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Jean-François Jarrige, Catherine Jarrige, Gonzague Quivron, Luc Wengler, David Sarmiento Castillo

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MÉMOIRES DES MISSIONS ARCHEOLOGIQUES FRANÇAISES EN ASIE CENTRALE ET EN ASIE MOYENNE

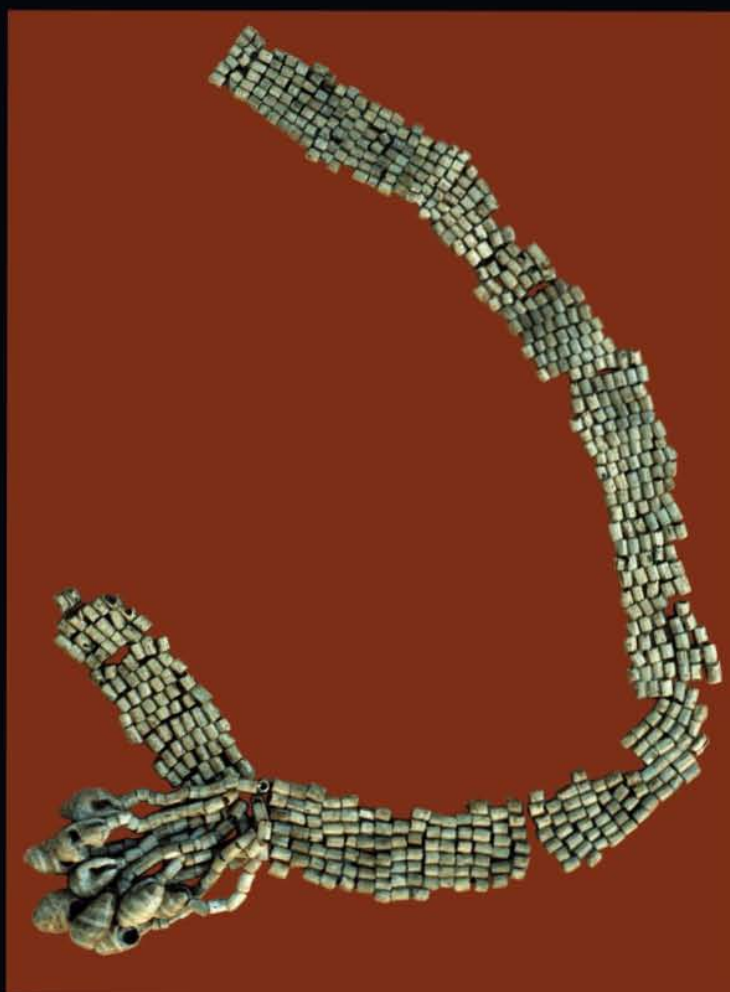
TOME XV

SÉRIE INDUS-BALUCHISTAN

# MEHRGARH

NEOLITHIC PERIOD - SEASONS 1997-2000

Pakistan



Jean-François JARRIGE  
Catherine JARRIGE  
Gonzague QUIVRON

Éditions de Boccard

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# MEHRGARH

NEOLITHIC PERIOD SEASONS 1997-2000

PAKISTAN

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Cover: « *Head ornament in sea shell from Burial 274, Graveyard 5* »

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ET EN ASIE MOYENNE

Tome XV

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*With an appendix by*  
*Luc WENGLER*

*With the collaboration of*  
*David SARMIENTO CASTILLO*

**M.A.I.**  
**(Mission Archéologique de l'Indus)**

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2013



Neolithic structures and fishermen in the Bolan River

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**I : Excavation at Mehrgarh, music party during a midday break.**

**Photography and Artwork Credits:  
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Gonzague Quivron and his team during the excavation in MR.03 area

- FIRST PART -

**THE RESUMPTION OF THE  
EXCAVATIONS AT MEHRGARH**



## CHAPTER 1

### THE 1997-2000 PROGRAM OF EXCAVATIONS AT MEHRGARH

In 1995, the Department of Culture and Tourism (Government of Sindh) published, with the financial support of the French Ministry of Foreign Affairs, the preliminary reports of the eleven seasons of fieldwork at Mehrgarh from 1974 to 1985, originally sent to Pakistan Archaeology. A general introduction and five contributions by the specialists associated with the Mehrgarh project were added to these reports (C. Jarrige *et al.* 1995).

The field reports of the 1997-2000 program, when excavations of the Neolithic area at Mehrgarh were resumed, were sent to the Department of Archaeology and Museums of Pakistan but were never published. Therefore we have taken the decision to publish these reports with a short introduction and, instead of a conclusion, an overview of the early Neolithic period giving an account of the contribution brought by the work conducted in collaboration with the Department of Archaeology of Pakistan. We have added to these reports a still unpublished environmental and sedimentological study of the Kachi/Bolan area by Luc Wengler, a prehistorian and geologist known for his work in Morocco, who worked with our team at Mehrgarh in 1986.

The reports of the four seasons of the 1997-2000 program of excavations contain an important amount of new information about the aceramic Neolithic occupation, shedding light on many aspects of the earliest known occupation in the northwestern part of the Indo-Pakistani subcontinent. As stated in the previously published reports, the archaeological area of Mehrgarh extends over more than 300 hectares, with remains covering a time span of more than five millennia. Until 1985, the Neolithic area known as MR.03 in the general grid-plan of the site, was excavated along with other areas occupied by Chalcolithic and Bronze Age remains. From 1985 to 1996, our archaeological team left Mehrgarh in order to undertake excavation at the 3rd millennium site of Nausharo, 7 km south of Mehrgarh. In 1996, the decision was taken to resume work at Mehrgarh, but only in the aceramic Neolithic area. The publication in 1995 of the Field Reports of the campaigns conducted at Mehrgarh until 1985 had convinced us that the sequence of the successive Neolithic occupations needed further clarifications.

The publication of the reports of the 1997-2000 program of excavations shows clearly that resuming work at Mehrgarh from the winter 1996-97 till 2000 has allowed to extend on a much larger scale than before the exposure of the successive levels of the aceramic Neolithic occupation.

In the reports edited in 1995, several sections through the Neolithic deposits, including the cleaning of the 10 m high cliff overlooking the Bolan River, were published. But due to the limited scale of the previously conducted work in MR.03 area, the stratigraphy, which includes many sloping layers, needed to be checked. The 1997 to 2000 reports based on more extensive exposures of the archaeological deposits of the aceramic period, including also several more complete sections, provide a more precise and comprehensive sequence of the whole Neolithic occupation. This updated sequence has for the first time been presented at the South Asian Archaeology Conference in Paris in 2000 (Jarrige J. -F. *et al.* 2005: 129-142) and later in further contributions (Jarrige 2004, 2009).

In the reports from 1977 to 1985 (C. Jarrige *et al.* 1995), the Neolithic occupation was divided into a Period 1, entirely aceramic, followed by a Period IB associated with the occurrence of a very small number of coarse chaff-tempered potsherds, and then by a Period IIA when the same coarse chaff-tempered pottery was apparently becoming more abundant. The much larger exposure of the Neolithic levels due to the resumption of work in the MR.03 area in the winter 1996-97 has shown that

the very few potsherds, which were apparently found at the periphery of some buildings cleared out just below the surface, were in fact not contemporary with these buildings. Such confusion was due to sloping layers that could not be well noticed in the very limited space of previous excavations. It then turned out that some buildings, attributed to a no longer relevant Period IB, belonged in fact to the very last period of the aceramic Neolithic (Period I) and that the potsherds found outside of these buildings could be dated from the following Period IIA

The resumption of work in MR.03 has allowed defining, in a very precise way, 9 major consecutive levels of architectures and of graveyards. Therefore the aceramic Period I can be divided in nine occupation levels and nine graveyards, starting from 1, the earliest occupation and the earliest graveyard, to 9 the latest occupation level, followed by the latest graveyard just below the surface. The reader of the 1987 to 1985 reports can, as far as the Neolithic is concerned, refer himself to a chart connecting the previous denominations with the nine major episodes of the aceramic Period I (fig. 2). The graves published in the 1977-1985 reports (C. Jarrige *et al.* 1995) have also been included in the revised chart of the nine graveyards (fig. 3 and 3b).

It should also be pointed out that the altitudes in the reports from 1977 to 1985 have been taken from a reference point arbitrary referred as 100 marked by a station at the surface of the MR.03 area. But when we resumed work in MR.03 area, this station had been taken away by a wide gully. So it was decided to fix a new reference point at the foot of the cliff cut by the Bolan river in order to have no longer a negative system of altitudes. This new reference point is therefore at about 13 m below the still preserved top of the MR.03 area.

At the end of these reports, we have added a conclusion, which keeps also into account the work conducted in the MR.03 area from 1977 to 1985. We have also joined some comments about Period IIA, which has now to be interpreted in the light of the revised sequence.

In the spring 2000, we thought that the main aims fixed for resuming work in the early Neolithic area of Mehrgarh, according to a planned four-year project, had been fulfilled. We then decided to focus on publications, limiting ourselves in the field to undertake small soundings at a few sites near Mehrgarh and Nausharo, where we had found on the surface potsherds and objects connected with the graveyard of Mehrgarh VIII displaying obvious similarities with the cultural assemblage of the Bronze Age of Bactria and Margiana, today referred as the Oxus Civilisation. Some of these sites had also yielded Harappan and Kulli potsherds (cf. Reports from 1977 to 1981 in C. Jarrige *et al.* 1995). We wanted to extend this work, considering the far reaching implication of the presence in the Kachi/Bolan area of groups of people whose material culture was connected with the Oxus Civilisation in the final period of the Indus Civilisation at the time of Nausharo, Period IV, between about 2100 and 1900 BC. (Jarrige, Quivron 2008).

In the winter 2000-2001, no excavation was planned at Mehrgarh in order to work on publications. But when we were to come back to Mehrgarh in the end of January 2002, we were warned that a local politician, head of a tribe in conflict with the Raisani tribe of Mehrgarh, was about to attack the area. We sent a request to the Pakistani authorities through our Embassy in Islamabad and our Consulate in Karachi to protect our camp. We were told that such a protection would be granted, but finally the Pakistani authorities did not act and let the local politician burn down several villages and plunder entirely our camp, destroying all the scientific samples and the anthropological material stored in the house of the mission. In front of the still smoking ruins of the village of Mehrgarh and of our plundered camp, we understood that time had changed. The outstanding hospitality that we had enjoyed for so many years had obviously no more significance for some people who had nothing to do with the secular traditions of a province of which we are proud to have contributed to reveal the exceptionally rich cultural heritage. But we wish to express once more our gratitude to the Department of Archaeology and Museum, Government of Pakistan for a constant support to our work.

## CHAPTER 2

### THE GEOGRAPHICAL SETTING

For the reader not familiar with the work conducted by the French archaeological mission in the Kachi/Bolan region, we just would like to point out some of the main geographical features of an area which belongs to Balochistan, though being closely connected to the Indus Valley.

The Kachi/Bolan plain lies in a triangular-shaped break in the Sulaiman and Kirthar mountain chains, the great north-south barrier that cuts the Indus Valley off from the highlands of Balochistan and Central Asia. The Kachi region is thus made up of an immense cone that has been filled in by fluvial and aeolian deposits, transported from the surrounding mountains: the Marri and Bugti hills to the east and the Brahui and Kirthar ranges to the west. The Bolan basin, drained by the Bolan river, which merges with the Nari river, is separated from the Kachi plain by the low range of the Banh. An imposing amphitheatre of mountains encloses the whole region; rocky outcrops emerge here and there in the flat, sunburnt surface of the clay and sand beds. A few of these outcrops consisting mostly of limestones and puddingstones emerge near the archaeological area of Mehrgarh. To the south, the Kachi plain gradually merges into the Indus valley near the modern city of Jacobabad, near the present-day boundary line between the provinces of Balochistan and Sindh. Further south the waters of the Nari river and of its tributary, the Bolan river, reach the Manchhar lake in Sindh.



