 411–415]. Since specimens of incised ware with grooved pattern were found from this level, the present author assumes that this level belongs to the Early Excised Period. The most remarkable fact is that some twenty fragments of painted jars which are characterized by pendant solid triangle motifs were found from this level. Similar examples to these specimens have been found from Tell Chagar Bazar [Mallowan 1936: Fig. 19–5–8]. This type of painted jar was presumed to be a regional ones of the Khabur Area so far [Rova 1988; Schwartz 1985]. However, in the design composition, layout or painting regularity, these painted jars are inferior to those of the Painted and Early Incised Period, and show the declining painted ware. It is, therefore, these jars must be the painted ware in their final stage. Besides, the painted ware found from that level are all painted jars. This fact also suggests the final stage, because most of the other types of ware in the Early Excised Period, such as carinated and footed bowls, are fine or grey wares, unsuitable for painted designs [Killick in press].

On the other hand, in the Mosul Area, levels 7 and 8 of Tell Thuwaij are assumed to belong to the Early Excised Period, but no painted ware was found in these levels [Numoto in press]. Before the specimens of painted ware with final features (latest style) were found from Tell al-Raqa'i level 4 mentioned above, there was no obvious evidence for painted ware belonging to the Early Excised Period[12]. Then, there is a great possibility that this type of painted ware belonged to the Early Excised Period. Although similar examples to this painted ware have not been reported yet from the Mosul Area, it can not be affirmed that this specimen from Tell al-Raqa'i is a regional variation in the Khabur Area, as there is also a great possibility that the same type of painted ware will be discovered in the Mosul Area by future investigations.

The other remarkable fact is that bowls and jars with the Early Incised designs and a jar with the Late Excised design have been found together in Grave 68 at Tell Chagar Bazar [Mallowan 1936: Figs. 18, 19]. The same fact has not been reported yet from the Mosul Area. This suggests that the Early Incised pattern and the Late Excised pattern existed side by side, and that the Early Excised Period overlaps with the Late Incised and Late Excised Period.

Taya IX Period is regarded to be parallel to the Leilan Period II [Roaf and Killick 1987: 225], however, there is almost no example of incised ware found in pottery collection of the Leilan Period II.

It is not known whether the above fact is due to the regional factor or the chronological factor. It is difficult to determine the differences of incised and excised ware, as well as those of painted ware, to be chronological, regional or only a variation of the same period [Numoto 1992a: 134]. In actual evolution of pottery designs and shapes, various factors are considered to have been entangled and produced an effect on the evolution. If difference between pottery of the Mosul Area and that of the Khabur Area in the Late Incised and Late Excised Period and the Leilan Period IIId show an obvious regional variation, there is a possibility that the differences of political, economic and social systems existed between two areas.

IX. Appearance and ending of the incised and excised designs: Changes in the technique of pottery production

In the Painted and Early Incised Period, incised designs became popular with the appearance of grey ware as ornamentation. One of the reasons for this is that high firing temperatures accompanied with grey ware production are not suitable for painted designs [Killick in press]. This suggests that it is natural the number of painted carinated bowls decreased in the Paited and Early Incised Period compared with the Transitional Period, while the incised carinated bowls increased in the Painted and Early Incised Period. Besides, it is clear that painted ware and incised ware of the Painted and Early Incised Period were not baked together in the same kiln judging from their colors, fabric and hardness. It is evident that the development of kiln control made possible to produce such pottery as grey ware with high firing temperature in this period.

There are few examples of incised and excised designs found in large-sized jars (Type 4) of the Painted and Early Incised Period and the Late Incised and Late Excised Period. Specimens of large-sized jar of these periods are mainly plain buff ware and made with lower firing temperature than incised and excised wares. Judging from this fact, it is assumed that large-sized jars were not baked together with incised and excised wares in the same kiln. Painted designs are commonly arranged on large-sized vessels, while specimens of large-sized vessels which have incised designs are few. The reason for this is presumed to be the following two points: applying incised and excised designs on a large-sized vessel takes a lot of time compared with doing painted designs; the kiln control with high firing temperatures for large-sized vessels had not been developed enough in the Painted and Early Incised Period and the Late Incised and Late Excised Period. Consequently, it is considered that large-sized jars of those two periods were not suitable for incising and excising.

On the other hand, the incised designs are frequently found in large-sized jars of Taya IX Period. They are mainly greenish ware, and their hardness are similar to those of small-to medium-sized vessels of the same period. This suggests the possibility to have produced large-sized vessels together with small-to medium-sized vessels in the same kiln. It is, therefore, assumed that the technique of kiln control rapidly advanced from the Late Incised and Late Excised Period to the Taya IX Period.

With regard to the pottery assemblage of Taya IX Period, the following points have been noted.

1. A large quantity of pottery are found from each site compared with previous periods.
2. Sizes and shapes of each ware are almost standardized.
3. Small-sized vessels are mainly made by fast-wheel throwing techniques.
4. Most vessels have about the same hardness and color (mainly greenish).

The above-mentioned features show the development of potter's wheel, potter's tools and kiln control. Moreover, this indicates the possibility of pottery mass-production in this period. Thus, these technical innovations suggest that the pottery production systems underwent a great change in the Taya IX Period compared with the Ninevite 5 Period. This may imply that the changes of political, economic and social systems had already occured in this period.

X. Conclusions

In this paper, the present author has discussed the features of the Ninevite 5 incised and excised designs from the Painted and Early Incised Period through the Taya IX Period. Here, remarkable features on chronology and changes of the incised ware and excised ware will be considered.

In the Late Uruk Period, incised designs are mainly found on jars. It is thought, however, that they were not directly linked with incised designs of the Painted and Early Incised Period [Killick in press].

As it stands, there is no sufficient evidence that incised ware existed in the Transitional Period, though there is a possibility that the prototype of incised ware existed in this period. A footed bowl with notched bands was found from Tell Fisna (Fig. 6, No. 37). This specimen shows different features from those of incised ware of the Painted and Early Incised Period. It is a burnished buff ware, and the shape is similar to those of the footed bowls of the Transitional Period. Unfortunately, it is not clear whether this specimen belonged to the Transitional Period; it is unknown which strata it was excavated from. It is sure, however, that this specimen shows the old style of incised ware. It is assumed that the incised ware already appeared in the Intermediate Period (between the Transitional Period and the Painted and Early Incised Period). As previously mentioned, this period is the one established by the present author, though its details are still unknown. As will be discussed later, however, there is a great possibility that specimens of incised ware which have old style of the Painted and Early Incised Period belonged to the Intermediate Period.

Incised ware appeared and became popular in the Painted and Early Incised Period. It is thought that both of the old and new style specimens existed in the Painted and Early Incised Period. Comparing with specimens from Tell Mohammed Arab Period 2, Killick proposed to place the incised specimens from Tell Thalathat to slightly later than those from Tell Mohammed Arab Period 2, on the basis of the following observations [Killick in press]:

1. Among the incised design elements of specimens of Tell Thalathat, motifs such as two lined zigzag, butterfly filled with dots, and lozenges filled with dots, are regarded as new design patterns.
2. Specimens of Thalathat show a tendency to have a larger proportion of vessel body with incision.
3. There are no examples of incised designs of Mohammed Arab Period 2 which are composed of more than one motif or register, while many specimens of Thalathat are composed of more than

one motif.

Roughly speaking, these characteristic features suggest that specimens with more simple incised designs can be regarded as the old style. However, specimens of Mohammed Arab Period 2 amount to only twelve, and are all fragmentary. It is difficult, therefore, to know the details of the whole layout of the incised designs, and to confirm the conclusion from the above observations. According to Killick's view, incised designs showing the old style within incised design patterns of Fig. 1 are Group 1a, Nos. 1–3, Group 1b, Nos. 9, 11, and Group 2a, No. 36. If these specimens really show the old style of incised design patterns, there is a possibility that they belonged to the Intermediate Period.

On the basis of the following points, the present author assumes that the pottery assemblage of levels 7 and 8 of Tell Thuwaij [Numoto in press] belonged to the Eatly Excised Period. At Tell Thuwaij levels 7 and 8, the early style of incised ware and the grooved (Early Excised pattern) ware were found together, although the grooved ware was not found from the Painted and Early Incised Period of Tells Thalathat and Mohammed Arab. This fact indicates that the grooved pattern is the "Early Excised pattern", and Tell Thuwaij levels 7 and 8 can be chronologically placed in a later period than the Painted and Early Incised Period, i.e. the period between the Painted and Early Incised Period and the Late Incised and Late Excised Period. Furthermore, bowls with pointed base but without carination on its body (Type 1) were found from Tell Thuwaij levels 7 and 8, while no such specimens were found in Tell Thalathat. This fact supports the present author's assumption [Numoto 1989: 23]. The pottery assemblage of Tell Thuwaij levels 7 and 8 is very similar to those of Tell Leilan Period IIIc [Schwartz 1988]. Facts such as similarity of shapes of carinated bowl and bowl with pointed base (Fig. 6, No. 11), the presence of carinated bowl with short everted rim (Fig. 6, No. 12), and similarity of incised design elements suggest that there was not a big chronological difference or regional variation between Tell Thuwaij levels 7 and 8 and Tell Leilan Period IIIc.

As mentioned previously, it is clear that incised and excised design patterns of the Late Incised and Late Excised Period were evolved from the painted and incised design patterns of the Painted and Early Incised Period. As painted ware vanished in the Late Incised and Late Excised Period, it is thought that panel pattern, which is the most common design pattern among the painted ware, was succeeded into designs of incised and excised ware. Most of the rules governing the design compositions found in the painted ware are discernible in the designs of incised and excised ware of this period.

It is not known how Leilan Period IIId pottery related to that of the Late Incised and Late Excised Period; whether they are to be chronologically placed side by side or belonged to different periods is unknown. If they really belonged to the same period, it is assumed that incised ware of Leilan Period IIId had peculiar regional features of the Khabur Area. The design patterns common to both Leilan Period IIId and the Late Incised and Late Excised Period are also found. For example, the excised panel pattern (Group 9a) of Leilan Period IIId and the excised panel patterns (Groups 8a, 8b) of the Late Incised and Late Excised Period have design composition basically identical. The most typical excised designs of Leilan Period IIId are hatched zigzag and step patterns (Groups 9b, 9c, 9d); and specimens of these designs have been reported from tells in the Eski-Mosul Area, though very few[7]. Accordingly, it can not be concluded that such an incised ware indicates a regional variation in the Khabur Area.

Tell Thuwaij levels 1 to 3 produced specimens of hatched zigzag pattern and step pattern. These levels belong to the latest occupation in this site; the occupation levels (levels 4 to 6) lower than these levels belong to the Late Incised and Late Excised Period [Numoto in press]. The specimen of a scratched zigzag pattern was also found from the top level of Tell Mohammed Arab Period 3, which is regarded as the latest period specimen within the specimens of Mohammed Arab Period 3 (the Late Incised and Late Excised Period) [Killick in press]. These facts suggest that pottery of Leilan Period IIId is chronologically placed in the later period than the Late Incised and Late Excised Period.

The period of Leilan IIId seems to have lasted relatively long (about 200 years) [Weiss 1991: 706]. It is assumed, therefore, that changes in the designs and shapes of vessel were inevitable, and pottery with old and new styles can be treated as a single pottery assemblage of this period. Consequently, the present author has presumed that the first half of Leilan Period IIId overlaps with the Late Incised and Late Excised Period, while the second half comes after the Late Incised and Late Excised Period.

The period of Leilan IIId is regarded as the beginning of the urbanization [Weiss 1990]. There is a possibility, therefore, that the pottery production systems had greatly changed in this period. Furthermore, it is assumed that mass-production system of pottery had further advanced in this period. Incised and excised wares of Leilan Period IIId seem to have been made more roughly than those of the Late Incised and Late Excised Period. As already mentioned, the rules governing the incising and excising or the delicacy of design patterns of incised and excised wares of Leilan Period IIId are less rigid than those of the Late Incised and Late Excised Period. This phenomenon is thought to have reflected the simplification and subsequent decline of incised and excised designs of Leilan Period IIId. Why were such rough designs commonly used in Leilan Period IIId? One of the reasons for this seems to have been the influence of mass-production of pottery. Roughly speaking, it seems that to apply elaborate designs takes a lot of time and hands, and therefore are not suitable for mass-production of pottery. It seems, therefore, that incised and excised designs shifted to rough style designs in Leilan Period IIId.

Late Incised Ninevite 5 ware (the Late Incised and Late Excised Period) is regarded to have changed to incised Taya ware [Roaf and Killick 1987: 224]. It is evident, however, that examples of pottery with incised designs, such as design pattern of Group 10 (Nos. 186–188), are chronologically placed between these two periods. This was confirmed by the stratigraphy at Tell Jigan Area C [Numoto 1992b][13]. The present author assumes that this incised pottery belonged to the second half of the Leilan Period IIId.

As discussed above, incised design patterns of Taya IX Period were based on those of the Late Incised and Late Excised Period and Leilan Period IIId (Groups 7a, 10). Most of these design patterns are horizontal belt patterns, and specimens with complex design combinations or elaborate designs decreased in this period. Incised designs themselves tended to become simpler styles. Moreover, the incising techniques greatly changed from those of the Late Incised and Late Excised Perid and Leilan Period IIId. For example, comb and cylinder seal-like tool made incising (arranging incised designs) simpler and more speedy. It is presumed that mass-production of pottery accelerated simple and speedy arrangement[14].

As previously mentioned, examples of incised bowls (Types 1, 2, Fig. 6, Nos. 34, 35, 61) in the Taya IX Period (Leilan Period II) are fewer than those of the Late Incised and Late Excised Period and Leilan Period IIId. The possible reason for this is the influence of mass-production of pottery and changes of vessel shapes. Another possible reason is that bowls became more important for practical use in this period. This suggests that most bowls had flat bottoms in this period, while pointed or rounded bottoms had been more frequent in the two previous periods. It is thought,therefore, that decoration of bowls became less important in Taya IX Period.

In this paper, the present author has mainly discussed the features of incised and excised designs in the whole of the Ninevite 5 Period. However, details of the following points could not be made clear: the exact period of the appearance of incised ware; chronological relationship between the Late Incised and Late Excised Period and the Leilan Period IIId; the presence of regional variation between the Mosul and the Khabur Areas; and the detail features of the "Transitional Period" between the Late Incised and Late Excised Period and the Taya IX Period. These questions unanswered may be solved by future investigations.

Acknowledgement

The present author heartfeltly wishes to thank Mrs. Chieko Nakatsu, who kindly improved the English manuscript.

Notes

1) With regard to the notch of notched band motif, the differences in its width and depth are assumed to have occurred chronologically, as well as the differences in the width of interval between the incised bands.
2) A footed bowl from Tell Fisna, a large footed bowl and a potstand from Tell Thuwaij (Fig. 6, Nos. 42, 89). Black or smoked black wares (mostly burnished ware) from Graves at Tells Chagar Bazar and Thuwaij [Mallowan 1936: Figs. 18-1-4, 7, 19-4; Numoto in press: Fig. 28-120].
3) As the example for the large-sized incised ware, there are footed bowls and a potstand excavated from Tells Thuwaij (Fig. 6, Nos. 42, 89) and Chagar Bazar [Mallowan 1936: Fig. 18-8].
4) Specimens of a large footed bowl and a carinated bowl which were found from Tell Thuwaij level 9. The carinated bowl is a fragment of lower part of body (Zone C) which has a feather pattern motif [Numoto in press: Fig. 23-75].
5) There is one specimen with incised and excised designs on Zone D, which is a fragment of foot of a footed bowl in the Late Incised and Late Excised Period, found from Tell Jigan (Fig. 3, No. 149).
6) Killick named these design elements "top register", while the main design elements which located on middle part of Zone named "main register" [Killick in press].
7) Some specimens are found from Tell Hamad Aga levels VIII-IX, phase 4 [Spanos 1990: Abb.14-8, 9] and Tell Thuwaij level 1 (Fig. 6, No. 82).
8) This has been comfirmed by the stratiglaphical excavations at Tell Jigan Areas A and B [Ii and Kawamata 1984/85].
9) Design patterns of Zones B and C of specimen No. 215 belong to those of Group 11.
10) This is proved by the presence of a specimen which design composition is composed of both painted and incised design elements (No. 37). The specimen has been reported from Tell Thalathat [Fukai et al. 1974: Pl. 51-7].
11) Roaf and Killick assumed that regional or chronological variations existed in the specimens of excised ware of two areas in the Late Incised and Late Excised period [1987: 224].
12) Roaf and Killick proposed that painted ware of the Painted and Early Incised Period belonged to the early part of the Early Excised Period [1987: 225].
13) These specimens were found from levels 4 and 5 of Tell Jigan Area C, and the upper level of levels 4 and 5 is level 3 which belongs to Taya IX Period, while the lower level of levels 4 and 5 belongs to the Late Incised and Late Excised Period.
14) System of the pottery production in Leilan Period IIa had greatly changed compared with that of Leilan Period III/Ninevite 5 Period [Weiss 1990: 217].

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TEXTILES FROM AT-TAR CAVES — PART II-(3): CAVE 16, HILL C —

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and Mikizo ICHIHASHI***

1. Foreword

This is to report on 5 textiles of the 43 non-pile textiles which have been uncovered at Cave 16, Hill C, following the report on the 8 pile textiles from Cave 16, Hill C which was printed in the journal, *Al-Rāfidān* Vol. XI, 1990: pp. 45–65, Pls. 1–3, the report on their representative colors and materials which were analyzed by Fibers & Textiles Laboratories, Toray Industries, Inc. [*Al-Rāfidān* Vol. XI, 1990: pp. 69–79, Pls. 1–13] and the report on the rush mat (Textile No. 51) which was printed in the journal, *Al-Rāfidān* Vol. XII, 1991: pp. 157–169. Thus, Textile No. 9 is the first to begin with here, coming next to the above 8 pile textiles.

The location of Cave 16, Hill C, structure, deposites, excavated situation of the textiles and other archaeological goods uncovered there have already been treated by Mr. Ii in his report "Excavations at at-Tar Caves, The Fifth Working Season: Cave 16, Part 1" in Japanese [Ii, 1986: pp. 1–21, Pls. 1–8].

In relation to the excavated situation of Cave 16, Hill C, as is reported in detail in the Ii's report mentioned above, it has been made clear that Cave 16 was much more disorderly confused than any other cave [Fujii and Sakamoto, 1990: p. 45; Fujii and others, 1991: p. 157]. In result, we had to devote much labor to the work of identification and data classification, because very small fragments of the non-pile textiles had been found scattered all over.

In this report, we will deal with 5 textiles which have been judged as the specimens provided with H-shape pattern and H-shape or Gamma-shape pattern of all the identified non-pile textiles. Moreover, it must be noted that the fiber analyses were made by Fibers & Textiles Laboratories, Toray Industries, Inc. and the dyestuff analyses of reddish purple color line, by Dr. Mitsuo Kimura, Professor of Mie University.

2. Identification and choice of representative specimen

In order to approximate the textile fragments unearthed as close to their original state as possible, the identification work was practiced by us that the fragments of the same origin were assorted and/or allocated in accordance with material, thickness, twist count, twist direction of the thread, structure, thread density, thread-spacing, production technique, color and design of the fabric, with care taken to their state of excavation as well.

Every cave has its own consecutive "Textile Number" given to each group of the individual fragmentary specimens which are identified as the same textile, respectively. From among the fragments thus identified so far, larger and better-preserved cloth pieces were picked up as individual representatives,

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the numerals of which resulting from measuring size, color, thickness, material, thread thickness, twist direction, twist count and thread density were recorded as data.

3. Identification and weave technique

Textile 9 Textile with H-shape pattern and oblong pattern: Representative Specimen No. V-72-1 (Pl. 1a～1b, 2a～3a)

Textile 10 Textile with H-shape pattern and oblong pattern: Representative Specimen No. V-71-4b (Pl. 3b～4b)

Textile 11 Textile with H-shape pattern and oblong pattern: Representative Specimen No. V-62-1 (Pl. 4c～5a, 1c)

Textile 12 Fragmentary textile with H-shape or Gamma-shape pattern: Representative Specimen No. V-126-3 (Pl. 6a～6b)

Textile 13 Fragmentary textile with H-shape or Gamma-shape pattern: Representative Specimen No. IV-W-59 (Pl. 6c)

Textile 9 (Representative Specimen No. V-72-1: Size 51.5×31.5 cm)

Specimen V-72-1 (Pl. 1a) is a fragmentary ground cloth of a fairly large dimension whose threads have been spun with very fine, high-quality fibers. Its warp fiber is 25–50 μm, while weft fiber, 30–45 μm in width respectively (Toray Analyses Report: pp. 149–150, Pls. 1–2 of this volume). It has warp thread of 0.15–0.30 mm and weft thread of 0.18–0.30 mm in diameter. With a paired weft, the cloth is woven into variation of plain weave (warp 1, weft 2), whose weave density is very high both in warp: 18.0–22.0/cm and weft (ground): 14.0–17.0/cm×2. Thus, an identifying work of Textile 9 has been conducted, after this specimen was defined as a basic ground material to be identified in Textile 9. In doing so, V-79-2 (Pl. 1b), the relatively large, non-patterned fragment with selvage, and V-77-2 (Pl. 2d), a fragment with the weave mark near cord-like warp finish, are first identified in the same cloth as that of V-72-1, since their data are very similar to those of V-72-1. Next, both V-73-1b (Pl. 2c) and V-65-1 (Pl. 2a) are concluded as belonging to V-72-1, judging from the situations of the warp and weft diameters, thread twist direction, twist count, thread density, thread spacing and the paired weft shown on the ground remaining on V-73-1b and on the ground between the two oblong patterns along the selvage of V-65-1.

The first pattern portion of V-65-1, as seen at the upper part of the photo, has been confirmed to own a turning part ('hatsure' in Japanese) in warp direction where the pattern weft and the ground weft turn back each in dovetailed tapestry weave technique (Fig. 1) along the pattern end on the other side of the selvage. So, this is understood as an oblong pattern along the selvage, not as the end of simple band pattern.

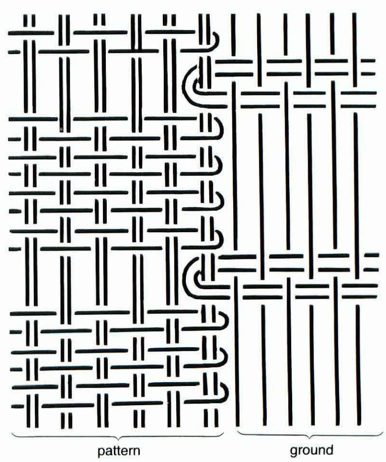

Fig. 1 Dovetailed tapestry weave technique seen between oblong pattern and ground. (Parts of the ground have been reconstructed by the authors). (V-65-1).

In result, the size of the pattern is about 7 cm wide from the selvage. And, along the contour of its top part, there is arranged a shifting zone [Fuji and

Sakamoto, 1992: pp. 99–101, Figs. 2, 3] of warp 2 and weft 2 in 12 picks. And, directly after that, with warp crossing, the cloth turns to the ground structure of warp 1 and weft 2. In the meantime, the first pattern along the selvage of about 12 cm long (warp 2, weft 1) is followed by the ground (warp 2, weft 2) of about 2.9 cm in length. And after that, there continues a pattern remnant of about 9 cm long (warp 2, weft 1). In this case, without the shifting zone by warp crossing technique on either end of the two patterns, the ground is woven by the basket weave of warp 2 and weft 2. It has been deduced from the above that V-65-1 has two of three oblong patterns which make up one set of three oblong patterns woven along the selvage, because it also resembles Textile 14 (IV-OH-368-13) from Cave C-12 and Textile 1 (C-31, 31′) from Cave F-4 in weave composition of the oblong patterns along the selvages, as already stated in the report: [Fujii, Sakamoto and Ichihashi, 1989: pp. 131–134, pp. 149–151, Pl. 31].

V-68-4 (Pl. 3a) is presumed as a fragmentary specimen of the oblong pattern woven along the selvage, just like V-65-1, partly because it is a pattern (warp 2 and weft 1 structure) with the selvage, and partly because it tells us so from its remaining sizes in warp and weft directions. V-68-4 and V-65-1 have such selvage cords as composed of 3.3.4 warp thread alignment. On their pattern portions, the reddish purple paired additional thread, which is the same color as that of the pattern weft, after interlacing and turning around the third selvage cord from the end twice, skips 6–10 picks of the pattern wefts which repeat U-turn motion, to protect the weft's U-turn portion, and then, interlaces itself with the warp cord again. Evidenced from the method of this kind, it is most probable that both V-68-4 and V-65-1 can be identified in the same fabric (Fig. 2). Meanwhile, the selvage of the ground fragment, V-79-2, has its cord composed of 3.3.3 warp thread alignment. Here, the paired additional thread colored same as the ground weft, regularly makes surplus U-turn to fill the gap of the ground weft return, besides making normal U-turn motion along each weft thread, thus resulting in reinforcing the ground selvage (Fig. 3). This kind of weave technique is also seen on the selvage on the ground portion between oblong patterns in V-65-1. Therefore, it seems that the differences of selvage cord-making methods on V-65-1 and V-68-4 with those of V-79-2 may have come from the differences of making right-side selvages and left-side selvages. In this way, the method of reinforcing the selvage with additional threads has been termed Type 3 [Fujii, Sakamoto and Ichihashi, 1989: p. 116, Fig. 6].

The characteristics commonly seen on both V-65-1 and V-73-1b are: first, on the pattern, two warps

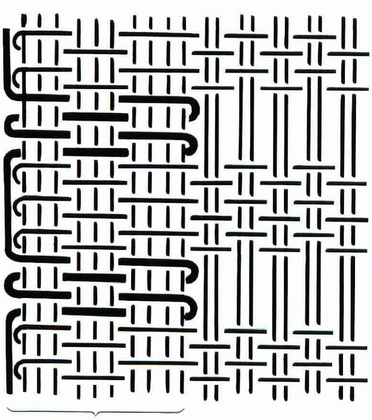

Fig. 2 Method of additional thread on selvage of pattern portion. (V-68-4, V-65-1).

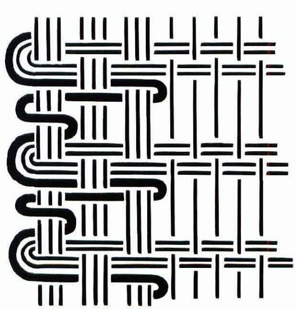

Fig. 3 Method of additional thread on selvage of ground portion. (V-79-2).

each are repeatedly interlaced with a single weft of high density; secondly, the turning part of the pattern weft and the ground weft can be confirmed along the pattern border in warp direction by means of dovetailed tapestry technique; thirdly, in turning from pattern to ground, there is a shifting zone of warp 2 and weft 2 in several picks along the pattern end, and directly after that, by warp crossing the weave is altered into the ground of warp 1 and weft 2. In addition, it is evidenced in V-73-1b that when turning from ground to pattern, by warp crossing at several picks before the pattern, the ground of warp 1 and weft 2 turns to the shifting zone of warp 2 and weft 2, and directly after that there comes a pattern of warp 2 and weft 1 composition (Fig. 4), [Fujii and Sakamoto, 1992: pp. 99–101, Fig. 3]. Especially from the second feature mentioned above, V-73-1b cannot be regarded as a fragment of a simple band pattern, nor can be considered as an oblong pattern directly linking to selvage, because the length of 4.3–4.5 cm in warp direction on its pattern is not equal to that of the oblong pattern along the selvage, 12.0 cm, on V-65-1. Such being the situation, therefore, V-73-1b seems to be a pattern fragment which is common to Textile 10 (V-71-4b), Textile 11 (V-62-1, V-51-3), Textile 12 (V-126-3) and Textile 13 (IV-W-59) in design composition, thereby resulting in the assumption that this is a fragmentary projecting part of a pattern which is accompanied with the notched part in parallel to weft direction. In this way, V-73-1b as a fragmentary pattern end and V-65-1 as a piece of fragmentary oblong pattern along the selvage have been identified in the same cloth.

Among the typical examples of the textiles with patterns in which notched parts contain that have ever

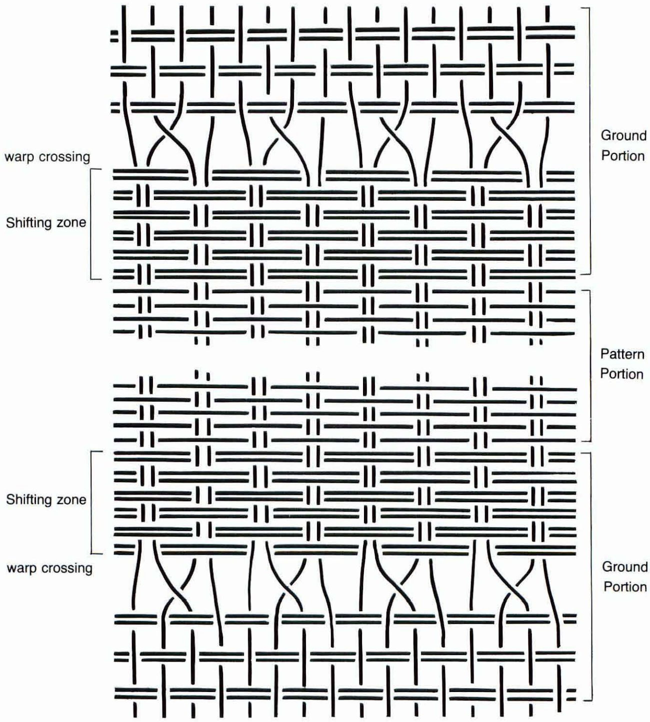

Fig. 4 Warp crossing and shifting zone. (V-73-1b).

been excavated at at-Tar Caves, there are Textile 12 (IV-OH-368-14ⓐ), Textile 14 (IV-OH-368-13) from Cave C-12 and Textile 1 (C-31, 31′) from Cave F-4. Textile 12, which is rather thicker than the latter two in cloth thickness, uses no warp crossing when its weave is altered from ground to pattern. There are no oblong patterns along its selvage, either. The whole pattern band consists of the letter L (gamma-shape), so that its notched parts are allocated at warp direction and weft direction separately 〔Fujii, Sakamoto and Ichihashi, 1989: pp. 129–131, 138–139, Pl. 29a〕. On the other hand, the latter two are much thinner than Textile 12 in cloth thickness. It is found on them that, when shifting from ground to H-shape pattern, both of them weave the shifting zone close to the pattern contour after weave alteration by warp crossing, and then go on weaving the H-shape pattern band of warp 2 and weft 1, while adding a set of 3 oblong patterns each at the 4 corners of both selvages. These pattern contours look like the letter H, whose notched parts are both in parallel with weft directions 〔Fujii, Sakamoto and Ichihashi, 1989: pp. 131–134, 140–144, 149–150, Pl. 31〕. To sum up, in the case of at-Tar Caves, the textile with gamma shape (L-shape) pattern has no oblong pattern along the selvage, whereas the textile with H-shape pattern has a set of 3 oblong patterns along the selvage, but it has no band pattern. This is also true of the data from the Cave of Letters 〔Yadin, 1963: Specimen with L-shape pattern without oblong patterns along the selvage, p. 238, No. 43–8.11, Specimen with H-shape pattern with oblong patterns along the selvage, p. 235, No. 30–2.86〕. In this connection, it is likely that the above-mentioned V-68-4 can be regarded as a fragmentary oblong pattern along the selvage, not as a fragmentary simple band pattern. Naturally, V-73-1b may be identified in the same fabric as V-65-1 and V-68-4 which are provided with oblong patterns along the selvages. It has thus been concluded that V-73-1b is a piece of a projecting edge accompanied with the notched part of the H-shape pattern. In a word, therefore, Textile 9 is a thin cloth with H-shape patterns and oblong patterns on it.

Textile 10 (Representative Specimen No. V-71-4b: Size 5.5×5.2 cm)

The specimens which are identified in this group contain the following features: (1) With the ground warp of 0.50–0.75 mm and the ground weft of 0.45–0.80 mm in diameter, thick threads and relatively thin threads are mixed irregularly there. The ground has warp density of 8.0–10.0/cm and weft density of 8.0–9.0/cm, while the pattern has weft density of 24.0–28.0/cm, showing that they are coarser than those identified in Textile 9 and Textile 11. The specimens belonging to Textile 10 are medium-thick in cloth thickness, whose ground is 1.15–1.20/mm, and pattern, 1.30–1.60/mm in thickness. Both the ground and the pattern are of plain weave. (2) As regards thread twist direction, warp is S-twist, while weft is Z-twist both on the ground and on the pattern. Here, the weft's Z-twist is a unique trait particularly shown among the wool textiles excavated at at-Tar Caves except for some pile textiles, which has afforded an important key to this group's identification.

IV-W-66-3 (Pl. 4a) owns a pattern of about 2.5 cm in width along the selvage. Its selvage cords are of 4.3.3 warp thread alignment, where the weft's simple return work of Type 1 and the weft's more complicated return work on the 3rd cord of Type 2 are combined together (Fig. 5) 〔Fujii, Sakamoto and Ichihashi, 1989: p. 116〕. These techniques used here are similar to those used in V-90-3b (Pl. 4b), so that we can treat both IV-W-66-3 and V-90-3b as the same cloth. Just as in Textile 9 (V-65-1), the former has a turning part of

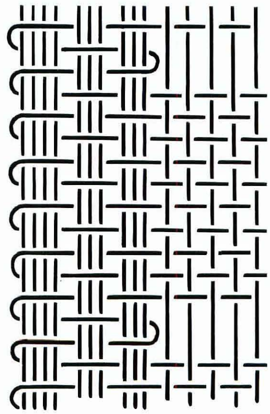

Fig. 5 Selvage of pattern portion (Types 1 and 2). (IV-W-66-3).

the ground weft and the pattern weft by dovetailed tapestry technique evidenced, where different colors meet in warp direction. And the latter has a remnant of plain weave ground with selvage, linking together with the pattern along the selvage. An overall comparison of a set of both V-90-3b and IV-W-66-3 with V-65-1 is that the patterns of the former two are regarded as resembling the oblong pattern on V-65-1 in design composition. V-73-8 has selvage cords of 3.3.3. warp thread alignment, and its weft return work on the pattern selvage is combined with Type 1 and Type 2, as you see in IV-W-66-3 and V-90-3b. Such different sorts of cord making methods seem to have resulted from the different ways of selvage making taken on the right side and the left side separately. In this way, it is considered that V-73-8 also belongs to the same cloth as IV-W-66-3 and V-90-3b, which is presummably a fragment of an oblong pattern along the selvage. Such selvage making of Type 1 and Type 2 combined together as mentioned above is the first of all the non-pile textiles that have ever been seen among the at-Tar textiles, except for the pile textiles [Fujii, Sakamoto and Ichihashi, 1989: p. 121, Fig. 11(C), pp. 160–161 (Textile 10[1)])].

It is observed that V-71-4b (Pl. 3b) has 11 picks' turning weft in warp direction on its ground placed between the upper pattern and the lower pattern, from which this is presumed to be a fragment which contains two projecting parts of the pattern end and the notched part. The total length of the notched part in warp direction (about 1.2 cm) plus the upper and the lower patterns in warp direction (about 1.4 cm$\times$2) is roughly calculated at the pattern width of V-62-2 (about 4.0–4.2 cm) (Pl. 3c). Thereby, V-71-4b can be identified in the same cloth as V-62-2, because both of them are provided with patterns without any traces of warp crossing and shifting zone along their patterns' outside borders. So, V-71-4b seems to be the pattern end linking to V-62-2. And V-71-4b can be classified in the same cloth as IV-W-66-3, V-90-3b and V-73-8 which are regarded as coming from the oblong patterns along the selvages, because of their similarity in thread twist direction and weave structure. Judging from the data ever excavated at at-Tar Caves, it has been concluded that V-71-4b has its origin in the projecting part of the H-shape pattern accompanied with an oblong pattern along the selvage.

V-98-4 and V-126-1 are good examples of the warp cord finish seen along the weave end [Fujii, Sakamoto and Ichihashi, 1989: P. 115, Fig. 5]. With the warp cord worked with the five-ply warps at the end, V-98-4 is finished up at about 5 mm in diameter, while with the warp cord worked with the 2 or 3-ply warps at the end, V-126-1 is done at about 3.5 mm in diameter, respectively. In the meantime, V-41-1b is different in its cord diameters, such as 3 mm at some places and 5 mm at others, which was caused in the process of warp finishing work. Similarly, it is natural to consider that the different numerals given on warp cord diameters between V-98-4 and V-126-1 have resulted from the different ways of work process between them, just as shown in the example of V-41-1b. Thus, the above three have been identified in Textile 10, because of their common features in weave structure and weft twist direction.

Textile 11

The textiles belonging to this group Textile 11 have a little thicker threads than the ones grouped in Textile 9. But their threads are rather thin, i.e., about 0.30–0.40 mm in the ground warp diameter and about 0.38–0.42 mm in the ground weft diameter. Just as in Textile 9, with the use of a paired weft, the ground is of variation of plain weave (warp 1, weft 2). The two specimens, V-62-1 (Pl. 4c) and V-51-3 (Pl. 4d), which are presumed to be the two projecting parts of the patterns with notched parts, can be identified as the same cloth, since they have (1) weave structure and (2) pattern size in common with each other. For example, (1) the work shifting from ground to pattern is so contrived that warp, which is changed to the combination of warp 1 and warp 2, is interlaced with two parallel wefts several picks before the pattern, by means of warp crossing technique, so is it on the notched part. Here, warp crossing is conducted at an interval of 4 warps (Fig. 6b), which is different from the evidence seen in Cave C-12 Textile 14

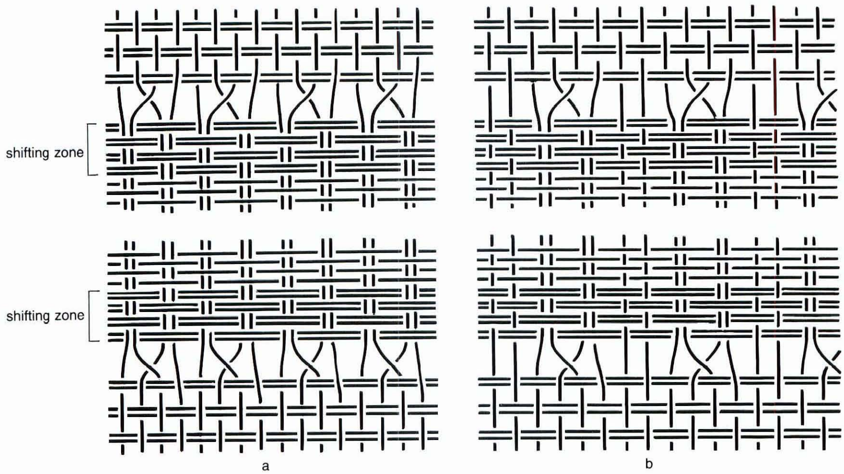

Fig. 6 Warp crossing and shifting zone.
a. Warp crossing at an interval of two warps. (Type A).
b. Warp crossing at an interval of four warps. (Tybe B).

(IV-OH-368-13), Cave F-4 Textile 1 (C-31, 31′) and Cave C-16 Textile 9 (V-73-1b) where warp crossing is done at an interval of 2 warps (Fig. 6a). In the case of Textile 11, the warp next to the crossed warps turns to a pair with one of the crossed warps. Here, the resultant paired warps and two of a single warp each placed between the paired warps are interlaced with a paired weft for several picks in high density. In doing so, a shifting zone has been formed on the part close to the pattern. And then, everything is ready for a pattern weaving. On the pattern, the warp alignment of 2.1.1.2 is repeatedly interlaced with a single weft of high density [Fujii and Sakamoto, 1992: p. 99, Fig. 2 (Type B)]. In turn, the work from pattern to ground has been done in the way that, by way of the shifting zone with warp crossing technique, the cloth turns to the ground of warp 1 and weft 2, variation of plain weave, so is evidneced in the case of the notched part. (2) The ends of the patterns in both the specimens V-62-1 and V-51-3 are of tapestry weave by dovetailed technique in warp direction, where different colors meet. And then we were able to measure the sizes of both of their patterns each in warp direction (about 4.3 cm each) and the size of the notched part in warp direction (about 4.3 cm), whose total length in warp direction is about 13.0 cm. Deduced from the above, it has been concluded that both of V-62-1 and V-51-3 originate in the same cloth.

V-98-1 (Pl. 5a) is a fragmentary textile of oblong patterns woven along the selvage, which is composed of a whole oblong pattern and a half-missing oblong pattern, since the turning part of pattern weft and ground weft by dovetailed tapestry technique is evidenced along the pattern border in warp direction. In this respect, it resembles the situation of the oblong pattern remaining on V-65-1 which has been identified in Textile 9. The differences between both of them lie in size and weave structure. As for V-98-1, for example, the size of the whole oblong pattern is 8.5 cm in warp length and 5.2 cm in weft width. On its pattern, warp alignment of 2.1.1.2 is repeatedly interlaced with a single weft of high density. At its selvage cord of 4.4 warp thread alignment, an additional thread of reddish purple 3-parallel wefts, after turning around the selvage's second cord twice, skips over 6–8 wefts which continue U-turn motion, while covering the wefts' U-turn section, and then is interworked with the cords again on the pattern (Fig. 7). In the meantime, on the ground, an additional thread of 4-parallel wefts whose quality is the same as that of the ground weft is worked between 2 picks of the wefts which repeat U-turn motion in order to protect their work. And the ground of variation of plain weave (warp 1, weft 2) is turned to the pattern where a single pattern weft is densely interworked with the warp 2.1.1.2 repetition, directly after passing the shifting zone (warp 2.1.1.2/repetition, weft 2), of weave alteration by warp crossing, which is done several picks before the pattern portion. In the work shifting from pattern to ground between the patterns, warp crossing technique is used after the shifting zone, just as at the notched parts of the H-shape patterns. Thus, it is evident that V-98-1 is a fragment separate from Textile 9 (V-65-1) in weave structure and size. Nevertheless, the oblong pattern along the selvage on V-98-1 seems to belong to the group of a set of three oblong patterns woven along the selvage, like that of V-65-1, deduced from the pattern making type evidenced there. V-134-5 is a pattern fragment with selvage, which is the same as the pattern of V-98-1 in selvage and pattern making structures. They are equal in pattern width, and just as seen in V-98-1, V-134-5 has a shifting zone along the pattern border in weft direction, where warp crossing is used, and there is a link part with the ground by means of dovetailed tapestry technique in warp direction, from which it has been thought to be a separate fragment of an oblong pattern.

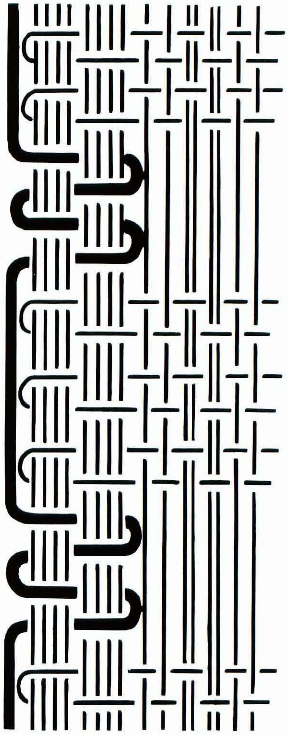

Fig. 7 Method of additional thread on selvage of pattern portion. (V-98-1).

The weave structure seen in the weave technique of V-98-1, whose pattern warp number is composed of the repetition of 2.1.1.2 alignment, is common to those of the patterns of V-62-1 and V-51-3. Consequently, the above three specimens have been identified in the same cloth. As shown in the data excavated at at-Tar Caves, it has thus been understood that the projecting parts of V-62-1 and V-51-3 correspond with those of H-shape patterns with other oblong patterns, just as in Textile 9 and Textile 10.

IV-W-54a (Pl. 1c) is a specimen with a selvage and a cord-like finish evidenced on the weave finish of the ground. At the selvage cord of 6.4.5 warp thread alignment, an additional thread of 3-parallel weft whose quality is the same as that of the ground weft, is worked between two picks of the U-turning wefts so as to protect the wefts (Fig. 8). The method of passing the additional thread seen here is the same as that of the ground on V-98-1, but IV-W-54a is different from V-98-1 in the number of selvage cord and additional thread used there. Still, it resembles V-98-1 closely in thread thickness, twist count, twist direction, warp density and weft density. It is, therefore, considered that IV-W-54a can be identified in the same cloth as V-98-1, allowing that the difference of the selvage structures existing between the two has resulted from that of the right and left selvage making methods seen between them.

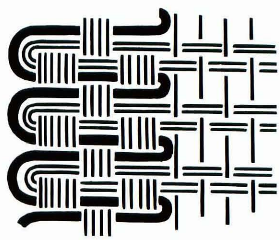

Fig. 8 Method of additional thread on selvage of ground portion. (IV-W-54a).

The other thirty small fragmentary specimens have been identified in Textile 11, judging from thread thickness, twist count, twist direction, thread density and warp crossing technique in which warp threads are crossed in an interval of four warps between them.

Textile 12 (V-126-3) and Textile 13 (IV-W-59)

They are a single specimen each, both of which have some traits idenpendent of Textile 9, Textile 10 and Textile 11. Textile 12 (Pl. 6a) is regarded as a projecting part of a pattern with notched part, evidenced from the orthogonal bending of the part making a corner, the turning part of the ground weft and pattern weft each by dovetailed tapestry technique in warp direction, and the remnant of ground seen along the pattern border in weft direction. Textile 12 has the pattern warp number of 2.2.2.2 repeated alignment, which is common to that of Textile 9 and Textile 13, but it is different from Textile 11 whose pattern warp is aligned with 2.1.1.2 repeatedly. On their patterns, Textile 9 is 0.15–0.30 mm, Textile 13 is 0.25–0.30 mm and Textile 12 is 0.35–0.45 mm in weft diameter, respectively, while Textile 9 is 58.0–68.0, Textile 13 is 50.0–52.0 and Textile 12 is 40.0 in pattern weft density, showing a difference of number among them. In this connection, therefore, the above four have been concluded as separate textiles.

Textile 13 (Pl. 6c) has a basket weave (warp 2, weft 2) at the part between 2 patterns, which is quite different from the ground which is composed of variation of plain weave (warp 1, weft 2). It is feasible to understand that this is a fabric with the notched part, judging from the H-shape pattern data on Textile 14 ever uncovered at Cave C-12 [Fujii, Sakamoto and Ichihashi, 1989: pp. 141–142]. The notched parts of both Textile 12 and Textile 13 are of basket weave (warp 2, weft 2), which is identical in weave structure between them. On the other hand, Textile 9 and Textile 11 only have basket weave within the limits of the several picks (shifting zone) along the pattern border in weft direction at the notched part of the H-shape pattern, and then the notched part (warp 1, weft 2) follows by way of warp's weave alteration through warp crossing technique.

4. Description and design

Textile 9

Textile 9 consists of 20 identified fragments such as one with a medium-sized H-shape pattern (V-73-1b), one with two oblong patterns placed up and down along the selvage each (V-65-1, a piece of cloth with an oblong pattern V-68-4), a cloth where ground only has been largely surviving (V-72-1), a cloth with weaver's mark and cord-like warp finish remaining on the weave end (V-77-2), a cloth with warp finish only (V-73-1a) and a ground cloth with selvage (V-79-2).

V-65-1 was already returned to the Iraqi Museum. Instead, it has been proved that the reddish purple wefts used for the other fragment V-68-4 which has been confirmed as the one with an oblong pattern were dyed with Tyrian purple as a result of their dyeing analysis (p. 143). It is thus found that the reddish purple wefts identified in Textile 9 are of Tyrian purple dyeing and that they have been finely spun with excellent sheep wool (0.15–0.30 mm), resulting in the formation of pattern band with high density wefts (58.0–68.0/cm). On the pattern, however, there are some differences of weft densities among these specimens. For example, the weft densities on the oblong patterns along the selvages are 58.0–68.0/cm in V-65-1, 66.0–68.0/cm in V-68-4 and 60/cm in V-73-1b which is regarded as the projecting part of H-shape pattern.

V-65-1 is still uncertain as to which is its pattern weave start. It contains two oblong patterns placed separately along the selvage, i.e., one of which is a whole oblong pattern of 12 cm in warp length and the other, the remaining part of about 7.0 cm in warp length. Textile 14 (IV-OH-368-13) from Cave C-12 and Textile 1 (C-31, 31′) from Cave F-4 can be cited as typical cloths of the oblong pattern woven along the selvages. Deduced from the above, V-65-1 and V-68-4 are considered as fragments of a set of 3 oblong pattern bands which are allocated close to the 4 corners along both the selvages of a large cloth each. As regards the cloth with large H-shape patterns, Textile 1 (C-31, 31′) Cave F-4, the lengths of the oblong pattern bands, which are laid out along the selvage near the weave finish, measured in the order of the weaving: the first pattern, about 15.0 cm, the second about 9.5 cm and the third, about 15.0 cm. Moreover, as for the specimen with smaller H-shape patterns, Textile 14 (IV-OH-368-13) from Cave C-12, the lengths of the oblong pattern bands along the selvage near the weave finish are likewise: the first pattern, about 8.0 cm, the second, about 6.0 cm and the third, about 8.0 cm, respectively. These evidences tell us that the length of the second oblong pattern is a little shorter than the first and the third ones, while the first pattern is nearly as long as the third pattern. In this connection, as already stated in the item of Identification, V-65-1's remaining oblong pattern, about 7.0 cm in length, is regarded as the second pattern, since its pattern length of 12.0 cm is the first or the third pattern, as seen at the upper part of the photo (Pl. 2a). In the two kinds of data given above, we have learned that the second pattern was woven rather shorter than the first and the third patterns in length, from which it is presumed that the second pattern of V-65-1 is shorter than 12 cm, maybe around 9 cm long. And there is a 卍-shape pattern (Pl. 2b) in tapestry weave about 4.5 cm from the second pattern end and about 3.3 cm inside the selvage. Therefore, it can safely be estimated that the 卍-shape pattern woven in the second pattern is located nearly at the center of a set of 3 oblong pattern band, if the original size of the defective third pattern as we see now is allowed nearly the same as that of the first pattern whose full length remains, deduced from the 2 examples shown above. Moreover, Cave F-4 Specimen C-17 [Fujii (ed.), 1976: p. 126, p. 192, No. 184] can be cited as a single discovery of the textile with 卍 meander pattern. This is a pattern which is chain-stitched with dark grayish brown thread on the plain weave cloth of 15.3×14.6 cm (Pl. 7a). And among the human statues uncovered at Hatra, there are some ones wearing the garment designed with 卍 meander pattern (e.g., Safar and Mustafa [1974: p. 77, Pl. 22]). Such 卍 meander patterns can also be seen together with grapevine scroll pattern on the architrave of the Hellenistic temple restored in Hatra (Pl. 7b).

The weave technique taken here for making the selvage by using additional thread is of Type 3. But the method of using the additional thread in the oblong patterns of V-65-1 (pattern weft density: 58.0–68.0/cm) and V-68-4 (pattern weft density:66.0–68.0/cm) differs from that of the specimen with ground only, V-79-2 (ground weft density: 16×2/cm). This seems to have something to do with the degree of the weft density used there. For example, the additional thread taken on the selvage of the oblong patterns of V-65-1 and V-68-4 is so used that the additional thread of paired pattern weft, whose quality is the same as that of the pattern weft, passes over 6–10 picks of the pattern wefts which repeat U-turn motion at the end of the selvage, and turns around the third cord from the selvage end, while covering the U-turning wefts all the way, to protect them (Fig. 2). On the other hand, in the case of the ground of V-79-2, the additional thread of paired weft, whose quality is the same as that of the ground weft, not only repeats U-turn along each weft for its protection, but also regularly makes surplus U-turn to fill the gap of the ground weft return (Fig. 3). This is probably because the weft's high density on the pattern would make the pattern selvage only excessively thick and hard, if the additional thread repeated U-turn along each weft's U-turn motion. Meanwhile, it may have been on the ground of low weft density that the additional thread goes together with the U-turn of each weft up to the third cord, and in addition goes around the first cord from the selvage end once, thus aiming at the natural balance of thickness of the selvage between the pattern and the ground. In this way, the method of using the additional thread was changed from pattern to ground out of neceessity for the weft density taken there. Moreover, it is presumed that the evidences of the 3.3.4 selvage cord alignment for V-65-1 and V-68-4 in contrast with the evidence of the 3.3.3 selvage cord alignment for V-79-2 are probably because the former two originate in the textile with oblong pattens on the same side of the selvage, whereas the latter has the selvage woven on the other side. It is thus noticeable that the difference of the cord-making between the former and the latter has come from the different ways of selvage making method separately taken on the right side and the left side.

V-73-1b is a small piece of 7.5×6.2 cm in size. But this is an important specimen from which we can draw an inference that this is one side of the projecting parts of H-shape pattern with notched part. Here, weave alteration by warp crossing is found on the grounds near the upper and lower parts of the pattern contour, where the warps turn from the ground, variation of plain weave (warp 1, weft 2) to paired warp each, with which paired ground weft is densely interlaced in several picks. We call this 'shifting zone' [Fujii and Sakamoto, 1992: pp. 99–101, Figs. 2, 3]. Making the shifting zone will help to minimize the occurrence of the warps' slight zigzag which is caused by the warp crossing. And right after that, making the pattern (warp 2, weft 1) by using pattern weft in high density will be started. In result, the pattern contour will be made clear. Furthermore, shortly after the pattern weaving work, the paired ground weft is densely interlaced with the paired warp in several picks again, which is also called by us 'shifting zone'. And then, right after that, with the use of warp crossing technique, the cloth turns back to the ground, variation of plain weave (warp 1, weft 2), thus resulting in the formation of the clear pattern contour. At the pattern contour in warp direction, we see the weft turn back by dovetailed tapestry technique. As already mentioned in detail, Textile 14 (IV-OH-368-13) from Cave C12 and Textile 1 (C-31, 31′) from Cave F4, which are the textiles with H-shape patterns, can be regarded as fundamental examples of the above techniques [Fujii, Sakamoto and Ichihashi, 1989: pp. 140–143, Figs. 26; Fujii and Sakamoto, 1992: pp. 99–101, Fig. 3]. Such pattern weave techniques as shown in V-73-1b closely resemble those of Textile 11 (V-51-3, V-62-1). So, it has been presumed that V-73-1b is one piece of the projecting parts of H-shape pattern with notched part. If V-73-1b, whose pattern length in warp direction is 4.3–4.5 cm, is thought to be one side of the projecting parts of the H-shape pattern with notched part, the warp length of the other side of the projecting part is regarded as the same as that of the above, estimated from the data from Textile 11 (V-51-3, V-62-1). Thereby, estimation of the whole H-shape pattern in full length will be feasible, as will be referred to afterward in the item of Textile 11. Nevertheless, V-73-1b has its pattern composed of the repetition of 2.2.2.2 warp alignment caused by warp crossing technique, whereas Textile 11 has its pattern composed of the repetition of 2.1.1.2 warp alignment.

V-72-1 is the largest non-patterned cloth of all the ones that have been identified in Textile 9, from which we can grasp enough data about its weave structures such as warp and weft thicknesses, thread twist direction, thread twist count, warp density, weft density, cloth thickness, texture, etc. Relying on the numerical value given for V-72-1 as standard, therefore, we worked at identifying the specimens which were to belong to Textile 9. The most outsanding quality about this specimen is that it has some parts where finely spun weft threads are seen twisting and crossing (Pl. 1a). This is a phenomenon to occur when plural weft threads set in parallel are passed at the same time. Their twists are always of the same direction, but the interval between twists is not always constant. The technique of this kind can be seen not only on the ground of Textile 9 but also on the grounds of Textile 11, Textile 13 and Textile 14 (IV-OH-368-13) from Cave C12 [Fujii, Sakamoto and Ichihashi, 1989: p. 141, Pl. 30b]. Regarding the textiles coming from at-Tar Caves, this kind of technique has often been used among some thin, soft fabrics with H-shape patterns in texture [Fujii, Sakamoto and Ichihashi, 1989: p. 114]. The two-weft picking method that two fine wefts are passed in pairs, seems likely to have been devised as a technique for weaving soft cloth in touch. We presume that this is the method to wind two wefts together around the weft-picking tool. The paired weft is different from the two-plied thread which is made of twisting two threads into one. In the case of two-plied thread, thicker and rounder the thread, harder will be the cloth texture. On the other hand, the cloth woven with two-parallel wefts has its threads lined in parallel, which keeps the cloth from getting thick. So, as for plain weave, this is finished up with softer touch than that woven with two-plied threads.

The cloth ends of V-77-2 and V-73-1a show us the method that their weave ends are finished with warp threads twisted together into a cord [Fujii, Sakamoto and Ichihashi, 1989: p. 115, Fig. 5]. For example, V-77-2 has its warp ends twisted up into a cord diameter of 2.5–3.0 mm, while putting 2–4 warp ends each together. And there is a single tapestry weave ⤚ shape pattern of about 2.0 cm in weft direction, which is woven with reddish purple weft threads, about 3.6 cm inside its weave finish (Pl. 2d). As regards the mantle with notched band excavated at the Cave of Letters (Our H-shape pattern band has been named 'Notched band' and our oblong pattern, 'Segmented stripe ornament' by Yigael Yadin), there are ┿ shape pattern and 工 shape pattern 1.9–2.0 cm inside the weave finish and 器 shape pattern which symbolize something and others beside the oblong pattern along the selvage on the very mantle, all of which Yadin calls 'weavers' marks [Yadin, 1963: p. 219, Fig. 73, pp. 224–225, Figs. 73, 76, Pls. 69, 85]. Among them, the 工 shape pattern has been evidenced about 2.0 cm inside the weave finish of a cloth with notched band [Yadin, 1963: p. 234, No. 27-2.83]. Also, among the specimens with various pattern fragments from at-Tar Caves, it is possible to confirm that there are some pieces of patterns resembling those mentioned above. For instance, it can be said that Specimen C-201-d from Cave F-5, Hill A [Fujii (ed.), 1976: p. 175, No. 102; Fujii (ed.), 1980: p. 273, No. 185] is the one of the same atmosphere in mode of pattern as that of the aforementioned third pattern from the Cave of Letters. Specimen IV-OH-368-5 which belongs to Textile 12 (IV-OH-368-14a with gamma (L-shape) pattern) excavated at Cave C12, has arrow (← shape) pattern in tapestry weave used by reddish purple weft thread in weft direction about 5 cm inside the cord-like warp finish [Fujii, Sakamoto and Ichihashi, 1989: pp. 138–139, Pl. 29b]. This is very similar to V-77-2 in mode of mark. Moreover, the feature common to both is that their patterns have been woven in tapestry weave nearly at the same place close to the weave finish. In addition, V-77-2 is a fragment with H-shape pattern whereas IV-OH-368-5 is a one with gamma (L-shape) pattern.

Specimen IV-OH-368-13 (Textile 14) from Cave 12, Hill C, which is provided with H-shape patterns in tapestry weave arranged up-and-down and right-and-left with the central part of the cloth as its center, and oblong patterns along the both selvages, is a textile with weave start, weave finish, and right-and-left side selvages traceable. Of all the textiles with H-shape patterns that have ever been uncovered at at-Tar, this is the only one whose sizes are measurable as 238.5×164.0 cm. It is possible to understand that the textiles with H-shape and gamma-shape patterns are very large and may be an outerwear like a mantle, as shown in an example (at Shrine VI) of several priest images excavated at Hatra [Fujii, Sakamoto and Ichihashi, 1989: p. 150, Pl. 34C], and the Conon figure of a fresco at Palmyra Temple, Dura-Europos. If this sort of large cloth was an outerwear which was worn by some specific professional group of people like priests, it is quite feasible to consider that such marks as mentioned above used to be 'users' marks, besides 'weavers' marks.

The dyestuff analysis made for the wefts (yarns) of V-68-4 as representative pattern weft in Textile 9 has proved that the reddish purple wefts were spun by the loose fiber dyed with Tyrian purple (p. 143).

Textile 10

Textile 10 is made up of 28 identified fragmentary specimens such as a fragment with notched part which is presumable as a part of H-shape pattern (V-71-4b), a fairly large one whose band pattern of 4.2 cm in warp length with ground (V-62-2), fragmentary pieces with oblong patterns along the selvages (IV-W-66-3, V-90-3b, V-73-8) and fragments with cord-like warp finishes (V-98-4, V-126-1). All the specimens belonging to this group are medium-thick and rather coarse in warp and weft densities, so it is easy for us to distinguish them from other excavated things. In particular, the Z-twist weft found on both the ground and the pattern is a feature rarely met with among the wool textiles except for pile textiles uncovered at at-Tar Caves [Fujii, Sakamoto and Ichihashi, 1989: pp. 160, 164; Fujii and Sakamoto, 1990: pp. 60–65].

V-71-4b, at a sight, looks like two reddish purple pattern portions separated up and down. Here, each pattern weft placed at the side edges of both these patterns and each ground weft turn back with the use of dovetailed tapestry weave, and then the ground weft between the patterns turns back each other by tapestry weave, where the wefts are interlaced with warps in 11 picks (about 1.2–1.4 cm). Quite naturally, therefore, this is considered to be the ground of notched part inserted between patterns. So, the patterns which look like the 2 up-and-down ones apart seem to be the projecting parts of the H-shape pattern with notched part inserted between them. The size of the notched part in weft direction is about 3.0 cm. And the sizes of the upper and the lower projecting patterns in warp direction are about 1.4 cm each. Further, the total size in warp direction of the aforementioned notched part (about 1.2–1.4 cm) plus these sizes is equal to about 4.0–4.2 cm in all, which roughly corresponds to the size in warp direction of the weft band pattern for V-62-2. Thus, V-71-4b has been found to be a projecting part of H-shape pattern which links to the weft band pattern for V-62-2. Nevertheless, neither the shifting zone nor the warp crossing technique in weft direction near the pattern contour can be seen in V-71-4b, V-62-2 and V-90-3b which has oblong pattern and ground along the selvage, which is different from V-65-1, V-73-1b (Textile 9), and V-62-1, V-51-3 (Textile 11) in which we can see the above devices. As far as the above 3 specimens belonging to Textile 10 are concerned, the thick warp and weft threads used on both the ground and the pattern will make thick fabrics in texture, and the coarse warp and weft density will make the ground and the pattern rather well-balanced, even if weft threads are densely passed on the pattern. This is why the textiles given above may have been woven without the necessity of warp crossing technique and the formation of shifting zone in them, we presume.

V-85-1 is a fragment whose ground is largely remaining (Size: 31.8×21.6 cm). The turning part of the ground weft and the pattern weft by dovetailed tapestry technique has been confirmed at its color border. This situation is common to the dovetailed tapestry technique taken at the end of the projecting pattern in V-71-4b, so that it can be said that this is a portion of H-shape pattern. Moverover, V-90-3b is presumable as a fragment of oblong pattern, deduced from the exampels of V-65-1 and V-68-4 which have been identified in Textile 9.

The selvages along the oblong pattern in IV-W-66-3, V-90-3b and V-73-8 are so composed that 8 picks of simple wefts' turn belonging to Type 1 precedes 2 picks of wefts' turn around the 3rd cord from the selvage side belonging to Type 2, in the way of repeating Type 1 and Type 2 combination work (Fig. 5). The ground selvage (V-90-3b) seems to have been made of the repetition of Type 2 technique in high density. IV-W-66-3 and V-90-3b are of 4.3.3. warp cord alignment, while V-73-8 has 3.3.3 warp cord alignment. It makes us hard to understand as to the latter's present situation whether one warp was severed on the way, or only due to the different way of selvage making taken on right side and left side.

IV-W-66-3 is a fabric whose linking part of the oblong pattern along the selvage and the ground clearly tells us the state of turning back the ground weft and the pattern weft each. The dovetailed tapestry technique shown here corresponds to that in V-65-1 which has been identified in Textile 9 (Fig. 1). And also, IV-W-66-3 has been made with such technique as can be evidenced in the linking part between the pattern and the ground of V-71-4b. It has the oblong pattern of about 2.5 cm in weft width. We have already mentioned about the situation of the warp cord finish evidenced in V-98-4, V-126-1 and V-41-1b in Identification. The dyestuff analysis made for the wefts of V-90-3b as representative pattern wefts in Textile 10 has proved that the reddish purple weft threads were spun by the mixtures the loose fiber dyed with Tyrian purple and the loose fiber dyed with kermes (p. 143).

Textile 11

Textile 11 has 34 identified fragmentary specimens such as the ones which are evidently thought to be the projecting parts of the H-shape patterns with notched parts (V-62-1, V-51-3), the ones with oblong patterns woven along the selvages (V-98-1, V-134-5), the one of weave finish where there is a warp cord finish linking from the selvage (IV-W-54a) and so forth. V-62-1 and V-51-3 are the specimens which clearly suggest to us that they are the fragments of projecting part of H-shape patterns. One side of these projecting pattern lengths in warp direction each can be measured as 4.3–4.5 cm, because each of them remains perfect, but the other side of them each is hard to measure due to half-missing. And the depths of their notched parts cannot be measured. However, it is possible for us to estimate the warp length of the missing side of the pattern as about 4.3–4.5 cm which is equal to the warp length of the other remaining projecting pattern, as we see it remain intact. Then, we were able to measure the notched part of V-62-1 as about 4.3 cm in warp length. Thus, the notched part of V-51-3 is also presumable as about 4.3 cm in warp length, because its remaining situation of the pattern and notched part resembles that in V-62-1. It seems, accordingly, that the total length of the H-shape pattern which can be identified in Textile 11 is (4.3–4.5 cm×3=) 13.0 cm or more in warp length. After all, with the things in Textile 11 taken into account, we can guess that the total warp length of the H-shape pattern in Textile 9 is (4.3–4.5 cm×3=) about 13.0 cm providing that two projecting portions of the H-shape pattern and the notched part in warp length are almost the same, as referring to the case of V-73-1b (Textile 9), one side of whose projecting parts of the H-shape pattern remains intact, just as you see in Textile 11.

The common weave structures evidenced in the projecting parts of the H-shape pattern, V-62-1, V-51-3, and the oblong patterns, V-98-1, V-134-5, are shown as follows:

1) The ground (variation of plain weave) is of warp 1, weft 2 (paired weft).
2) Warp crossing is done before entering the pattern.
3) Immediately afterwards, there comes the formation of shifting zone by interlacing the paired ground weft with the 2.1.1.2 warp alignment in high density about 4–5 mm wide (about 10 picks of wefts).
4) Directly after that, pattern-weaving starts by passing a single reddish purple pattern weft each in high density through the 2.1.1.2 warp alignment.

The number of warps used on the pattern-making belongs to Type B which means the repetition of warp threads, 2.1.1.2 (Fig. 6b). And the work changing from pattern to ground is just in the reverse order. That is, shifting zone is formed by densely interlacing the paired ground weft with the 2.1.1.2 warp alignment 4–5 mm wide or so, followed by warp crossing. And then, the cloth gets back to the variation of plain weave (warp 1, weft 2). This is also true of the notched part. As already mentioned in Textile 9 (V-73-1b), the above technique of making the shifting zone with the ground wefts passed more densely seems to have been devised in order to minimize the occurrence of minor zigzag lines affected by warp crossing. In result, it will help to make the pattern contour much clearer [Fujii, Sakamoto and Ichihashi, 1989: pp. 140–143, 144–146; Fujii and Sakamoto, 1992: pp. 99–102]. Some other examples of such large textiles with H-shape patterns where the pattern warp number 2.1.1.2 is repeated as seen above can only be found in Specimen IV-MK-469 from Cave 17. After warp crossing, some warps are arranged into 2.2.2.2 and others, 2.1.1.2. It can be said, in this connection, that under the fixed condition that the ground warp and the pattern weft are equal in density, the warp alignment of 2.1.1.2 will have more intercrossing and interlacing points, thus making the cloth touch harder. But the warp density in Textile 11 is lower than that in Textile 9. Since the pattern weft in Textile 11 is larger than that of Textile 9 in diameter, it prevents the weft from passing smoother than the weft-passing for Textile 9. So the weft density used in Textile 11 is lower (refer to Table 1). The above 2 reasons make Textile 11 free from hard feel in texture, as it does not lead to the increase of intercrossing and interlacing points, even though it has the pattern warp alignment of 2.1.1.2. It seems likely that the use of the 2.1.1.2 pattern warp alignment evidenced in Textile 11 is probably because its relatively large warp diameters had to avoid becoming thicker to be caused by their crossing as much as possible.

Among the textiles discovered at Nubia, there is also a specimen (Number Q594/Q2288A: Oriental Institute Museum Registration No. 22027A) whose warps are aranged into 2.1.1.2 in the pattern part, after warp crossing [Thurman and Williams, 1979: p. 126, No. 145]. In this specimen, the pattern weft is passing through the warp alignment of 2.1.1.2 which is altered directly after warp crossing (Pl. 5b). And no shifting zone can be seen at the pattern contour here, different from Textile 11 (Cf. Fig. 6b). It is probable that this must be regarded as the evidence arising from the low density of the pattern weft or as a matter of regional features. Its warp density is about the medium between that of Textile 9 and that of Textile 11. The Nubia specimen is also medium in pattern weft diameter, which makes it difficult to pass weft threads more frequently. Therefore, it is lower than Textile 9 and Textile 11 in pattern weft density. We see the warp diameter of the Nubia specimen described as 'medium', which, we presume, is about the size of the warp diameter for Textile 11. As for V-62-1, the ground weft and the pattern weft beside the

Table 1 Comparison of textiles with warp alignment in the pattern part.

Textile No.	Warp alignment in the pattern part	Density		Diameter	
		Warp/cm	Pattern weft/cm	Warp/mm	Pattern weft/mm
Textile 9	2.2.2.2	18.0~22.0	58.0~68.0	0.15~0.30	0.15~0.30
Textile 11	2.1.1.2	13.0~14.0	40.0~42.0	0.30~0.40	0.30~0.45
Nubia Q594/Q2288A	2.1.1.2	16.0~18.0	33.0	Medium	Medium

pattern end in warp direction turn back each other by dovetailed tapestry technique. V-98-1 is a specimen of oblong patterns woven along the selvage, where the ground weft and the pattern weft beside the pattern end in warp direction turn back by dovetailed tapestry technique. Its pattern weft width has been measured as about 5.2 cm. This is a specimen which has a ground part spreading up and down with a complete oblong pattern (warp direction: 8.5 cm×weft direction: 5.2 cm) inserted in the middle, and the ground part (warp direction: 3.5 cm×weft direction: 5.2 cm) which directly links to the above-mentioned pattern, is connected with an oblong pattern one end of which is missing. Deduced from this sort of situation, V-98-1 has been regarded as a fragment of a set of three-oblong pattern band, like V-65-1 which was identified in Textile 9, evidenced from the data of Textile 14 (IV-OH-368-13) from Cave C-12 and Textile 1 (C-31, 31′) from Cave F-4. Its pattern warps which are composed of 2.1.1.2 repetition are interlaced with weft threads. And the shifting zone and warp crossing technique can be seen on the ground along the outer pattern contour in weft direction, as already stated in Identification. Also, on the ground between the patterns, there are two parts of such evidneces along the pattern ends, which is different from V-65-1 in Textile 9. For its selvage-making of the pattern, V-98-1 uses Type 3 which means consolidation by additional threads, where with the use of 2 cords of 4.4 warp alignment at the selvage, the additional thread of 3-parallel wefts, whose quality is the same as that of the pattern weft, each is worked between the wefts which repeat U-turn motion, at an interval of 6–8 picks, which helps to protect the said wefts' U-turn section all the way (Fig. 7). In the meantime, on the ground, the additional thread of 4-parallel wefts, whose quality is the same as that of the ground weft, each is woven into the U-turning weft at an interval of 2 picks to protect the U-turning weft section. It seems that such different ways of selvage-making between pattern and ground are attributed to higher weft density seen on the pattern portion. Probably it may have aimed at keeping balanced thickness to be required for a whole cloth.

IV-W-54a is a specimen where the ground selvage and the cord-like finish at its weave end are remaining. Its selvage is composed of 6.4.5 warp cord arrangement, and at the selvage, the additional thread of 3-parallel wefts, whose quality is the same as that of the ground weft, each is worked between the U-turning wefts at an interval of 2 picks (Fig. 8). As regards its selvage structure, as mentioned in Identification, the method of using the additional thread is common to that of the ground in V-98-1, but it differs from the ground in V-98-1 in number of selvage cord and additional thread. It may be more reasonable to notice that the differences of the selvage cord number between IV-W-54a and V-98-1 result from the technical differences in making the right side selvage and the left side one. So, we can also think that the existent number of 3 additional threads instead of 4, as we find at present, seems to have been their original number. At the weave finish of this specimen, we see the three cords of warp threads at the selvage left several centimeters long, with the rest cut off. Having been divided into 2, the warps begin to be twisted into a cord for finishing. Next, the other warp threads at their finished stage are gradually left several centimeters long each, with the rest cut off, and are finally finished up with the cord of about 3 mm in diameter, while adding them into the above-mentioned twisted cord little by little. It is usual that the cord diameter varies with the warp length left over and the number of warps to be added there [Fujii, Sakamoto and Ichihashi, 1989: p. 115]. The dyestuff analysis made for the wefts of V-68-8 as representative pattern weft in Textile 11 has proved that the reddish purple pattern wefts were spun by the mixtures of 3 colored loose fibers, that is, kermes, indigo and the yellow natural dye (not yet defined) (p. 147).

Textile 12

This is a partial specimen of a notched part of either H-shape pattern or gamma-shape pattern. It has a pattern portion (warp 2, weft 1) and a ground portion (warp 2, weft 2) which links to the pattern. Its pattern is made into weft-faced one, by passing a single weft into 2 parallel warps each in high density. The warp threads are of 2.2.2.2 repetition. At the pattern border in warp direction, the turning end of the ground weft and the pattern weft by dovetailed tapestry technique is visible, but it is hard to take its actual size in warp direction, because the warpward terminal has been broken. Meanwhile, we can observe the remnant of the basket weave where a paired warp is interlaced with a paired weft each along the pattern end which is positioned weftward. From the above remnant grounds, we can guess that the space surrounded by the warpward pattern portion and the weftward pattern portion is a ground which corresponds to a notched part. With regard to the basket weave structure, the following two are presumable:

1) As evidenced in V-73-1b (Textile 9) V-62-1 and V-51-3 (Textile 11), this is a shifting zone which means weave structure shortly before warp crossing technique is taken when pattern turns to ground on notched part.
2) Just as seen in IV-W-59 (Textile 13) and IV-OH-368-13, Cave C-12 (Textile 14), the paired warp as was done so in pattern-weaving goes on interlacing itself with the paired ground weft without any change of weave alteration after that, such as warp crossing.

But, anyhow, the possibility of shifting zone which requires high density there, is scarce, since the surviving data tell us that the paired weft is not so high in density. And on the ground along the outer pattern border, there is a part which looks like the trace of warp crossing (Pl. 6a, □ part). But it is very difficult to presume that this is a trace of warp crossing owing to its imperfect weave structure, as far as we see now. Nevertheless, the specimens uncovered at at-Tar Caves indicate that the evidence of two or more parallel warps used on the ground is nothing other than the pile textiles [Fujii, Sakamoto and

Ichihashi, 1989, p. 164, Cave-12, Textile 17; Fujii and Sakamoto, 1990, pp. 60–62, Cave-16, Textile 1 and Textile 2], which proves the high possibility that weave alteration by warp crossing was actually conducted in shifting from pattern to ground (Pl. 6b).

It has been analysed that the reddish purple wefts on the pattern were spun by the mixtures of the 3 colored loose fibers, that is, kermes, indigo and the yellow natural dye (not yet defined) (p. 147).

Textile 13

This specimen contains turning points of ground weft and pattern weft by dovetailed tapestry technique in warp direction along the two pattern ends. Its ground is of variation of plain weave by interlacing paired weft with single warp, while its pattern is made of the repetition of 2-parallel warps and single weft in high density. Along the outside pattern border of the one side pattern (upper side of the photo), there is a shifting zone in which 2 warps are densely interworked with 2 ground wefts in 4 picks or so and directly after warp crossing, the cloth turns back to variation of plain weave (warp 1, weft 2). But the portion between the two patterns is of basket weave (warp 2, weft 2). Here, the 2-parallel warps which constitute the pattern continue up to the shifting zone at the outer pattern border on the other side. That is, on the pattern, the 2-parallel warps are interlaced with a single pattern weft which turns back by dovetailed tapestry technique, while on the portion between the patterns and the shifting zone, the warp is interlaced with the paired ground weft in high density, respectively. This sort of structure resembles the weave method of the H-shape pattern taken in IV-OH-368-13, Cave C-12 (Textile 14) [Fujii, Sakamoto and Ichihashi, 1989: pp. 141–142], where the ground between the patterns has no such measures as weave alteration by warp crossing by which 2 warps in the pattern are to turn back to a single warp in the ground. In result, there is no existence of shifting zone that several picks of weft 2 could have otherwise been woven with warp 2 only along the ground closest to the inside borders of both the patterns. Textile 13 in question, therefore, is similar to Textile 14 (Cave C-12) in weave structure, so that it is possible to regard that the basket weave portion, which means the ground between the two patterns, corresponds to a notched part lying between two patterns. The warpward length of the one better-preserved pattern is about 1.4–1.5 cm, while that of the ground between the two patterns, i.e., notched part, is about 1.9–2.0 cm in warp direction. Thereby, if these two patterns can be regarded as the projecting parts of H-shape pattern, and the portion between them, as notched part, the total warp length of the H-shape pattern on this specimen is roughly equal to that of Textile 14 (Cave C-12), which is about 4.9 cm in length. Therefore, Textile 13 is different from V-73-1b (Textile 9), V-62-1 and V-51-3 (Textile 11) in that their notched parts have warp crossing near the pattern border to alter warp system, but it can be said that this is a specimen which has projecting pattern portions with a notched part included inside. But such sort of data is limited only to this one, lacking data of oblong patterns. So we have to conclude that Textile 13 is a specimen provided with projecting parts of either H-shape pattern or gamma-shape pattern, just like Textile 12.

As a result of analysis, the reddish purple pattern wefts were spun by the mixtures of the loose fiber dyed with Tyrian purple, and the loose fiber dyed with indigo (p. 143).

5. Conclusion

Deduced from the aforementioned analyses, the features of the H-shape patterns may be summaried as follows:

Cave F-4 Textile 1 (C-31, 31′) and Cave C-12 Textile 14 (IV-OH-368-13) are the specimens with H-shape patterns that have ever been excavated at at-Tar. The similarity between them lies in thin and large cloth. Regarding the latter, IV-OH-368-13, its whole cloth width can be measured as 238.5×164.0 cm, because both of its selvages with oblong patterns, some parts of its weave start and weave finish have remained. With the middle of the cloth as its center, there are 4 H-shape patterns laid out up and down, and right and left, respectively, and in addition, a set of 3 oblong patterns (in tapestry-weave technique each) is individually allocated close to the corners along both the selvages [Fujii, Sakamoto and Ichihashi, 1989: p. 132, Fig. 16, Pl. 31]. In the meantime, as for the former, C-31, 31′, it is rather difficult to determine the whole information of the cloth owing to its half defective fabric. Judging from such remnant as part of the weave finish, a set of 3 oblong patterns on part of the one side selvage, and a single H-shape pattern near its central portion, the size within the range given above is measurable as 146×109 cm [Fujii (ed.), 1976: p. 160, Nos. 47, 47′, Pl. Textile No. 47′]. The H-shape pattern is provided with notched parts on both ends, which are in parallel with weft direction. The following are the warp length of the H-shape pattern and the weft width of the oblong pattern along the selvage for both:

	(Warp length of H-shape pattern)	(Weft width of oblong pattern)
C-31, 31′, Cave F4	about 25.0 cm	about 10.3 cm
IV-OH-368-13, Cave C12	about 4.9 cm	about 2.2 cm

It has been proved from the above that former's warp length of H-shape pattern is about 2.43 times as large as the weft width of oblong pattern, while the latter's warp length of H-shape pattern is about 2.23 times as large as the weft width of oblong pattern, which shows that the warp length of H-shape pattern and the weft width of oblong pattern are well balanced for both [Fujii, Sakamoto and Ichihashi, 1989: pp. 149–150, Fig. 29].

The following table indicates the individual technical features on weaving the H-shape pattern, the notched part and the oblong pattern, proved among Cave C-16's Textile 9, Textile 10, Textile 11, Textile 12 and Textile 13, which are compared with the features of Cave F-4, Textile 1 (C-31, 31′) and Cave C-12, Textile 14 (IV-OH-368-13).