**II: The landscape from the northern limit of the Neolithic site (the Marri Bugti mountains in the background)**

The annual rainfall seldom exceeds 75 mm and occurs mostly in July and August, though there are also some heavy rains in January and February. Unlike the mountainous zones that surround it on all sides, this region, whose average altitude in the Bolan Basin is not more than 160 m, has mild winters, in spite of sharp drops in temperature when the north wind blows from the snow-covered mountain peaks. In spring the temperature rises rapidly above 50 degrees centigrade. Especially in June and July, there is sometimes a wind that blows from the south, caused by concentrations of ozone in the atmosphere full of electricity. The vegetation is of desert type: stunted, thorny bushes seem to stick up in the midst of the mirages and tangles of scrub. Patches of green follow the lines of the hydrological system.

The numerous run-off channels from the northern area converge towards the two main streams, the Nari river and its tributary, the Bolan river. In winter, the Bolan and the Nari rivers form chains of ponds, which serve as watering-places. Sometimes rainfall on the mountains or a sudden rise in temperature in the areas where snow has fallen causes the rivers to swell for some hours or for a few days. In summer, the monsoon storms over highland Balochistan lead to floods of exceptional force. The friable deposits that make up the geological structure of this region cannot hold these rivers to a fixed course. At the time of the floods, it is a frequent sight to see whole sections of the bank crumble and, with a thunder-like sound, disappear into the waters. Sometimes it is the whole river that suddenly carves out a new bed in the sand. The unstable nature of the hydrological system directly affects the life of the villagers who have to abandon their village in hurry, often several times in a century, and found a new one. For this reason it is, unfortunately, impossible to draw a map showing what could have been the distribution of the sites over the centuries.

As far as the agricultural resources of the area are concerned, they are far from being negligible, in spite of the vast stretches of desert that make up the "dasht-i-amvat" or "desert of death". On either side of rivers like the Nari and the Bolan there are extensive irrigable zones that are traditionally thought of as the granary of Baluchistan. In good years it is possible to harvest three crops a year, with irrigation and some rainfall. Nowadays the wheat crop in spring and the "jowar" crop in autumn are the most important ones. "Jowar" is a type of millet that is suited to arid zones and it is also used as fodder for the cattle that give the famous annual fair at Sibi its reputation. Among the natural resources of this region, we should mention a wild cereal locally called "gam" (*Panicum antidotale*), which grows plentifully on the ground watered by the spring and summer floods. Until recent times this wild cereal formed the basic food supply in drought years, when it was made into flat cakes or porridge.

The land which is flooded by the overflow of the rivers is particularly fertile and makes it possible to obtain a good harvest without a great deal of effort. But it is too limited an area to guarantee subsistence for large communities. Dry farming provides only extra supplies, since rainfall is so scarce and irregular. And so, it is easy to imagine that an irrigation system was used, doubtless right from the time when the Kachi/Bolan region first began to be exploited for agriculture, a system that was still in use up to a few years ago. At the end of the winter the farmers used to get together for building earth walls in different places across the dry bed of the river Nari and Bolan river. The height of these walls varied according to the depth of the riverbed. On either sides, channels were dug branching out from the banks towards the fields that had been prepared beforehand. When the river flooded, the levees held back the water long enough for it to rise to the height of the channel openings. In this way large areas of land were progressively flooded. The advantage of this system is that it does not call for very advanced technical means. Teams of oxen drawing wooden planks and a few dozen men using wooden shovels is all that is needed to build these embankments during the period of about a month. But this system has always been made unreliable by the force of the rivers that, in years of heavy floods, sweep away these embankments one after the other. Even when the floodwaters rise gradually, relays of men have to work non-stop filling in the gaps and carrying out necessary repairs. Therefore the efficient functioning of this irrigation system depends on the collaboration of many farmers, acting under the authority of persons who coordinate the work, and on a system of agreement between villages that presupposes a fair degree of social unity. As we shall point out later on, it is hard

to imagine the prehistoric settlements that have been discovered in this region obtaining their food supplies without making use of this type of temporary embankment.

As far as its population is concerned, in the Kachi region we see different people living side by side, though they are often recent arrivals and therefore do not interest us directly in our archaeological studies. However, we may imagine that, since very early times, balance in the economy of this region has depended largely on three different groups-sedentary, semi-nomadic and nomadic-living together more or less in harmony, according to the times.

As a whole, the Kachi/Bolan region is one of the main areas of contact between two great geographical and ecological zones of Asia: on the one hand the plateaus of Central Asia and eastern Iran and on the other the Indus-Ganges plains. The northern Kachi/Bolan region is the border-line between two different worlds: Khorasan to the west, with its cold winters, planted with poplars, fruit trees and vines, and the dusty plains of Hindustan to the east covered with vegetation of a tropical type. The French archaeological mission began working in this region in 1967, being convinced that archaeological researches had a particular importance in an area of transition between two quite different worlds. We were rightly aware that archaeological sites, located just at the foot of the Bolan Pass, were likely to provide information that would go far beyond the scope of a purely local study.



The eastern part of MR.03 North during excavation

- SECOND PART -

**THE FOUR LAST SEASONS OF  
EXCAVATIONS**



## CHAPTER 1

### REPORT 1996-1997

The 23rd season of work at Mehrgarh, district Kachi, Balochistan, was conducted from December 1996 until the end of February 1997 by the French Archaeological Mission, in collaboration with the Department of Archaeology and Museums, Government of Pakistan. In addition to the representative of the Pakistan Government and Officer-in-Charge, Mr. Muhammad Mehrban, Assistant-Director, the field staff included: Jean-François Jarrige, Director of the project, Catherine Jarrige, C.N.R.S., archaeologist, Gonzague Quivron, C.N.R.S., archaeologist, Blanche Barthélemy de Saizieu, C.N.R.S., archaeologist, Monique Lechevallier, C.N.R.S., archaeologist in charge of lithics, Vincent Marcon, archaeologist in charge of lithics, Pietro-Paolo Petrone, University of Naples, physical anthropologist, Antoine Galinié, draftsman and Stanislas Reydellet, draftsman.

#### 1. AREA MR.03 NORTH

An area of 475 sq. m. was excavated, limited by gullies towards south and northwest and by the edge of the cliff formed by the Bolan River to the northeast (areas C, D and O of the grid-plan) (fig. 4b). A cluster of structures had already been exposed in this area in the course of the 1980-81 season (Structure H, Structure I renumbered as VIb, Structure J, Structure K renumbered as IV and Structure L renumbered as VIII) (fig. 13b, 14b). In order to get a larger plan of the layout of the architectures of the uppermost layers of the Neolithic settlement, excavations were resumed in this area and ten houses, belonging to the two last occupations levels of Mound I, were identified (Level 9 and Level 8 from top to downwards).

##### 1.1. The houses of the Period I Neolithic settlement (Levels 9 and 8)

Among the nine recorded houses (fig. 216, 217), seven were completely excavated (Houses I, II, III, IV, V, VI and X) and two partly unearthed (Houses VII and IX). These houses belong to occupation Level 9 (Houses I, II, III, VI and X), to occupation Level 8 (Houses VI, VIIb and IX) and to occupation Level 7 (House V).

These rectangular houses of various sizes are subdivided into four rooms. The walls, which usually are composed of two rows of bricks, are made of courses of very long mud-bricks longitudinally set. The length of the bricks is 62 cm, their width is about 12 cm and their thickness 8 cm. They have rounded ends and are finger-impressed on their upper faces. A clay coating, about 2 cm. thick (sometimes thicker, up to 4 cm), covered both inner and outer surfaces of the walls. Openings in the walls were evidenced in several houses.

##### Houses from occupation Level 9 (fig. 14b)

###### *House I*

This rectangular house was preserved to a maximum height of 0,76 m. With a north-south orientation the house was built on a prepared infrastructure consisting of a thick layer of clay on an ashy layer spread over the ruins of the former settlement. Its dimensions are 6 x 5 m, with regular rooms of slightly over 2 x 2,5 m sizes. The rooms were filled with fallen bricks.

Locus 4, in the south-eastern quarter (fig. 218), is the only room with a floor completely covered with remains, mostly of butchered animals, as well as heavy and small lithics and a few bone tools. Remains of a hearth were found in the south-eastern corner.

Locus 5 (south-western quarter) yielded a grinding stone and a pestle on the otherwise empty building floor.

Locus 6 (north-western quarter) contained, on its greyish floor as well as sunk into the clay preparation soil, twenty flint drills (fig. 246) along with a stone chisel and seven fragments of prepared calcite.

On the floor of Locus 7 (north-eastern quarter) heavy and small lithics, among them two drills as well as a rough calcite bead and a large quantity of flint debitage, were recovered. The skull of a bovid was leaning against the southern wall.

#### *House II*

This rectangular structure was partly excavated within the limits of the dig. The house is of the usual four-roomed type, but two rooms only have been completely excavated (Locus 9 and 10). Nearby gullies prevented us to unearth the two other rooms. The rooms are 3.30 m long and 1.60 m wide. The structure is north-south oriented and the best preserved part of its walls is 1.00 m high. The eastern outer wall was very damaged by erosion and consisted of only one course of bricks. An entrance doorway was managed in the western outer wall. The rooms were filled with fallen bricks and only very few artefacts were found among the debris.

#### *House III*

The remains of this extremely damaged rectangular structure (Locus 2) were sunk into melted fallen bricks and its north-eastern corner has been destroyed due to the collapse of the cliff. Gullies and two graves (T.102 and T.103) have also contributed to damage this house. It was however possible to delimit its walls preserved to a height of about 0.20 m. This north-south oriented house measures 6.5 x 4.25 m, with 1.75 x 2.75 m sized rooms.

#### *House IV*

The house, east-west oriented, measures 6 x 4 m, with rooms of sizes of about 2.60 x 1.70 m. Preserved to a maximum height of 0.31 m, with a living floor 0.10 m higher than the apparent construction level, it has yielded mostly heavy and small lithics in its four rooms (Locus 26, 27, 28, 29).

#### *House VIII*

This building (appearing under House IV) was to a large extent washed away by gullies that destroyed a large portion of the walls and of the floors. It is therefore difficult to be sure of its dimensions and exact plan. Its eastern wall collapsed in the adjacent street (Locus 14) before the time when Houses I and III were built, as it is shown by the preparation layer of these houses overlaying the collapsed remains of this house.

However, we can tell that this north-south oriented structure was 2.25 m wide and probably 4.5 m long. It was preserved to a maximum height of 0.47 m and its ruins were still visible at the time of the building of House IV that reused part of its eastern wall as foundation. Under the floor of House VIII a large foot-shaped clay figurine (fig. 23 n°1) was lying close to a small animal figurine also in clay.

#### *House X*

It seems that only the southern half of this north-south oriented structure was preserved only to a height of 0.16 m (two courses of bricks). The rest of the house was eroded by gullies running north-south, which affected the whole area including older Houses VII and IX. Its eastern wall is partly built on top of the western wall of House VII.

Locus 55 contains a rectangular structure of 1.80 x 0.55 m, which may have been a trough and contains no particular remains. The rest of the room yielded a few horn, bone and stone tools, including a stone axe (fig. 29 n°2).

Locus 57 yielded a large quantity of material on its floor, though it was very close to the surface. Most of it is heavy lithic (fig. 248) including three stone axes (fig. 29 n°1, 3, 6), two large grinding stones and three pestles, bone awls and nine cuttings of calcite including three rough beads (fig. 249). Many pebbles and stones show traces of wear or utilization.

Locus 56, which was outside House V, has yielded at that level a huge quantity of animal bones, mostly in an ashy deposit. They are most probably remains of butchery, except for a number of tools, mostly awls and a noteworthy shell bead or pendant with two transversal perforations in addition to the longitudinal one (fig. 25 n°4 and fig. 250).

A stone axe was found at the top of the fill of Locus 54 in the next House VII, so corresponding to the occupation level of House X.

### Houses from occupation Level 8 (fig. 13b)

#### *House VI*

This south-north oriented house is rectangular and measures 4.30 x 5.75 m. The structure is composed of four rectangular rooms. Two of the four rooms are smaller than the other two (Locus 45 : 1.80 x 2.52 m - Locus 46 : 1.80 x 2.52 m - Locus 44 : 1.75 x 2.35 m - Locus 47 : 1.67 x 2.35 m). The walls are two bricks wide and are preserved to a height of almost 2 m. Such a height is the result of successive modifications. Several times, the building was partly demolished and new portions of walls were rebuilt.

Three occupation phases were evidenced. The third and final phase was excavated during the 1980-81 season. At the time, House VI was named Structure I in the reports and was overlain by the remains of Structure H (Locus 45 was Locus 142, Locus 44 was locus 143, Locus 46 was Locus 144 and Locus 47 was Locus 145) (cf. 1980-81 report in C. Jarrige *et al.*: 317, fig. 7.4, 7.5)

**1980-81 excavation:** The house was outlined at an altitude of 12.67 m and was excavated down to the floors of the third phase of occupation in Locus 44 and 45 (altitude : 11.47 m). The rectangular rooms were filled up with earth and numerous fallen bricks. A fire-place, located in the north-eastern angle of Locus 45, was found on a prepared clay floor and was associated with remains of domestic activities including several animal bones. Four bone awls and two bone tools made of *Barasingha* antler were found in Locus 44.

Two walls were perpendicularly added to the outer southern wall to link the structure to a newly-built neighbouring house (Structure U).

**1996-97 excavation:** After resuming excavation, the second and the first occupation phases of House VI were exposed.

The second phase: House VI was enlarged to the north. An additional outer room (excavation units 23, 32 and 50) was built to the north of Locus 44 and linked the structure with the contemporary House VII. This new room was probably a single unit of storage or habitation and no openings were managed to provide access neither to House VI or House VII. The entrance of the room was continued by a narrow corridor situated between Locus 47 (House VI) and Locus 33 (House VII). (See description of House VII).

This second episode of construction of House VI was preserved to a height of about 0.30 m. The rooms were filled in with fallen bricks and, after removing them, a fireplace was discovered in the north-eastern angle of Locus 45 at an altitude of 11.18 m.

During the first episode of construction (preserved to a height of 0.55 m), the northern outer room was not yet built. The initial plan of the structure consists of four rectangular rooms with floors at an altitude of 10.73 m. Five fireplaces were uncovered in the house (south-west angle of Locus 46, north-east angle of Locus 45, south-east angle of Locus 44 and against the eastern walls of Locus 45 and 46).

An exterior doorway was located in the western wall of Locus 46 and two doors provided access from Locus 46 to Locus 47 and from Locus 45 to Locus 44. All the openings were carefully walled-up with mud-bricks disposed in regular rows (except the rounded upper parts of the doors). These openings are rather small with a height of about 0.55 m.

Many bone awls and stone objects were recovered in the house. Locus 45 yielded several noteworthy artefacts. The fill of the room included a stone figurine (fig. 24 n° 3) and an engraved stone object (fig. 28 n° 4 and fig. 247) was discovered against the eastern wall.

*House VIIB*

This house, whose plan was outlined at an altitude of 12.66 m, is north-south oriented; it measures 5.25 x 4.25 m. It has four rooms measuring roughly 2.25 x 1.75m. The walls are two bricks wide and are preserved to a height of at least 1.58 m, though the base has not been reached yet. A large part of the upper structures was washed away by a gully.

This structure shows several episodes of occupation, and probably of subsequent reconstructions, as it is the case with House VI.

The first occupation has been evidenced in Locus 54 where a floor was reached at an altitude of 11.08 m, corresponding to the second episode of construction of House VI. It yielded a large quantity of fauna, of stone and flint tools including elements of sickles set in bitumen, as well as a few bone awls.

A second episode of occupation occurred at an altitude of about 11.70 m, evidenced in Locus 33 and 48 with irregular ashy floors with bone and stone tools under a filling of bricks topped by an entire portion of the collapsed southern wall.

Some noteworthy finds were made under the brick filling of Locus 33, among them a clay pendant with small impressed dots (fig. 251), a lump of bitumen, a tool made out of a horn. It is also worth pointing out the discovery of a foot-shaped object in white stone, decorated with coils painted in red ochre, with on one side a small hole suggesting the presence of an eye. Such a stone object can be interpreted as a figurine (fig. 24 n° 1).

A small corridor between House VII and House VI was closed in its later phase by narrow partitions (alt. 12.27 m), corresponding to the building of the additional outer room of House VI.

An open space near the base of the southern outer wall of House VII, Locus 56, corresponds in its deeper layers to Locus 49, west of House VI. There the wall was lined up by a thick heap of fallen and melted bricks due to some disturbance, probably the collapse of the wall and reshaping of the structure. Under that accumulation, a large quantity of tools was found made out of bones, antlers and flint. Of special note are the remains of painted plaster which were found collapsed on the floor (see further).

*House IX*

Washed away by the gully that damaged House VII, House IX is north-south oriented with approximate dimensions of 3.50 x 1.75 m. Its only visible room is Locus 66 in its south-eastern corner.

Overlying its southern wall is a fragment of a later structure whose orientation fits that of the structures of occupation Level 1.

Occupation Level 7*House V*

This four-roomed house with an east-west orientation is rectangular and measures 4.50 m by 5.30 m. (Locus 21, 24, 60 and 61). One occupation phase only was identified. Two openings were evidenced in the western wall of Locus 24 and in the partition wall between Locus 21 and 60. The best preserved portions of walls, to the west, are at an altitude of 11.56 m and are 1.00 m high. To the east, the walls are preserved to a height of about 0.70 m only. This is the result of a sloping erosion, which damaged the house after its abandonment. The rooms were filled with fallen bricks and the surface of the structure was covered with a thick layer of melted remains of walls into which was set a circular space paved with clean complete and broken pebbles which belongs to Level 9.

Of particular note is the discovery in the fill of Locus 61 of nine large flint cores, which were found grouped together in the middle of the room (fig. 219).

## 1.2. The layout of the settlement of Period 1

### Occupation Level 9

Six houses from this level were outlined this year. To this same level we can add other multi-roomed structures in particular Structures A, B and R, partly or completely excavated in previous years in different parts of the last settlement of Period I.

As a whole these houses were partly destroyed by the erosion that horizontally levelled down the surface of the site and they were unearthed just below the present flat surface delimited to the east by the edge of the cliff overhanging the Bolan River. As a result, their walls were, in many cases, preserved only to a height of a very few courses of bricks.

At first glance, the exposed houses, located in the area selected for the excavation for this 1996-1977 season, reveal some regularity in the layout of the settlement. They are free-standing and, apart from an open space void of construction, are grouped together. They are more or less alternatively north-south and east-west oriented and their surfaces range from 49 sq. m. up to 68 sq. m. This regularity of the lay-out of these houses separated one from the other by narrow lanes is nevertheless not the result of a strict one-time planning since from several sections (fig. 19), this clustering of dwelling houses appears to be the result of successive episodes of construction and reconstruction during a long span of time.

### Occupation Level 8

Three houses from this level were partly or completely excavated this year. They were partly overlain by the constructions belonging to occupation Level 9. Structures previously exposed in other areas of the settlement, for example Structures S, T and U (fig. 13b) can now be attributed to this same occupation Level 8

Deeper in the dig, the houses from this level were in a much better state of preservation. At least, they were uncovered in a way showing how they had been reconstructed or, to the contrary, abandoned in course of time. The cluster of houses excavated this year (Houses VI and VII) and a nearby structure unearthed in 1980-81 (Structure U) give an example of the successive modifications that neighbouring structures were subjected to.

Those successive repairs and modifications give an idea of the long duration during which some of Neolithic houses were in use. The raised walls were found preserved sometimes to a height of almost 2 m and each phase of their occupation is documented by successive fire-places and remains connected with domestic activities.

## 1.3. Painted mud plaster

For the first time, a very significant discovery was made this season: fragments of painted mud plaster were unearthed near the base of the southern outer wall of House VII (Period I-Level 8). Because of the fragmentary state of preservation, the geometric pattern is not easily decipherable (fig.21). Parts of a large V-shaped motif are painted in red ochre and are associated with white, black and red small dots. The pigments were applied to a very thin mud coating that once probably covered a clay object of medium size. Among the fragments, some rather thick specimens were decorated on both faces. It may have adorned clay furniture rather than a wall.

## 1.4. Clay and stone figurines

Several figurines were found in the course of this last field season (fig. 23). Most of them are considered as human representations and belong to occupation Level 8 (fig. 23, 24).

A foot-shaped specimen in untempered clay measuring 15 x 13 cm is the largest figurine of this type found so far in MR.03 (fig. 23 n° 1). It was found in the south-eastern room of House VIII.

Also in unbaked clay, a small foot-shaped figurine bearing an application representing a snake is worth noticing. It belongs to the filling of Locus 49. It is the first time that applications, already reported on other figurines, can be identified without any doubt with coiling snakes (fig. 23 n° 3).

Such an association of human figurines with snakes, which is not recorded in the later periods at Mehrgarh, is known in Central Asia, for instance at Kara Tepe in the Namazga III period but only around 3000 BC. (Masson, Sarianidi, 1972: pl. 27).

Another figurine can be interpreted either as a conical standing human figurine or as a highly stylised four legged animal (fig. 23 n° 7). It may also be a combination of both. Next to this figurine found in Locus 40, three other fragments of tempered clay belong to human representations (fig. 23 n° 5, 6, 8).

Another interesting contribution of this new field-season at Mehrgarh has been the discovery of several foot-shaped pebbles (fig. 24). Such small pebbles, with their surfaces polished by rubbing, had already been found before but, though their shapes were rather similar to the clay figurines, we could not exclude that they had been used as polishers. But in an open space, east of House VII, a small foot-shaped object in white stone was decorated with coils painted in red ochre, on one side a small hole could even suggest the presence of an eye (fig. 24 n° 1). It is a clear indication that several of the small foot-shaped stones have to be recorded among the figurines. To occupation Level 9 belongs the head of an undetermined figurine (fig. 23 n° 4).

An object belonging to this same Level 9 was recorded as a bone amulet, in comparison with other items found previously in area MR.3/4 (see Mehrgarh Reports 1974-1985, plates 5,10 (d), 5,13 (d), 9,3 (g, f). But one cannot exclude in this very case that it could be interpreted as an anthropomorphic representation

## 2. BURIALS AND GRAVE GOODS

### 2.1. The burials in Area MR.03 North

#### *Graveyard 8*

An important result of the excavations was the discovery of graves belonging to Graveyard 8. Eight graves were excavated (T.107, T.108, T.109, T.111, T.112, T.113, T.114 and T.115) this season (fig. 101, 102, 104, 105 and 106).