Table 2 Comparison of textiles with H-shape pattern and oblong pattern.

Textle	Representative Specimen	warp crossing			shifting zone	
		H-shape pattern, Oblong pattern along selvage	H-shape pattern	Oblong pattern along selvage	H-shape pattern, Oblong pattern along selvage	H-shape pattern
		Ground ↕ Pattern	Pattern ↕ Notched part	Pattern ↕ Ground between oblong patterns	Ground ↕ Pattern	Pattern ↕ Notched part
Textile 9	V-72-1	○ (1), (2)	○ (1)	× (2)	○ (1), (2)	○ (1)
Textile 10	V-71-4b	×	×	×	×	×
Textile 11	V-62-1	○ (and 3)	○	○ (3)	○ (and 3)	○
Textile 12	V-126-3	Maybe ○	Maybe ×		Maybe ○	Maybe ×
Textile 13	V-W-59	○	×		○	×
Cave 12 Textile 14	IV-OH-368-13	○	×	×	○	×
Cave F Textile 1	C-31, 31′	○	○	×	○	○

○: Existence; ×: Nil; (1): data of V73-1b; (2): data of V-65-1; (3): data of V-98-1;

To sum up, the following can be drawn from the table given below:

(1) Textile 9 and Textile 11 are 13.0 cm each in H-shape pattern length while Textile 9 is 7.0 cm and Textile 11 is 5.2 cm in oblong pattern width, respectively. Meanwhile, Textile 10 is 4.2 cm in H-shape pattern length and 2.5 cm in oblong pattern width, showing a correlation between the H-shape pattern length and the oblong pattern width, like Cave C-12 Textile 14 (IV-CH-368-13) and Cave F-4 Textile 1 (C-31, 31′) as already stated above. There are 3 kinds of H-shape pattern lengths: 24.5 cm, 13.0 cm and 4.2–5.0 cm, and oblong pattern widths, corresponding to them, are 10.3 cm, 5.2–7.0 cm and 2.5–2.2 cm, from which we see them mutually related.

(2) Warp crossing and shifting zone in shifting from ground to pattern and vice versa can be evidenced in all the specimens except for Textile 10. Textile 10 without warp crossing uses thick warps and thick wefts. Its thickness of 1.15–1.20 mm is thicker than those of other textiles. Here, ground warp density (8.0–10.0/cm) and ground weft density (8.0–9./cm) are low, but well balanced. And its pattern weft density (24.0–28.0/cm) is nearly half of those of other textiles.

(3) The textiles of no warp crossing and shifting zone at notched part (Textiles 10, 12, 13 and Cave 12 Textile 14) have short lengths of their H-shape pattern as described in Table 2.

(4) Textile 11 is the only specimen which has warp crossing and shifting zone at the pattern contour of the ground placed between oblong patterns along the selvage.

The designs on the specimens reported here are summarized as follows: H-shape pattern, oblong pattern woven along the selvage, weavers' marks or users' marks and 卍-shape pattern. The design compositions and comparative data relating to the above are written in Description where individual identified textiles have been detailed. In this connection, here, we must take note of the evidence of the Hatra human statues. We see some of them wear the outerwear of H-shape pattern design [Fujii, Sakamoto and Ichihashi, 1989: p. 127, Pl. 34C, A priest wearing the mantle with H-shape pattern (No. Six Shrine, Iraq Museum, IM58085)], and the other wears the garment of 卍 meander design [A statue representing a prince or nobleman whose name is Shamshákab (Shamshiheb) unearthed from Grand

Table 2 (continued).

	length & width (about cm)		thickness (mm)	density (/cm)		
Oblong pattern along selvage / Pattern ↕ Ground between oblong patterns	H-shape pattern length	Oblong pattern width	Ground	warp	weft: ground	weft: pattern
× (2)	13.0 (1)	7.0 (2)	0.48~0.57	18.0~22.0	(14.0~16.0)×2 (1)	60.0 (1)
×	4.2	2.5	1.15~1.20	8.0~10.0	8.0~9.0	24.0~28.0
○ (3)	13.0	5.2	0.74	13.0~14.0	(13.0~15.0)×2	40.0~42.0
	Maybe 4.8~5.0		Immeasurable	12.0~13.0	Immeasurable	40.0
	4.9		0.72~0.80	12.0~13.0	(17.0~22.0)×2	50.0~52.0
×	4.9	2.2	0.58~0.74	16.0~18.00	(12.0~13.5) ×2	44.0~52.0
×	about 25.0 (4)	10.3	0.54~0.65	15.0~19.0	17.0~19.0	52.0

(4): *Al-Rāfidān* vol. XIII, P. 100, Fig. 3.

Temple in front of the Iwan No. 1, 5/Hatra/97; Safar and Mustafa, 1974: p. 77, Pl. 22]. Besides them, there are human statues wearing such tunic as woven with the grapevine scroll pattern which is similar to the ones from at-Tar. NIHRA image (Second son of SANATRUQ I, IM73001) is one of the above examples [Fujii, Sakamoto and Ichihashi, 1989: p. 127, Pl. 34b; Fujii and Sakamoto, 1992: p. 97]. At Cave F-6, we have unearthed a large, thin cloth with a pattern whose motif resembles that of NIHRA image (Specimen C-38-5-1-b) [Fujii (ed.), 1976: p. 171, No. 91; Fujii (ed.), 1980: p. 150, Fig. IV-34]. And it is very interesting to learn that the restored architrave of the Hellenistic temple at Hatra contains grapevine scroll pattern and 卍-shape pattern arranged up and down (Pl. 7b), which suggests to us the close relationship between the above two as the symbol of worship.

From the dyestuff analytical results, the following conclusion has been drawn on the pattern weft threads used for the H-shape pattern and the oblong pattern along the selvage so far reported here:

(1) The pattern wefts for Textile 1 (Cave F-4), Textile 14 (Cave C-12) and Textile 9 (Cave C-16) consist of the threads which were spun only with the loose fiber of Tyrian purple dyeing.

(2) On the other hand, the pattern wefts for Textile 10 (Cave C-16) are the threads which were spun with the loose fiber of Tyrian purple dyeing and the loose fiber of kermes dyeing together.

(3) The H-shape pattern or gamma-shape pattern wefts for Textile 13 (Cave C-16) are the ones which were spun with the loose fiber of Tyrian purple dyeing and the loose fiber of indigo dyeing by mixture.

(4) The pattern wefts for Textile 11 (Cave C-16) and the H-shape pattern or gamma-shape pattern wefts for Textile 12 (Cave C-16) consist of the threads which were spun with such three kinds as the loose fiber of kermes dyeing, the loose fiber of indigo dyeing and the loose fiber of undefined yellow natural dyeing mixed together.

It is, therefore, a matter of remarkable importance to note that some specimens from at-Tar Caves have the evidence of pure Tyrian purple dyeing as shown in (1) and, at the same time, the others have the evidence of the substitutes for Tyrian purple as shown in (2), (3) and (4).

It is probable that, in considering the matter of the archaeological age and regional features of the at-Tar specimens, we have seriously thought about how to make use of the knowledge obtained from the comparative studies between our data and the resembling ones unearthed at Dura-Europes, Palmyra, the Cave of Letters and Nubia graves [Fujii, Sakamoto and Ichihashi, 1989: pp. 127–128, pp. 146–151] and we must continue to study towards this line. In addition, due consideration must also be given to the comparative studies between ours and the cultural heritages in Hatra, a caravan city in Mesopotamia, whose geographical location is good for mutual traffic along wadis, oases and artesian wells.

Acknowledgements

One of the most interesting problems for us to be engaged on the analytical research of the textiles at at-Tar Caves for these several years was whether or not the comparatively thin cloths contain both the warp crossing technique at the pattern contour and its following shifting zone technique. It is evidenced that some specimens studied here have both of them, and others not. How on earth had such techniques been used at the places other than at at-Tar Caves? It seems probable that the pursuit of the above will give us a clue for solving the matter of how the at-Tar textiles had ranked among others in the history of cultural exchange. As an example coming from Palmyra, we have already introduced a specimen uncovered at Tomb No. 64 [Fujii and Sakamoto, 1992: pp. 101–102; Sakamoto, 1992: pp. 55–56; Schmidt-Colinet, 1992, Abb 1]. In this article, we were able to take up the Nubian textile Q594/Q2288A (Oriental Institute Museum Registration No. 22027A) as a specimen for reference. This is because Dr. Christa C.

Thurman, Curator at the Department of Textiles, the Art Institute of Chicago, showed us the Nubian textile which has been kept in the said institute, in reply to our request. We wish to express our sincere thanks to Dr. Thurman for her kindness. We also wish to thank Mr. John A. Larson, Museum Archivist of the Oriental Institute Museum, the University of Chicago, who kindly permitted us to publish the color photo of the Nubian textile (Registration No. 22027A).

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Note

1) Concerning the selvage making method of Textile 10, as reported in *Al-Rāfidān* Vol. X, we have classified it in Type 2. This is also a combination of simple return work of pattern weft (Type 1) and pattern weft's return on the 2nd cord (Type 2).

List of Data on Non-pile Textiles from Cave 16, Hill C

Explanatory notes

The following textile data indicate the analyses based on the research method specified in Chapter I, Textiles from at-Tar Caves Part 1: Cave 12, Hill C [*Al-Rāfidān* Vol. X, pp. 110–112]:

1. The Textile number (e.g.: Textile 9) indicates an identified series of fragmentary specimens, of which the representative one is best-preserved and most characteristic. And each fragmentary specimen has its own registered number given at the time of its excavation.
2. 'Size' is determined by "the maximum length of warp direction × the maximum width of weft direction".
3. 'Thickness' is given by "Peacock dial thickness gauge, H 0.01–10 mm (OZAKI MFG. Co., Ltd.)".
4. The color of all the textiles is chiefly given to its representative specimen in accordance with 'Jacal color cards 220', following the ones shown in the revised Munsell Table. But, markedly discolored representative specimens are replaced by some other better preserved ones from among fragmentary specimens for naming, if available.
5. 'Thickness, diameter, twist count and thread density' are shown with their minimum-maximum values. 'Diameter' shows the thread diameter measured with the 25-fold magnifier (Monocular 8 × 30, Asahi Pentax).
6. The weft density in the case of two or more wefts used at one shed is indicated as follows: It is shown by the number of shed and the weft number which is passed at a single opening operation. For example, the data description is: (12–14) × 2/cm; the figures in the parentheses show the minimum-maximum values at the spots where the frequencies of shed are measured. '× 2' means paired weft; '× 3' means three wefts. And the multiplied value is equivalent to the actual number. In the case of double or more warp threads in parallel, the warp density is indicated as the ones mentioned above.
7. The thread number of selvage cord is so arranged as to start from the selvage edge in regular order.
8. When a selvage or an edge is observed in the fragmentary specimen, its detail and specimen No. are additionally written.
9. The figures and photos shown here all accord with the warp direction, and the textiles with edges and pile knots clearly identified are positioned with their weave finish up and weave start down in warp direction.
10. The description of 'raw material' of beast fibers entered in the report has conformed to the analytical results of Fibers & Textile Laboratories, Toray Industries, Inc.
11. The raw material marked with an asterisk ※ is from the analytical result given by Fibers & Textiles Laboratories, Toray Industries, Inc. (see pp. 149–150 and Pls. 1–2 of this volume), while the raw material without any mark on is from our determination based on some analytical data hitherto given by Fibers & Textiles Laboratories, Toray Industries, Inc. [1990: pp. 69–79, Pls. 1–13; 1991: pp. 163–165, Pls. 3–4; 1993: pp. 149–150, Pls. 1–2] and some others.
12. The dyestuff analytical results of reddish purple color line obtained here come from Dr. Mitsuo Kimura, Professor of Mie University.

Textile 9: Textile with H-shape Pattern and Oblong pattern

Representative specimen:	Registered No.: V-72-1		
Size (cm):	51.5×31.5		
Structure:	Ground Variation of plain weave: warp 1, weft 2. balanced Design Variation of plain weave: warp 2, weft 1, weft-faced, tapestry-weave technique		
Design:	H-shape pattern [V-73-1b (projecting part)], Oblong pattern [V-65-1, V-68-4 (along the selvage)]		
Thickness (mm):	Ground 0.48–0.57 (V-72-1) Pattern 0.65–0.78 (V-73-1b), 0.71 (V-65-1) 0.70~0.75 (V-68-4)		
	Warp	Weft (ground)	Weft (pattern)
Raw material:	※Sheep	※Sheep	※Sheep
Color:	2.5Y 7.5/6 (Dull reddish yellow)	2.5Y 7.5/6 (Dull reddish yellow)	7.5RP 2.4/5 (Dark wine)
Diameter (mm):	0.15–0.30	0.18–0.30	0.20 (V-73-1b), 0.15–0.25 (V-65-1), 0.20–0.30 (V-68-4)
Twist, Twist No. (/cm):	—S (12.0–13.0)	—S (5.0–7.0)	—S (5.0) (V-73-1b), —S (7.0–8.0) (V-65-1), —S (3.0–4.0) (V-68-4)
Density (/cm):	18.0–22.0	(14.0–17.0)×2	60.0 (V-73-1b), 58.0–68.0 (V-65-1), 66.0–68.0 (V-68-4)
Selvage:	Type 3; Cord (3,3.4) V-65-1, V-68-4, Type 3; Cord (3.3.3) V-79-2.		
Edge:	Weave finish S S —Z, *Cord worked with ply warps*, dia. 2.5~3.0 mm (V-77-2, V-73-1a).		
Dyestuff:	Tyrian purple, V-68-4 (pattern weft)		
Others:	Arrow shape pattern [V-77-2 (tapestry-weave technique), 7.5RP 2.4/5 (dark wine color), width about 2 cm] 卍-shape pattern [V-65-1 (tapestry-weave technique), 2.5Y 7.5/6 (dull reddish yellow color), 1×1 cm square]		

Fragmentary specimens

IV-H-1-7	V-41-9	V-65-1	V-77-2	IV-H-1-9	V-44-5	V-65-2	V-79-2	IV-W-23-1
V-47-28	V-68-4	V-90-4	IV-W-32-1	V-51-7	V-72-1	V-127-3	V-21-1	V-58-2
V-73-1a	V-73-1b							

Textile 10: Textile with H-shape Pattern and Oblong Pattern

Representative specimen:	Registered No.: V-71-4b		
Size (cm):	5.3×5.0		
Structure:	Ground Plain weave: balanced Design Plain weave: weft-faced, tapestry-weave technique		
Design:	H-shape pattern [V-71-4b, V-85-1 (projecting part), V-62-2 (weft band)], oblong pattern [IV-W-66-3, V-90-3b, V-73-8 (along the selvage)]		
Thickness (mm):	Ground 1.15–1.20 (V-71-4b) Pattern 1.30–1.60 (V-71-4b), 1.24 (V-62-2), 1.34 (IV-W-66-3)		
	Warp	Weft (ground)	Weft (pattern)
Raw material:	※Sheep	Sheep	Sheep
Color:	2.5Y 7.5/6 (Dull reddish yellow)	2.5Y 7.5/6 (Dull reddish yellow)	4R 2.4/5 (Dark red)
Diameter (mm):	0.50–0.75	0.45–0.80	0.45–0.55
Twist, Twist No. (/cm):	—S (1.0–2.0)	—Z (0.5–1.0)	—Z (3.0–3.5)
Density (/cm):	8.0–10.0	8.0–9.0	24.0–28.0
Selvage:	Type 1 and 2; Cord (4.3.3) IV-W-66-3, V-90-3b, Cord (3.3.3) V-73-8		
Edge:	Weave finish S S —*Z, cord worked with 1–3 ply warps, dia. 3.5~4.0 mm (V-126-1); cord worked with 5 ply warps, dia. 5.0 mm (V-98-4); cord worked with 3–5 ply warps, dia. 3.5~5.0 mm (V-41-1b).*		
Dyestuff:	Tyrian purple and kermes V-90-3b (pattern weft)		

Fragmentary specimens

V-21-6	V-58-3	V-77-4	V-95-7	V-115-1	V-73-8	V-41-1b	V-62-2	V-79-3
V-98-4	V-116-1	IV-W-66-3	V-44-19	V-68-6	V-82-1	V-101-3	V-127-15	V-116-5b
V-47-7	V-71-4b	V-85-1	V-103-1	V-134-2	V-51-4	V-15-6	V-90-3b	V-107-2
V-126-1								

Textile 11: Textile with H-shape Pattern and Oblong pattern

Representative specimen:	Registered No.: V-62-1			
Size (cm):	38.0×35.5			
Structure:	Ground Variation of plain weave: warp 1, weft 2. balanced.			
	Design Variation of plain weave: warp 2.1.1.2/repeat, weft 1, weft-faced, tapestry-weave technique.			
Design:	H-shape pattern [V-62-1, V-51-3(Projecting part)], Oblong pattern [V-98-1 (along the selvage)]			
Thickness (mm):	Ground 0.67 (IV-W-54b)–0.74 (V-62-1)–0.81 (V-98-1)			
	Pattern 1.23 (V-98-1)–1.24 (V-62-1)–1.35 (V-51-3)			
	Warp	Weft (ground)	Weft (pattern)	
Raw meterial:	Sheep	Sheep	Sheep	
Color:	2.5Y/6	2.5Y/6	7.5RP 2.4/5	
	(Dull reddish yellow)	(Dull reddish yellow)	(Dark wine)	
Diameter (mm):	0.30–0.40	0.38	0.35	0.3–0.45 (V-98-1)
Twist, Twist No. (/cm):	—S (10.0)	—S (6.0)	—S (5.0)	
Density (/cm):	13.0–14.0	(13.0–15.0)×2	40.0–42.0	
Selvage:	Type 3; Cord (4.4) V-98-1, Cord (6.4.5) IV-W-54a			
Edge:	Weave finish S S >—Z, *cord worked with 2–4 ply warps, dia. ca 3 mm* (IV-W-54a).			
Dyestuff:	kermes, indigo and yellow natural dye (not yet defined), V-68-8 (pattern weft)			

Fragmentary specimen

IV-W-9-2	V-2-4	V-44-8	V-65-4	V-95-8	V107-1	IV-W-27-2	V-19-2	V-47-12
V-68-8	V-85-3	V-98-1	V-127-5	IV-W-52	V-21-5	V-51-3	V-73-10	V-86-3
V-101-4	V-134-5	IV-W-54a	IV-W-54b	V-58-4b	V-75-3	V-87-4	V-103-5	IV-W-62
V-41-21	V-62-1	V-77-3	V-90-8	V-106-3	V-79-4	V-37-6		

Textiel 12: Fragmentary textile with H-shape or Gamma-shape pattern

Representative specimen:	Registered No.: V-126-3		
Size (cm):	6.2×6.9		
Structure:	Ground (notched part): Basket weave: warp 2, weft 2. balanced		
	Design Variation of plain weave: warp 2, weft 1. weft-faced, tapestry-weave technique		
Design:	H-shape or Gamma-shape pattern [V-126-3 (projecting part)]		
Thickness (mm):	Ground Immeasurable		
	Pattern 1.13		
	Warp	Weft (ground)	Weft (pattern)
Raw material:	Sheep	Sheep	Sheep
Color:	2.5Y 9/5	2.5Y 9/5	7.5RP 4.5/6
	(Light reddish yellow)	(Light reddish yellow)	(Dull reddish purple)
Diameter (mm):	0.30–0.40	0.25–0.40	0.35–0.45
Twist, Twist No. (/cm):	—S (10.0)	—S (8.0–10.0)	—S (8.0–10.0)
Density (/cm):	12.0–13.0	Immeasurable	40.0
Selvage:	None		
Edge:	None		
Dyestuff:	kermes, indigo and yellow natural dye (not yet defined), V-126-3 (pattern weft)		
Fragmentary specimen:	V-126-3		

Textile 13: Fragmentary textile with H-shape or Gamma shape pattern

Representative specimen:	Registered No.: IV-W-59
Size (cm):	12.3×10.6

Structure:	Ground Variation of plain weave: warp 1, weft 2. balanced Basket weave (notched part): warp 2, weft 2, balanced		
	Design Variation of plain weave: warp 2, weft 1. weft-faced, tapestry-weave technique		
Design:	H-shape or Gamma-shape pattern [IV-W-59 (projecting part)]		
Thickness (mm):	Ground 0.72–0.80		
	Pattern 1.08–1.14		
	Warp	Weft (ground)	Weft (pattern)
Raw material:	Sheep	Sheep	Sheep
Color:	2.5Y 7.5/6 (Dull reddish yellow)	2.5Y 7.5/6 (Dull reddish yellow)	7.5RP 2.4/5 (Dark wine)
Diameter (mm):	0.25–0.35	0.20–0.30	0.25–0.30
Twist, Twist No. (/cm):	—S (9.0–10.0)	—S (7.0–10.0)	—S (7.0–8.0)
Density (/cm):	12.0–13.0	(17.0–22.0)×2	50.0–52.0
Selvage:	None		
Edge:	None		
Dyestuff:	Tyrian purple and indigo, IV-W-59 (pattern weft)		
Fragmentary specimen:	IV-W-59		

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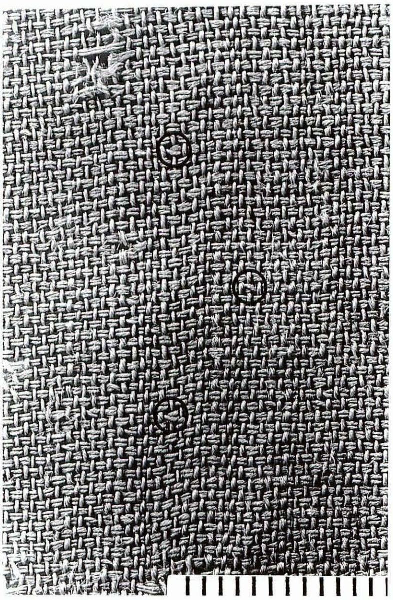
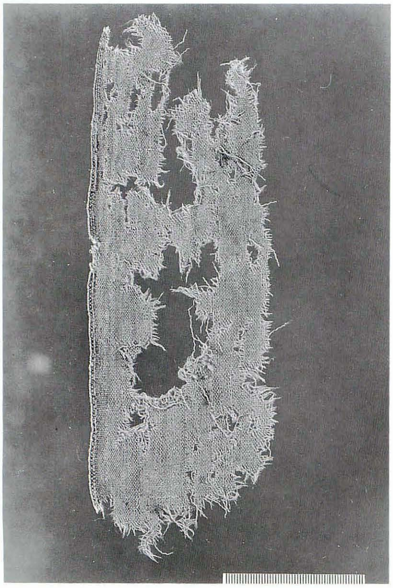
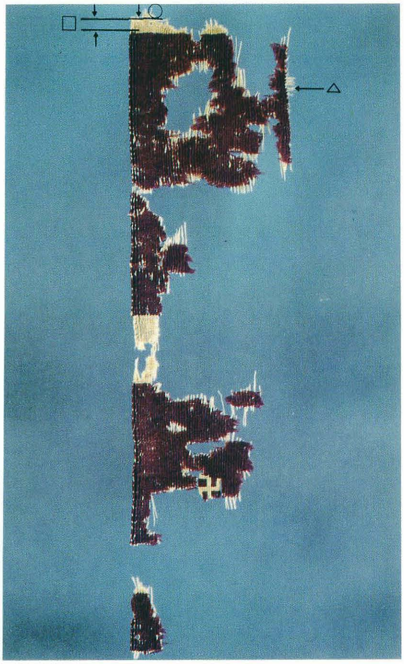


a. Twist portion of weft thread, V-72-1 (Textile 9). ○: twist portion.

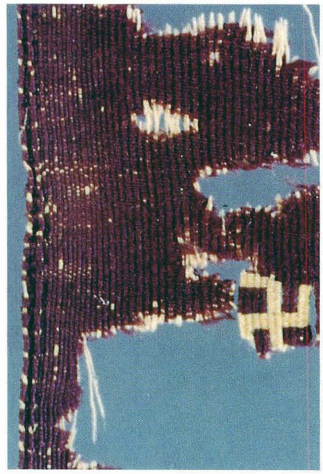


b. Fragment with selvage, V-79-2 (Textile 9).

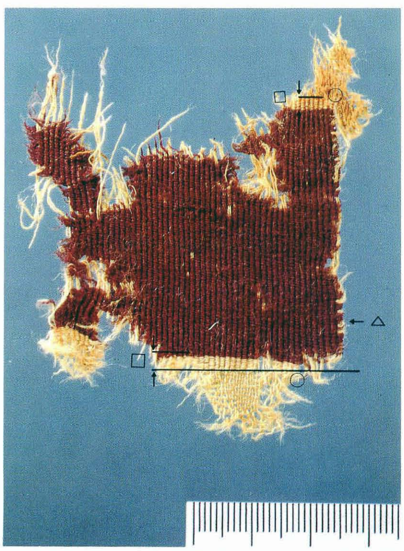
c. Fragment with selvage and cordlike finish, IV-W-54a (Textile 11).



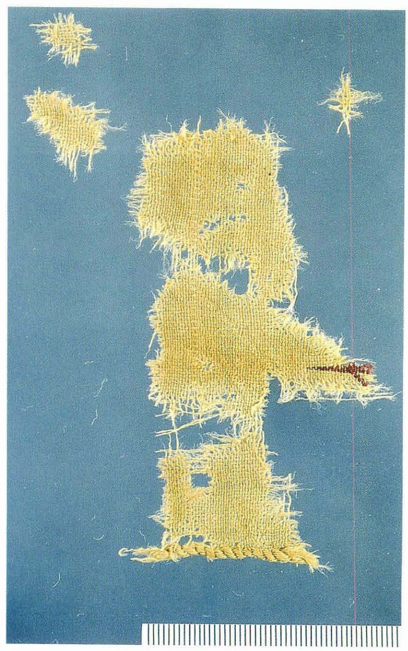
a. Fragment with oblong pattern along selvage, V-65-1 (Textile 9). ○: warp crossing line; □: shifting zone; △: dovetailed tapestry weave line.



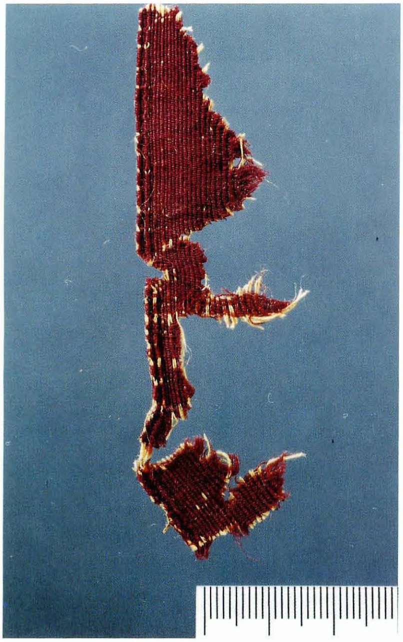
b. 卍-shape pattern in tapestry weave, V-65-1.



c. Projecting part of H-shape pattern, V-73-1b (Textile 9). ○: warp crossing line; □: shifting zone; △: dovetailed tapestry weave line.

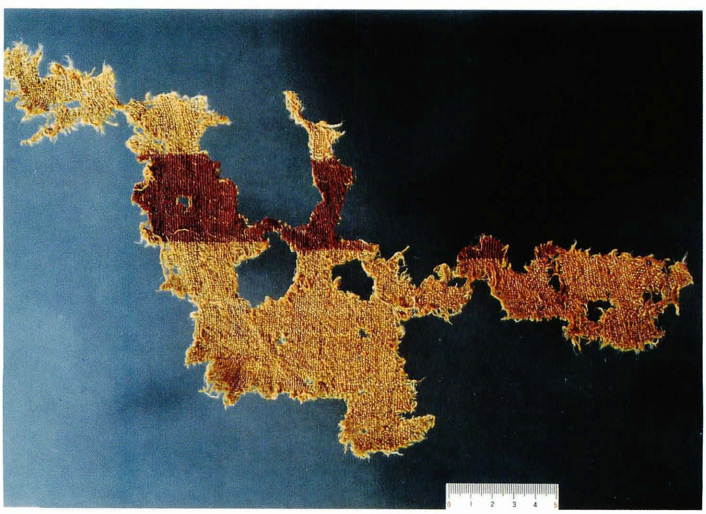


d. Fragment with the weave mark, V-77-2 (Textile 9).



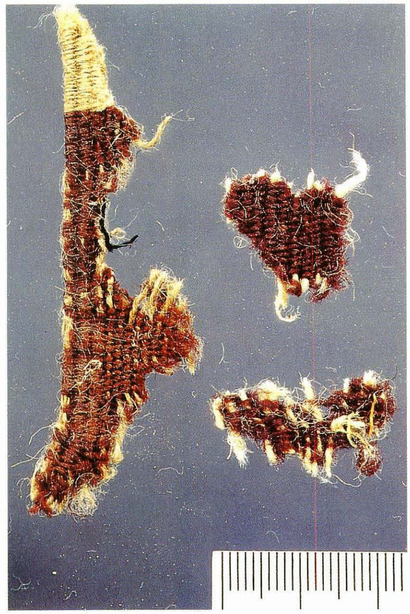
a. Fragment of the oblong pattern, V-68-4 (Textile 9).

b. Projecting part of H-shape pattern, V-71-4b (Textile 10). △: dovetailed tapestry weave line.

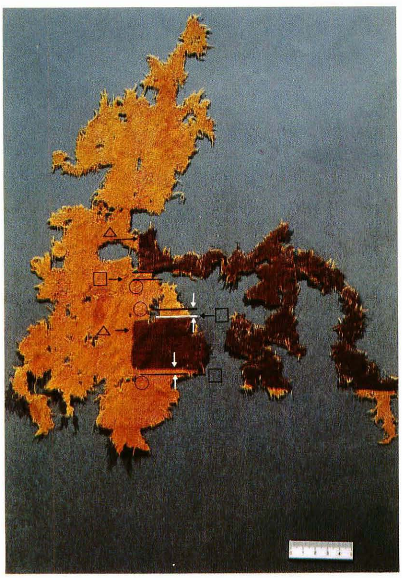


c. Weft band pattern, V-62-2 (Textile 10). (a part of H-shape pattern).

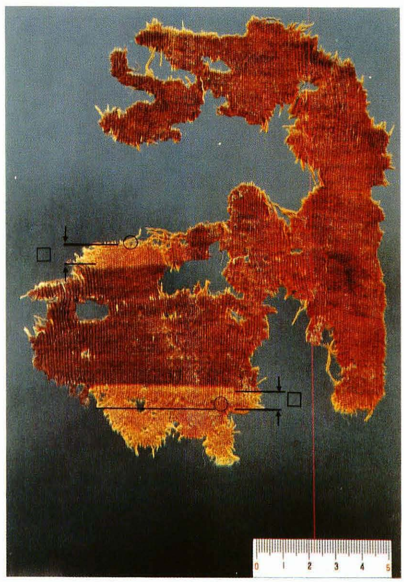
a. Fragment with oblong pattern along selvage, IV-W-66-3 (Textile 10). △: dovetailed tapestry weave line.



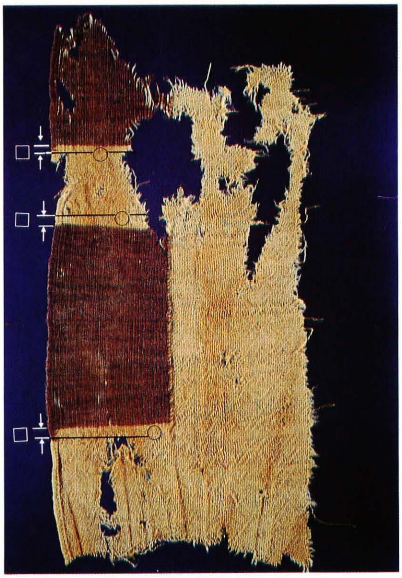
b. Fragment of ground and pattern selvage, V-90-3b (Textile 10).



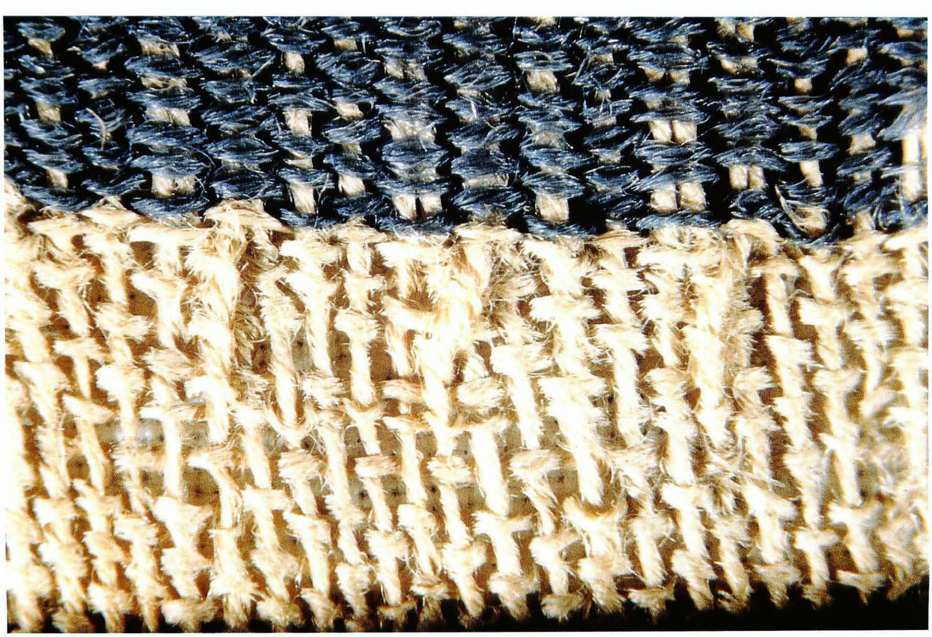
c. Projecting part of H-shape pattern, V-62-1 (Textile 11). ○: warp crossing line; □: shifting zone; △: dovetailed tapestry weave line.



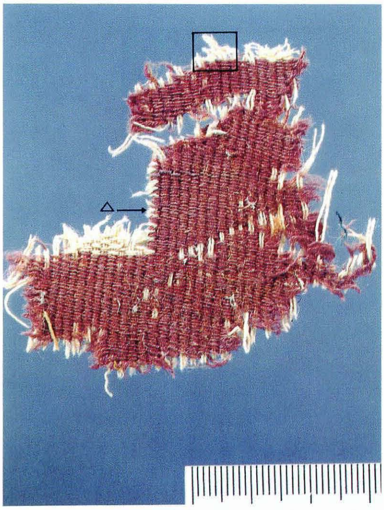
d. Projecting part of H-shape pattern, V-51-3 (Textile 11). ○: warp crossing line; □: shifting zone.



a. Fragment with oblong pattern along selvage, V-98-1 (Textile 11). ○: warp crossing line; □: shifting zone.



b. 2.1.1.2 warp alignment after warp crossing: Nubian specimen Q594/Q2288 (By courtesy of the Oriental Institute of the University of Chicago: Oriental Institute Museum Registration No. 22027A).

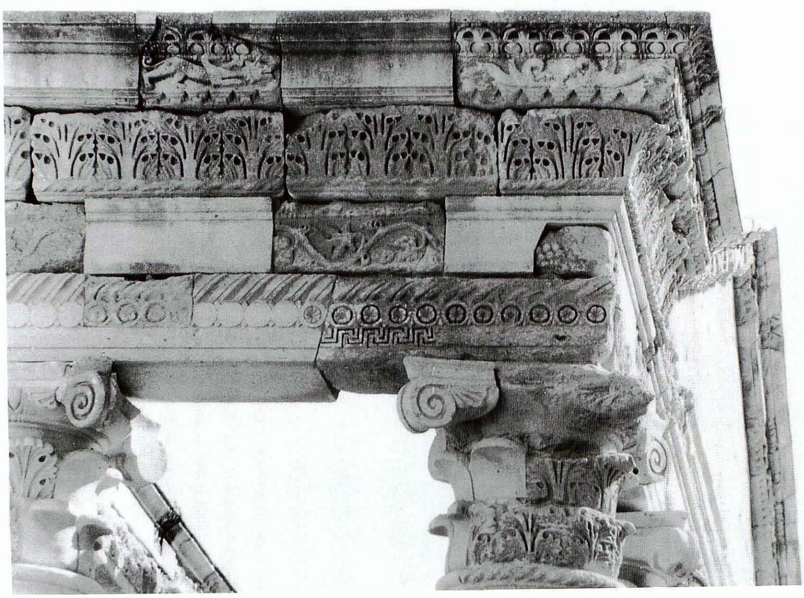


a. Projecting part of H-shape or Gamma-shape pattern. □: part magnified to Pl. 6b; △: dovetailed tapestry weave line, V-126-3 (Textile 12).

b. Magnified view of the trace of warp crossing seen at □ part of Pl. 6a. ○ part is thought to be the trace of warp crossing of V-126-3.

c. Projecting part of H-shape or Gamma-shape pattern, IV-W-59 (Textile 13). ○: warp crossing line; □: shifting zone; △: dovetailed tapestry weave line.

a. 卍 meander pattern, Specimen C-17 (Cave F-4).



b. 卍 meander and grapevine scroll patterns on the architrave of the Hellenistic Temple restored in Hatra.

STUDIES ON IDENTIFICATION OF THE NATURAL DYES ON THE TEXTILES FROM AT-TAR CAVES

Mitsuo KIMURA*, Kazuko SAKAMOTO**
and Hideo FUJII***

1. Introduction

The natural dyes are defined as the mixed aq. solution of natural pigments (glucosides and/or aglycones) which were extracted from dye plants or animals. But, many parts of these natural pigments are decomposed gradually by the extraction from their own cells in plants or animals.

Therefore, the identification of natural dyes on old fibers very often get into difficulties by the decomposition or color change of containing natural pigments.

In this paper, results of experiments on the identification of natural dyes on textiles from at-Tar Caves, which were dyed about 2000 years ago, are reported.

2. Textiles used

2.1. Sample yarns for identification:

As shown in Table 1, 10 reddish purple wool weft yarns in fabrics and 3 reddish purple wool yarns were used for experiments on identification. As these yarns seem to be dyed with Tyrian purple, the following dyed textiles were used as references, on the experiments of identification in this paper.

2.2. Textiles used for references:

(a) Old sample dyed with Tyrian purple: a silk fabric dyed in 1983.
(b) New sample dyed with Tyrian purple: a wool fabric dyed at this time.
(c) New sample dyed with kermes: a wool fabric dyed at this time.

3. Experiments

3.1. Microscopic observation:

The structure of sample yarns was observed under the microscope (Olympus kk, model SZ-60, $\times 60$).

3.2. Measurements of the color difference:

Color differences of each yarn were measured as positions on the chromaticity diagram by the micro color computer (Tokyo denshoku kk, model TR3001MX, measuring spot: 0.2 mm). Results are shown in Fig. 1.

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Table 1 Textile Samples Used

No.	cave No.	textile No.	specimen No.	state of textile sample		
				Shade	appearance	structure
※ 1	F-4	T-1	C-31	reddish purple	v. plain weave fabric piece	2 warps/1 weft
※ 2	C-16	T-9	V-68-4	reddish purple	v. plain weave fabric piece	2 warps/1 weft
※ 3	C-16	T-10	V-90-3b	reddish purple	plain weave fabric piece	1 warp/1 weft
※ 4	C-16	T-11	V-68-8	reddish purple	v. plain weave fabric piece	1~2 warps/1 weft
※ 5	C-16	T-12	V-126-3	reddish purple	v. plain weave fabric piece	2 warps/1 weft
※ 6	C-16	T-13	V-W-59	reddish purple	v. plain weave fabric piece	2 warps/1 weft
7	C-16	T-15	V-71-1	reddish purple	v. plain weave fabric piece	4 warps/1 weft
8	C-16	T-29	V-85-2	reddish purple	weft yarn piece	—
9	C-16	T-38	V-21-13	reddish purple	weft yarn piece	—
10	C-16	T-42	V-41-15	reddish purple	v. plain weave fabric piece	2 warps/1 weft
11	C-16	T-43	V-73-4	reddish purple	plain weave fabric piece	1 warp/1 weft
△12	C-12	T-13	IV-OH-124	reddish purple	plain weave fabric piece	1 warp/1 weft
△13	C-12	T-14	IV-OH-368-13	reddish purple	weft yarn piece	—

Concerning the textile features, Samples with marks ※ are only reported in "Textiles from at-Tar Caves Part II-(3): Cave 16, Hill C" (pp. 109–133 of this volume), those with △ were reported in *Al-Rāfidān* Vol. X [1989], and Samples without any mark (Nos. 7–11) will be reported in the next volume of *Al-Rāfidān* (Vol. XV). v.: variation of.

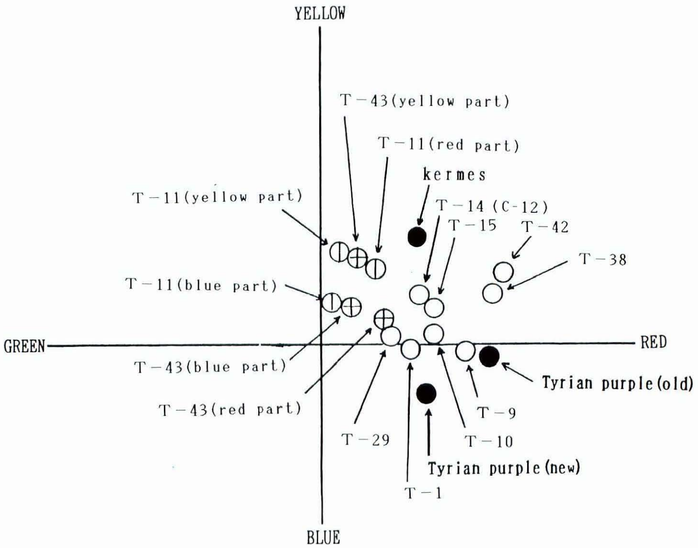

Fig. 1 Chromaticity Diagram

3.3. Methods of extraction and measurement of absorption spectra:

Natural pigments were extracted from each weft yarn of samples as follows.

weft yarn of sample (2～10 mg) —— hot DMF (1 ml) —— 70～80°C

→ solution [1] (0.05 ml)

→ +10%NaOHaq. (0.2 ml) —— $+H_2O$ (10 ml) → solution [2] (0.05 ml)

Absorption spectra (300～650 nm) of these solution [1] (DMF=dimethylformamide) and solution [2] (DMF+NaOHaq.) were measured by the spectrophotometer (Beckmann kk, model DU-70).

From these extraction and measurements of absorption spectra, if the weft yarn of sample was dyed with Tyrian purple or indigo, natural pigment (6,6′-dibromoindingo or indigo) should be observed on the absorption spectrum of solution [1] and give the I_a-peak of 6,6′-dibromoindigo in Tyrian purple or the I_b-peak of indigo at 600～620 nm.

But, the weft yarn of sample was dyed with kermes, the natural pigment (kermesic acid in kermes) should not be extracted by hot DMF. This natural pigment is observed on the absorption spectrum of solution [2] and gives two K-peaks at 550～600 nm.

The I_a-peak of 6,6′-dibromoindigo and K-peaks of kermesic acid were shown in Fig. 2. And results obtained by measurements of absorption spectra are shown in Table 2.

4. Results and discussions

From results of experiments, natural dyes on each textile sample were estimated as follows.

① T-1 (F-4), T-9 (C-16), T-29 (C-16) and T-14 (C-12):

As shown in Fig. 3 (absorption spectra of solutions extracted from weft yarn of T-1) and Table 2, natural dyes on T-1 and T-9 textile samples have the I_a-peak and have not the K-peaks. Therefore, it is certain that these weft yarns were spun by the loose fiber dyed with Tyrian purple. T-29 is rather insufficient in experimental samples, which did not enable us to take its measurement by absorption spectra. Judging from chromaticity diagram (Fig. 1) showing that it is positioned close to T-1, however, T-29 also seems to have been dyed with Tyrian purple, just like T-14 (Table 2).

② T-15 (C-16), T-38 (C-16) and T-42 (C-16):

As shown in Fig. 4 (absorption spectra of solutions extracted from weft yarn of T-15 and T-42) and Table 2, natural dyes on these textile samples have the K-peaks and have not the I_a-peak. Therefore, it is certain that these weft yarns were spun by the loose fiber dyed with kermes.

③ T-10 (C-16) and T-13 (C-12):

From results of the microscopic observation and measurements of absorption spectra (extracted solution of both samples have I_a-peak and K-peaks, Fig. 5), it can be considered that these samples were spun by the mixtures of the loose fiber dyed with Tyrian purple and the loose fiber dyed with kermes.

④ T-13 (C-16):

From result of the microscopic observation (weft yarn of sample consisting of the reddish purple yarn and

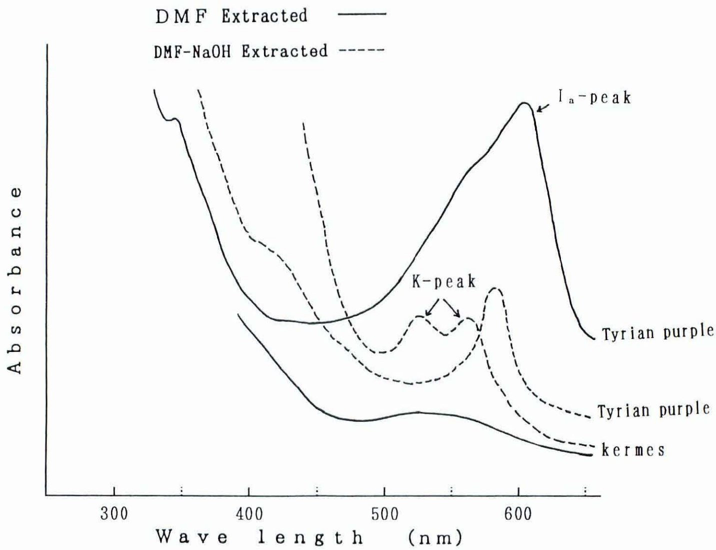

Fig. 2 Absorption Spectra (part 1)

Table 2 Results of Examination

No.	cave No.	textile No.	specimen No.	microscopic observation		absorption spectra*)		
				warp	weft	I_a-peak	I_b-peak	K-peak
1	F-4	T-1	C-31	undyed yarn	reddish purple dyed yarn	○	×	×
2	C-16	T-9	V-68-4	undyed yarn	reddish purple dyed yarn	○	×	×
3	C-16	T-10	V-90-3b	undyed yarn	reddish purple dyed yarn	○	×	○
4	C-16	T-11	V-8-8	undyed yarn	mix spun of red, blue and yellow dyed yarn	×	△	△
5	C-16	T-12	V-126-3	undyed yarn	mix spun of red, blue and yellow dyed yarn	×	△	△
6	C-16	T-13	IV-W-59	undyed yarn	mix spun of reddish purple and blue dyed yarn	△	△	×
7	C-16	T-15	V-71-1	undyed yarn	reddish purple dyed yarn	×	×	○
8	C-16	T-29	V-85-2	—	reddish purple dyed yarn	—	—	—
9	C-16	T-38	V-21-13	—	reddish purple dyed yarn	—	—	-
10	C-16	T-42	V-41-15	blue dyed yarn	reddish purple dyed yarn	×	×	○
11	C-16	T-43	V-73-4	undyed yarn	mix spun of red, blue and yellow dyed yarn	×	△	△
12	C-12	T-13	IV-OH-124	undyed yarn	mix spun of red and reddish purple dyed yarn	○	×	○
13	C-12	T-14	IV-OH-368-13	—	reddish purple dyed yarn	△	×	×

*) I_a-peak: peak by Tyrian purple; I_b-peak: peak by indigo; K-peak: peak by kermes; ○: distinct peak; △: slight peak; ×: no peak

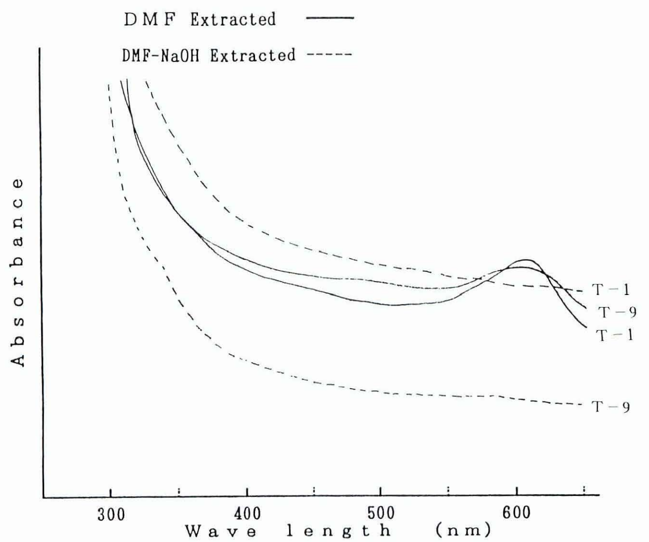

Fig. 3 Absorption Spectra (part 2)

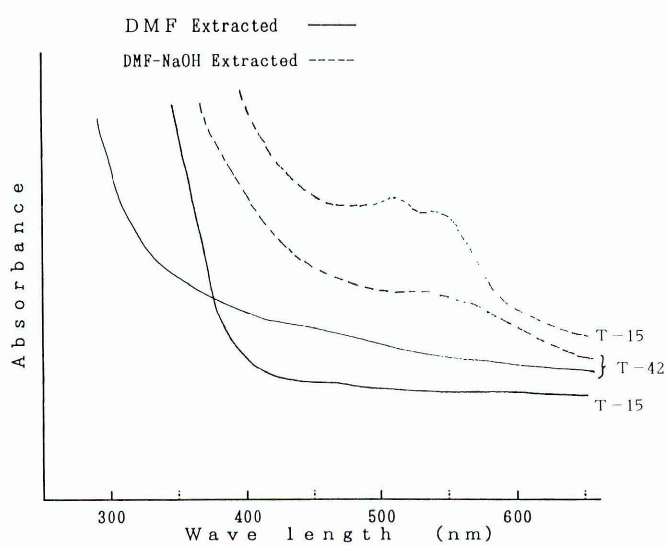

Fig. 4 Absorption Spectra (part 3)

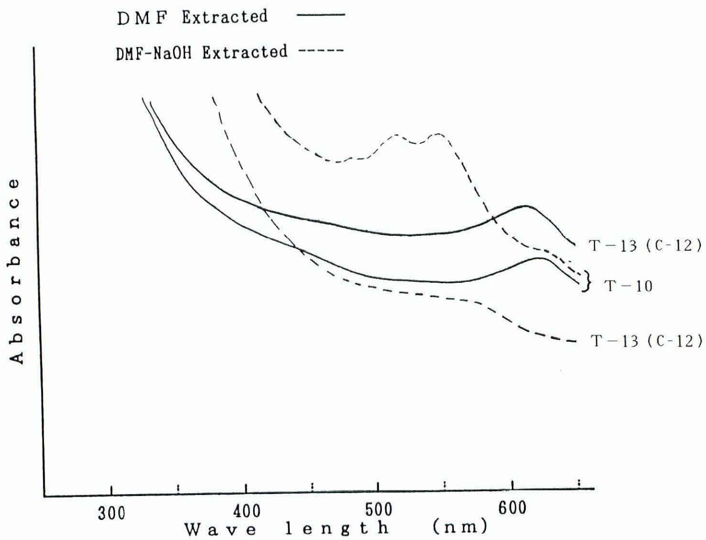

Fig. 5 Absorption Spectra (part 4)

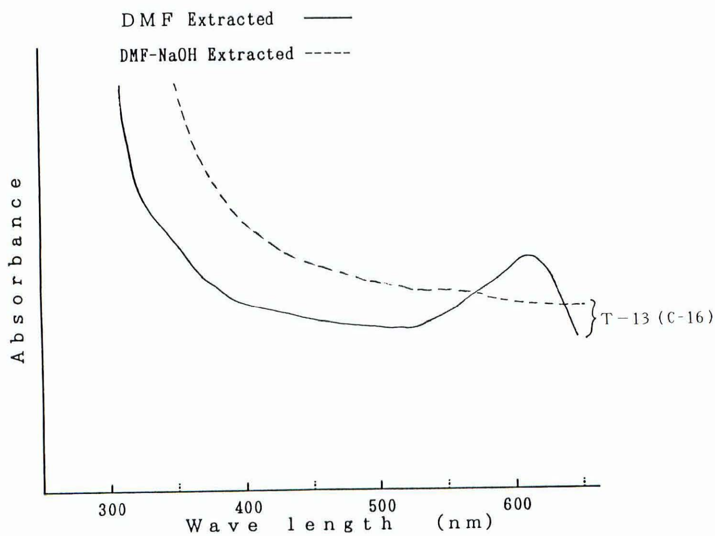

Fig. 6 Absorption Spectra (part 5)

the blue yarn) and the absorption spectrum (extracted solution has only I-peak. Fig. 6), it can be considered that this sample was spun by the mixture of the loose fiber dyed with Tyrian purple and the loose fiber dyed with indigo.

⑤ T-11 (C-16), T-12 (C-16) and T-43 (C-16):

From result of the microscopic observation and spots on the chromaticity diagram (these weft yarns consisted of the purplish red loose fiber, blue loose fiber and yellow loose fiber) and the absorption spectra (extracted soltuions of these samples have I_b-peak, K-peak and another peak at 400 nm which correspond to the yellow loose fiber, Fig. 7), it can be considered that these samples were spun by the mixtures of the loose fiber dyed with kermes, the loose fiber dyed with indigo and the loose fiber dyed with yellow natural dye (not yet defined).

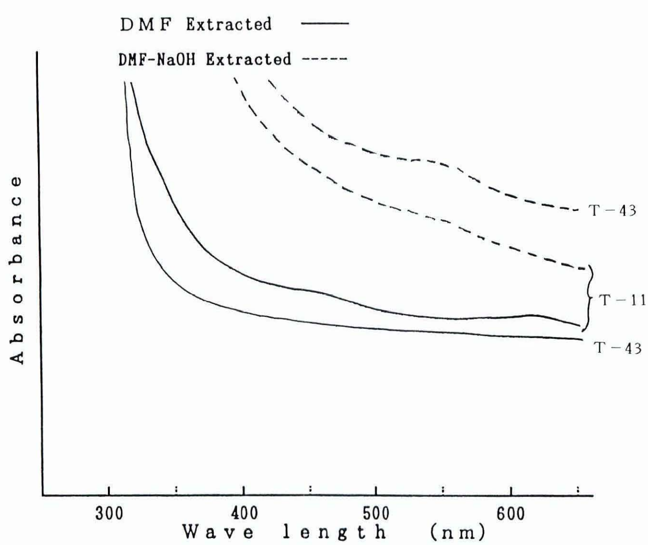

Fig. 7 Absorption Spectra (part 6)

5. Conclusion

In this paper, the identification of natural dyes on those sample textiles (dyed wool weft yarns) were tried with the microscopic observation, measurements of color differences and measurements of absorption spectra of solvents extracted solutions from each weft yarn.

By these examinations, 6,6'-dibromoindigo, indigo and kermesic acid could be observed in reddish purple colored yarns which look like the same color. Therefore, these samples can be classified into the following four:

Group (1): yarns dyed with Tyrian purple only.

Group (2): mix spun yarns which consist of the loose fiber dyed with Tyrian purple and the loose fiber dyed with kermes or indigo for volume-up.

Group (3): mix spun yarns which consist of the loose fiber dyed with kermes, the loose fiber dyed with indigo and the loose fiber dyed with yellow natural dye (not yet defined), for using in place of the yarn dyed with Tyrian purple.

Group (4): yarns dyed with kermes only.

The analytical results given above are very interesting to us. At-Tar caves are located in the borderland of the Mesopotamian Southwestern Desert, which is an important place for traffic open to the East Mediterranean coastal areas and the Gulf areas through the caravan routes cleared along oases and artesian wells [Jones: 1966, VII, pp. 233–235, Strabo: XVI, C748].

Thus, Group (1) the yarns dyed with Tyrian purple only must have been carried in from the East Mediterranean coastal areas or the Gulf areas [Murakawa: 1946, pp. 102–103]. As a matter of fact, Alexander the Great expected that the Gulf area would become no less rich in natural resources than the Phoenician area. Thus, in order to prepare himself for his conquering expedition, Alexander actually employed a large number of Phoenicians who had been working in their homeland as professional gatherers of 'murex' so that they might be engaged in the work on board his armada [Ōmuta, 1987: p. 78]. It is presumed that the above record not only suggests the possibility that 'murex' lived in the Gulf area in those days but also proves the value of Tyrian purple dyeing.

As for Group (2) the mix spun yarns with Tyrian purple loose fiber and kermes loose fiber or indigo loose fiber, Tyrian purple loose fiber had also been carried in from the East Mediterranean coastal areas or the Gulf areas, and Tyrian purple loose fiber seems to have been mix spun into yarns with kermes loose fiber or indigo loose fiber at at-Tar or thereabouts. In the case of Group (3), 3 kinds of loose fiber may have been mix spun into yarns at at-Tar or thereabouts. (4) As Yadin mentions [Yadin, 1963: pp. 182–183], it seems that the color effect of the yarn dyed with kermes only is almost identical with that of the yarn dyed with Tyrian purple only, thus resulting in the presumption that the yarn dyed with kermes only was highly valued, next to the yarn dyed with Tyrian purple only.

As for the matter that the above (2), (3) and (4) were actually devised, the following suggestion may be taken into consideration: In those days, dyeing with tyrian purple was in high repute as bright reddish purple dyeing, so that lack of its material made it more difficult to obtain tyrian purple. That is why such substitutes came to be devised to meet the demand for the dye of the reddish purple color line.

Therefore, as stated in the conclusions of *Al-Rāfidān* Volumes X, XI, XII and XIII, it seems likely that a considerable scale of society had been formed at at-Tar and its neighborhood, allowing the existence of some textile workshop including dyeing, with some authorities kept in the background.

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REPORT ON THE ANALYSES OF TEXTILES UNCOVERED AT THE ANCIENT IRAQI SITE: PART 3

Fibers & Textiles Laboratories,
TORAY Industries, Inc.*

Given below are the results of morphological analyses attempted by us on the textiles found at at-Tar Caves. The English was kindly improved by Mrs. Maya Ikuma.

Summary

Textiles coming from at-Tar Caves:

Fiber analyses (No. 28–32)

A. In view of the fiber surface structure and cross sectional structure, it has been proved that all the samples are composed of beast fibers which belong to animal fibers. The fibers which have great resemblance to sheep fibers, one of today's typical beast fibers, are used there.

B. The samples treated here are generally composed of thicker sheep fibers than the other sheep fibers from at-Tar Caves and the Assyrian graves that have ever been analysed. The sample numbers follow those in the report that appeared in *Al-Rāfidān* Vol. XI [Fibers & Textiles Laboratories, Toray Industries, Inc., 1990, p. 70, Table 1] and Vol. XII [Fibers & Textiles Laboratories, Toray Industries, Inc., 1991, p. 164, Table 1].

Analytical details

Methods

A. **Pretreatment**: The textiles were treated with ultrasonic wave washing while immersed in water, since their fiber surfaces were found soiled by lots of mud or the like.

B. **Observation of the fiber surface structure**: The textiles were observed by using the scanning electron microscope after Au-Pd shadowing had been applied to their fiber surfaces.

C. **Observation of the cross sectional structure**: The light microscope observation was carried out on a section of 6 μm in thickness each into which the samples were cut by Minot's microtome after embedding them in paraffin.

D. **Elementary analyses**: Each sample was left to the analyses by means of scanning electron microscope and X-ray microanalyzer after its carbon shadowing.

Observations and consideration

Material analyses

Pls. 1–2 show the results of photo-observation of the samples' fiber surface structures and cross sectional structures. And Table 1 indicates the results of their morphological analyses.

* 3–3–7, Sonoyama, Ohtsu, Shiga

Table 1 Analytical Results of Beast Fibers of the None-Pile Textiles: Cave 16, Hill C.

Sample No.	Description				Material	Fiber width (μm)
	Textile No.	Specimen No.	Kind	Color of outward appearance	Beast fiber	
28	T9	V-72-1	Warp	Dull reddish yellow	Sheep	25–50
29	T9	V-72-1	Ground weft	Dull reddish yellow	Sheep	30–45
30	T9	V-73-1b	Pattern weft	Dark wine	Sheep	20–30
31	T10	V-62-2	Warp	Dull reddish yellow	Sheep	20–30
32	T1 (F-4 Cave)	C-31	Warp Ground weft	Dull reddish yellow	Sheep	15–30

a. All the samples are judged to be of sheep fibers, seen from their fiber surface structures, cross sectional structures and fiber widths.

b. As a whole, the samples treated here are composed of thick fibers. They are the thickest of all the sheep fibers that have ever been analysed.

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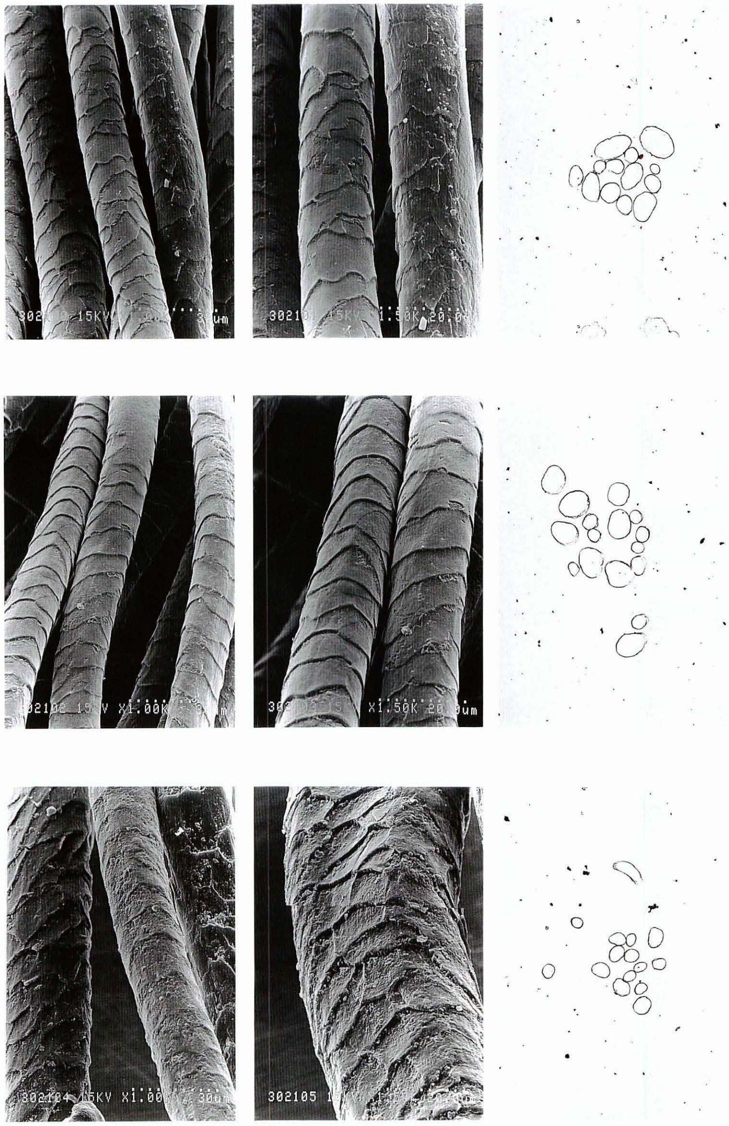
Longitudinal view | Cross section

×1000 ×1500 ×200

Sample 28
(Dull reddish yellow)
Sheep fiber

Sample 29
(Dull reddish yellow)
Sheep fiber

Sample 30
(Dark wine)
Sheep fiber



Samples 28, 29 and 30

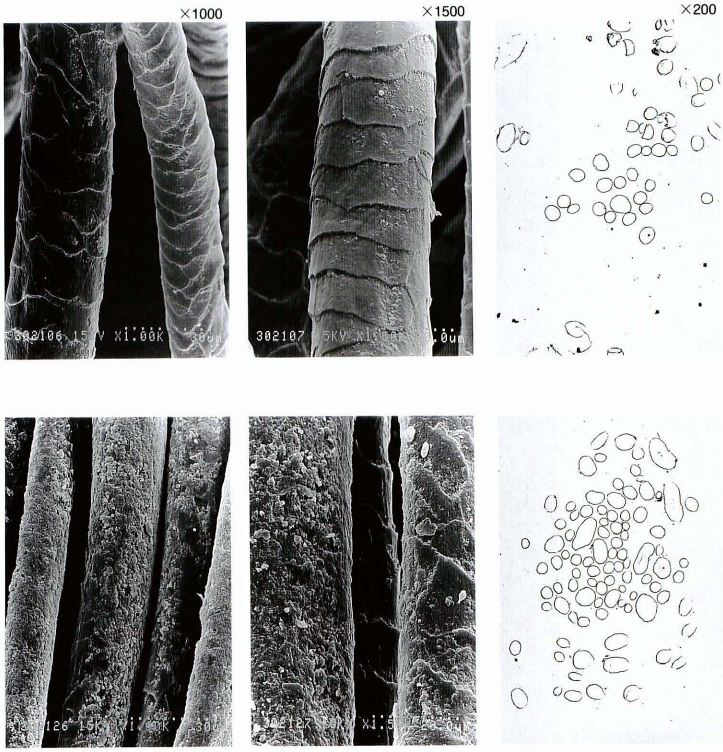
Pl. 2

Longitudinal view | Cross section

×1000 ×1500 ×200

Sample 31
(Dull reddish
yellow)
Sheep fiber

Sample 32
(F-4 Cave,
Dull reddish
yellow)
Sheep fiber



Samples 31 and 32

EXPERIMENTAL STUDIES IN THE DETERMINATION OF MANNERS OF MICRO-BLADE DETACHMENT

Katsuhiko OHNUMA*

Introduction

It is agreed by most prehistorians that the Mesolithic or Epipalaeolithic industries of Eurasia appeared in a geological time range transitional between the Pleistocene and the Holocene periods.

It is often said that the Mesolithic industries in Europe appeared in a new environment with forest grown again, the descendants of the Palaeolithic population trying to adapt themselves to the post-glacial ecological change; in Europe, the decrease of big gregarious animals, resulting from their concentrated hunting in the Upper Palaeolithic period, led the Mesolithic people to modify hunting methods for the pursuit of forest game such as ox, red deer, elk, wild pig, and beaver [The Trustees of the British Museum 1968: p. 70].

Some of the European Mesolithic artifacts were related to this ecological change, i.e. some types of axes for lumbering, bone arrows used for accurate hunting of a certain target among the herd, and some of the geometric microliths, categorized as trapezoid, used as arrow heads [Newcomer 1978/1979].

Especially to be mentioned about the Mesolithic industries is the intensive production of microliths. Either ordinary micro-blade detachment or the micro-burin technique [Tixier 1963: pp. 39–42] was employed to produce the microlithic tools.

The geometric microliths and retouched or unretouched micro-blades were inserted into grooved handles, made of wood or antler, and were used as replaceable edges of composite tools or weapons.

As to the Mesolithic technological innovations briefly described above, there are two opposed hypotheses. One of the hypotheses sees the technological innovations as having resulted from the efforts of the descendants of the Palaeolithic people to get more food to satisfy the increased population. The other hypothesis contrarily sees the innovations as having led the population to increase [Mellaart 1975: p. 22].

There is seen continuity between the Upper Palaeolithic industries of West Asia, such as the Zagros Baradostian and the Late Levantine Aurignacian, and the Mesolithic industries of the area, roughly dated to between 20,000 and 16,000 B.C., such as the Kebaran of the Levant, the Belbasi industry in the Antalya region of Turkey, and the Zarzian of the Zagros Mountains; there existed some microliths in the Baradostian, and tools in the Late Levantine Aurignacian tended to be smaller.

This continuity strongly suggests that the Mesolithic of West Asia were derived from the Upper Palaeolithic in the area [Mellaart 1975: p. 19].

Mesolithic, "pre-Neolithic" and pre-pottery Neolithic sites in Iraq

The Mesolithic industries of Iraq are represented at the cave site of Zarzi.

The Zarzi cave is located in the valley of Cham Tabin in the Zarzi village, which lies 50 km north-west of Sulaimani (Fig. 1).

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At Zarzi, the elongated triangle, the only geometric form ever found at this site, was confined to the upper part of Level B, and the upper part of Level B at least bears Mesolithic features [Garrod 1930: pp. 13–23]. The lithic artifacts found all through Level B are generally small, and consisted of Gravette points, backed blades, notched and/or denticulated blades, burins, end-scrapers, and various types of scrapers. The blades and micro-blades are narrow. Various kinds of raw material such as jasper, flint, and chert were used to make the lithic artifacts [Garrod 1930: pp. 13–23].

Only a few animal remains were unearthed from this site. They consisted of the bones of foxes, gazelles, goats, and turtles [Bate 1930: p. 23].

The "pre-Neolithic" and pre-pottery Neolithic industries of Iraq, placed in the passage between the Mesolithic and the pottery Neolithic periods, are represented at the open-air sites of Zawi Chemi Shanidar, Karim Shahir, M'lefaat, Der Hall, Nemrik 9, and Qermez Dere.

All of these sites are located in the "Zagros flanks" in the northern part of Iraq (Fig. 1).

The site of Zawi Chemi Shanidar is located in the Shanidar valley, on the first prominent terrace of the left bank of the Greater Zab river, a branch of the Tigris.

Layer B at this site, dated by a C-14 determination to 8,920±300 B.C., yielded a lithic assemblage with Mesolithic features. A circular stone architecture, designated Structure I, was found associated with Layer B. This structure had walls, which measured ca. 2 m in diameter and were composed of both large and small rocks and fragmentary stone tools. The lithic artifacts from Layer B are made on various kinds of flint, and consisted of backed blades, denticulated pieces, notched pieces, truncated pieces, borers, side scrapers, *pièces esquillées,* and geometric microliths, mostly of the lunate category (Fig. 2–2～7). Neither sheen-bearing pieces nor micro-burins are reported. The striking plarforms of the cores are single or double, and triple in some cases. Judging from the published photograph of the cores [Solecki 1981: Plate 13], it is unlikely that the blades or micro-blades were pressure flaked at this site. The stone celts are either wholly chipped or bit-polished, and are wholly polished in rare cases. Stone artifacts such as mullers, querns, and pecking stones were also found [Solecki 1981].

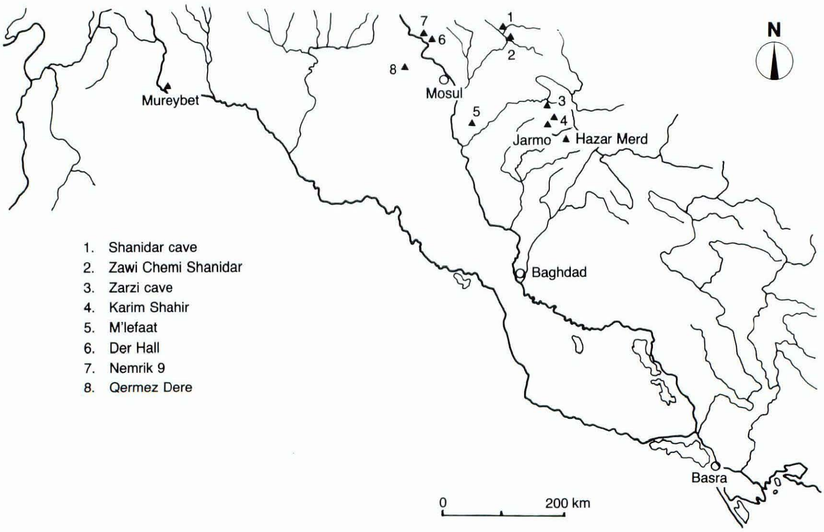

Fig. 1 Mesolithic, "Pre-Neolithic" and Pre-pottery Neolithic Sites in Iraq

Animal remains from Zawi Chemi Shanidar included the bones of sheep and/or goats, most likely wild, and of birds [Solecki 1981].

The site of Karim Shahir is located east of Chemchemal in the province of Kirkuk.

A large number of lithic artifacts were unearthed from a single occupation floor. This occupation floor, dated to between 8,900 and 8,600 B.C., was 500–600 m^2 in area, and was composed of stone pavement and pits. The lithic artifacts from this floor are made on several kinds of flint, and consisted of backed micro-blades, drills, end-scrapers, side scrapers, obliquely truncated pieces, and a large number of notched pieces. Because of the absence of geometric microliths as a true category, the micro-burins from this site are described as the by-products of manufacture of the obliquely truncated pieces, unrelated to the micro-burin technique to produce geometric microliths. There are examples of sheen-bearing pieces, though very rare. Most of the blade or micro-blade cores are conically shaped. The published illustrations of the cores [Howe 1983: Figs. 20–2, 20–4, 21–3, 21–4] strongly suggested the use of pressure technique at this site to detach the micro-blades (Fig. 2–12, 13, 15, 16). Nearly half of the stone celts are wholly polished, and some are chipped with polished bits. Stone artifacts like querns, mortars, and mullers are also reported [Howe 1983].

Almost half (47%) of the animal bones from Karim Shahir are of sheep and goats. Bones of wild boars, deer, gazelles, wild cattle, foxes, hares, turtles, and birds are also reported. It is said that the sheep and goats were not being domesticated at this site, but that they were being hunted [Howe 1983].

The site of M'lefaat is located north-east of the Tigris-Greater Zab junction, on the west bank of the Khazir river. To the west of M'lefaat and the Khazir river is the plain of Mosul.

Three floors made of stones, dated to between 8,900 and 8,600 B.C. [Howe 1983: pp. 130–131], were unearhed from this site. The lithic artifacts are made on several kinds of flint, and include notched pieces, micro-blades with edges nibbled by use, various types of scrapers, and perforators. Neither geometric microliths nor micro-burins are reported. Some of the micro-blade cores are conically shaped. On the basis of very parallel ridges and edges and very uniform width of the micro-blades, M. Dittemore, who described the lithic assemblage from this site, concluded that pressure technique had been employed at this site to detach the micro-blades [1983: pp. 673–674] (Fig. 2–11). The stone celts are either wholly polished or bit-polished [Dittemore 1983: p. 681].

Nearly half of the animal remains from M'lefaat were the bones of sheep and gazelles. Bones of wolves, foxes, wild cats, wild pigs, wild cattle, lesser mole rats, hares, and birds such as ducks and geese are also reported. It is strongly suggested that the sheep was being hunted at this site [Turnbull 1983].

The site of Der Hall was located some 40 km north-northwest of the city of Mosul, on the edge of the projected left bank of the meandering area of the river Tigris.

Level 6 of this site yielded a lithic industry without pottery. Neither structural remains nor living floors were confirmed associated with Level 6. The lithic artifacts unearthed during excavations are made on various kinds of chert- or agate-like flint, generally fine-grained and ranging in colour from white to dark-brown. They consist of denticulated pieces, notched pieces, geometric microliths of the lunate category, few blades, and many flakes and micro-blades. There are no examples of sheen-bearing pieces. There are a considerable number of micro-burins, which strongly suggest the manufacture of the lunate microliths using the micro-burin technique. Cores are classified into several morphological types, and most of them were for micro-blades. It is supposed on the basis of outward appearance of the cores (Fig. 2–10) that pressure technique was not being employed at this site to detach the micro-blades. The only stone celt unearthed is bit-polished. Stone artifacts such as querns and mortars were not found [Ohnuma and Matsumoto 1988].

The animal remains from Der Hall consisted of the bones of sheep, goats, turtles, deer, and cattle. It

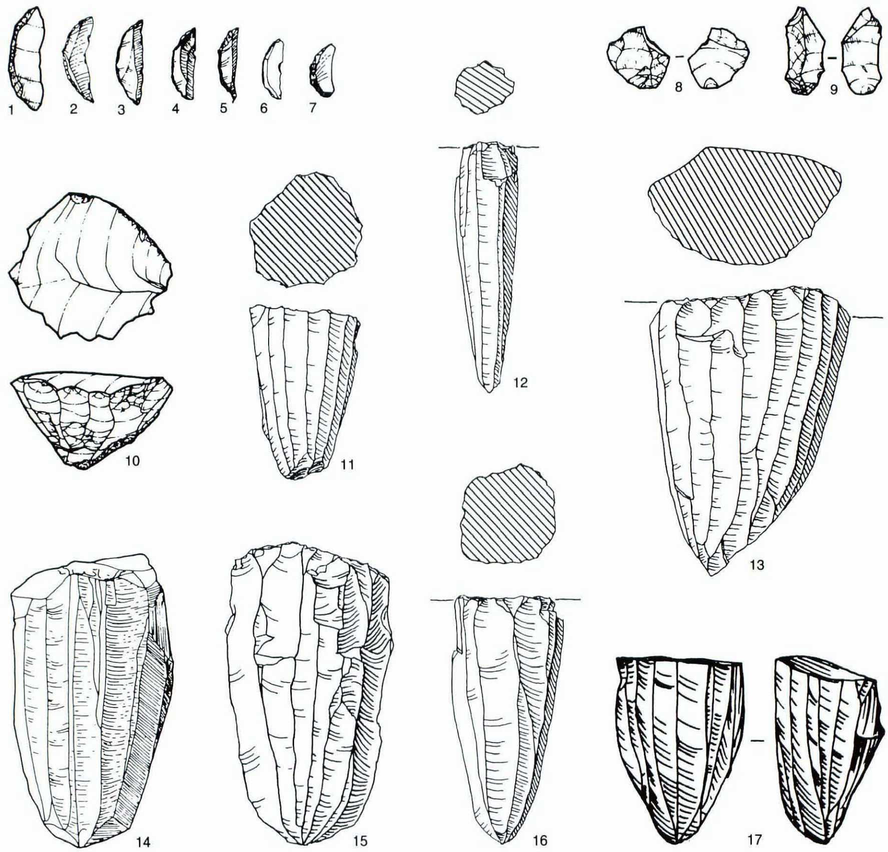

Fig. 2 Geometric Microliths, Micro-burins, and Micro-blade Cores from "Pre-Neolithic" and Pre-pottery Neolithic Sites in Iraq (Scale: 1/1)

1～7: Lunates; 8～9: Micro-burins; 10～17: Micro-blade cores (1, 8, 9, 10: Der Hall; 2～7: Zawi Chemi Shanidar; 11: M'lefaat; 12, 13, 15, 16: Karim Shahir; 14: Qermez Dere; 17: Nemrik 9)

is not concluded if or not the sheep and goats were domesticated [Abe 1988].

The site of Nemrik 9 is located in the southern part of the Dohuk governorate, some 48 km north-northwest of Mosul. About 1.5 km south of Nemrik 9 is the river of Tigris [Kozlowski (ed.) 1990].

At Nemrik 9, at least three settlement phases belonging to the pre-pottery Neolithic period were confirmed. C-14 determinations dated these three settlement phases to between the 9th millennium B.C. and the first half of the 7th millennium B.C.: the oldest phase to the 9th millennium B.C., the middle to the 8th millennium B.C., and the youngest to the end of the 8th millennium through the first half of the 7th millennium B.C. [Kozlowski and Kempisty 1990: pp. 349–350]. Several structures were unearthed associated with these phases. The structures show an evolutionary scheme of architecture, roughly corresponding to the three settlement phases: the simplest hut-like structures and *tauf*-walled circular houses ⟶ circular houses with walls of sun-dried mud-bricks and wooden roofs ⟶ subrectangular houses with walls of sun-dried mud-bricks and marl pillars [Kozlowski and Kempisty 1990: pp. 352–359]. The lithic artifacts are made on white- to black-coloured local flint, acquired from flint deposits in the immediate vicinity, and are essentially the same all through the settlement phases, i.e. retouched blades, end-scrapers, various kinds of scrapers, perforators, tanged points, microlithic tools such as backed micro-bldes, and so on. Neither geometric microliths nor micro-burins are reported [Kozlowski and Szymczak 1990]. There are a considerable number of very regular conical cores (Fig. 2–17), and S. Kozlowski and K. Szymczak conclude that pressure technique was being employed at Nemrik 9 to detach the blades [1990: p. 97]. They also conclude that in the oldest settlement phase the blades were struck off with the aid of a punch, while from the middle phase onwards they were detached by pressure technique [Kozlowski and Kempisty 1990: p. 350]. The stone celts are wholly ground/polished. Stone artifacts such as querns, mortars, pounders, and grinders were also found [Mazurowski 1990a]. There are four fragments of stone vessels made of marble, sandstone and limestone. These fragments are said to have been parts of stone bowls [Mazurowski 1990b].