The burials were dug in the ruins of occupation Level 7, in particular at the location of House V and in its vicinity. The structures of some of the graves (T.113 and T.115) have been put in evidence in the sections limiting the excavated area. A small space left empty for the corpse was managed on one side at the bottom of a pit dug about one metre deep. The skeletons, in a flexed position, were east-west oriented, the skull facing either east or west. The bones were covered with red ochre and, sometimes, grave-goods were associated with the burials.

The stratigraphic position of the graves is not yet easy to define. Only one grave (T.113) was found, cut through the successive layers of debris evidenced in the southern section of the dig. The pits of the other graves, which were not cut or very close to the sections, were not visible during the excavation and the burials were usually identified only when the chamber was reached.

But, as grave T.113 shows it, the funerary structures were dug down before House IV and Structures H and J from Level 9 were built. A layer of red ashes sealing the pit and spreading on the surface, rested against the first course of bricks of the nearby House II (also from occupation Level 9). In the limits of the dig, the burials of graveyard 8 were uncovered only near and in the ruins of the buried House V (occupation Level 7) which was the only one not overlain by structures from the subsequent occupation Level 9. This indicates that the inhabitants of the settlement did not select an area void of visible constructions to bury their dead, but dug their graves among the more or less ruined buildings.

#### *Graveyard 9*

The structure of the six burials excavated this season belongs to the side-wall grave type (Graves T.102, T.103, T.104, T.105, T.106 and T.110) (fig. 97, 98, 99, 100, 103 and fig. 285). The

burial chambers, sealed by a small mud-brick wall, were unearthed just below the present surface of the plain. But, we can postulate from evidence previously gathered elsewhere in the Neolithic site, that the depth of the grave-pits must have been about one metre. The skeletons and fragments of skeletons were coated with red ochre and the individuals were generally found in the “standard” position: east-west oriented, in a flexed position, skull to the east, facing south. In several cases, grave goods were associated to the dead bodies (fig. 287).

A deposit including three ochred stone chisels, beads from a necklace in *Dentalium*, three shell beads, a mother of pearl pendant and a polished bone amulet (fig. 157 and fig. 286), was found just on the edge of the cliff overlooking the Bolan river. This deposit was obviously part of the grave goods placed at the feet of the dead whose remains have fallen down into the river. This deposit has been referred as T.101.

## 2.2. Anthropological report (by P.P. Petrone and B. Barthélemy de Saizieu)

### 2.2.1. The burials in Area MR.03 North

#### Graveyard 8

##### Burial T.107 (fig. 101, 284)

<i>Type:</i>	Individual burial.
<i>Structure:</i>	Pit, funerary chamber closed by a mud-brick wall located to the south of the chamber, the two first longitudinal courses of the wall are preserved (the second was found collapsed on a part of the skeleton).
<i>Inhumation :</i>	Primary, connected bones excepted for the right ilium which was quite far from its anatomical position, probably due to the intrusion of some small rodent while the chamber was not yet filled up of sediment.
<i>Decomposition of the corpse:</i>	In an empty space.
<i>Manipulation of the grave and the corpse:</i>	Body and bottom of the funerary chamber are red ochred.
<i>Orientation:</i>	East-West; skull eastwards, facing south.
<i>Condition of bones:</i>	Complete skeleton in a very good state of preservation.
<i>Position of the skeleton:</i>	Left lateral decubitus, the left lower limb is flexed, the right one is half-flexed, the left upper limb is elongated, and the right one is half-flexed.
<i>Age at death:</i>	18-24 months.
<i>Sex:</i>	Male???
<i>Grave goods:</i>	<u>n°107.1</u> (fig. 158 n° 8): Necklace constituted of 2 ellipsoidal shell beads. <u>n°107.2</u> (fig. 158 n° 9): 1 ellipsoidal shell bead (element of a belt ?) found between the left ilium and the left femur. <u>n°107.3</u> : A complete skeleton of a small caprine (probably a goat) with the same orientation than the child but with skull to the west.

##### Burial T.108

<i>Type:</i>	Individual burial.
<i>Structure:</i>	Undetermined. No bricks were found.
<i>Inhumation:</i>	True secondary burial, incomplete and dislocated bones.
<i>Decomposition of the corpses:</i>	Undetermined.
<i>Manipulation of the grave</i>	

<i>and the corpse :</i>	A thin line of red ochre was found lying under the bones, which were not red ochred.
<i>Orientation:</i>	East-West.
<i>Condition of bones:</i>	Very bad state. The skull and long bones are highly fragmented and powdered.
<i>Position of the skeleton:</i>	The skull and maxillae are at east, the long bones at west.
<i>Age at death:</i>	10 years +/- 30 months.
<i>Sex:</i>	Undetermined.
<i>Grave goods:</i>	Absent.

#### Burial T.109 (fig. 102)

<i>Type:</i>	Individual burial.
<i>Structure:</i>	Funerary chamber closed by a mud-brick wall located to the south of the chamber, the first longitudinal course and part of the second, also longitudinal, are preserved.
<i>Inhumation:</i>	True secondary burial, incomplete and dislocated bones.
<i>Decomposition of the corpse:</i>	Undetermined.
<i>Manipulation of the grave and the corpse :</i>	Great quantity of red ochre on the bones and on the bottom of the chamber around them.
<i>Orientation:</i>	East-West.
<i>Condition of bones:</i>	Very bad state.
<i>Position of the skeleton:</i>	The skull is lying on few long bones.
<i>Age at death:</i>	Adult.
<i>Sex:</i>	Undetermined.
<i>Grave goods:</i>	<u>n°109.1</u> (fig. 159): A big round completely ochred stone was found on the west side of the chamber. Around it, sediment is not ochred.

#### Burial T.111

Burial not excavated.

#### Burial T.112 (fig. 104)

<i>Type:</i>	Individual burial.
<i>Structure:</i>	Undetermined.
<i>Inhumation:</i>	Primary???
<i>Decomposition of the corpse:</i>	Undetermined.
<i>Manipulation of the grave and the corpse:</i>	Undetermined.
<i>Orientation:</i>	East-West; skull eastwards, facing south.
<i>Condition of bones:</i>	Very incomplete skeleton, only skull and maxillae, some vertebrae and ribs, some long bones of upper limbs were apparently present.
<i>Position of the skeleton:</i>	Undetermined.
<i>Age at death:</i>	Child??
<i>Sex:</i>	Undetermined.
<i>Grave goods:</i>	Absent??

#### Burial T.113 (fig. 105)

<i>Type:</i>	Individual burial.
<i>Structure:</i>	Undetermined (partially excavated)
<i>Inhumation:</i>	Primary, connected bones.
<i>Decomposition of the corpse:</i>	Undetermined.

*Manipulation of the grave  
and the corpse :*

*Orientation:*

*Condition of bones:*

*Position of the skeleton:*

*Age at death:*

*Sex:*

*Grave goods:*

Undetermined.

East-West; skull eastwards, facing south.

Bad state.

Left lateral decubitus, half-flexed lower limbs.

Adult, undetermined age.

Undetermined.

Absent??

Burial T.114 (fig. 106)

*Type:*

*Structure:*

*Inhumation:*

*Decomposition of the corpse:*

*Manipulation of the grave  
and the corpse :*

*Orientation:*

*Condition of bones:*

*Position of the skeleton:*

*Age at death:*

*Sex:*

*Grave goods:*

Individual burial.

Undetermined (partially excavated).

Primary, connected bones.

Undetermined.

Undetermined.

East-West; skull eastwards, facing south.

Bad state.

Left lateral decubitus, flexed lower limbs, the upper limbs are flexed on the corpse.

Adult, undetermined age.

Undetermined.

One big flattened polyhedron shell bead (*Conus* sp.) has been collected.

**Graveyard 9**

Burial T.102 (fig. 97)

*Type:*

*Structure:*

*Inhumation:*

*Decomposition of the corpse:*

*Manipulation of the grave  
and the corpse :*

*Orientation:*

*Condition of bones:*

*Position of the skeleton:*

*Age at death:*

*Sex:*

*Grave goods:*

Individual burial.

Funerary chamber closed by a mud-brick wall located to the south of the chamber, only part of the first longitudinal course of bricks is preserved.

Primary, connected bones.

In an empty space.

Body and bottom of the funerary chamber are red ochred.

East-West; skull eastwards, facing south.

Discrete, skull and long bones are fragmented.

Left lateral decubitus, flexed lower limbs, the left upper limb is elongated, and the right one is half-flexed with the hand on the pelvis.

15-16 years.

Female (coefficient M of sexualization: - 1.00).

n°102.1 (fig. 157 n° 8): A headband made out of 20 perforated shells of gastropods has been collected and preserved. One *Dentalium* segment found on the skull was also probably associated with this ornament.

n°102.2 (fig. 157 n° 9): A necklace of 4 ellipsoidal calcite beads.

n°102.3 (fig. 157 n° 10): A bracelet (left wrist) of 9 shell beads, one was crushed.

n°102.4 (fig. 157 n°12): A bracelet (right wrist) of 5 (at least) shell beads.

N°102.5 (fig. 157 n°11): A belt made out of 1 big flattened polyhedron shell bead (*Comus* sp.), 3 discoidal shell beads and 2 ellipsoidal calcite beads.

n°102.6 : Near the skull, 1 lump of red ochre.

### Burial T.103 (fig. 98)

<i>Type:</i>	Individual burial.
<i>Structure:</i>	Funerary chamber closed by a mud-brick wall located to the south of the chamber, only part of the first longitudinal course of bricks is preserved.
<i>Inhumation:</i>	Primary, connected bones.
<i>Decomposition of the corpse:</i>	In an empty space.
<i>Manipulation of the grave and the corpse :</i>	Body and bottom of the funerary chamber are red ochred.
<i>Orientation:</i>	East-West; skull eastwards, facing south.
<i>Condition of bones:</i>	The skull is completely crushed and the long bones are fragmented.
<i>Position of the skeleton:</i>	Left lateral decubitus, flexed lower limbs, flexed upper limbs with hands in front of the face.
<i>Age at death:</i>	40-45 years.
<i>Sex:</i>	Male (coefficient M of sexualisation: + 1.48).
<i>Grave goods:</i>	<u>n°103.1</u> (fig. 158 n° 2): 2 ellipsoidal shell beads (probably a necklace), the one was found on the left shoulder, the other on the top of the left humerus. <u>n°103.2</u> (fig. 158 n° 1): 1 ellipsoidal shell bead found near the pelvis, probably an element of belt. <u>n°103.3</u> (fig. 158 n° 3): Part of a bitumen coated basket, on the right ankle

### Burial T.104

<i>Type:</i>	Double burial.
<i>Structure:</i>	Funerary chamber, mud-brick wall was not found, only part of the north wall of the funerary chamber was preserved and coloured by red ochre.
<i>Inhumation:</i>	True secondary burials of an infant and an adult, both incomplete and dislocated bones.
<i>Manipulation of the grave and the corpses:</i>	Only the bones of the infant are red ochred ; due to this fact and to the position of the bones is likely that this grave was used twice : before for the bones of the adult and later for the bones of the infant.
<i>Orientation:</i>	East-West (for funerary chamber).
<i>Condition of bones:</i>	Discrete.
<i>Position of the skeletons:</i>	104A adult: the long bones (2 femura and 2 fibulae) and few other fragments are lying on different levels and position. 104B infant: the skull (4 fragments) and the long bones (2 femura) are on the same level, which is higher of that one of the bones of the adult.
<i>Age at death:</i>	104A: mature adult (40-59 years). 104B: infant (24 months).

*Sex:* Both indetermined.  
*Grave goods:* Absent

#### Burial T.105 (fig. 99)

*Type:* Individual burial.  
*Structure:* Funerary chamber closed by a mud-brick wall .located to the south of the chamber, only the first longitudinal course of the wall is preserved.  
*Inhumation:* Primary, connected bones.  
*Decomposition of the corpse:* In an empty space.  
*Manipulation of the grave and the corpse:* Body and bottom of the funerary chamber are red ochred.  
*Orientation:* East-West; skull eastwards, facing south.  
*Condition of bones:* Incomplete skeleton (most of the vertebrae, the pelvis and the foot are missing), saved bones are discretely preserved.  
*Position of the skeleton:* Left lateral decubitus, half-flexed lower limbs, flexed upper limbs with hands in front of the face.  
*Age at death:* 4-5 years.  
*Sex:* Male???  
*Grave goods:* n°105.1 (fig. 158 n° 4): 1 small turquoise bead (cylindrical ring in shape) was found near the left ear.

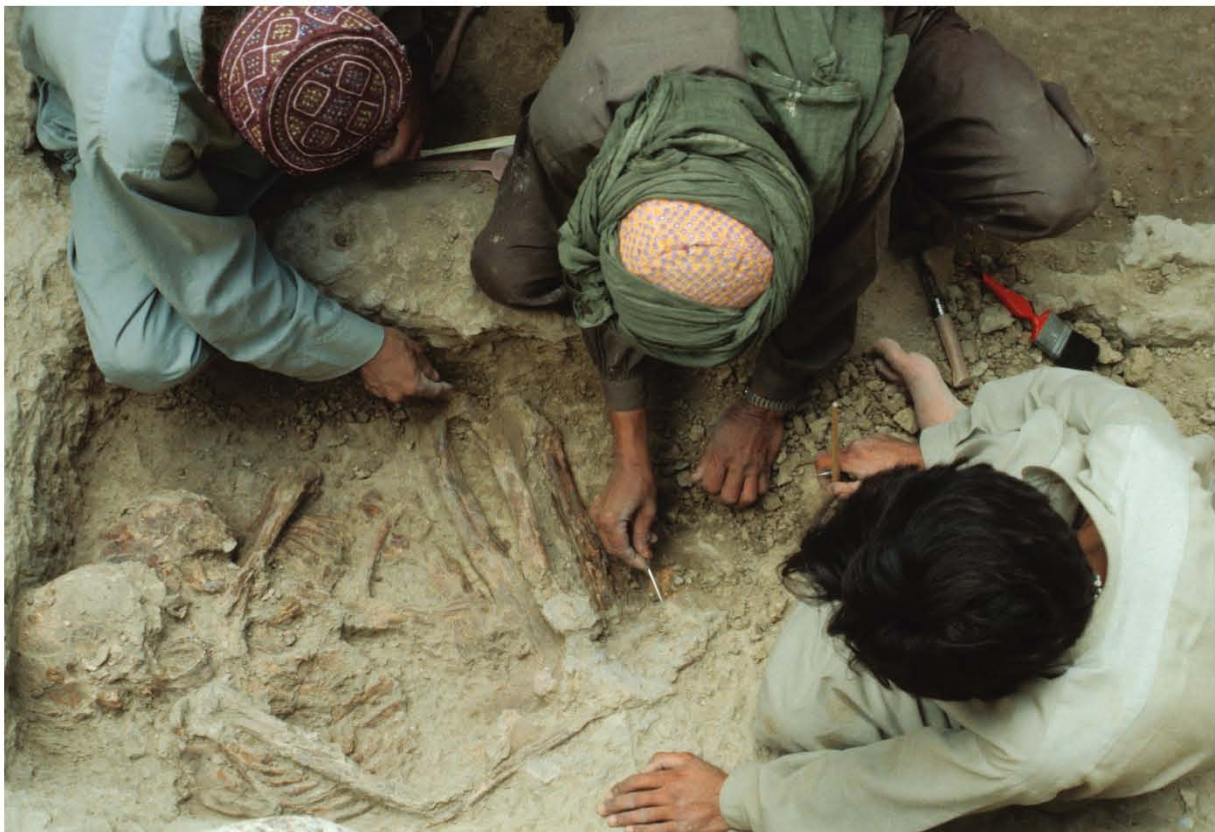
#### Burial T.106 (fig. 100)

*Type:* Individual burial.  
*Structure:* Undetermined. No bricks were found. Funerary chamber was not visible.  
*Inhumation:* Primary, connected bones.  
*Decomposition of the corpse:* In an empty space.  
*Manipulation of the grave and the corpse :* Body and bottom of the funerary chamber are red ochred.  
*Orientation:* South-North; skull southwards, facing west.  
*Condition of bones:* The skeleton is completely crushed; the lower limbs were not preserved.  
*Position of the skeleton:* Left lateral decubitus, flexed upper limbs with hands in front of the face.  
*Age at death:* Mature adult (40-59 years).  
*Sex:* Female (coefficient M of sexualisation: - 1.40).  
*Grave goods:* n°106.1 (fig. 158 n° 5): Probably a belt, 2 ellipsoidal calcite beads were collected near the pelvis.  
n°106.2 (fig. 158 n° 6): 1 small shell bead (cylindrical ring in shape) found near the left ear. This case is very similar to the turquoise bead, n°105.1, of the burial 105: same position on skeleton, same shape, only material is different.  
n°106.3 : A big lump of red ochre near the skull.  
n°106.4 (fig. 158 n° 7): 7 small polished stones were found with yellow ochre under the skull.

#### Burial T.110 (fig. 103, 285)

*Type:* Individual burial.  
*Structure:* Funerary chamber closed by a mud-brick wall located to the south of the chamber, part of the first longitudinal course is preserved and collapsed in a part on the skeleton.

<i>Inhumation:</i>	Primary, connected bones.
<i>Decomposition of the corpse:</i>	In an empty space.
<i>Manipulation of the grave and the corpse:</i>	Body and bottom of the funerary chamber are red ochred.
<i>Orientations:</i>	East-West; skull eastwards, facing south.
<i>Condition of bones:</i>	Complete skeleton in quite good state of preservation but bones are very brittle.
<i>Position of the skeleton:</i>	Left lateral decubitus, lower limbs are flexed, the left upper limb is flexed with the hand in front of the face, and the right one is on the corpse (on the ribs).
<i>Age at death:</i>	6 years +- 24 months.
<i>Sex:</i>	Undetermined.
<i>Grave goods:</i>	<u>n°110.1</u> (fig. 160 n° 2): A headband made out of 2 rows of small perforated shells of gastropods (at least 95 shells but others were present and could not be preserved since too friable). Near and partially under the skull were found more than 45 dentalia segments (45 could be collected), they were probably associated to the headband. <u>n°110.2</u> (fig. 160 n° 1): A necklace of small dentalia segments (103 could be collected and preserved) and of 1 perforated shell of gastropod. <u>N°110.3</u> (fig. 160 n° 3): A belt of 23 ellipsoidal shell beads.



**III : Local workers exposing a neolithic burial**

## CHAPTER 2

### REPORT 1997-1998

The 24th season of work at Mehrgarh, district Kachi, Balochistan, was conducted from December 1997 until the end of February 1998 by the French Archaeological Mission in collaboration with the Department of Archaeology and Museums, Government of Pakistan. In addition to the representative of the Pakistan Government and Officer-in-Charge, Mr. Farzand Masih, Assistant-Director, Sub-Regional Office, Quetta, the field staff included: Jean-François Jarrige, Director of the project, Catherine Jarrige, C.N.R.S., archaeologist, Gonzague Quivron, C.N.R.S., archaeologist, Vincent Marcon, archaeologist in charge of lithics, Rozenn Douaud, archaeologist and draftsman, Gauthier Devilder, draftsman, Richard Meadow, Harvard University, zoo-archaeologist, Lorenzo Costantini, IsIAO, Rome, paleobotanist, Alessandro Lentini, IsIAO, Rome, paleobotanist, Pietro-Paolo Petrone, University of Naples, physical anthropologist and Luciano Fattore, assistant physical anthropologist.

#### 1. AREA MR.03 SOUTH

##### 1.1 Previous work in this area.

Between 1977 and 1984, a deep sounding had been dug close to the edge of the cliff overlooking the Bolan River that flows ten meters below (MR.3S). Only the northern half of the sounding had been carried out down to natural sediment some seven meters below the present surface. This sounding in the course of seven field-seasons since 1977 to 1984 (see C. Jarrige *et al.* 1995) provided significant information concerning the earliest Neolithic deposits. Series of graves (the oldest ones with animal offerings) and several building levels had been exposed.

This sounding also provided the possibility to study the earliest architectures and the associated material culture as well as the vegetal and faunal remains related to the earliest occupations of the site.

##### 1.2. The 1997-1998 field season

The work was resumed in this area in 1997-1998 in order to get additional information to allow a better knowledge of the Neolithic settlement, in particular of its earliest phases

A new area was excavated, limited by the previous sounding MR.3S towards west and by the edge of the cliff formed by the Bolan River to the east. In this cliff itself two soundings had been carried out in 1982 and 1983 over a length of twenty five meters along the cliff-face to a width inside the cliff of between one and five meters.

Since then, those soundings, as well as a part of the Neolithic settlement, have been washed away by the successive summer floods of the river which led to the collapse of the cliff to a width of about five meters (fig. 220).

Nevertheless, excavation was carried out over a preserved area of 75 sq. m between the previous deep sounding and what is today the edge of the cliff. (Squares A1B-A1C-D10B-D10C and part of square D10D of the grid-plan) (fig. 12c and fig. 221, 222, 223).

##### 1.2.1. Description of the deposits.

Several occupational deposits that accumulated in the course of time have been evidenced from an early aceramic period (Period I) to a phase associated with a coarse chaffed-tempered pottery (Period IIA).

## Period IIA

Eroded structures from this phase have been exposed below the surface in the southwestern part of the dig where a chaff-tempered potsherd was found associated with the exposed remains (fig. 221).

Part of a north-south oriented mud-brick wall was excavated. Shaved by erosion, it was preserved to a height of 20 cm only. Its curving shape and a buttress on its inner side suggest that the structure could have been a retaining wall constructed as a protection against slope-wash and erosion. Several structures of the same type and belonging to Period IIA, had already been unearthed in the past and described in the previous field reports (see field report 1981-1982 in C. Jarrige *et al.* 1995).

### Upper layers of Period I (between 13 m and 12.50 m)

This period is represented by the superimposed layers of debris, which covered up in this area the slopes of the mound. These deposits were the result of the erosion that destroyed northwards the uppermost occupation level of Period I. During this period also, the surface of the eroded mound was selected to become a graveyard (Graveyard 9).

Period I (sloping layers between 12.50 m and 10.50 m to the north and between 11.50 m and 9.50 m to the south).

Four main building phases have been evidenced for this period from top to downward (fig. 222, 223).

#### *First phase: occupation Level 9 (fig. 14c)*

A large building (Structure XXXI) was exposed within the limit of the excavation. It was in a very poor state of preservation and rather fragmentary. Three long walls, composed of a single row of bricks, delimited six rectangular east-west oriented rooms which were part of a structure of which the other sections had been destroyed. But it can be assumed that originally this building had at least 8 compartments. The walls were preserved to only a low height (12 cm on average).

This rather large building looks like another structure excavated nearby in 1978 which consisted of ten rooms, the seven longer ones laid out on either side of three smaller rooms (Field Report 1977-1978, fig. 4.1 and 4.2). The exact use of this building is not certain but its plan could be the prototype of some of the several compartmented buildings of Period IIA which have been interpreted as storehouses.