The animal remains from Nemrik 9 include the bones of cattle, pigs, sheep, goats, Indian buffaloes, red deer, horses, and antelopes. It is worthy of note that the domestication of cattle, pigs, sheep, and goats is confirmed [Lasota-Moskalewska 1990].

The site of Qermez Dere is located in the north-west outskirts of the town of Tel Afar, some 60 km west of Mosul.

Three houses with enclosure were unearthed at this site. Each of these houses was composed of a single chamber, constructed below ground level and with floor shaped like egg in outline. The floors ranged in area from 18 to 24 m^2. Seven settlement phases, grouped into three stages, were confirmed in these houses, i.e. the oldest stage composed of Phases 7 and 6 and placed in the transition between the Mesolithic and the Neolithic periods, the middle stage composed of Phases 5 and 4 with no residual Mesolithic features and belonging to the early pre-pottery Neolithic period, and the youngest stage composed of Phases 3 and 2. Except for some geometric microliths and micro-burins from the oldest stage as well as the tanged "Nemrik point" from Phase 4 onwards, with bilateral inverse retouch on the proximal and distal ends of blades, the lithic artifacts from Qermez Dere are essentially the same all through the phases, mainly consisting of notched pieces, denticulated pieces, and the "Khiam points", which are made on micro-blades and are characterized by a notch near proximal end and bilateral inverse retouch to shape the distal end. Backed blades, scrapers, and burins are small in number. There is a single example of sheen-bearing blade. The cores generally have a single striking platforms. Judging from the published illustration of the cores [Watkins et al. 1991: Fig. 8–4] (Fig. 2–14), it is highly likely that pressure technique was being employed at this site to detach the blades and micro-blades. The raw material commonly used for the above lithic artifacts is a medium- to fine-grained chert, varying in colour from light grey/brown to dark greyish/black. It is noteworthy that the brown flint was used almost exclusively in the youngest stage, and was rarely used in the earlier stages. Stone artifacts such as querns and grinders are very small in quantity [Watkins et al. 1991].

The most frequent of the animal remains from Qermez Dere are the bones of gazelles. Bones of sheep, goats, hares, and birds are also reported. It is concluded that the sheep and goats were not domesticated at this site [Watkins et al. 1991].

The "pre-Neolithic" and pre-pottery Neolithic sites in Iraq mentioned above are usually placed in a broad framework established as the passage from the Mesolithic to the pottery Neolithic of the region, dated to between 9,000 and 7,000 B.C.

Until today, we have neither firm evidences for domesticated sheep and goats nor traces of cultivated cereals such as the emmer wheat [Cole 1970: p. 8] at these sites.

However, there are seen at these sites biased frequencies of bones of particular animals, especially of sheep and goats, which were subsequently demesticated. Also constantly seen there is the occurrence of stone artifacts such as querns, mortars and grinders, which are supposed to have been related to cereal processing.

It is confirmed now that at the site of Jarmo, dated to 7,300 through 5,800 B.C. [Braidwood 1983], sheep and goats were domesticated [Stampfli 1983], and that einkorn and emmer wheats were grown in their wild forms [Watson 1983].

This confirmation, together with the frequent occurrence of sheep and goat bones and of stone artifacts, most probably used to treat particular cereals, at the "pre-Neolithic" and pre-pottery Neolithic sites in Iraq, naturally places these sites in the dawn of the new society, which was supported by consitent and secure means of foodstuff supply, i.e. planned domestication of sheep and goats and cultivation of wheats and barleys.

It is important to note that the lithic artifacts from the "pre-Neolithic" and pre-pottery Neolithic sites in Iraq seem to have been varied in their inventories and manufacturing techniques from site to site.

As to micro-blades, for example, it seems that different manners of their detachment were being employed, i.e. direct or indirect percussion and pressure.

Such differences are supposed to have been related to either spatial or temporal differences between the sites.

The temporal differences, if proven, may clarify detailed inter-site relations in the broad chronological framework defined as the transition between the Mesolithic and the Neolithic periods of the region.

T. Fujimoto stated that the appearance of permanent settled habitation, based on agriculture or animal domestication, led to a sudden decrease of geometric microliths and micro-blades [1990: pp. 1–2].

Fujimoto's statement is suggestive that the "pre-Neolithic" and pre-pottery Neolithic sites in Iraq at Karim Shahir, M'lefaat, and Nemrik 9, which lacked in geometric microliths, were more developed in settled habitation and/or later in period than the rest.

Pressure flaking, a manner of flake removal by means of pressure, is a unique tecnological concept, totally different from direct or indirect percussion, manners of flake removal by means of instantaneous striking.

It rather seems unlikely, as M.-L. Inizan, M. Lechevallier, and P. Plumet emphasize, that this unique flaking technique was independently invented at various times and places [Inizan et al. 1990].

It is thus important to identify pressure technique among the "pre-Neolithic" and pre-pottery Neolithic sites in Iraq, for the identification may mark a temporal boundary between them, under either of the suppositions that this technique was originally invented in the Sibero-Mongol center and was later diffused in eastward and westward directions [Inizan et al. 1990], or that it was also invented at a given place in West Asia without any connection with the Sibero-Mongolian invention.

Ethnographical records and experimental studies of flaking techniques

It is believed that the Stone Age people used different techniques in detaching flakes from cores, i.e. direct percussion, indirect percussion, the "anvil technique", and pressure technique.

Direct percussion is a manner of flaking using hammers of hard stone or softer material such as soft stone, antler and wood, struck against raw material to be flaked.

Indirect percussion uses a medium rod called "punch" between the material to be flaked and the hammer.

In the "anvil technique", the material to be flaked is struck against an angular part of an anvil stone, firmly fixed on the ground.

And, pressure technique detaches flakes by means of pressure.

We have archaeological evidences of hammers of deer antler [Bordes 1974], stone hammers, and stone anvils [Alimen 1963].

In North America, direct percussion by stone hammers and pressure technique using antler tines was observed to be practiced by Ishi of the Yahi tribe [Kroeber 1976: pp. 188–189].

In Australia, too, direct percussion by stone hammers and pressure technique by wooden rods was observed among the aborigines [Elkin 1948].

Because pressure technique is favourable for delicate and regular flaking, this manner of flaking is considered to have been employed in the Stone Age, especially in micro-lade detachment and in the manufacture of small tools like arrow heads.

F.H.S. Knowles, citing ethonographical records left by European observers, described various kinds of flaking tools used in stone tool manufacture among the Aleuts, Eskimos and American Indian tribes of North America [1953].

The flaking tools described by Knowles include stone hammers for direct percussion, deer antlers, whale teeth, hard bones and stones used as punches for indirect percussion, and reindeer antlers, teeth or tusks of walrus, wooden rods and elongated stones used in pressure flaking [1953: pp. 82–89].

D.E. Crabtree's articles and publication based on his replication of lithic artifacts, i.e. *Notes on Experiments in Flintknapping: 4: Tools Used for Making Flaked Stone Artifacts* [1967], *Mesoamerican Polyhedral Cores and Prismatic Blades* [1968], and *An Introduction to Flintworking* [1972], are the works indispensable in understanding lithic technologies, especially those of pressure flaking, as is a collection of articles by J. Tixier, J. Pelegrin and others on technologies concerning blade or micro-blade manufacture, *Préhistoire de la pierre taillée: 2: économie du débitage laminaire* [C.R.E.P. 1984].

These works described the details of the ways and methods or processes of their experimental flaking by direct percussion, indirect percussion, and pressure technique, and presented concrete features of the cores and débitage pieces derived from the experimentation with many photographs and illustrations.

Crabtree's 1968 work, especially, is an excellent article, in which his replication, by the pressure technique using a chest crutch, of very regular Meso-American blades was reported.

These works, however, did not present any systematic method how we determine which flaking manner produced archaeological specimens.

Tixier, for example, characterized pressure flaked débitage and cores by the following features: débitage having consistent thinness and flatness, parallel and straight dorsal ridges and edges, smooth ventral surfaces, very narrow butts, and short pronounced bulbs, and cores having uniform flake scars and pronounced negative bulbs left by uniform and flat débitage removed [1984: p.66].

At the same time, however, he stated that there were no criteria to identify pressure flaked débitage, except for obtuse angle between their butt and dorsal surface, which he concluded to be produced by pressure flaking alone [1984: p. 66].

One of the systematic trials to identify different flaking manners in archaeological specimens is the article by J.B. Sollberger and L.W. Patterson, *Prismatic Blade Replication* [1976].

After replicating flint blades and micro-blades by direct percussion (using quartzite hammerstones and a soft hammer of deer antler), indirect percussion (using a punch made from moose antler), and pressure flaking (using an antler pressure tool), they demonstated, through the analysis of the blades and micro-blades replicated, that a significant difference between the three flaking manners could be seen only in the width of the replicated specimens.

On the basis of this difference, they concluded that the Paleoindian blade technologies of Texas had used direct percussion exclusively, and that indirect percussion and pressure technique had been introduced in later times [Sollberger and Patterson 1976: p. 530].

Replication of micro-blades using three manners of flaking

Efficient exploitation of raw material and multi-manufacture of sharp edges linked to micro-blade production, especially in the case of pressure technique, was experimentally demonstrated by P.D. Sheets and G.R. Muto [1972: pp. 632–634]; 83 blades which were pressure flaked by them from a single obsidian core (originally 820g) weighed 746g altogether, the total length of sharp edges of the removed blades was 17.32 m, and the exhausted core weighed 50g, only 6% of its original weight.

Pressure technique may be characterized by the following two features; firstly, it can produce thin flakes, or it can not produce thick flakes, and secondly, it can produce uniform flakes continuously.

From these features, we may easily reach a supposition that pressure technique was favourable for efficient and continuous production of uniform micro-blades, said to have been intended for stone tools weighing light.

Micro-blade production, however, is not to be equated with pressure technique [Inizan et al. 1990].

And, in order to clarify relationship between micro-blade production and pressure technique, especially to clarify a certain role played by the former in the appearance of the latter or the reverse, we must wait for results of various fields of study, such as dating of archaeological sites concerned, intra-site and the environmental studies, and, above all, analyses of manners of micro-blade detachment through examining archaeological and replicated specimens.

As mentioned previously, it is important to identify manners of micro-blade detachment at such archaeological sites as yielded similar tool types and are given similar chronological positions; when different manners are identified among these sites, temporal differences veiled between them may be clarified.

In this view, a research theme occured to the present author as to how we determine manners of micro-blade detachment, and he replicated micro-blades using the three flaking manners (direct percussion, indirect percussion, and pressure), trying to establish, on the basis of analysis of the replicated samples, a method to determine which manner had been employed in micro-blade production in the past [Ohnuma and Kubota 1992].

The raw material used in the replications was black obsidian from Shirataki, Hokkaido, Japan, and the flaking tools were made of various parts of deer antler, except for a stone hammer used in the rough-out stages of core reduction.

In the replication by direct percussion, a hammer made of "Ezo" deer antler, 13 cm long and weighing 60g, was used (Fig. 3). The "tangentile percussion" was employed, in which the core edge directly above a ridge on the flaking surface was obliquely and lightly struck with the hammer (Fig. 3). The angle between the platform and the flaking surface of the core was established less than 90°, being idealized at some 80°.

An antler tine of "Ezo" deer, 8 cm long and weighing 20g, was used as a "punch" (Fig. 4) for indirect percussion. The core was held in the left palm, and the thumb and index fingers, extending from the core bottom up to its platform, fixed the pointed end of the punch acutely at the base of a ridge on the core surface. And, the antler hammer, also used for direct percussion, was lightly struck on to the flat end of the punch by the right hand (Fig. 4). The flaking angle was established the same as in the direct percussion. This indirect percussion was invented in Japan by M. Kubota. The similar technique is reported regarding the blade manufacture by the Lacandon tribe of the Meso-American Maya Indian [Clark 1980].

In pressure flaking, a half portion of a South-East Asian deer antler, some 40 cm long and weighing 330g, was used as the pressure tool (Fig. 5). The core was stabilized on a flat rock, one of the core sides being

Fig. 3 Micro-blade Detachment by Direct Percussion

Fig. 4 Micro-blade Detachment by Indirect Percussion

leant and fixed against a natural crack wall of the rock by the left hand, which covered and firmly fixed the core platform with the flat surface above the crack. The pointed end of the pressure tool was then fixed on the edge of the core platform, directly above a ridge, and micro-blades were detached with pressure created on to the other end of the pressure tool by the chest/shoulder part of the body[1)] (Fig. 5). The flaking angle was the same as in the two flaking manners described above. When necessary, core platforms were strongly rubbed with cortex of fragmentary siliceous shale in order to prevent the pressure tool from slipping. In this regard, it is a better operation to rub wide area of core platform in advance (Fig. 9–13) than to rub only the area adjacent to core edges immediately prior to every detachment of micro-blades; the latter operation is liable to damage core edges, and the damaged edges become troublesome for subsequent removal of micro-blades.

Smaller cores to be pressure flaked can be stabilized more simply and easily on the palm (Fig. 6). In this case, a graspable vice[2)] is necessary, for the palm is unavoidably flexible, and this flexibility causes the core to move when it is pressed, leading to unsuccessful removal of a desired flake. A small branch of

Fig. 5 Micro-blade Detachment by Chest/Shoulder Pressure

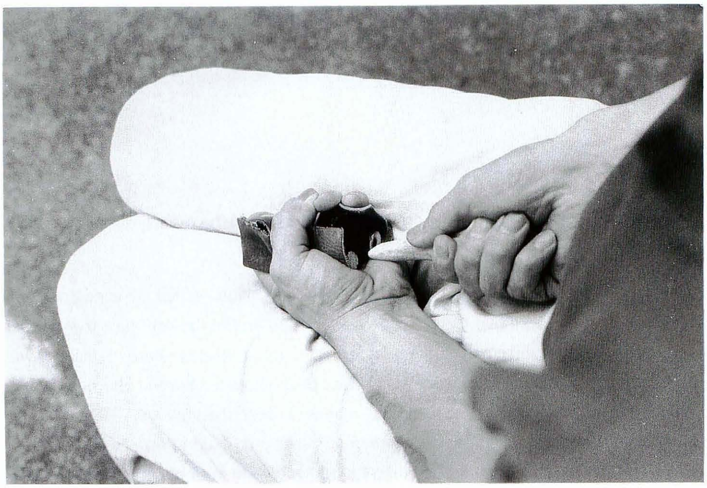

Fig. 6 Micro-blade Detachment by Pressure on Palm

tree (Fig. 7) is good enough for such a vice and easy to obtain. So, it is highly possible that this kind of natural vice was used in pressure flaking in the past, too. Two pressure tools were used in detaching micro-blades on the palm: the longer one (Fig. 5), also used for larger cores, pressed by the chest/shoulder, and a shorter one made of antler tine (Fig. 6), 13 cm long and weighing 60g, grasped and pressed by the right hand.

Fig. 7 Small Branch of Tree Used as Natural Vice for Pressure Flaking on Palm

Analysis of replicated micro-blades

After micro-blades were replicated by the three flaking manners described above (Fig. 8-1~4, 9~12, 13~14; Fig. 9-1~8, 13~14), three hundred replicas, one hundred from each manner, were chosen to be analyzed in their non-metrical and metrical attributes.

Only the replicas fulfilling Tixier's micro-blade definition [1963: pp. 36-39] were chosen for the analysis, i.e. blades whose width is less than 1.2 cm regardless of their length.

The butts of the chosen replicas were plain in most cases, with those modified by minute facets almost non-existent. The butts, therefore, were analyzed in their shapes, not in the types of butt modification.

It was felt that the outline shapes of the butts of the micro-blades were determined by the presence or absence of prominent impact points on the ventral surfaces, left at the moment when hammers or pressure tools detached the micro-blades: one which is triangular- or diamond-shaped with a projection indicating the point of impact, and another which is smooth-shaped without any clear impact point (Fig. 10).

Non-metrical attributes for the analysis other than the butt shapes were the presence or absence of a clear point of impact on the ventral surface of the micro-blades, and the presence/absence of the lip between their butt and ventral surface.

Metrical attributes comprised the flaking angle between the butt and dorsal surface, the maximum butt thickness at the point/area of impact, and the maximum length, width and thickness of the micro-blades themselves. The maximum thickness of the micro-blades excluded plunged parts.

The ratios calculated from the dimentions of the micro-blades were the maximum length/the maximum width (L/W), the maximum thickness/the maximum butt thickness (T/BT), and the maximum width/the maximum butt thickness (W/BT).

The analysis results in the above attributes did not produce any marked difference between the three groups of micro-blades in terms of the presence or absence of a clear impact point and of the lip and the averages of the flaking angle and of the maximum length.

With regard to the maximum butt thickness, however, it was seen that the average of the group replicated by direct percussion was smaller than those of the groups replicated by indirect percussion and pressure.

The average of the maximum width of the group replicated by pressure was smaller than those of the groups by direct and indirect percussion.

And, the group replicated by pressure was smallest in the average of the maximum thickness, while the group by indirect percussion was largest, with the group replicated by direct percussion between them.

It seemed, however, that the above three differences could not be used individually as a means to identify the different flaking manners, only reflecting personal variations within each manner of flaking; the thickness of the butt might be determined by the exact point of impact on the core edge, to which hammers were intentionally aimed or pressure tools were firmly fixed, and both of the maximum width and the maximum thickness might be strongly linked to butt thickness.

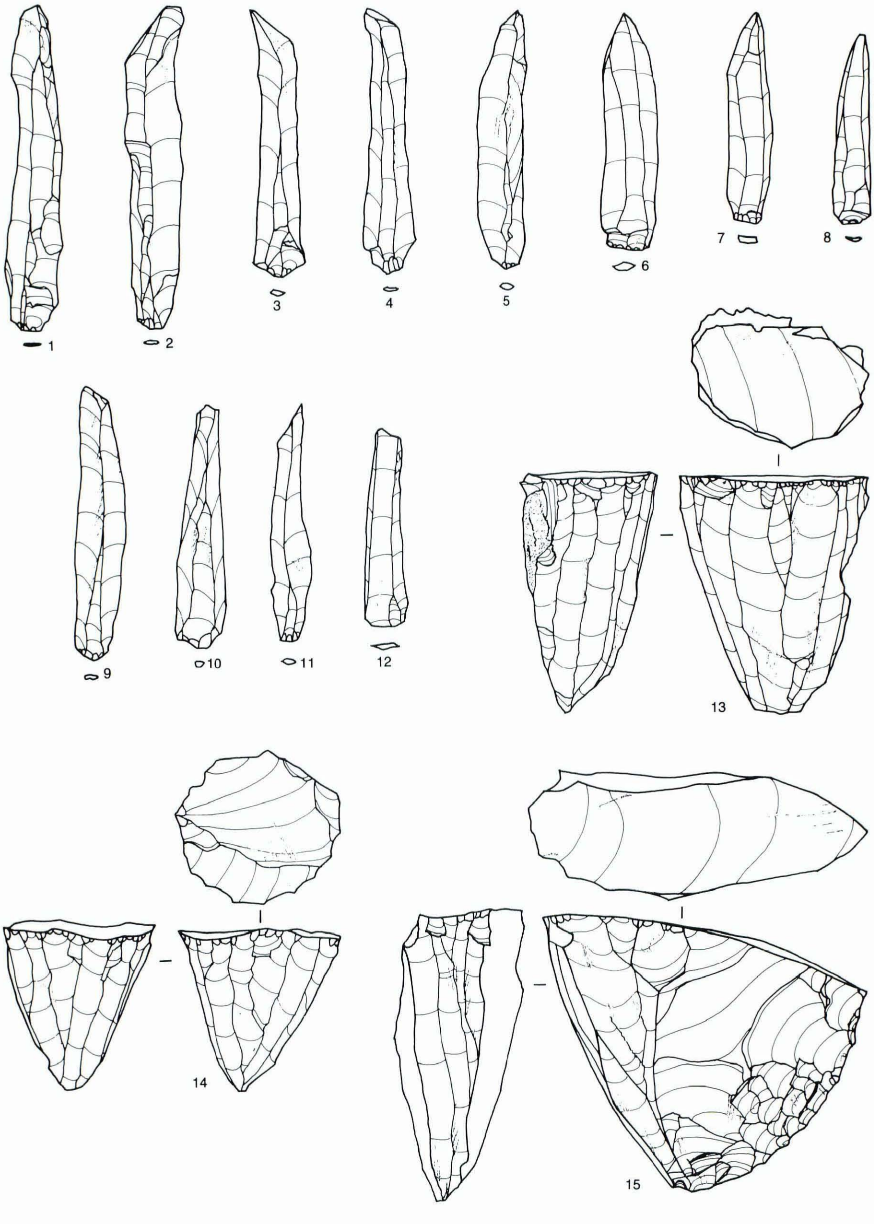

Fig. 8 Micro-blades and Cores Replicated by Direct and Indirect Percussion (Scale: 1/1)
1～4, 13: Direct percussion; 5～12, 14～15: Indirect percussion (1～4, 9～14: Obsidian; 5～8, 15: Siliceous shale)

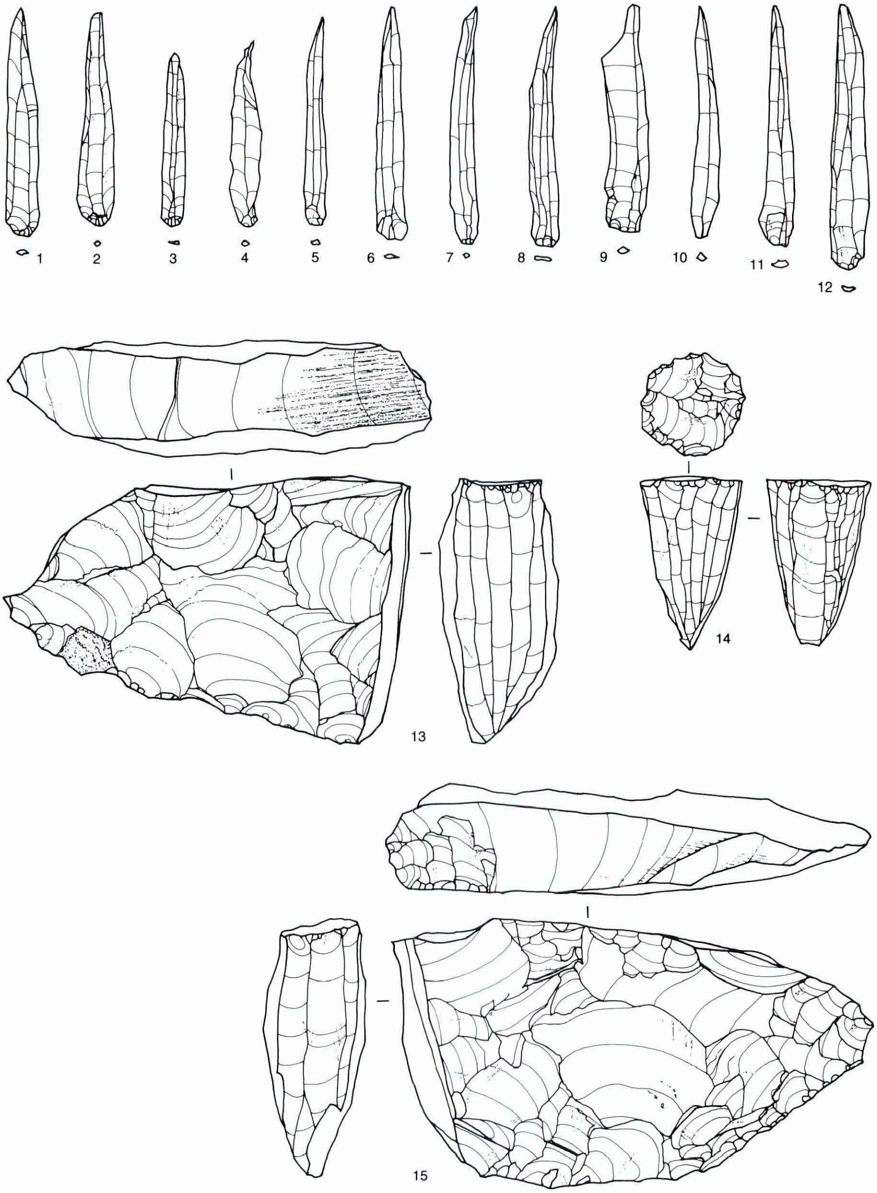

Fig. 9 Micro-blades and Cores Replicated by Pressure (Scale: 1/1)
(1~8, 13~14: Obsidian; 9~12, 15: Siliceous shale)

The analysis results which produced marked differences between the three groups and which seemed to be valid criteria in identifying the three flaking manners are listed below (Table 1).

Fig. 10 Shapes of Butts
1~3: Triangular- or diamond-shaped butts with a projection (•) indicating impact point; 4~6: Smooth-shaped butts without clear impact point

1) The shapes of the butts were divided into two types according to whether or not the hammers or pressure tools had left prominent impact point on the ventral surfaces of the micro-blades when they had been detached: one with this prominence and triangular- or diamond-shaped, and another without such prominence and smooth-shaped. The butt shapes, which were supposed to reflect breakage mechanism and transcend technological proficiency, separated the group replicated by direct percussion from those replicated by indirect percussion and pressure.

2) The L/W ratios of the micro-blades were valid in separating the two groups replicated by direct and indirect percussion from that replicated by pressure.

3) The T/BT ratios were valid in separating the group replicated by direct percussion from that replicated by pressure.

4) The W/BT ratios were valid in separating the group replicated by direct percussion from that replicated by pressure.

It was supposed that the shapes of the butts, which separated the group replicated by direct percussion from those replicated by indirect percussion and pressure, and the L/W ratios, which separated the groups replicated by direct and indirect percussion from that replicated by pressure, were good criteria, when combined together, to identify the three flaking manners.

It was also supposed that the two ratios of T/BT and W/BT could be used as supplementary criteria in the identification.

In order to prove these suppositions, replication of micro-blades by another person employing the same

Table 1 Four Criteria Considered to be Valid for Separation of Three Groups of Obsidian Micro-blades Replicated by Different Flaking Manners

1) Shapes of butts	**Triangular-/diamond-shaped**	**Smooth-shaped**
Direct percussion	32.1%	67.9%
Indirect percussion	79.8%	20.2%
Pressure	56.1%	43.9%
2) L/W ratios	**Average**	**Standard deviation**
Direct percussion	3.5	1.1
Indirect percussion	3.3	1.0
Pressure	5.1	1.6
3) T/BT ratios	**Average**	**Standard deviation**
Direct percussion	2.2	0.7
Pressure	1.2	0.4
Indirect Percussion	1.7	0.6
4) W/BT ratios	**Average**	**Standard deviation**
Direct percussion	10.1	4.1
Pressure	5.4	1.9
Indirect percussion	6.8	2.5

flaking manners as those used by the present author was indispensable.

So, the present author asked Mr. Kubota to replicate three groups of micro-blades to examine which group was produced by which manner of flaking.

The flaking tools used in Kubota's replications were similar to those of the present author, and the raw material was the black obsidian from Shirataki, Hokkaido.

Examination of micro-blades replicated by Kubota

Kubota provided the present author with three groups (A, B and C) of micro-blades replicated by the three flaking manners.

Only the replicas, 50 specimens from each group, which fulfilled the micro-blade definition by Tixier [1963: pp. 36–39] were chosen for the examination.

The attributes for the examination were confined to those which were thought to be productive in comparing analysis results, i.e. the shapes of the butts, the maximum butt thickness, the maximum length, width and thickness of the micro-blades themselves, and Ratios L/W, T/BT and W/BT.

Table 2 Results of Examination of Obsidian Micro-blades Replicated by Kubota

1) Shapes of butts	**Triangular-/diamond-shaped**	**Smooth-shaped**
D.p.	32.1% (Ohnuma): 22.9% (Kubota·A)	67.9% (Ohnuma): 77.1% (Kubota·A)
Id.p.	79.8% (Ohnuma): 74.4% (Kubota·B)	20.2% (Ohnuma): 25.6% (Kubota·B)
Prss.	56.1% (Ohnuma): 59.5% (Kubota·C)	43.9% (Ohnuma): 40.5% (Kubota·C)
2) L/W ratios	**Ohnuma Average: S.d.**	**Kubota Average: S.d.**
D.p.	3.5: 1.1	(A) 4.1: 1.0
Id.p.	3.3: 1.0	(B) 3.9: 0.9
Prss.	5.1: 1.6	(C) 4.2: 0.9
3) T/BT ratios	**Ohnuma Average: S.d.**	**Kubota Average: S.d.**
D.p.	2.2: 0.7	(A) 2.7: 1.4
Prss.	1.2: 0.4	(C) 1.4: 0.5
Id.p.	1.7: 0.6	(B) 1.9: 1.0
4) W/BT ratios	**Ohnuma Average: S.d.**	**Kubota Average: S.d.**
D.p.	10.1: 4.1	(A) 10.9: 4.9
Prss.	5.4: 1.9	(C) 6.4: 1.7
Id.p.	6.8: 2.5	(B) 7.1: 2.8

D.p.: Direct percussion; Id.p.: Indirect percussion; Prss.: Pressure; S.d.: Standard deviation

The results of the examination were compared with the four criteria which had been supposed to be valid in identifying the different flaking manners, i.e. the shapes of the butts, Ratio L/W, Ratio T/BT, and Ratio W/BT (Table 2).

Of the three groups examined, Group A was correctly identified, in terms of the butt shapes, to have been detached by direct percussion, and Groups B and C were also correctly identified to have been detached by indirect percussion (B) and pressure (C) through overall consideration of the four criteria [Ohnuma and Kubota 1992].

The listed below are the attributes which were supposed during the examination and after it to be valid or invalid in identifying the different flaking manners.

1) the shapes of butts as valid attributes which transcend personal variation or proficiency within each

manner of flaking.

2) the maximum length of micro-blades as an invalid attribute which is determined by the length of the flaking surface of cores.

3) the maximum width of micro-blades as an invalid attribute which is determined by the location of impact point relative to ridges on the flaking surface of cores, and which is determined by the plane angle of the core edge to be flaked off in such a way that narrower and wider micro-blades are to be detached from acute and obtuse platforms respectively.

4) The maximum thickness of micro-blades as a rather valid attribute which is proportioned to the thickness of butts, with the ways how it is proportioned different according to the three flaking manners.

It was concluded, on the basis of the above four standpoints, that the butt shapes and Ratio T/BT were reliable criteria in identifying the different flaking manners, while Ratios L/W and W/BT were not.

Analysis of micro-blades from Shirataki-Hattoridai

After the different flaking manners were correctly identified in the three groups of micro-blades replicated by Kubota, archaeological micro-blades from a Japanese site at Shirataki-Hattoridai were analyzed.

The Shirataki-Hattoridai site is located at Oku-Shirataki in the village of Shirataki, Mombetsu-county, Hokkaido.

This site was excavated in July 1961 by Meiji University, and the Layer 2 yielded a large number of lithic artifacts belonging to a single industry [Sugihara and Tozawa 1975].

The lithic artifacts, predominantly made on obsidian, consisted of micro-blades, micro-blade cores, ski-shaped spalls, bifacially-modified core blanks, bifacial points, tanged points, end-scrapers, side scrapers, burins, burin spalls, keeled scrapers, blades, flakes, chips, and cores [Sugihara and Tozawa 1975] (Fig. 11).

The analysis of the Shirataki-Hattoridai material was carried out on March 9th, 1992, at the Archaeological Museum of Meiji University, Tokyo.

Specimens chosen for the analysis were 50 micro-blades, made on black obsidian, which had been magazined in the museum.

The attributes for the analysis were the same as those used in the examination of the micro-blades replicated by Kubota.

All of the analyzed micro-blades fulfilled Tixier's micro-blade definition [1963: pp. 36–39], and were the ones considered to have been "end-product" micro-blades, removed in the flaking technique most important for Shirataki-Hattoridai people.

Consideration of the analysis results, in comparison with those from the thus-far undertaken experimentation and examination, led the present author to conclude that the micro-blades from the Shirataki-Hattoridai site are best described to have been detached by pressure [Ohnuma and Kubota 1992] (Table 3) (Figs. 12, 13 and 14).

This conclusion concerns the micro-blades from Shirataki-Hattoridai, and of course can not be simply applied to micro-blades from other sites yet to be analyzed.

In Japan, M. Yoshizaki described the whole process of the "Yubetsu method", and stated that the micro-blades had been detached in this method by pressure technique with tools made of deer antler [1961: pp. 15–19].

M. Aso also alleged the general use of pressure technique for micro-blade detachment in the final stage of the Japanese Upper Palaeolithic period [1965: p. 168].

T. Matsuzawa, however, reservedly stated that micro-blades could have been detached either by

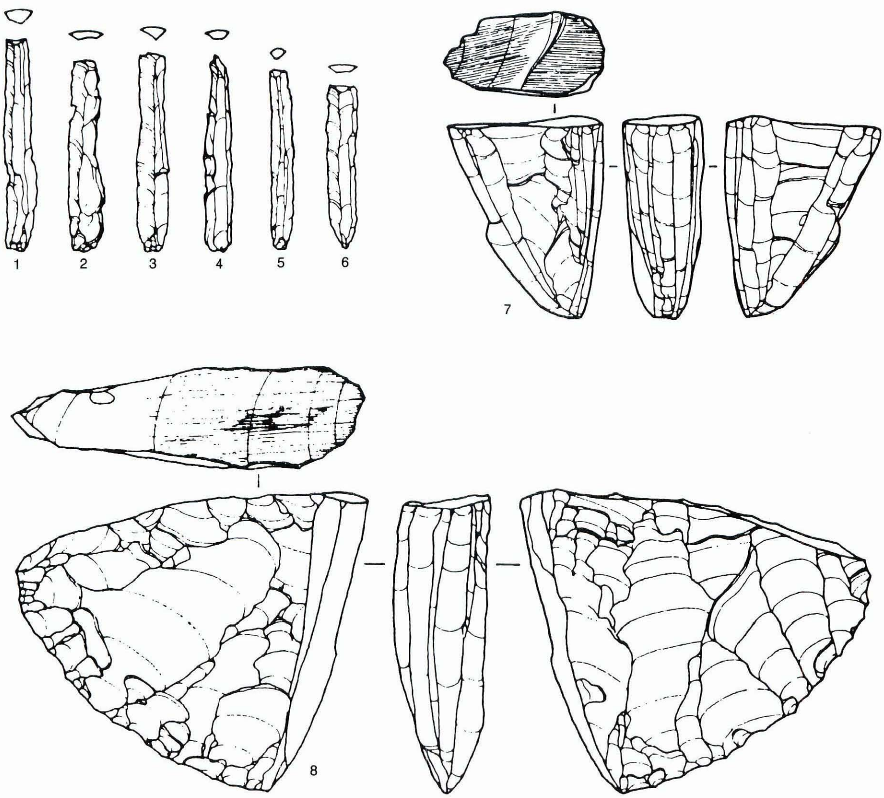

Fig. 11 Micro-blades and Micro-blade Cores from Shirataki-Hattoridai (Scale: 1/1)

(direct or indirect) percussion or by pressure [1988: p. 14].

It is believed that whether or not Stone Age people employed a pressure technique in micro-blade detachment was tightly linked to environmental factors such as the presence or absence of rocks favourable for pressure technique and of material turnable into pressure tools.

It thus seems unreasonable to establish a straight and simple scheme which equates micro-blade detachment with pressure technique.

Analysis of micro-blades from Karim Shahir and M'lefaat

In May 17th to 19th of 1993, the present author visited the Oriental Institute, the University of Chicago, and analyzed the micro-blades from the archaeological sites of Karim Shahir and M'lefaat in the northern part of Iraq (see Fig. 1 of this paper for the location of these sites).

The site of Karim Shahir was excavated in March to May of 1951 by the Oriental Institute of the University of Chicago, under the direction of R.J. Braidwood [Braidwood et al. (eds.) 1983]. A large number of flint lithic artifacts were unearthed at this site from a single occupation floor dated to between 8,900 and 8,600 B.C. [Howe 1983]. The lithic artifacts unearthed mainly consisted of unretouched micro-blades and tools such as notched pieces, backed pieces, end-scrapers, and side scrapers. As

Table 3 Results of Analysis of Micro-blades from the Shirataki-Hattoridai Site

1) **Shapes of butts**	**Triangular-/diamond-shaped**	**Smooth-shaped**
D.p.	32.1% (Ohnuma): 22.9% (Kubota·A)	67.9% (Ohnuma): 77.1% (Kubota·A)
Id.p.	79.8% (Ohnuma): 74.4% (Kubota·B)	20.2% (Ohnuma): 25.6% (Kubota·B)
Prss.	56.1% (Ohnuma): 59.5% (Kubota·C)	43.9% (Ohnuma): 40.5% (Kubota·C)
	※65.1%	**※34.9%**
2) **L/W ratios**	**Ohnuma Average: S.d.**	**Kubota Average: S.d.**
D.p.	3.5: 1.1	(A) 4.1: 1.0
Id.p.	3.3: 1.0	(B) 3.9: 0.9
Prss.	5.1: 1.6	(C) 4.2: 0.9
	※5.3: 1.6	
3) **T/BT ratios**	**Ohnuma Average: S.d.**	**Kubota Average: S.d.**
D.p.	2.2: 0.7	(A) 2.7: 1.4
Prss.	1.2: 0.4	(C) 1.4: 0.5
	※1.3: 0.4	
Id.p.	1.7: 0.6	(B) 1.9: 1.0
4) **W/BT ratios**	**Ohnuma Average: S.d.**	**Kubota Average: S.d.**
D.p.	10.1: 4.1	(A) 10.9: 4.9
Prss.	5.4: 1.9	(C) 6.4: 1.7
	※5.6: 2.0	
Id.p.	6.8: 2.5	(B) 7.1: 2.8

D.p.: Direct percussion; Id.p.: Indirect percussion; Prss.: Pressure; S.d.: Standard deviation; ※: Micro-blades from the Shirataki-Hattoridai site

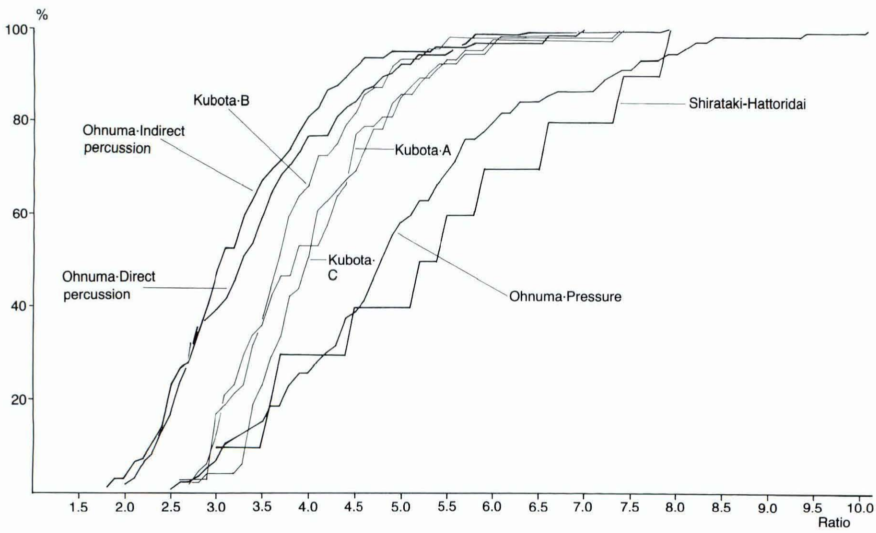

Fig. 12 Cumulative Graph Showing L/W Ratios of Micro-blades Replicated and from Shirataki-Hattoridai

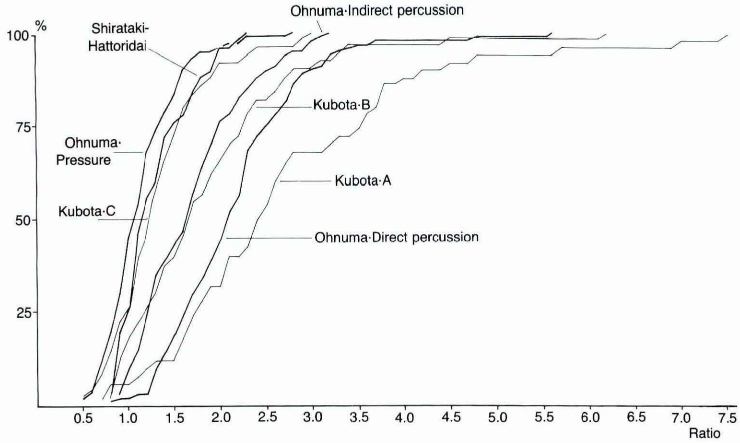

Fig. 13 Cumulative Graph Showing T/BT Ratios of Micro-blades Replicated and from Shirataki-Hattoridai

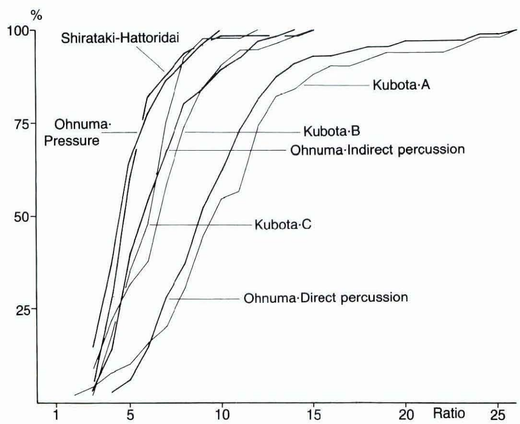

Fig. 14 Cumulative Graph Showing W/BT Ratios of Micro-blades Replicated and from Shirataki-Hattoridai

mentioned previously, the published illustrations of the cores [Howe 1983: Figs. 20–2, 20–4, 21–3 and 21–4] convinced the present author that the micro-blades had been detached by pressure technique at this site.

The site of M'lefaat, also dated to between 8,900 and 8,600 B.C. [Howe 1983], was excavated in the fall of 1954 by the Oriental Institute of the University of Chicago under the direction of R.J. Braidwood [Braidwood et al. (eds.) 1983]. The flint lithic artifacts from this site included notched pieces, nibbled or use-retouched micro-blades, scrapers, and perforators. On the basis of parallel ridges/edges and uniform width of the micro-blades, Dittemore concluded that pressure technique had been used for micro-blade detachment at this site [1983].

The attributes for the pertinent analysis were confined to those which seemed to be productive in identifying the different flaking manners, i.e. the shapes of butts, the presence/absence of a clear impact point on the micro-blades, the maximum butt thickness, the maximum length, width and thickness of the micro-blades, and Ratios L/W, T/BT and W/BT.

One hundred complete and unretouched micro-blades were chosen for the analysis from among the Karim Shahir material, while 14 complete or broken micro-blades were chosen from the M'lefaat material.

Nearly all of the specimens chosen from the Karim Shahir material had been unearthed from Operation I, with the rest from Operations III, V, VI and VIII [Braidwood et al. 1983: pp. 4–5].

The micro-blades and cores from these two sites were so regularly-made that the present author was convinced at first sight that they had been detached by pressure technique; they typically bore such characteristic features as Tixier had proposed for pressure flaked débitage and cores [1984: p. 66], i.e. micro-blades with regular thinness/flatness, parallel/straight dorsal ridges/edges, smooth ventral surfaces, narrow butts and short pronounced bulbs, and cores with regular flake scars and pronounced negative bulbs left by uniform and thin/flat micro-blades removed.

There was seen no difference between the two sites in the shapes of the micro-blade cores, very few of which were "bullet"- or pyramidal-shaped with the platform circumference totally removed.

A significant difference was seen, however, in the features of the platforms of the micro-blade cores; the platforms of the Karim Shahir cores are predominantly plain (23 out of 25) and are only rarely faceted (2 out of 25), while those of the M'lefaat cores are predominantly faceted like the illustrated cores from Nemrik 9 [Kozlowski and Szymczak 1990: Figs. 24, 25 and 26].

The analysis results of the micro-blades from Karim Shahir and M'lefaat were compared in Japan with the results for the micro-blades that had been replicated from finely-grained siliceous shale, a flint-like raw material in Japan, from the Tsukinuno river in Sagae-city, Yamagata-prefecture (Fig. 8–5～8, 15; Fig. 9–9～12, 15).

The flaking tools and the flaking manners used in the replication of these siliceous shale micro-blades were identical to those employed in the previously-described replications of obsidian micro-blades.

Unlike in the replication with obsidian, however, it was not necessary in pressure flaking to rub the platforms of the siliceous shale cores, for this raw material was far less slippery than obsidian.

It was found through the comparative consideration of the analysis results that both of the non-metrical and metrical attributes produced reliable keys to identify the three flaking manners within the groups replicated.

The shapes of butts separated the group replicated by direct percussion from those by indirect percussion and pressure. And, the presence/absence of a clear impact point separated the group replicated by indirect percussion from those by direct percussion and pressure.

The three groups of the replicated micro-blades, therefore, were separated from each other in these two non-metrical attributes.

The ratio L/W separated the group replicated by pressure from those by direct and indirect percussion. Both of Ratios T/BT and W/BT separated the group replicated by direct percussion from those by indirect percussion and pressure.

The three replicated groups were thus separated from each other also in the three ratios, though as mentioned previously the ratios except T/BT were rather unreliable criteria.

The above tri-separation of the replicated micro-blade groups was then applied to the analysis results of the Karim Shahir and M'lefaat materials.

The shapes of butts, supposedly transcending personal variation or proficiency within each manner of flaking, placed the Karim Shahir and M'lefaat materials with the groups replicated by indirect percussion and pressure (Table 4).

Table 4 Separation of Replicated Micro-blades of Siliceous Shale and Archaeological Micro-blades from Karim Shahir and M'lefaat in Terms of Butt Shapes

Shapes of butts	Triangular-/diamond-shaped	Smooth-shaped
Direct percussion	40.2%	59.8%
Micro-blades from M'lefaat	72.7%	27.3%
Micro-blades from Karim Shahir	74.4%	25.6%
Pressure	77.1%	22.9%
Indirect percussion	87.0%	13.0%

Direct percussion: Micro-blades replicated by direct percussion; Pressure: Micro-blades replicated by pressure; Indirect percussion: Micro-blades replicated by indirect percussion

The presence/absence of a clear point of impact, on the other hand, placed the Karim Shahir and M'lefaat materials with the groups replicated by direct percussion and pressure (Table 5).

Table 5 Separation of Replicated Micro-blades of Siliceous Shale and Archaeological Micro-blades from Karim Shahir and M'lefaat in Terms of Presence/Absence of Clear Point of Impact

Clear point of impact	Present	Absent
Micro-blades from Karim Shahir	30.0%	70.0%
Direct percussion	31.0%	69.0%
Micro-blades from M'lefaat	35.7%	64.3%
Pressure	39.0%	61.0%
Indirect percussion	52.0%	48.0%

Direct percussion: Micro-blades replicated by direct percussion; Pressure: Micro-blades replicated by pressure; Indirect percussion: Micro-blades replicated by indirect percussion

Table 6 Separation of Replicated Micro-blades of Siliceous Shale and Archaeological Micro-blades from Karim Shahir and M'lefaat in Terms of Maximum Thickness

Maximum thickness	Average	Standard deviation
Pressure	1.8 mm	0.5
Micro-blades from M'lefaat	2.3 mm	0.5
Micro-blades from Karim Shahir	2.3 mm	0.6
Direct percussion	2.9 mm	1.0
Indirect percussion	3.1 mm	1.1

Direct percussion: Micro-blades replicated by direct percussion; Pressure: Micro-blades replicated by pressure; Indirect percussion: Micro-blades replicated by indirect percussion

So, it was concluded from these two non-metrical attributes that the Karim Shahir and M'lefaat materials had been detached by pressure.

These materials, however, did not approach the group replicated by pressure in terms of Ratio T/BT, which had been considered as a reliable criterion in the analyses of the obsidian micro-blades replicated.

The likeliest reason for this inconformity is an apparent difference between the Stone Age people of Karim Shahir and M'lefaat and the present author in the details of the pressure techniques employed; the butts of the micro-blades from the two sites are extremely punctiform and thin, and yet the micro-blades themselves are rather thicker than those replicated by the present author, suggesting that at these sites core edges for pressure tools to be fixed on were far more isolated than the edges of the replicated cores.

As mentioned previously, the maximum thickness of micro-blades seems to be proportioned to butt thickness, and is a rather reliable criterion.

The smaller variation of this metrical attribute seen in the group replicated by pressure is very suggestive that the thickness of micro-blades produced by pressure is more uniform than that of micro-blades produced by direct and indirect percussion (Table 6).

This suggestion further comes to a conclusion that the Karim Shahir and M'lefaat micro-blades, both of which are even smaller than the group replicated by pressure in the variation of the maximum thickness, were detached by pressure technique.

Conclusions

The results of the analyses of the replicated micro-blades and the application of these results to the micro-blades from the Japanese and Iraqi archaeological sites produced conclusions, which may present guide-lines from a technological viewpoint in researching several problems unsolved in the Japanese and Iraqi prehistory.

One of the conclusions is that the micro-blades from the Japanese site at Shirataki-Hattoridai were detached by pressure technique.

Another conclusion is that the micro-blades from the Iraqi sites at Karim Shahir and M'lefaat were also detached by pressure.

The first conclusion, if combined with future research of materials from the same spatial and temporal context, may lead us to clarify when and how this unique flaking technique using pressure first appeared in Japan or in its surrounding area.

With regard to the second conclusion, the "pre-Neolithic" and pre-pottery Neolithic sites in Iraq, placed in the broad framework generally defined as the transition between the Mesolithic and the pottery Neolithic

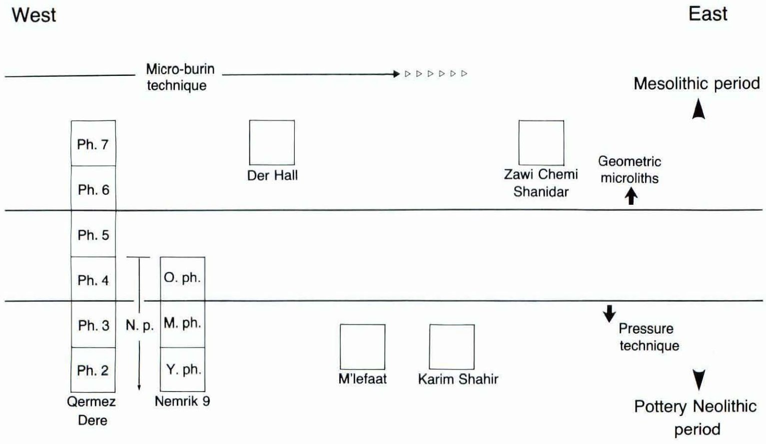

Fig. 15 A Hypothetical Chronology of "Pre-Neolithic" and Pre-pottery Neolithic Sites in Iraq Based on the Presence of Geometric Microliths and Pressure Technique
Ph.: Phase; O. ph.: Oldest phase; M. ph.: Middle phase; Y. ph.: Youngest phase; N. p.: Nemrik point

periods there, dated to between 9,000 and 7,000 B.C., are all located in a rather limited region called "Zagros flanks" in the northern part of Iraq.

Environmental similarity between these sites, supposed from their location and the inventories of their lithic industries, makes it less likely that different flaking technologies were independently invented there, responding to different environmental conditions.

It seems more likely, therefore, that the pressure technique employed among the "pre-Neolithic" and pre-pottery Neolithic people in North Iraq had been introduced from somewhere outside their region as a diffusion of technological concept, rather than that it had locally developed as their original technological innovation.

So, the second conclusion that the micro-blades from Karim Shahir and M'lefaat were detached by pressure may technologically divide the Iraqi "pre-Neolithic" and pre-pottery Neolithic sites into two groups: one which is placed in the period prior to the introduction of pressure technique and the other in the period posterior to it (Fig. 15).

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I would like to thank Mr. Tsugio Matsuzawa of the Center for Archaeological Operations, Nara National Cultural Properties Research Institute, who has given me kind and valuable information toward the completion of this study.

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This study has also been made possible by obtention of deer antlers, and I am grateful in particular to Mr. Hideo Shimozawa of Nibutani-village, Hokkaido, for his warm help in obtaining the "Ezo" deer antlers.

My sincerest gratitudes are also due to Professors Hatsushige Ohtsuka and Mitsunori Tozawa of Meiji University, Tokyo, and Messrs. Masaya Kumano and Hiroshi Kurosawa of the Archaeological Museum of Meiji University; they kindly facilitated the analysis of the Shirataki-Hattoridai material and the publication of the analysis results.

And finally, the analysis of the micro-blades from Karim Shahir and M'lefaat was carried out under a fund from the Oriental Institute, the University of Chicago; for this I am very grateful to Professor McGuire Gibson, Professors Robert J. Braidwood and Linda S. Braidwood, and Dr. Raymond D. Tindel for their kind help and useful advices toward the completion of the research of the Iraqi materials.

Notes

1) Crabtree published articles on blade/micro-blade detachment using chest or shoulder crutches [1967: pp. 68–69]. The similar pressure technique, though using a ventral crutch, is practiced by Pelegrin [1984a: p. 120; 1988]. However, it seems that Pelegrin, as Crabtree [1967], uses artificially-made vices [Pelegrin 1984b: pp. 105–116] instead of natural ones such as a naturally-cracked or -pitted rock.
2) C.A. Bergman uses an artificially-made small wooden vice to prevent core movement on his left palm. This vice has a V-shaped notch for micro-blades to pass when they are removed with an antler tine grasped and pressed by the right hand. Similar grooved vices are used by Pelegrin [1988].

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APPENDICES: RESULTS OF ANALYSES

1. Analysis results of obsidian micro-blades replicated by Ohnuma:

1) Micro-blades replicated by direct percussion (100 specimens):
Shapes of butts: triangular- or diamond-shaped (25: 32.1%); smooth-shaped (53: 67.9%); unidentifiable (22)
Clear point of impact: present (75: 75.0%); absent (25: 25.0%)
Lip: present (100: 100.0%)
Flaking angle (6): maximum 86°; minimum 70°; average 77°; standard deviation 7
Maximum butt thickness (100): maximum 2.9 mm; minimum 0.4 mm; average 1.0 mm; standard deviation 0.4
Maximum length (97): maximum 55.6 mm; minimum 15.2 mm; average 30.7 mm; standard deviation 7.8
Maximum width (100): maximum 14.3 mm; minimum 4.1 mm; average 9.1 mm; standard deviation 2.3
Maximum thickness (100): maximum 4.5 mm; minimum 0.5 mm; average 2.0 mm; standard deviation 0.7
Ratio L/W (97): maximum 7.9; minimum 2.0; average 3.5; standard deviation 1.1
Ratio T/BT (100): maximum 5.6; minimum 0.8; average 2.2; standard deviation 0.7
Ratio W/BT (100): maximum 26.0; minimum 3.7; average 10.1; standard deviation 4.1

2) Micro-blades replicated by indirect percussion (100 specimens):
Shapes of butts: triangular- or diamond-shaped (79: 79.8%); smooth-shaped (20: 20.2%); unidentifiable (1)
Clear point of impact: present (91: 91.0%); absent (9: 9.0%)
Lip: present (93: 93.0%); absent (7: 7.0%)
Flaking angle (45): maximum 84°; minimum 55°; average 75°; standard deviation 5
Maximum butt thickness (100): maximum 3.8 mm; minimum 0.6 mm; average 1.6 mm; standard deviation 0.7
Maximum length (89): maximum 47.0 mm; minimum 19.2 mm; average 31.4 mm; standard deviation 6.4
Maximum width (100): maximum 18.0 mm; minimum 4.3 mm; average 10.0 mm; standard deviation 2.7
Maximum thickness (100): maximum 4.6 mm; minimum 1.0 mm; average 2.6 mm; standard deviation 0.8
Ratio L/W (89): maximum 7.0; minimum 1.8; average 3.3; standard deviation 1.0
Ratio T/BT (100): maximum 3.2; minimum 0.9; average 1.7; standard deviation 0.6
Ratio W/BT (100): maximum 14.4; minimum 2.7; average 6.8; standard deviation 2.5

3) Micro-blades replicated by pressure (100 specimens):
Shapes of butts: triangular- or diamond-shaped (55: 56.1%); smooth-shaped (43: 43.9%); unidentifiable (2)
Clear point of impact: present (90: 90.0%); absent (10: 10.0%)
Lip: present (98: 98.0%); absent (2: 2.0%)
Flaking angle (12): maximum 86°; minimum 74°; average 82°; standard deviation 4
Maximum butt thickness (100): maximum 3.0 mm; minimum 0.6 mm; average 1.4 mm; standard deviation 0.5
Maximum length (86): maximum 63.2 mm; minimum 17.8 mm; average 33.8 mm; standard deviation 11.7
Maximum width (100): maximum 11.5 mm; minimum 3.6 mm; average 6.9 mm; standard deviation 1.6
Maximum thickness (100): maximum 2.8 mm; minimum 0.8 mm; average 1.5 mm; standard deviation 0.5
Ratio L/W (86): maximum 10.5; minimum 2.5; average 5.1; standard deviation 1.6
Ratio T/BT (100): maximum 2.8; minimum 0.5; average 1.2; standard deviation 0.4
Ratio W/BT (100): maximum 10.3; minimum 2.6; average 5.4; standard deviation 1.9

2. Analysis results of obsidian micro-blades replicated by Kubota:

1) Group A (50 specimens):
Shapes of butts: triangular- or diamond-shaped (8: 22.9%); smooth-shaped (27: 77.1%); unidentifiable (15)
Maximum butt thickness (50): maximum 3.3 mm; minimum 0.3 mm; average 1.1 mm; standard deviation 0.6
Maximum length (47): maximum 53.1 mm; minimum 25.5 mm; average 36.7 mm; standard deviation 5.2

Maximum width (50): maximum 13.5 mm; minimum 4.6 mm; average 9.6 mm; standard deviation 2.2
Maximum thickness (50): maximum 4.2 mm; minimum 0.7 mm; average 2.4 mm; standard deviation 0.8
Ratio L/W (47): maximum 7.4; minimum 2.7; average 4.1; standard deviation 1.0
Ratio T/BT (50): maximum 7.5; minimum 0.7; average 2.7; standard deviation 1.4
Ratio W/BT (50): maximum 26.0; minimum 2.2; average 10.9; standard deviation 4.9

2) Group B (50 specimens):
Shapes of butts: triangular- or diamond-shaped (32: 74.4%); smooth-shaped (11: 25.6%); unidentifiable (7)
Maximum butt thickness (50): maximum 2.7 mm; minimum 0.5 mm; average 1.3 mm; standard deviation 0.6
Maximum length (47): maximum 36.3 mm; minimum 21.6 mm; average 29.5 mm; standard deviation 3.7
Maximum width (50): maximum 10.9 mm; minimum 4.8 mm; average 7.8 mm; standard deviation 1.5
Maximum thickness (50): maximum 3.3 mm; minimum 0.8 mm; average 2.1 mm; standard deviation 0.5
Ratio L/W (47): maximum 7.4; minimum 2.6; average 3.9; standard deviation 0.9
Ratio T/BT (50): maximum 6.2; minimum 0.8; average 1.9; standard deviation 1.0
Ratio W/BT (50): maximum 15.3; minimum 3.0; average 7.1; standard deviation 2.8

3) Group C (50 specimens):
Shapes of butts: triangular- or diamond-shaped (25: 59.5%); smooth-shaped (17: 40.5%); unidentifiable (8)
Maximum butt thickness (50): maximum 2.5 mm; minimum 0.7 mm; average 1.3 mm; standard deviation 0.4
Maximum length (48): maximum 39.2 mm; minimum 26.0 mm; average 30.7 mm; standard deviation 2.9
Maximum width (50): maximum 11.1 mm; minimum 3.7 mm; average 7.6 mm; standard deviation 1.5
Maximum thickness (50): maximum 4.0 mm; minimum 0.7 mm; average 1.6 mm; standard deviation 0.6
Ratio L/W (48): maximum 7.0; minimum 2.7; average 4.2; standard deviation 0.9
Ratio T/BT (50): maximum 3.0; minimum 0.5; average 1.4; standard deviation 0.5
Ratio W/BT (50): maximum 12.0; minimum 3.4; average 6.4; standard deviation 1.7

3. **Analysis results of micro-blades from Shirataki-Hattoridai** (50 specimens):

Shapes of butts: triangular- or diamond-shaped (28: 65.1%); smooth-shaped (15: 34.9%); unidentifiable (7)
Maximum butt thickness (50): maximum 2.0 mm; minimum 0.4 mm; average 1.1 mm; standard deviation 0.3
Maximum length (10): maximum 44.3 mm; minimum 21.4 mm; average 31.3 mm; standard deviation 7.1
Maximum width (50): maximum 9.3 mm; minimum 4.2 mm; average 5.9 mm; standard deviation 1.0
Maximum thickness (50): maximum 2.6 mm; minimum 0.8 mm; average 1.4 mm; standard deviation 0.4
Ratio L/W (10): maximum 7.9; minimum 3.0; average 5.3; standard deviation 1.6
Ratio T/BT (50): maximum 2.3; minimum 0.8; average 1.3; standard deviation 0.4
Ratio W/BT (50): maximum 15.3; minimum 3.2; average 5.6; standard deviation 2.0

4. **Analysis results of siliceous shale micro-blades replicated by Ohnuma:**

1) Micro-blades replicated by direct percussion (100 specimens):
Shapes of butts: triangular- or diamond-shaped (37: 40.2%); smooth-shaped (55: 59.8%); unidentifiable (8)
Clear point of impact: present (31: 31.0%); absent (69: 69.0%)
Maximum butt thickness (100): maximum 3.1 mm; minimum 0.3 mm; average 1.2 mm; standard deviation 0.6
Maximum length (100): maximum 70.7 mm; minimum 13.5 mm; average 38.6 mm; standard deviation 11.6
Maximum width (100): maximum 20.4 mm; minimum 6.3 mm; average 12.6 mm; standard deviation 3.1
Maximum thickness (100): maximum 5.7 mm; minimum 1.2 mm; average 2.9 mm; standard deviation 1.0
Ratio L/W (100): maximum 5.8; minimum 1.5; average 3.1; standard deviation 0.9
Ratio T/BT (100): maximum 7.8; minimum 0.9; average 2.8; standard deviation 1.3
Ratio W/BT (100): maximum 40.0; minimum 4.5; average 12.4; standard deviation 6.0

2) Micro-blades replicated by indirect percussion (100 specimens):
Shapes of butts: triangular- or diamond-shaped (87: 87.0%); smooth-shaped (13: 13.0%)
Clear point of impact: present (52: 52.0%); absent (48: 48.0%)
Maximum butt thickness (100): maximum 4.9 mm; minimum 0.3 mm; average 2.1 mm; standard deviation 0.8
Maximum length (100): maximum 59.8 mm; minimum 15.6 mm; average 36.6 mm; standard deviation 8.4
Maximum width (100): maximum 18.4 mm; minimum 5.3 mm; average 11.5 mm; standard deviation 2.9
Maximum thickness (100): maximum 7.3 mm; minimum 1.0 mm; average 3.1 mm; standard deviation 1.1
Ratio L/W (100): maximum 6.2; minimum 1.9; average 3.4; standard deviation 1.1
Ratio T/BT (100): maximum 3.6; minimum 0.7; average 1.6; standard deviation 0.6
Ratio W/BT (100): maximum 22.3; minimum 1.9; average 6.2; standard deviation 2.5

3) Micro-blades replicated by pressure (100 specimens):
Shapes of butts: triangular- or diamond-shaped (74: 77.1%); smooth-shaped (22: 22.9%); unidentifiable (4)
Clear point of impact: present (39: 39.0%); absent (61: 61.0%)
Maximum butt thickness (100): maximum 2.1 mm; minimum 0.3 mm; average 1.1 mm; standard deviation 0.4
Maximum length (100): maximum 48.7 mm; minimum 15.0 mm; average 31.0 mm; standard deviation 7.0
Maximum width (100): maximum 9.4 mm; minimum 3.9 mm; average 6.5 mm; standard deviation 1.1
Maximum thickness (100): maximum 3.1 mm; minimum 0.6 mm; average 1.8 mm; standard deviation 0.5
Ratio L/W (100): maximum 8.6; minimum 2.4; average 4.9; standard deviation 1.3
Ratio T/BT (100): maximum 4.7; minimum 0.6; average 1.8; standard deviation 0.8
Ratio W/BT (100): maximum 20.7; minimum 2.7; average 6.9; standard deviation 3.3

5. Analysis results of micro-blades from Karim Shahir (100 specimens):

Shapes of butts: triangular- or diamond-shaped (58: 74.4%); smooth-shaped (20: 25.6%); unidentifiable (22)
Clear point of impact: present (30: 30.0%); absent (70: 70.0%)
Maximum butt thickness (100): maximum 2.6 mm; minimum 0.4 mm; average 0.9 mm; standard deviation 0.3
Maximum length (100): maximum 57.7 mm; minimum 25.4 mm; average 39.5 mm; standard deviation 7.1
Maximum width (100): maximum 14.9 mm; minimum 6.4 mm; average 9.9 mm; standard deviation 1.9
Maximum thickness (100): maximum 4.8 mm; minimum 1.3 mm; average 2.3 mm; standard deviation 0.6
Ratio L/W (100): maximum 7.6; minimum 2.7; average 4.1; standard deviation 1.0
Ratio T/BT (100): maximum 7.3; minimum 0.8; average 2.9; standard deviation 1.2
Ratio W/BT (100): maximum 29.3; minimum 3.8; average 12.2; standard deviation 4.7

6. Analysis results of micro-blades from M'lefaat (14 specimens):

Shapes of butts: triangular- or diamond-shaped (8: 72.7%); smooth-shaped (3: 27.3%); unidentifiable (3)
Clear point of impact: present (5: 35.7%); absent (9: 64.3%)
Maximum butt thickness (14): maximum 2.1 mm; minimum 0.5 mm; average 1.1 mm; standard deviation 0.5
Maximum length (6): maximum 40.8 mm; minimum 22.3 mm; average 28.4 mm; standard deviation 6.2
Maximum width (13): maximum 11.3 mm; minimum 6.2 mm; average 8.3 mm; standard deviation 1.4
Maximum thickness (14): maximum 3.6 mm; minimum 1.3 mm; average 2.3 mm; standard deviation 0.5
Ratio L/W (6): maximum 4.1; minimum 2.5; average 3.1; standard deviation 0.6
Ratio T/BT (14): maximum 4.0; minimum 1.1; average 2.5; standard deviation 0.7
Ratio W/BT (13): maximum 15.4; minimum 4.0; average 8.9; standard deviation 3.2

THIRD REPORT ON THE EXCAVATIONS AT SONGOR A

Hiroko KAMADA* and Tadahiko OHTSU**

EARLY DYNASTIC PERIOD

Preface

Western Area hereupon reported is to the west of Tell Songor A, where the flat top of this mound swells a little more than surroundings. We found badly damaged structural remains of mud bricks within the limits of the excavated area (XIX～XXII-16, 17, XXII-15, Fig. 1–1).

In the course of the search for these remains, we found small shards of the Early Dynastic Period including "Scarlet Ware" (XXII-16, 17) and a pendant (XX-16) from the surface soil of the grids. We thought that these objects should suggest the period of the structural remains. Besides, we found two shards of the "Scarlet Ware" that might be dated to the Early Dynastic I Period in the Northern Area (VI-21, IX-23).

Stratigraphy

According to a deep sounding at the western corner of the grid XXI-16 (Fig. 1–3), the lowest layer is composed of reddish brown, claylike soil and brown sand which is full of ash. This layer could be suited to the deposit accumulated in the holes in the Central Area. It contains many fragments of Halaf pottery. On this layer is the badly damaged structural remains of mud bricks. Above the brown, sandy layer mixed with silt and ash, the structural remains were dug into the grayish brown layer mixed together with chaff and fragments of mud brick. From the bottom of the hole that is seen on the section, two stone vessels were found. The outermost layer was of reddish brown, sandy soil.

Structural remains

We had no sooner removed the outermost layer and we could see some pits, such as the examples from grids XX-16, 17, and the ranges of the mud bricks (Fig. 1–1 and Pl. 1-a). We could not define the character of these pits. The mud bricks had a $40 \times 20 \times 8$ cm figure, and contained many grits. Their colour were gray with a greenish tint. From the example of grid XX-16 that were relatively in fair preservation, we could see the three rows of bricks like a part of building walls. The piling method of the bricks vaires with every step, and longitudinal axes of the three-layer bricks were arranged up and down to cross at right angles with one another.

Some parts of the insides surrounded by the ranges of the mud bricks have a distribution of bluish green coloured soil similar to that of the floor remains (XIX, XX-16). And burnt animal bones and pieces of charcoal could also be found there (XX-16). These findings might have assumed the condition of the bottom of the pit dug from above.

The form of this structural remains bears some resemblance to those of tombs excavated at Kheit Qasim I site (Early Dynastic I) in the Hamrin area by the French Archaeological Mission. But in the case

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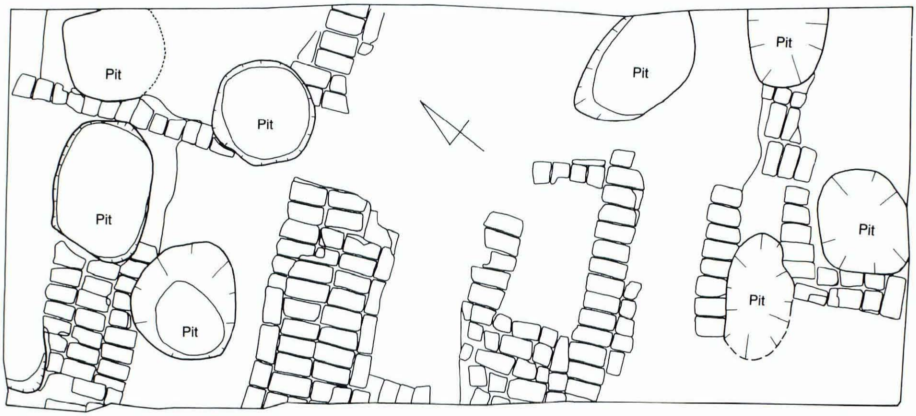
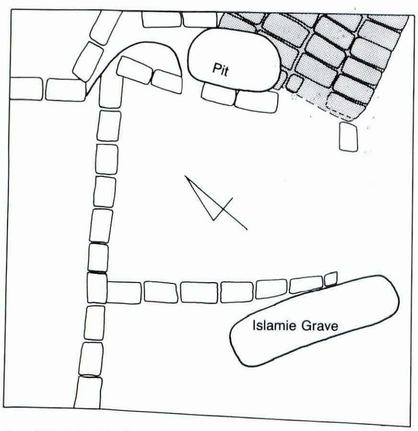
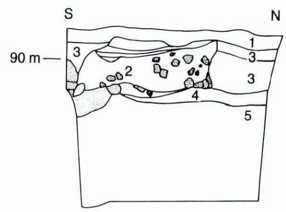


1. Mud-Brick Remains, Early Dynastic Period, Westearn Area (XX-16, 17), Tell Songor A



2. Mud-Brick Remains, Early Dynastic Period ( )
Southern Area (XXVIII-20), Tell Songor A



3. Section, Westearn Area (XXI-16), Tell Songor A

1. reddish brown, sandy soil
2. dark brown, sandy soil with clay
3. grayish brown soil
4. brown, sandy soil
5. reddish brown, claylike soil with sand and ash

structural remains of mud bricks and fragments of the bricks

0 2 m

Fig. 1 Mud-Brick Remains, Early Dynastic Period, Tell Songor A of Tell Songor A, we never found clear traces of interments as at the Kheit Qasim I site. For the restricted data from Tell Songor A, it could be hard to expect that the practice of the secondary burial resulted in emptying of the tombs as was suggested at Kheit Qasim I Site.

Judging from the size, quality and the direction of the range of mud bricks it should be pointed out that the structural remains found from the upper layer of the Southern Area (XXVIII-20) could belong to the same period as the ones of the Western Area (Fig. 1–2 and Pl. 1-b).

Finds

In the Western Area of Tell Songor A we could not find Archaeological remains which surely associate with the structural ramains of the mud bricks. The following is the report on the findings from all the researched areas of Tell Songor A which seem to be dated toward the Early Dynastic Period.

1. Mouth to shoulder part of the "Scarlet Ware" jar found from grid IX-23. The rim diameter restored is 12 cm. The paste contains much fine grit and wheel made. The plum red colour of the designs resembles that of the pottery from Tell Gubba (Fig. 2–1 and Pl. 2-a).
2. Shoulder part of the "Scarlet Ware" jar found from grid VI-21. The size is unidentified. The brown paste contains relatively a lot of fine grits and wheel made. The surface is finished by wet-smoothing technique, and covered with clay slip. On it geometrical designs are painted (Fig. 2–2).
3. A Spouted jar found from the top soil of the grid XVII-23 together with two tubular human bones. The presence of relative structural remains could not be made clear. The surface is rugged but seems to have been covered with clay slip originally. An upward tubular spout is attached under a grooved line surrounding the shoulder. The rim assumes the same form of the Early Dynastic I pottery found from Tell Gubba (Fig. 2 –3 and Pl. 2-b).
4. A conical bowl found from the grid V-20. The rim is 10.4 cm in diameter. It utterly lacks base. Outside the body there can be seen the ribbed marks due to the wheel formation (Fig. 2–4 and Pl. 2-c).
5. Small goblet-shaped vessel found from the grid III-21. It lacks rim and base. The body is 6.3 cm in maximum diameter and traces of scraping or shaping with spatula can be seen on its outside (Fig. 2–5 and Pl. 2-d).
6. A white stone bead decorated with dot-in-circles incised on the rectangular surface, found from the disturbed level of the grid XX-16. This seems to belong to the same type as that of Kheit Qasim Site and that of Level VII in Tell Gubba (Fig. 2–6).

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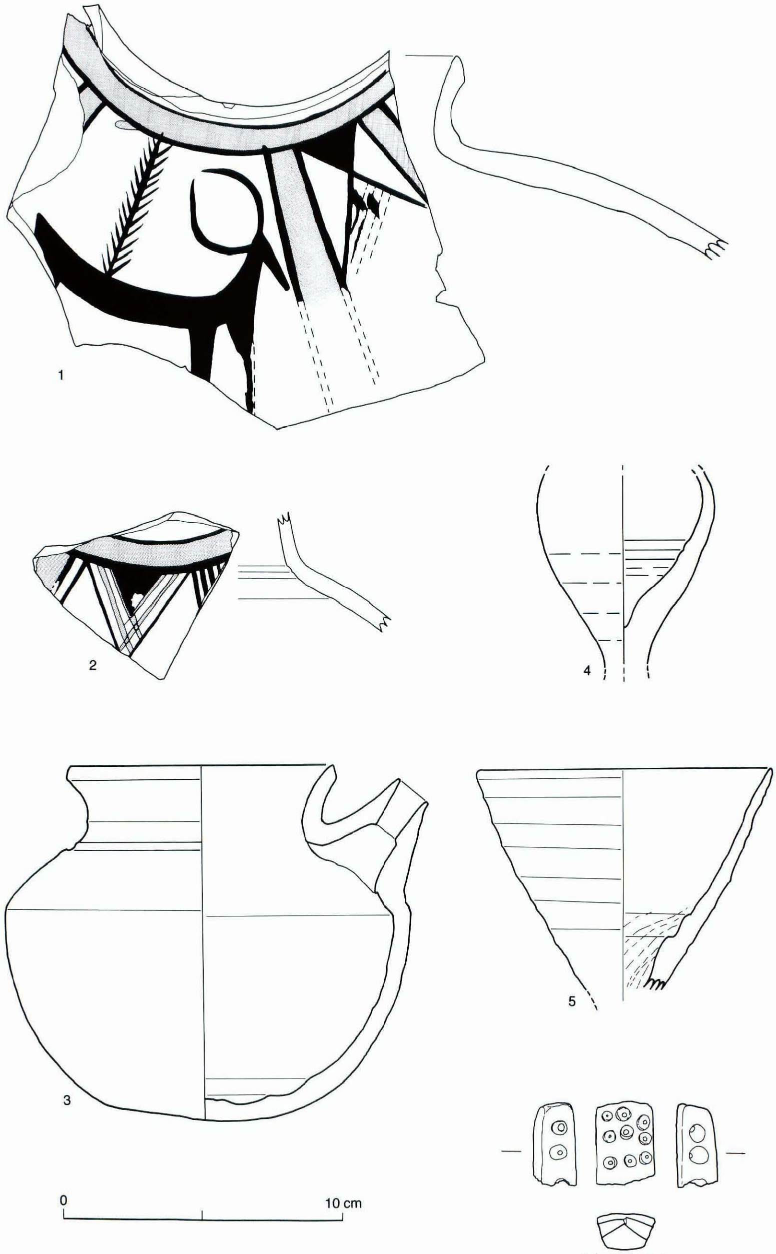

Fig. 2 Finds from Tell Songor A, Early Dynastic Period

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(by Tadahiko OHTSU)

HALAF PERIOD

Preface

There are not many remains of Halaf Peiod at Songor A. One is a grave, the other is a kiln. They were found in the Northern Area. Besides, many large holes containing fragments of Halaf pottery were found in the Central and West Areas. For the pottery from Central Area, we had no time to study, and Mr. Matsumoto, K. made some drawings of them. He also took photographs of objects.

Freatures

Grave 65:

Found in Grid VI-20. This is a grave for a child. The grave was dug into the mud-brick debris of Samarra period. The dimention and the shape of the burial pit is not clear because two sides of the grave was cut by later graves. We only recognised an area of 0.75*0.50 m. Two pieces of pottery were found on the body; one is an open bowl (P. 41) and the other a small jar (P. 13), both area painted. The body was lying on its right, the head was put in the south-east, facing to the north. Only upper part of the body was remained. The arms are bent and set in front of the breast. The jaw-bone was apart from the scull (Fig. 3, Pl. 3). There may have been other graves in Halaf Period, because we found an almost complete painted jar (P. 7), that is one of the finest jars at songor A, in a layer just below the surface.

Kiln 1:

Found in Grids IV-21 and 22. Its shape is not clear because of the poor reservation. Only bottom of the firing chamber is remained. Its diameter is 1.30 m long and the depth remained is 0.6 m. The side wall is strongly fired so that it is green to black in color. Fragments of a painted bowl (P. 43) are found in it (Pl. 4).