#### *Second phase: occupation Level 8 (fig. 13c)*

Part of a building (Structure XXXIV) was uncovered in the north-western corner of the dig. Two rectangular rooms only were partly preserved but, at the time of its edification, the structure was probably a four-roomed building similar to the numerous houses previously exposed in different parts of the settlement.

The walls were composed of two rows of bricks (very long mud-bricks longitudinally arranged) and were preserved to a height of 80 cm. Both inner and outer surface were covered by a clay coating.

#### *Third phase: occupation Levels 8 and 7 (fig. 12c and 13c)*

Structures XXXII and XXXV were the remains of two houses, east-west oriented and rectangular in plan. These belong to the four-roomed type of structures and belong also to the level of architecture described as occupation Level 8 in the northern part of the site (MR.03 North).

Structure XXXV was a fragment of a four-roomed house that extended outside of the limits of the present excavation. One rectangular room only (2.58 x 1.30 m) and the corners of a second and of a third room were excavated. Unfortunately, pits of more recent tombs from Graveyard 9 had badly damaged parts of the original fillings of the rooms made of compact clay as well as large portions of

the walls which had collapsed. Only the clearing of the rectangular room was completed down to its floor.

The second building (structure XXXII) was located about 85 cm to the east of Structure XXXV. The eastern part of this house was found destroyed by the erosion of the cliff overhanging the Bolan River. It is therefore difficult to be sure of its dimensions. Nevertheless the structure which is oriented east-west and is divided into four rooms must have covered in its original state a surface of about 4.45 x 6.80 m.

The walls made of two rows of bricks were 30 cm thick and were preserved to a height of about 1.60 m. In addition, a second outer wall, two rows of bricks wide also but only 25 cm high, had been built around the structure. It was probably constructed later to reinforce the leaning walls of the house. An opening was located in one of the rooms (50 cm wide and 85 cm above the base of the walls).

The fill of the house consisted of bricks debris fallen from the higher portion of the walls.

Both houses (Structures XXXII and XXXV) were linked southwards by three small outer additional walls 45 cm high edified to form a trapezoidal courtyard probably devoted to domestic activities.

South of House XXXII were the remains of a small structure (Structure XXXIII) whose thin and badly built walls stood 45 cm high. The structure, east-west oriented, was divided into two portions by a thin partition wall and was most probably used as a storage container; the sizes of the two rooms being rather small for habitation.

This latter building was edified on the debris above the walls of the above-mentioned courtyard then buried and not in use any longer.

#### *Fourth phase: occupation Level 6 (fig. 11c)*

Structure XXXVI had been partly uncovered in 1980 on the east side of the excavation of the sounding MR3.S. Two rectangular rooms, oriented east-west measured 2.5 x 1.2 m each. The walls, 30 cm thick, were two rows of bricks wide. One of the rooms was bare of material while a large quern and a stone basin fragment were found in the other one.

The eastern part of the same house was unearthed this year showing that the building was of the usual four-roomed house type. The two rooms cleared in 1998 were much smaller (1 x 1.35 m) and they were mostly filled with clay. Of special note is the long tool made of antler, which was found on the floor of one of them.

The house was linked to another one (whose remains are visible on the northern section of the excavation) by a low outer wall, 40 cm high, made of a single row of mud-bricks. A fragment of a stone bowl with the interior stained with red ochre was found near the wall (fig. 59 B and fig. 255 centre).

Structure XXXVI belongs to the building in which one other rectangular house has been previously exposed (MR3.S) The house was oriented north-south and among the artefacts found in the rooms, was a cluster of calcite beads, some of them unfinished, along with many fragments of calcite indicating the presence of a bead workshop.

#### *1.2.2. The cleaning of the eastern section of the trench MR.03 1997*

A long trench has been dug last year from the south-eastern corner of the sounding MR3.S towards the south and the edge of the cliff over a length of 25 m to study in a more extensive way the occupational deposits of the Neolithic settlement and to extend the understanding of the formation process of the site (fig. 16). The work was resumed this year and the eastern section of the trench was carefully cleaned. In addition, a part of the trench was dug deeper over a length of 3 m in order to reach the alluvial deposits which have partly buried the settlement.

By examining the section, the shape of the early aceramic mound can be clearly seen as well as the way later deposits accumulated on its slope. It appears clearly that the sloping side of the aceramic

mound was covered with thick deposits of trash mixed with fallen bricks. They come from the erosion and the many gullies, further north, of the last occupation level (9) of Period I whose structures little by little collapsed after the abandonment of the aceramic mound (or of this part of the settlement) as a dwelling area. In the section these deposits, divided in several layers, slope down to the south where they meet the bevel-edge of successive alluvial strata.

The whole ruined mound (or at least its southern part) was used as a large funerary zone (Graveyard 9) during both its phase of erosion and the contemporary alluvial process that progressively buried a large part of the base and the slopes of the aceramic settlement.

The area was reused as living spaces after a lapse of time difficult to evaluate with the beginning of Period IIA, the Neolithic phase associated with the first occurring of the chaff-tempered pottery. The remains of this new occupational level originally covered the ancient eroded aceramic Period I mound as well as the upper alluvial deposit representing the last of the alluvial strata which contributed to bury the slope of the Period I mound.

## 2. AREA MR.03 NORTH

Excavation was resumed in the area excavated during season 1996-1997, limited by gullies towards south and northwest and by the edge of the cliff formed by the Bolan River in the northeast (zones C, D and P of the grid-plan). It had already increased the plan of a series of grouped structures in mud-bricks which had been unearthed in this area in the course of the 1980-81 season (see report 1996-97).

The aim of this season was to extend the plans of period I settlement, especially in an area where some structures are preserved up to a height of almost 2 m.

Nine houses were excavated in areas MR.03 C/D/N/P, in squares:

- MR.03 C 1-I, 1-J
- MR.03 D 1-A, 1-B, 1-C, 1-D, 2-B, 2-C
- MR.03 N 8-J, 9-I, 9-J, 10-I, 10-J
- MR.03 P 8-A, 9-A, 10-A, 10-B, 10-C, 10-D

Thus covering an area of roughly 450 sq. m occupied by buildings, most of them rectangular four-roomed houses, and open spaces, as well as burials dug later in the eroded debris (fig. 224, 225, 226).

Excavation was resumed in houses no. VII, VIII, IX, and X.

Eight houses appeared in the excavation of new trenches and under houses of occupation Level 9: houses no. XI, XII, XIII, XIV, XV, XVI, XVIII, XIX.

They complete the plan of the settlement showing successive building phases of period I, corresponding to occupation Levels 9 and 8.

### 2.1. Resumption of the 1996-1997 excavation

#### 2.1.1. Lower level (Level 8) (fig.13b)

##### House VII

Excavation of this house with a north-south orientation, undertaken in 1996-1997 (see report), starting at a preserved altitude of 12,65 m, has been carried down to 10,55 m, thus to an extent of 2,10 m.

Its dimensions are 5,25 x 4,25 m. It is divided into four rooms, Locus 33, 48, 53, 54, of approximately 2,25 x 1,75 m.

The floor corresponding to the building phase bears a large quantity of charcoal. Older structures emerge where they were not used as substructures.

The first occupation floor exposed in Locus 53 and 54 is at an altitude ranging between 11,00 m and 11,15 m and contains on a flat surface remains including flints and stones, bitumen, bone tools and

fauna and, in room 53, a stone vessel, probably a mortar (fig. 59 A and fig. 255 right). The rooms were later filled by successive layers of debris containing stones, flints, bone tools and displayed a slope more and more pronounced as it was heightened up.

Doors at different altitudes connect the rooms either to the open outer space or between themselves. The lowest, in the western wall of Locus 53, corresponds to its floor (11,15 m) and is about 0,60 m high. Another opening between Locus 33 and 53, also corresponding to the floor of Locus 53, seems to have weakened the upper part of the wall, letting cracks appear straight above the sides, unless it was kept open at a later stage.

### Locus 69/110 (north of Locus 56)

This open space west of house VII was extensively used as an activity area during the successive phases of occupation of the house and previously to the building of house X which covered it partly.

It shows, on successive floors sloping towards the south, thick layers of burnt debris and hardened ashes and a large quantity of lithic material - grinding stones, pestles, hammering stones, flint debitage and a large quantity of faunal remains.

### House IX

Only the southern part of this house with a north-south orientation is visible (Locus 66 and 67). All its northern part was washed away by the gully which destroyed the northern part of house X and the north-western corner of house VII and which was subsequently filled up with the debris of the former excavation in MR.03. Its reconstructed dimensions were approximately 6,00 x 3,50 m, with rooms measuring 2,50 x 1,40 m.

The two southern rooms were excavated down to an altitude of 11,50 m. A floor was exposed at an altitude of 11,60 m with traces of burning and is at the base of a hard filling of melted collapsed bricks. Bricks seem to have also been organised into a 0,60 m wide platform along the southern wall of Locus 66, supporting an accumulation of ashes and stones east of an intermediary brick perpendicular to the wall, parting the platform in two equal parts. It rests on the same red floor as the collapsed debris. In Locus 67, the fill has yielded more material, in particular flints, pebbles and a shattered animal figurine in clay (fig. 48 D).

Under the burnt reddish floor in Locus 66, in a compact fill, half of a stone vessel has been exposed (fig. 59 C and fig. 255 left).

#### *2.1.2. Upper occupation (Level 9) (fig. 14b)*

### House VIII (formerly House L)

The plan of this house had already been exposed as House L in the course of the seventh season, 1980-1981 (see C. Jarrige et al. 1995: 317); its north-east room had been cut by sounding MR.3T. This house has a north-south orientation and its dimensions are 5,80 x 4,40 m. The maximum preserved height of the walls (between altitude 12.5 m and 11.98 m) is about 0,50 m. The fill of the house consisted of fallen bricks disturbed by gullies containing some stone objects possibly not in situ, among them two grooved stone polishers (fig. 54 A,B and fig. 256).

### House X

This north-south oriented house has been built at an altitude of 12,64 m. After the removal of the eroded structures dug in season 1996-1997 in order to excavate the remains corresponding to the neighbouring House VII, the north-west and south-west corners of Locus 67 were exposed.

The northern part of the house has been thoroughly washed away by a gully. Its reconstructed dimensions would be roughly 6,60 x 3,60 m, with rooms c. 3,00 x 1,50 m.

Locus 57 had yielded a floor with remains of crafts activities (see report 96/97); the very limited space of this year excavation has not given any new information.

## 2.2. New excavation 1997-1998

### 2.2.1. Lower level (occupation Level 8) (fig. 13b)

#### House XV

Below House IV (denominated house K in the plan of the seventh season: 1980-81 in C. Jarrige *et al.* 1995: 317)), a new House XV has been uncovered with a west/east orientation. Its dimensions are 5,90 x 4,00 m with rooms (Locus 71, 72, 73, 74) measuring 2,80 x 1,50 m. In Locus 74 the excavation was conducted from the top of the walls at an altitude of 12,35 m down to an altitude of 10,24. But the very first occupational layer corresponds to an altitude of about 10.50 m, as it is the case in the other rooms. The fills of the four rooms are hard and compact made of fallen brick walls. In Locus 72, fragments of wall plasters painted with red ochre were lying among the fallen bricks. Most of the finds come from what seems to have been the episode of occupation of the house (between 10,75 m and 10,50 m); they include in Locus 72 a clay human figurine with applied pastilles and a rather elaborate hairdo (fig. 48 A and fig. 259) and an antler probably used as a pick (fig. 254). In room 71, three clay figurines (fig. 48 B,C and fig. 49 B) were found as well as two sickle blades shafted slantwise in bitumen (fig. 257).

#### House XVIII

This house with an east-west orientation, has been excavated from an altitude of 12,58 m (maximum preserved height) down to 11,03 m, thus to an extent of 1,55 m.

Measuring 5,40 x 4,00 m, it is divided in four rooms, Locus 104, 105, 106 and 107, whose inside dimensions are roughly 2,30 x 1,70 m. Two openings at different levels, each rounded at the top and corresponding to a floor, connect on one side Locus 104 and 106 and on the other Locus 105 and 107. An opening in the southern wall of Locus 104 allows access from the south. Due to the presence of a gully running through Locus 107 and 106, it is difficult to find out whether this gully has engulfed itself into a door between Locus 107 and 106 or if it has cut the wall.

The walls of this house are laid at an altitude of 11,45 m on a compact and thick accumulation of clay in which rows of bricks can be outlined, perhaps remains of an older building and containing nothing else than a few stones. This altitude corresponds to the first occupation with, in Locus 104 and 106, a burnt floor and the base of a 31cm high opening.

This first occupation is separated by compact layers from a second occupation floor at an altitude of 11,70-11,75 m with, in Locus 104 and 106, on an ashy floor important deposits of stones, bone tools (fig. 50 E-G, fig. 51 C-H, fig. 52 E), bones and a horn. In Locus 105 and 107, floors around this altitude have yielded mullers, bone tools, heaps of large stones and debris of fauna. The base of the opening between the two rooms is slightly higher; it culminates at 12,14 m.

Fillings, either compact (104-106) or ashy and loose (105-107) separate these floors from a wide black burnt layer at an average altitude of 12,00 m which seems to be the base of the subsequent use of the ruins in the next period, either overlaid by thick brick fillings or by the disposal of the later settlement. On the western and southern sides (Locus 106-107-104), collapsed bricks have melted into a hard fill that is part of a sort of platform which surrounds House XVIII and corresponds to the occupation floor of House XIV.

#### House XIX

Just below the remains of House VIII was uncovered an earlier house of almost the same plan and same north-south orientation. Only the southern half of the house (Locus 114 and 115) was excavated, but its total dimensions (5,60 x 3,90 m) have been assessed from the section cut by the sounding MR.3T and the rooms measure 2,50 x 1,70 m. Its walls were preserved to a height of almost 1,50 m (between altitudes 11,98 m and 10,50 m). In Locus 114, an occupational layer with ashes about 0,25 m thick rests on a floor with a fire place. In this ashy layer, two fragments in fired clay covered with a red paint and with a hollow core were found. It is impossible to know if these fragments exceptional by the quality of the fired clay in an aceramic context were part of a figurine.

### Locus 116

This open space between Houses XV and XIX was probably used as a passageway. After abandonment of the two houses, it was filled with debris and, at a time preceding the building of Level 9, the emerging upper part of one house fell out on a wet ground, probably due to rain, thus closing in the remains of painted mud plaster applied on the external mud-brick wall whose imprint was found on the ground (fig. 22 and fig. 227), at an altitude of 11,54 m.

The position of the painted plasters is confirmed by faint traces of red paint still visible on the upper part of the western wall of house VII on its external side.

### Locus 30 and 31

Other remains of painted plaster were found in Locus 30, also an open space west of Locus 116, surrounded by Houses VII, IX, XV and XIX. Though their altitude is slightly higher (12,10 m), it is also below the highest preserved level of the walls of houses VII (12,66 m) and IX (12,40 m).

Two large human figurines (fig. 261) were also found in Locus 30 (fig. 49 A) and 31 (fig. 49 C), at respective altitudes of 11,10 m and 11,18 m, both on a floor under fallen bricks. The latter is coated with red ochre.

### House XI

This north-south orientated house, was cleared at a maximum altitude of 12,89 m with a building level at 12,59 m and a preserved height for the walls ranging from 15 to 30 cm. The rooms, Locus 75, 77, 80, 81 are roughly 2,40 x 1,60 m. An occupation floor was cleared in Locus 77 with fire-burst stones, a fragment of a grinding stone and lithics. Locus 75 was disturbed by two graves that were dug through the floor. The fill of the rooms consists of lithics, bones and a few pebbles, some utilised.

The house was built on a layer of reddened earth, probably due to heating, which is found all over this part of the site under this level of construction.

#### *2.2.2. Upper level (occupation Level 9) (fig.14b)*

### House XII

Situated in an area (Locus 95) devastated by gullies, it has yielded little information. Only a room and part of another have been cleared superficially at a maximum preserved altitude of 12,80 m, thus suggesting a north-south orientation.

### House XIII

This house with a north-south orientation, west of House XI, has been thoroughly excavated. Its dimensions are 5,10 x 3,60 m, with rooms (Locus 96, 97, 98, 99) measuring 2,30 x 1,50 m. Cleared at a maximum altitude of 12,92 m, it has a building level at 12,41 m with walls preserved on 3 to 5 rows of plastered bricks. A few objects at an altitude of 12,50 m in Locus 67 may belong to the occupation level of this house: a bone bead (fig. 60 A), bone tools (fig. 50 C), a lozenge in calcite (fig. 60 D) and flint sickle elements shafted in bitumen (fig. 257). Earlier floors were evidenced around 11,75 m, with fireplaces in the south-eastern corners of Locus 96 and 98 made of fragments of grinding stones and containing pebbles and compact ashes. In Locus 96, the corresponding floor yielded many burnt pebbles, flints, mullers, pestles and a few bones. No occupation floor was clearly visible in the more eroded northern rooms, but their deflated contents - a fragment of a grinding stone, beads, bone and stone tools - were there.

The walls were built on a preparation layer of hard clay, already evidenced under other houses of this level (see 96/97 report). This preparation layer was used on the sloping ground in order to restore horizontality for the building level and thus shows important variations of thickness (as much as 40 cm between the eastern and the western walls of the house) following the original slope. It rests on the reddened layer described earlier (see house XI).

### House XIV

Situated west of House X, it has a slightly different orientation, though also of north-south direction. It was built previously (or at least deeper) with a base at an altitude of 12,26 m but an occupation floor at 12,64 m corresponding to the building level of House X.

It was preserved to a maximum height of 0,70 m in its southern part and gullied in its northern part. Its dimensions are 7 x 4,50 m, but with a doubling of its external walls which reduces its inner dimensions to 6 x 3,50 m. It is divided in four rooms, Locus 85, 86, 87 and 88 which have yielded floors with a large quantity of lithics: flints, many used pebbles and a polished stone axe (fig. 55 A).

Doors with thresholds connect room 85 to room 87 and room 86 to room 88. A third door seems to have been set up between Locus 87 and 88, but this part is too eroded to be reliable. The opening between Locus 85 and 87 has been reinforced by buttresses on either side which double its length.

Under the building floor, itself resting directly over the reddened layer (see above), a small wall of north-south direction emerges, probably a remain from a previous construction.

### Locus 84 and 100

The exterior of House XIV was a very hard platform on its southern side, probably reusing part of the collapsed walls of House XVIII which was partly filled with fallen bricks and also used as a platform at that time, except its north-east room, locus 105, which was kept as a pit for activities dealing with fire.

### House XVI

As structure XII, House XVI has been cleared only superficially in its eastern part (Locus 92 and 101), its powdery walls being reduced to an imprint on the surface. Associated to this structure of likely north-south orientation are a few pieces of flints.

## **3. BURIALS AND GRAVE GOODS**

### **3.1. The burials in Area MR.03 South**

#### ***Graveyard 6***

Only a small portion of sloping ashy layers below the above-mentioned structures was excavated this year. Two four-roomed houses had been found buried in the same ashy layers in the adjacent sounding MR3.S. A series of more recent tombs had also been excavated near these buildings. This year, the grave of a child (T.237) was found.

#### ***Graveyard 7***

A young infant was buried in flexed position in this level (T.235). No material was found near the skeleton placed in a pit without funerary chamber. According to the 1979-80 and 1980-81 reports on this building level in MR3.S, an adult was uncovered buried in one of the rooms of a house. Contrary to earlier thinking, the dead body had not been laid in the room reused as a burial place after its abandonment. The tomb is in fact more recent and its pit was dug at the location of this room already filled up with debris.

#### ***Graveyard 9***

Many burials, in the uppermost ruined remains of occupation Level 9, have been previously discovered in the adjacent sounding MR.3S. They can be now associated to Graveyard 9. Four graves of the same type have been excavated this year (T.223-T.224-T.225 and T.234). Located further north, their pits have partly damaged two levels of houses belonging to earlier occupation levels.

The structure of the burials was of the usual side-wall grave type. The skeletons were found coated with red ochre and in a flexed position. Ornaments and objects were associated with the dead

bodies. In one grave (T.234), a set of stone and bone tools was found carefully placed in one of the hands (fig. 291, 292).

The structure of another grave (T.223) was particular compared to the usual type of side-wall noted for the tombs of this period. The long bricks of its wall were not laid in alternate headers and stretchers but were placed lengthwise one above the other (five courses of bricks in two rows).

### **3.2. The burials in Area MR.03 North**

#### ***Graveyard 7***

T.235 was also dug deep in this open space. Only the head was visible in the excavation.

#### ***Graveyard 8***

A grave (T.222) of an about 15 year old male with a well preserved red ochre coating,, with its pit and funerary chamber still visible, was dug in the southern part of this space, in the same area as burials T.107, T.109, T.110 (see report 96-97).

T.231, of east-west direction, was dug in the platform south of house XIV, cutting the western wall of house XVIII into Locus 106.

#### ***Graveyard 9***

The large open space, Locus 109, south of houses XIV and X has yielded no architectural remains of Level 9, but contains a large quantity of graves to be included in Graveyard 9.

T.219 and T.220 were limited to powdery remains of bones. T.220 contained a belt made of 38 shell beads. T.228 and T.229 were very close to the surface, east of House XVIII. T.228 contained remains of two very young kids (fig. 289). T.229 had a well preserved funerary chamber and wall.

Two east-west oriented graves were dug on top of each other in Locus 69 at the south-western corner of House VII, perpendicular to its western wall, destroying part of the corner. Though they both belong to Graveyard 9, they may have been separated by a fairly important lapse of time, the remains of the earlier (T.236) being apparently no longer visible when the later was dug (T.226). They both belong to the side-wall grave type. T.236 had grave goods consisting of a large necklace of 700 shell beads, a shell belt (Fig. 293), a basket coated in bitumen and a faunal offering. In T.226, the dead was buried with two long grooved bone spindles along his chest (fig. 290).

### **3.3. Preliminary report on the anthropological survey (by P.P. Petrone and L. Fattore\*)**

The graves typology is the one noticed for the tombs excavated in the previous surveys: the corpse is lying on the left side, mostly with the head to the east facing south, inside a funerary chamber at the bottom of a pit. Only in two cases, the decubitus is right lateral. the entrance of the chamber is closed by a mud-brick wall, with bricks alternatively disposed in longitudinal and transversal rows.

The graves recovered in this last season are nineteen. Only sixteen of them were completely excavated and the bones removed. Sixteen are belonging to a single deposition, one is double and two are multiple burials (at least three individuals). In the last case, there is always a primary deposition and the others are secondary. In only one case, there is a single secondary burial, an adult over 45 years old.

Some cultural data can be reported about some action regarding the body and the grave. All the skeletons entirely excavated show bones covered with red ochre and the bottom of the graves is also red ochred (though it is doubtful in some of them). In the case of five adults and five children, grave

goods of different kinds are present, as well as two faunal offerings, in both cases associated with an adult.