Holes:

There is no remains of buildings in the Central Area. We opened twenty grids, total 320 m^2, and certified nine holes and a large depression after removing the surface soil (Fig. 4, 5). We dag down one hole in Grid XIX-21 and the large

Fig. 3 Grave 65
(after removing pottery)

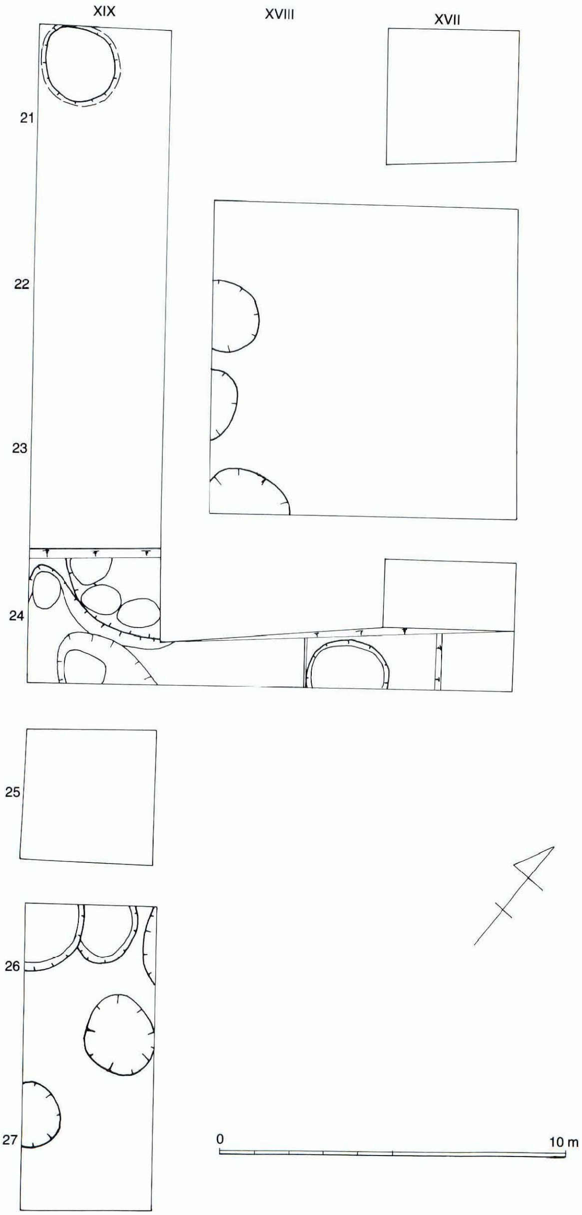
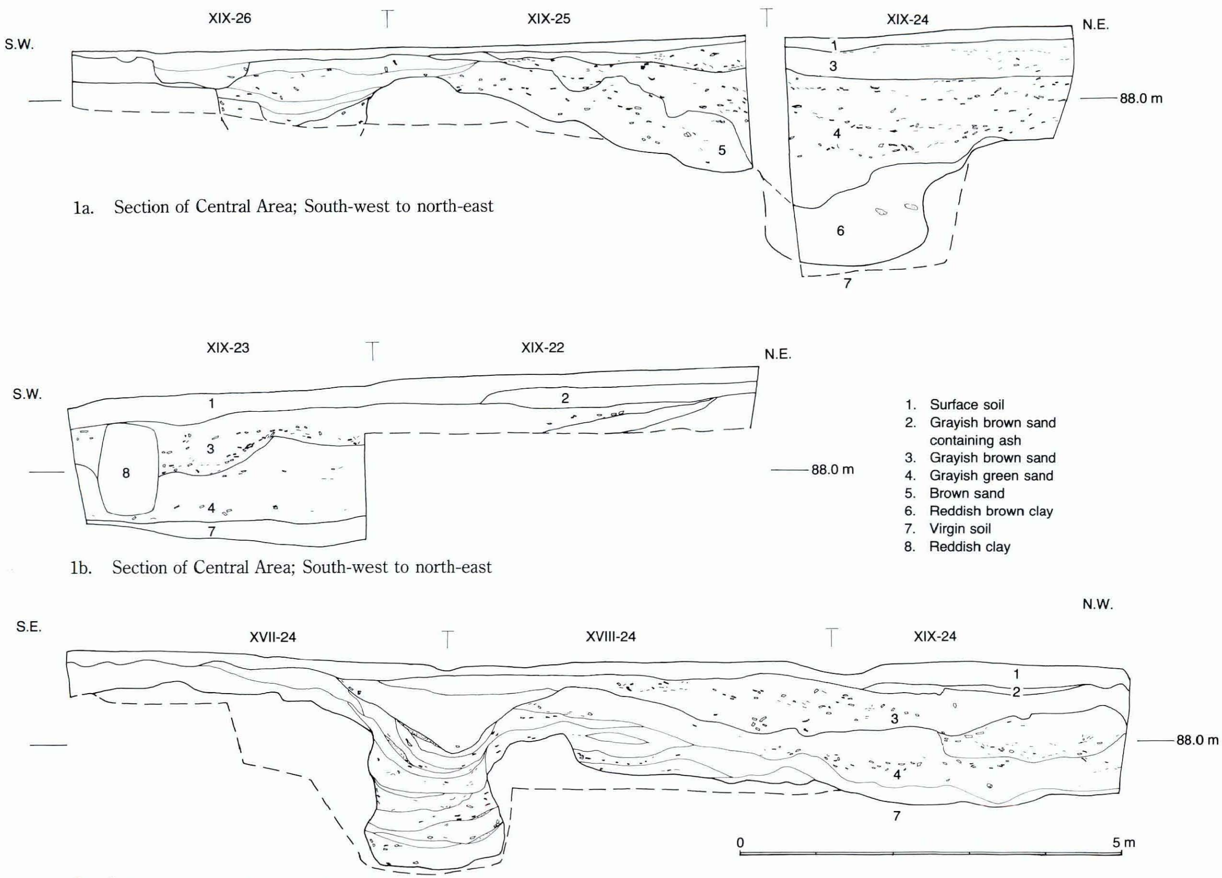


Fig. 4 Holes in the Central Area



1a. Section of Central Area; South-west to north-east

1b. Section of Central Area; South-west to north-east

2. Section of Central Area; South-east to north-west

Fig. 5 Sections of the Central Area

depression in Grids XVII to XIX-24. The soil in these holes and the depression contains much Halaf pottery, very small quantity of Samarra pottery and some other objects. We also set a deep sounding in Grid XIX-33, eastern limit of our work, where we met subsoil water at the depth of 1.80 m below the surface. Fragments of Halaf pottery were found here, but they were all very small and worn out. The soil in this east, low part of the mound must be secondary sediment.

The hole in Grid XIX-21 is 2.3 m in diameter at the top level, 0.9 m deep and the bottom diameter is 2.5 m. The diameter is larger in the lower portion than that in the top, so that its sectional view is bag-like. In Grid XIX-24, we reached the bottom of the depression at the depth of 1.2–1.5 m. The bottom is not flat, but made up of smaller depressions, each one is about 1.3 m in diameter. The bottom of the hole is reddish brown, compact clay, that is the virgin soil.

The filling soil is divided into two to four layers, but thier nature is not much different. One mass of clay is found in the south corner of Grid XIX-24 (Fig. 5).

Undulation of bottom is very strong in Grids XVII-XVII-24. There are one deep hole and a shallower depression. The deep one is 1.5 m in diameter at the upper, narrowest portion and is 1.8 m in diameter near the bottom. The depth is 2.4 m from the top of the remained virgin soil. We could divide the filling into many layers. They are mostly mixed, different colored soils from reddish brown to greenish brown. Ash, blocks of clay, animal bones and carbonized objects were mixed in addition to Halaf pottery, but they were all fragmentary and scarce. Reddish brown soil containing Halaf pottery was observed under the layer of Early Dynastic Period in the Western Area, but it was not found in the Southern and Northern Areas.

Judging from the shape of the holes and blocks of clay in the filling, these holes may have been dug to get the clay itself. The characteristics of the pottery point to the time of Layer IV at Songor B. The clay may have been used for making buildings or pottery and others.

Pottery

The pieces we show here are selected ones. They are rather supplementary to those from Songor B. Usually Halaf pottery from Songor A contains a small quantity of fine sand. It is not wheel-thrown, but a kind of rotating table may be used. Some pieces show scraping marks, but elaborate smoothing erased most of them. The body or paste color is buff to orange, the surfase is wet-smoothed. Cream or white slip is often observed. The colors of painted designs are different. They are orange, red, brown, dark brown, black and green. Bichrome designs are not rare. We show the difference of colors only for bichrome pieces, using all painted part and small-dotted part in this report. Recorded Halaf pottery from Songor A does not contain many shapes. They are: 1. Jars, 2. Lids of Jars, 3. Bowls, 4. Dishes 5. Very small bowls. Each shape has several forms. To avoid the confusion of nomenclature between Songor A and B, we call each form attaching an alphabetic letter.

Jars (P. 1 to P. 13, Fig. 6 and 7):

- **A**: Large jar with a flange near the mouth. This flange may receive a lid (P. 1). It is painted outside.
- **B**: Large jar with short, straight neck (P. 2 to p. 4). They are painted outside.
- **C**: Large jar with high neck. The body is rather long (P. 5 and P. 6). P. 6 has two handles with a vertical perforation at the neck. The mouth is a bit everted.
- **D**: Small jar with swelling shoulder and short, straight neck. The rim is everted or bent outwards (P. 7 and P.8). P. 7 is finely painted outside.
- **E**: Small jar without neck. The body narrows to the rim with rather straight side (P. 12).
- **F**: Very small jar with high, straight neck (P. 13). It is painted outside.

Lids of jars (P. 14 to P. 16, Fig. 7):
P. 14 to P. 16 are lids for jars. They have flat top and slightly curbed side. They are painted on side and top.
Bowls (P. 17 to P. 52, Fig. 7 to Fig. 10):
Bowls can be divided into four.

- **A**: Deep bowl.
- **B**: Deep bowl with a flange inside.
- **C**: Open bowl with a carination in the lower part, rather straight side flares out from that point.
- **D**: Open bowl with roundish side.

Each form can be divided according to difference of size and shape of detail. The variances are shown by number after alphabet.

- **A1**: Large, deep bowl with the mouth slightly narrowing to the rim (P. 17). It is painted on both sides.
- **A2**: Large, deep bowl with slightly everted rim. The rim diameter is more than 25 cm. The side is rather straight. All pieces are painted on both sides. Several horizontal lines are painted at the rim inside, geometric designs are painted outside (P. 18–21).
- **A3**: Medium-sized, deep bowl with everted rim. The rim diameter is around 22 cm (P. 22–24). The difference from A2 is limited to size.
- **A4**: Small, deep bowl with straight side and slightly everted rim. The diameter of the rim is less than 12 cm (P. 25 and P. 26). The characteristics of the paintings are the same with A1 to A3.
- **A5**: Medium-sized, deep bowl with S-curbed side. It has roundish lower body and everted rim (P. 27–30). The diameter of the rim is around 20 cm. P. 26 has geometric designs on both sides, but others have horizontal lines inside and geometric design outside.
- **A6**: Small-sized, deep bowl with S-curbed side. The diameter of the rim is around 15 cm (P. 31–33). P. 31 is plain. P. 32 and P. 33 have horizontal lines inside and geometric designs ouside.
- **A7**: Rather deep bowl with a carination in the lower portion. The side does not flare, but the mouth opens a bit (P. 34 and P. 35). It is painted; horizontal lines at the inner rim and geometric designs outside.
- **B1**: Middle-sized bowl with straight side. It has a flange near the rim inside. The mouth is slightly open outwards. One hole is pierced above the flange. A band is painted at the inner rim and geometric designs are painted outside (P. 36).
- **B2**: Small-sized bowl with a flange inside. The side slightly narrows to the mouth. A band is painted at the rim inside and geometric designs outside (P. 37).
- **C**: Open bowl with flaring side above a carination. There are two pieces which have this characteristics (P. 38 and P. 39). They are plain.
- **D1**: Large, open bowl with the side gradually opens to the mouth from roundish lower portion. It has ring base and thick rim. All pieces are painted on both sides (P. 40–42).
- **D2**: Medium-sized, open bowl. The side curbes gently from bottom to rim (P. 43–46). The rim of P. 42 is slantwise cut, but the rim of other three pieces are tapering. All are painted on both sides.
- **D3**: Large- to medium-sized bowl with hemispherical body. The rims are slightly everted (P. 48 and P. 49) or simply finished (P. 47). All are painted on both sides.
- **D4**: Large-sized, open bowl with strongly inverted rim. It is painted; horizontal lines at the inner rim, a row of triangles at the outer rim (P. 50).

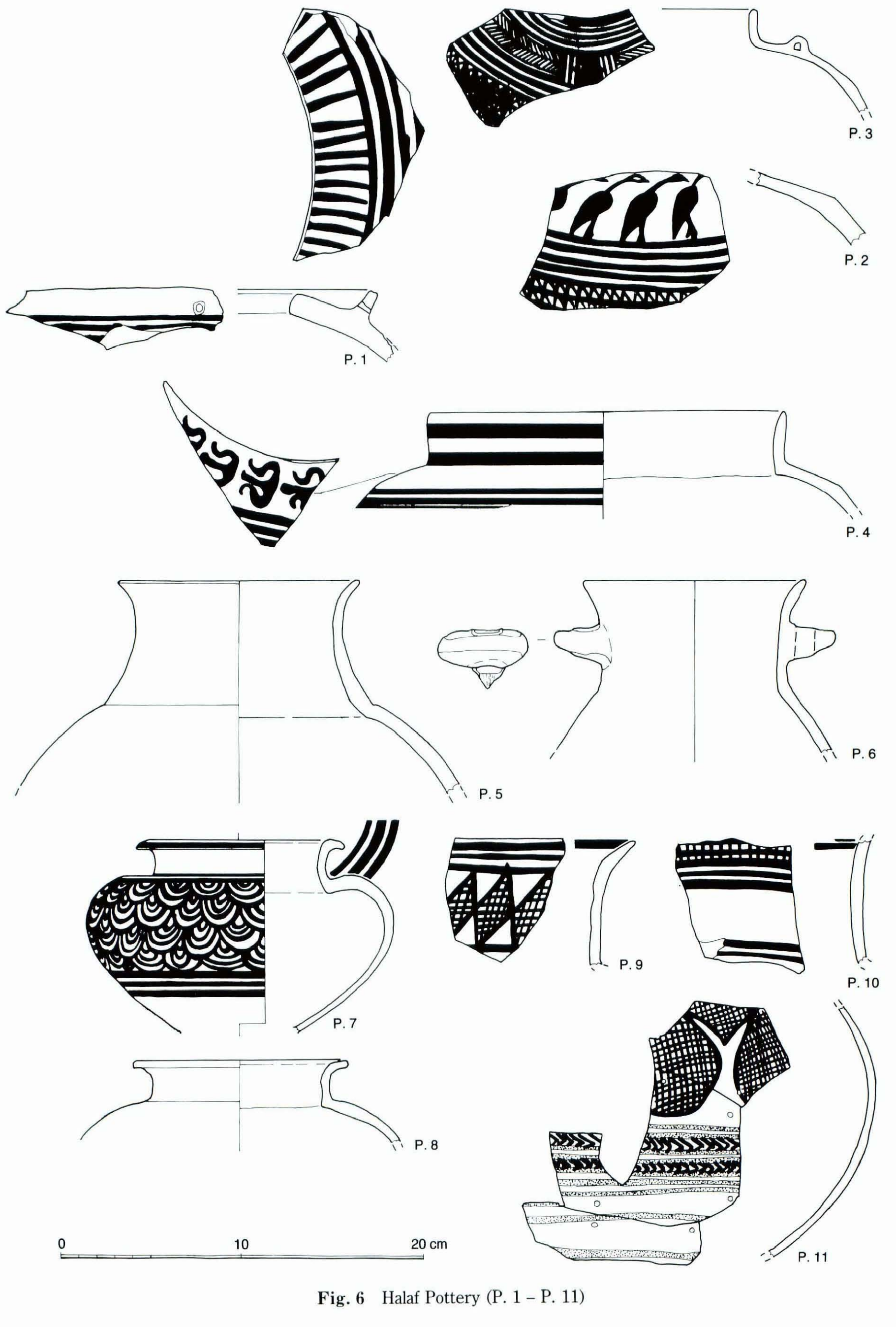


Fig. 6 Halaf Pottery (P. 1 – P. 11)

Fig. 7 Halaf Pottery (P. 12 – P. 29)

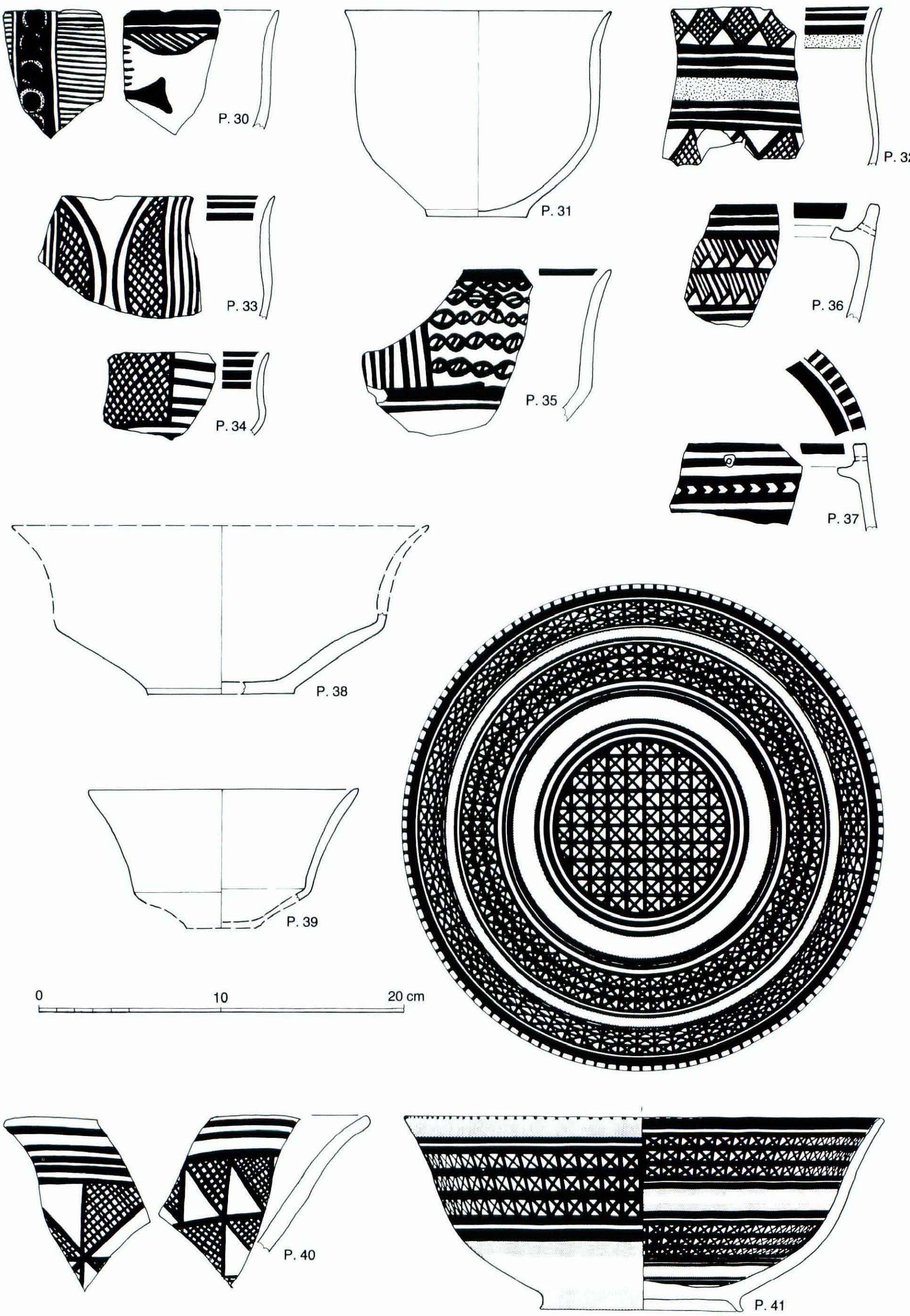


Fig. 8 Halaf Pottery (P. 30 – P. 41)

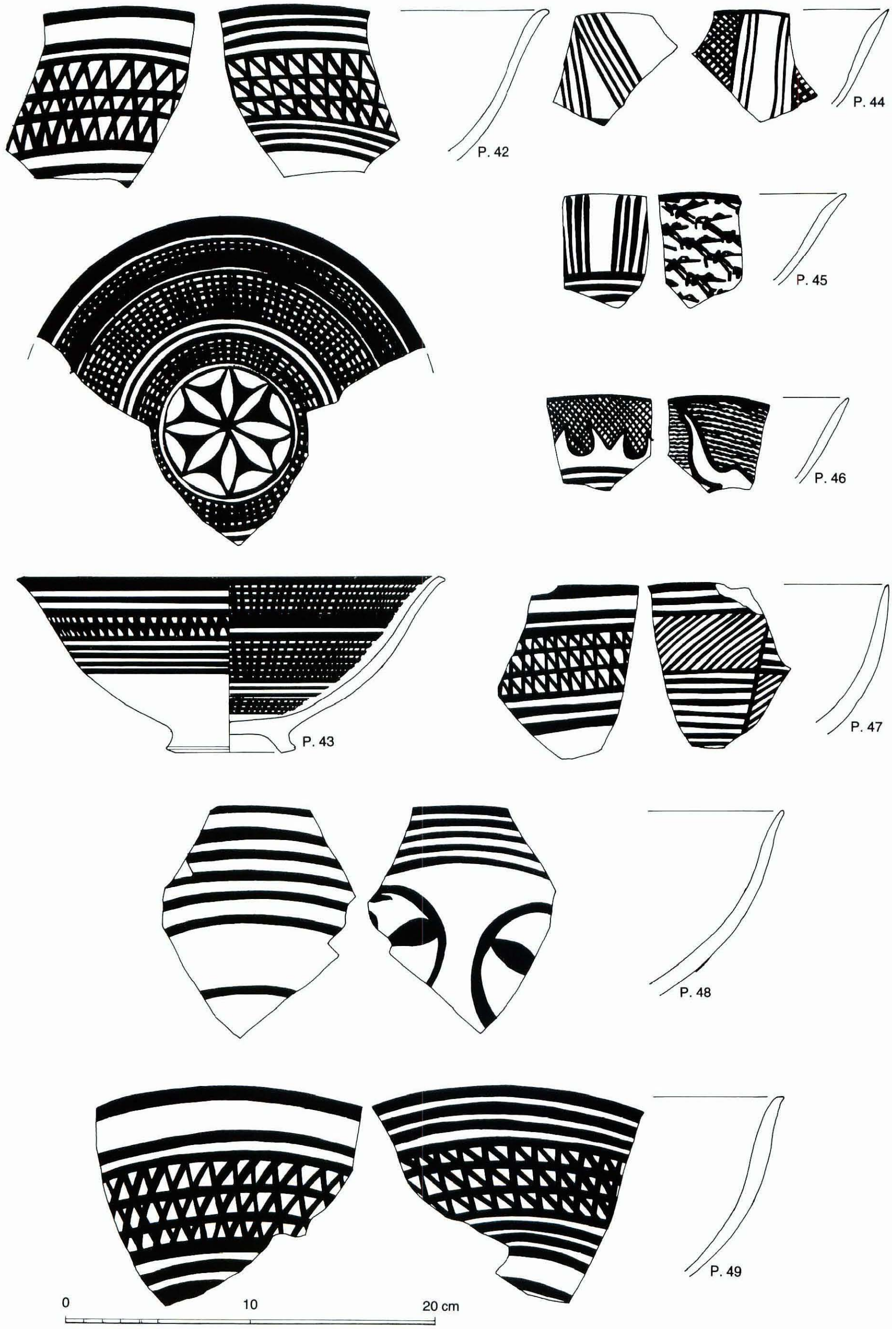


Fig. 9 Halaf Pottery (P. 42 – P. 49)

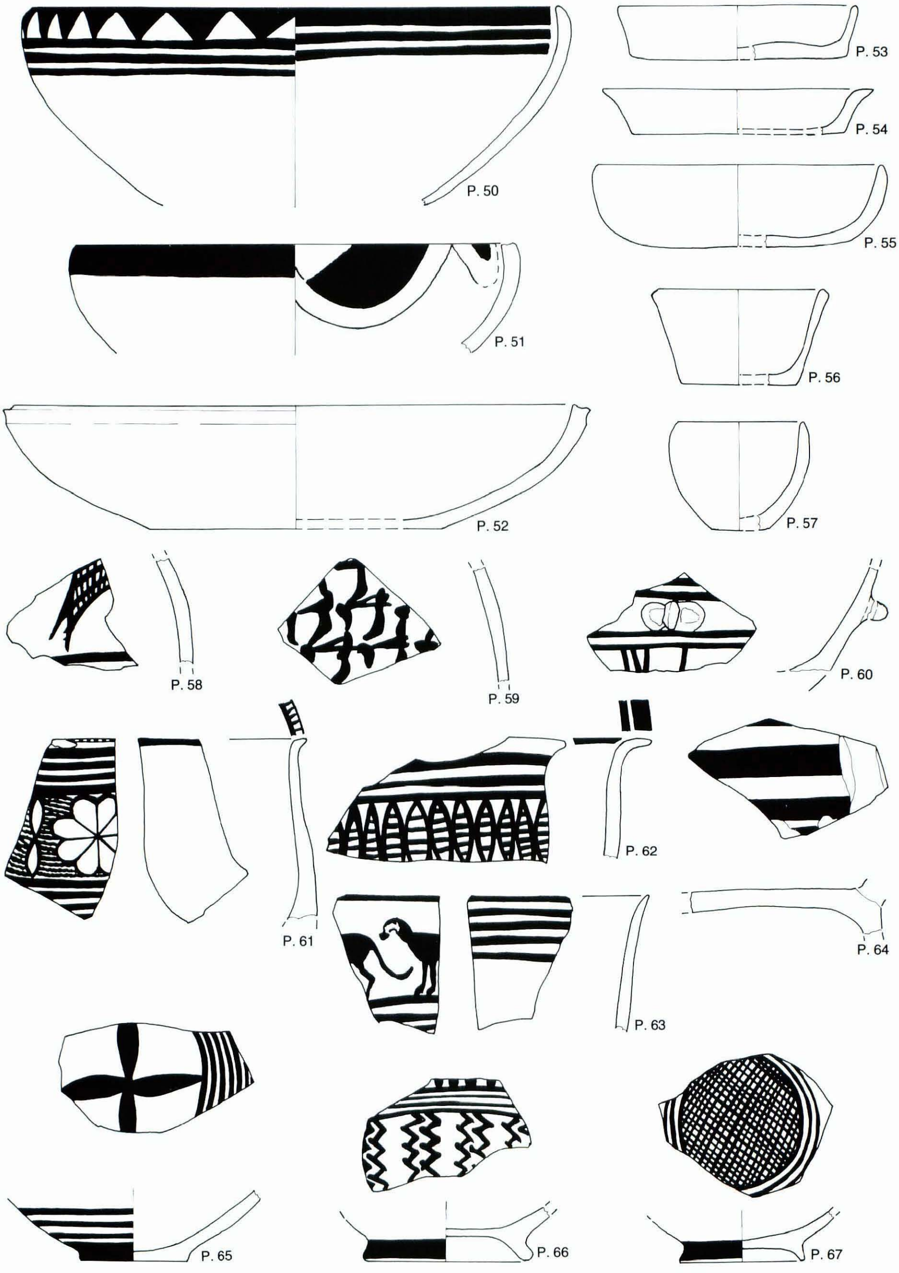


Fig. 10 Halaf Pottery (P. 50 – P. 67)

D5: Large- to medium-sized, open, shallow bowl with flattish rim end. P. 51 has geometric designs inside, P. 52 is plain.

Dishes (P. 53, P. 55, Fig. 10):
Dishes are distinguished from lids by their rough outer surfaces and well finished, smooth inner surface. All pieces have flat base, but side and rim is different in each. P. 53 has vertical side and simple rim, P. 54 has open side and outwards projecting rim and P. 55 has roundish side and simple rim.
Very small bowls (P. 56, P. 57, Fig. 10):
There are bowls with their mouth diameter less than 9 cm. P.56 is deep, slightly open bowl with straight side. P. 57 has roundish side.
Others (P. 61–P. 67, Fig. 10):
P. 9, P. 10 and P. 11 are neck and body fragments of Jar C. P. 58 and P. 59 are also body fragments of jars. P. 60, that may be a jar fragment, has a pierced knob at the lower part. P. 61 to 63 are deep bowls, whose mouth diameter is not clear. P. 64 is a bowl with stand. It is decorated on the bottom of the bowl. P. 65 to P. 67 are base of Bowl D.
Designs:
There are two kinds of designs: geometric disigns and naturalistic designs. The former can be divided into four by the method of expression. One expresses the designs by lines only (P. 1, 2, 4, 7, 13, 42 and 48 and others); one by solid painting (P. 3, 24, 50, 51, 63 and 65), many are naturalistic designs; one by lines and fillings such as cross-hatching, horizontal lines and oblique lines (P. 9, 11, 18, 19, 29, 40, 46 and others); the other reserved designs with other parts filled with fine waving lines (P. 61) or cross-hatching (P. 20, 21 and 23).

Clay objects (Fig. 11)
There are fired clay objects and roundly-cut pottery fragments.

T.1: It is a spindle whirl made of fine clay. The shape is made by pressing clay by fingers. The color is reddish brown and its weight is 6.3 g.

T.2 to T.3: They are made of Halaf pottery. The side is rubbed and verical. Both are pierced in the center from two directions. They may be spindle whirls. T.2 weights 12.8 g, its diameter is around 4.5 cm, the thickness is around 0.6 cm. The body is grayish brown and black paint is remained. T.3 weights 8.5 g and its diameter is 4.9 cm, the thickness is 0.6 cm. The body is buff. Red and black paint is remained.

T.4 and T.5: They have a hole in the center, it is, however, incomplete and their side is rather sharp. There is a possibility that they were used for scraping or rubbing something.

T.6: It may be a lid for vessel, but we could not found a pottery vessel that fits it. The vessel material can be other thing. The outer surface is wet-smoothed and the inner surface is scraped and smoothed. The side is finished by spatula polishing. Its body is yellowish brown, and the surface is whitish.

T.7: It is a miniature vessel with bowl shape. The surface is worn out.

T.8: It is a fragment of ring-shaped object. The base is thickened inside, and tapered to the top. The height is 2.4 cm. It looks like a scraper for potter, as Mr. Ii, H. studied (Ii 1991, "Potter's tool in Mesopotamia" in *Al-Rāfidān* Vol. 12, in Japanese), but the reddish brown painting inside may show that this piece is an ornament, perhaps a bangle. The outer surface is worn out.

T.9: It is a cylindrical object usually called "peg". Its top is cup-shaped and the base is rather

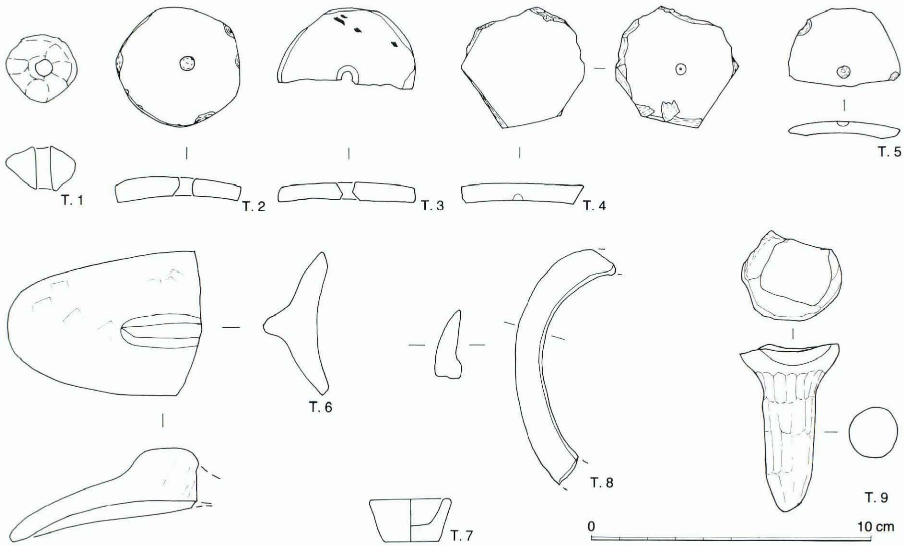


Fig. 11 Clay Objects

sharpened. The surface is smoothed by a spatula horizontally. The body is gray in color and the surface, including the bottom of the cup, is slipped and whitish red. Only the sharpened base lacks the slip, which is worn out perhaps by use.

Stone objects (Fig. 12)

S.1 to S.3: They are stone vessels. S.1 is the largest, its mouth diameter is 8.2 cm and the height is 10.2 cm. It has flattish base, semi-spherical body and sharp carinated shoulder. The body wall is farely thick, but is thin at the shoulder. The rim is out-spread and thick. The material is semi-transparent, white stone with pale gray striations. The outer surface is roughly cut, then polished. We can seen fine scratches caused by polishing. The inner hollowing is done by a rotating device, yielding regular circles and smooth shape. S.2 is made of gray limestone. Its shape is similar to S.1, but the rim is small. The diameter of the mouth is 8.8 cm. The height may be around 6 cm. S.3 is the smallest one. The mouth diameter is 6.8 cm and the height is 4.6 cm. It is made of black stone with cream striations. It also has thick body wall, carinated shoulder, and everted rim.

S.4: It is a flat stone with a ditch. The ditch is 1 cm in width, 0.3 cm in depth. It may be a polisher to make a cylindrical objects, such as beads.

S.5 to S.7: They are small axes made of siliceous shale. The edge is made after finishing the whole body by rubbing.

S.8: It is a pounding stone made of black stone. Naturally long stone is selected.

S.9: It is a pounding stone, but considering its central hole, it may originally been a door socket.

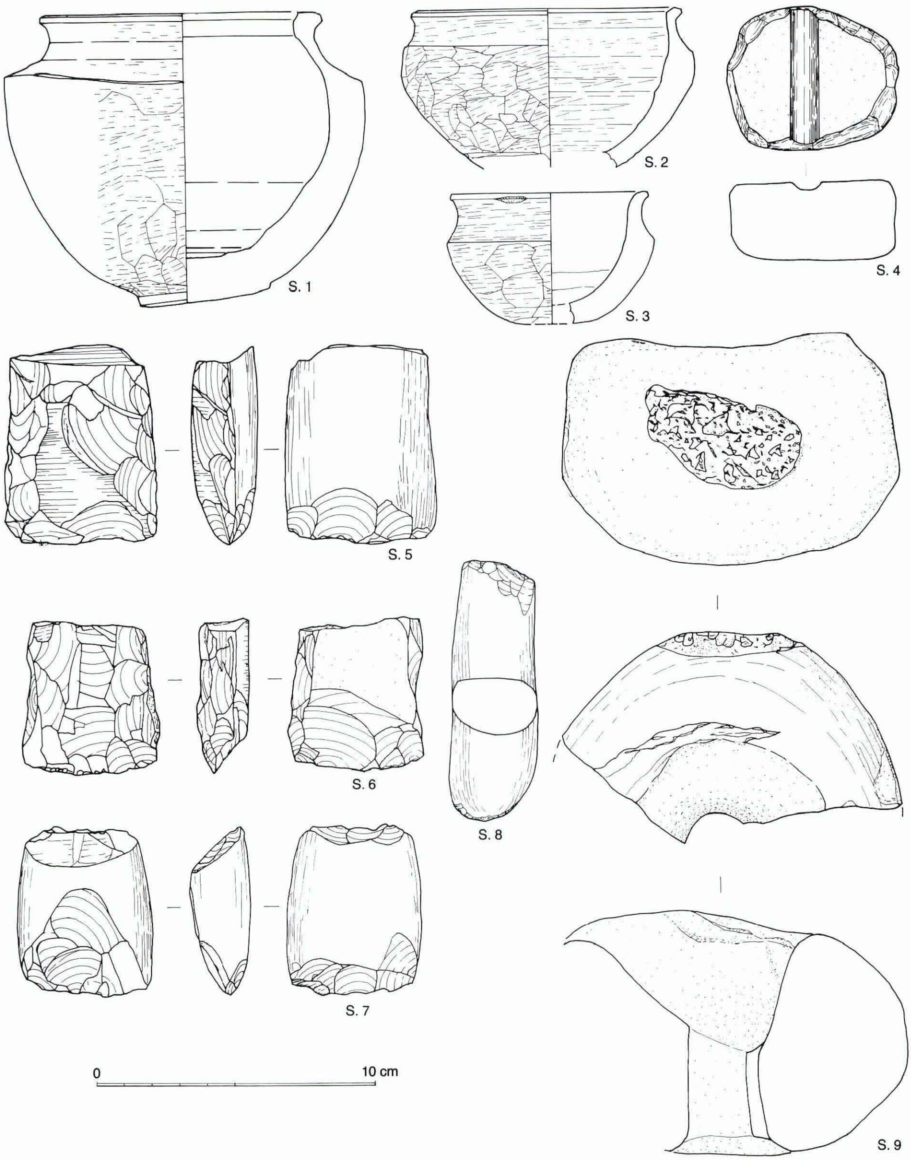


Fig. 12 Stone Objects

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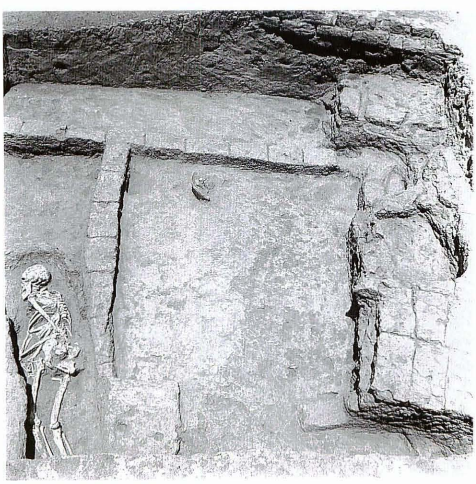
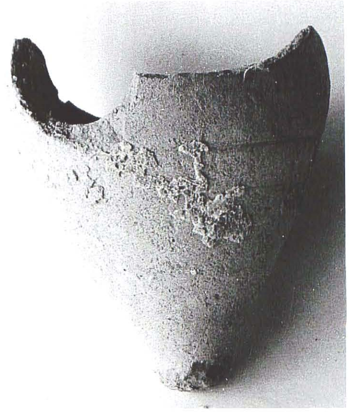
(by Hiroko KAMADA)

a. The Ranges of Mud Bricks, Western Area of Tell Songor A (XX-16, 17)



b. The Ranges of Mud Bricks, Southern Area of Tell Songor A (XXVIII-20)

a



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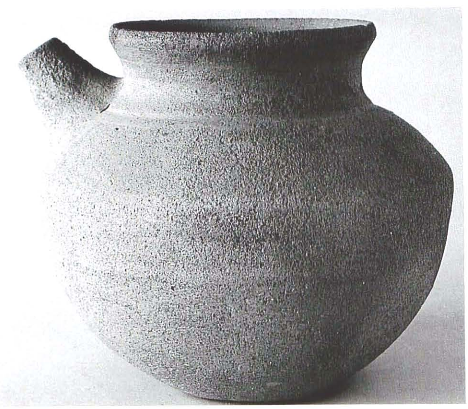
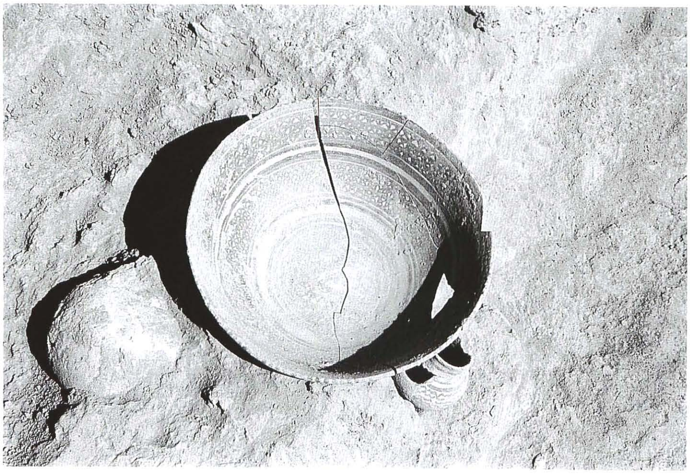


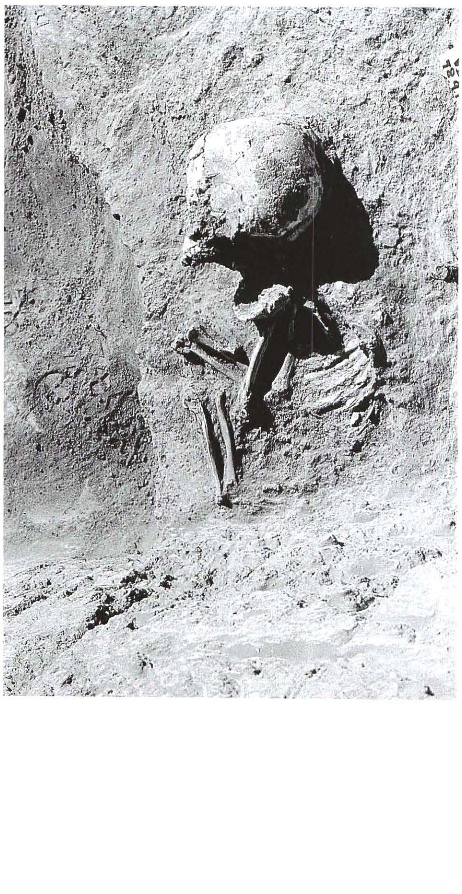
b

d

Early Dynastic Pottery

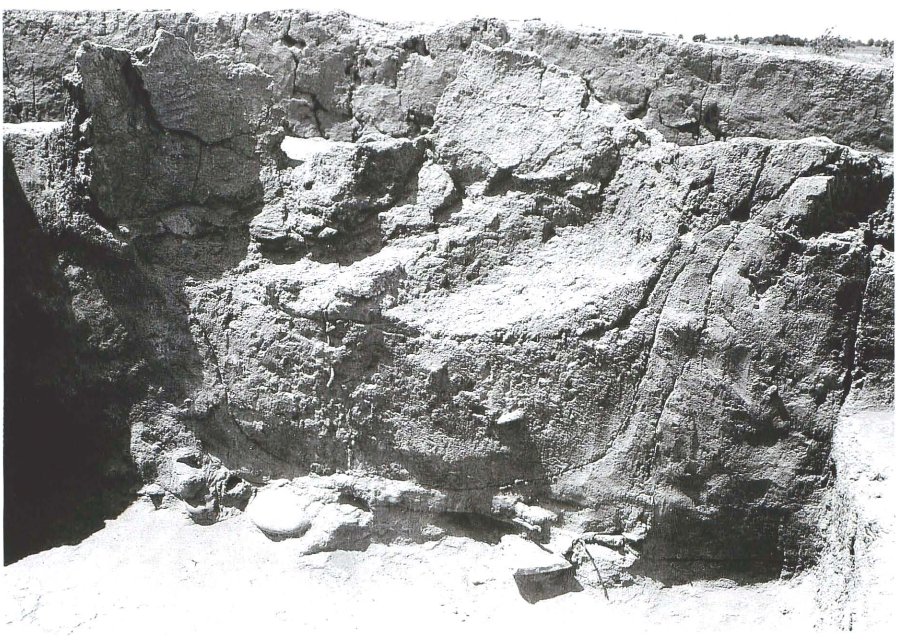


a. Grave 65
(from east)

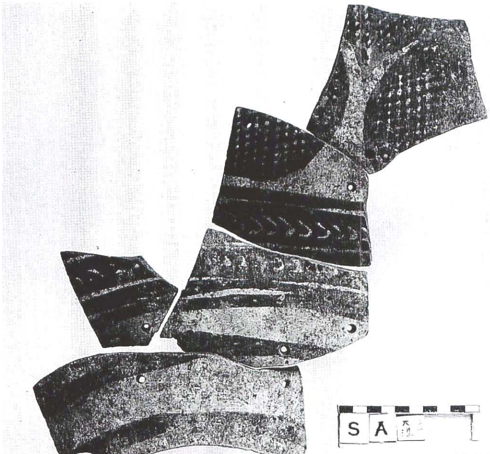


b. Grave 65
(after removing pottery;
from north-west)

a. Kiln 1 (section)

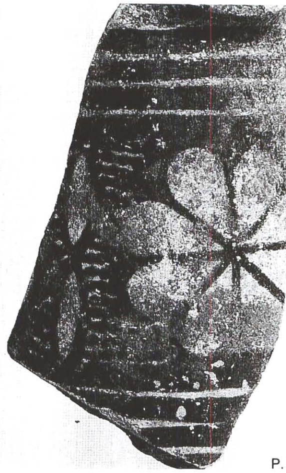


b. Kiln 1 (after removing fillings)



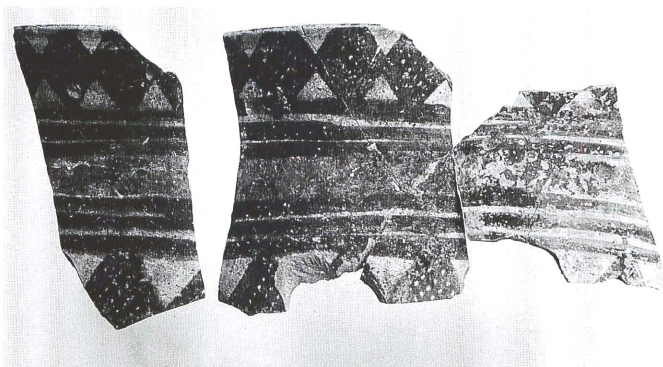
P. 11

a



P. 61

b



P. 32

c

P. 20

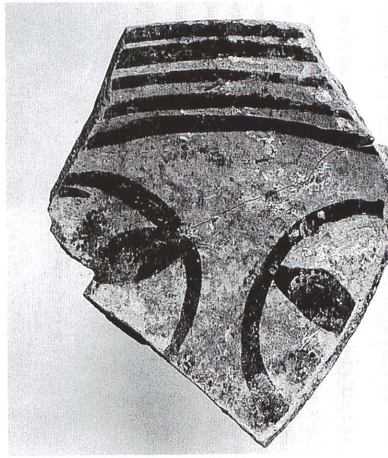
d

P. 35

e

Halaf Painted Pottery

a



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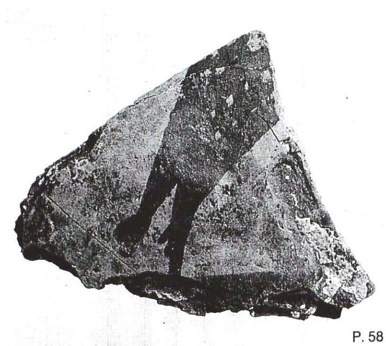

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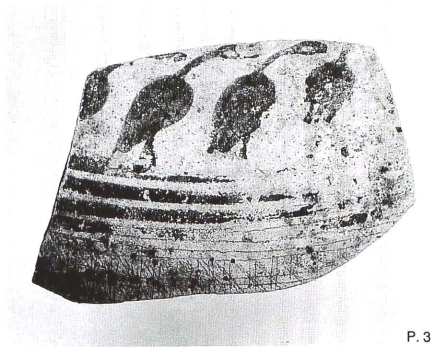

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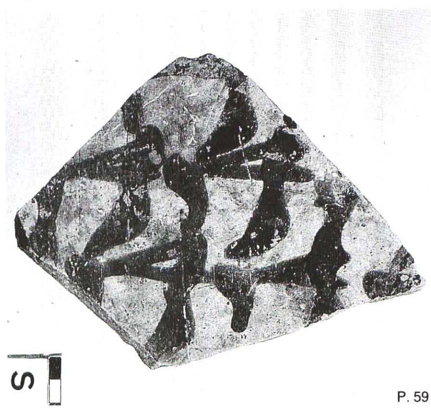
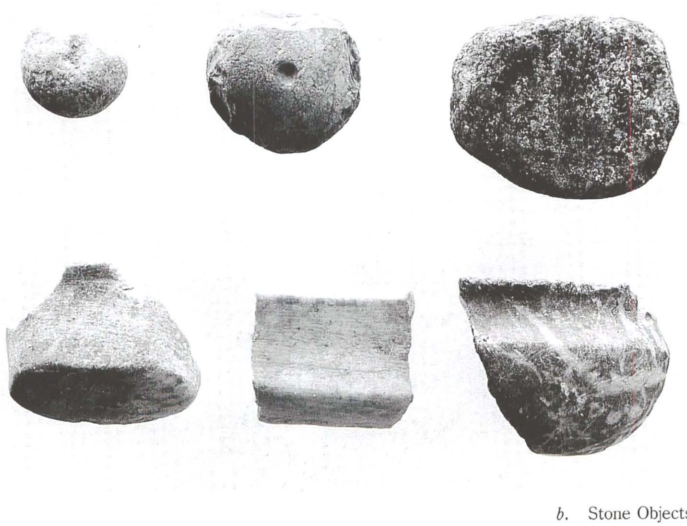


f

Halaf Painted Pottery

a. Pottery from Grave 65 (left: P. 13; right: P. 41)



b. Stone Objects

CATALOGUE OF POTTERY FROM TELL GUBBA: LEVEL VII

(テル・グッバ出土の土器：第 VII 層)

Hiroyuki II*

This catalogue has been compiled by the writer. The pottery drawings were made in the excavation camp at Nuri-Amin and a branch office of the Iraqi Department of Antiquities and Heritage at Bahiza, Hamrin, from 1978 to 1981. Individual drawings were made by the following members: Mr. Ryuji Matsubara (Nos. 571, 817, 952, 953); Mrs. Kazumi Oguchi (Nos. 547, 548, 739, 814, 842, 896, 899, 900, 906, 946, 948, 958, 960–1, 963, 1014–17, 1019); Mrs. Mitsuyo Ii (painted potsherds with PP numbers) and Hiroyuki Ii (the rest).

The form of the catalogue consists of the figure number, the drawing numbers: GP=Gubba pottery or PP=painted potsherd, the registration numbers (with G), the Iraq Museum numbers (with IM), levels, findspot, type of pottery, method of manufacture, color of pottery, temper in clay, slip, remarks of pottery, color of paint, and dimensions of pottery (in millimeter).

The construction levels of the round building of level VII are subdivided into four phases, i.e., a, b, c, and d from the top downward (see Fujii, H. ed. 1981, Preliminary report of excavations at Gubba and Songor, *Rafidan* vol. 2: Fig. 64; Fig. 1 in this catalogue).

The findspot is as can be seen in Fig. 1 illustrated on page 229.

The following abbreviations are used for pottery dimensions:

Extant: ext, *Circa*: c., Height: Ht, Rim diameter: Rd (external diameter), Body diameter: Bd, Maximum diameter: Maxd, Base diameter: Bsd.

Polychrome or bichrome painted pottery

524 GP.497. VIIc, XI-11 Corridor 2. Painted jar, handmade, cream ware, fine fabric (well levigated clay), buff slip, painted after firing. Paint: 2.5R 4/10 red and black. Rd: 104 mm.

525 GP.664. VIIc, XIII-10 Corridor 3. Painted jar, handmade, greenish buff, fine fabric, burnished exterior and interior neck. Paint: 2.5R 4/10 red and black. Rd: 87 mm.

526 GP.669. VIIb, XII-10 Corridor 2. Painted jar, handmade, greenish, no visible temper, scraped interior body. Paint: 7.5RP 3/8 dark purplish red and black.

527 GP.666. VIIc, XIII-13 Corridor 4. Painted jar, handmade probably ring-method, greenish buff, no visible temper, traces of finger impressions on interior. Paint: 7.5R 5/10 reddish orange and black. Rd: 80 mm.

528 GP.667. VIIb, X-10 Room 3. Painted jar, handmade, greenish buff, no visible temper, burnished interior neck, scraped interior shoulder. Paint: 7.5R 5/10 reddish orange and black. Rd: 78 mm.

529 PP.245. VIIc, XIII-10 Corridor 4. Painted jar, handmade, greenish, no visible temper. Paint: 7.5R 5/10 reddish orange and black. Rd: 60 mm.

530 GP.496. VIIc, XIII-11 Corridor 4. Painted jar, handmade, cream, no visible temper, burnished interior neck. Paint: 7.5YR 7/8 yellow orange and black. Rd: 96 mm.

531 GP.574. VIIc, XII-12 Corridor 4. Painted jar, handmade, greenish, no visible temper, rubbed interior body. Paint: 7.5R 5/10 reddish orange and black. Rd: 60, Bd: 102 mm.

532 GP.732. VIIc, XI-10 Corridor 3. Spouted jar, handmade, cream, no visible temper, buff slip(?), scraped/rubbed interior shoulder. Paint: 7.5R 5/10 reddish orange and black. Rd: 94, Bd: 174 mm ?

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533 GP.668. VIIc, XIII-9 Corridor 4. Spouted jar, handmade, cream, no visible temper, buff slip(?), scraped interior shoulder. Paint: 2.5YR 6/10 bright orange and black.

534 PP.243. VIIc, XIII-10 Corridor 4. Spouted jar, handmade, greenish, no visible temper, scraped/rubbed interior body. Paint: 7.5R 5/10 reddish orange and black. Bd: c. 180 mm.

535 GP.547. VIIc, XIII-12 Corridor 4. Spouted jar, handmade, greenish, no visible temper, burnished interior neck, scraped/rubbed interior upper body. Paint: 7.5YR 7/8 yellow orange and black. Ht: c. 137, Rd: 129, Bd: 190 mm.

536 PP.385. VIIc, XII.XIII-11.12 Corridor 4 fill. Painted jar body, handmade, greenish, no visible temper, buff slip? Paint: 2.5R 4/10 red and black.

537 PP.387. VIIc, XII.XIII-11.12 Corridor 4 fill. Painted jar body, handmade, pinkish, no visible temper. Paint: 7.5R 5/10 reddish orange and black.

538 PP.386. VIIc, XII.XIII-11.12 Corridor 4 fill. Painted jar body, handmade, pinkish, no visible temper, scraped interior. Paint: 2.5R 4/10 red and black.

539 GP.595. VIIb, XI-11 Corridor 4. Painted jar, coil/ring-method and wheel-finished, cream, fine fabric with sparse white inclusions, scraped interior and exterior body. Paint: 10RP 4/6 dark purplish red, 2.5Y 6/7 bright yellowish brown and black(?), fire-blackened. Ext Ht: 147, Bd: 208 mm.

540 GP.567. VIIb, IX-11 Corridor 5. Painted jar, handmade, greenish gray, no visible temper, burnished exterior neck and shoulder, finger-rubbed interior body. Paint: 5YR 5/4 dull reddish brown (changed color by fire), black, and interruption of the black line in the crosshatched panel suggests that third color was used for decoration. Ht: 166, Rd: 91, Bd: 172 mm.

541 GP.499. VIIc, XIII-10 Corridor 3. Square bottle, handmade, greenish gray, no visible temper, greenish slip, Paint: pale black.

542 GP.800. VIIb-a, XII-12 Corridor 4 fill. Square bottle, handmade, light gray, no visible temper, burnished exterior. Paint: 2.5R 5/10 red and pale black. Body width: 90 mm.

543 GP.568. G96. IM.89897. VIIc, X-11 Corridor 4. Square bottle, handmade, greenish, no visible temper, lightly burnished exterior. Paint: 7.5Y 9/4 vary pale light yellow and pale black. Ht: 110, Rd: 78, Body width: 119 mm. Reconstruction of missing parts is conjectural.

544 GP.537. VII, XII-15 Moat bottom. Painted jar, wheelmade, pinkish, sparse white inclusions and fine sand temper, cream slip, shallow groove on upper shoulder. Paint: 10R 5/8 red and black. Rd: 91, Bd: 158 mm.

545 GP.638. VIIc-b, X-10 Corridor 4 fill. Painted jar, wheelmade, pinkish, fine black sand temper, white slip, two shallow grooves on shoulder, added ring-base, reconstructed drawing from several pieces. Paint: plum-red and black. Rd: 120, Bd: c. 195, Bsd: 90 mm.

546 GP.643. VIIc, XIII-10 Corridor 3. Painted jar, wheelmade, cream, fine sand temper, white slip. Paint: plum-red and black. Rd: 106 mm.

547 GP.550. G91. IM.89894. VIIb, X-11 Corridor 4. Painted jar, wheelmade, pinkish, fine sand temper, white slip, scraped interior body, lightly burnished exterior shoulder and body. Paint: brownish red and dark brown. Ext Ht: 165, Rd: 121, Bd: 233 mm.

548 GP.552. G94. IM.89895. VIIb, X-11 Corridor 4. Painted jar, wheelmade, pinkish, fine sand temper, cream slip, added ring-base, shallow groove on upper shoulder. Paint: plum-red and dark brown, blackened by fire. Ht: 297, Rd: 138, Bd: 288, Bsd: 131 mm.

549 GP.116. VIIa, XIII-12 fill. Painted jar, wheelmade, pinkish, sparse white inclusions and fine sand temper, white slip. Paint: dark red and very dark brown. Rd: 82, Bd: c. 140 mm.

550 GP.128. VIIb, VIII-10 Corridor 5. Painted jar, wheelmade, pinkish, fine fabric with high density white inclusions, slip on exterior? scraped interior and exterior body. Paint: traces of red and black. Ht: 240–250, Rd: 124, Bd: 250, Bsd: c. 80 mm.

551 GP.642. VIIc, XI-11 Room 2 lower floor. Painted jar, wheelmade, cream, fine fabric, lightly burnished exterior. Paint: plum-red, black and white(?). Bd: c. 120 mm.

552 PP.249. VIIb, XIV-9.10 Corridor 5. Painted jar, wheelmade, cream, fine fabric with white inclusions, buff slip. Paint: red and dark brown. Bd: c. 110 mm.

553 GP.494. VIIa, XI-9 Corridor 4. Painted jar, wheelmade, cream, sandy fabric, white slip(?), scraped exterior body, rubbed interior body. Paint: 5R 4/8 red and blackish brown. Bd: 170 mm.

554 GP.637. VIIa, X-10 Room 3. Painted jar, wheelmade, cream, fine fabric, white-buff slip. Paint: 5RP 5/8

purplish red and black (geometric and naturalistic designs on shoulder).

555 GP.644. VIIb, XII-11 Room 1 and XI-11 Room 2 (3 fragments). Four-lugged jar, coil/ring-method and wheel-finished, cream, fine sand temper, cream slip, pierced lugs connected by shallow groove, scraped interior body, geometric designs on shoulder, representational designs on body. Paint: plum-red and black, reconstruction of missing part is conjectural. Ext Ht: c. 300, Rd: 162, Bd: 375 mm.

556 PP.290. VIIa, XIII-11 Corridor 4. Medium-sized jar body, cream, fine sand temper, buff slip. Paint: 10RP 3/6 dark purplish red and 5R 3/4 brownish red.

557 PP.122. VIIa(?), IX-11 fill. Large-sized jar body, creamy, fine fabric. Paint: 7.5YR 5/4 brown and partially 2.5R 2/4 very dark red (changed color by fire).

558 PP.267. VII, unknown. Painted jar body, cream, white inclusions and fine sand temper, scraped interior. Paint: 7.5YR 5/4 dull brown and 5YR 5/6 bright reddish brown.

559 PP.379. VII, VI-9.10 Moat fill. Painted jar body(?), pinkish, fine fabric, scraped interior. Paint: 2.5R 3/4 dark red and 2.5YR 3/2 dark reddish brown.

560 PP.378. VIIb, XIII-12 Corridor 5 fill. Painted jar shoulder-body, pinkish, fine fabric, cream-buff slip, scraped interior. Paint: pale black and/or partially 5R 5/8 red (changed color by fire).

561 PP.371. VIIa, XII.XIII-15 fill. Painted jar (portion unknown), cream, fine fabric, slip, scraped interior. Paint: 2.5R 3/8 dark red and 10PR 3/4 dark purplish red.

562 GP.639. VIIc-b, scattered on XII-12 to XIII-11 in Corridor 4 fill. Painted jar, wheelmade, pinkish, fine sand temper, cream slip, scraped interior and exterior body. Paint: plum-red and dark brown, fire-blackened. Ext Ht: 155, Rd: 118, Bd: c. 230 mm.

563 GP.630. VIIb, XII-11 Room 1. Painted jar, wheelmade, cream, fine sand temper. Paint: plum-red, black and white paint/slip. Ext Maxd: c. 290 mm.

564 PP.242. VIIa, VII-9.10. Painted jar, wheelmade, cream, fine sand temper, cream-buff slip. Paint: plum-red and dark brown. Bd: 221 mm.

565 PP.288. VII, VII-9.10 Moat fill –60 cm. Lugged jar, wheelmade, cream, sandy fabric, cream-buff slip, pierced lug, shallow groove at level of lug. Paint: 7.5R 5/12 reddish orange (scarlet) and black.

566 GP.673. VIIa, XII-11 Corridor 2–3. Four-lugged jar, wheelmade, greenish gray, fine sand temper, pierced lugs connected by shallow groove. Paint: 10PB 3/6 violet and pale black. Rd: c. 120 mm.

567 GP.498. VIIa, XI-9 Corridor 4. Painted jar (with bucket handle ?), wheelmade, greenish, sandy fabric, Paint: 5R 4/8 red and black. Rd: 83 mm.

568 PP.244. VIIa, XIX-12 pebble paved floor. Spouted bowl, wheelmade, cream-buff, white inclusions and fine sand temper. Paint: plum-red and black. Rd: c. 120, Bd: c. 170 mm.

569 GP.670. VIIa, VI-10. Spouted bowl, wheelmade, cream, fine fabric, slip. Paint: 7.5R 5/12 scarlet and black.

570 GP.640. VIIc-b, XII-11 Corridor 2–3 fill. Four-lugged jar, wheelmade, cream, fine fabric, cream slip. Paint: dark red and black. Ext Ht: 112, Rd: 98, Maxd: c. 160–165 mm. Reconstructed drawing.

571 GP.548. G92. VIIa, XIV-9 Corridor 5. Four-lugged jar, wheelmade, reddish pink, fine sand temper, added ring-base, white-buff slip/paint on shoulder. Paint: plum-red and black. Ht: 280, Rd: 123, Bd: 292, Bsd: 142 mm. Reconstruction of missing parts is conjectural.

572 GP.500. G123, IM.89901. VIIb-a, XII-14 Pit 14 (bottom of grave pit, see *Rafidan* volume 2: Fig. 5; Pl. 11.4). Painted jar, wheelmade, reddish pink, fine sand temper, added ring-base, scraped interior and exterior body, plum-red and white paint applied before dark brown paint, motifs on plum-red paint are ill-preserved, i.e., human figure, animal, suckling animal? etc. Ht: 223, Rd: 124, Bd: 223, Bsd: 106 mm.

573 GP.569. VIIa, XIII-11 Corridor 4. Four-lugged jar, wheelmade, creamy, white inclusions and fine black sand temper, pierced lugs, shallow groove on upper body, white slip. Paint: plum-red and brownish black. Bd: 170 mm.

574 GP.1132. VIIa, XVIII-10 Room 8-1 upper floor. Painted jar, wheelmade, greenish, fine sand temper, buff slip, scraped interior and exterior body. Paint: 7.5YR 6/8 orange and dark brown. Bd: c. 310 mm. Reconstructed drawing in profile.

575 PP.380. VIIb-a, scattered on XII-11 Room 1 and Corridors 2–3, and XII.XIII-13 Corridor 5. Large-sized jar, wheelmade, cream, fine sand temper. Paint: 2.5R 3/6 dark red and dark brown, fire-blackened.

576 PP.32. VII, XVI-10 Moat fill. Medium-sized jar, pinkish, fine fabric, white slip, step/ridge on upper shoulder. Paint: 2.5R 3/4 dark grayish red and 10P 2/4 very dark purple.

577 PP.52. VIIa, X-11 Corridor 4 fill. Medium-sized jar, wheelmade, pinkish, fine fabric, white slip, shoulder-ridge at the carination point. Paint: 2.5YR 6/4 dull orange and black.

578 PP.373. VIIb, XII.XIII-11.12 Corridor 4. Medium-sized jar shoulder, wheelmade, creamy, fine fabric, slip on exterior. Paint: 2.5R 4/10 red and black.

579 GP.1558. VII, XI-9 Corridor 4. Medium-sized jar, wheelmade, grayish, fine sand temper, white slip, shallow groove at the point of shoulder-carination. Paint: brown (changed color by fire) and brownish black.

580 PP.382. VIIc-b, X-11 and XI-9 of Corridor 4. Jar, wheelmade, creamy, fine fabric, cream-buff slip, step/ridge on upper shoulder. Paint: 10RP 3/5 dark purplish red and black.

581 PP.282. VIIb-a, XII-9 Corridor 4 fill. Medium-sized jar, wheelmade, pinkish, fine sand temper. Paint: plum-red and black.

582 PP.381. VIIa, XIII-10 Corridor 4. Medium-sized jar, wheelmade, pinkish, fine fabric, burnished exterior, sharp carination between shoulder and body. Paint: 10RP 3/4 dark purplish red and 2.5R 2/2 blackish red, fire-blackened.

583 PP.29. VII, IX-11 Corridor 5 fill. Medium-sized jar, wheelmade, light brown, white inclusions and fine black sand temper, white-buff slip. Paint: 5R 4/10 red and black.

584 PP.361. VII(a?), VIII-9. Medium-sized jar shoulder, wheelmade, fine fabric. Paint: 5R 5/10 red and black.

585 PP.283. VIIa, XVI-9 fill. Medium-sized jar, wheelmade, buff, sparse white inclusions and high density fine sand temper, white-buff slip, groove on shoulder. Paint: 10RP 3/4 dark purplish red and very dark brown.

586 PP.376. VII, IX.X-11 fill. Medium-sized jar body, wheelmade, creamy. Paint: 10R 2/2 very dark reddish brown and 10YR 4/4 dark yellowish brown.

587 GP.1557. VIIa, XVI-10 fill. Medium-sized jar, wheelmade, buff. Paint: dark brown.

588 PP.15. VIIa, XII-9 Corridor 4. Painted jar shoulder, wheelmade, pinkish, white inclusions and fine sand temper, white slip. Paint: plum-red and dark brown.

589 PP.26. VIIb, IX-11 Corridor 5. Medium-sized jar shoulder, wheelmade, brownish, fine fabric. Paint: 2.5R 3/4 reddish brown and 7.5R 2/3 very dark reddish brown, fire-blackened.

590 PP.30. VIIb, IX-11 Corridor 5. Fragment belongs to No. 589.

591 PP.23. VII, XVI-10 fill. Medium-sized jar shoulder, wheelmade, pinkish, fine fabric, white slip/paint. Paint: 10RP 3/4 dark purplish red and brownish black.

592 PP.363. VII, XII-11 Room 1 fill. Medium-sized jar shoulder-body, wheelmade, creamy, fine fabric. Paint: 5YR 5/4–5/6 dull reddish brown to bright reddish brown (changed color by fire).

593 GP.1560. VII (unstratified). Jar shoulder, wheelmade, creamy-pink, fine sand, sparse white inclusions and fine chaff temper, white slip. Paint: light brown and black (fire-blackened).

594 PP.392. VIIa, XIII-13 fill. Large-sized jar shoulder, wheelmade, creamy, fine fabric. Paint: plum-red and dark brown.

595 PP.257. VIIa, X-11 Corridor 4. Medium-sized jar, wheelmade, creamy, fine fabric, white slip. Paint: 7.5R 6/10 reddish orange and black.

596 PP.364. VIIb, X-11 Corridor 4. Jar shoulder, creamy, fine fabric. Paint: 2.5R 3/6 dark red and dark brown.

597 PP.365. VIIa, XII-13 Corridor 5 fill. Medium-sized jar, fabric and color of paint are as in No. 596.

598 PP.17. VIIa, XIII-12 Corridor 4. Medium-sized jar shoulder. Paint: red and black.

599 PP.64. VII, XVI-9.10 Moat. Wheelmade, pinkish, fine sand temper. Paint: 7.5R 5/12 scarlet and black.

600 PP.284. VIIa, XI-10 Corridor 3 fill. Small-sized jar, wheelmade, light yellowish brown, sandy fabric, white slip/paint. Paint: 10RP 3/4 dark purplish red and very dark brown.

601 PP.359. VII, X-10 Corridor 4. Medium-sized jar, creamy, white slip. Paint: 10R 5/10 red and black.

602 PP.279. VIIa, XI-9 Corridor 4. Medium-sized jar, greenish, sandy fabric, greenish buff slip. Paint: 7.5R 5/12 scarlet and black.

603 PP.278. VIIa, XII-15 fill. Medium-sized jar, wheelmade, creamy, fine fabric, white slip or paint on reserved panel. Paint: 7.5R 5/12 scarlet and black.

604 PP.393. VIIa, XII-13 fill. Medium-sized jar, wheelmade, pinkish, fine fabric. Paint: 10RP 5/10 deep pink and black.

605 PP.281. VIIa, XVI-9.10. Small-sized jar, wheelmade, greenish, high density sand temper, white slip, sharp carination between shoulder and body. Paint: 2.5R 5/10 red and black.

606 PP.316. VIIb-a, XIII-11 Corridor 4 fill. Medium-sized jar shoulder, wheelmade, greenish, fine fabric, white-buff

slip. Paint: plum-red and black.

607 PP.319. VII, XIII-12 Corridor 4 fill. Jar shoulder, pinkish, fine fabric. Paint: red and black.

608 PP.272. VIIa, X-11. Jar shoulder, creamy, sparse white inclusions and fine sand temper, white slip. Paint: red and black.

609 PP.287. VIIa, VIII-9.10 fill. Large-sized jar with lugs(?), wheelmade, creamy, fine fabric with white inclusions, buff slip, scraped interior. Paint: 7.5R 5/10 reddish orange and black.

610 PP.273. VIIa, XIII-12 Corridor 4 fill. Jar shoulder, wheelmade, light yellowish brown, fine sand temper. Paint: 7.5R 5/10 reddish orange and black.

611 PP.388. VIIa/b, XII-5 Room 8-6. Medium-sized jar shoulder-body, wheelmade, pinkish, fine fabric. Paint: 2.5R 5/10 red and black.

612 PP.16. VIIb-a, IX-10 and XI-9 of Corridor 4 fill. Large-sized jar shoulder-body, creamy, fine fabric with white inclusions, white slip. Paint: plum-red and dark brown.

613 PP.389. Unstratified. Medium-sized jar shoulder, wheelmade. Paint: 2.5R 3/3 reddish brown and dark brown.

614 PP.391. VII, XII-11 Room 1. Medium-sized jar shoulder, wheelmade. Paint: 7.5R 5/6 dull yellowish red and 2.5R 3/2 dark grayish red.

615 PP.122. VIIa(?), IX-11 fill. Large-sized jar shoulder-body, wheelmade, creamy, fine fabric, white slip. Paint: 5YR 6/3 dull orange and black.

616 PP.280. VIIa, VIII-9.10 fill. Medium-sized jar, wheelmade, creamy, sandy fabric, white slip, sharp carination between shoulder and body. Paint: 7.5RP 4/8 purplish red and black.

617 PP.360. VIIc-b, VIII-9 Corridor 6 fill. Medium-sized jar body, wheelmade, creamy, fine fabric. Paint: 5R 4/8 red and black.

618 PP.276. VIIa, VIII-9.10 Corridor 6 fill. Painted jar shoulder, sandy fabric, white slip. Paint: 7.5R 5/10 reddish orange and black.

619 PP.258. VIIa, X-11 Corridor 4 fill. Medium-sized jar shoulder, pinkish, white inclusions and fine sand temper. Paint: 2.5R 4/8 red and black.

620 PP.252. VIIa, XI-10 on the staircase. Large-sized jar shoulder, pinkish, fine fabric with white inclusions, white slip. Paint: 10RP 4/8 purplish red and brownish black.

621 PP.277. VIIa, XII-6 Moat upper fill. Medium-sized jar shoulder, wheelmade, greenish, white slip. Paint: 7.5R 5/12 scarlet and black.

622 PP.275. VIIa, XII-12 Corridor 4. Large-sized jar, pinkish, coil-method and wheel-finished, high density sand temper, white slip. Paint: 5R 5/8 red and black. Max thickness: 18 mm.

623 PP.366. VIIb, XII-10 Corridor 2 fill. Jar shoulder-body, creamy, fine fabric. Paint: N6 gray (changed color by fire) and vary pale black.

624 PP.400. VIIa(?), IX-11 fill. Large-sized jar shoulder-body, wheelmade, creamy, fine fabric, cream-buff slip. Paint: 2.5R 3/4 reddish brown and blackish brown.

625 PP.318. VIIa, XVI-9.10. Medium-sized jar shoulder, wheelmade, creamy, fine fabric, white slip. Paint: plum-red and black.

626 PP.384. VIIc, findspot unknown. Large-sized jar shoulder, wheelmade, creamy, fine fabric. Paint: 2.5YR 4/6 reddish brown and traces of another color (probably black), fire-blackened.

627 PP.329. VIIc, XIII-11.12 Corridor 4. Medium-sized jar shoulder, creamy, wheelmade, fine fabric, white-buff slip. Paint: 2.5R 3/6 dark red and 2.5YR 2/2 very dark reddish brown.

628 PP.22. VIIc, XII-10 Corridor 3. Shoulder fragment, pinkish, fine fabric. Paint: plum-red and black.

629 PP.50. VII, XIX-9 Room 8-7. Medium-sized jar shoulder, wheelmade, pinkish, fine black sand temper. Paint: 10R 5/6 red and dark bluish black.

630 PP.24. VII, IX-11 Corridor 4 fill. Medium-sized jar, wheelmade, pinkish, fine fabric, white slip, carination on upper shoulder. Paint: 10RP 3/4 dark purplish red and black.

631 PP.395. VIIa, XIII-12 Corridor 4. Medium-sized jar, wheelmade, cream, white slip. Paint: 10RP 3/6 dark purplish red and very dark brown.

632 PP.285. VIIa, XIV-9.10. Medium-sized jar shoulder, wheelmade, cream, sandy fabric, white slip. Paint: 10RP 4/8 purplish red and black.

633 PP.323. VIIb-a, XVII-9 Room 8-2. Jar shoulder, wheelmade, cream, fine fabric, white-buff slip. Paint: 7.5R 5/12 bright pinkish red and black.

634 PP.251. VIIa, XI-10 Corridor 3 fill. Medium-sized jar, wheelmade, creamy, sandy fabric, buff slip, groove on upper shoulder. Paint: 5YR 7/6 orange and black.

635 PP.372. VIIb, XIV-10 Corridor 5. Jar shoulder, creamy, fine fabric, buff slip. Paint: 5YR 4/6 reddish brown and black.

636 PP.631. VII, XVIII-12 floor of the gate way. Large-sized jar shoulder, wheelmade, creamy, fine fabric with white inclusions, white-buff slip. Paint: 10RP 3/4 dark purplish red and 2.5YR 2/2 very dark reddish brown.

Monochrome painted pottery

637 GP.40. VIIb, IX-10 Room 4. Four-lugged jar, handmade (coil/ring-method) and wheel-finished, cream, fine fabric, light yellowish brown slip, scraped interior. Paint: 2.5YR 4/6 reddish brown. Ext Bd: c. 280 mm.

638 GP.629. VIIb-a, XI.XII-10 Corridor 3 fill. Four-lugged jar, wheelmade, greenish, fine sand temper, greenish buff slip, scraped interior, pierced lugs connected by shallow groove. Paint: 2.5G 2/2 very dark green. Ext Ht: 125, Rd: 140, Bd: 298 mm. Reconstructed drawing in profile, restoration of missing parts is conjectural.

639 GP.39. VII, XII.XIII-11 Level IV fill. Lugged jar, wheelmade, light yellowish brown, fine fabric, white-buff slip, pierced lugs. Paint: 2.5YR 3/4 dark brown. Rd: 90, ext Maxd: 155 mm.

640 PP.301. VIIa, XV-10. Medium-sized jar, wheelmade, creamy, fine fabric, applied rounded lug/knob. Paint: 5YR 5/6 bright reddish brown.

641 GP.627. VII, X-11 Corridor 4 fill. Lugged jar, greenish, fine sand temper, greenish buff slip, pierced lug, scraped interior. Paint: 7.5GY 4/4 dark yellowish green.

642 GP.634. VII, X-9.10 level V fill. Lugged jar, wheel-finished, greenish, high density sand temper, buff slip, pierced lug, scraped interior. Paint: 10YR 4/4 brown.

643 PP.358. VIIb(?), XII-10 Corridor 2. Medium-sized jar, creamy, fine fabric, rounded lug/knob on shoulder. Paint: 5YR 5/4 dull reddish brown.

644 GP.199. VIIa, XI-9 Corridor 4. Lugged bowl, wheelmade, greenish, fine sand temper, vertically double-pierced lug, scraped interior. Paint: 7.5Y 5/2 grayish olive.

645 GP.654. VIIb, scattered on XII-10 Corridor 3 and Room 1 to XIII-13 Corridor 5. Spouted jar, wheel-finished, light yellowish brown, scraped interior. Paint: 2.5R 3/6 dark red. Rd: 152, Maxd: c. 260 mm.

646 GP.658. VIIb, XVI-9.10 Corridor 5. Spouted jar, creamy, fine fabric. Paint: 2.5YR 4/6 reddish brown. Length of spout: c. 62 mm.

647 GP.102. G93. VIIb, IX-11 Corridor 5. Spouted jar, wheel-finished, creamy-gray (fire-blackened), no visible temper, scraped interior, rubbed exterior lower body. Paint: 5YR 3/3 dark reddish brown. Ht: 245, Rd: 130, Bd: 260, Bsd: 98 mm.

648 GP.98. VIIb, XIII-12 Corridor 4. Spouted jar, wheelmade, greenish, fine sand temper, scraper interior and exterior body. Paint: dark green. Ext Ht: 110, Rd: 107, Bd: c. 157 mm.

649 GP.127. G90. IM. 89893. VIIa, XIX-9 Room 8-7. Spouted jar, wheelmade, greenish, fine sand temper, scraped interior body, scraped/shaved exterior body. Paint: 2.5G 2/2 very dark green. Ht: 165, Rd: 150, Bd: 209, Bsd: c. 80 mm.

650 GP.65. VIIb-a, X-10 Room 3 fill. Spouted jar, wheel-finished, pinkish, fine fabric, cream-buff slip, scraped interior shoulder. Paint: 7.5RP 4/8 dull purplish red. Rd: 151 mm.

651 GP.656. VII, XII-11 Tunnel-like structure of the central core (see *Rafidan* vol. 2, 1981: Pl. 9.2). Spouted jar, greenish, fine fabric, white-buff slip, scraped interior. Paint: 5YR 4/4 dull reddish brown. Length of spout: 52 mm.

652 GP.657. VIIc, X-10 Corridor 4. Spouted jar, greenish, no visible temper, two shallow grooves on upper shoulder. Paint: 2.5Y 4/4 olive brown. Length of spout: 55 mm.

653 GP.659. VIIa, VIII-9 Corridor 6 fill. Spouted jar, creamy, fine sand temper, buff slip, scraped interior. Paint: 5RP 4/8 purple. Spout length: c. 40 mm.

654 GP.651. VIIa, IX-10 Corridor 4 and XI-10 Corridor 3. Spouted jar, wheelmade, pinkish, fine sand temper, buff slip, comb grooves (4 lines) on shoulder, scraped interior and exterior body. Paint: 7.5RP 3/4 dark purplish red. Rd: 163, Bd: c. 280 mm, reconstructed drawing from several shards.

655 GP.660. VIIa, XIII-15 Moat top fill. Spouted jar, pinkish, fine fabric, buff slip(?). Paint: 7.5R 4/6 red. Spout length: c. 45 mm.

656 GP.661. VIIa, VIII.IX-10. Spouted jar, pinkish, sandy fabric. Paint: black. Spout length: c. 37 mm.

657 GP.662. VIIa, XIII-10 Corridor 4 fill. Spouted jar, creamy, fine sand temper, shallow groove on upper shoulder, scraped interior. Paint: 10GY 3/4 dark grayish green.

658 GP.1130. VIIb, XV-10 Pit 16. Jar, coil/ring-method and wheel-finished, pinkish, low density fine sand temper, white slip, shallow groove on upper shoulder, scraped interior and exterior body. Paint: 10RP 4/10 purplish red. Ht: 191, Rd: 104, Bd: 204, Bsd: c. 70 mm.

659 GP.64. VIIb, IX-10 Room 4. Jar, wheel-finished, creamy, fine fabric, buff slip, scraped interior. Paint: 2.5YR 5/6 bright reddish brown. Rd: 133 mm.

660 GP.648. VIIc, XI-9 Corridor 4. Jar, probably wheel-finished, cream, fine fabric, low carination at base of neck. Paint: 2.5YR 4/6 reddish brown.

661 GP.61. VIIa, XVI-10 fill. Jar, wheel-finished, greenish, fine sand temper, buff slip, scraped interior. Paint: 10YR 4/4 brown. Rd: 198 mm.

662 GP.647. VIIc, XI-9 Corridor 4. Jar, wheel-finished, creamy, fine fabric, cream-buff slip, carination on upper shoulder, scraped interior shoulder. Paint: 2.5YR 4/6 reddish brown. Rd: 120 mm.

663 PP.340. VIIc, X-10 Corridor 4. Medium-sized jar, pinkish, fine fabric, white-buff slip, scraped interior. Paint: 10YR 4/5 brown.

664 PP.331. VIIc, XI-10 Corridor 3. Medium-sized jar, wheel-finished(?), greenish, no visible temper, greenish-buff slip, finely scraped interior. Paint: 2.5G 3/2 dark grayish green.

665 PP.328. VIIc, IX-10 Corridor 4 to Room 4. Medium-sized jar, handmade(?), pink, fine fabric, scraped interior. Paint: 2.5R 3/6 dark red.

666 GP.38. VIIc, XI-9 Corridor 4. Jar, wheel-finished, greenish, fine fabric, buff slip, scraped interior shoulder. Paint: 7.5YR 4/4 brown. Rd: 94 mm.

667 PP.341. VIIc, XII-11 Corridor 3. Medium-sized jar, coil/ring-method and wheel-finished, creamy, fine fabric, buff slip, scraped interior. Paint: 2.5YR 5/8 bright reddish brown.

668 PP.367. VII, unstratified. Medium-sized jar, greenish, fine fabric, greenish buff slip. Paint: coal-black.

669 PP.328. VIIc, fragment belongs to No. 665.

670 PP.296. VIIa, XIII-12 Corridor 4 fill. Medium-sized jar, light yellowish brown, carination on upper shoulder, scraped interior. Paint: 5YR 6/4 dull orange.

671 PP.259. VIIb, XIV-9.10 Corridor 5. Jar, pink, fine fabric with white inclusions, slip on exterior, scraped interior. Paint: 5YR 6/6 orange.

672 PP.338. VII, XII-15 fill. Medium-sized jar, pink, fine fabric, scraped interior. Paint: 10RP 5/10 deep pink.

673 GP.62. VIIb(?), XVII-10 Room 8-2. Jar, wheel-finished, greenish, fine sand temper, buff slip, scraped interior. Paint: 10YR 4/4 brown. Rd: 190 mm.

674 PP.330. VIIc, X-10 Corridor 4. Jar, wheelmade, greenish, fine fabric, white-buff slip. Paint: 10YR 4/4 brown.

675 PP.333. VIIc, XI-11 Room 2. Medium-sized jar, greenish gray, fine fabric, scraped interior shoulder. Paint: black/very dark brown, fire-blackened.

676 PP.332. VIIb-a, XVII-10 Room 8-2. Large-sized jar, wheel-finished, greenish, fine fabric, white-buff slip, scraped interior. Paint: 7.5Y 6/4 light olive.

677 PP.294. VIIa, XI-12. Medium-sized jar with spout or lug, pink, fine fabric. Paint: 7.5R 6/10 reddish orange.

678 PP.295. VIIa, XIV-9 Corridor 5. Medium-sized jar, pinkish, cream-buff slip, scraped interior. Paint: 5R 5/10 red, fire-blackened interior.

679 PP.396. VIIa, XIII-13 fill. Large-sized jar, pink, fine sand and straw/chaff temper, cream slip. Paint: 10R 6/8 reddish orange.

680 PP.325. VIIc-b, XIII-11.12 Corridor 4 fill. Large- to medium-sized jar, creamy, fine fabric, white-buff slip, scraped interior, shallow groove on upper shoulder. Paint: 5YR 2/2–4/4 brownish black to dull reddish brown.

681 PP.336. VII, XII.XIII-14 fill. Large-sized jar, wheel-finished(?), fine fabric, white-buff slip, scraped interior, shallow groove on upper shoulder. Paint: 7.5YR 4/2–4/6 grayish brown to brown.

682 GP.63. VIIc, XI-9 Corridor 4. Jar, wheelmade, greenish, fine sand temper, cream slip, scraped interior shoulder, wiped interior neck. Paint: 2.5YR 5/6 bright reddish brown. Rd: 136 mm.

683 GP.649. VIIb-a, X-10 Corridor 4 fill. Jar, greenish, high density sand temper, scraped interior shoulder. Paint: 7.5GY 3/4 olive green. Rd: 127 mm.

684 GP.1569. VII, VIII.IX-9.10 level VI fill. Jar, wheel-finished, greenish gray to cream, fine fabric, buff slip(?),

groove on upper shoulder, scraped interior shoulder. Paint: brown. Rd: c. 155 mm.

685 GP.655. VIIa, VI-10 –200 cm. Jar, cream, sandy fabric, wheelmade, cream slip(?), scraped interior shoulder. Paint: 7.5RP 3/4 dark purplish red. Rd: 143 mm.

686 PP.334. VIIc, X-11 Corridor 4 and XI-11 Room 2. Large-sized jar, method of manufacture difficult to determine, pinkish, fine fabric, cream-buff slip, shallow groove on upper shoulder. Paint: 5R 5/8 red.

687 GP.66. VIIa, XIII-13 Corridor 5 fill. Jar, wheel-finished, greenish, no visible temper, buff slip, two grooves on upper shoulder, scraped interior body. Paint: 5RP 3/4 dark purplish red. Rd: c. 183 mm.

688 GP.645. VIIb, IX-10 Room 4. Jar, wheel-finished, pinkish, fine fabric, cream slip, scraped interior shoulder. Paint: 10RP 3/4 dark purplish red. Rd: 209 mm.

689 GP.652. VIIc, XI-10 Corridor 3. Jar, wheelmade, cream, fine fabric, buff slip, groove on upper shoulder, scraped interior shoulder. Paint: 10YR 4/4 brown. Rd: 118 mm.

690 GP.67. VIIb, XII-12 Corridor 4. Jar, coil/ring-method and wheel-finished, greenish, no visible temper, buff slip. Paint: 5YR 4/6 reddish brown. Rd: 136 mm.

691 GP.110. VIIa, XI-9 Corridor 4 fill. Jar, wheel-finished, scraped interior shoulder, Paint: 10R 2/3 very dark reddish brown.

692 PP.20. VIIa, XVI-10 Granary fill. Large-sized jar, greenish, fine black sand temper, scraped interior. Paint: 2.5G 2/2 very dark green.

693 GP.628. VIIc, XII-11 Corridor 4. Jar, coil/ring-method and wheel-finished, pinkish, fine fabric with white inclusions, cream slip, scraped interior shoulder. Paint: 2.5R 3/6 dark red. Rd: 121, ext Bd: c. 310 mm.

694 GP.99. VII, XVII-9.10 Room 8-2 lower floor. Jar, wheel-finished, greenish, fine fabric, buff slip, scraped interior and exterior lower body. Paint: 5YR 3/4 dark reddish brown. Ext Ht: 170, Rd: 120, Bd: 267 mm.

695 GP.653. VIIb, XII-13 Corridor 5, against No. 1040. Jar, coil/ring-method and wheel-finished, cream-buff, no visible temper, cream slip on exterior and interior neck, finely scraped interior, scraped/wiped exterior body. Paint: 2.5YR 4/4 dull reddish brown. Ht: c. 370, Rd: 132, Bd: 363, Bsd: c. 130 mm.

696 PP.348. VIIa, XVI-10. Medium-sized jar, pink, fine fabric, white-buff slip, scraped interior. Paint: 10RP 3/5 dark purplish red.

697 PP.354. VIIb, IX-10 Room 4. Large-sized jar, wheel-finished, greenish, fine fabric, white-buff slip, shallow groove on upper shoulder, scraped interior. Paint: 2.5Y 6/4 dull yellow.

698 PP.255. VIIa, XI-9 Corridor 4 fill. Jar, cream, fine fabric, white slip, scraped interior. Paint: 7.5YR 6/6 orange.

699 PP.54. VIIb, X-11 Corridor 4. Jar, light brown, no visible temper, scraped interior. Paint: 7.5YR 4/3 grayish brown.

700 PP.350. VIIb, XIII-13 Corridor 5. Large-sized jar, wheel-finished, creamy, fine fabric, white-buff slip, scraped interior. Paint: 5YR 5/4 dull reddish brown.

701 PP.352. VII, VI-9.10 Moat upper fill. Medium-sized jar, wheelmade, pink, fine fabric, buff slip. Paint: 2.5Y 8/4 pale yellow.

702 PP.298. VIIa, XI-10. Jar, wheel-finished, creamy, fine fabric, buff slip, groove on upper shoulder, scraped interior. Paint: 2.5YR 5/6 bright reddish orange.

703 PP.25 and 57. VIIb, X-11 Corridor 5 fill. Jar, light pink, fine fabric, white slip. Paint: 2.5YR 6/6 orange.

704 PP.344. VII, XII-11 Room 1 fill. Jar, wheel-finished, greenish buff, fine fabric, cream-buff slip, groove on upper shoulder, scraped interior. Paint: 2.5Y 7/4 light yellow to 2.5R 3/6 dark red (partially).

705 PP.351. VII, X-9.10 Level VI fill. Large-sized jar, wheel-finished, greenish, fine fabric, white-buff slip, scraped interior. Paint: 10YR 4/4 brown.

706 PP.343. VIIb, XIV-9.10, Corridor 5. Jar, light grayish buff, fine fabric, scraped interior. Paint: 10GY 4/4 dark yellowish green.

707 PP.96. VII, XIX-9 fill. Jar, wheelmade, greenish, scraped interior. Paint: 7.5GY 5/3 grayish yellow green.

708 PP.362. VIIb, XII-13 Corridor 5. Medium-sized jar, gray, fine fabric. Paint: dark reddish brown.

709 PP.66. VIIa, XI-9 Corridor 5. Medium-sized jar, wheelmade, greenish, fine fabric, two grooves on upper shoulder, scraped interior shoulder. Paint: 5YR 5/6 bright reddish brown.

710 PP.253. VIIa, XIV-9 Corridor 5. Small-sized jar, wheelmade, creamy, fine fabric, white slip, scraped interior shoulder. Paint: 5YR 5/6 bright reddish brown.

711 PP.300. VIIa, XIV-9 Corridor 5. Spouted (lost) jar, cream, fine fabric, buff slip, scraped interior. Paint: 2.5R 3/6 dark red.

712 PP.349. VII, XVII-9 Room 8-2. Jar, creamy, fine fabric, buff slip, scraped interior. Paint: 2.5YR 3/3 dark reddish brown.

713 GP.1544. VIIb, XIV-10 Corridor 5. Jar, wheel-finished, light pinkish gray, no visible temper, white-buff slip, scraped interior and exterior body (just below the neck to the base). Paint: 5YR 5/6 bright reddish brown. Ht: 370, Rd: 118, Bd: 330–335, Bsd: 110–113 mm.

714 GP.671. VII, XII-11 Room 1 fill. Jar, wheelmade, creamy, fine sand temper, buff slip, shallow groove on upper shoulder. Paint: 5R 3/5 dark red. Rd: 144 mm.

715 GP.650. VII, XIV-9.10 level V fill. Jar, wheelmade, yellowish, sandy fabric, carination at base of neck, buff slip, scraped interior shoulder. Paint: 5YR 4/6 reddish brown. Rd: 140 mm.

716 GP.104b. VII, VI-9.10 –180 cm. Jar, greenish, scraped interior shoulder. Paint: 5GY 3/2 dark olive green.

717 PP.335. VII, XI-11 Corridor 2 fill. Large-sized jar, wheel-finished, greenish, fine fabric, scraped interior shoulder. Paint: 2.5 YR 5/8 bright reddish brown.

718 PP.346. VII, unstratified. Large-sized jar, greenish, cream-buff slip, scraped interior shoulder. Paint: 10Y 6/5 light olive.

719 PP.51 and 94. VIIa, XIX-9 Room 8-7. Large-sized jar, coil/ring-method and wheel-finished, greenish, fine black sand temper, scraped interior. Paint: 2.5YR 4/4 dull reddish brown.

720 PP.21. VIIa, XVI-10 Granary fill. Large-sized jar, method of manufacture difficult to determine, greenish, fine black sand temper, slip on exterior, scraped interior. Paint: 10GY 4/4–2.5G 2/2 dark yellowish green to dark green.

721 PP.399. VIIc, XI-11 Room 2 lowest floor. Large-sized jar, coil/ring-method and wheel-finished, cream, fine fabric, cream slip, two shallow grooves on upper shoulder, scraped interior. Paint: 2.5YR 5/8 bright reddish brown. Maxd: c. 450–500 mm.

722 PP.98. VIIb, XIV-10 Pit 16 fill. Jar, wheelmade, gray, high density fine sand temper, carination on upper shoulder, scraped interior. Paint: 2.5YR 5/6 bright reddish brown.

723 GP.1565. VIIb, X-10 Corridor 4. Medium-sized jar, cream-pink, sandy fabric, scraped interior. Paint: 2.5YR 4/8 reddish brown.

724 PP.292. VIIa, XIV-9.10. Large-sized jar, wheelmade, creamy, fine fabric. Paint: 2.5R 3/6 dark red.

725 PP.97. VII, XIV.XV-9.10 Surface. Jar, greenish, sandy fabric, scraped interior. Paint: 5Y 6/4 olive yellow.

726 PP.19. VIIa, XIV-10 Granary fill. Medium-sized jar, wheelmade, pinkish, fine fabric. Paint: 2.5R 3/4 dark red.

727 GP.635. VII, XII-12 level II fill. Jar, wheelmade, greenish, fine fabric, buff slip, scraped interior shoulder. Paint: 7.5GY 3/4 dark olive green. Rd: c. 117 mm.

728 GP.495. VIIb(?), XII-11 Room 1 fill. Jar, greenish, fine sand temper, greenish buff slip, scraped interior shoulder. Paint: 5G 3/4 dark green. Rd: c. 160 mm.

729 GP.672. VII, XII-10 Corridor 1 of the central core. Jar, wheelmade, cream-pink, fine sand temper, buff slip, scraped/wiped interior shoulder. Paint: 7.5YR 6/7 orange. Rd: 145 mm.

730 GP.192. VII, XII-11 Room 1 fill. Jar, handmade, cream-pink, no visible temper, buff slip. Paint: coal-black.

731 GP.1552. VIIc, XI-12 Corridor 4, Pit 12 fill. Jar, handmade, light brownish yellow, straw/chaff temper. Paint: plum-red.

732 GP.536. VIIb-a, XII-9 Corridor 4 fill. Jar, handmade, cream-pink, low density fine straw/chaff temper, buff slip. Paint: 10RP 3/6 dark purplish red. Rd: 98 mm.

733 GP.107. VIIc, XIII-10 Corridor 4. Pot, coil/ring-method and wheel-finished, cream, high density white inclusions, buff slip. Paint: 5YR 5/6 bright reddish brown. Rd: 82 mm.

734 GP.491. XVI-10 level VI fill. Pot, wheel-finished, greenish buff, fine fabric, white buff slip, scraped interior shoulder. Paint: 2.5Y 5/6 yellowish brown. Rd: c. 92 mm.

735 GP.631. VIIb, IX-10 Room 4. Small pot, wheelmade, creamy, fine fabric, buff slip, scraped exterior body. Paint: 2.5YR 4/6 reddish brown. Bd: 131 mm.

736 GP.492. VIIc, X-10 Corridor 4. Small pot, handmade (coil or ring-method), buff, fine fabric. Paint: 2.5Y 7/8 yellow. Rd: 56, Bd: c. 107 mm.

737 PP.250. VIIc, X-10 Corridor 4. Small pot, wheelmade, greenish, fine fabric with white inclusions, buff slip, scraped exterior body. Paint: 7.5YR 6/6 orange. Bd: 123 mm.

738 GP.493. X-12 fill. Pot, wheelmade, greenish, fine fabric, buff slip, scraped interior shoulder. Paint: 7.5GY 3/4 dark olive green. Rd: c. 100. ext Bd: c. 190 mm.

739 GP.522a. G60. VIIb, XIV-9 Corridor 5. Small pot, wheelmade, pinkish, white inclusions and sand temper, scraped exterior body. Paint: orange to dark brown. Bd: 88 mm.

740 GP.633. VIIb, IX-11 Corridor 5. Small pot, wheelmade, creamy, fine fabric, buff slip, scraped exterior body. Paint: 10YR 4/3 grayish yellow brown. Rd: 64, Bd: 120 mm.

741 PP.241. VIIa, XIX-11 Room 8-8 upper floor. Pot, wheelmade, brownish, low density fine black sand temper, grayish buff slip, scraped exterior body. Paint: 7.5YR 5/4 dull brown. Bd: c. 170 mm.

742 GP.714. VII, XI-11 Corridor 2 fill. Small pot, coil/ring-method and wheel-finished, cream, no visible temper, rubbed exterior body. Paint: dark brown. Bd: c. 100 mm.

743 GP.632. VIIb, IX-10 Room 4. Small pot, wheelmade, creamy, fine fabric, buff slip, scraped exterior body. Paint: 2.5YR 4/6 reddish brown. Bd: 128 mm.

744 PP.246. VIIa, XIII-10 Corridor 4. Small pot, wheelmade, cream-buff, fine fabric with white inclusions, scraped exterior body. Paint: black. Bd: 115 mm.

745 GP.636. VIIb-a, XII-13 Corridor 5 fill. Bottle(?), wheelmade, creamy, fine fabric, buff slip. Paint: 5YR 6/4 dull orange. Rd: 55 mm.

746 PP.56. VIIb, X-11 Corridor 4. Small pot, wheelmade, pinkish, fine fabric. Paint: 2.5YR 5/6 bright reddish brown.

747 PP.317. VII, unstratified. Small pot, wheelmade, pinkish, cream-buff slip. Paint: pinkish red.

748 PP.313. VIIc, XIII-11 Corridor 4. Medium-sized pottery shoulder, creamy, fine fabric, buff slip, scraped interior. Paint: 5YR 2/2 brownish black.

749 PP.14. VIIa, XVI-9.10. Large-sized jar shoulder, cream-buff slip, scraped interior. Paint: 5YR 6/3 grayish brown.

750 PP.314. VIIa, XIII-15 fill. Jar shoulder, wheel-finished, greenish, scraped interior, buff slip. Paint: orange.

751 PP.18. VIIa, XVI-10 Granary fill. Jar shoulder, wheelmade, greenish, high density black sand temper. Paint: 2.5R 3/6 dark red.

752 PP.315. VIId-c, XI-11 Room 2 lowest floor. Shoulder, pinkish, fine fabric, cream-buff slip, scraped interior. Paint: 5RP 4/8 purplish red.

753 PP.312. VIIa, VI-9.10. Jar shoulder, creamy, fine fabric, white-buff slip. Paint: 2.5Y 6/4 dull yellow.

754 PP.345. VIIc, X-10 Corridor 4. Medium-sized jar shoulder, pink, fine fabric, buff slip, scraped interior. Paint: 2.5R 4/8 red.

755 PP.262. VIIc-b, X-10 Corridor 4 fill. Medium-sized jar shoulder, pink, fine fabric, cream-buff slip. Paint: 5YR 6/4 dull orange.

756 PP.374. VIIb, IX-10 Room 4. Small-sized pottery shoulder, probably handmade, creamy, fine fabric, scraped/lubbed interior. Paint: 5YR 5/4 dull reddish brown.

757 PP.311. VIIb, XI-10 Corridor 3. Medium-sized jar, pinkish, fine fabric, cream-buff slip, shallow groove on upper shoulder, scraped interior. Paint: 10RP 3/6 dark purplish red.

758 PP.309. VIIb, XII-11 Corridor 2. Jar(?), pinkish, cream-buff slip, scraped interior. Paint: 10RP 5/10 purplish red.

759 PP.310. VIIb, XII.XIII-13 Corridor 5. Jar shoulder, greenish, white-buff slip, scraped interior. Paint: 5YR 3/2 dark reddish brown.

760 PP.307. VIIb, IX-11 Corridor 5. Jar shoulder, creamy, fine fabric, cream-buff slip, scraped interior. Paint: 5YR 6/6 orange, fire-blackened interior.

761 PP.308. Unstratified. Medium-sized jar, greenish, fine fabric, white-buff slip, shallow groove on upper shoulder, scraped interior. Paint: 5YR 2/3 brownish black.

762 PP.628. VIIa, XII-12 Corridor 4. Jar shoulder, wheelmade, greenish gray, sandy fabric. Paint: 2.5YR 3/2–5/4 dark reddish brown to dull reddish brown.

763 PP.297. VIIa, XII-11 Corridor 2–3. Medium-sized jar, cream, fine fabric, cream-buff slip, scraped interior. Paint: 7.5YR 6/4 dull orange.

764 PP.49. VII, XIX-9 Room 8-7. Jar shoulder, creamy, fine fabric, white slip, scraped interior. Paint: 10RP 4/6 purplish red.

765 PP.368. VIIb, IX-10 Room 4. Shoulder-body, creamy, white-buff slip, scraped interior. Paint: 7.5 RP 3/4 dark purplish red.

766 PP.375. VIIa, XII-12 Corridor 4. Large-sized jar shoulder-body, wheelmade, pinkish, fine fabric, buff slip.

Paint: 5RP 3/6 dark purplish red.

767 PP.398. XII-13 level V fill. Medium-sized jar shoulder, wheel-finished, greenish, fine fabric, white slip, scraped interior. Paint: 2.5G 5/4 yellow green.

768 PP.293. VIIa, XIII-12 Corridor 4. Medium-sized jar, creamy, fine fabric, white buff slip, two grooves on upper shoulder, scraped interior. Paint: 10RP 3/4 dark purplish red.

769 PP.28. VII, X-10 fill. Jar, wheel-finished, greenish, white inclusions and fine black sand temper, white slip, scraped interior shoulder. Paint: 10Y 4/4 olive.

770 PP.321. VII, XII-11 Room 1. Medium-sized jar, creamy, fine fabric, scraped interior. Paint: 5YR 2/2 brownish black.

771 PP.11. VIIa, XV-9.10. Jar shoulder, greenish, fine fabric, white slip, two grooves on upper shoulder, scraped interior. Paint: 10YR 4/4 brown.

772 PP.324. VIIb, XII-12 Corridor 4. Jar shoulder, creamy, fine fabric, white-buff slip, scraped interior. Paint: 5YR 2/2–4/4 brownish black to brown.

773 PP.353. VIIa, XVII-10 Room 8-2. Large-sized jar, wheelmade, greenish, fine fabric, white-buff slip. Paint: bluish black.

774 PP.263. VIIb-a, X-11 Corridor 4 fill. Jar shoulder, cream, fine fabric, scraped interior. Paint: 7.5YR 6/4 dull orange, fire-blackened interior.

775 PP.268. VIIb-a, XII-13 Corridor 5 fill. Jar body, cream, fine fabric with sparse white inclusions, cream-buff slip, scraped interior. Paint: 7.5YR 5/4 dull brown partially plum-red.

776 PP.266. VII, XII-11 Room 1 fill. Jar body, light yellowish brown, sparse white inclusions temper, cream-buff slip, scraped interior. Paint: 7.5YR 6/4 dull orange.

777 PP.289. VIIa, XIII-12 Corridor 4. Jar shoulder, cream, fine sand temper, scraped interior. Paint: 2.5R 2/4 very dark red.

778 PP.3. VIIa, XVI-9. Large-sized jar shoulder, pinkish, wheel-finished, white inclusions and fine sand temper, white slip, scraped interior. Paint: coal-black.

779 PP.264. VIIc, XI-9 Corridor 4. Jar shoulder-body, creamy, fine fabric. Paint: 7.5YR 5/4 dull brown.

780 PP.265. VIIb, IX-9 Room 4 fill. Jar (portion unknown), creamy, fine fabric. Paint: 7.5YR 6/4 dull orange.

781 PP.629. VIIb-a, XII-10 Corridor 3 fill. Jar shoulder-body, wheelmade, cream, white inclusions and fine sand temper, cream-buff slip. Paint: 10RP 3/4 dark purplish red.

782 PP.13. VIIa, XII-9 Corridor 4. Jar body, creamy, fine fabric, white slip, scraped interior. Paint: 7.5YR 5/4 dull brown.

783 PP.274. VIIb-a, XII-11 Tunnel like structure fill of the central core. Large-sized jar, wheel-finished, light yellowish brown, high density sand temper, cream-buff slip, scraped interior body. Paint: black. Bd: c. 425 mm.

784 GP.665. VIIa, VI-9.10 –200 cm. Jar, wheelmade, creamy, low density fine sand temper, buff slip, added ridge on upper shoulder. Paint: 10YR 5/6 yellowish brown.

785 PP.62. VII, XI-10 fill. Jar, wheelmade, pinkish, fine fabric, white slip. Paint: 2.5YR 4/6 reddish brown.

786 PP.377. Unstratifaied (probably VII). Jar shoulder, wheelmade(?), pinkish, low density fine straw/chaff temper, cream-buff slip. Paint: 2.5YR 4/6 reddish brown.

787 PP.270. VII, IX-10 fill. Jar shoulder-body, brownish gray, sparse white inclusions temper, scraped interior. Paint: 7.5YR 5/4 dull brown, changed color by fire.

788 PP.88. IX-12.13 level V fill. Jar shoulder, wheelmade, gray, fine fabric, white slip. Paint: 10RP 3/6 dark purplish red.

789 PP.269. VIIa, XI-10 Corridor 2 fill. Jar shoulder, wheelmade, cream, buff slip. Paint: 5YR 6/4 dull orange.

790 PP.65. VIIb, XIII-12 Corridor 4. Jar, wheelmade, grayish (fire-blackened), low density fine black sand temper, slip. Paint: 2.5R 2/4 very dark red.

791 PP.627. VIIb, XII-10 Corridor 3. Jar shoulder, wheelmade, greenish, sandy fabric, cream-buff slip. Paint: black.

792 PP.626. VIIa, VI-9.10. Jar shoulder, pinkish, sandy fabric, scraped interior. Paint: 2.5R 3/4 dark red.

793 PP.261. VIIb, XIV-9.10 Corridor 5. Portion unknown, cream, white slip. Paint: black.

794 PP.12. VIIa, XVI-9. Jar shoulder, wheelmade, creamy, fine fabric, white slip. Paint: 7.5RP 3/4 dark purplish red, fire-blackened.

795 PP.394. VIIa, XV-9.10. Jar shoulder, creamy, fine fabric, buff slip, scraped interior. Paint: black.

796 PP.271. VIIb, XVII-10 Room 8-2 lower floor. Jar shoulder, creamy, fine fabric, buff slip, scraped interior. Paint: 10R 4/4 reddish brown, fire-blackened.

797 PP.291. VIIa, XII-6 Moat fill. Jar shoulder, wheelmade, light yellowish brown, fine fabric, white slip. Paint: black.

Lugged, spouted and plain pottery

798 GP.719. VIIc, X-11 Corridor 4. Lugged jar, wheelmade, pinkish, fine sand temper, pinkish slip, pierced four lugs. Rd: c. 104 mm.

799 GP.730. VIIb, XI-9.10 Corridor 4. Lugged jar, wheelmade, pinkish, fine sand temper, buff slip, pierced lugs on shoulder carination. Rd: 110 mm.

800 GP.842. VIIc, X-10 Corridor 4. Lugged jar, wheelmade, buff, fine sand temper, pinkish buff slip, four pierced lugs on shoulder connected by shallow groove, scraped interior and exterior body. Rd: 116, Bd: 243 mm.

801 GP.717. VIIb, XI-11 Corridor 4 and XIII-10 Corridor 3 fill. Lugged jar, wheelmade, cream, low density fine sand temper, four pierced beak/wing-lugs connected by two grooves with notches. Rd: 112, Bd: 230 mm.

802 GP.718. VIIc-b, XII-13 Corridor 5 fill. Lugged jar, wheelmade, pinkish, low density fine sand temper, slip on exterior, pierced lugs on shoulder. Rd: 135, ext Bd: 260 mm.

803 GP.720. VIIc, X-10 Corridor 4. lugged jar, wheelmade, pinkish, low density fine sand temper, slip on exterior(?), pierced lug, wiped interior.

804 GP.721. VIIb, XIV-9.10 Corridor 5. Lugged jar, pinkish, low density fine sand temper, buff slip, scraped interior, pierced lug.

805 GP.725. VIIb, XI-10 Corridor 2 and 3. Lugged jar, wheelmade, pinkish, low density fine sand temper, pierced lugs connected by three grooves with circular impressions. Rd: 153, ext Bd: 360 mm.

806 GP.728. VIIc-b, X-11 Corridor 4 fill. Lugged jar, wheelmade, greenish, fine sand temper, greenish gray slip, shallow groove at level of lug.

807 GP.723. VIIb, XI-10 Corridor 2. lugged jar, wheelmade, pinkish, fine sand temper, pierced lug, shallow groove at level of lug.

808 GP.726. VIIa, XII-12 Corridor 4. Lugged jar, wheelmade, cream, sparse fine sand temper, grayish slip, pierced lug connected by grooves. Rd: c. 200 mm.

809 GP.729. VIIa(?), XI-11 on a staircase. Lugged Jar, wheelmade, cream, fine sand temper, added trianguler/wing-shaped lug connected by three parallel ridges on shoulder, uppermost ridge is notched.

810 GP.731. VIIa, XIV-9 Corridor 5. Lugged jar, wheelmade, cream pink, fine sand temper, large lag on shoulder.

811 GP.727. VIIa, XIII-10 Corridor 4. Lugged jar, wheelmade, cream, fine sand temper, round knob on shoulder.

812 GP.724. VIIb-a, XII-10 Corridor 3 fill. Lugged jar, wheelmade, greenish, fine sand temper, added round knob, shallow groove at level of knob.

813 GP.722. VIIb-a, IX-10 Room 4 fill. Lugged jar, wheelmade, light greenish, fine sand temper, greenish gray slip, round knob on shoulder, scraped interior.

814 GP.534. VIIb, IX-11 Corridor 5. Spouted jar, wheelmade, pinkish to light brownish, very fine chaff and fine sand temper, series of grooves (by comb) on shoulder, wiped/scraped interior shoulder, scraped and rubbed exterior body. Rd: 131, Bd: 223 mm.

815 GP.750. VIIb, X.XI-11 Corridor 4. Spouted jar, wheelmade, greenish, low density fine sand temper, greenish buff slip, series of grooves on shoulder (6 lines by comb), scraped interior and exterior body.

816 GP.575. G124. VIIb-a, XII-14 Pit 14 (lower fill of grave pit). Spouted jar, wheelmade, greenish, low density fine sand temper, scraped interior and exterior body. Ht: 175, Rd: 104, Bd: 187, Bsd: 75 mm.

817 GP.501. G89. IM.89892. VII, XII-11 Fire-pit bottom of the central core. Spouted jar, wheelmade, cream, fine sand temper, wiped interior body, abraded base from use, fire-blackened whole interior and upper half of exterior, oil spot(?) of dark brown color on body (50 mm in diameter, see *Rafidan* vol. 2: Pl. 12.4). Ht: 149–151, Rd: 78–82, Bd: 178, Bsd: 49–52 mm.

818 GP.83. VIIb, IX-11 Corridor 5. Spouted jar, coil/ring-method and wheel-finished, greenish gray, fine fabric, yellowish buff slip, scraped interior and exterior body. Ht: 322, Rd: 113, Bd: 320, Bsd: 120 mm.

819 GP.993. VIIb-a, XII-14 Pit 14 fill. Spouted jar, coil/ring-method and wheel-finished, greenish, fine black sand temper, greenish buff slip, scraped interior. Bsd: 322 mm.

820 GP.844. VII, XII-15 Moat bottom. Spouted jar, wheel-finished(?), greenish, high density sand temper, scraped interior. Bd: 312 mm.

821 GP.736. VII, XII-11 Room 1 fill. Spouted jar, wheelmade, pinkish, fine sand temper, creamy slip. Rd: 130 mm.

822 GP.780. VIIa, XII-12 Corridor 4. Spouted jar, wheelmade, greenish, fine black sand temper, greenish gray slip, scraped exterior shoulder. Rd: 133 mm.

823 GP.740. VIIa, XIII-10 Corridor 4 fill. Spouted jar, wheelmade, cream, sandy fabric, buff slip. Rd: 168 mm.

824 GP.688. VIIc, XII.XIII-11.12 Corridor 4. Spouted jar, handmade or wheel-finished, greenish, no visible temper, buff slip, scraped interior shoulder. Rd: 167 mm.

825 GP.739. VIIa, XIII-10 Corridor 4 fill. Spouted jar, wheelmade, cream, fine sand temper, Rd: 173 mm.

826 GP.738. VIIb, X.XI-11 Corridor 4. Spouted jar, wheelmade, grayish, fine sand temper, slip on exterior. Rd: 166 mm.

827 GP.772. VIIa, XIII-12 Corridor 4. Spouted jar, wheelmade, cream, fine black sand temper, horizontal reserved slip on shoulder. Rd: 190, ext Bd: 402 mm.

828 GP.733. VIIa, XII-11 Room 1. Spouted jar, wheelmade, pinkish, low density fine sand temper, cream-buff slip, scraped interior shoulder. Rd: 115, Bd: 163 mm.

829 GP.734. VIIa, XVI-10 Well. Spouted jar, wheelmade, pinkish, sparse fine sand temper. Rd: 100, ext Bd: 173 mm.

830 GP.735. VIIa, XVI-10 Well. Spouted jar, wheelmade, pinkish, sparse fine sand temper, partially wiped interior. Rd: 134, Bd: 174 mm.

831 GP.742. VIIa, XII-10 Corridor 3. Spouted jar, greenish, fine sand temper.

832 GP.749. VIIc, X-10 Corridor 4. Spouted jar, greenish gray, fine sand temper.

833 GP.743. VIIa, XIII-10 Corridor 4. Spout, greenish, low density fine sand temper, greenish buff slip.

834 GP.748. VIIa, XIII-10 Corridor 4. Spout, Greenish, fine sand temper, greenish buff slip.

835 GP.744. VIIb-a, XIV-9 Corridor 5 fill. Spouted jar, wheelmade, greenish, low density fine sand temper, greenish buff slip, series of grooves on shoulder by comb. Rd: 188, ext Maxd: 320 mm.

836 GP.747. VIIa, XV-10 Corridor 6. Spouted jar, wheelmade, cream, low density fine sand temper, three grooves on upper shoulder, horizontal reserved slip on shoulder.

837 GP.682. VIIa, XIV-9 Corridor 5. Spouted jar (spout lost), wheelmade, cream, fine fabric, buff slip, grooves on shoulder, wiped exterior lower shoulder, scraped and wiped interior shoulder. Rd: 117, ext Maxd: 220 mm.

838 GP.84. VIIb, XVIII-10 Room 8–2 lower floor. Spouted jar, wheelmade, pinkish, high density fine sand temper, light pink slip, line of circular incisions/impressions on shoulder, small hole filled with bitumen on upper shoulder, wide bitumen line on exterior. Ext Ht: 310, Bd: 342, Bsd: 105 mm.

839 GP.745. VIIa, X-10 Room 3. Spouted jar, wheelmade, greenish, low density fine sand temper, oblique reserved slip on shoulder, added two circular pellets, two vertical wavy lines and plant/pinnate-like incisions just below the spout, probably representing human feature of "mother-goddess". Maxd: c. 450–500 mm.

840 GP.746. VIIa, XIV-10 Corridor 5. Spouted jar, wheelmade, pinkish, low density fine sand temper, grooves and wavy incision on shoulder.

841 GP.737. VII, XII.XIII-12 Corridor 4 fill. Spouted jar, wheelmade, greenish, sandy fabric, buff slip, groove line at base of neck, series of vertical wavy incisions on shoulder, scraped interior shoulder. Rd: 150, ext Bd: 253 mm, reconstruction of missing parts is conjectural.

842 GP.263. VII, VIII-9 fill. Jar, wheelmade, greenish, fine fabric, two grooves on upper shoulder, scraped exterior body. Rd: 117, Bd: 175 mm.

843 GP.685. VIIc, XI-9 Corridor 4. Jar, wheelmade, greenish, fine sand temper, greenish buff slip, series of shallow grooves on shoulder, scraped exterior body, partially wiped interior shoulder. Rd: 118, Bd: 184 mm.

844 GP.686. VII, XI-10 Corridor 3 fill. Jar, wheelmade, cream. fine sand temper, buff slip, series of shallow grooves on shoulder. Rd: 138 mm.

845 GP.843. VIIb, IX-10 Corridor 5. Jar, wheelmade, fine straw temper, buff slip, shallow grooves on upper shoulder, scraped interior and exterior body. Rd: 139, Bd: 220 mm, reconstructed drawing.

846 GP.698. VII, XII-11 Room 1 fill. Jar, wheelmade, cream, fine sand temper, shallow grooves at base of neck and upper shoulder, scraped/wiped interior. Rd: 161 mm.

847 GP.687. VIIb, XIV-9 Corridor 5. Jar, wheelmade, cream, fine sand temper, grooves on shoulder, scraped interior shoulder. Rd: 118 mm.

848 GP.773. VIIb-a, XIII-11.12 fill. Jar, wheelmade, greenish, fine black sand temper, wavy incision on shoulder treated after corrugated basis. Rd: 152 mm.
849 GP.762. VII, XII.XIII-12 fill. Jar, greenish, fine sand temper, decoration on shoulder is as in No. 848.
850 GP.760. VII, IX-11 fill. Jar, wheelmade, greenish, grooves and wavy incisions on shoulder.
851 GP.761. VII, XII-13 fill. Jar, wheelmade, greenish, grooves and wavy incision on shoulder.
852 GP.763. VIIb-a, XII-13. Jar, wheelmade, greenish, fine sand temper, series of irregularly spaced incisions on upper shoulder.
853 GP.754. VII, XII-5 Room 8-6. Jar, wheelmade, cream, fine sand temper, buff slip, scraped interior and exterior body, wavy incision and line of pricked/impressed decorations on lower shoulder.
854 GP.751. VII, VI-9.10 Moat fill. Large-sized jar, cream, low density fine sand temper, greenish buff slip, series of incisions and pricked/impressed decorations on shoulder.
855 GP.755. VIIb, XIV-9.10 Corridor 5 fill. wheelmade, greenish, sandy fabric, incised and impressed decorations on upper shoulder.
856 GP.756. VII, IX-10 Room 4 fill. Spouted jar fragment, yellowish pink, fine sand temper, shallow groove and impressed decorations on shoulder.
857 GP.757. VII, XIII-15 Moat fill. Jar, greenish, line of pricked decorations on upper shoulder.
858 GP.877. VII, VII.VIII-9 fill. Jar, wheelmade, cream, fine black sand temper, series of pricked decorations on upper shoulder.
859 GP.753. VII, XVI-9.10 Moat fill. Jar, greenish, series of pricked/impressed decorations on upper shoulder.
860 GP.752. VIIa, XIII-12 Corridor 4. Jar, wheelmade, cream, fine sand temper, incision and pricked decorations on shoulder.
861 GP.758. VIIc-b, XI-12 Corridor 2 fill. Jar, wheelmade, greenish, line of pricked decorations on shoulder.
862 GP.759. VIId-c, VIII-9.10 Corridor 5. Jar, light gray, fine sand temper, buff slip, series of pricked decorations on shoulder, scraped interior.
863 GP.683. VII, XIII-10 Corridor 4 fill. Jar, coil/ring-method and wheel-finished, greenish, low density fine sand temper, scraped interior and exterior body. Rd: 152, Bd: 224 mm.
864 GP.778. VIIc, X-10 Corridor 4. Jar, wheelmade, greenish buff, fine black sand temper, buff slip. Rd: 134, ext Bd: 350 mm.
865 GP.784. VIIa, XV-10. Jar, wheelmade, cream, sandy fabric, grooves on upper shoulder. Rd: c. 170 mm.
866 GP.841. VIIb, IX-11 Corridor 5. Jar, wheelmade, light yellowish pink, fine fabric, wiped interior lower shoulder, scraped interior and exterior body, fire-blackened exterior. Rd: 170, Bd: 310 mm.
867 GP.774. VIIa, XII-10 Corridor 2. Jar, wheelmade, greenish, fine black sand temper, buff slip, shallow groove on upper shoulder. Rd: 143 mm.
868 GP.845. VIIc-b, XI-10 Corridor 2 fill. Jar, wheelmade, cream, low density fine sand temper, buff slip, shallow groove at base of neck, scraped interior and exterior body. Bd: 250 mm.
869 GP.909. VII(a/ED I), XVI-10 Granary upper fill. Jar, greenish, fine black sand temper. Rd: 136 mm.
870 GP.722-2. VII, VI-9.10 fill. Jar, greenish. Rd: c. 150 mm.
871 GP.679. VIIa, XI-9 Corridor 4. Jar, wheelmade, cream, low density fine sand temper, buff slip. Rd: 182 mm.
872 GP.680. VIIb-a, XII-14 fill. Jar, wheelmade, grayish, fine sand temper, scraped interior shoulder. Rd: 160 mm.
873 GP.674. VIIa, XI-10. Jar, wheelmade, cream, fine sand temper. Rd: 167 mm.
874 GP.675. VII(a/ED I), XIX-11 fill. Jar (with four lugs?), wheelmade, cream, low density fine sand temper, notched ridge on shoulder. Rd: 128 mm.
875 GP.681. VIIc, X-11 Corridor 4. Jar, cream, fine fabric, buff slip, shallow grooves on upper shoulder, scraped interior lower shoulder. Rd: 142 mm.
876 GP.694. VIIa, XIII-11.12 fill. Jar, wheelmade, greenish, fine sand temper, buff slip. Rd: 163 mm.
877 GP.722-3. VII, VI-10 fill. Jar, wheelmade, cream. Rd: 125 mm.
878 GP.692. VIIb, XII-10 Corridor 3. Jar, wheelmade, cream, sandy fabric. Rd: 130 mm.
879 GP.691. VIIb-a, XIII-11 Corridor 4 fill. Painted jar, wheelmade, creamy, fine fabric. Paint: 5YR 5/3 dull reddish brown. Rd: 120 mm.
880 GP.777. VII, IX-10 Room 4 fill. Large-sized jar, coil/ring-method and wheel-finished, greenish, low density fine black sand temper, wiped interior upper shoulder and scraped lower shoulder. Rd: 180, ext Bd: c. 400 mm.
881 GP.693. VIIb, XII-11 Room 1. Painted jar, wheelmade, fine sand temper, shallow groove on upper shoulder.

Paint: 5YR 4/4 dull reddish brown. Rd: 150 mm.

882 GP.689. VIIb, XII.XIII-10 Corridor 3. Jar, wheelmade, greenish, fine sand temper. Rd: 140 mm.

883 GP.690. VIIc, X-10 Corridor 4. Jar, wheelmade, greenish, low density fine sand temper. Rd: 147 mm.

884 GP.781. VIIa, XII.XIII-14 Corridor 6. Jar, wheelmade, greenish, fine black sand temper, slip. Rd: 220–230 mm.

885 GP.697. VIIc, X-11 Corridor 4. Jar, wheelmade, cream-buff, low density fine sand temper. Rd: 176 mm.

886 GP.908. VII(a/ED I), XVI-10 Granary upper fill. Jar, wheelmade, greenish, fine black sand temper. Rd: 136 mm.

887 GP.782. VIIb, XIV-9 Corridor 5. Spouted (lost) jar, wheelmade, greenish, fine sand temper, greenish gray slip. Rd: c. 180 mm.

888 GP.775. Unstratified, XI.XII-9.10. Jar, greenish, fine black sand temper, fire-blackened interior. Rd: 148 mm.

889 GP.695. VIIa, X-10 Room 3 fill. Jar, wheelmade, greenish, fine sand temper, buff slip on exterior and interior upper neck. Rd: 164 mm.

890 GP.783. VII, XI.XII-11 Corridor 2, 3 fill. Large-sized jar, wheel-finished, greenish, fine sand temper, buff slip, shallow groove on upper shoulder, fire-blackened whole interior. Rd: 230–240, ext Maxd: 450 mm.

891 GP.776. VIIc, X-10 Corridor 4. Jar, coil/ring-method and wheel-finished, greenish, fine sand and fine straw temper. Rd: 153 mm.

892 GP.1391. VII(?), XIII-12 Level V fill. Jar, greenish, sandy fabric, groove on neck, scraped exterior shoulder. Rd: 164 mm.

893 GP.696. VII, XII-10 Corridor 1 of the central core. Jar, wheelmade, greenish, fine sand temper, greenish buff slip. Rd: 155 mm.

894 GP.779. VIIb-a, X-11 Corridor 4 fill. Large-sized jar, wheelmade, greenish, fine black sand temper, shallow grooves on upper shoulder. Rd: 169 mm.

895 GP.785. VIIb-a, XII-10 Corridor 2 fill. Large-sized jar, coil/ring-method and wheel-finished, greenish, fine fabric, series of grooves/corrugation on shoulder, scraped interior shoulder. Rd: c. 180, ext Maxd: 360 mm.

896 GP.528a. G61. VIIb, XIII-10 Corridor 3. Miniature pot, handmade, greenish, sand temper. Ht: 54, Rd: 42, Bd: 59, Bsd: c. 26 mm.

897 GP.715. VIIb-a, XIII-13 fill. Pot, wheelmade, greenish gray, low density fine sand temper, scraped/shaved exterior body and base. Bd: 98, Bsd: c. 30 mm.

898 GP.91. VIIc-b, IX-10 Room 4. Pot, wheelmade, greenish, low density fine sand and fine straw temper, scraped exterior body. Bd: 108, Bsd: 32 mm.

899 GP.528b. G64. IM.89889. VII (probably VIIb), IX-10 Room 4 fill of well. Pot, wheelmade, light brown to pinkish, fine sand temper, scraped exterior body. Ht: 90, Rd: 65, Bd: 111, Bsd: c. 40 mm.

900 GP.527. VIIb, XII-12 Corridor 5. Pot, wheelmade, pinkish red, low density fine sand temper, shaved/scraped exterior body. Bd: 130, Bsd: c. 45 mm.

901 GP.711. VIIa, XII-12 Corridor 4. Pot, wheelmade, greenish gray, fine fabric, shaved/scraped exterior body. Ht: 120, Rd: 82, Bd: 140, Bsd: 70 mm.

902 GP.712. VIIa, XII-12 Corridor 4. Pot, wheelmade, greenish, fine fabric. Rd: 101 mm.

903 GP.684. VIIb, XI-10 Corridor 3. Pot, wheelmade, cream, fine sand temper. Rd: c. 85, Bd: c. 145 mm.

904 GP.566. VIIb, XII-10 Corridor 2. Pot, wheelmade, pinkish, white inclusions and fine sand temper. Ht: 100, Rd: 62, Bd: 120 mm.

905 GP.710. VIIb, XIV-9.10 Corridor 5. Pot, wheelmade, light yellowish gray, fine fabric, scraped interior and exterior body. Rd: 98, Bd: 161 mm.

906 GP.533. VIIb, IX-11 Corridor 5. Jar, wheelmade, yellowish brown, fine sand temper, cream slip, groove on upper shoulder, scraped interior and exterior body. Rd: 109, Bd: 186 mm.

907 GP.713. VIIa, XI-12 Corridor 4. Jar, wheelmade, greenish, fine fabric, slip, shallow groove at base of neck, scraped interior and exterior body. Rd: 110, Bd: c. 160 mm.

908 GP.699. VIIb-a, XII-11 Corridor 2 fill. Jar, wheelmade, greenish gray, fine sand temper. Rd: 113 mm.

909 GP.74. VIIb-a, XII-14 Pit 14 fill. Jar, ring-method and wheel-finished, greenish, high density black and white sand temper, scraped interior and exterior body. Ext Ht: 315, Bd: 318, Bsd: 130 mm.

910 GP.676. VIIc, XI-11 Corridor 2. Jar, wheelmade, greenish, fine sand temper. Rd: 190 mm.

911 GP.678. VIIc-b, IX-10 Room 4 fill. Jar, wheelmade, greenish, some fine sand temper, buff slip. Rd: 124 mm.

912 GP.913. VIIa, XVI-10 Granary fill. Jar, wheelmade, light yellowish green, fine black sand temper. Rd: 100 mm.

913 GP.790. VII, XI-10 Corridor 3 upper fill. Jar, wheelmade, light yellowish pink, fine black sand temper, slip on exterior, scraped exterior. Rd: 160 mm.

914 GP.677. VII, XV-9.10 Corridor 6. Jar/bowl(?), wheelmade, creamy, fine sand temper. Rd: 92 mm.

915 GP.795. VIIb, X.XI-10 Corridor 4. Jar, wheelmade, greenish, fine black sand temper. Rd: c. 290 mm.

916 GP.1553. VIId or earlier, XIII-13.14 Pit fill. Jar, fine fabric, light pink, red washed and burnished exterior (Uruk "red ware" ?).

917 GP.769. VIIa, XIII-12 Corridor 4. Jar, wheelmade, greenish, fine sand temper, oblique reserved slip on shoulder, wiped interior by wheel.

918 GP.770. VIIb-a, XI-10 Room 3. Jar, greenish, fine black sand temper, horizontal reserved slip on shoulder.

919 GP.771. VII, XII-12 Corridor 4 fill. Jar, greenish, black sand temper, horizontal reserved slip on shoulder.

920 GP.797. VIIa, XI-11 Corridor 4. Jar, wheelmade, cream, fine black sand temper, plain ridge at base of neck.

921 GP.846. VIIa, XII-11 Room 1. Jar, wheelmade, pinkish, low density fine sand temper, horizontal reserved slip on shoulder, added notched ridge between shoulder and body. Bd: c. 270–280 mm.

922 GP.798. VIIa, XII-12 Corridor 4. Jar, wheelmade, fine black sand temper, slip on exterior, added notched ridge on carination, scraped interior body.

923 GP.799. VIIa, XII-11 Room 1 fill. Jar, greenish, fine black sand temper, notched ridge on body.

924 GP.767. VII, VI-9.10 –190 cm. Bucket handled jar with spout(?), reddish, high density fine black sand temper, randomly pierced solid handle.

925 GP.766. VIIb, IX-11 Room 4 fill of well. Handle, greenish gray, fine sand temper, series of pierces in the center.

926 GP.765. VIIa, XI-10 Corridor 2–3. Handled jar with spout(?), wheelmade, greenish, fine sand temper, pierced solid handle (lost), scraped interior shoulder.

927 GP.764. VIIc, X-10 Corridor 4 (in front of Room 4). Bucket handled jar, wheelmade, greenish, fine sand temper, slip on exterior, shallow grooves on neck, added solid handle, scraped interior lower shoulder. Rd: 127, ext Bd: 235 mm.

928 GP.706. VIIc, XII-10 Corridor 3. Goblet, wheelmade, greenish, fine sand temper, string-cut base. Ext Maxd: 66, Bsd: 20 mm. (All pottery cited on Figure 31 are wheelmade)

929 GP.704. VII, XII-11 Corridor 3. Goblet/bowl, creamy-pink, fine sand temper, string-cut base. Ext Maxd: 93, Bsd: 29 mm.

930 GP.707. VII, XV-10 Pit 16 upper fill. Goblet, greenish, shaved off base. Ext Maxd: c. 50, Bsd: 20 mm.

931 GP.703. VIIc, XII-11 Corridor 2–3. Goblet, pinkish, low density fine sand temper, string-cut base. Ext Maxd: 75, Bsd: 25 mm.

932 GP.702. Unstratified (probably VII), X.XI-11.12 fill. Goblet, creamy, low density fine sand temper, shaved off base. Ext Ht: 107, Bd: 79, Bsd: 29 mm.

933 GP.968. VII, XII-15 Moat fill –200 cm. Goblet, reddish pink, sandy fabric, bitumen coated interior and part of exterior. Ext Ht: 105, ext Maxd: 78 mm.

934 GP.96b. VIIa, XI-10 Corridor 2 upper fill –130 cm. Goblet, light yellowish pink, fine black sand temper, self slip. Ext Ht: 92, ext Maxd: 55, Bsd: 18 mm. (Probably latest phase of the transitional period or the beginning of ED I).

935 GP.701. VII, VI-9 Moat fill –60 cm. Goblet, creamy, fine sand temper, string-cut base. Ext Ht: 94, ext Maxd: 80, Bsd: 28 mm.

936 GP.96a. G67. VIIa, together with No. 934. Goblet, greenish, fine black sand temper, string-cut base, abraded lower exterior. Ht: 113, Maxd: 81, Bsd: 16 mm.

937 GP.705. VIIc-b, XII-10 Corridor 3 fill. Goblet(?), greenish, low density fine sand temper, string-cut base. Ext Ht: 76, ext Maxd: 81, Bsd: 24 mm.

938 GP.700. VIIb-a, IX-10 Room 4 upper fill of well. Goblet(?), cream, low density fine sand temper, string-cut base. Ht: 119, Rd: 106, Bsd: 35 mm.

939 GP.114. VIIa, XII-9 Corridor 4. Bowl/cup, light reddish brown, low density fine sand temper, string-cut base, abraded base from use. Ht: 74, Rd: 97, Bsd: 26 mm.

940 GP.93a. VIIa, XIII-9.10 Corridor 4. Bowl or lid as a jar stopper, yellowish green, fine black sand and sparse grit temper. Ht: 79, Rd: 106, Bsd: 26 mm.

941 GP.94b. G81. VIIa, XI-10 Corridor 4. Bowl-shaped lid, greenish-buff, high density very fine sand temper, string-cut base. Ht: 52, Rd: 111, Bsd: 41 mm.

942 GP.505. VIIb, XV-9 Corridor 6. Bowl-shaped lid, cream, sparse white inclusions and fine black sand temper, string-cut base, remains of carbonized material/bitumen on whole interior. Ht: 47, Rd: 90, Bsd: 40 mm.

943 GP.504. VIIb, XV-9 Corridor 6. Bowl-shaped lid, cream, sparse white inclusions and fine black sand temper, string-cut base, remains of carbonized material/bitumen on whole interior. Ht: 46, Rd: 87, Bsd: 58 mm.

944 GP.92. VII, XII-11 Fire-pit fill of the central core. Bowl-shaped lid, greenish buff, fine sand temper. Rd: c. 100 mm.

945 GP.93b. VIIa, X-10 Room 3. Bowl-shaped lid, greenish, high density fine black sand temper, string-cut base. Ht: 45, Rd: 66, Bsd: 32 mm.

946 GP.262b. VIIa, XIII-12 Corridor 4. Bowl-shaped lid, greenish, string-cut base. Ht: 45, Rd: 100, Bsd: 43 mm.

947 GP.1261. VIIa, VI-9 Granary fill. Bowl-shaped lid, high density fine sand temper, string-cut base. Ht: 62, Rd: 110, Bsd: 48 mm.

948 GP.262a. G83. VIIb, XII-10 Corridor 3. Bowl-shaped lid, greenish, fine fabric, string-cut base. Ht: 63, Rd: 97, Bsd: 41 mm.

949 GP.708. VII, XV-10 Pit 16 upper fill. Bowl-shaped lid, greenish, fine sand temper. Ht: 66, Rd: 104, Bsd: 43 mm.

950 GP.94a. VIIa, XI-9 Corridor 4. Bowl-shaped lid, greenish, sparse sand temper, string-cut base, abraded exterior body from use. Ht: 56, Rd: 105, Bsd: 34 mm.

951 GP.1537. VII, VI-9 Moat bottom, Bowl, method of manufacture difficult to determine, light yellowish gray, fine black sand temper. Ht: 55, Rd: 80 mm.

952 GP.502. VIIb, XII-13 Corridor 5. Bowl, wheelmade, low density fine sand temper, string-cut base. Ht: 56, Rd: 82–86, Bsd: 30 mm. (All small-sized bowls cited on Figure 32 are wheelmade except No. 951)

953 GP.503. VIIb, XIII-13 Corridor 6 fill. Bowl, sparse fine sand temper, string-cut base. Ht: 56, Rd: 82, Bsd: 22 mm.

954 GP.100. VIIa, X-10 Room 3. Bowl, greenish, high density fine straw temper, slip on exterior and interior, string-cut base, abraded rim and base. Ht: 55, Rd: 86, Bsd: 25 mm.

955 GP.101b. VIIa, XI-9 Corridor 4. Bowl, greenish (over fired), high density fine sand temper, string-cut base. Ht: 55, Rd: 92, Maxd: 95, Bsd: 36 mm.

956 GP.101a. VIIa, XIII-9.10 Corridor 4. Bowl, light greenish yellow, fine black and white sand temper, string-cut base, abraded base. Ht: 58, Rd: 95, Bsd: 33 mm.

957 GP.851. VIIa, XV-9 fill. Bowl, pinkish, fine sand temper, string-cut base. Ht: 55, Rd: 91, Maxd: 95, Bsd: 34 mm.

958 GP.517b. VIIb, VIII.IX-9. Bowl, buff to reddish, sparse grit temper, string-cut base. Ht: 56, Rd: 70–72, Bsd: 43 mm.

959 GP.112b. VIIa, XI-9 Corridor 4. Bowl, light brown, high density fine black sand temper, scraped exterior lower body, shaved off base, abraded base. Ht: 62, Rd: 77, Bsd: c. 40 mm.

960 GP.517a. VIIc, XII-10 Corridor 3. Bowl, reddish, sparse fine grit temper, string-cut base. Ht: 45–53, Rd: 82, Bsd: c. 30 mm.

961 GP.522b. VIIb, XII-11 Room 1. Bowl, pinkish, fine sand temper, string-cut base. Ht: 56, Rd: 85, Bsd: 29 mm.

962 GP.112a. VIIa, X-10 Room 3. Bowl, pinkish, low density fine sand temper, string-cut base. Ht: 61, Rd: 80, Bsd: 24 mm.

963 GP.518. VII, XVI-9 Moat fill. Bowl, pinkish, fine sand temper, string-cut base, coated with dark brown-colored material (not bitumen) on interior and part of exterior. Ht: 50, Rd: 81, Bsd: 30 mm.

964 GP.113. VIIa, XIII-12 Corridor 4. Bowl, greenish buff, high density sand temper, string-cut base. Ht: 44, Rd: 88, Bsd: 30 mm.

965 GP.88. VIIa, XIX-9 Room 8-7. Bowl, greenish light brown, low density fine sand temper, string-cut base, coated with blackish brown-colored material on interior and part of exterior. Ht: 59, Rd: 108, Bsd: 35 mm.

966 GP.786. VII, XVIII-12 Gate floor. Bowl, wheelmade, cream, fine fabric, buff slip, wiped interior by wheel. Rd: c. 190, Maxd: c. 200 mm.

967 GP.196. VII(?), XII-9.10 ED I fill. Bowl, handmade, cream-buff, medium coarse fabric with fine straw temper. Ext Ht: 65, Rd: c. 160 mm.

968 GP.788. VII, XIII-15 Moat fill. Bowl, wheelmade, greenish, fine black sand temper. Rd: c. 220 mm.

969 GP.787. VIIa, XIII-11.12 Corridor 4. Bowl, wheelmade, greenish, fine sand and straw temper, scraped exterior lower body. Rd: c. 220 mm.

970 GP.1523. VIIa, XIII-13 fill. Bowl, mould-made (lower portion), creamy-pink, some straw temper. Rd: c. 250 mm.

971 GP.86. VIIa, XIII-9.10 Corridor 4. Bowl, wheelmade, greenish, sandy fabric, scraped/shaved exterior lower body and base, abraded interior from use. Ht: c. 100, Rd: 230, Bsd: 77 mm.

972 GP.817. VII, XIII-15 Moat fill –160 cm. Bowl, handmade, reddish, fine sand temper, abraded interior from use. Rd: c. 250–300 mm.

973 GP.789. VIIb, X-10 Room 3. Bowl, wheelmade, greenish, fine black sand temper, greenish gray slip, scraped exterior lower body. Rd: c. 320 mm.

974 GP.1266. VII, IX-10 Room 4 fill. Strainer, wheelmade, cream, fine sand temper, shaved lower exterior, perforation on base. Ht: 60, Rd: 133mm.

975 GP.716. VII(?), V.VI-10 fill –100 cm. Cup/goblet, wheelmade, cream, fine sand temper, slip on exterior, shaved off exterior and base. Ext Ht: 63, Maxd: 68, Bsd: 63 mm.

976 GP.791. VIIb, XIII-10 Corridor 4. Bowl, wheelmade, pinkish, fine black sand temper, creamy slip, scraped interior and exterior lower body. Ext Ht: 170, Rd: c. 350–360, Maxd: c. 360–370 mm.

977 GP.741. VII, IX-10 Room 4 fill. Spouted bowl, wheelmade, greenish, fine sand temper, row of crescent-shaped impressions on upper body made by splitted reed. Rd: c. 340, Maxd: c. 360 mm.

978 GP.793. VIIa, XII-9 Corridor 4. Bowl, wheel-finished, greenish, high density sand temper, added finger-impressed ridge. Ext Ht: 130, Rd: c. 440 mm.

979 GP.792. VIIa, IX-10 Room 4. Bowl, wheel-finished, greenish, fine black sand temper, added finger-impressed ridge, wiped/grooved exterior upper body. Rd: 440–450 mm.

980 GP.794. VIIa, X-11 Corridor 4. Bowl, wheel-finished, creamy, fine sand temper, buff slip, scraped interior and exterior lower body. Rd: c. 470–480 mm.

981 GP.796. VIIa, X-11 Corridor 4. Bowl, wheel-finished, cream, high density black sand temper, scraped interior and exterior lower body. Rd: c. 400 mm.

982 GP.709. VIIa, XIII-14 Corridor 6. Leg of therimorphic vase or handle, coil/ring-method, creamy pink, fine fabric, seal impression or imprint on upper portion. Ext Length: 88, Maxd: 42 mm.

Coarse pottery

983 GP.826. VIIb, XV-10 Pit 16 upper fill. Inner protuberance bowl (brazier?), handmade, cream-buff, medium coarse fabric with straw temper.

984 GP.1481. VIIa, XIII-13 fill. Inner protuberance bowl, mould-made (lower portion), grayish buff, grit and straw temper, fire-blackened exterior.

985 GP.1460. VIIb, XIII-10 Corridor 4. Bevelled-rim bowl, mould-made, reddish pink, grit, grog and straw temper. Ext Ht: 70, Rd: c. 180 mm.

986 GP.1462. Surface (probably VII), VI-9.10. Bevelled-rim bowl, mould-made, greenish buff, grit, grog and straw temper. Rd: c. 160–180 mm.

987 GP.1461. Unstratified. Beveled-rim bowl, reddish, grit, grog and straw temper. Rd: c. 170 mm.

988 GP.819. VII, XI-10 Corridor 3 upper fill. Bevelled-rim bowl, mould-made, dark brown surface black core, grit and straw temper. Rd: c. 200 mm.

989 GP.820. VIIc-b, XIII-13 Corridor 5 fill. Bowl with rounded rim, mould-made, reddish pink, grog temper. Rd: c. 190 mm.

990 GP.103. G122, IM.89905. VIIb-a, XII-11 Corridor 3. Bowl, mould-made, pinkish red, medium coarse fabric with white inclusions and high density sand temper, imprint of textile on interior (approximately 5 by 5 lines/ cm^2), wet-smoothed exterior. Ht: 74, Rd: 215 mm.

991 GP.816. VIIc, XIII-10 Corridor 4. Bowl, mould-made (lower half), reddish, coarse fabric. Rd: 187 mm.

992 GP.811. VIIb, XI-10 Corridor 3. Bowl, handmade, straw temper, wet-smoothed. Ht: 65, Rd: 93, Maxd: 97 mm.

993 GP.813. VIIa, XIII-13. Bowl, handmade, pinkish, medium coarse fabric. Ext Ht: 45, Rd: c. 100 mm.

994 GP.980. VIIa, X-10 Room 3. Bowl, handmade, reddish pink, moderate coarse fabric. Ht: 65, Rd: 137, Maxd: 145 mm.

995 GP.815. VIIc, X-11 Corridor 4. Bowl, mould-made (lower half), pinkish, sand temper. Ht: 63, Rd: 180, Bsd: 163 mm.

996 GP.95. VII, XII-11 Fire-pit fill of the central core. Bowl, method of manufacture difficult to determine, grit, grog and sparse straw temper. Rd: c. 340 mm.

997 GP.821. VIIc, X-10 Corridor 4. Bowl, mould-made, pinkish brown, moderate coarse fabric. Rd: c. 340 mm.

998 GP.97. VIIa, XIX-10. Bowl, mould-made, pinkish, coarse fabric with low density straw temper, traces of basket on exterior. Ht: 132, Rd: 440, Bsd: 150 mm.

999 GP.818. VII, XIX-12 pebble paved floor. Bowl, mould-made, reddish brown, moderate coarse fabric. Ext Ht: 115, Rd: c. 460 mm.

1000 GP.801. VII, XII-10 Corridor 2–3 upper fill. Bowl, handmade (coil/ring-method), greenish, high density straw temper, series of finger-impressions on exterior. Rd: c. 470 mm.

1001 GP.1183. VIIa, XIII-11.12 Corridor 4 upper fill. Oval tray, handmade, greenish, high density straw temper, abraded interior from use. Ht: 44, Rd: c. 440–460 mm.

1002 GP.812. VIIa, XVI-10 Well fill. Jar, handmade, reddish buff, medium coarse fabric. Ht: 105, Rd: 81, Bd: 95, Bsd: 62 mm.

1003 GP.814. VIIc, XII-12 Corridor 4. Jar, handmade, reddish brown, moderate coarse fabric. Rd: 63, Bd: 92 mm.

1004 GP.809. VIIb, XVII-10 Room 8-2. Spouted jar, handmade, reddish, grog and straw temper, roughened interior. Rd: c. 200 mm?

1005 GP.803. VIIb, XIV-9.10 Corridor 5. Spouted jar, handmade, reddish, sand and grit temper, smoke-blackened interior and exterior neck. Rd: 124, Maxd: 216 mm.

1006 GP.810. VII, VI-9.10 Moat fill. Spouted jar, handmade, pinkish, medium coarse fabric with straw temper. Rd: c. 140 mm.

1007 GP.828. VIIa, IX-10 Corridor 4. Jar, handmade, sand temper, pinkish, set of crescent (horseshoe-shaped) and round pellet on shoulder. Rd: 190, ext Bd: 300 mm.

1008 GP.1478. VIIb, XI-12 Corridor 4. Jar, wheelmade, high density sand temper (not coarse pottery), set of crescent (horseshoe-shaped) and round pellet on shoulder, self slip on exterior, rough interior from use.

1009 GP.822. VII, XVI-7 Moat fill. Large-sized Jar, coil-method, reddish, fine fabric, set of double-crescent and round pellet on shoulder.

1010 GP.804. VII, XII-11 Room 1 fill. Cooking jar, handmade, cream-buff, grit and low density straw temper, smoke-blackened interior and exterior neck. Rd: 126, Bd: 20 mm.

1011 GP.806. VII, X-10 Small chamber. Cooking jar, mould-made (lower half), pinkish, sand and grit temper, lightly burnished interior, scraped exterior. Ext Ht: 147, Rd: 108, Maxd: c. 210 mm.

1012 GP.805. VIIb, XIII-10 Corridor 3. Cooking jar, handmade, pinkish, grit and fine straw temper, scraped lower exterior, roughened lower interior, smoke-blackened interior and exterior neck. Rd: c. 98?, Bd: c. 200 mm.

1013 GP.1472 VII, VIII-9.10. Lid (jar-stopper), hand-formed, burnt in greenish gray, grit and grog temper, cylinder seal impression on obverse (Seal no. 133, see *Rafidan* vol. 9: p. 115). Ht: 40, Maxd: 113 mm.

1014 GP.531a. VIIa, XIII-13 fill. Jar-stopper, hand-formed, light yellowish brown, straw temper. Ht: 28, Maxd: 95 mm.

1015 GP.531b. VIIc, XII-10 Corridor 3. Jar-stopper, greenish, high density straw temper. Ht: 50, Maxd: 103 mm.

1016 GP.520b. VIIb, XI-10 Corridor 2. Jar-stopper, light yellowish brown, high density white inclusions and sparse straw temper. Ht: 45, Maxd: 92 mm.

1017 GP.519b. G72. VII, IX-9 Corridor 5. Jar-stopper, light reddish brown, fine sand and sparse straw temper, string impression across the reverse. Ht: 32, Maxd: 113 mm.

1018 G450. Seal no.69. VIIb, XI-10 Corridor 3. Jar-stopper, hand-formed, light brown (very lightly burnt), fine fabric with straw temper, mouth trace of jar (110 mm in diameter) on reverse, cylinder seal impression at edge. Ht: 46, Maxd: 120 mm.

1019 GP.519a. VIIb, XI-10 Corridor 2. Jar-stopper, brown, medium coarse fabric. Ht: 25, Maxd: 107 mm.

1020 GP.111. VIIa, XVI-7 Room 8-5. Lid, hand-formed, reddish, sandy fabric. Ht: 23, Maxd: 146 mm.

1021 GP.825. VIIa, XII-9 Corridor 4. Lid, burnt in light yellowish gray, high density straw temper. Ht: 66, Diam: 185–195 mm.

1022 GP.832. VII, XVII-10 Room 8-2 fill. Jar, coil/ring-method, pinkish, grit and grog temper. Rd: c. 440 mm.

1023 GP.840. VIIa, XII-12 Corridor 4. Jar, coil/ring-method, reddish brown, coarse fabric with straw temper, finger-impressed ridge on shoulder. Rd: 280, ext Maxd: 490 mm.

1024 GP.839. VII, XI-11 Corridor 2–3. Jar, handmade, light yellowish pink, straw temper, string-impressed ridge on shoulder. Rd: c. 200, Maxd: c. 240 mm.

1025 GP.836. VIIa, XIX-12 floor. Jar, handmade, light yellowish brown, grog and straw temper, finger-impressed ridge on shoulder. Rd: c. 460 mm.

1026 GP.837. VIIa, XIII-13 Corridor 6 fill. Jar, handmade, light yellowish brown, grog temper. Rd: c. 250 mm.

1027 GP.807. VII, XI-10 Corridor 3 fill. Jar, pinkish, medium coarse with grit temper, lightly burnished exterior at leather-hard stage. Rd: 122, ext Maxd: 275 mm.

1028 GP.838. VIIc, XII-12 Corridor 4. Jar, coil/ring-method, brown surface black core, grog and grit temper, smoke-blackened interior. Rd: c. 300–400 mm.

1029 GP.834. VIIb, IX-10 Room 4 fill. Jar, handmade, cream-buff, grog temper, abraded rim. Rd: 320–340 mm.

1030 GP.835. VIIa, Corridor 4 fill. Jar, coil/ring-method, pink surface gray core, grog temper. Rd: c. 340 mm.

1031 GP.833. VIIc, XII-12 Corridor 4. Jar, handmade, brownish gray, grog and straw temper. Rd: c. 380 mm.

1032 GP.831. VIIa, XVI-10. Jar, wheel-finished(?), cream-buff, sand and straw temper. Rd: c. 300 mm.

1033 GP.829. VIIa, X.XI-9 Corridor 4. Jar, handmade and wheel-finished, greenish, sand and straw temper, slip on exterior(?). Rd: 280 mm.

1034 GP.830. VIIb, XII.XIII-9 Corridor 4. Jar, wheel-finished, greenish, straw temper, fire-blackened rim. Rd: 270 mm.

1035 GP.808. VII, XX-11. Jar, handmade, reddish, grog and straw temper, smoke-blackened interior neck. Rd: 190 mm.

1036 GP.827. VIIc, XIII-11 Corridor 4. Base of bowl or jar, mould-made, reddish, sandy fabric, scraped interior and exterior. Bsd: 100 mm.

1037 GP.157. VIIa, XI-12 Corridor 4. Jar, coil/ring-method, reddish pink, fine grit and straw temper, added finger-impressed ridge with hanged decoration on shoulder. Ht: 501–518, Rd: 261, Maxd: 532 mm.

1038 GP.150. VIIa, XII-12 Corridor 4. Jar, coil/ring-method, reddish brown to pinkish, sand and straw temper, cylinder seal impression on rim (Seal no.87, see *Rafidan* vol. 9: p. 103). Ht: c. 656, Rd: 336, Maxd: 668 mm.

1039 GP.1427. VIIb, XI-11 Corridor 3 corner. Jar, mould-made (lower portion) and coil/ring-method, light yellowish gray, grog and straw temper. Ht: 378, Rd: 210, Maxd: 383 mm.

1040 GP.621. VIIb, XII-13 Corridor 5. Jar, coil/ring-method, reddish brown, grit and straw temper, impressed ridge with hanged end on shoulder, contained carbonized grain, nearly intact *in situ,* drawing made *in situ.* Ht: c. 540, Rd: c. 330, Maxd: 620 mm.

(本カタログは，文部省科学研究費の補助を得て行った調査〔研究代表者：藤井秀夫，課題番号：304146, 404153, 504348〕の成果の一部である。)

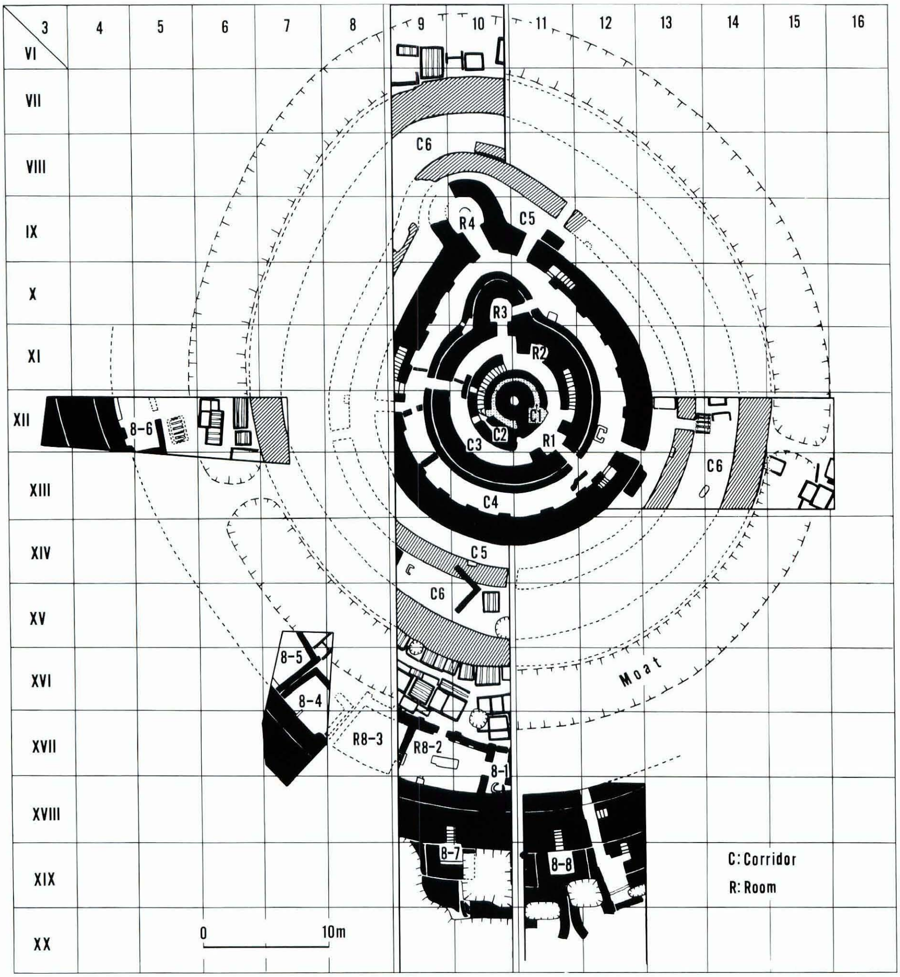


Fig. 1 Plan of Tell Gubba level VIIa (the transitional period from Jemdet Nasr to ED I, hatched walls indicates removed and/or under removing).

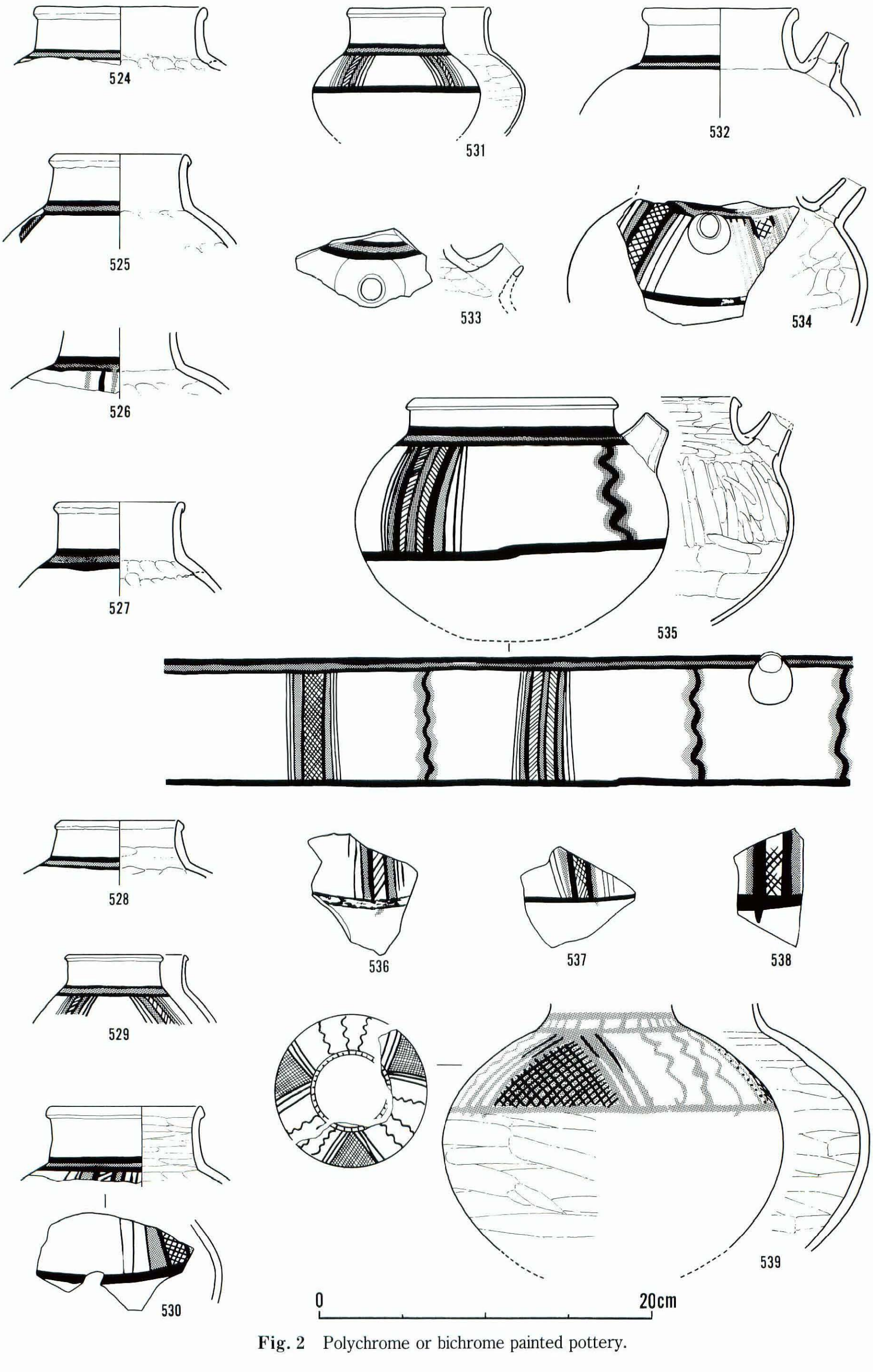
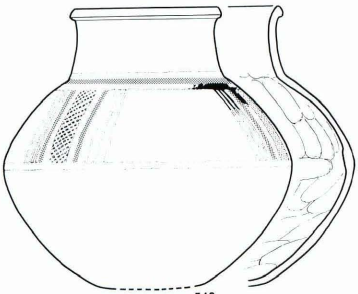


Fig. 2 Polychrome or bichrome painted pottery.



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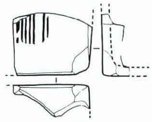

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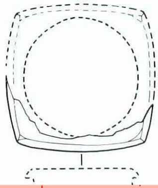

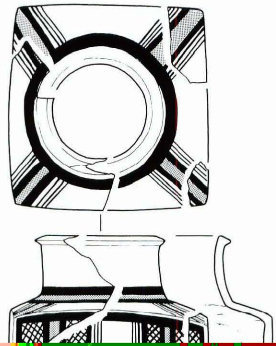

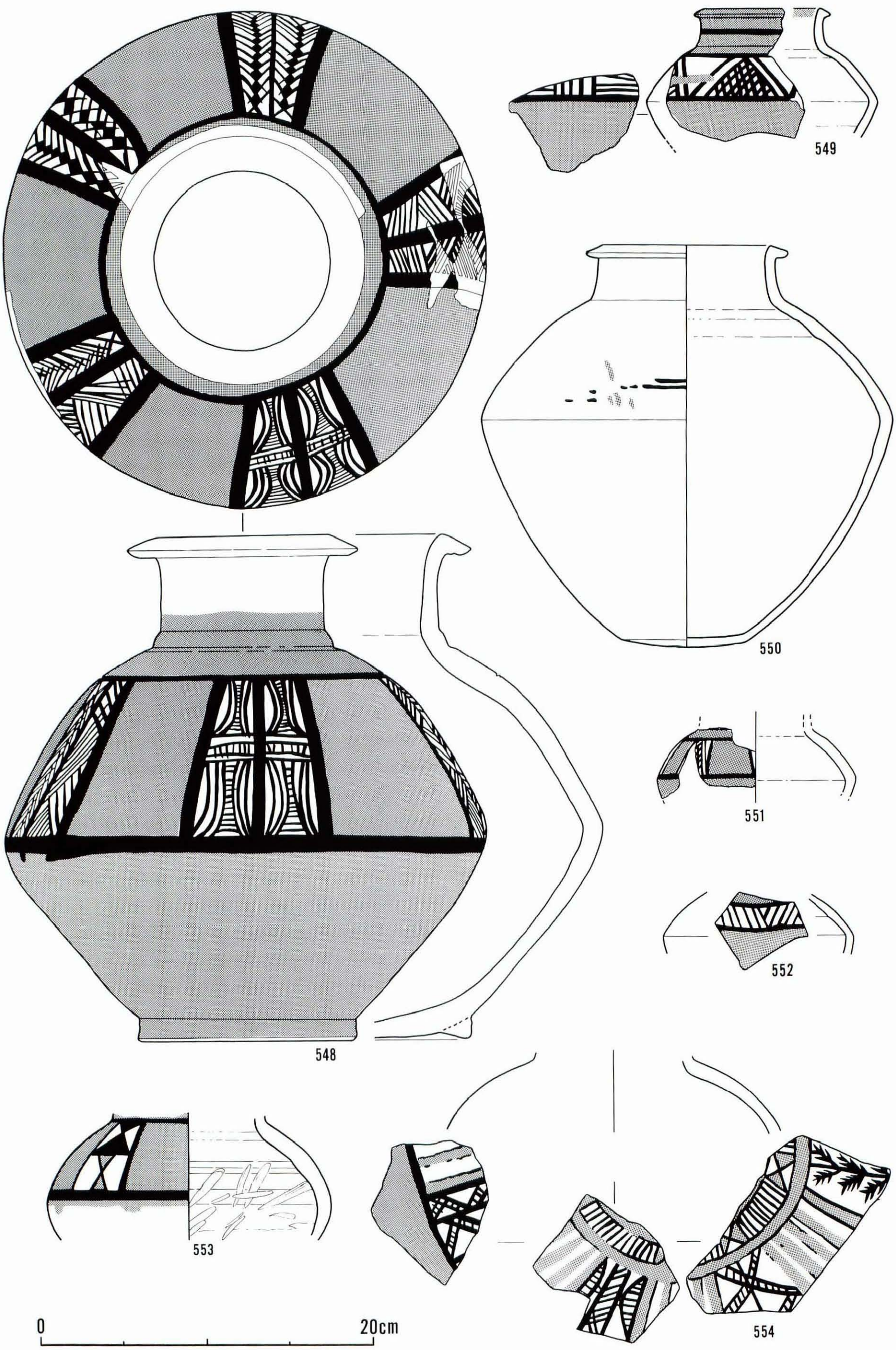

Fig. 4 Polychrome or bichrome painted pottery.

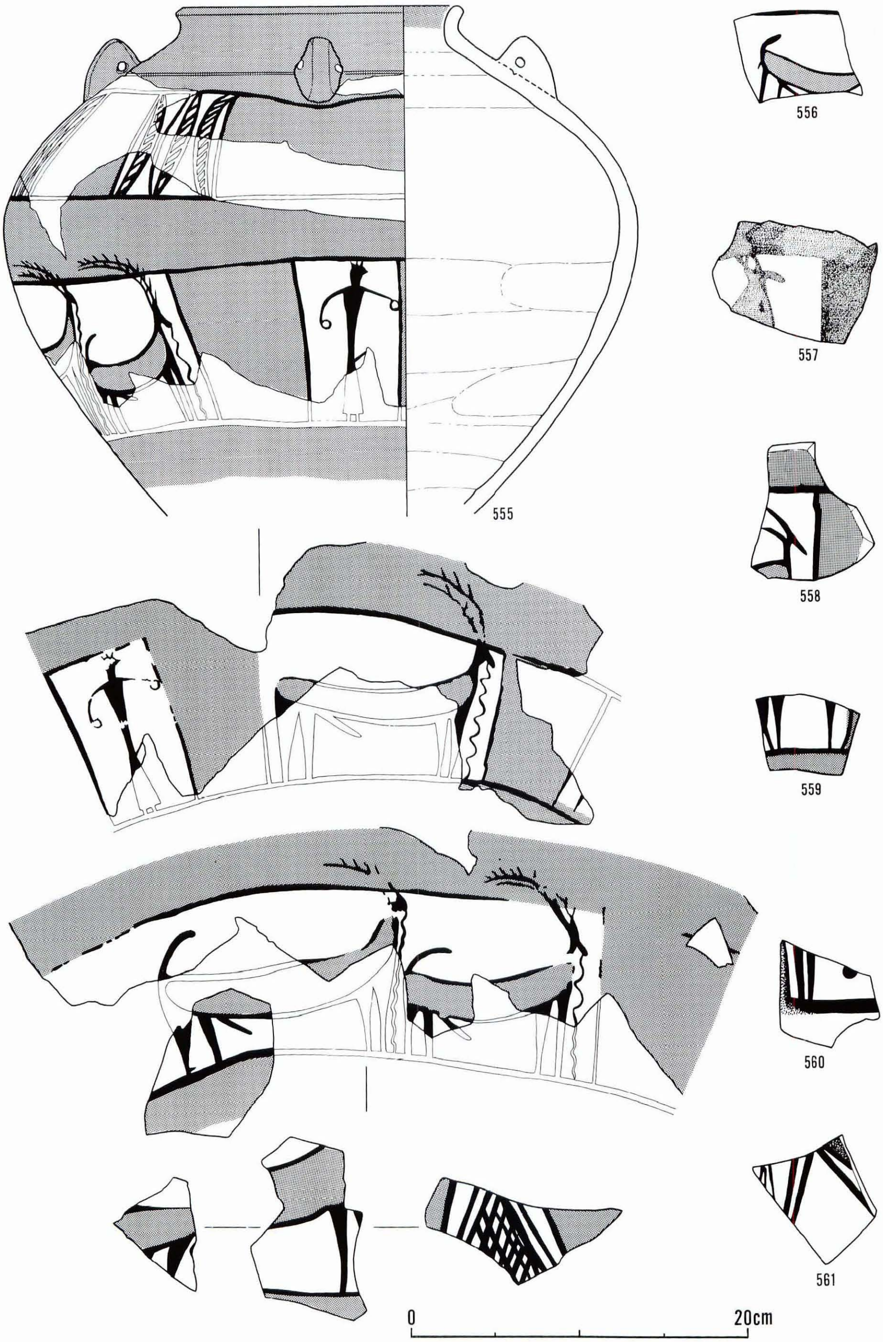

Fig. 5 Polychrome or bichrome painted pottery.

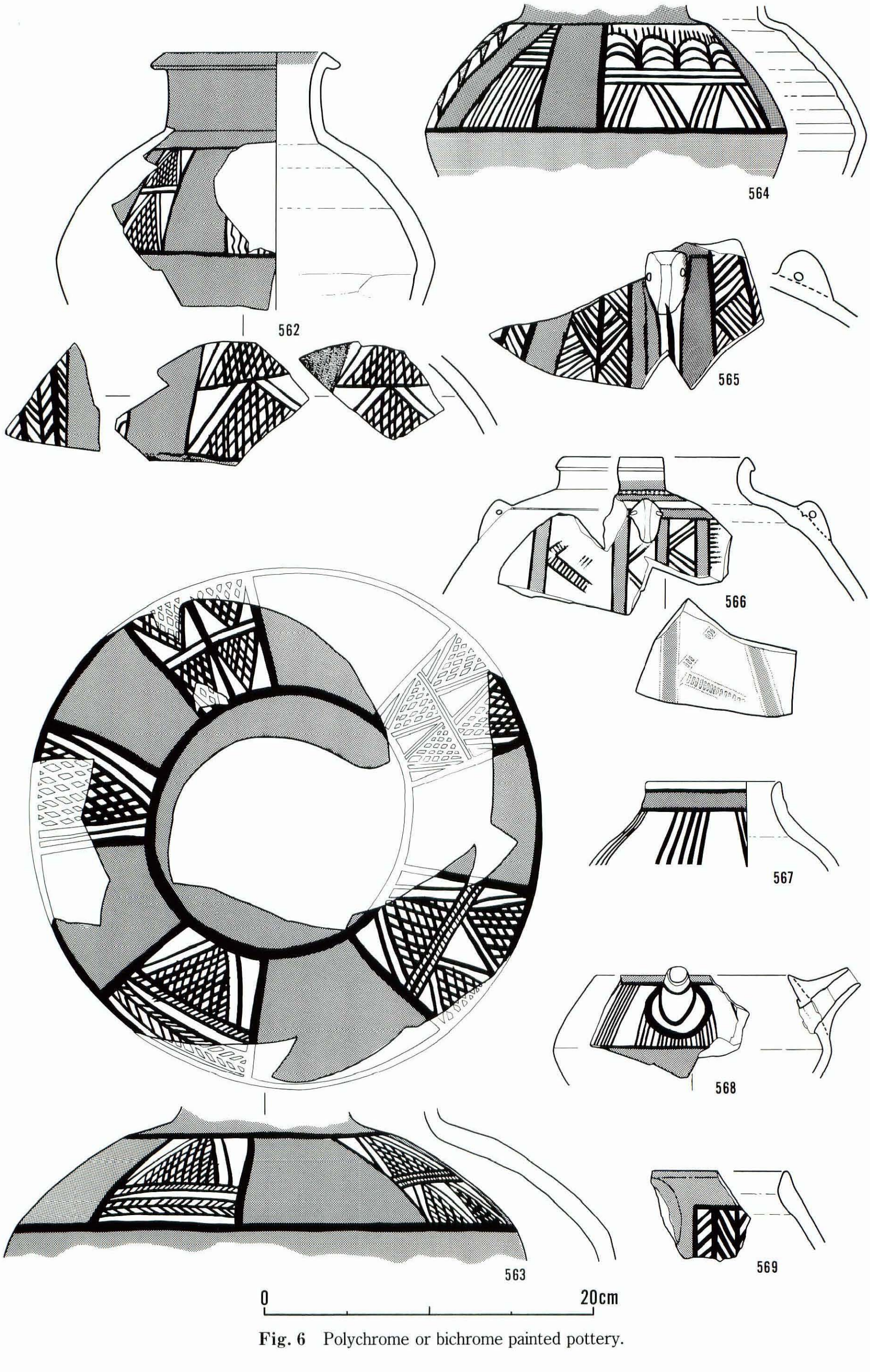

Fig. 6 Polychrome or bichrome painted pottery.

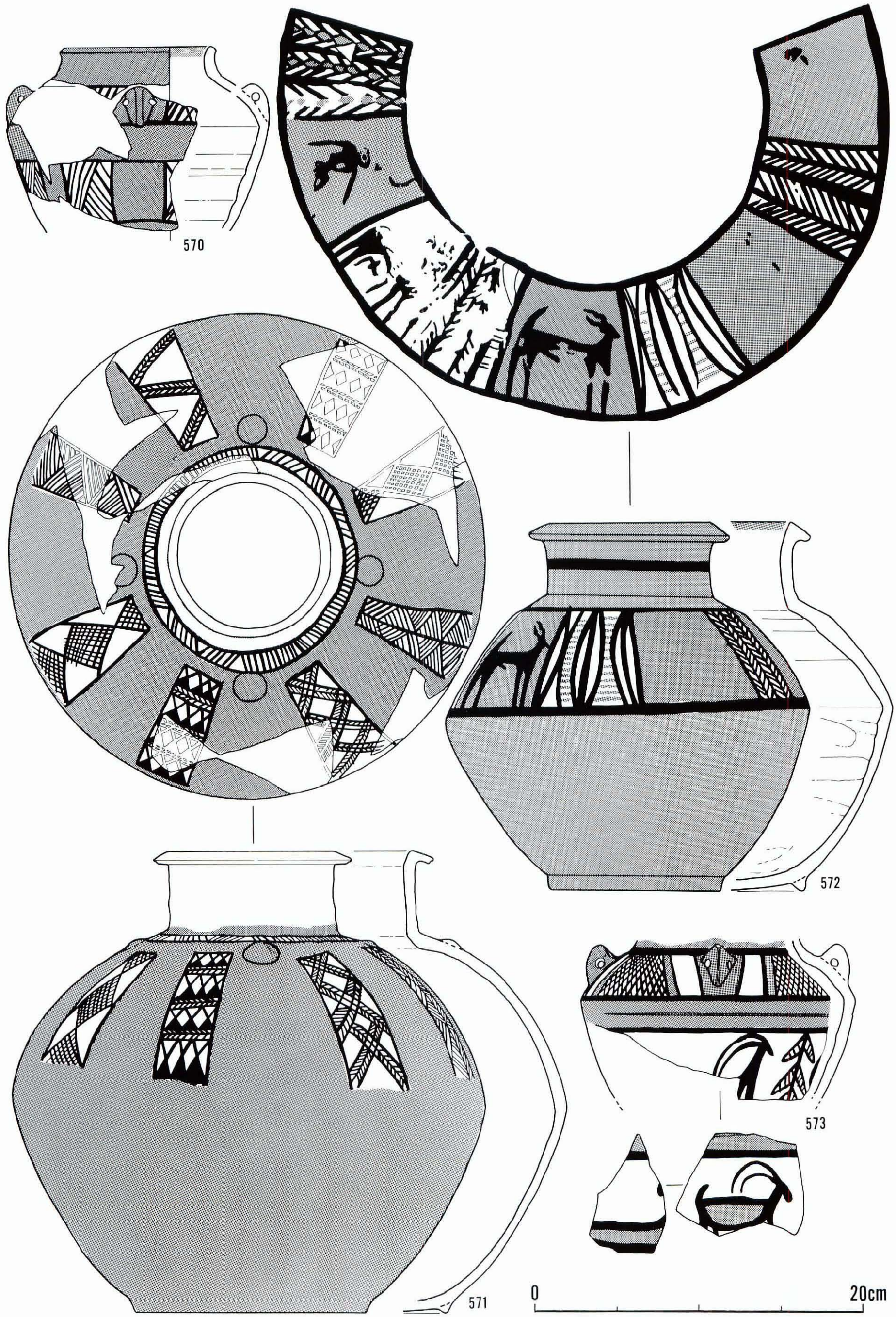

Fig. 7 Polychrome or bichrome painted pottery.

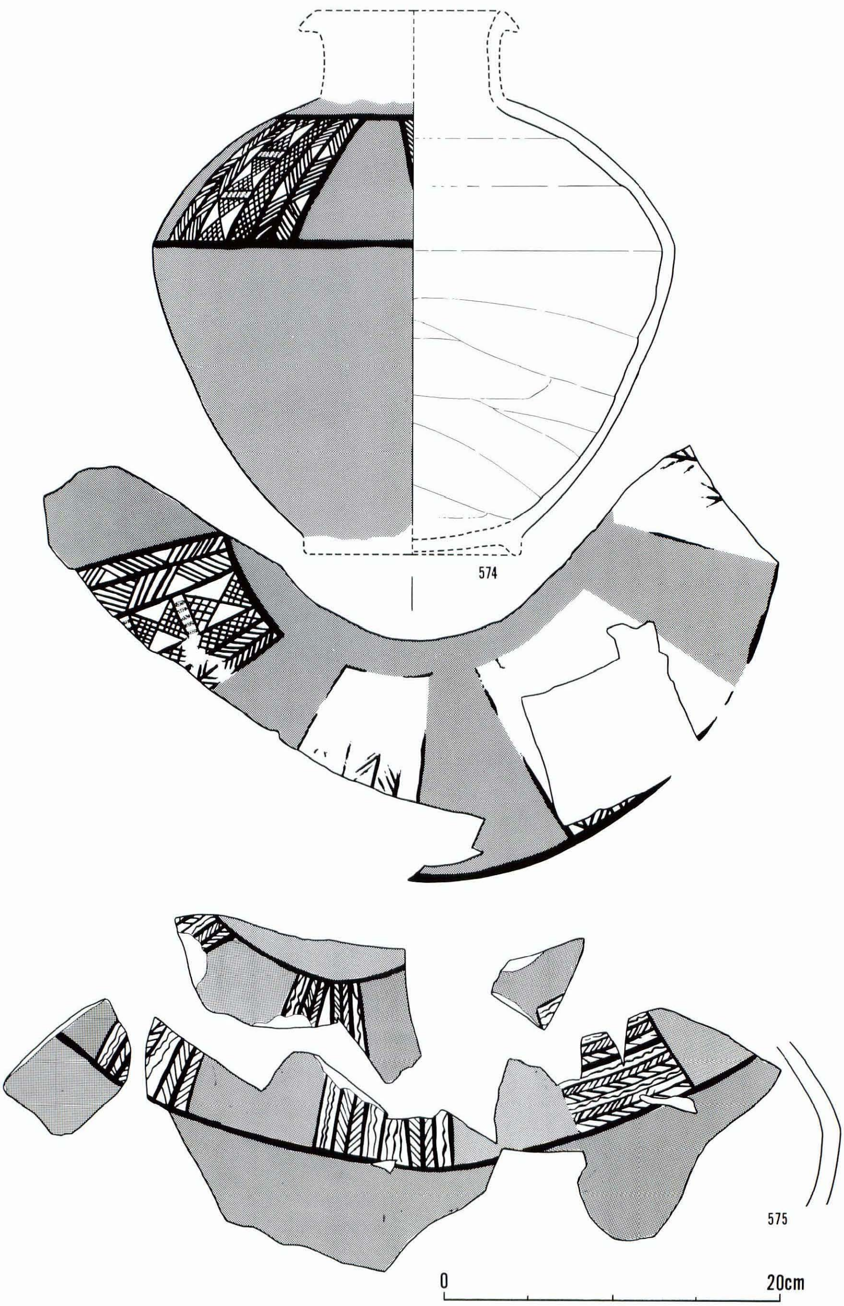

Fig. 8 Polychrome or bichrome painted pottery.

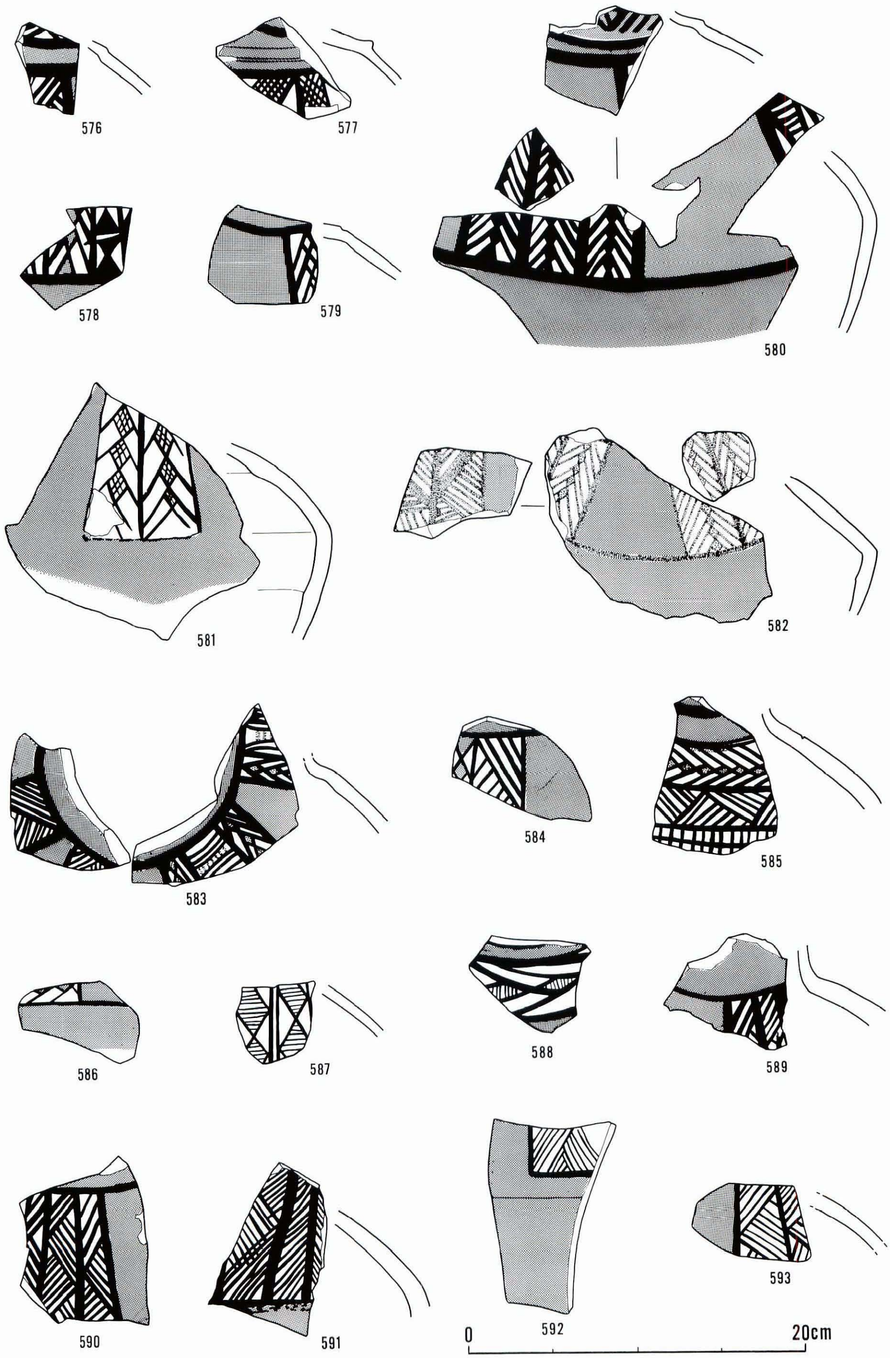

Fig. 9 Polychrome or bichrome painted pottery.

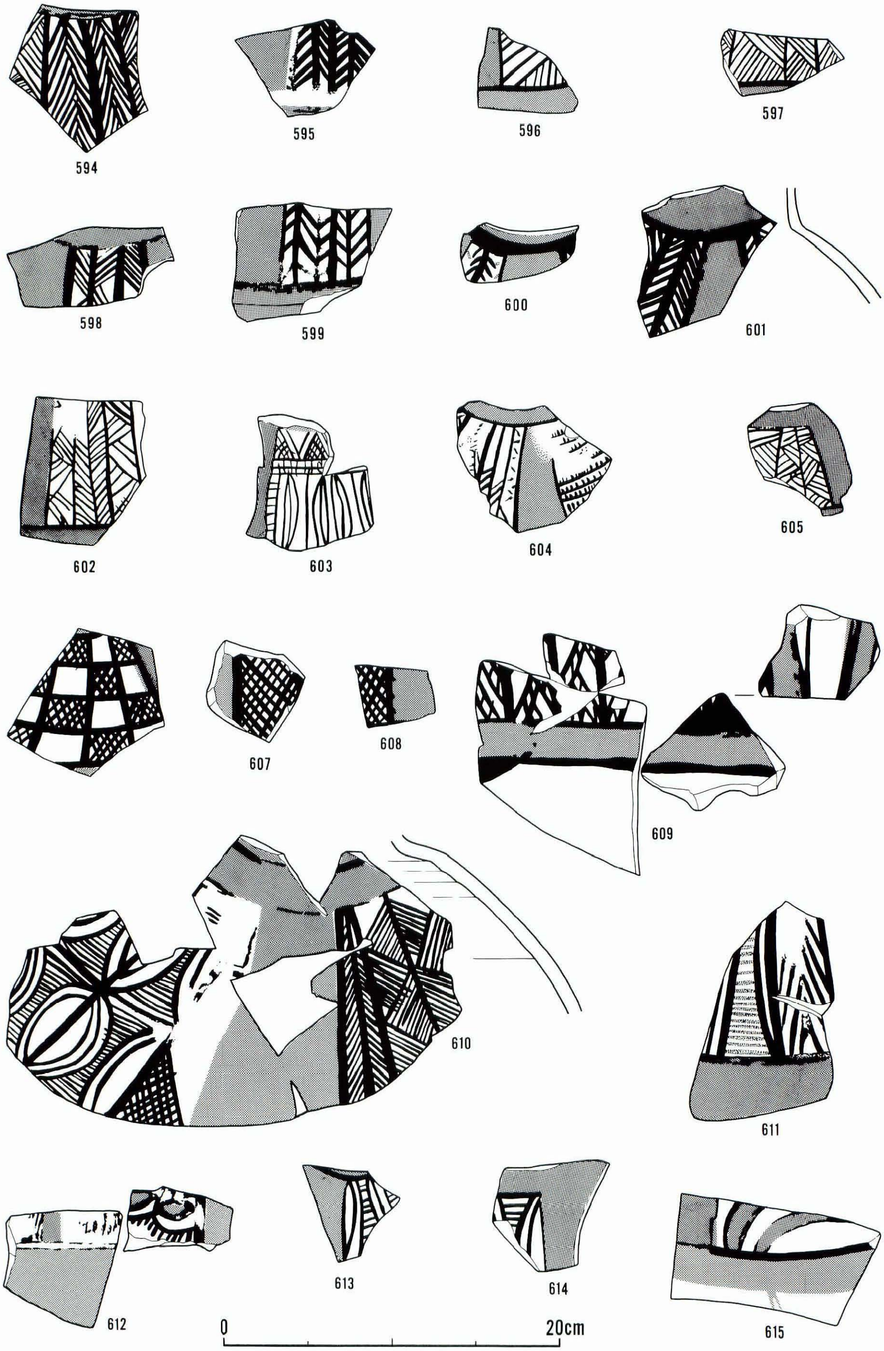

Fig. 10 Polychrome or bichrome painted pottery.

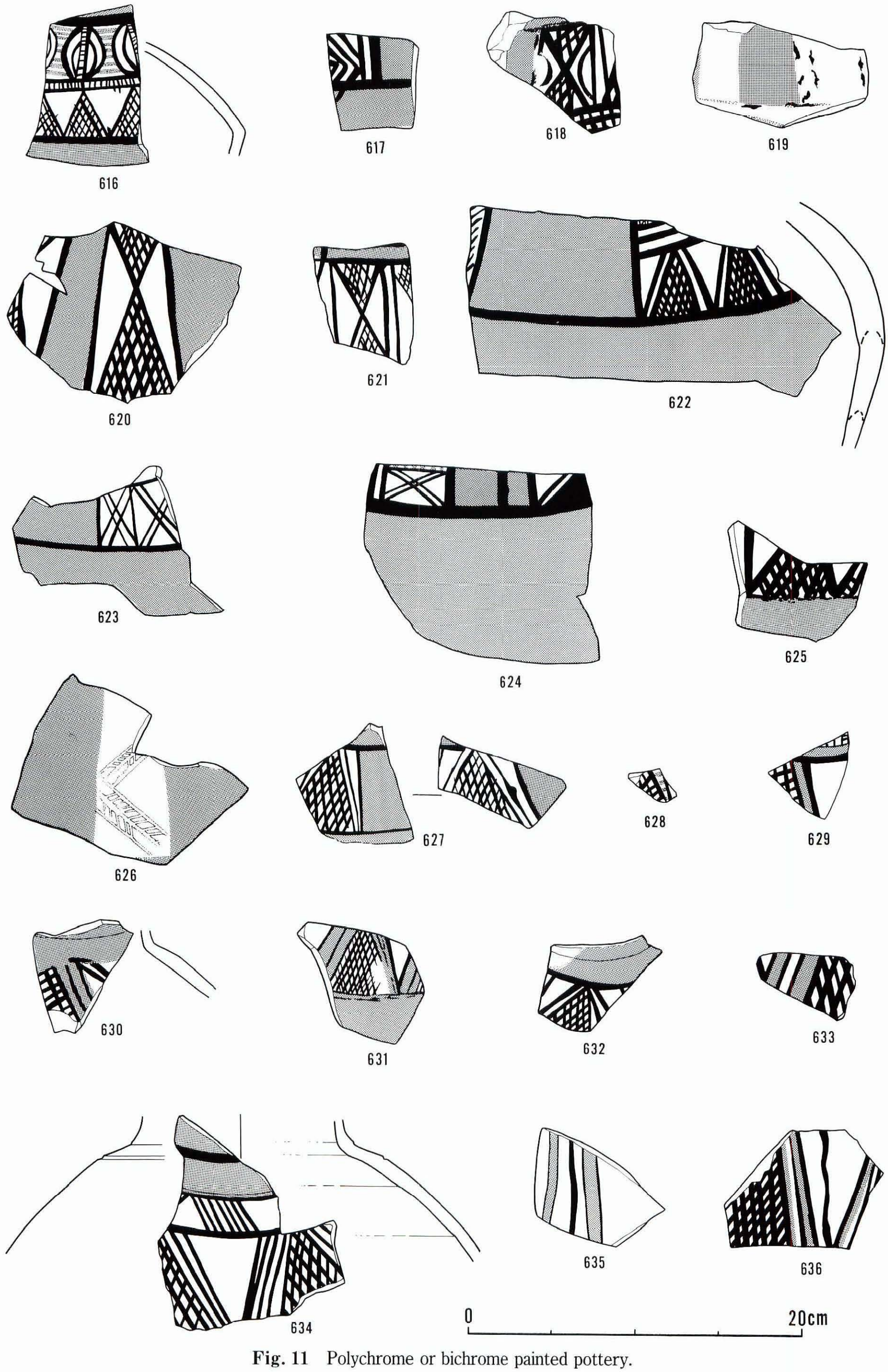

Fig. 11 Polychrome or bichrome painted pottery.

Fig. 12 Monochrome painted pottery.

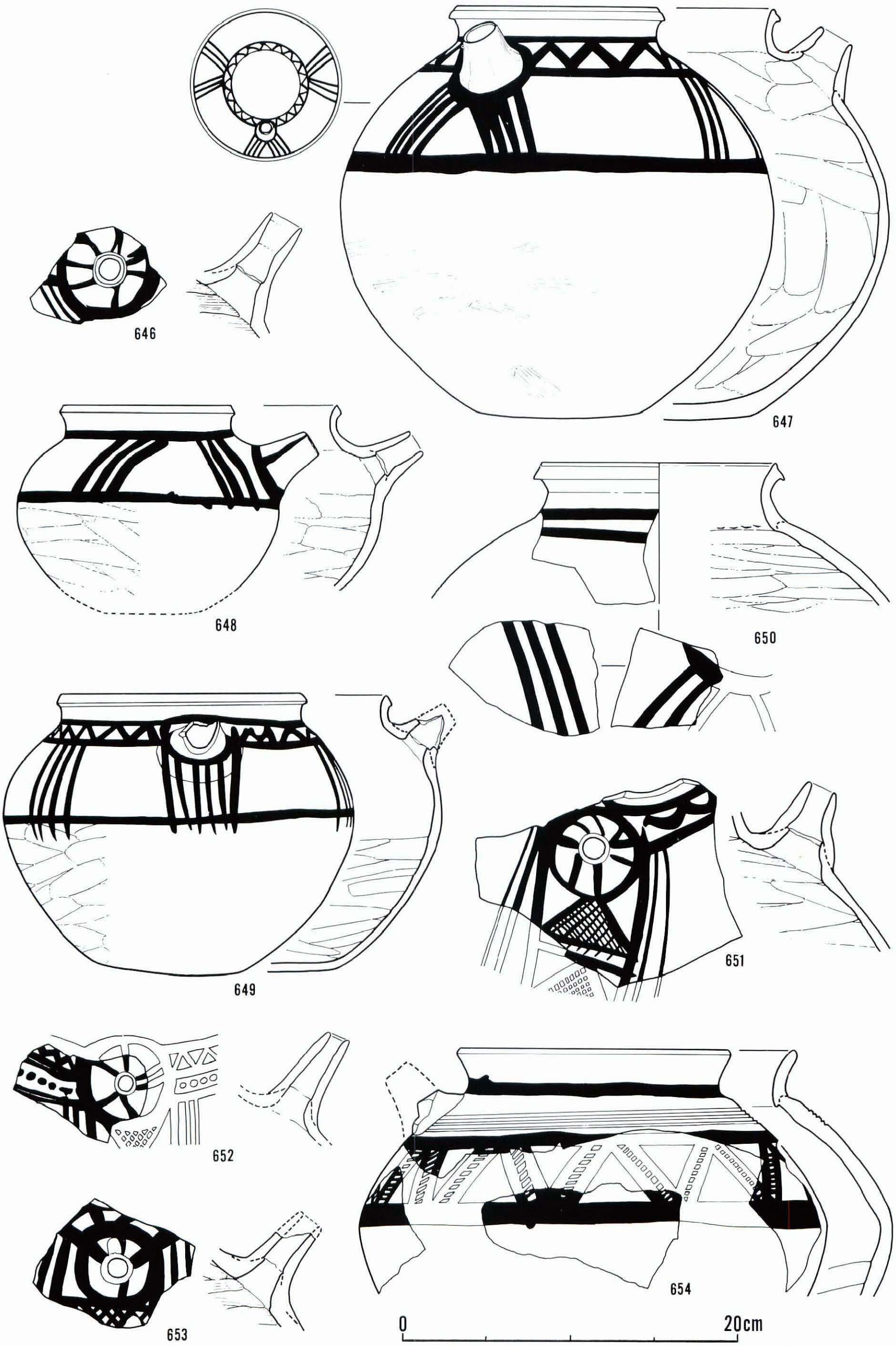

Fig. 13 Monochrome painted pottery.

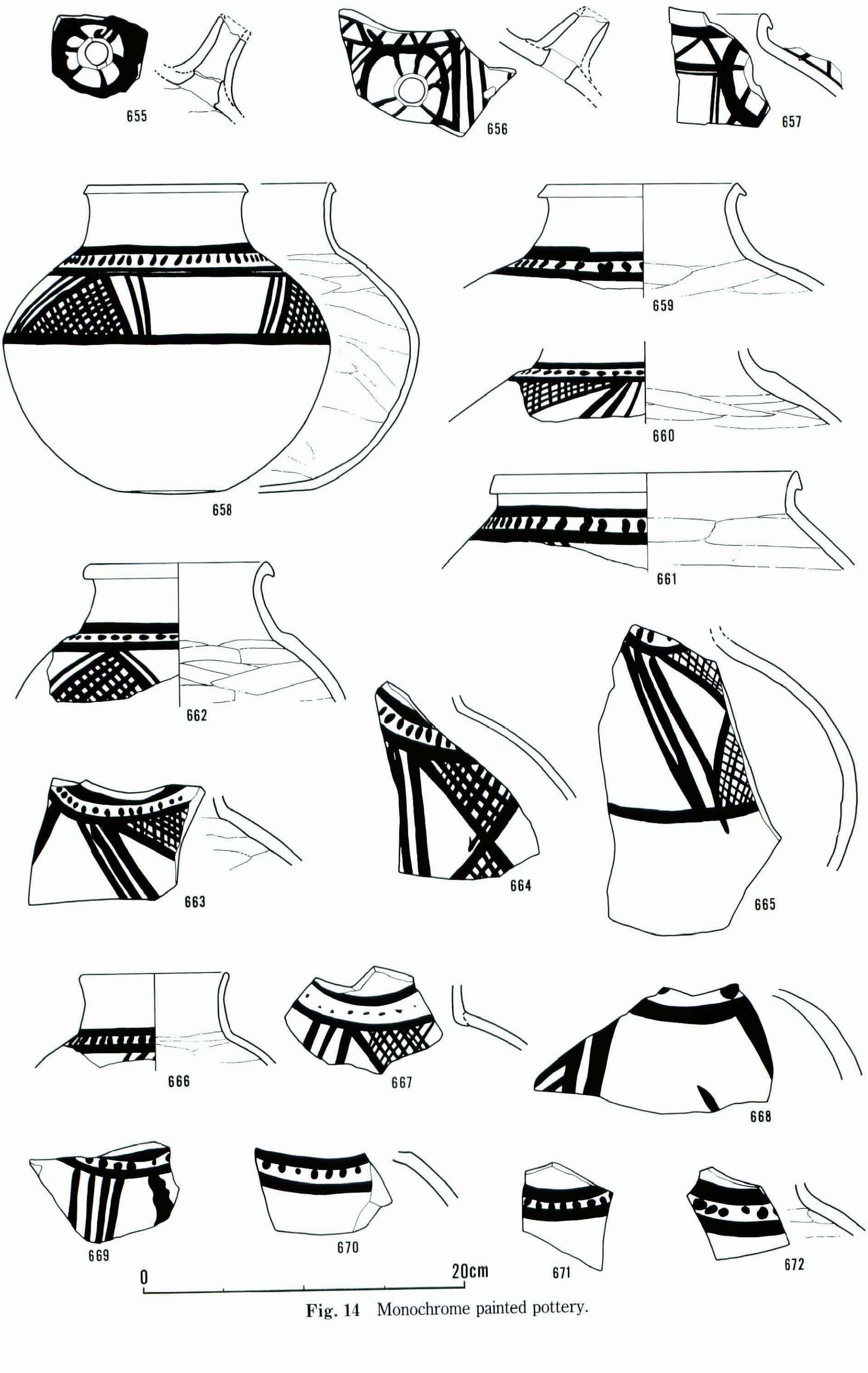

Fig. 14 Monochrome painted pottery.

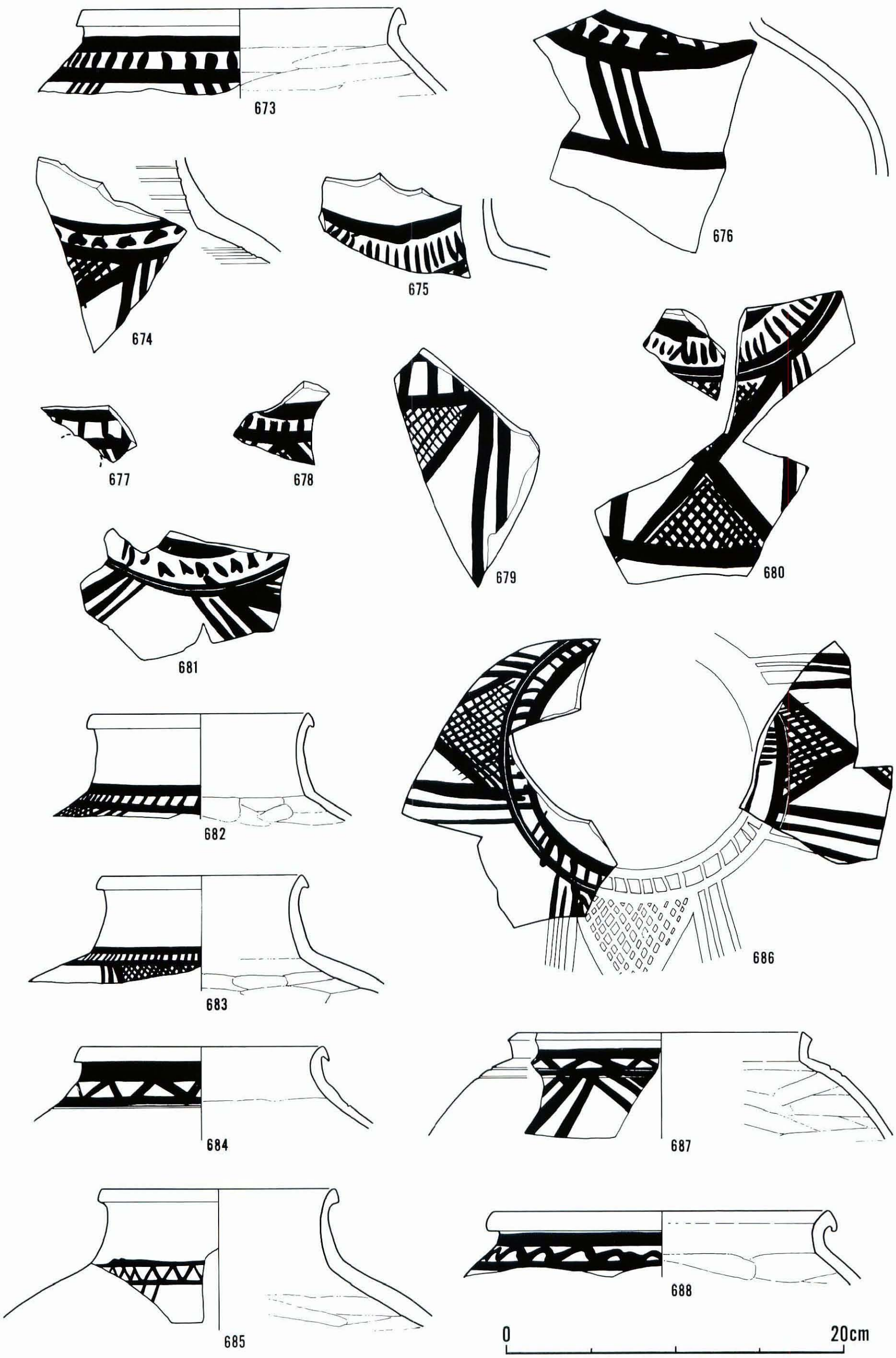

Fig. 15 Monochrome painted pottery.

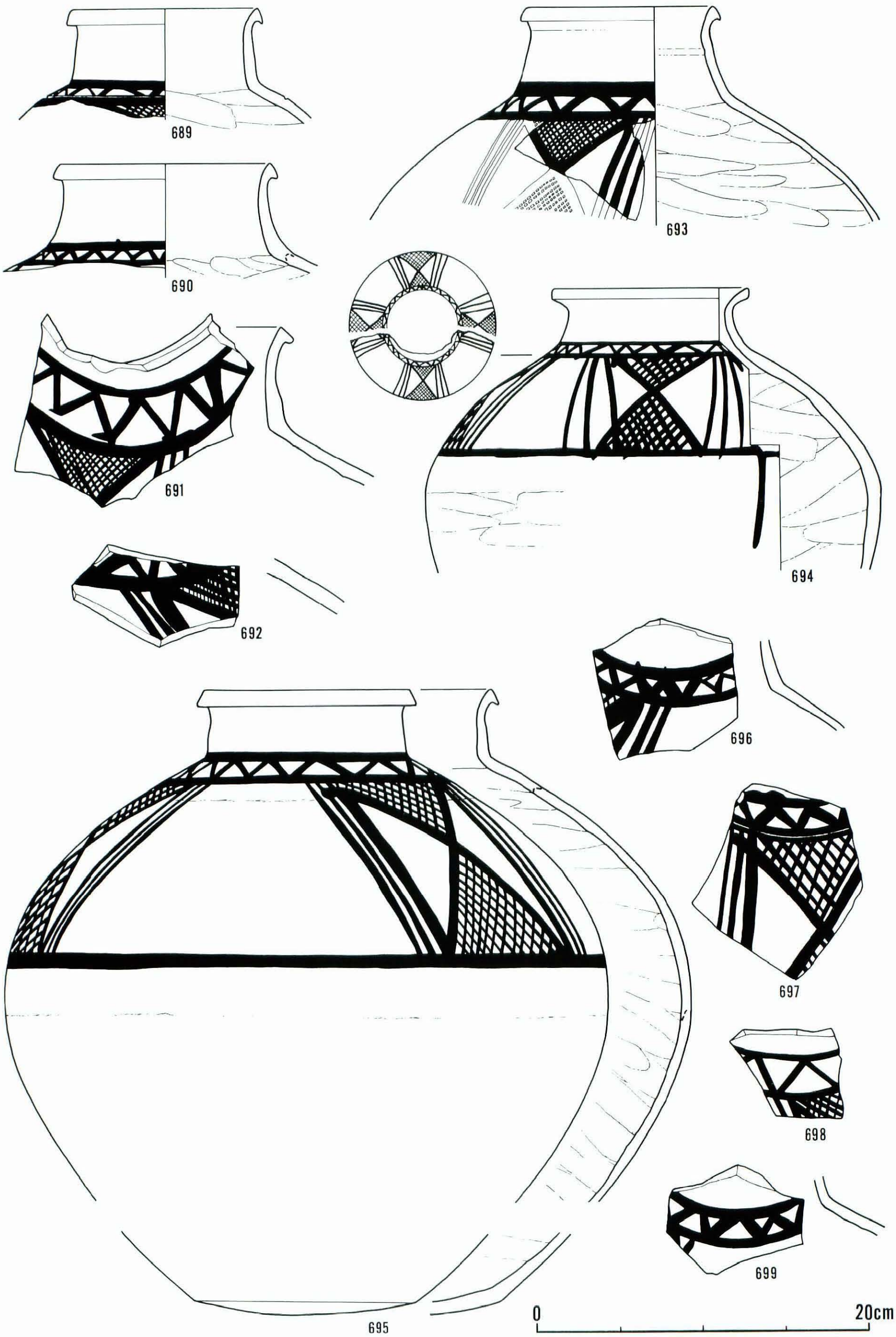

Fig. 16 Monochrome painted pottery.

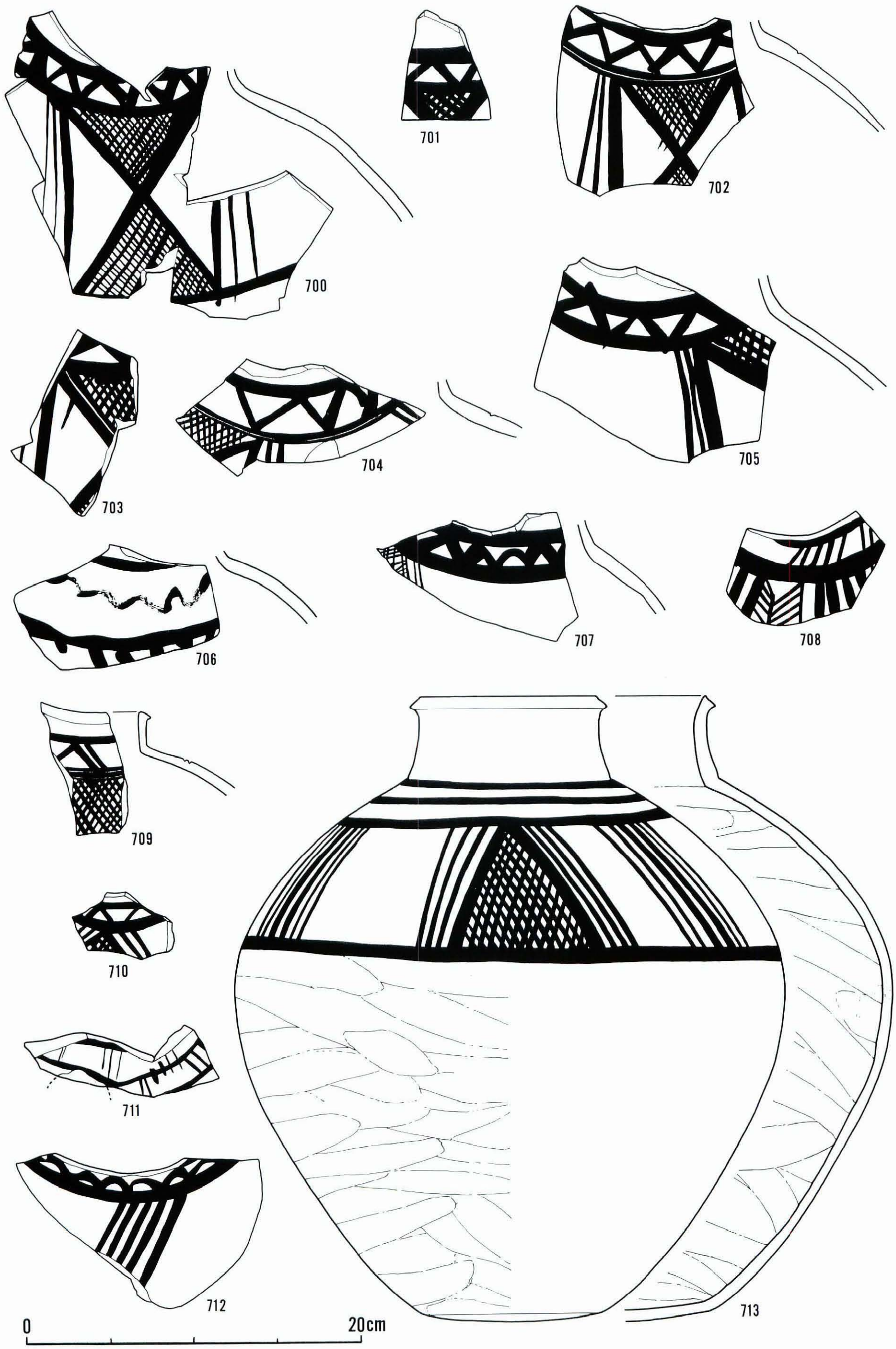

Fig. 17 Monochrome painted pottery.

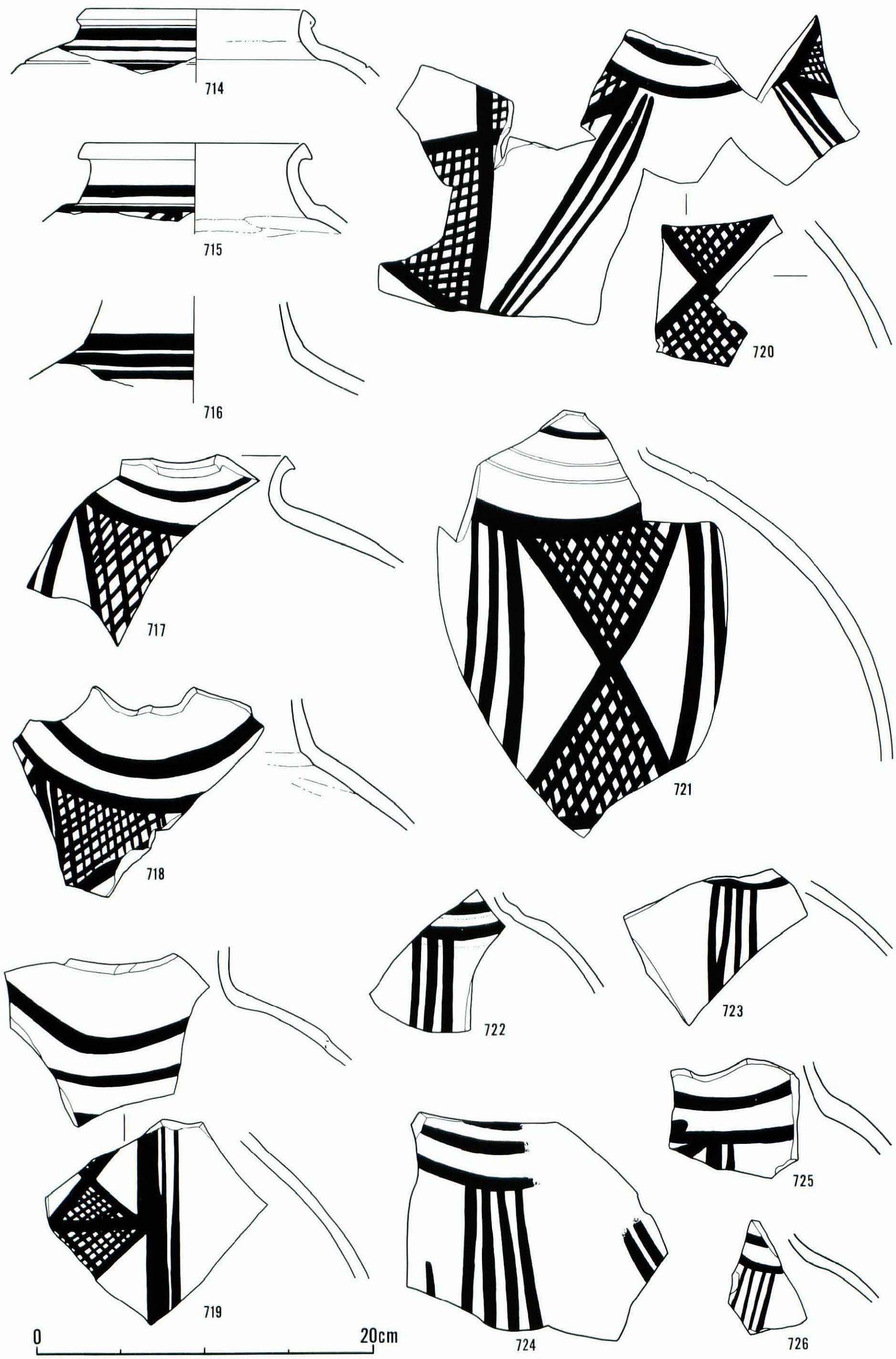

Fig. 18 Monochrome painted pottery.

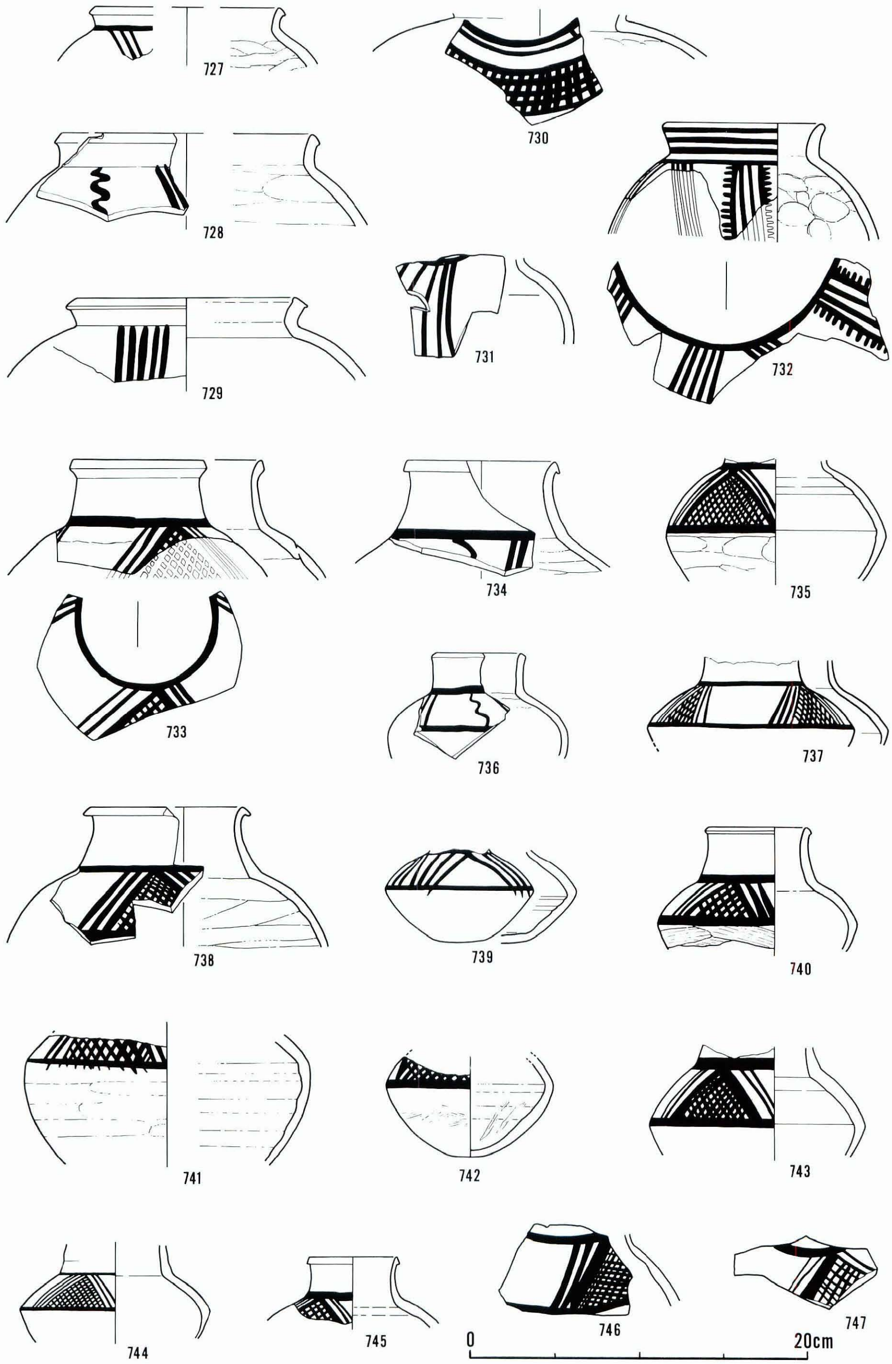

Fig. 19 Monochrome painted pottery.

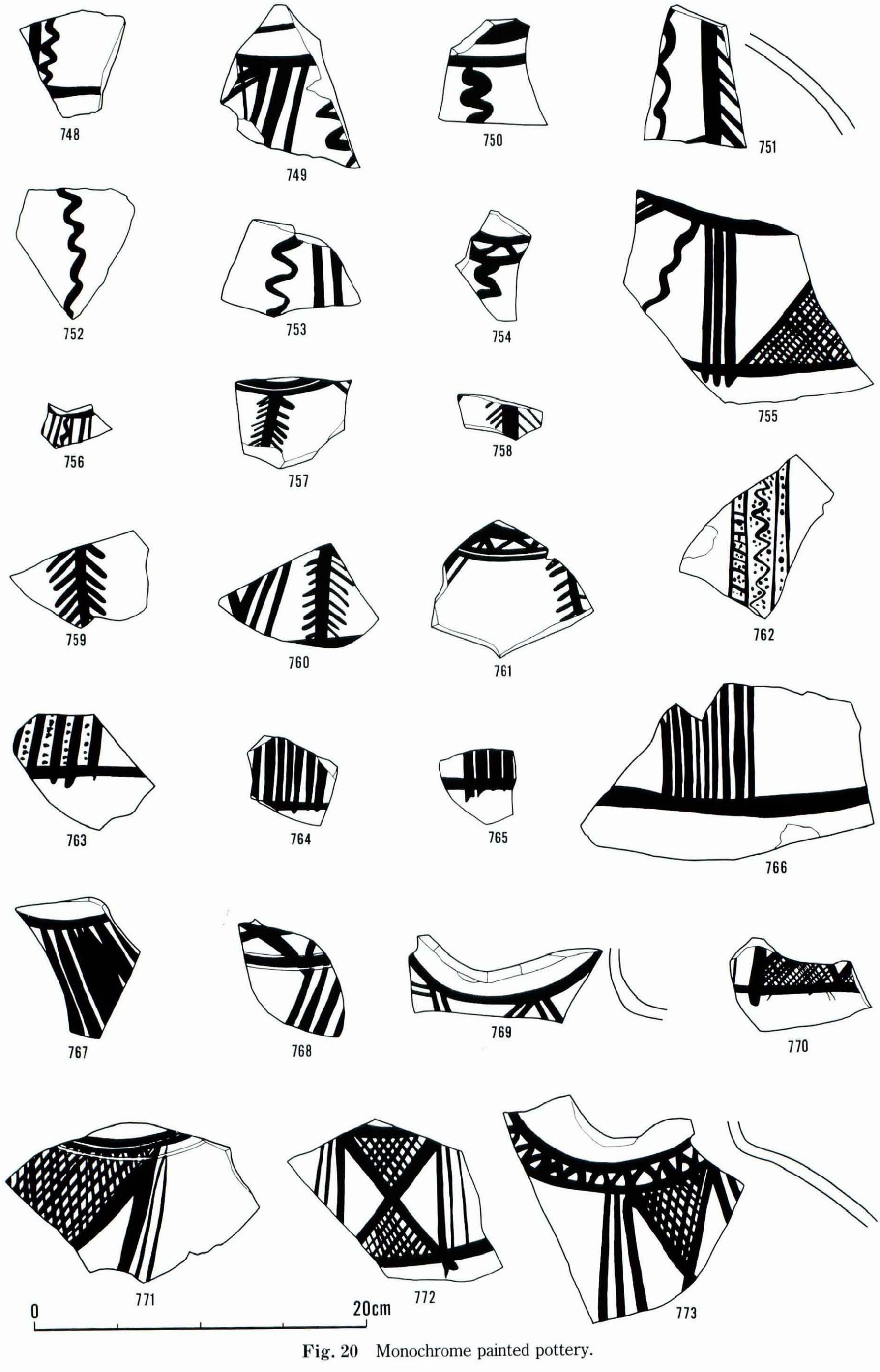

Fig. 20 Monochrome painted pottery.

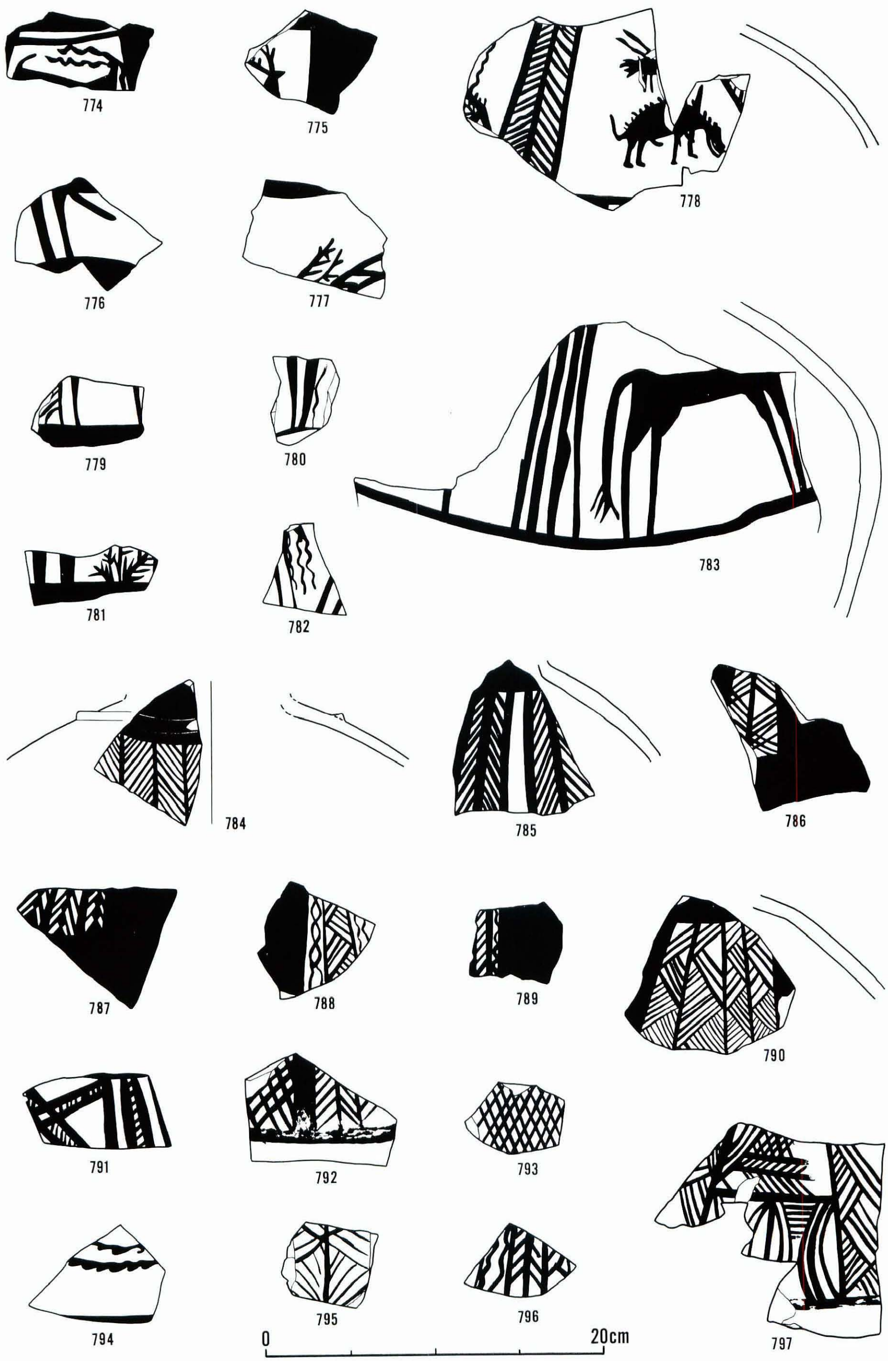

Fig. 21 Monochrome painted pottery.

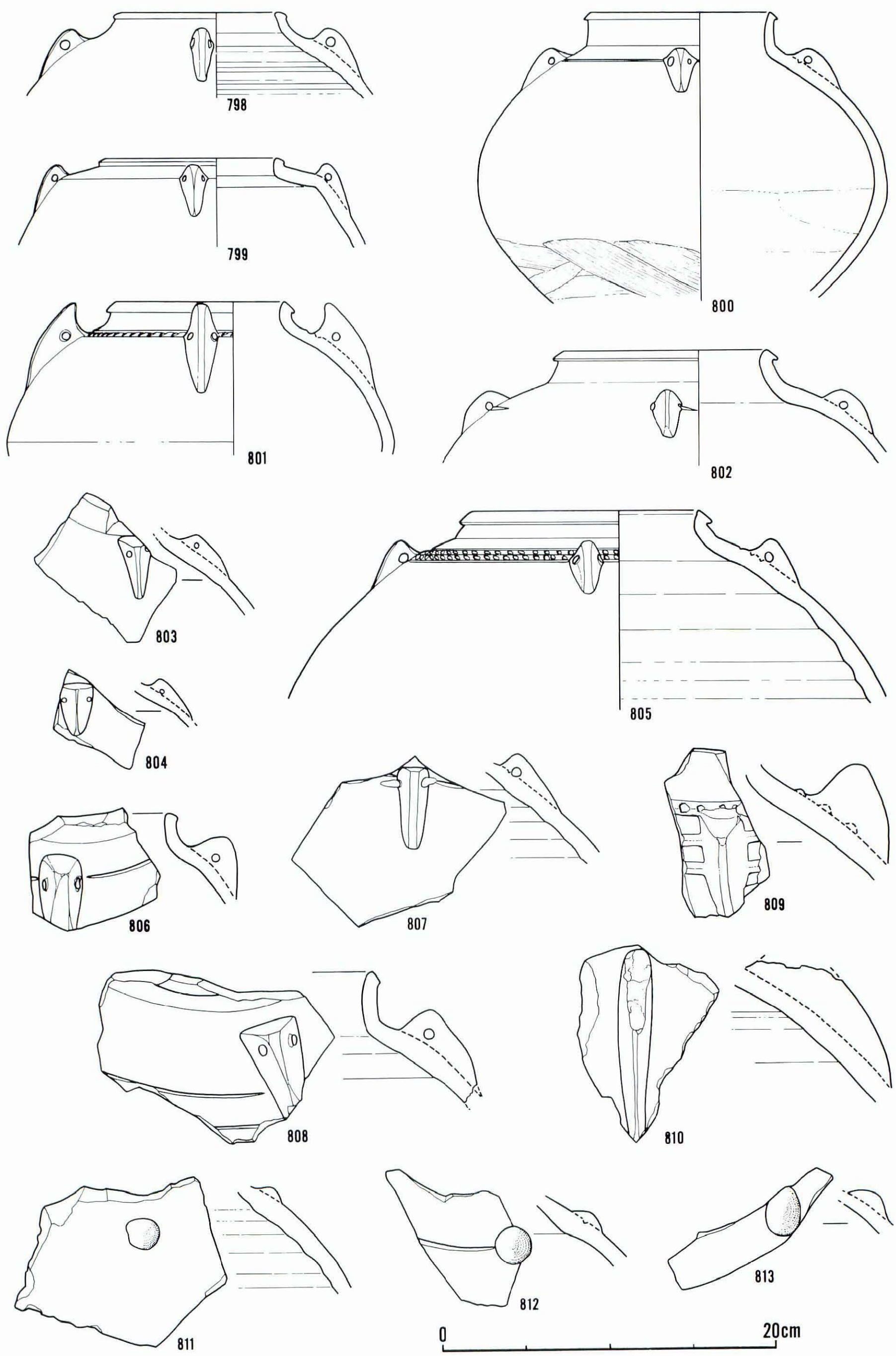

Fig. 22 Lugged pottery.

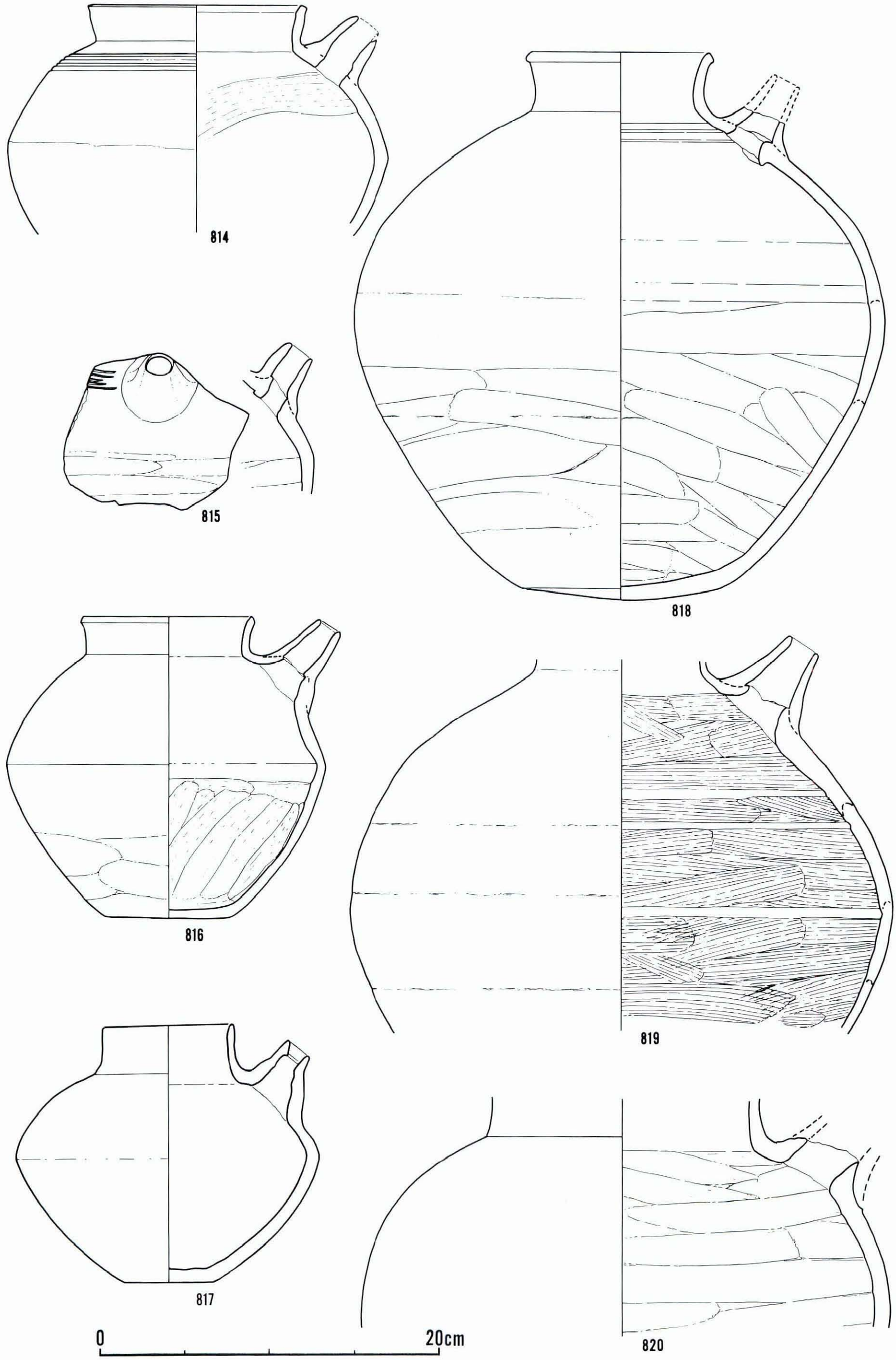

Fig. 23 Spouted pottery.

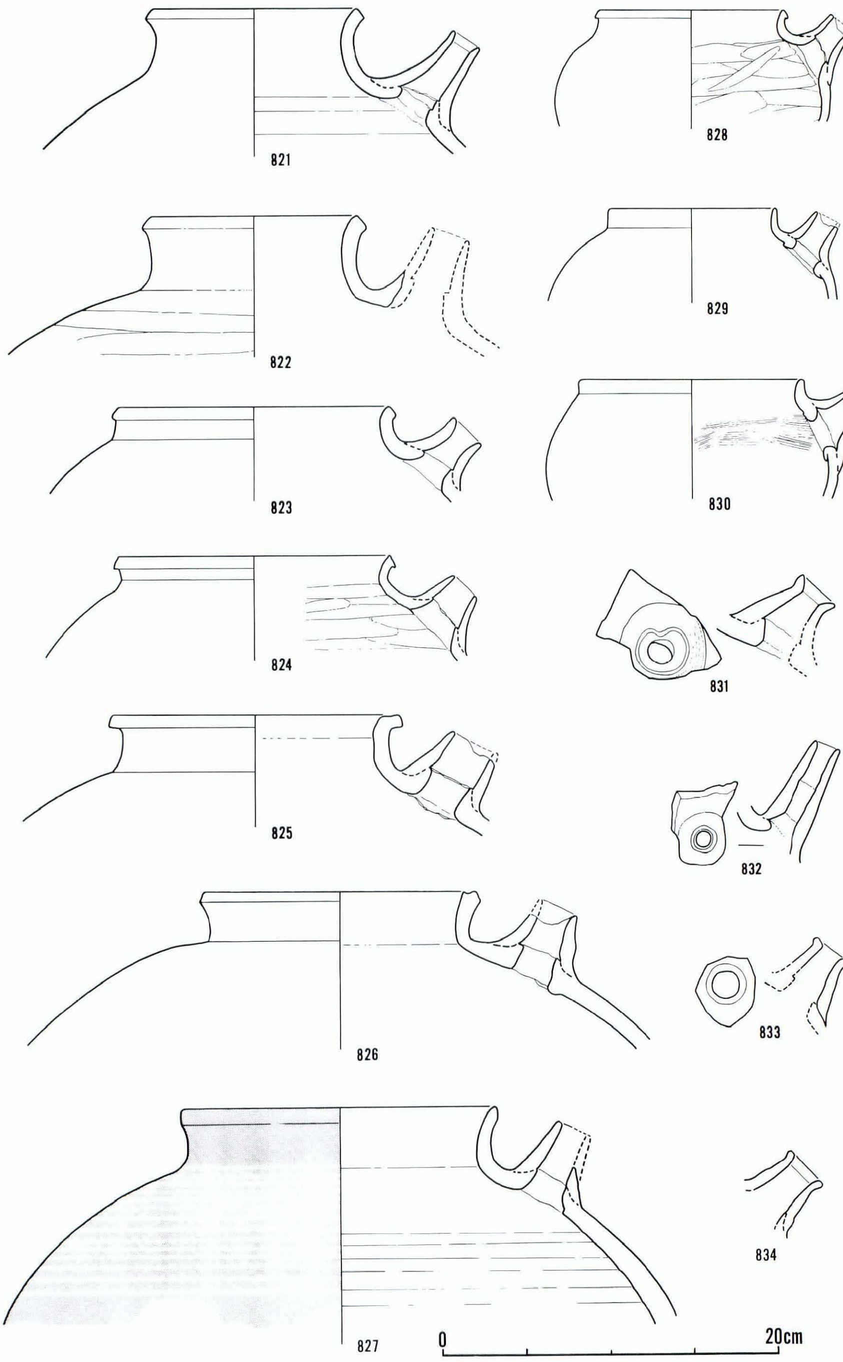

Fig. 24 Spouted pottery.

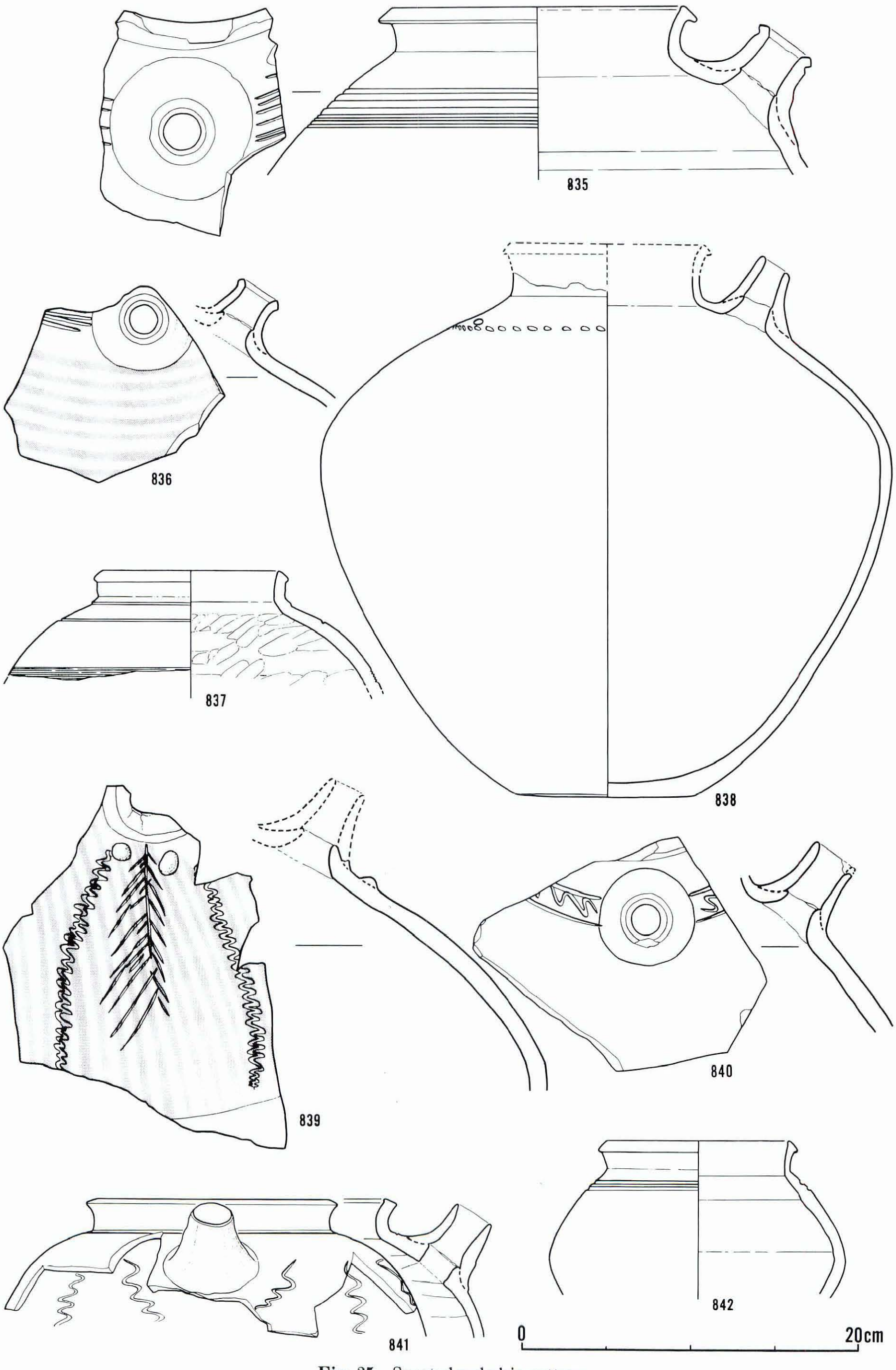

Fig. 25 Spouted and plain pottery.

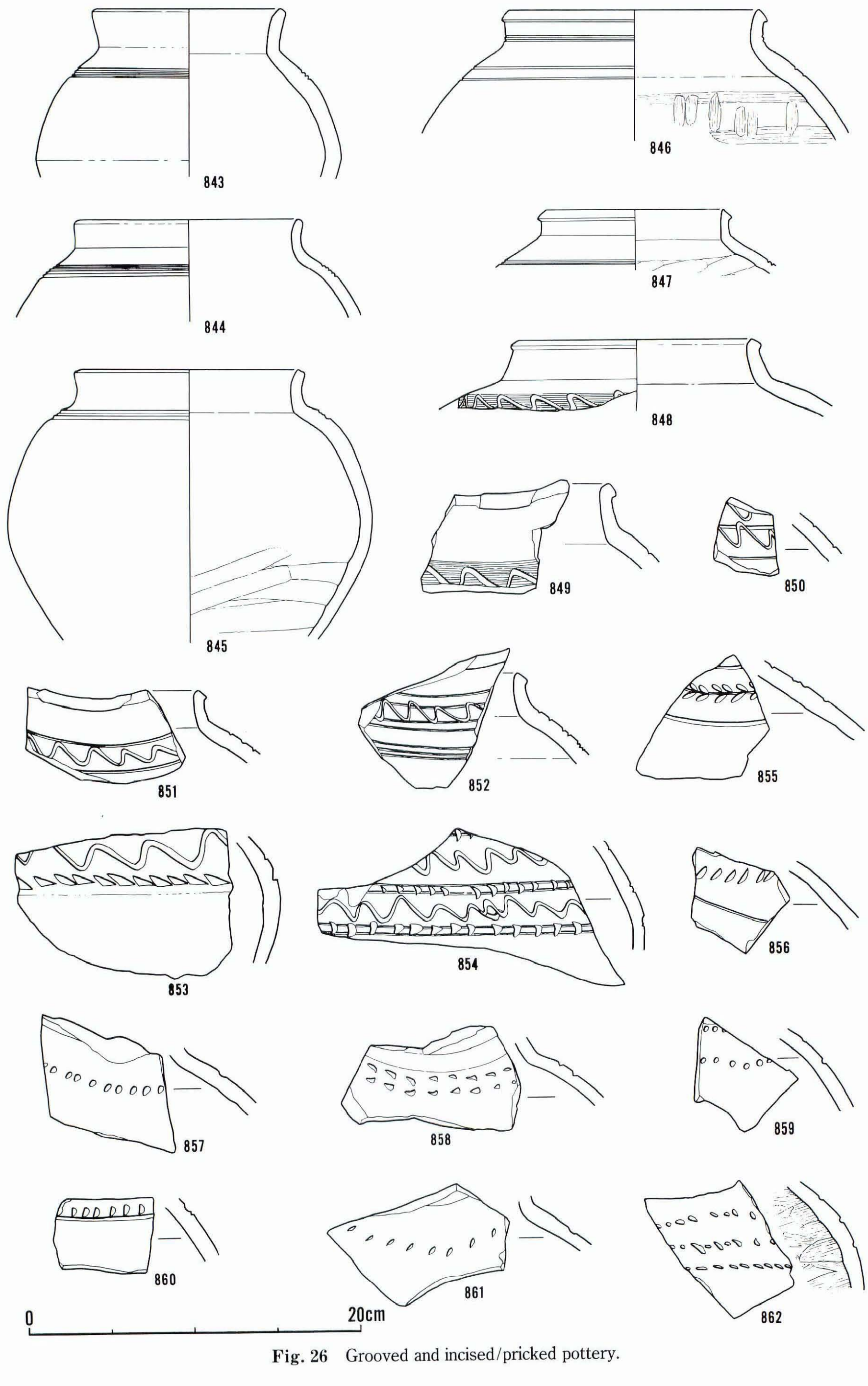

Fig. 26 Grooved and incised/pricked pottery.

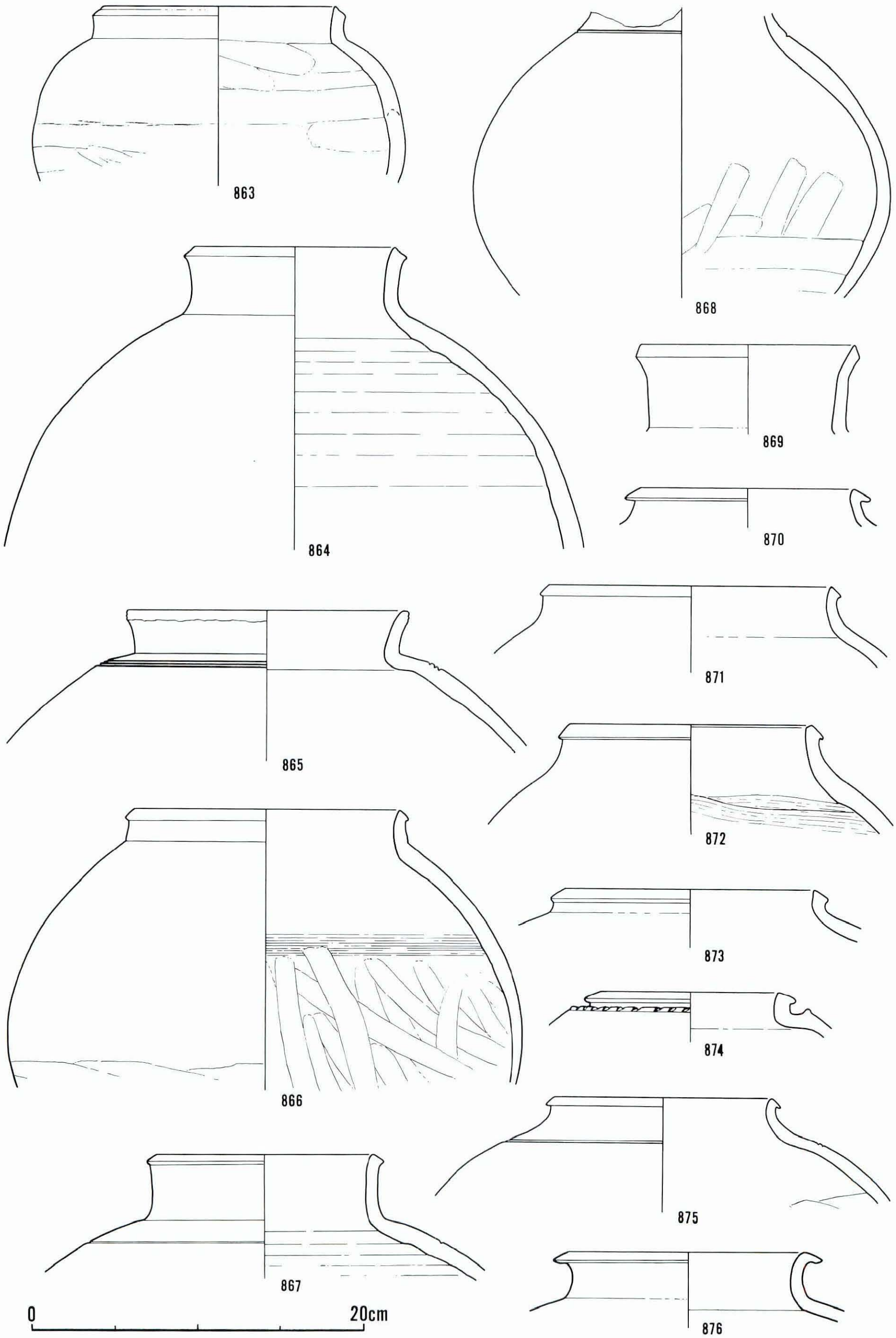

Fig. 27 Plain pottery.

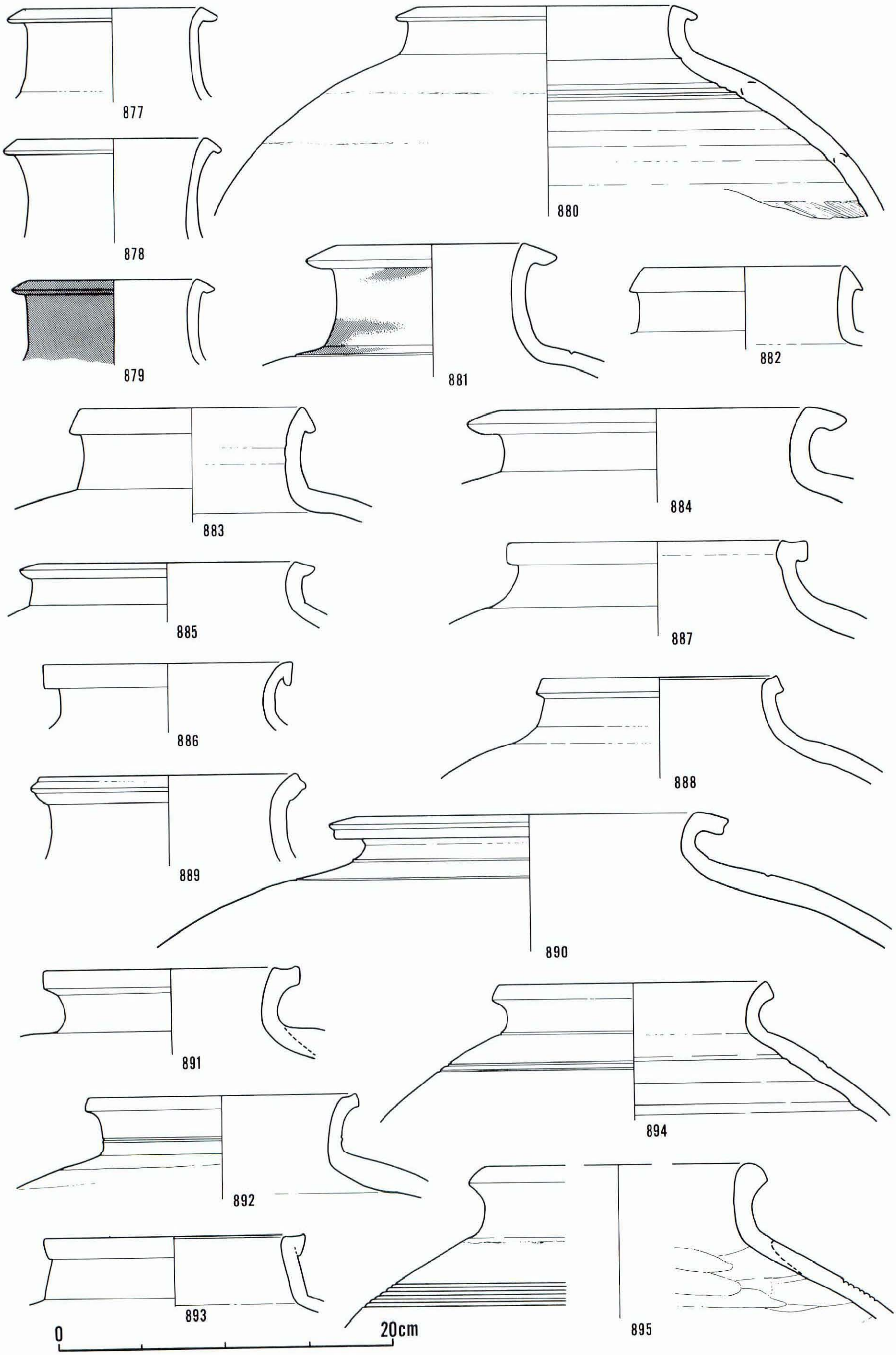

Fig. 28 Plain and painted pottery.

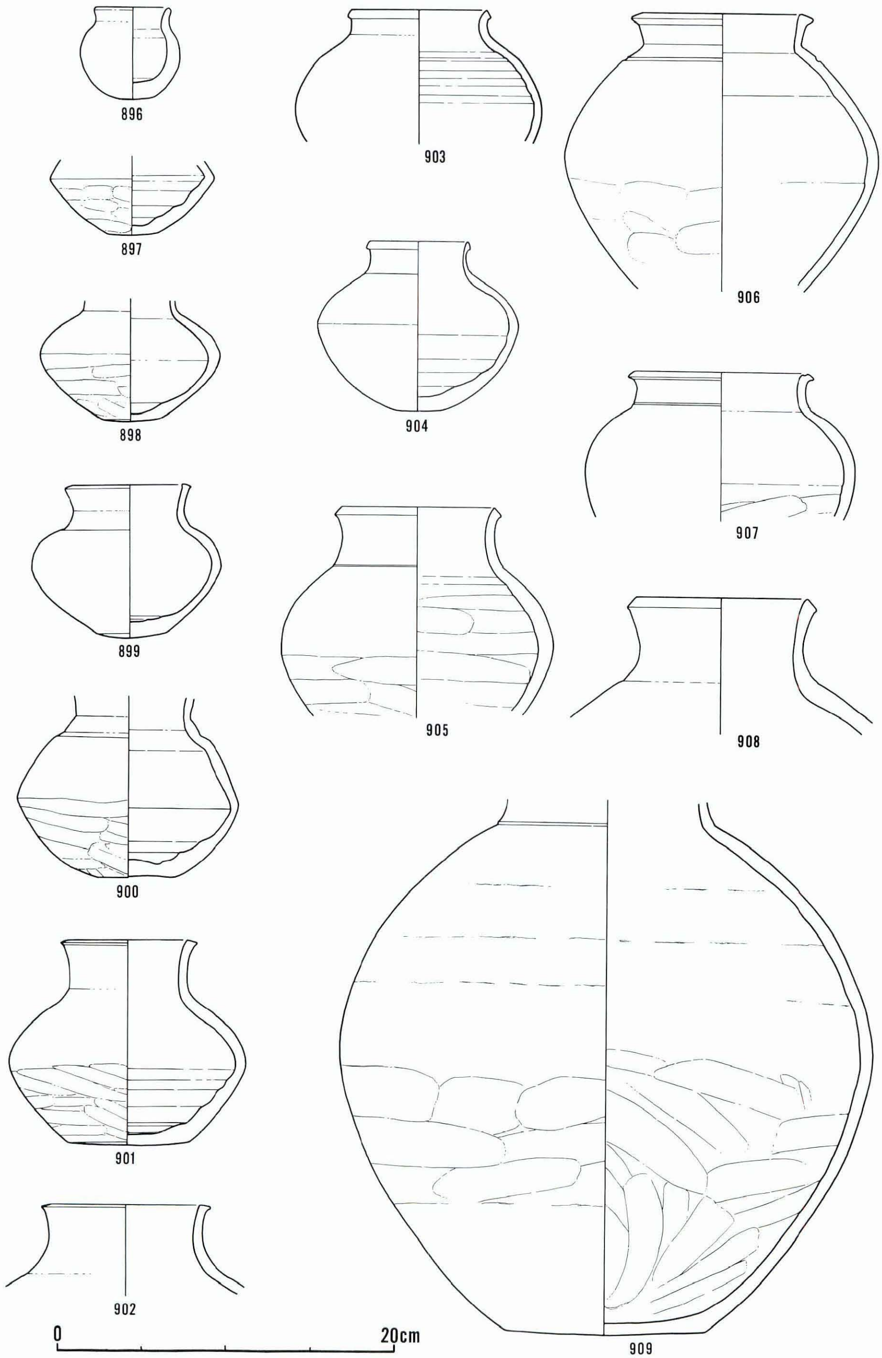

Fig. 29 Plain pottery.

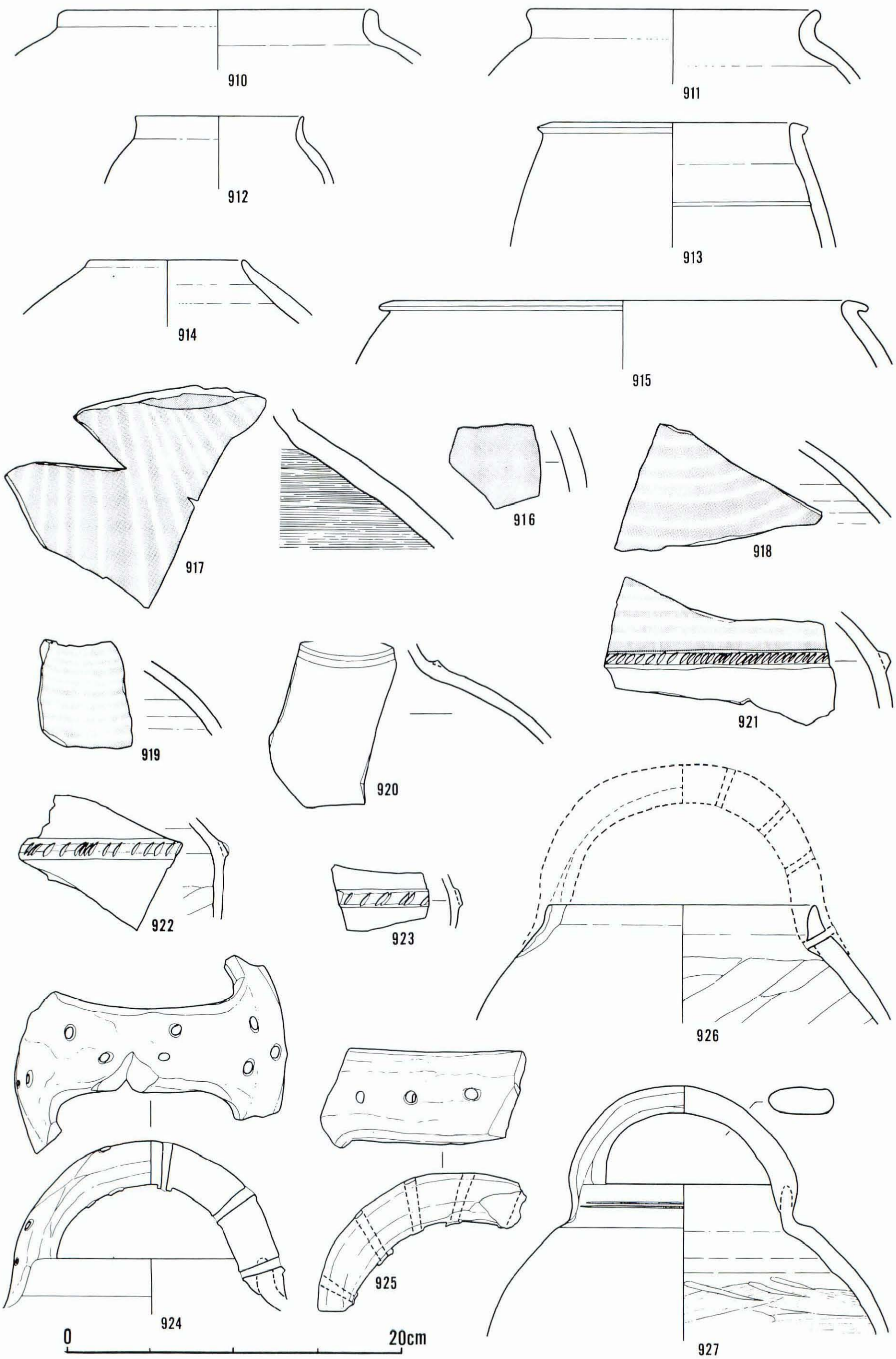

Fig. 30 Plain pottery.

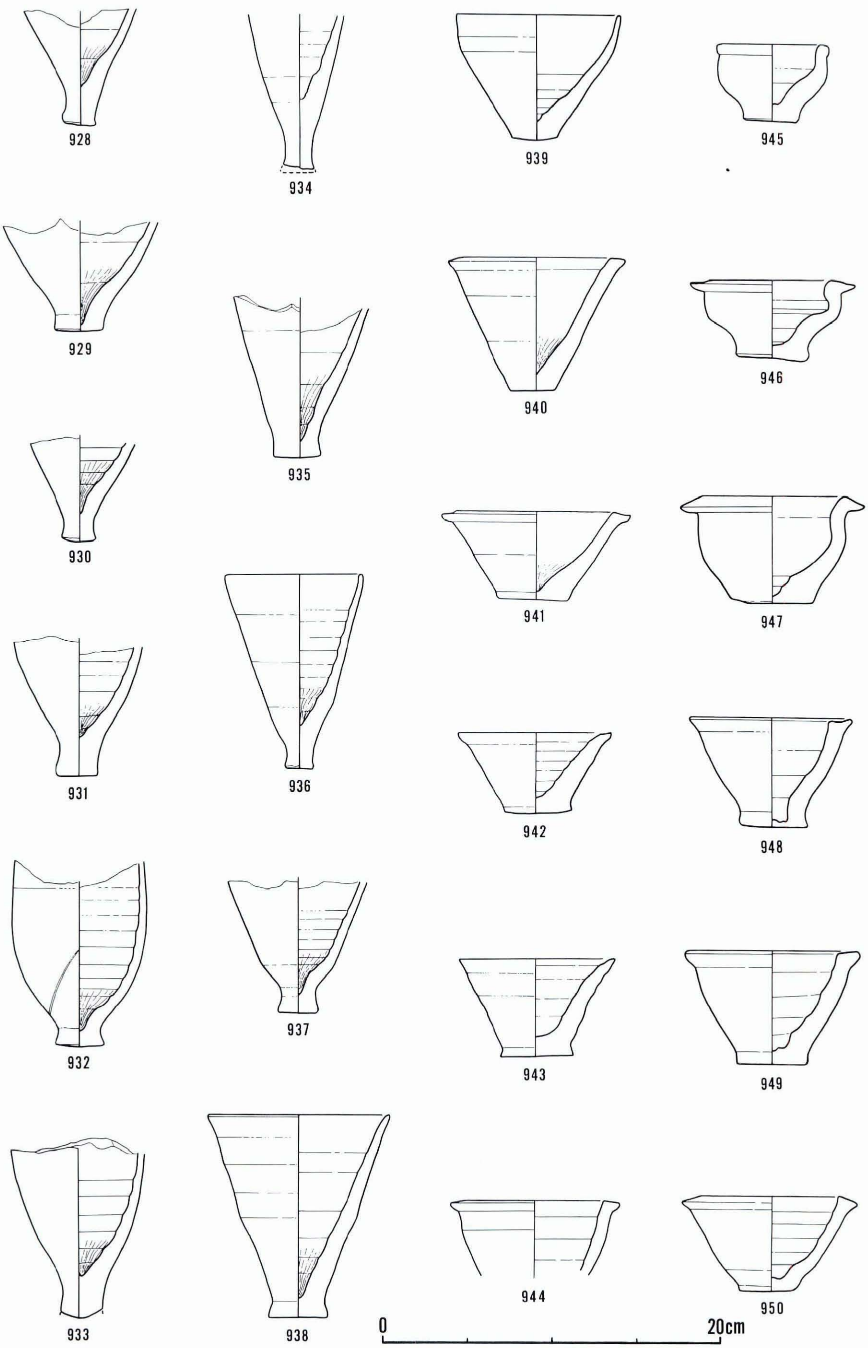

Fig. 31 Plain pottery.

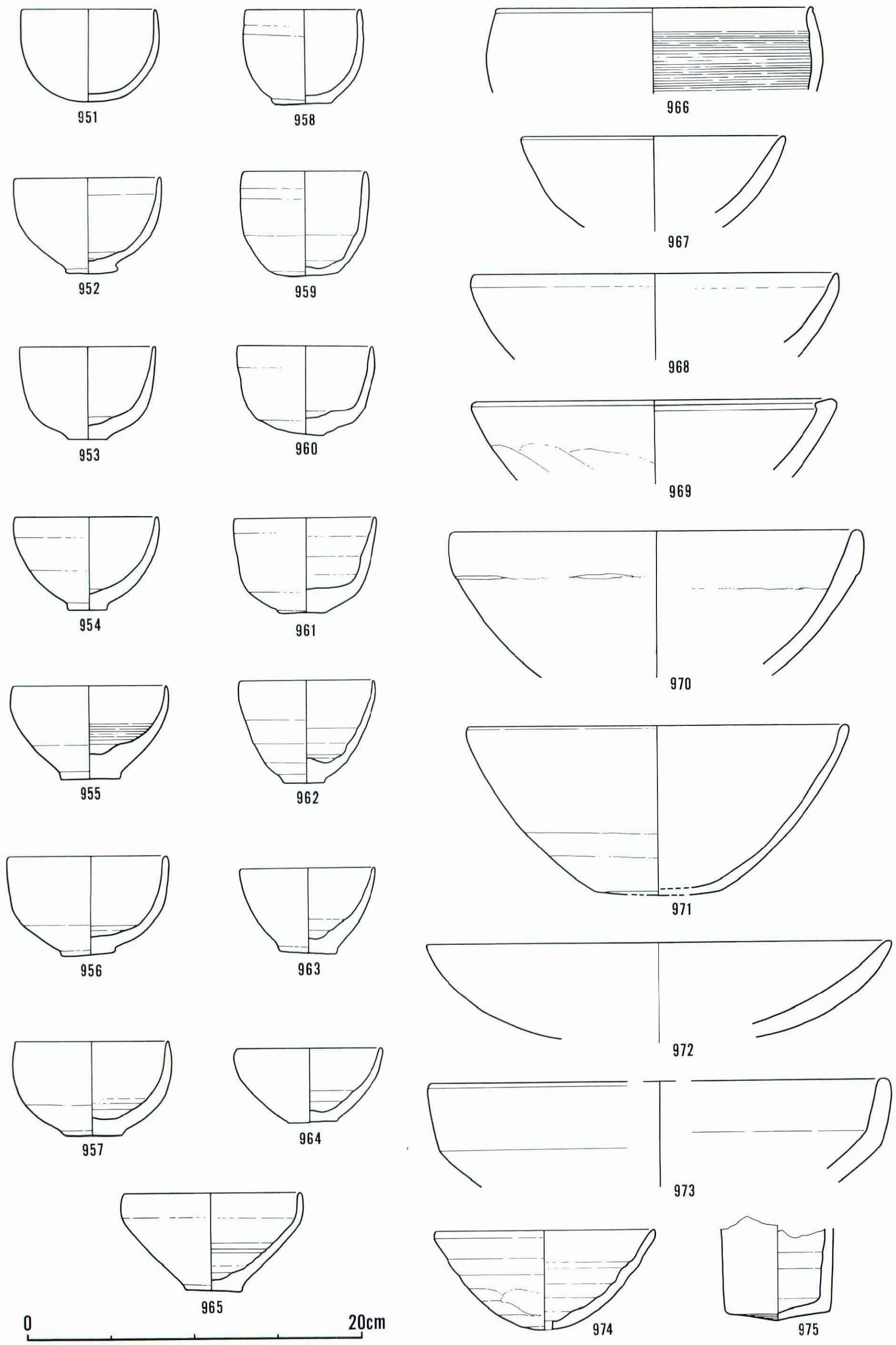

Fig. 32 Plain and medium coarse (970, 972) pottery.

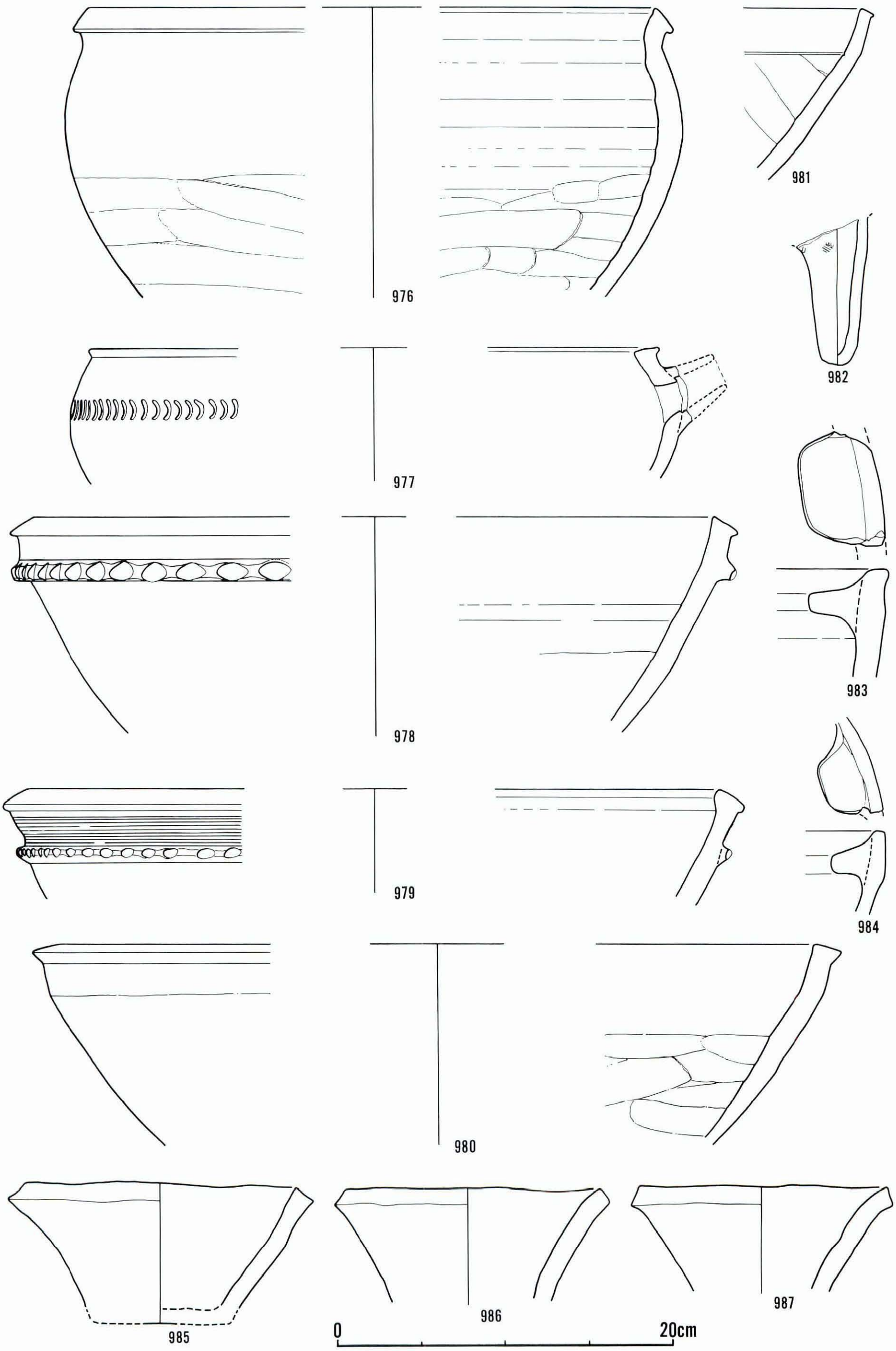

Fig. 33 Plain and coarse (983–987) pottery.

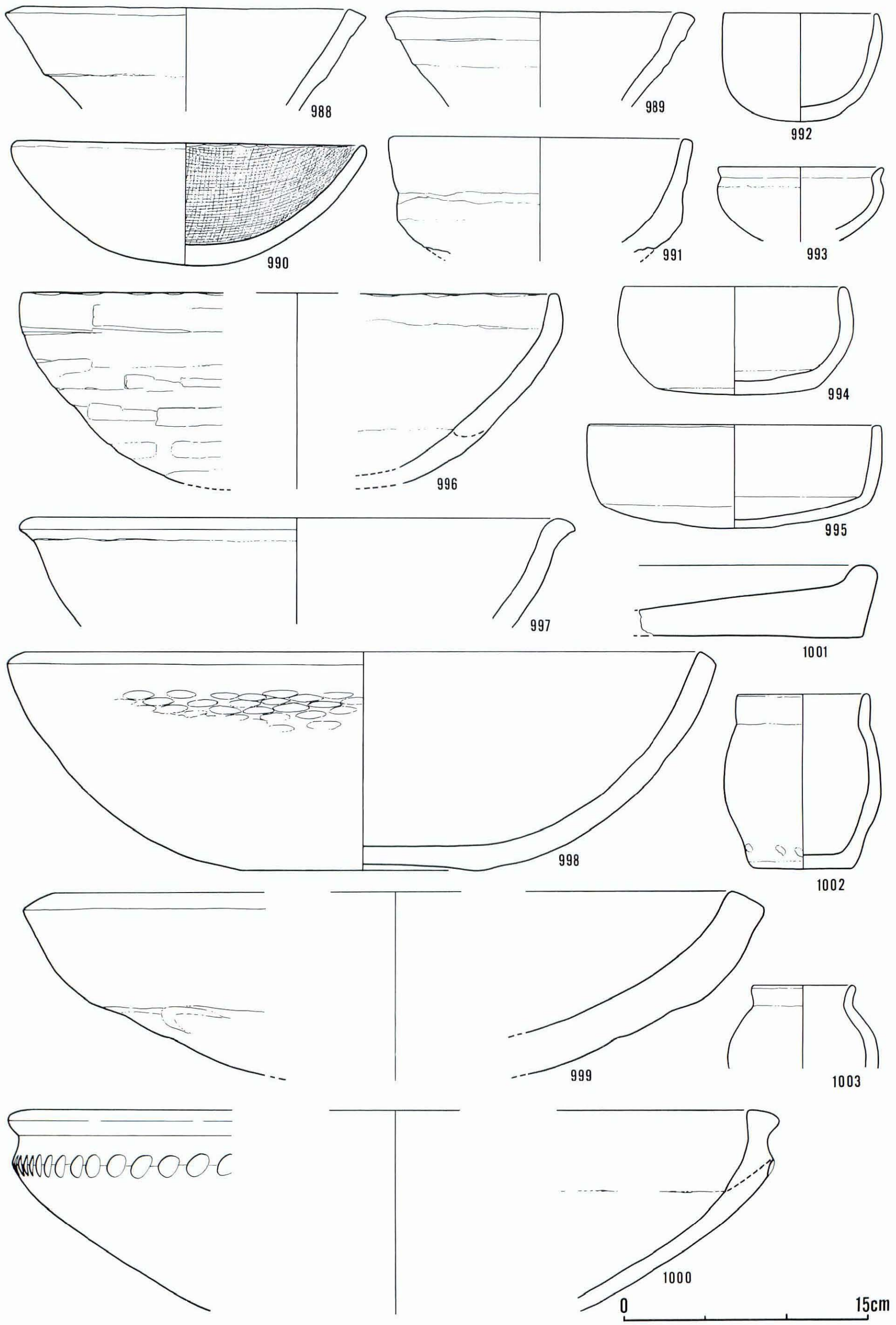

Fig. 34 Coarse pottery.

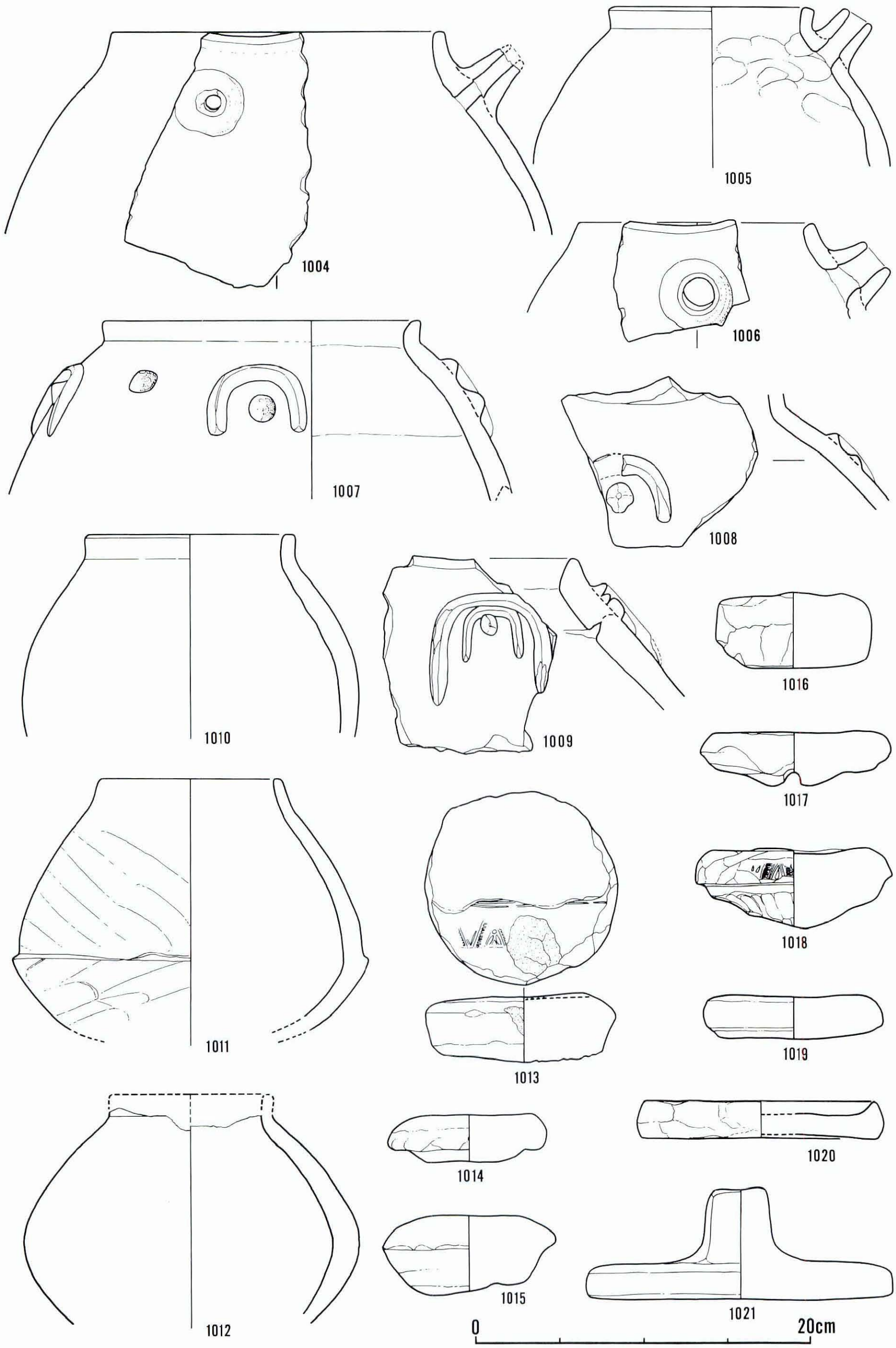

Fig. 35 Coarse and moderately fired (1007–9) pottery.

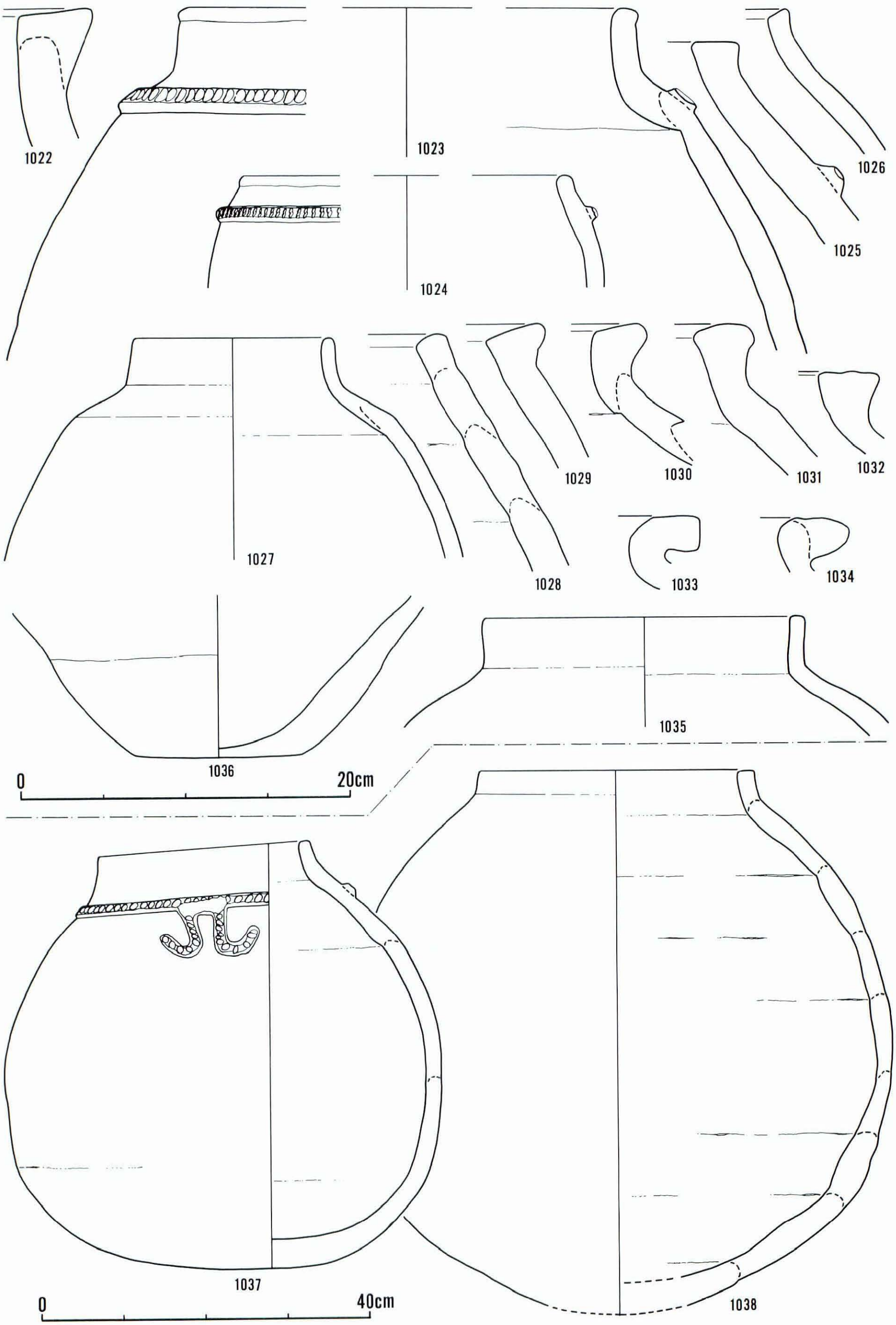

Fig. 36 Coarse pottery.

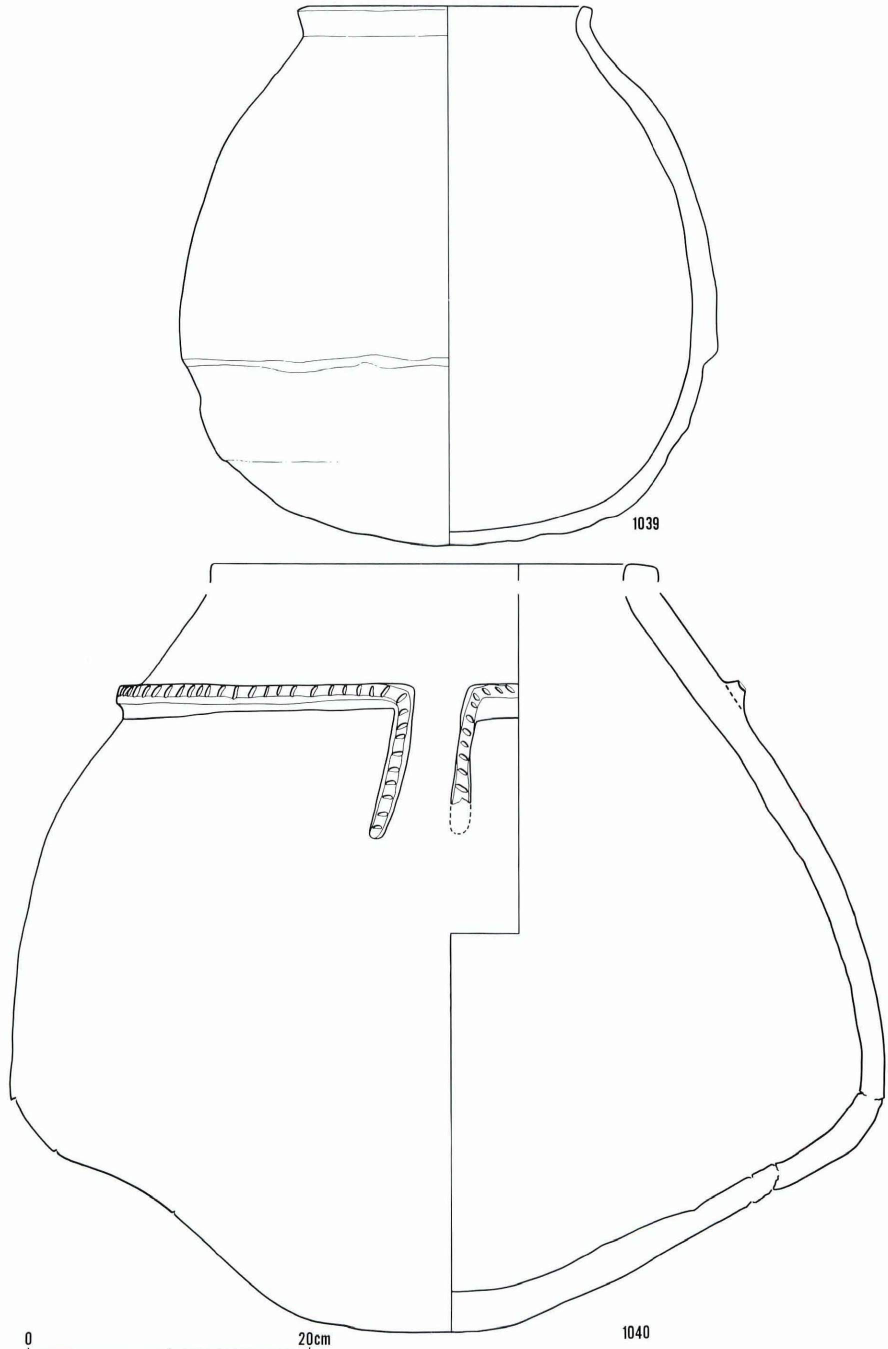

Fig. 37 Coarse pottery.

研究ノート

「メソポタミア」についての覚書

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はじめに

古代西アジアの文明を主導したティグリス，ユーフラテス両大河の流域を指す歴史的な地域概念として，「メソポタミア」という呼び名ほど重宝する単語はない。ヘレニズム期のギリシア人が遙か彼方の地方を指した名称が，今日では洋の東西を問わず，それとして広く定着した観がある。ただその範囲は，「(複数の)川の間の土地」という原意をもはやはなれ，およそ現在のイラク共和国全土を包含し，北シリアや，南東トルコにも及ぶ[1]。それゆえ北部と南部では自然環境はもちろん基層となる文化は一様といえるものではなく，都市化の進捗の度合いも相当にちがっていた。アッシリアとバビロニアという，やはりギリシア語を経由して我々に伝えられた歴史上の地理的区分もそうした必然によっている。その両者を合わせた地域がおおむね「メソポタミア」に当たるけれど，歴史のスパンを古くは旧石器時代，新しくはイスラーム以後にまで引き伸ばしてみると，この地域を「アッシリアとバビロニア」と呼んで済ませるわけにもいかない。「メソポタミア」が重宝なのは，大河を境界とする地理的明晰さに加えて，それが含蓄する歴史性の希薄さによるといってもよいと思う。これを広義のメソポタミアとしておこう。

ところが最近になって，イラクのキリスト教遺跡を扱う関係から教会史やローマ，ビザンティンの歴史と接する機会が増えたこともあるのだが，「メソポタミア」に対する別のより限定的な——より古典的というべきかもしれない——地理的概念がけっしてそれほど過去のものではないことを筆者は知った。これを狭義のメソポタミアとする。あたりまえに思っていた上記のような「メソポタミア」が，もしかしたら我々のせまい専門領域での独り善がりではないのか，という疑念すら生じてきた。同時に，どういう過程を経て，先のような広義の地域概念が内外で定着してきたのか，はっきりさせておきたい衝動にも駆られる。ややもすると，それは日常的な研究の正当性にかかわる問題かもしれず，あるいは発展性のない後ろ向きの議論かもしれないが，ここに研究の余録として綴ってみることにした。

なお，メソポタミアの地理については数年前，東京大学の松谷敏雄先生から貴重な示唆をいただいた。つい最近も先生にお会いした折に話題となり，それが本稿執筆の大きな契機となった。ここに謝意を表したい。

古典叢書をひもとく

『歴史』を著わしたヘロドトスは，アッシリアとバビロニアを区別せず，バビロンをアッシリア人の都と呼び，バビロンに住む人々を，繰り返しアッシリア人の名で呼んでいる (I. 106, 178, 192 など)[2]。ここではアッシリアが，バビロンとニネヴェという2大都市を含む明らかに広義のメソポタミアに近似する地理的用語だった。それが前5世紀代のギリシア人知識層の認識だったのだろう。ところが『歴史』には，「メソポタミア」は登場しない。もちろんそれより古くにそういう地域概念があった証拠もない。•M.A. ビークによれば，ギリシアの歴史家ポリビウス（前2世紀）が，両河川に挟まれた一部の地方をメソポタミアと呼んだのを初見とし，次いでストラボン（後1世紀）も同様に用いたという〔Beek 1962：9〕。ほかにシチリアのディオドロス（前1世紀）やローマのプリニウス（後1世紀），エジプトのプトレマイオス（後2世紀）らの著作にも「メソポタミア」は頻繁に現われる。Loeb Classical Library から，該当箇所をいくつか検証

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してみよう。

ポリビウスでは，まずメディアの四囲を記す中に，その南を占める土地として，アポロニアやペルシアと並んでメソポタミアが現われる（Book V. 44）。それがティグリス以西を指すのか，確たることは言えないように思う。次いで，セレウコス軍のモロンが自らをバビロニア君主と称したくだりで，

「エウロポスまでパラポタミアを占有，ドゥラまでメソポタミアを占有」（同. 48）

と記す。メソポタミアをパラポタミアと対にして，恐らくはバビロンからドゥラ・エウロポスまで，ユーフラテスの両側一帯を示そうとしたのだろうが，その領域は見えてこない。付言すれば，ユーフラテス川について，

「ペルシア湾に注ぐと想像されるが，この場合は別だ。国中にめぐらされた運河が，ペルシア湾に達する前に川の水を使い果してしまう」（Book IX. 43）

とし，彼の地理感覚にはいささか的確さを欠く面もあったようだ。

ディオドロスは，アレクサンドロス時代前後のサトラッピーのひとつとしてメソポタミアを捉らえている。

「ペルディッカスはアジアのその他のサトラッピーを乱さないことにし（中略）メディアをアトロパテスに，バビロニアをアルコンに，そしてメソポタミアをアルケシラウスに，それぞれ与えた」（Book XVIII. 3）

「インドのサトラッピーの隣はアラコシアが占め，（中略）バビロンはアラビア沙漠まで広がる。他方，内陸方向には，二つの川にまたがり，その名を両河に負うメソポタミアがある。メソポタミアのつぎには，呼ばれるままにいうと上シリア，..」（同. 6）

というように，メソポタミアは両河に挟まれ，かつバビロニアとはっきり区別され，さらにメディアや上シリアと隣り合う領域をディオドロスは指したのだった。

ストラボンの『地理書』にはメソポタミアが頻繁に登場する。地理的には，ティグリスが東側を，ユーフラテスが西と南とを流れ，その間にあることがメソポタミアの由来だと述べるとともに，北方のタウルス山地がアルメニアと隔てるとする（Book 16. I. 21）。両河を結ぶ最小距離はセレウキアやバビロン近傍で，200スタディオンよりやや大きいとし，ポリビウスなどに比べてより正確な情報がもたらされていることをうかがわせる[3)]。さらにはパルティア人，メディア人，アルメニア人とならぶアジア各地の民族の一つとしてメソポタミア人 the Mesopotamians という理解まで生じている（Book 2. V. 32）が，これはあまり一般的でない。

プリニウスの『博物誌』では，距離の表記がさらに詳しくなるとともに，メソポタミアの地域概念がやや曖昧になっているように思える。

「メソポタミア全体はかつてアッシリア人のもので，バビロンとニネヴェを除けば人口はまばらだった」（Book VI. XXX. 117）

などと，広義の意にとれるくだりもあれば，ローマ領行政区域を意味するらしい「メソポタミア地方 praefectura Mesopotamiae」に言及する箇所（Book V. XXI. 86）もある。また，ユーフラテスの分流が，

「メソポタミアに入ってセレウキアを横切り，その町を囲うように流れるティグリスに注ぎこむ」（Book V. XXI. 90）

あるいはやはりユーフラテスの流路について，

「メソポタミアの始まりからセレウキアまでの距離は，ユーフラテスを航行すること1125マイル」（Book VI. XXX. 125–6）

など，メソポタミアの記述が両河とセレウキアとの関係から述べられる。全般的にはセレウキア辺りより下流域はメソポタミアから切り離そうとする見方に傾いているようだ。これとは別に，前1世紀半ば，湾頭のカラクス（あるいはカラケネ）地方出身のイシドロスは，パルティアとローマとの交易ルートについて叙述した記事の中で，ティグリス河畔のセレウキアがメソポタミアとバビロニアの境をなすという意味のことを記している〔Schoff 1914：5〕。しかしプリニウスがしばしば引用するマルクス・アグリッパの見解の中には，

「メソポタミアという地域は，東をティグリス，西をユーフラテス，北をタウルス，南をペルシア海で限り，それだけで長さ800マイル，幅360マイルとなる」

(Book VI. XXX. 137)

という地域観まで見られ，この頃，つまり紀元後1世紀の中ごろ，メソポタミアの地域概念はすでに拡散してゆく傾向にあったかのようだ。

以上のように，古典期の著述家たちにとってのメソポタミアは，その原意にもかかわらず，各々が指示する地域概念に多少の差がある点に注意しておきたい。もともと便宜的な呼称であったところに，ヘレニズム期のサトラッピーや，ローマ領の行政区域などが重ねられ，すでに古典期のうちにその地域概念は多義的なものにならざるを得なかったのである。

聖書とキリスト教の世界

古典著作のみならず，キリスト教のヨーロッパ世界への普及もまた，メソポタミアの名を広めることに一役買っている。ただ一方でその地域概念をさらに複雑にしてしまう。まず旧約聖書がギリシア語に訳される際に，北シリアにあってアブラハムゆかりのハランの土地を指し，「2つの川のあるアラム」を意味する「アラム・ナハライム Aram Naharaim」というヘブライ語に対して，訳者が本来の指示概念を理解しないまま「メソポタミア」なる単語をあててしまったというのである〔Layard 1849：237〕。ビークもまたこの点を強調する〔Beek 1962：9〕。この場合，アラム地方における2つの川とは，一方がハブール川であることは間違いなく，他方はユーフラテス本流か，またはハブールより上手の支流バリフ川を指すことになり，メソポタミアの意味は地理的にきわめて狭くなる[4]。ところが新約中の「使徒の働き　7」では，「メソポタミア」をアブラハムの故地として「カルデア人の地」と同義に扱っている。一見「メソポタミア」の概念が，一気にユーフラテス下流域にまで拡大されたようにみえるが，新約が編纂された時代には，メソポタミアに対するさきの古典的解釈も，「カルデア人の土地」そのものの位置もすでに曖昧になっていたかもしれないし，さらにいえば，作者にとっては文脈上どうでもよいことだったと考えられる[5]。

ローマ帝国は，パルティアとの抗争の過程でこの地帯に幾度となく攻め入り，2世紀はじめのトラヤヌス帝の時代から「メソポタミア」という県（プロヴィンキア）[6]の興廃が繰り返された。3世紀のセプティミウス・セヴェルス帝の時代には，北西部のみが比較的安定したローマ領としてメソポタミア県とされた[7]。ビザンティン帝国の時代になっても，メソポタミアはオリエンスという帝国東端の州（ディオエケイア）を形成する一つの県だったが，6世紀はじめにさらに3つの県に細分されたことがわかっている。「アルメニア IV」「メソポタミア」「南メソポタミア」がその3県であり，それぞれの県都が，マルティロポリス（シルヴァン），アミダ（ディヤルバクル），アナスタシオポリス（ダラ）だったという[8]。教会建築の遺構が集中することで知られるトゥール・アブディン地方は，その南メソポタミア県からビザンティン領外にまたがっている（図1）。結局，ビザンツ領におけるメソポタミアとは，西にハブール，東にティグリスという2つの川を控えた現在の南トルコの一帯をを指すのであり，ササーン朝ペルシアが優位にあった今のイラク領は含まれていなかったことがわかる。しかもそれらが正統派キリスト教の大主教区にも対応していたので，キリスト教史におけるメソポタミア，あるいは教会建築のメソポタミア形式を言う場合に，この地方が代表するという理解が生じることにもなったのである。4世紀という早い時期に，カエサレアの司教エウセビウスが著わした『教会史』の中に現われるメソポタミアは，まさにそういう限られた地方だった[9]。こういう狭義のとらえ方は，とくにローマ世界や初期キリスト教を論じる分野では，いまでも完全に払拭されたわけではないと考えておいた方がよいかもしれない。たとえば，アラブ世界の初期キリスト教を詳述したJ.S. トリミンガムはメソポタミアとバビロニアを並列して記すことを常としている〔Trimingham 1979〕。メソポタミアという地方名は，もとをただせばギリシア・ローマの知識階層の世界観から生まれ，キリスト教社会に受け継がれてヨーロッパ世界に広まったという経緯を，あらためて承知しておきたいと思う。

ちなみにササーン朝へとこの地域の覇権が推移した当時，ティグリス上流でビザンツ領メソポタミアと接するあたりは，すでにアラブ系民族の進出が著しかったことから「アルバイスターン」と称され，旧バビロ

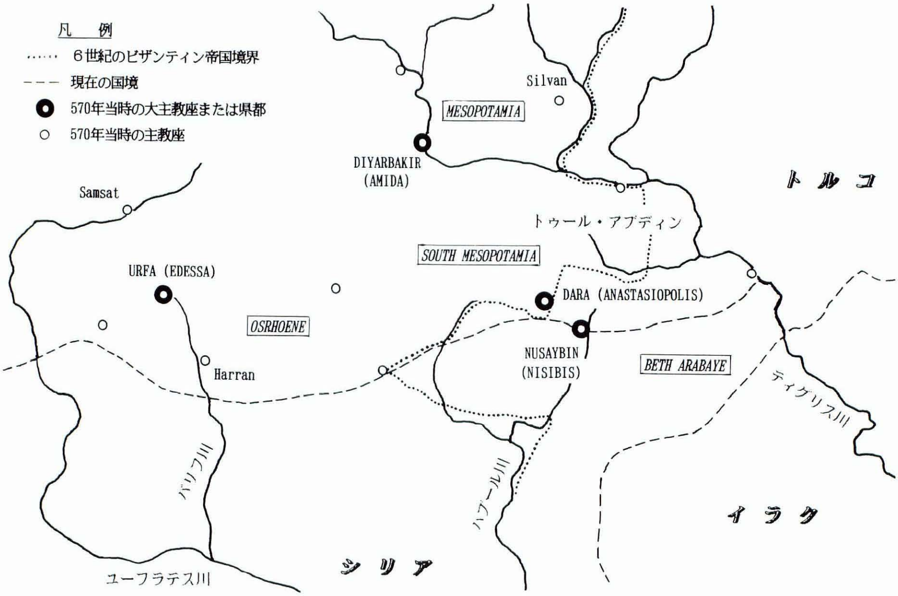

図1　6世紀代北部メソポタミアの教区と主教座
(M.M. マンゴによる〔Bell and Mango 1982：綴込み図〕)

ニアはアッシリアに由来する「アソレスターン」というのがペルシア側からの呼称だったようだ[10]。後者には王都クテシフォンが含まれ，西洋史におけるペルシアに関する記述の舞台が，しばしばこれら両河地方だったことは注意しておく必要がある。たとえば，ペルシア教会ともアッシリア教会とも呼ばれる東方キリスト教が最も普及した地域について，410年の記録に現われる6つの古典的大主教区のうち5つは両河地方に属するというのが実態であった〔Asmussen 1983：932〕[11]。つまり広義のメソポタミア地方は，ペルシア文化の一翼を担ったという以上に，古代から中世イスラームの時代へと橋渡しをなすべき初期キリスト教伝播の主要舞台として，なお重要な役割を果たしていたのである。いずれにせよ，当時，両大河流域一帯を包摂するような地域名称は存在しなかった。

近代考古学の先駆者たち

バビロニア，アッシリアまでを含めて「メソポタミア」という地域概念が，今日なぜ当然のごとくに用いられるのか。それは偏に近代考古学の成果に負っているといってよい。先史文化の生成と伝播の問題に始まり，都市の形成期を経て両者が国土の覇権を競うに至る過程をたどると，周辺のイランやアナトリアの高原地帯との影響関係に比べ，メソポタミアの両地域が互いの自然環境や文化相の違いにもかかわらず，民族，言語，造形理念など，文明的基盤をどれほど共有していたか，相次いで発掘される資料からもはや疑いようがないのである。では，誰をして「メソポタミア」をこの地域全体にあてる主唱者とするかとなると未だ判然としないのだが，管見の及ぶ限りでは，そういう認識が一般的となるのは今世紀に入ってからのことのようである。

19世紀中，その地域観はまだ揺らいでいた。C.J. リッチと J.S. バッキンガムは，ともに1810年代にアッシリアやバビロンを別々に訪れたイギリス人で，それぞれ著名な旅行記をのこしている。古典や聖書への造詣の深さ，遺跡への関心のつよさという点で二人は共通する。しかしメソポタミアの地域観には違いが

見られる。リッチはメソポタミアという表記をあまり用いないものの，主題としたバビロン付近の土地について「メソポタミアのこの部分を複数の運河が横切っていた」〔Rich 1839：56〕とバビロンをメソポタミアの内に捉えている。バッキンガムの方はというと，その旅行記のタイトルにまで用いたメソポタミアの概念を，古代文明よりむしろローマ史の観点から得ているようで，それはカルデア人の国やアッシリアと並び称するべき地域であり〔Buckingham 1827：128, 244〕，「バグダードの女性の衣服はメソポタミア最貧の村で見るのと同じくらい貧しい」〔*ibid.*：381〕などという記述からみても，彼の観念の中ではメソポタミアの外にバグダードがあったことがわかる。

19世紀半ばにメソポタミア考古学の草分け的な業績を残したA.H. レヤードは，アッシリアの遺跡調査報告を中心に数年の間隔をおいて，*Nineveh and its Remains*（1849年）と *Discoveries in the Ruins of Nineveh and Babylon*（1853年）という2編の書を著わした。ところが面白いことに，2書の間でメソポタミアに対する観念の相違がみてとれるのである。前者ではまだ聖書や古典による理解が優先されていて，メソポタミアは，アッシリアやバビロニア，あるいはティグリス東岸地方と一線を画する地域だった〔Layard 1849〕[12]。またその土地が，アラブ人には「島」を意味するアル・ジャジーラ al-Jazirah にあたることも注記している〔*ibid.*：225〕。ところが後者になると，ニッフェル（ニップール）やワルカ（ウルク）の所在を「南メソポタミア」と表現するとともに〔Layard 1853：557, 562〕，両河の流域全体を示した添付の地図に「メソポタミア」という見出しを付けた。ただ本文中には，アッシリアの一部をメソポタミアの外に置く記述があり〔*ibid.*：616〕，ティグリス東岸をその地域概念の中に取り込むにはまだ躊躇があったようだ。

その後 *Five Great Monarchies* を著わしたG. ローリンソンは，世界史上の5つの偉大な帝国のうち，カルデア，バビロニア，アッシリアの3つが，等しく「シリア―アラビア沙漠の外縁とクルディスタンからルリスタンの大山脈の麓との間」の地に生まれたことを強調する中で，メソポタミアを上下に分かち，カルデアの北端を上下メソポタミアの間に求めた〔Rawlinson 1871：2–3〕。さらに，バビロニアはティグリスの西方にある広大な2つの平地から成るとみなし，両河の間にあって「ギリシア人やローマ人がいうメソポタミア」の下流部分と，もう一方は，ユーフラテスとアラビアの間に挟まれ，その豊かな川の右岸に沿った長いけれども狭い地帯とした〔*ibid.*：436–7〕。ローリンソンにとってメソポタミアは，あくまでも両河に挟まれた土地だったことがわかる。

世紀が改まると，文明創始の地としての「両河の流域 the Valley of the Two Rivers」をメソポタミアにあてようとする見解が登場してくる。のちにキシュの発掘を指揮したS. ラングドンがコロンビア大学に籍を置いていた当時の講演録に，そういう叙述がある〔Langdon 1906：3〕。ギリシア語の原意を説いた上で，メソポタミアに新たな地域概念を与えようとする主張であった。「前1500年までに，アッシリア人はメソポタミア上流の盟主となってバビロニアとアジア帝国の覇を競った」〔*ibid.*：8〕と，アッシリアまでメソポタミアに包摂しようと意図した。しかし，やや遅れてニューヨークで出版されたL.W. キングによる概説書では，まだメソポタミアを両河の間に限定するという古典的理解がつよく反映されているばかりか，バグダード付近を挟んで MESOPOTAMIA と BABYLONIA を明確に描き分けた地図を添付している〔King 1915：付図〕[13]。かのブレステッドにしても，「肥沃な三日月地帯」という着想に至った折，「この偉大なる半円全体を含み込む名称は，地理的にも政治的にも存在しない。歴史的目的に応じて，その半円を特定する何らかの用語が是非とも必要だ」〔Breasted 1926：117 note〕という認識を示す一方，「バビロニアの北にあるメソポタミアは沙漠地で，そこはバビロニアに属さない」〔*ibid.*：123 note〕とわざわざ断わっている点からみて，彼のいうメソポタミアとはアル・ジャジーラにほかならず，バビロニアやアッシリアと隣接する別個の地域だった。その記述はなおも古典期の地理概念を踏襲する見解を披瀝したものであり，ラングドンの主張がここでは受け入れられていない。

これらに対して，19世紀末からドイツ隊によるバビロンの発掘を率いたコルデヴァイの場合，初期の報告書の中では「バビロニアとアッシリア babylonischeassyrische」という表現はあっても，「メソポタミア」という言葉を用いることはなかった[14)]。彼の隊から別れてアッシュールやハトラの調査にあたったW. アンドレーは，ハトラの地理的位置をジャジーラ der Dschesire と表現し，「すなわち島，メソポタミア d.i. Insel, Mesopotamia」と注記した〔Andrae 1908：1〕。その後まもなく，コルデヴァイは一般向けのバビロン発掘報告を著わし，「バビロンのイシュタル門はメソポタミア全域の中で最も印象深い遺構だ」〔Koldewey 1914：32〕などのほか，「バビロニアとアッシリア」を「メソポタミア」と言い換える傾向がはっきりしてくる。

またイギリスにおけるメソポタミア考古学を代表したC.L. ウーリーは，シュメールとアッカドの地を指して，バビロニアという呼称より「メソポタミア下流域 lower Mesopotamia」を好んで用いた。同時に，メソポタミアにおけるセム語系民族として，アッカド人，アモル人，アッシリア人を挙げ，いずれもシュメール由来の宗教と文化を受容したことを指摘し，言外にアッシリアをメソポタミアに含めようとしたのではないかと思われる〔Woolley 1928：179〕。これより早く，フランスのL.J. ドラポルトは，バビロニア，アッシリア両文明の地として「メソポタミア」の語をあて，一書の表題とした〔Delaporte 1923〕[15)]。ウーリーの見解を支持していたG. チャイルドも，1936年の著書の前書きで現在のイラク領がおよそメソポタミアに該当すると記した[16)]。したがって，古典的用法から一転してバビロニアとアッシリアの全域をカバーする地域名称として「メソポタミア」を用いることは，この頃までにヨーロッパで定着したとみてよい。

確たることはまだ言えないが，アメリカでも同様な理解が共通のものとなったのは，ペンシルバニア大学が1927年に開始したテペ・ガウラの発掘，あるいは1930年代のシカゴ大学によるディヤラ川流域の調査を経たのちではなかったかと思う。いち早くメソポタミアの広義的な概念を積極的に敷衍しようと持論を展開したのは，ペンシルバニアのE.A. スパイサーだったように思う。彼はテペ・ガウラの発掘報告を通じて，すでに蓄積のすすんでいた両河流域の考古学上の成果を編年的に総括しようと試みる際に，シュメールからアッシリアまでの流域全体を「メソポタミア」でくくり，「メソポタミア先史期の諸段階 stages of Mesopotamian prehistory」〔Speiser 1935：vii〕，「メソポタミアの相対年代 the relative chronology of Mesopotamia」〔*ibid.*：177〕などと頻用した[17)]。一方，1932年に出されたテル・アスマルとハファジェの最初のレポート〔Frankfort et al. 1932〕の中では，「メソポタミア」の使用に，フランクフォートほか執筆者らの注意深い姿勢がうかがえる。たとえば，「バビロニアの歴史」とか「バビロニア史の枠組み」という記述はあっても，「メソポタミアの歴史」などとはけっして言わない。ハムラビが統一した地域も「両河流域 the valley of the Two Rivers」だった〔*ibid.*：25〕。しかし，同じ調査隊にいたP. デルーガズは，その後すぐに著わしたプラノ・コンヴェックス煉瓦に関する論考〔Delougaz 1933〕において，もはや広義のメソポタミアを適用することに躊躇はなかった。そこにはラングドンやスパイサーの影響がはっきりと読み取れる。ディヤラ流域はバビロニアとアッシリアを結ぶ中間地帯で，文化的に両方からの影響がつよく及んだ土地柄であり，メソポタミアの広義的解釈は，この3地域を一体に扱うことのできる地域概念として最適だったと推察する。1940年にはこうした地域概念に即した「メソポタミアの家屋形式」なる論文まで著わされるようになった〔Müller 1940〕。

こうした近代考古学の地道な蓄積を抜きにして，今日的な「メソポタミア」の地域概念が広く定着したとは考えられない。「広義のメソポタミア」はまだごく短い歴史しかもたないのである。

以上のように，「メソポタミア」はヨーロッパ古典古代の著述家の間で生まれた呼称で，ローマ，ビザンツの世界や，キリスト教の歴史の上では北シリアや南アナトリアの一地方のみを指すことすらあったことを知る。19世紀末までは文字どおり「2つの川の間」に限って用いられるのがふつうであり，下流域のバビロニアがその範囲から除外されることもめずらしくなかった。ところが近代考古学はアッシリアとバビロニアの歴史をつよく関連づける成果を次々にもたらし，今世紀はじめまでには両地域の古代史を一体にとらえ

る必要性も高まった。加えて1932年にイラクが王国としてはじめて独立し，ほぼ両地域を治める一つの統治体制が生まれる。遺跡の調査をすすめ，古代をかえりみることもその体制の下で行われることがあたりまえになった。かつてヨーロッパの人々がさまざまに用いてきた「メソポタミア」という言葉は，両河流域一帯を指し示す歴史的地域名称として重宝な単語であると同時に，その土地の歴史と共生するイラク国民の国土としてさらなる重みを持ち始めたといえるのではなかろうか。

注

1) 一例として，M.A. ビークはメソポタミアの範囲を次のように理解する。「メソポタミアという用語は，北のクルディスタン山地と南のマーシュデルタとの間で，かつ西方のステップや沙漠地と東方イランの山麓との間を占める多様な地域をカバーする」〔Beek 1962：9〕。また最近の著書で目につくものとして，N. Postgate, *Early Mesopotamia, Society and Economy at the Dawn of the History* (London/New York, 1992) では，その冒頭で次のようにメソポタミアを説明する。「メソポタミアという名は，ローマの一地方のための造語で，いまではティグリス川とユーフラテス川の間の土地として用いられ，『肥沃な三日月地帯』の東側の角部分として叙述する一般書も多い。」
2) ここでの『歴史』は，松平千秋訳の岩波文庫版 (1971) によった。
3) 『歴史』に採用されている 1 st.＝0.185 km という換算で，ほぼ実際値に近い。
4) ここでの聖書は，日本聖書刊行会刊の『聖書・新改訳』(1973年版) を用いている。「アラム・ナハライム」は「創世紀　24：10」にある。また聖書とメソポタミアの関係については『旧約新約聖書大辞典』(教文館 1989) を参照した。
5) 「使徒の働き (使徒行伝)」は，紀元１世紀の末近くに，福音書で知られるルカが小アジア地方で書き記した，というのが通説である。
6) *O.D.B.*「PROVINCE」によれば，プロヴィンキアとは，ローマ，ビザンツ領内で，州にあたるディオエケシスをさらに分割した地方単位。県と邦訳される。
7) *O.C.D.*「MESOPOTAMIA」による。
8) *O.D.B.*「MESOPOTAMIA」によるものだが，ここに掲げた M.M. マンゴによる教区地図では，アルメニア県が表示されていない。
9) Loeb の Eusebius, *Ecclesiastical History* (2 vols.) による。115年頃のトラヤヌス帝によるユダヤ教徒弾圧 (Book IV. I)，ヴェルス帝 (161-69) 時代の異教徒増加 (同. XXX)，250年頃の迫害とディオニシウスによる平和回復 (Book VII. V)，著者の時代の各地の迫害 (Book VIII. XII) などの記事にメソポタミアが現われる。
10) *E.I.*「ARBAYSTAN」および「ASORISTAN」による。
11) 北部ではニシビス，アルベラ (エルビル)，カルカー (キルクーク)，中部はクテシフォン，南東部にマイシャーン，それぞれを中心とした教区があり，今のイラン領内といえばフゼスターンだけである。
12) 「ひどい砂嵐は，メソポタミア，バビロニア，スシアナを通じて夏の早い時期にしばしばおこる」(p. 124 注)，「今日アッシリアやメソポタミアの川辺に住むアラブ人が用いるような皮袋」(p. 128)，「メソポタミアの平原は，ティグリスと丘陵地との間の低地とともに，粗いアラバスターや石膏が豊富だ」(p. 254)，「ニムルドの浮彫りにある牡牛は，メソポタミアかアッシリアにいた」(p. 430) など。
13) 本文中には，「セレウキア，クテシフォン，バグダードはみなメソポタミア平原の狭い頸部に集まっている」(p. 5)，「アラブによるメソポタミアの軍事的占拠は，(中略) メソポタミアの征服に続いて，この国最南端のシャト・アル・アラブ河沿いにバスラが建設される」(p. 10)，「メソポタミア，アッシリア，バビロニア諸王との外交文書」(p. 219) というように，メソポタミアを両河の間に限定した記述がある。
14) 本書はバビロンとボルシッパの神殿遺構の報告書だが，その当時までに考古学的調査が行われたメソポタミアの遺跡について，巻末に概要をまとめている〔Koldewey 1911：60-66〕。
15) チャイルドの一連の著作を紹介した禰津正志の指摘によると，日本語訳もあるという。またこれより半世紀以上も早くに，フランス人の探検家オペール Oppert の著書として *Expedition scientifique en Mesopotamie* という２巻本がある。いずれも未見である。
16) 「メソポタミヤは現代のイーラックとされ，アッシリヤ――だいたいチグリス河とモズール附近のザブ河の間の三角地帯――と，バビロニア――チグリス河とサマラの南にあるユーフラテス河の間の地帯――を含んでいる」〔チャイルド 1957：xiii〕と述べている。とはいえ，1934年にチャイルドが著わした *New Light on the Most Ancient East* では，アッシリアとメソポタミアは別々の地域として扱われていた。この書も禰津正志によって1944年に「アジヤの古代文明」として邦訳が出版されている。
17) すでに1930年，スパイサーは *Mesopotamian Origins* を著わしているが，未見である。

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翻訳

動物考古学入門*

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序　　論

1956年に，Joachim Boessneck はテッサリア地方の2つの先史時代遺跡，Arapi-Magula と Otzaki-Magula から出土した動物骨について1冊の報告書を発表した。これがギリシアの考古学遺跡から出土した動物骨について詳細な情報を提供した最初の報告である。以来過去25年のあいだに考古学者は，動物骨やその他の動植物遺存体が考古学とりわけ経済活動や環境条件の復原に役立つとしだいに気づくようなり，それにつれて報告書はついに氾濫するまでになった。

しかし一般的にはこれらの報告は広範な考古学の文献の中で孤立する傾向にあり，発掘報告書においても別の出版物や付録として出版され他の考古学データとの統合をほとんどみていない。多くの考古学者は自然科学を学んだ経歴をほとんど持たないないために，動物考古学の進展によって報告書が次第に詳細で専門的なものになってくるにしたがって専門外の読者にとってはさらに読みづらいものとなり，おそらくさらに重大なことにはそれを評価することも難しくなってしまったのである。本稿の目的は，動物考古学の文献を他分野の考古学者たちにも利用しやすくするために2つのことを行うことにある。第1は，ギリシアで発掘された動物骨についての文献目録を，それぞれの報告書から得られる情報について若干のコメントをつけて提供することである（付録）。第2は，考古学遺跡から出土した動物骨資料の分析や解釈について，特にギリシアでの状況に関して簡単に解説した“読者案内”を提供することである。

付録や表9にしめすように，ギリシアの遺跡から出土した動物骨資料について利用できる情報はまちまちである。新石器時代と青銅期時代について報告された資料は，地理学的，年代学的にも比較できる件数と資料数を持っている。しかしこの前後の時代の動物骨資料ははるかに少ない情報しか提供しない。旧石器，中石器時代についてはこれは純粋に遺跡と発掘の件数が乏しいことの反映である。しかし鉄器時代以降については遺跡，発掘ともに豊富であるにもかかわらず，これらの時代を研究している考古学者が伝統的に文献資料や建築，美術などに関心を示し，経済や環境などの問題についてはあまり関心を持たないためである。このような姿勢は現在変わりつつあるが，研究者間のコミュニケーションに問題があることが最近の教科書からとった以下の一節によってわかる：

もちろん乏しい文献史料を考古学によって補足することはできる。動物骨や炭化種子は古人の食物についての証拠となる。しかしそのような発見物は比較的まれであり，証拠は断片的である〔Chadwick 1976：109〕。

実際には，ギリシアのほとんどの遺跡において動植物の遺存体はけっしてまれなものではない。むしろまれであったのは，動植物遺存体の体系的な採集に古典考古学者が時間と費用を投資することなのである。Nichoria 遺跡は環境的，経済的アプローチが明確に重視され，動物骨が計画的に採集された数少ない歴史時

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*原題：Zoo-archaeology in Greece: A Reader's Guide, In N.C. Wilkie and W.D.E Coulson (eds.) 1985 *Contributions to Aegean archaeology*, pp. 211–244. Center for Ancient Studies, University of Minnesota

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代遺跡のひとつである。この理由から，このエッセイを William McDonald を記念するこの書に献じることは喜びである。

動物骨についての報告書を解釈するためのガイド

動物骨についての報告書は膨大な量と多様性を持った情報を含んでいる。さまざまな動物種の現れ方の相対的な差はいろいろな方法で調べられる。時には同定された標本数が用いられ，ときにはその重量が用いられる。そして時には最小個体数が用いられる。結果として得られた数字は環境条件や経済活動の復原に使われ，それぞれの目的に応じて様々な方法で手が加えられるかもしれない。様々な骨格部位の相対出現頻度は，それぞれの動物種の解体作業や遺体の分配についての指標となる。また切痕の研究は解体方法の詳細について知らせてくれる。年齢や性の異なる動物の相対的な現れ方の差は，それぞれの種がどのように利用されたか教えてくれる。骨の計測値は，異なる時代や異なる遺跡から採集された骨を比較し，大きさやポピュレーションの変化について調べられるために用いられる。薄片の切り出し，同位体分析，走査型電子顕微鏡による検鏡といったより複雑な一連の調査方法の増加は，動物の利用や遺跡居住の季節性，人や動物の栄養状態について情報をもたらすこと約束してくれるだろう。

しかしながら結果として生じるデータや解釈の氾濫には注意が必要であり，そのことについてはあまりにも触れられていない。本稿では，骨が遺跡に堆積し，そして考古学者によって採集されるプロセスを検討することから出発して，同定，計測，定量化の問題について調べ，最後に過去の環境や経済を復原しようと試みる際に出会う問題点を論じる。

骨資料と骨データ

私たちが考古学的文脈から動物骨資料の解釈について考えるとき，それらの動物骨資料が何であるか，どうしても承知しておかなくてはならない。すなわちいかにして骨が遺跡に堆積するのか，また堆積してから報告書のデータ表になるまでに何が骨に起こる可能性があるか知っておかなくてはならない（図１）。

狩猟民であれ牧畜民であれ，人が殺してその骨を遺跡の堆積に残した動物は，その地方に生息する動物のランダムサンプルではない。それらの動物は，人に利用された遺跡周辺の領域内に生息する膨大かつ多様な動物の中から人によって選択されたのである。この選択は経済的，文化的要素を反映している。特定の種類の動物が好まれたり，より有益とされるかもしれない。一方他の動物はそれほど有益ではなく，嫌われ，タブーとされるかもしれない。例えば，もし１日に１人がシカの肉 10 kg もしくはリスの肉 5 kg を狩るとするとシカ猟のほうが有益であるが，リスの肉が好まれたりシカがタブーとされていたら，人はシカのかわりにリスを選択するに違いない。

遺跡に埋められた骨もまた，人に食べられた動物のランダムサンプルではない。時には，動物は遺跡から離れた場所で殺され，食べられてしまい特定の部位だけ——時には骨をのぞいた肉だけ——が遺跡に運び込まれたかも知れない。骨が遺跡に持ち込まれたときには人々はそれを解体作業や調理，燃料としての使用，骨器の製作などを含むさまざまな方法で手を加えたり，破壊したりするだろう。いちど地表面に捨てられてしまうと，骨はさらに変形されたり，破壊されたりしたかも知れない。ゴミとして掃き捨てられて焼却されたり，人間や大型動物に踏みつけられたり，イヌやその他の動物によって噛み砕かれ食べられたり，微生物に冒されたり，不適当な化学条件，温度，湿度の変化にさらされたりするだろう。同時に，人間に利用されたのではない骨が遺跡に加わるかも知れない。すなわち遺跡で死んだ動物や，イヌやフクロウといった遺跡に住み着いた動物に食べられた動物に由来する骨である。

骨が埋められる率はその骨の大きさや地面のかたさ（おそらく季節によって変動する），堆積物の蓄積されていく速さによって左右される。ゴミ穴に埋められたり，堆積速度の速いゴミ捨て場に捨てられた骨はむき出しの状態にあるものよりもよく残る。骨は埋められてしまうと襲われたり，破壊されたりする率が下がるのである（土壌が強酸性であったり，強アルカリ性であったりしなければ）。特に，より活性の高い上部の土壌層より下に埋まってしまうと骨はよく残る。しか

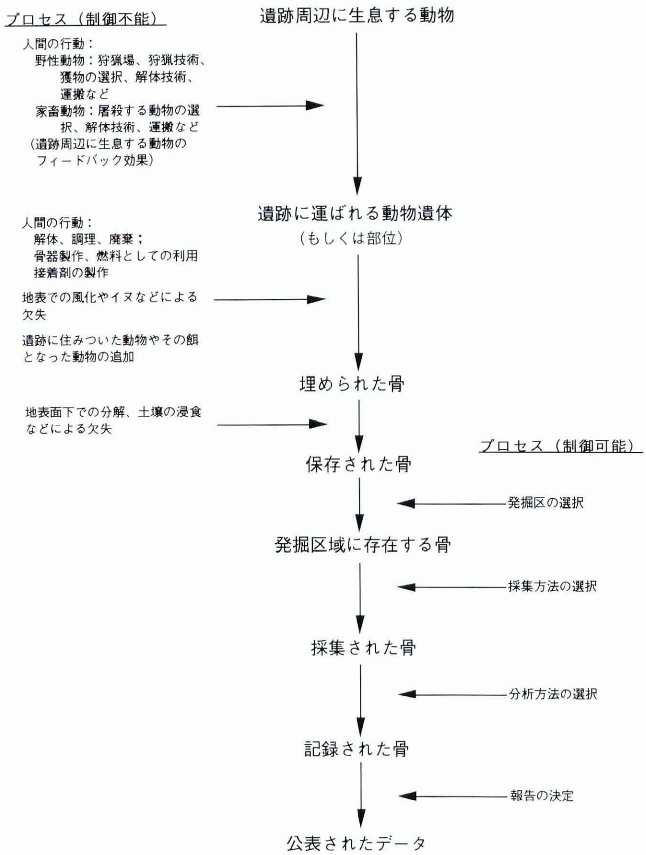

図１　考古学遺跡から出土する動物骨の堆積，改変，破壊，採集，分析に伴うプロセスのいくつか（Meadow〔1980〕に加筆）。

しそのような深さにおいても骨は土壌条件やしみ出てくる地下水によってゆっくり影響を受ける。土中に穴を掘るような動物は堆積を撹乱し，時として彼ら自身や外から持ち込んだ動物の骨を堆積に加える。また堆積は人間や侵食作用によってもっと大規模に切り崩され手が加えられる。

結局このようなプロセスを経た堆積物や骨が私たち考古学者によって発見され発掘される。しかし，発掘自体が偏りをかける原因なのかも知れない。普通，私たちは非常に狭く必ずしも遺跡全体を代表しない領域だけしか発掘しないし，手にする資料は発掘に用いられる採集方法の影響を受けている。ギリシアの遺跡でふるいがけを用いた実験を行った結果〔Payne 1972a；1975a〕，ツルハシや移植ゴテを用い，ふるいを用いない“通常”の発掘では，典型的には小動物の骨のほとんどと大型の動物の小さな骨の多くが採集されていないことがわかった。

同定と分析の手順も最終的なデータに影響を与える。例えば同定が難しかったり，あいまいだったりする標本を様々な動物考古学者が非常に様々な方法で扱っている。ある者はより楽観的で，ある者は慎重である。前者は，ある特定の種類の骨や骨片の同定はまちがえやすいとか，時間がかかるわりに有益な情報がほとんど得られないと考えて分析から除外するのに対

し，後者はそれがどんな骨でも同定できるものは同定を行う。そして前者は“中型の偶蹄類”といったより大ざっぱな分類基準も含めるのに対し，後者は種か属のレベルまで同定できないものはどんなものも分析に加えない。

全体を通してみて，心にとめておくべき重要な点は2つある。第1に，堆積する時や埋蔵のあいだに骨に加わる変化のプロセスと，発掘や分析のあいだに行われるプロセスを区別すべきだということである。堆積する時や埋蔵のあいだに生じるプロセスはまったくコントロールできない。私たちには，そうしたプロセスが考古学資料に影響を与えていると認識するための判断基準を開発しようと試みることしかできない。一方，発掘や分析のあいだに作用するプロセスはかなりの程度を見積もることができ，コントロールできるものである。またそうする必要があり，用いた方法を記載する必要があることをさらにしっかりと認識しなければならない。報告書には採集方法と，同定や分析で行われた手順について明瞭に記載しなくてはならない。このような情報は，発表されたデータを評価したり，発表された他のデータと比較できるかどうか評価する上で最も重要なものなのである。

第2に，ほとんどすべての状況において私たちが調べる資料は，どんなものでも，かつて存在したもののほんのわずかな断片にすぎず，改変や破壊などの介在するプロセスの多くがいろいろな方法で――普通は小さくもろい骨より大きく頑丈な骨に有利になるやり方で――最終的な資料に偏りをあたえている可能性が高いということである。発表された動物骨資料の違いを，経済的，文化的慣習，あるいは環境条件の違いの反映という，私たち考古学者として最も興味を持つ事として解釈する前に，これらの差異が破壊による偏りや発掘における拾い残しによる偏り，動物考古学者のアプローチの違いによる偏りなどの他の原因で説明できないか考える必要がある。

同　　定

同定は動物骨について研究する最初の段階であり，全てのつづく研究はそれを基にしなくてはならない。同定が厳密な科学ではなく，同定者の経験にかなりの部分依存していることは忘れられやすい。多くの場合基準がきちんと確立されていない上に，作業の多くはしばしばフィールドで適当な比較資料もないまま行われる。慎重を求めることは，同定は可能な限り進めるべきであるとか種レベルまで同定できない骨は十分に同定されていないという感情と対立する。つまり実際には，種まで同定できる骨は属まで同定できる骨よりも少なく，種レベルまで同定されたものの多くは，骨学的規準によるよりも，どんな種が期待されるかといった報告書には記載されていない推量によっているのである。ギリシアで採集された考古学標本の中にジャッカル（*Canis aureus*）の報告がみられないことはこの問題についての適例であろう。ジャッカルは今日，ギリシアにおいてかなり一般的にみられるが，その骨のほとんどは同じ様な大きさのイヌの骨と区別するのがたいへん難しい。属レベルにおいてさえも，動物組成の中に近縁で大きさもよく似たより一般的な動物が含まれていると，一般的でない方の動物は見逃されるのかも知れない。例えばギリシアの新石器時代以降の標本ではバイソン（*Bison*）とスイギュウ（*Bubalus*）がおそらく畜牛の骨に混じって見逃されているだろうし，レイヨウ（*Rupicapra*）もおそらくヒツジやヤギに混じってしまっているのだろう。Higgs, Clegg and Kinnes〔1968〕がシカの骨は認められないと報告したSaliagos遺跡から出土した資料の中に，Bökönyi〔1971〕はダマジカ（*Dama*）を同定している。とはいえ，次第に詳細な比較研究がより信頼できる規準を確立しつつある。例えばBoessneck, Müller and Teichert〔1964〕による研究はヒツジとヤギの骨を分類する新しいガイドラインを確立したのである。

計測：骨の大きさと家畜化

骨の計測値は動物骨報告書，特にドイツの動物考古学者による報告書において大きな部分を占めている。このような計測値は単に骨を記載するために，かつまた様々な特定の目的のために発表されている。例えば野生種を家畜種から区別したり（図2），雌雄の区別をしたり，異なる時代のあいだ，異なる遺跡のあいだで比較を行うほか，形の違いやその変化を明示するために行われている。明確に計測値を記載することの必要

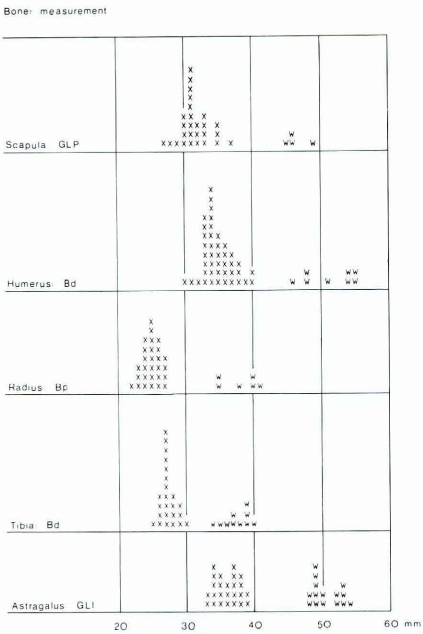

図2　計測値によるブタ（X）とイノシシ（W）の識別：Pevkakia 遺跡の後期新石器時代と青銅器時代のデータ〔Jordan 1975；Hinz 1979〕。計測値の定義については von den Driesch〔1976〕を見よ。

性は一般に認識されてきており，計測値を定義づける多くの基準となる研究が一般に用いられている（そのような研究でもっとも新しいものは von den Driesch〔1976〕によるものである）。従って記載や基準化が容易ではないほとんどの他の種類の動物考古学のデータを比較するよりも，計測値を比較することはたとえそれがことなる研究者によって計測されたものであってもはるかに問題が少ない。

図3は，2つの近縁種（この場合は Nea Nikomedeia 遺跡の新石器時代遺跡から出土したヒツジとヤギ）を区別するための計測値の利用を示している。大きさの顕著な違いによって成熟した雌のヤギと雄のヤギの区別もできるが，このような違いはヒツジでは見られない。多くの若いヤギの骨が雌の成獣と雄の成獣のあいだに分布している。おそらくこれらは若い雄たちなのであろう。

重要なことは，どの集団内でも計測値にばらつきがみられるということだけではなく，ある計測値は別の計測値よりも大きくばらつきがでることを認識することである。性的二型をよく表す計測値もあれば，あまり表さない計測値もある。多くの計測値は加齢とともに大きくなるが，あるもの（例えばブタの臼歯長）は小さくなる。また，他の計測値に比べ単にばらつきが大きいというだけの計測値もある。もしある時代における特定の計測値の平均が他の時代に比べ明らかに小さかったら，これは動物の大きさの変化を反映しているかもしれない。しかし，雌に対する雄の比率の変化（もしこの種が雌雄で大きさに違いをもつ種であれば）や年齢構成の変化（この危険性は骨端の癒合が完了した標本や，年齢によってほとんど変化しない歯の大きさだけを考慮することで，ほぼ取り除くことができる）の反映であるかも知れない。計測値の変化を生息していた動物の大きさの変化の反映であるとみなす前に，両者の可能性を除外する試みがなされなくてはならない。Pevkakia 遺跡では新石器時代後期から青銅器時代にかけてアカシカの骨の大きさが小さくなる（図4）。この場合，青銅器時代の標本では雄と雌はほぼ同数であり比較的若獣が少ないので，骨の大きさの縮小は年齢や性の比だけでは説明できないから実際に大きさの変化を表しているらしいと Amberger〔1979〕は明示した。家畜化の影響として動物が小さくなるという一般的な解釈の視点からするとこれは興味深いことであるが，他にも大きさの変化に影響を及ぼす多くの遺伝的，環境的要因がある。例えば Pevkakia 遺跡のアカシカについては大きな個体を選んで捕獲し，殺した選択的狩猟の影響や環境の悪化の影響，またはシカがもたらされる領域の変化，もしくは小型の家畜種のシカが導入されたことなどの影響であったかもしれない。

計測値は地域的な家畜化の問題を考える上でたいへん重要である。Renfrew〔1968〕と Dennell〔1983〕は，ある種の動物はトルコやレバントなどから家畜種としてもたらされたのではなく，ギリシアかヨーロッパ南東部においてその地で家畜化されたのではないかと唱えた人々の一部である。新石器時代の農業にみられるヒツジ，ヤギ，ウシ，ブタ，イヌの5種の家畜のうち，ヒツジとヤギはギリシアで家畜化されたもので

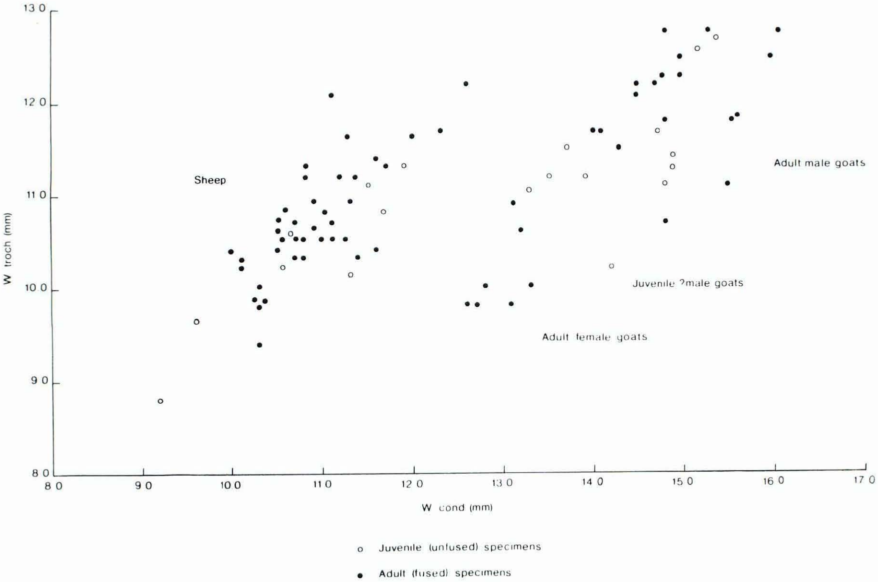

図 3　Nea Nikomedeia 遺跡から出土した中手骨遠位端を測った２つの計測値（顆幅と滑車幅）の散布図。これによってヤギとヒツジが識別される（Payne〔1969a〕に計測値の定義が示されている）。ヤギのクラスター内で雌の成獣は底部に小さなグループを形成し，一方雄の成獣は上部にさらに大きなグループを形成する。中間の若獣標本はおそらく若い雄だろう。

はないだろう。家畜化に必要な野生種がギリシアに生息していなかった可能性が高いのである〔Payne 1968〕。後期更新世のヨーロッパ南東部における唯一の caprine（ヒツジとヤギを含むグループ）の良好な証拠はアイベックス（*Capra ibex*）である。ほとんどの研究者は，アイベックスが，家畜化されたヤギの祖先としてはたした役割はほとんどあるいは全くなく，近東のパサン（*Capra aegagrus*）に極めてよく似たものであったという点で一致している[1)]。一方でイノシシ，野生ウシ，オオカミはすべて更新世と完新世はじめのギリシアの遺跡にみることができ家畜化は可能であっただろう。

５種すべてにおいて家畜化は体格の顕著な縮小によって特徴づけられ，もしくはそれを伴うように見える。体格の縮小がどの程度遺伝要因によりどの程度環境要因によっているのか，さらにこのような変化がどのくらいの速さで起こるのかわからないが，一連の層序にわたって大型の“野生型”標本から小型の“家畜

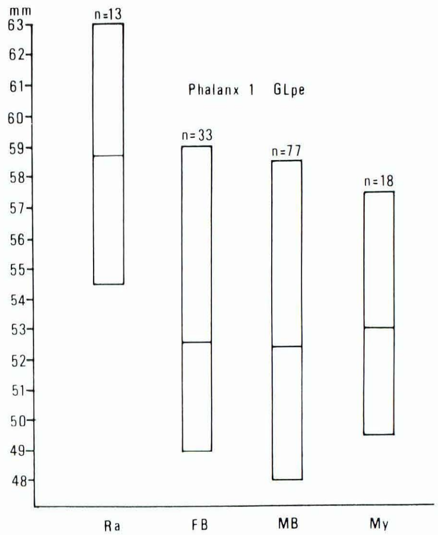

図 4　Pevkakia 遺跡から出土したシカ属の第１指骨の縮小（Amberger〔1979〕より）。Ra＝後期新石器時代；FB＝前期青銅器時代；MB＝中期青銅器時代；My＝ミケーネ文化。計測値の定義については von den Driesch〔1976〕を見よ。

型”標本への縮小化がみられるときや，“野生型”から“家畜型”への著しく広範で，根本的には連続的な多様性がある（これは後の段階で広範な交配があった場合にも生じるだろう）資料からははっきりと独自に家畜化が生じたことを期待できると，一般に意見が一致している。同時に，ヒツジにおいては角を失うとかブタでは涙腺が短くなるといった家畜化にともなう形態的特徴の出現を探すのが普通だろう。

ギリシアのヒツジとヤギの場合，この地で家畜化が生じた証拠は報告されていない。すべての遺跡における無土器新石器時代と前期新石器時代の骨資料の中でヒツジは優位を占めるが，それらが“野生型”の標本を含むとか，大きさの変異が著しく大きいとかいった示唆はなされていない。これは特に Franchthi 洞窟での結果とよく一致する。Franchthi 洞窟ではヒツジをまったく含まずアカシカが大勢を占める中石器時代の堆積の上に，99%以上をヒツジが占める無土器新石器時代の堆積がのっているのである〔Payne 1975b〕。Franchthi 洞窟のヒツジは新石器時代のあいだに小さくなるが，ヒツジが新石器時代の最も早い段階ですでに家畜化されていたということは，その出現が突然であることや若い個体群の割合が高いことなどからほとんど疑問の余地がない。また新石器時代の最も早い段階（無土器新石器時代）以降，ヒツジやヤギの乳歯が普通に存在することはそれらが一般に洞窟で飼われていたことを示唆する（Payne 出版準備中)。

しかしブタとウシについてはいくぶん状況が異なる。イノシシと野生ウシはその家畜化されたもの同様，新石器時代から青銅器時代の多くの遺跡から報告されており，これら2属について野生種と家畜種をはっきりと分けることはしばしば困難なのである。たとえば Gejvall〔1969〕は Lerna 遺跡のブタ属とウシ属のほとんどを“家畜と家畜への移行型”としてリストに載せている。問題は本当にこれが“野生”と“家畜”の連続を反映しているものなのか，単にわれわれが2つのそれぞれ固有の実体を区別することができないだけなのかという点である[2]。この問題はさらに多くのデータによってのみ答えることができるものである。すなわちポピュレーションのなかでの変異が低く，家畜化にともなって顕著に縮小を示す計測値だけを集中的に用いるために，様々な計測値の変異についてさらに多くのことを知る必要がある。新石器時代とそれ以前の遺跡から出土したこれらの属のもっと多くの資料が必要である。

骨を数える：相対頻度の計測

環境条件や経済のパターンを復原しようとするとき，ひとつの資料に含まれる様々な種の相対出現頻度についての情報は単なる種のリストよりも明らかに多くのことを教えてくれる。しかし，相対出現頻度を定量化する様々な方法が現在用いられており，それらの相対的なメリットが議論の対象となっている。

同定された標本数（NISP）を用いることはその簡潔性にメリットがある。様々な動物の骨格における単なる骨の数の違いは容易に考慮することができる。例えばブタはヒツジの2倍の指骨を持っているが，これを数えるときは数を半分にするか軸側の指骨だけを数え反軸側は無視すればよいのである。しかし問題は NISP では異種間の骨の破砕の違いを考慮してやることができないことである。つまり骨格要素のごく限られた部分しか現れない種は過小評価され，何らかの理由で同定しやすい破砕骨をもつ動物は過大評価されてしまうのである。また，実際にはごく少数の動物しか含まれていないときでも多くの標本を扱っているという印象を与えてしまうのである。こうした難点の一部については Watson〔1979b〕によって提案された“特徴的な領域”手法（“diagnostic zone” approach）などによって改良されいる。

代わりに用いられる一般的な方法は資料中に含まれるそれぞれの種の最小個体数（MNI）を算定することである。MNI 算定の基本原理はまったく簡単なものである。資料中に4本のヒツジの左橈骨近位端があれば少なくとも4頭のヒツジが含まれていることがわかる（一方 NISP を用いて数えた50の標本にはたった1頭しか含まれていないかもしれない――ヒツジはおよそ200の骨を持っているのである――）。しかし，同じ生データに出発しながら違うやり方をすることで動物考古学者によって異なる MNI が算定される。ある者は単に，最も顕著な特徴的要素を採用する（必要とあれば適切な調整をして；例えばウマは4個の第1指骨

を持っているので，17個の第1指骨は少なくとも5頭のウマを示す)。またある者はこれとは異なる見地からさらに多くの個体数を見積もる。すなわち，もし4本のヒツジの左橈骨近位端と，それらとは合致しない右橈骨近位端が1本，さらに1本の大きすぎる上腕骨遠位端と，それらどの橈骨を持つにも幼すぎる咬耗していない乳臼歯を1本含む資料には，7というMNIが使われるにちがいない。動物考古学者のうちある者は発掘区や層序の異なるところから由来した骨は同一個体のものではありえないと仮定するので，ある時期ある時代のMNIの総計を得るためにそれぞれの発掘区で算定したMNIを合計する。別の動物考古学者は，1つの発掘区にMNIを与えている4本の左橈骨近位端は別の発掘区から出土した3個の左下顎骨と同一個体から由来したかもしれないとみなし，一つの単位と見なされる層から出土した全資料のMNIを計算する。そのため通常かなり低い見積をするのである。これはMNIを用いる際の問題の中心をはっきりと示している。同一個体の骨が異なる2つの発掘区から見つかることはないと仮定するのが安全ではないとしたら，もしくは2つの発掘区のMNIが同一部位にもとづいていないのだとしたら2つの発掘区のMNIの数字は合計できず，資料が合計されるときに分析の各段階で再計算されなければならない。対照的にNISPの数字は何の問題もなく合計できる。

数が多く，詳細に採集された資料を研究するときはMNIもNISPもどちらも有効であり，もし両者が異なった相対頻度を示したらこれは興味深いことで，説明が必要である。数は少ないが詳細に採集された標本には，MNIは困ったことにあまり一般的でない種の重要性を過大評価してしまう傾向があり，一般にNISPが好まれる。一方，数は多いが詳細に採集されていない資料についてはNISPは大型種の重要性を強調する傾向があり，MNIの方がおそらく間違いが少ないであろう。Sitagroi遺跡での，ふるいがけ実験の結果〔Payne 1972a；1975a〕はこれらの点を例証している（表1）。ふるいがけはMNIとNISPがたいへんよく一致する資料を提供した。主な差は相対的に頻度の低い種がMNIによっておそらく過大に見積もられたものだ。ふるいがけされない資料についてはMNIのほうがNISPよりもふるいがけした資料に近い結果を示したが，それでもウシのような大きな動物を相対的に過大に見積り，ヒツジやヤギのような小さな動物を過小に見積もっている。

ギリシアの遺跡から出土した動物骨資料のほとんどは，ふるいがけを行わない発掘や，ほんのいくつかの堆積（例えば埋葬や床）だけがふるいがけされた遺跡から得られたものである。したがってこれらの資料は同じく発掘中の見落としによる偏りを被っているだろう。この偏りを検証するひとつの方法は骨格中で互いに近接して位置する小さな骨と大きな骨の頻度を比較することである。表2には，指骨の数，および手根骨と足根骨の数が中手足骨の数と，また，足根骨の数と脛骨の数が，さらに，遊離した歯と下顎骨の数が様々な資料について比較されている。明らかに他の要素も含まれているだろうし，それぞれの比は違った要素によって影響されているだろう。例えば遊離歯の下顎骨に対する比は最初の破砕や踏みつけ，保存に影響されているかも知れず，指骨の中手足骨に対する比は解体の違いに影響されるかも知れない。しかしすべての比が同様の兆候を示す。ふるいがけされないすべての資料は，ふるいがけされた資料よりも小さな方の骨の相対頻度がたいへん低い。したがって，これは明らかにふるいがけされない資料は発掘中の見落としの結果として偏りを受けていることを示唆する。このアプローチはこのような偏りを見つけるためだけでなく，それがいかに深刻なものであるか示唆するためにも用いることができる。例えば表2の数字は，Argissa-Magula遺跡の無土器新石器時代についての回収は，それ以後の時代についてよりも優れていたことを示唆している。したがってArgissa-Magula遺跡でのその後の時代におけるウシの相対的な増加は，何らかの実際の変化より，むしろ回収の違いを反映しているのかも知れないことを示唆している。

表3では，いくつかの発掘資料のデータが現代の同じ県（eparchies）の家畜数と比較されている。現代の家畜数は生きた動物の数なので，生きている家畜におけるヒツジ／ヤギに対するウシの比と，（私たちが考古学資料と比較すべき数字である）屠殺された数における比との違いを考慮するために，ある調整（ギリシ

表1　相対頻度の測定：MNI と NISP の比較は Sitagroi 遺跡から出土したふるいがけされた資料とされなかった資料である〔Payne 1975a〕。実験では，一連の発掘層から通常の方法を用いて作業員によって骨が採集された（“ふるいがけされなかった”資料）；作業員に見のがされた骨は次いで同じ土から水洗選別によって採集され，“ふるいがけされた”資料として加算された。ふるいがけされた資料では MNI と NISP は似たようなパーセンテージを示した。ふるいがけされない資料では，資料数が少ないにもかかわらず MNI は NISP よりも誤りが少ないという結果が出た。どちらの資料とも希少種の重要性を誇張する傾向がある。

	Sieved				Unsieved				
	NISP		MNI		NISP		MNI		
Bos	266	*11%*	6	*11%*	116	*43%*	5	*20%*	Cattle
Cervus and *Dama*	7	+	2	*4%*	3	*1%*	1	*4%*	Red and fallow deer
Sus	473	*19%*	7	*13%*	51	*19%*	5	*20%*	Pig and wild boar
Ovis and *Capra*	1538	*63%*	34	*62%*	95	*35%*	12	*48%*	Sheep and goat
Capreolus	2	+	1	*2%*	-	-	-	-	Roe deer
Canis and *Vulpes*	103	*4%*	2	*4%*	3	*1%*	1	*4%*	Dog and fox
Martes	4	+	1	*2%*	1	+	1	*4%*	Marten
Felis	5	+	1	*2%*	-	-	-	-	Wild cat
Lepus	44	*2%*	1	*2%*	-	-	-	-	Hare
	2442		55		269		25		

ア全土の屠殺数にもとづく）が行われた。調整が行われたとき私たちは，Sitagroi 遺跡出土のふるいがけされた資料は，現代の家畜のデータに近い数字を示すが，ふるいがけされないすべての資料ではウシが現代のデータにおけるよりも相対的にずっと一般的であることがわかった。これは，より多くのウシが飼われていたか，ヒツジとヤギが少なかったためにウシが過去において相対的にもっと豊富であったことを示唆する，ととることができる。しかし代わりの，そしてもっと可能性があると思われる説明は，ふるいがけされなかった考古学資料におけるウシの相対的重要性が，発掘時の見落としによる偏りの結果として，一貫して強調されたというものである。

骨の破壊は，考古学資料における偏りのもうひとつの重要な要因である。骨の破壊はほとんどすべての考古学資料において，上腕骨近位端，脛骨近位端，肋骨，脊椎骨などの弱い部位が，上腕骨，脛骨の遠位端，足根骨，歯などの強い部位に比べて相対的に乏しいことに反映されている。

しかし破壊による偏りは説明として濫用されるべきではない。Coy〔1977〕と Clutton-Brock〔1982〕は，島の遺跡である Kephala と Emporio での予想外の魚骨の乏しさが破壊による偏りによって説明されるだろうと示唆した。すなわち：

私たちは動物遺存体に関する限り不完全な絵を見ている。魚の骨……がほとんど完全に消えてしまっているのだ〔Coy 1977：132〕。

魚骨のうちあるものが壊れやすいことは確かである。しかし脊椎骨椎体のような骨は比較的頑丈で，時として示唆されるほど容易に壊れない〔Casteel

表2 いくつかのギリシアの遺跡から出土した動物骨資料の採集水準の指標。ふるいがけされない資料のなかで Lerna 遺跡と Argissa 遺跡の古い時代の指標が高いことは後の時代よりも採集水準が優れていることを示唆する。遊離歯の数字は，上顎歯と下顎の数字が別々に与えられている場合その両者を含む。指標がもとにしている骨の数が30に満たないときは指標をかっこに示す。

		Ovis and *Capra* Sheep and Goat				*Sus* Pig and Wild Boar	*Bos* Cattle (incl. wild)	
		single teeth / mandibles	phalanges / metapodia	carpals + tarsals / metapodia	tarsals / tibiae	single teeth / mandibles	single teeth / mandibles	Source, comments
Wet-sieving: Sitagroi	Neolithic/Bronze Age	15.22	1.77	0.95*	2.40*	8.11	7.30	Payne 1975a, Figures 2 and 8 (combined)
Dry-sieving: Sitagroi	Neolithic/Bronze Age	8.67	1.90	0.80*	(2.4)*	9.75	(—)	Payne 1975a, Figure 8 (DS). Dry-sieving at Sitagroi recovered 83% of the cattle bones, 60% of the pig bones, and 58% of the sheep/goat bones.
Partial sieving: Nichoria	Middle Helladic	10.69	(1.1)	(1.6)	(1.6)	12.00	4.83	Sloan and Duncan 1978, Tables 6-2, 6-3 and 6-4
	Late Helladic	5.41	0.61	0.78	1.50	2.64	8.18	
	Dark Ages	14.29	(1.0)	(0.6)	(0.9)	5.25	15.17	
Unsieved: Sitagroi	Neolithic/Bronze Age	0.29	(0.0)	(0.0)*	(0.0)*	(0.1)	2.30	Payne 1975a, Figure 2. 'Normal excavation' at Sitagroi recovered 44% of the cattle bones, 11% of the pig bones and 6% of the sheep/goat bones.
Argissa	Preceramic Neolithic	1.48	0.13	0.19	0.26	1.43	(1.9)	Boessneck 1962, Table 3
	Middle Helladic	0.27	0.03	0.10	0.09	0.13	0.24	Boessneck 1962, Tables 11-13 (combined)
Lerna I + II	Early & Middle Neolithic	0.46	0.16	0.16*	0.26*	0.29	(2.0)	Gejvall 1969, Tables 12-18
Lerna III + IV	Early Helladic	0.48	0.05	0.22*	0.34*	0.23	2.18	
Lerna V	Middle Helladic	0.54	0.30	0.25*	0.43*	0.19	1.54	
Lerna VI + VII	Late Helladic	0.03	0.02	0.09*	0.11*	0.01	(0.3)	
Agia Sofia-Magula	Late Neolithic	0.84	0.11	0.17	0.13	0.19	0.78	von den Driesch and Enderle 1976, Table 3
Pevkakia	Early Helladic	0.84	0.22	0.27	0.20	0.47	0.77	Amberger 1979, Tables 4, 10 and 12, and Hinz 1979, Tables 4 and 11
	Middle Helladic	0.69	0.30	0.26	0.14	0.39	0.77	

表 3　ギリシアの遺跡から出土した，ある範囲の資料におけるウシとヒツジ／ヤギの相対的な量の多さが同じ県での現代データと比較されている。飼育数は Kayser and Thompson〔1964〕による。屠殺数は，ギリシア全体の最近の数字から出された屠殺率にもとづいて見積もられた（表 5 を見よ）。

Archaeological data					Modern data, same eparchy (county)		
Site	Period	Source	Basis	Cattle as percentage of cattle, sheep and goats	Slaughter (estimate) Cattle (*Bos* & *Bubalus*) as percentage of cattle, sheep and goats	Living stock: Cattle (*Bos* & *Bubalus*) as percentage of cattle, sheep and goats	Eparchy (county)
Argissa-Magula	Preceramic Neolithic	Boessneck 1962	NISP, unsieved	6%	3%	4%	Larissa
Prodromos	Early Neolithic	Halstead & Jones 1980b (Table 1a)	NISP, unsieved	29%	8%	12%	Karditsa
Knossos	Early Neolithic	Jarman & Jarman 1968	NISP, unsieved	23%	2%	3%	Temenos
Agia Sofia-Magula	Late Neolithic	von den Driesch & Enderle 1976	NISP, unsieved	24%	3%	4%	Larissa
			MNI, unsieved	16%			
Sitagroi	Late & Final Neolithic	Payne 1975a (Fig. 2)	NISP, unsieved	55%	18%	26%	Drama
			MNI, unsieved	29%			
			NISP, water-sieved	15%			
			MNI, water-sieved	15%			
Emporio I-V	Early Bronze Age	Clutton-Brock 1982	NISP, unsieved	28%	7%	11%	Chios
Lerna III + IV	Early Helladic	Gejvall 1969	NISP, unsieved	45%	1%	1%	Argos
Pevkakia	Early Helladic	Amberger 1979	NISP, unsieved	39%	1%	2%	Volos
			MNI, unsieved	36%			
Lerna V	Middle Helladic	Gejvall 1969	NISP, unsieved	47%	1%	1%	Argos
Pevkakia	Middle Helladic	Amberger 1979	NISP, unsieved	40%	1%	2%	Volos
			MNI, unsieved	24%			
Argissa-Magula	Middle Helladic	Boessneck 1962	NISP, unsieved	44%	3%	4%	Larissa
Nichoria	Late Helladic	Sloan & Duncan 1978	NISP, partially sieved	23%	3%	5%	Messini
Phylakopi III + IV	Late Bronze Age	Gamble 1980	NISP, unsieved	16%	3%	5%	Melos

1976〕。もし，哺乳類の上腕骨や脛骨の近位端と遠位端のあいだの比や，四肢体幹骨と歯のあいだの比といった弱い部位と強い部位との相対的な量の多さを，考古学資料における破壊による偏りの程度をおおざっぱに見積もるために用いると，たとえ破壊による偏りが明かな遺跡でも魚骨はかなり普通に見つかるのである。Coy も Clutton-Brock も比較に使える詳細な数字を出していないが，彼らが出したデータは，彼らが議論しているどちらの資料も著しく保存が悪かったわけではないことを示唆している。魚骨は比較的小さいという傾向があり，ふるいがけを行わない発掘ではとくに見落とされやすい。しかし Gamble〔1979〕は他の島の遺跡，Phylakopi での魚骨の乏しさやマグロの脊椎骨（これはかなり大きい）の欠落は，マグロその他の漁がこの遺跡の経済の中心であったに違いないという Bintliff〔1977：540〕の主張に対して疑問をなげかけるとコメントをしている。この点に関して彼はまったく正しい。

イヌはほとんどすべての新石器時代およびそれ以降の遺跡から見つかるが，多くの骨を咬み，壊してしまう骨の崩壊の重要な原因の一つである。イヌはふつう選択的で柔らかい骨か報酬の大きな骨には熱心に働きかけ，硬い骨や報酬の少ない骨，そしてほとんどのウシの成獣の長骨のようなイヌにとっては大きすぎて簡単には扱えない骨は無視する。このことも再び，考古学資料においてウシには残りやすい偏りを，ヒツジ・ヤギ・ブタなどの種にはそれとは反対の偏りをかける傾向があるだろう。イヌの活動は歯の痕によって認識できるが，ふるいがけされた資料においては，消化器系を通過することによって侵食された骨の破片によっても認識される。このような侵食された資料には大きさの上限があり，このことが酸性の土壌条件によって侵食された骨と区別している。酸性の土壌条件による攻撃は大きさに関係がない。例えば Franchthi 洞窟から出土した新石器時代の資料においてヒツジ／ヤギの手根骨，足根骨，指骨はたいてい侵食されているのに対し，ウシの骨やヒツジ／ヤギの大きな骨は良好な状態である。

環境復原

骨を同定し，数を数え，様々な種の相対的な量の多さを見積もってしまえば，私たちはようやく考古学者として答えようと努めている問題に進むことができる。第1に，私たちは環境状態を復原しようと努めている。この目的については，考古学資料中の様々な野生種の相対的な量の多さが合理的に信頼できるガイドを与えてくれる。とはいっても注意が必要である。多くの動物たちは私たちが知っているよりも環境に対して耐性があり，いつもの競争者や補食者がいないときには未知の小生活圏（biotope）に入り込むかも知れない。骨は遺跡に，通常選択的な要因によって遺跡周辺の様々な距離から運ばれる。普通，人間は比較的広範な領域にわたって狩りをし，時には遺跡から非常に遠くまで出かけていくこともあるが，フクロウは一般的に巣から半径わずか 2–3 km のなかで獲物を捕らえる。私たちが遺跡周辺の環境状態の復原を試みるとき，それらの点から考えること，そして地域的な地勢と関連して遺跡周辺に存在していたであろう様々な小生活圏の点から考えることが重要である。

Franchthi 洞窟の中石器時代層を例として取り上げることができる。この期間アカシカ（*Cervus elaphus*）がもっとも一般的な大型哺乳類であり，イノシシ（*Sus scrofa*）・ヤギュウ（*Bos primigenius*）そして時おりノロジカ（*Capreolus capreolus*）があとに続く。キツネ（*Vulpes vulpes*）とノウサギ（*Lepus europaeus*）は最も一般的な中型哺乳類であり，もっと数は少ないがアナグマ（*Meles meles*）・ヤマネコ（*Felis silvestris*）・ブナテン（*Martes foina*）がともに出土する。アカシカは多様な環境状態の下で見つかるだろうが，比較的歯冠の低い歯を持つ若芽を食べる動物なので，適度に柔らかな植物が十分に供給されることが必要である。ノウサギとヤギュウはもっと歯冠の高い歯を持っている。これは地面近くで草を食むために食物といっしょに砂を食べてしまうことによる高い咬耗率への適応である。これらの動物の存在は開けた草原，またはそれに似たような丈の低い植物を示唆する。ノロジカ・アナグマ・ヤマネコは樹木で覆われた地域の指標でありイノシシの存在はやや湿った地域を示唆する。総合すると――動物相全体から得られた指標は，つねに，単一種にもとづくいか

なるものよりも信頼できる——この動物相は，開けた草に低木林が点在する複雑な景観を示唆する。この復原は齧歯類の遺存体を調べることで精度を上げられる。齧歯類ではハタネズミ類が大勢を占ている。ハタネズミ属（*Microtus*）は開けた草原を示唆し，一方マツネズミ属（*Pitymys*）は草と低木の混在を示唆する〔Payne 1982〕。もし，小型哺乳類は主にかなり小さな半径内でのフクロウの狩りによって遺跡に運ばれたのだと仮定すると，より小さなアカネズミ属（*Apodemus*）の種のような疎林性の齧歯類の乏しさは，ノロジカ・アナグマ・ヤマネコなどによって示される疎林は遺跡から遠く離れたところにあったことを示唆する。遺跡周辺の地形を考慮にいれると〔van Andel 他 1980〕，現在の Koilada 湾のような近くの平地はまばらな樹木と灌木をいくらかともなった草原に覆われ，おそらく泉があったところでは湿った草地がところどころに点在していたかも知れない。現在ははげあがった石灰岩の丘は，洞窟が切り込んでいる丘も含めて，乾燥したマキ（*maquis*）を繁らせていたかも知れない。そして洞窟から内陸に向かう狭い谷には密な低木や，ある程度の疎林も形成されていたかも知れない。

可能な場合には植物や地質に関する情報も環境復原を行うときには利用すべきである。Franchthi 洞窟では我々は好運にも種子や炭化木材の破片の良好な資料を得た。中石器時代の種子資料では野生のアーモンド・ナシ・マスチック・エンバク・レンズマメ・ユリ科植物などが優勢である〔Hansen 1980〕。アーモンド・ナシ・マスチックはみな南ギリシアのマキにおいて一般的な要素であるが，その他の種は，フクジュソウ属（*Adonis*）・カラクサケマン属（*Fumaria*）・フウチョウソウ属（*Capparis*）・アオイ属（*Malva*）といった量の少ない多くの種も示すように，より開けた草木の地を示している。このように植物遺存体は動物骨から描かれた景観を裏付けている。

環境と経済の関係について考えるとき，本来経済に関するデータを環境状態の復原のために用い，つぎに同じデータを経済と環境の関係について論じるために用いると循環論に陥る重大な危険がある。これは新石器時代とそれ以降の時代の遺跡に特有の障害である。そこではほとんどの骨はふつう家畜に由来するものであり，種子は栽培植物から由来したものである。このような状況においてはできるだけ広い範囲の証拠を調べることが特に大切である。特に，環境に対して経済活動が及ぼす影響を，一貫して通常はあまり直接反映しない花粉や齧歯類の遺存体といった証拠を調べることが大切である。例えば Franchthi 洞窟では，中期新石器時代と後期新石器時代のほとんどを通じてウシがたいへん少ないが新石器時代の最終期に増加する。我々は独立した指標（この場合小型哺乳類が最良の展望を与えてくれる）を調べてはじめて，これが夏の雨の増加といった環境の変化を反映しているのか，犁の導入といった経済の変化を反映しているのか識別できる。

経済の復原：相対的重要性

考古学資料に現れる様々な種について経済的役割と人間にとっての相対的な重要性を評価するためには，私たちはまず私たちが見つけるすべての骨が実際に人間によって食べられた動物に由来しているのかどうか問題にする必要がある。あるものは，遺跡に住みつきそこで死んだ動物に由来し，あるものはそのような動物によって残された食べ残しに由来しているかもしれない。例えば使われなくなった建物に巣をつくったフクロウは，齧歯類やその他の小動物の骨がぎっしり詰まった吐出物（ペレット）を大量に残すだろう。私たちが見つける骨のうちのあるものは，食べるためにではなく毛皮をとるために人間に殺された動物に由来しているかも知れない。またイヌ・ウマ・ロバの場合よくみられるように，食べること以外を目的として飼われていた動物から由来しているかもしれない。

これは洞窟遺跡を扱う際に特有の問題である。なぜなら洞窟は人間ばかりでなく，いろいろな種類の動物によっても利用されるからである。切痕，燃けた痕，加工品と骨の関連などはすべて人間が使用し消費した証拠として用いられるが，それでもなお誰が何を食べたのか識別することは困難である。新石器時代とそれ以降の時代の遺跡については問題はそれほど深刻ではない。村落や都市の遺跡から見つかる骨のほとんどは，人間によって利用されたり食べられたりした動物たちのものであると仮定して無理がないからである。

遺跡に棲みついていたのであろうネズミやその他の小型哺乳類はあきらかに例外であり，フクロウの吐出物の堆積，もしくは自然のわなに含まれる小型哺乳類の骨の集中（Nichoria 遺跡のピトスから採集された小さな脊椎骨の集中がひとつの例である〔Wolberg 他 1975；Sloan and Duncan 1978〕）も同様である。

しばしばイヌとウマは食べられなかったとみなされるが，これは実際の証拠以上に私たち自身の文化的憶測に基づいた考えである。例えば Lerna 遺跡において Gejvall〔1969〕は，骨の切痕の研究からイヌは食べられていたと結論づけている。イヌの骨に切痕がある割合は比較的高く（表4），そのうちのいくつかは皮を剝ぐあいだにつけられたのではなさそうな部分にあった。資料は少ないが，ロバの骨のいくつかにも切痕がついていた。ウマやロバも食べられていたのかもしれない[3]。

肉の供給という点から相対的重要性を計算するために，多くの動物考古学者は，大きさの異なる動物からとれる肉量の違いを考慮にいれた係数を用いて数字を加減するか，または考え方としては同様の調整によってそれぞれの種について同定された骨の重さを比較する。取れる肉の量と骨の重さはだいたい比例するからである。この種の補正は，おおまかな値になってしまうのは避けられないにしても，1頭の子ウシからは10頭のヒツジと同じ量の肉が取れることを気づかせてくれるのに役立つ。しかし冷蔵できなければ小さな動物の安定した供給の方が，たまに得られる大きな死体よりも都合がよく効果的に利用されるだろうことを私たちは思い出すべきである。

様々な家畜動物の経済上の相対的重要性を評価するために考慮しなくてはならないのはもちろん肉だけではない。現代のギリシアのデータを要約した表5に示されるように，多くの環境下ではミルク・チーズその他の“二次的”な生産物が肉よりもはるかに重要であろう。例えばギリシアのヤギでは，肉よりもミルクがカロリーを6倍以上，タンパク質を3倍近く供給している。肉以外に食料を供給しないのはブタとウサギだけである。また，これらの数字には羊毛・毛・肥料・牽引力などについては取り上げていない。例えば現代のギリシアにおけるウマの経済上の重要性は，この動物が供給する労働力・輸送力・肥料などにあり食べられていない。

表4　Lerna 遺跡で一般的な哺乳類の骨の切痕の頻度：Gejvall〔1969〕のデータ。

	No. of bones	No. with cut-marks	% with cut-marks
Sheep and goat	4685	11	0.2%
Pig	4158	4	0.1%
Cattle	3456	24	0.7%
Dog	625	40	6.4%
Horse and donkey	63	3	4.8%
Wild cattle	32	5	15.6%
Red deer	491	17	3.5%
Wild boar	127	1	0.8%
Hare	121	3	2.5%

表5 1977年のギリシアの家畜飼育数と生産高〔ギリシア国立統計局 1980〕。カロリー，タンパク質の含有量は中級の牛肉，豚肉などの値，3.5%牛乳の値，50 g を平均重量とした卵の値を用い，FAO〔1954〕によって計算した。

	Equids	Cattle (incl. water buffalo)	Sheep	Goats	Pigs	Rabbits	Poultry
Living animals	535,361	1,039,114	8,075,493	4,508,332	866,173	1,885,034	29,873,948
Animals killed	—	624,808	7,349,654	4,324,634	1,952,320	5,370,674	73,188,244
Slaughter rate (Animals killed/Living animals)	—	*.60*	*.91*	*.96*	*2.25*	*2.85*	*2.45*
Meat (tons)	—	120,592	79,428	41,096	120,473	8,386	117,412
Milk (tons)	—	678,960	568,991	420,770	—	—	—
Eggs (no.)	—	—	—	—	—	—	2,234,241,000
Food supplied by animal:							
Calories:							
Proportion supplied by meat	—	*38%*	*25%*	*14%*	*100%*	*100%*	*47%*
Proportion supplied by milk and eggs	—	*62%*	*75%*	*86%*	—	—	*53%*
Protein:							
Proportion supplied by meat	—	*43%*	*22%*	*27%*	*100%*	*100%*	*54%*
Proportion supplied by milk and eggs	—	*57%*	*78%*	*73%*	—	—	*46%*
Other products & uses	traction, transport, dung, skins	traction, dung, skins	wool, dung, skins	hair, dung, skins	dung, skins	dung, skins	dung, skins

家畜が管理される方法は肉や様々な二次的生産物の相対的重要性に左右される。このことは動物が殺された年齢として動物骨資料に反映するはずであり，したがって様々な年齢の動物の相対頻度や，雄・雌・去勢個体の相対頻度に反映されるはずである。羊毛・毛・労働などの二次生産物が重要な場合，成獣がもっとも生産性の高い階層であり，雄（もしくは去勢個体）も雌と同じだけの生産性をもつ。確実な世代交替だけを目的としていれば繁殖率はふつうかなり低く抑えられるだろう。すなわち若い個体が殺されることは比較的少なく，繁殖に必要のない雄は去勢されることが多い。対照的に肉やミルクが重要な時は高い繁殖率が求められ，雌の成獣は繁殖に必要な少数の雄の成獣よりはるかに多いだろう。ミルクの生産が主要な目的の場合，余分な子供は比較的若いうちに——例えば食用の子ウシ，子ヒツジ（*αρνακι γαλακτοσ*）として——殺されてしまうだろう。肉が主な目的である場合には，過剰な若い動物は太らせて，成長した若獣か若い成獣の時に殺される〔Payne 1973b〕。もちろんこれらの混合した経済では，さまざまな潜在的生産物のあいだのバランスを反映する混合したパターンが生じるだろう。例えば，現代のギリシアではミルクを採ることがヒツジやヤギを飼う主な目的であり，肉は重要な二次的生産物である。羊毛はそれほど重要ではない。このことは若い個体の屠殺率が非常に高いことに反映されており，多くの個体は生後3ケ月で，その他の個体も生後9ケ月から18ケ月のあいだに殺されてしまう。

考古学遺跡から出土した動物骨資料において，動物が殺された年齢を歯の萌出や咬耗の状態から決めることができる。若獣ではまず乳歯が生え，ついで永久歯の大臼歯が順々に萌出する。最後に乳歯はしだいに永久歯の切歯や犬歯，小臼歯によっておきかわる。したがってある動物種の歯の萌出の時期を知っていればその歯や顎骨の年齢を決めることができる。いちど萌出が完了してしまうと，あとは動物の成長にともなってしだいに歯はすり減っていく。咬耗は変異が大きいために萌出に比べると精度は劣るが，咬耗の量も年齢推定に用いることができる〔Deniz and Payne 1982〕。

精度は劣るが骨端部の癒合のデータによっても年齢を決めることができる。若獣では長骨の成長は3ケ所の骨化中心から進んでいく。2ケ所は関節部（骨端）であり，もう1ケ所は骨体である。骨体では骨の両端が骨端部に向かって成長していく。骨がその最大長に成長するまでは，骨の急速な成長を許すために骨体と骨端の癒合部の少なくともどちらか一方が骨化しないままでいる。骨化しない部分（骨端軟骨）はおもに軟骨から成っている。軟骨は土壌中で急速に分解されてしまうので，若獣の長骨は2つもしくは3つに分かれた破片として採集されるだろう。骨が最大長にまで達してしまえば，関節部（骨端）が骨体と癒合することによって軟骨は消える。骨端の癒合もやはりそれぞれの種における一連の順序にしたがって進行するので，考古学資料の年齢を推定する根拠として用いることができる——ただしどんな長骨骨端についても，それが骨端が癒合する年齢よりも若いとか，年をとっているということしかいえない。様々な骨端が癒合する年齢はいろいろな歯が萌出する年齢よりも，集団内および集団間でおそらくさらに変異が大きい。

時には雄の骨と雌の骨を区別することもできる。角心・寛骨，それに程度は強くないが中手足骨においてヒツジ・ヤギ・ウシは性的二型がある。ウマ・ブタでは雌の犬歯は雄のものに比べて小さく弱い。骨格の成長，例えば寛骨の形や中足骨の大きさなどに与える影響から去勢を認められるかも知れないが，この問題はさらに詳しく調べる必要がある。

このように，標本数が多ければこの種の方法によって，何才で動物は殺され消費されたのか，また特定の年齢では雄と雌のどちらが多く殺されたのかなどについて我々は語ることができる。また，去勢は普通に行われていたのかといったことを語ることもできるかもしれない。“未成熟”な標本の割合といった記載にとどまる動物骨報告書はあまり多くの情報を与えてはくれない。すなわちもっと詳細な条件をつけなければ，未成熟と記載される標本はいろいろな年齢で癒合する骨や，萌出する歯なども含むのである。例えばヒツジでは，癒合していない橈骨の近位端は生後1年以内に死んだ個体から得られるだろうが〔Habermehl 1975〕，癒合していない脛骨の近位端は3才を過ぎた個体からも由来するかもしれない。それまでにはすでに子を2回も産んでいたかも知れない。しかし様々な長骨の骨

表 6　Prodromos 遺跡から出土したヒツジ／ヤギの年齢推定のデータ〔Halstead and Jones 1980b〕。

(n)		0 – 1 – 2 – 3 – 4 – 5 – 6 yrs.	% dead by age
102	scapula	(6-10 mths)	9%
74	pelvis		8%
117	humerus d.		13%
62	radius p.		5%
68	mandible	(1 yr)	28%
49	tibia d.	(18-28 mths)	33%
48	metapodial d.		54%
68	mandible	(2 yrs.)	57%
19	ulna p.	(30-42 mths)	63%
42	radius d.		57%
15	femur p.		20%
31	femur d.		48%
21	tibia p.		48%
24	calcaneum		29%
6	humerus p.		33%
68	mandible	(3 yrs)	68%
68	mandible	(4 yrs)	87%
68	mandible	(6 yrs)	100%

端部のデータを分け，歯の萌出や咬耗を各段階に区別している詳細な報告書はより情報を与えてくれる（例えば Payne〔1973b〕）。

年齢や性の推定についてのデータは破壊による偏りや発掘での見落としによる偏りの影響をひどく受けているかも知れない〔Payne 1975a〕。より若い動物の骨や歯は成熟した動物のそれよりも小さく弱い。性的二型を強く示す骨では概して雌は雄ほど頑丈にできておらず，また小さいため，雄の資料のほうが残りやすく採集されやすい。

ほとんどの考古学的資料において，歯や顎骨は長骨骨端よりも比較的普通にみつかり，癒合の遅い長骨の骨端は特に少ない。このことは歯の萌出や咬耗のデータは一般に偏りが少ない傾向があり，したがって骨端の癒合のデータよりも信頼できることを示唆する。表 6 に示されている Prodromos 遺跡のデータは，Halstead and Jones〔1980b〕によって認められたように，これらの問題について例証している。骨端の癒合のデータでは，歯の萌出や咬耗のデータと比べて各年齢でより若い動物の割合が低く，癒合の遅い関節部がごく少数になることから，破壊による偏りがかかっているのは明らかである。

基準や計算方法の違いも結果に相当影響することがある。例えば表 7 はふるいがけを用いて Sitagroi から採集された資料における，ヒツジ／ヤギの脛骨遠位端癒合に関するデータを示している。これらのデータを用いて“癒合していない骨の割合”を計算すると，壊れた資料をどう扱うかによって，また癒合していない骨体と癒合していない骨端のデータを組み合わせるかどうか，そしてまたどのように組み合わせるかによって14%から40%のいずれにも算定できる。さらに，歯の萌出と摩耗のデータについて扱う時は壊れた資料を

表7　Sitagroi 遺跡から水洗選別によって採集されたヒツジ／ヤギの脛骨遠位端の癒合に関するデータ〔Payne 1972b〕。癒合していないすべての標本に対して癒合した標本すべてを数えると40%（23/57）になる。一方，（同じ骨を2度以上数えないように）半分のもの，それより小さい破片を除外し癒合していない骨幹か癒合していない骨端だけを数えると14%（4/28）になる。

	Complete	Nearly Complete	Half	Small Fragments	
Fused ends	17	7	2	8	34
Unfused shafts	4	-	-	7	11
Unfused epiphyses	2	2	1	7	12
	23	9	3	22	57

どのように扱うかに多くがかかっている。なぜならその多くは1つの成長段階に決めることができず，おおよその範囲だけが決められるからである。もし壊れた資料を含めると同じ個体を複数回数えてしまう危険があり，もし除外するとより壊れやすい年齢群は十分に評価されない傾向があるだろう。いろいろな研究者がいろいろな決定をしており，しかも滅多にその決定を明らかに述べないので遺跡間のデータを比較することは困難である。

Boessneck〔1962〕は，毛の多い羊は3000年紀にテッサリア地方に導入されたと主張しており，線文字Bの文書は後期青銅器時代には羊毛生産はかなり重要なものとなっていたことを示唆している〔Killen 1964〕。それゆえ青銅器時代の資料では，羊毛生産への転換の反映として若い個体の割合がかなり低いことが期待されるだろう。表8にいろいろな時代のギリシアの遺跡から出土したヒツジ／ヤギの年齢査定のデータが比較されている。予期した方向への多少の変化があるものの，さらにはっきり目立つことはデータの中の相当な“ノイズ”である。おそらくこれは経済行為の実際の違いばかりでなく，保存・回収・分析の違いを反映している。例えば Nichoria において Sloan and Duncan〔1978〕は，第二大臼歯の歯冠高をもとにヒツジ／ヤギの年齢を査定しているが，この歯は下顎の中で生後6ケ月から1年のあいだに成長し，だいたい1才になって初めて生えてくるので1才未満に殺された個体は事実上無視されてしまう。

Lerna と Argissa の2遺跡では，どちらも新石器時代から青銅器時代までの連続した堆積を見ることができる。Argissa 遺跡では，2才になるまえに殺されたヒツジの割合は先土器新石器時代（37%）から中期青銅器時代（36%）までほとんど変化しないのに対し，Lerna 遺跡では中期新石器時代（39%）から後期青銅器時代（21%）のあいだに段階的に減少していく。文書はたしかに羊毛生産がギリシアの後期青銅器時代の経済（宮廷経済）に重要だったことを示唆しており，紡錘車やその他の毛織り物のための道具も晩期新石器時代から青銅器時代の層序にかけてそれ以前の新石器時代遺物の中にみられるよりも豊富にみつかる。しかしその一方で，死亡年齢のデータに顕著な変化がみられないことは，宮廷の家畜という予想される例外はあるが青銅器時代のギリシアでは羊はふつう混合した目的のために飼われており，羊毛生産が家畜経営のすべてだったわけではなかったことを示唆する。現代の数値は興味深い対照を示している。公式統計〔ギリシア国立統計局（National Statistical Service of Greece）1980〕によると，ギリシアで殺されるすべてのヒツジ・ヤギのうち約85%は1才未満である。いかにミル

表 8　ギリシアから出土した考古学標本における若いヒツジ／ヤギの屠殺。

Source	Site	Period	% killed younger than 1 year	% killed younger than 2 years	n	Basis, comment
Boessneck 1961	Argissa-Magula	Preceramic	(37%)	(37%)	54	MNI, probably tooth eruption, *infantil* and *juvenil* taken as $<$ 1 year, and adult as $>$ 2 years.
Jarman & Jarman 1968	Knossos	'Camp'	12%	64%	67	NISP, tooth eruption and epiphysial fusion combined
Halstead & Jones, 1980b	Prodromos	EN	28%	57%	68	NISP, tooth eruption
Jarman & Jarman 1968	Knossos	EN 1	18%	73%	276	NISP, tooth eruption and epiphysial fusion combined
Gejvall 1969	Lerna II	MN	28%	39%	61	NISP, tooth eruption. No animals older than 42 months.
von den Driesch & Enderle 1976	Agia Sofia-Magula	LN	38%	54%	39	MIND, tooth eruption
Boessneck 1962	Argissa-Magula	EH	(20%)	(20%)	30	MIND, tooth eruption
Amberger 1979	Pevkakia	EH	20% (by 9 mths)	39%	69	MIND, tooth eruption
Gejvall 1969	Lerna III + IV	EH	15%	33%	370	NISP, tooth eruption, 2% older than 42 months
Boessneck 1962	Argissa-Magula	MH	(24%)	(36%)	114	MIND, tooth eruption
Amberger 1979	Pevkakia	MH	24% (by 9 mths)	47%	45	MIND, tooth eruption
Gejvall 1969	Lerna V	MH	17%	30%	339	NISP, tooth eruption, 2% older than 42 months
Gejvall 1969	Lerna VI + VII	LH	17%	21%	195	NISP, tooth eruption, 2% older than 42 months
Sloan & Duncan 1978	Nichoria	LH	0%*	15%*	39	NISP, wear on upper second molar: (*this eliminates animals killed in first year) 62% older than 4 years
National Statistical Service of Greece 1980	All Greece	Modern	85% 86%		4.3 million 7.3 million	Goats Sheep

クや子ヒツジ肉の生産が優勢な体制の下にあるとしてもこの数値は高いようにおもわれる。おそらく家庭内で消費するために殺されるもっと成長した個体を数え落としているのだろう。しかし同時にこの数値は，前述した理由から，考古学資料では若い個体の出土が相当少なめに見積もられているかもしれないことを示唆するものとみなすこともできる。

ひとつの遺跡から出土した動物骨はある経済システムの一部分についてしか私たちに語らず，過去の経済を復原しようとする時は，この部分的経済とシステム全体を関連づけようと試みなければならない。問題の中心は動物資源と植物資源との関係である。ヨーロッパの農耕経済においては植物資源と動物資源は多くの補完的な方法で結びついているので，それらを分けて考えるのが困難である。すなわち作物は動物に餌を与え，一方動物による牽引や肥料の投入は作物栽培にとって不可欠である。植物資源と動物資源の相対的重要性を見積もることはたとえ単に食料という点から考えるにしても非常に難しい。考古学資料のなかでは，動物資源は植物資源よりも非常に目につきやすい。そしてさきに述べたように，私たちが採集する動物骨はふつうもともと存在していたもののほんの一断片にすぎないのだが，遺物として残る率はほとんどすべての状況下で植物の方が動物よりもやはりはるかに低いことは疑いの余地がない。動物は役割を果たしたり，子を残したり，食べられたりした後でさえその骨は残されるだろう。しかし穀物の場合，私たちが見つける種子だけが食べられたり発芽したりせずに，何らかの事故によって――ふつうは燃焼によって――保存されたものである。したがって，ひとつの遺跡から採集される植物遺物と動物遺物を直接比較することでは，それらの相対的重要性についてなんら真の測定はできないのである。民族誌研究は，極端に北方や南方で暮らす人々を除くすべての狩猟民や採集民にとって，植物食料が動物食料よりも一般に重要であることを示唆している。また，ほとんどの農耕社会においては植物資源が主食となり，肉や乳製品は重要だが本質的には二次的資源であり，必要とあればマメ類のような高タンパクな穀物によって置き換えられると期待できると示唆している。しかしこれを確かめる方法を見いだそうともせずに，先史時代のギリシアの状況もこうであったと見なすのは誤りである。最近の，人骨や動物骨の微量元素や同位体分析などの研究はひとつの可能な検証を与えるが，これはまだ初期の段階にある（例えばBisel〔1980〕及びLewin〔1983〕）。

遺跡がまったく孤立していることはほとんどなく，通常多かれ少なかれ他の遺跡と緊密な経済的関係をもっているので，そのような関係も私たちの関心の一部とすべきである。古い時代については，ひとつの集団による相互補完的な資源のある遺跡の間での季節的移動の問題，例えば獲物や牧草地を求めて移動する狩猟民や牧畜民に特に関心が払われている。例えばHiggsは，Kastritsa遺跡とAsprochaliko遺跡は，冬の間は沿岸の低地に住み夏はAsprochaliko遺跡を過ぎてKastritsa遺跡，Ioannina盆地，Pindos高地までLouros谷を上っていった人々によって季節的に居住されたと示唆した〔Higgs他 1967〕。もちろんこのような示唆は検証の必要があり，動物骨はひとつの証拠を提供する。例えば1才未満の動物の歯の咬耗と萌出の詳細な研究は，その動物の年齢を2，3ケ月の範囲で示してくれるだろうから，その死亡季節がわかるだろう（もし出産が季節的に限定されていれば)。その他の季節性の指標には，季節的に移動する種の存在や毎年生え代わるシカの角の状態が含まれる。さらにまた，もっと専門的な手法はさらに優れた詳細な情報の見通しを提供してくれる。貝殻の縁辺の酸素同位体を分析することによって海産貝類の採集季節が分かり〔Shackleton 1970；他〕，歯の断面の研究〔Gordon 1982；他〕は季節に関係して変化するトナカイの歯のセメント質と象牙質の形成の変化を用いて旧石器時代の遺跡の居住の季節性を決定している。

より新しい時代，特に階級制度が現れてくると私たちの関心は集落間でのものの動きや労役のやりとりなどの異なる社会間の経済関係により多く向けられる。動物や動物から得られる産物は都市や町，村の間で交換されるものの中の一つである。また新しい時代の考古学的記録には増加していく相互依存や，地方的，地域的な特殊化が反映される。このような状況の中では，何が起こっているのか理解しようと望むなら，経済階層において異なる地位にある遺跡や相互補完的な

役割を果たしていたであろう地域から採集された適切で比較可能な資料が不可欠である。

結　　論

本稿において２つの一般的な点が明らかになった。第１は，動物骨資料とそれから私たちが引き出すデータは多くの要素に影響され，かつそれを反映しているということである。私たちが見いだそうと試みている環境的，経済的，文化的変数は確かにデータの中でパターンを生じる。一方で土壌条件やイヌの活動から発掘や分析の手順にわたる他の変数は，骨を破壊したりデータに偏りを与え得る。したがってもとのパターンを曖昧にしたり，誤ったパターンを生み出してしまう。動物骨資料とデータに偏りを与え得るさまざまな変数すべてについて考慮する準備をしてようやく実際に起こったことを理解し始めることが出来る。発掘や分析の手順に関わる変数のうちのあるものはコントロールできる。例えば水洗選別は遺物の採集を向上させ，発掘時の見落としによる偏りを減らすのを助けてくれる。また発掘や分析の手順についてのより優れた記載は，異なる遺跡から出土した資料や，様々な動物考古学者のデータの比較精度を高めてくれるだろう。しかしたとえこれが行われても，依然として私たちはそれぞれを容易には切り離せないある範囲の環境的，経済的，文化的変数を扱っているのである。異なる遺跡や報告書のあいだの比較精度を高めることは重要である。なぜなら私たちが答えようと試みている問題の多くは，多くの異なった遺跡や時代から得られたデータを比較することによってのみ明らかにされるからである。

第２に，動物考古学は考古学の主流にもっと緊密にとけ込んでいかなくてはならないということである。人と動物界との関わりは個々を切り離したなかで眺められるべきではない。私たちが答えようと試みている問題は人の行動に関わっており，考古学的記録の不完全な点を考慮すれば，それに答えようとするときには可能な限り広範に情報を集める必要がある。植物遺存体，人工遺物，動物骨，地質学的研究からのデータはみな，過去についてのより詳細な絵を描くために重要なデータである――その絵のなかでいろいろな種類の情報は私たちの仮説を検証し，確認するために用いることができる。私たちは動物骨の採集の全体的な質を向上させ，動物骨報告書と考古学の広範な関心との連関を高める必要がある。これは，発掘者が動物考古学の可能性と問題についてさらに理解し，動物考古学者も他の考古学者のデータや関心についてさらに学んだときはじめて達成されるだろう。

付録：現在のデータベース

この付録は，ギリシアから出土した動物骨のデータを収録した出版物を，付随的な言及や作業員による同定を除き，すべて一覧表にする試みを示したものである。表の記載は遺跡ごとのアルファベット順である。カッコ内の引用は，当該の言及が，異なる遺跡もしくは一般的な話題を議論する過程で，別の未発表の情報を与えることを示している。いろいろな種類の細かな情報のうち利用できるものについての情報は，ボールド体の文字によって与えられている。**M** は標本１点ずつに広範な計測値が与えられていることを示し，一方 **m** はデータがより限られていることを示す。同様に **A** と **a** は年齢推定の情報について用いられ，**S** と **s** は骨格の異なる部位の現れ方の相対的な差についての情報について用いられる。遺跡の立地は図５に示されている。表９は時代ごとの要約を示す。

ACHILLEION：前期および中期新石器時代。テッサリア地方，Farsala の近くに所在〔Gimbutas 1974：予報〕。

AGHIOS PETROS：前期新石器時代。Sporades に所在〔Schwartz 1982：比較表のなかで種のパーセンテージが示されている〕。

AGIA SOFIA-MAGULA：後期新石器時代。テッサリア地方，Larissa の近くに所在〔Von den Driesch and Enderle 1976：詳細な報告。同定標本は約3,500点。**M，A，S**〕。

AKROTIRI：前期から後期青銅器時代。Thera に所在〔Gamble 1978：いくつかの詳細な情報をともなう予報。同定標本は約2,900点。**a，S**〕。

ARAPI-MAGURA：後期新石器時代。テッサリア地方，Larissa の近くに所在。〔Boessneck 1956：詳細な報告。同定標本は約130点。**M，a**-*Sus* のみ，**S**-Otzaki-Magula 遺跡のデータと一括〕。

ARGISSA-MAGULA：先土器新石器時代から中期青銅器時代。テッサリア地方，Larissa の近くに所在〔Boessneck 1960；1961：ともに先土器新石器時代についての短報；**A**-データは Boessneck〔1962：詳細な報告。同定標本は約5,500点。**M，A，S**〕に繰り返されない〕。

ASPROCHALIKO：ムステリアンから中石器時代の岩陰遺跡。エピルスの Louros valley に所在〔Jarman 1972a：中石器時代の種の簡単なリスト；Bailey et al. 1983：偶蹄類とウマ類の層位ごとの集計。同定標本は約1,200点〕。

ASSIROS：中期青銅器時代[4]から鉄器時代。マケドニアの Salonika の北に所在〔Halstead and Jones 1980a；1980c：簡単な予報〕。

AYIA IRINI：前期から後期青銅器時代。Kea に所在〔Coy 1973：予報。計測された約1,100点の骨に言及。**a**；1977：**m**-*Bos* のみ〕。

CORINTH：古拙期からビザンチン時代。さらにその前後。Peloponnese に所在〔Williams 1979：古代カルタゴのア

図5　遺跡立地図

ンフォラに共伴した魚類遺存体の簡単な記述（pp. 117–118)〕。

EMPORIO：新石器時代から青銅器時代。Chios に所在〔Clutton-Brock 1982：報告。同定標本は約2,500点。**m, a, s**〕。

FRANCHTHI CAVE：ペロポネソスの Argolid の南東に所在する，後期旧石器時代，中石器時代，新石器時代の洞窟遺跡〔Payne 1969b；1973a；1975b；1982：すべていくつかの詳細な集計を含む予報〕。この遺跡は Jerman〔1972a〕に於いて Port Cheli として記載されている。

GRAVA：Corfu に所在する後期旧石器時代の岩陰遺跡〔Sordinas 1969：種の簡単なリスト〕。

KASTANAS：前期青銅器時代以後。マケドニアの Salonika の北西に所在〔Reichstein 1982：前期青銅器時代の資料，同定標本約900点についての詳細な報告。**M, S**〕。

KASTRITSA：エピルスの Ionnina 湖の近くに所在する後期旧石器時代の岩陰遺跡〔Higgs *et al*. 1967：種の簡単なリスト；(Jarmanand Jarman 1968)：**m**-*Bos* のみ；Bailey *et al*. 1983：偶蹄類とウマ類の層ごとの集計。標本数は約12,700点〕。

KEPHALA：後期新石器時代。Kea に所在〔(Coy 1973)：簡単なコメント；Coy 1977：報告。同定標本は約1,000点。**m, a, s**〕。

KITSOS：旧石器時代および後期旧石器時代の洞窟遺跡。ギリシア中部の Larrion の近くに所在〔Jullien 1970；1971；1972；1973；Mourer-Chauviré 1971：予報；Jullien 1981；Chaline 1981（齧歯類）；Mourer-Chau-viré 1981（鳥類）；Desse 1981（魚類）：報告。集計は更新世の齧歯類（約200点）と鳥類（約800点）についてのみ与えられている。**m, a, s**〕。

KNOSSOS：無土器新石器時代以後。クレタ島の Iraklion の近くに所在〔Jarman and Jarman 1968：無土器および前期新石器時代の資料，同定標本約200点についての詳細な予報。**m, a, s**；Jarman 1973：デメテル神の祭壇の周

表9　ギリシアの遺跡から出土した動物骨の報告書と時代ごとに利用できる情報の要約（付録も見よ）。＋＝数量が記載されていないか，きわめて限定された情報しか与えられていない；*＝0－299点の標本が同定されている；**＝300－1499点の標本が同定されている；***＝1500点以上の標本が同定されている；(　)＝予報のみ。最終的には標本数はいつももっと多い。

	Palaeolithic	Mesolithic	Preceramic Neolithic	Early Neolithic	Middle Neolithic	Late & Final Neolithic	Early Bronze Age	Middle Bronze Age	Late Bronze Age	Iron Age (to Archaic)	Classical to Hellenistic	Roman	Byzantine
Achilleion				(+)	(+)								
Aghios Petros				(+)									
Agia Sofia-Magula						***							
Akrotiri							— —	(***)	— —				
Arapi-Magula						*							
Argissa-Magula			***	*		*	**	***					
Asprochaliko	(**)	(+)											
Assiros								(+)	(+)	(+)			
Ayia Irini							— —	(***)	— —				
Corinth											+		
Emporio					*	**	***		*				
Franchthi Cave	(**)	(*)	(*)	(*)	(*)	(**)							
Grava	(+)												
Kastanas							**						
Kastritsa	(***)												
Kephala						**							
Kitsos	+					+							
Knossos			(**)	(***)				— — *	— —	— —	*	— —	
							— — —	(*)	— — —	(*)	(*)	(**)	
Krasi							*						
Lerna				*	**		***	***	**		*	*	
Lindos										*			
Midea									**				
Myrtos: Fournou Korifi							*						
Pyrgos							— —	(**)	— —				
Nea Nikomedeia				(**)									
Nichoria								**	***	**			*
Otzaki-Magula				**	*	*							
Peneios Valley	*												
Pentapolis							*						
Petralona	(***)												
Pevkakia						***	***	***	***				
Phaistos				— —	— —	— —	+	— —	— —				
Phylakopi							(**)	(**)	(***)				
Prodromos				***									
Saliagos						(***)							
Samos, Heraion										+			
Seidi	*												
Servia				(+)	(+)	(+)	(+)						
Sesklo			(*)	(**)									
Sitagroi					— —	(***)	— —						
Thebes, Kabirion											**	***	
Thermi							+						
Thorikos											+		
Tiryns									+				
Tylissos								+	+				

辺から出土した幾何学様式期からローマ時代の資料，同定標本約11,000点についての予報。さらにKnossosから出土した他のミノア文化期からローマ時代の資料についての情報を含んでいる；Jones 1978：グラウコスの聖堂から出土した，鉄器時代からローマ時代の資料，同定標本約150点についての簡単な報告。**a**；Jones 1979：ミノア文化期の家から出土した資料，同定標本約70点についての簡単な報告；(Gamble 1978)，(Halstead 1981)：ともに新石器時代の後期の資料についてのいくつかの情報で，Jarmanによって発表されなかった報告に言及している〕。

KRASI：クレタ島のMalliaに近い，前期ミノア文化期の墓〔Marinatos 1932：数点の動物骨についてのHilzheimerによる短報を含む。s〕。

LERNA：前期新石器時代からローマ時代。ペロポネソスのArgos の近くに所在〔Gejvall 1969：詳細な報告。同定標本は約14,000点。選択されたものについて **M**, **A**, **S**〕。

LINDOS：Rhodes の古拙期，古典期およびそれ以後の時代の遺跡〔Blinkenberg 1931：Winge と Degelbol によって同定された，古拙期の小さな資料についての簡単な記述を含む（pp. 183–184）。**s**〕。

MIDEA：中期および後期青銅器時代。ペロポネソスのArgos の近くに所在する〔Gejvall 1983：アクロポリスから出土した後期青銅器時代の資料，同定破片約600点についての簡単な報告〕。

MYRTOS：クレタ島の Ierapetora の近くに所在するミノア文化期の複数の遺跡〔Jarman 1972b：前期ミノア文化期の "Fornou Korifi" 遺跡から出土した資料，同定標本約130点についての簡単な報告。**a**；(Gamble 1979)："Pyrgos" 遺跡から出土した同定標本約1,100点についてのいくつかのデータ〕。

NEA NIKOMEDEIA：新石器時代。マケドニアの Veroia の近くに所在する〔Higgs 1962：最初のシーズンに出土した前期新石器時代の資料，同定標本約500点についての簡単な予報。**m**, **a**；(Payne 1969a)：**m**-*Ovis* と *Capra* のみ〕。

NICHORIA：中期ヘラディック文化期からビザンチン時代。ペロポネソスの Messini の近くに所在する〔McDonald 1972：後の報告には含まれていない資料からの同定を含む予報；Wolberg *et al.* 1975：小型の脊椎動物の堆積物についての予報；Sloan and Duncan 1978：発掘品の一部，同定標本約3,600点についての詳細な報告。**a**, **S**〕。

OTZAKI-MAGULA：前期新石器から晩期新石器時代。テッサリア地方，Larissa の近くに所在する〔Boessneck 1956：詳細な報告。同定標本は約700点。**M**, **a**-*Sus* のみ。**S**-Arapi-Mugla 遺跡のデータと一括〕。

PENEIOS VALLEY：テッサリア地方，Larissa 近くの様々な場所における，旧石器時代の遺物と関係した河川堆積物に含まれる動物骨〔Boessneck 1965：詳細な記載。同定標本は約120点。**M**, **S**〕。

PENTAPOLIS：前期青銅器時代。マケドニアの Serres の近くに所在する〔Koufos 1981：短報。同定標本数は約200点。**S**〕。

PETRALONA：マケドニアの Chalcidice にある中期更新世の洞窟遺跡〔Sickenberg 1964；1966；1971：すべて予報；Kretzoi 1977：小型脊椎動物についての予報；Kurtén and Poulianos 1977；1981：ともに食肉類についての詳細な報告。**M**, **a**, **s**；Fortelius and Poulianos 1979：*Dicerorhinus* についての詳細な報告。**M**, **s**；Kretzoi and Poulianos 1981：以前の報告を要約する予報。同定標本は2,000点を超える〕。

PEVKAKIA：晩期新石器時代からミケーネ文化期，テッサリア地方，Volos の近くに所在する〔Jordan 1975：1967／70年の発掘で出土した資料，同定標本約16,000点についての詳細な報告。**M**, **A**, **S**；Amberger 1979（反芻動物）および Hinz 1979（他の動物）：1971／3年の発掘で出土した同定標本約22,000点の資料についての詳細な報告。**M**, **A**, **S**〕。

PHAISTOS：クレタ島の南部にある，新石器時代，ミノア文化期およびそれ以後の時代の遺跡〔Pernier 1935：新石器時代とミノア文化期の動物骨についての簡単なコメントを含む（pp. 86–88）〕。

PHYLAKOPI：前期から後期青銅器時代。Melos に所在〔(Gamble 1979)：主要な種についての時期ごとの集計；Gamble 1980：約3,000－3,500点の同定標本に基づくいくつかの詳細な情報を伴う予報。**s**-*OvisCapra* のみ〕。

PRODROMOS：テッサリア地方，Karditsa 近くの前期新石器時代遺跡〔Halstead and Jones 1980b：詳細な報告。同定標本は約1,750点。選択されたものについて **M**, **A**, 選択されたものについて **S**〕。

SALIAGOS：後期新石器時代。Antiparos の近くに所在する〔Higgs, Clegg and Kinnes 1968：哺乳類についての予報。同定標本は約5,500点。**m**, **a**；Renfrew, Greenwood and Whitehead 1968：魚骨についての報告。同定標本は約2,700点。Bökönyi 1971：*Dama*の存在〕。

SAMOS, HERAION：古拙期からビザンチン時代。さらにその前後。Samos に所在する〔Boessneck and von den Driesch 1981；1983：何本かの *Hippopotamus* の歯と *Alcelaphus* の角心1点〕。

SEIDI：後期旧石器時代の岩陰遺跡。ギリシア中部の Thebes の近くに所在〔Schmid 1965：小さな資料—同定標本20点についての報告〕。

SERVIA：前期新石器時代から前期青銅器時代。マケドニアの Kozani に所在〔Watson 1979a：簡単な予報〕。

SESKLO：新石器時代。テッサリア地方，Volvo の近くに所在〔Schwartz 1982 および Wijnen 1982：約1,300（？）点の同定標本に基づく，無土器および前期新石器時代資料についての簡単な情報。**a**〕。

SITAGROI：中期新石器時代から前期青銅器時代。マケドニアの Drama の近くに所在〔Bökönyi 1971：Dama および他の情報について。合計約33,000点の同定標本に言及。**M**-*Dama* のみ；(Renfrew 1972) および (Bökönyi 1973)：一般的な種の時期ごとの相対的な量の豊かさ，および種のかなり長いリスト；(Payne 1972a；1972b；1975a)：いくつかの詳細な情報を伴う，ふるいがけ試験の予備的な試み。同定標本は約3,000点。**a**, **S**〕。

THEBES, KABIRION：古典期からローマ時代。ギリシア中部の Thebes の近くに所在〔Boessneck 1973：詳細な報告。約4,000点の同定標本。**M**, **A**, **S**〕。

THERMI：前期青銅器時代。Lesbos に所在〔Bate 1936：骨の "相対的選択" についての簡単な記述。**m**, **s**〕。

THORIKOS：後期青銅器時代からヘレニズム時代。ギリシア中部の Lavrion の近くに所在〔Gautier 1967：古典時代の小さな資料についての簡単な報告〕。

TIRYNS：青銅器時代とそれ以後。ペロポネソスの Argos の近くに所在〔Boessneck and von den Driesch 1979；1980：2点のライオンの骨。**m**〕。

TYLISSOS：ミノア文化期とそれ以後。クレタ島の Iraklion の近くに所在〔Hazzidakis 1912；1921：ともに Keller によって同定された中期および後期ミノア文化期の骨についての簡単な記述を含む（後者はギリシアの初期の出版物のフランス語への翻訳を産んだ）〕。

注

1)　クレタ島やその他のギリシアの島々の野生ヤギはほぼ確実に再野生化したものであり，キプロス島の野生ヒツジ，コルシカ島，サルディニア島の野生ブタもおそらく同様である。バルカン半島の遺跡から出土した野生ヒツジに関する少数の報告例は疑わしい。

2)　ほとんどの報告書が "ヒツジ／ヤギ" という分類項目を含んでいるが，これはそのあいだに連続性があったことを意味するのではなく，単に私たちが扱う壊れた骨においてそれらを区別することが通常できないことを意味している。

3) Lerna 遺跡の一般的な家畜の骨に残された切痕の頻度が低いことはもうひとつの必要な注意を示している。すなわちそれらの骨の切痕は数字が示すほど実際に少ないとは思われず，イヌの骨の切痕を探し記録することに著者が特に関心を持っていた可能性が高い。データが著者の特定の関心や経験によって偏りを受けることは珍しくなく，これは骨報告書の読者が気づいていなければならない別の種類の偏りである。
4) 前期青銅期時代の層を持つとは，もはや考えられない(Halstead pers. comm. 1983)。

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