On the total of the 24 individuals examined, 9 are aged between 0 and 15.5 years, while 15 are adult (over 20 years). Of the thirteen cases in which it was possible to determine the sex through the characteristics of the pelvis and the skull, seven are male and six female. The state of preservation of most of them is bad and the bones are very fragmented.

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## **CHAPTER 3**

### **REPORT 1998-1999**

The 25th season of work at Mehrgarh, district Kachi, Balochistan, was conducted from December 1998 until March 1999 by the French Archaeological Mission; in collaboration with the Department of Archaeology and Museums, Government of Pakistan. In addition to the representative of the Pakistan Government and Officer-in-Charge, Mr. Ejaz Ellahi, Assistant Curator, National Museum of Pakistan, Karachi, the field staff included: Jean-François Jarrige, Director of the project, Catherine Jarrige, C.N.R.S., archaeologist, Gonzague Quivron, C.N.R.S., archaeologist, Jérôme-F. Haquet, archaeologist, Jean-François Lefèvre, archaeologist and draftsman, Vincent Marcon, archaeologist in charge of lithics, Richard Meadow, Harvard University, zoo-archaeologist, Lorenzo Costantini, IsIAO, Rome, paleobotanist, Alessandro Lentini, IsIAO, Rome, paleobotanist and Andrea Cucina, University of Rome "La Sapienza", physical anthropologist.

#### **1. AREA MR.03 SOUTH**

##### **1.1. Previous work in this area.**

The area selected for excavation in 1997-1998 was limited to the east by the edge of the cliff formed by the Bolan River and towards west by the deep sounding MR.3S dug between 1977 and 1984. This location was chosen in order to more precisely understand the stratigraphic sequence of the sloping southern side of the Neolithic settlement. Eroded structures from Period IIA, a phase associated with chaff-tempered pottery, were uncovered just below the surface (fig. 221). The earliest aceramic occupation levels, Period I, were only reached in a small portion of the excavation.

##### **1.2. The objectives of the 1998-99-field season in the area**

The work was resumed in this area in 1998-1999 in order to explore on a larger scale the very first occupational layers of the site and to collect more information concerning not only the architectural remains and the associated artefacts but also the oldest funerary customs of the inhabitants of the settlement. The need to obtain more data about the vegetal and faunal remains in relation to the development of food-production in the earliest levels, as well as the possibility to have a more extensive recording of the entire stratigraphy of the Neolithic mound, also explain the selection of this location to carry out more excavation. For the same reason, it was thought important to resume work in the southern half of the deep sounding MR.3S. Only its northern part had been damaged by erosion but its southern part provided several metres of deposits from Period I, which were undisturbed by earlier excavations and still directly accessible.

##### **1.3. Western part of MR.03 South. Excavation in the northern half of the deep trench MR.3S.**

The area is corresponding in the grid-plan of MR.03 to squares A1A, A2A, B1J and B2J on a surface of about 58 sq. m. Two metres of undisturbed early Period I deposits were excavated in this trench. The aim was also to reach the natural sediments beneath the earliest level of occupation that had already been exposed in this central part of the Neolithic occupation at about 6 m below the surface. In order to confirm that the natural sediment has been reached, excavation in this trench was conducted 0.60 m deeper than occupation Level 1 without encountering any additional cultural level (Fig. 16, 17).

### *1.3.1. Lower occupational levels of Period I (Levels 1, 2 and 3)*

#### Level 1 (fig. 6c and fig. 228)

The earliest cultural deposit was encountered at about 6 metres from the top of the section and consisted in a series of nearly horizontal brown ashy layers. Portions of a mud-brick structure rest directly on them (House XL) (fig. 6c). The unfired bricks used to build the house measured approximately 60 cm in length. The walls are 35 cm wide and are preserved to a height of about 0,80 m. Unfortunately this building, so far the oldest ever uncovered at Mehrgarh, was badly eroded. The portions of three joined walls in a Z-shaped position were the only preserved remains of at least two rooms. An in-place hearth surrounded with numerous pebbles was located in the north-west corner of the southern room and one hammer stones and several stone mullers were uncovered on the floor and in the superimposed ashy layers interspersed with earthen layers that, in course of time, filled up the room.

A mass of fallen bricks, resulting from the collapse of the eastern wall of the house, was covering a part of the northern room. A most spectacular discovery was an intact portion of the wall which was still bearing its coat of mud-plaster painted in plain red ochre. The position of the fallen bricks indicates that it was the external wall of the structure that was adorned with paintings. Finally, a group of medium-sized stones and a grooved item (fig. 61 D and fig. 272) were found on the floor of this northern room and a grinding stone with its associated muller was still in situ against the outer western wall of the building.

Outside the house, in the western part of the trench, the recorded finds include stone tools among which a chisel and two unbaked human figurines (fig. 61 A, B and fig. 262, 263).

#### Occupation Level 2 (fig. 7c)

Above House XL, traces of an eroded rectangular structure with an east/west orientation (House XLI) have been exposed. The walls are 37,5 cm wide and are preserved to a height of 23 cm to the east and 40 cm to the west. The dimensions of the structure, at the time of its building, were 5,30 x 2,65 m. The filling of the room consisted of layers of clay mixed with ashes. Objects recovered from this structure include fragments of grinding stones and mullers and fragments of an awl and a spatula made of bone. A large-sized stone chisel was also uncovered against its northern wall (fig. 66 A and fig. 276). To the north and the west, the building was buried into debris including numerous pebbles and ashes. Due to the melting of the upper part of the ruined mud-brick structure, successive thin salty deposits covered up the whole area. After its abandonment, this area was heavily disturbed by natural erosion and, as a result, the southern part of the structure XLI was missing.

#### Occupation Level 3 (fig. 8c)

The main architectural feature of this Level 3 consisted in the remains of a mud-brick structure (House XXXIX), north-south oriented and rectangular in plan. This building was of the multi-roomed structure type and extended outside the limits of the present excavation. Two rectangular rooms were completely cleared by excavation this year as well as parts of a second and third room. The other part of these two rooms, located in the northern half of the deep trench MR.3S, had already been uncovered in 1982 (Structure E in 1981-1982 report in C. Jarrige et al. 1995). Therefore, by adding the previous information to that collected this year, it becomes possible to have the complete plan of the house. The four rooms had more or less the same size and measured approximately 2,25 x 1,50 m. The walls made of two rows of brick were 27,5 cm thick and were preserved to a maximum height of about 0,80 m. Two openings connected both southern rooms to the outside and a fire place was found in the corner of one of these rooms. Like all the so far uncovered Neolithic structures, the inner and the outer faces of the house were covered with a clay coating.

The fill of the rooms consisted of earth and ashy debris including a few items like bone awls, stone objects, an unfinished calcite bead (fig. 68 D) and two small rings made of bone (fig. 69 D, E). Around the house, successive layers of ashy deposits and of fallen bricks contained also stone and

bone tools as well as an unbaked human figurine (fig. 68 A and fig. 264) and a small circular object made of shell (fig. 68 J).

#### **1.4. Eastern part of MR.03 South.**

The described above remains of occupation level 3 also extended eastwards to another area selected for archaeological work this year and already partly excavated in 1998,. This area is close to the edge of the cliff cut by the Bolan river (squares D10B and A1B and parts of squares D10C and A1C).

##### *1.4.1 Lower occupation levels of Period I (Levels 3 and 4) (fig. 8c, 9c)*

###### Occupation Level 3

The lowest courses of a house corner were exposed in the limits of the dig (House XLII). The walls were 45 cm wide and the excavated part of the room was filled up with thick red and black ashy deposits.

###### Occupation Level 4 (fig. 9c)

A large portion of a four-roomed structure (House XXXVII) was exposed in this level. The mud-brick walls, approximately 30 cm wide, were preserved to a maximum height of 1,15 m. The clearing of the north-eastern room yielded remains of steatite bead manufacturing. They included 20 steatite fragments, 22 non-perforated polygonal blanks of various sizes and 1 small finished perforated disk bead (fig. 271). These specimens have not been found on the floor of the room. Obviously abandoned during the stages of manufacture, they had been thrown away along with trash and fragments of fallen bricks that filled up the room after its abandonment. A stone axe was also uncovered in the south-western room of the house (fig. 274 right).

##### *1.4.2. Upper occupation level of Period I*

###### Occupation Level 6 (fig. 11c)

A multi-roomed structure (House XXXVI) has partly been exposed during the 1997-1998 field-season. More recent grave-pits had damaged part of the original fill of the rooms as well as large upper portions of the walls. The clearing of the structure was completed this year. Within the limits of the trench, the excavation of one rectangular room (2,10 x 1,67 m) and of the corners of a second and a third room allowed to reach the well-preserved bases of their walls. The floor level consisted of a thin stratum of clean clay with numerous traces of red ochre on which were found an unbaked clay figurine (fig. 75 B and fig. 265) and two stone axes (fig. 274 left and centre). From the same level, another clay figurine was uncovered just below the house (fig. 75 A and fig. 266).

Future excavation will be conducted in this eastern part of MR.03 South in 1999-2000 and attempt will be made to reach the natural soil beneath this area of the Neolithic settlement.

## **2. AREA MR.03 NORTH**

### **2.1. Previous work in this area**

Excavation was resumed in the area excavated during field seasons 1996-1997 and 1997-1998. This area is limited by gullies towards south and northwest and by the edge of the cliff cut by the Bolan River in the northeast (area C, D and P of the grid-plan). Such a work had already allowed increasing the architectural plan of a cluster of mud-brick structures, which had been unearthed in this area in the course of the 1980-81 season (see reports 1996-97 and 1997-98).

## 2.2. Resumption of the 1997-1998 excavation

The aim of the excavations conducted in the course of this 1998-1999-field season, in this same area, was to extend the work concerning the successive upper stages of the period I settlement, especially Level 7 whose structures are in some cases preserved up to a height of 2 m, and are covered up by the later occupations of occupation levels 8 and 9.

Excavation has been concentrated on fourteen of the twenty-three buildings altogether excavated in these last three years and in their adjacent areas, in area MR.03 C/D/N/P, squares:

- MR.03 C 1-I, 1-J
- MR.03 D 1-A, 1-B, 1-C, 1-D, 1-E, 2-B, 2-C, 2-D, 2-E, 3-D, 3-E
- MR.03 N 8-J, 9-I, 9-J, 10-I, 10-J
- MR.03 P 7-A, 7-B, 8-A, 8-B, 9-A, 10-A, 10-B

Thus covering an area of roughly 625 sq. m., occupied by buildings - most of them rectangular four-roomed houses - and open spaces, as well as burials dug in the eroded debris between the occupation phases.

Excavation was resumed in houses from occupation level 7 (n° VII), from occupation Level 8 (n°I, XI, XV, XVI, XVIII, XIX,) from occupation Level 9 (n°XII, XIV) .

Other structures exposed are related to occupation Level 5 (houses n° XXII and XXIV), to occupation level 8 (houses n° XX, XXI) and to occupation Level 9 (n° XXIII)

This work was intended to provide more extensive architectural plans of the settlement showing the successive building phases of the Period I.

## 2.3. Eastern part of MR.03 North

*The excavated houses (fig. 230, 231):*

### House VII (occupation Level 7) (fig. 12b)

Excavation of this north-south oriented house, undertaken in 1996-1997 (see previous reports), starting at an altitude of 12,65 m, had been carried down from an altitude of about 11.80 m, an ashy floor on which the excavation was stopped in 1998, to an altitude of 10,90 m. At this altitude of 10,90 m a ashy layer was found spreading below the base of walls of House VII and covering the top of the walls of an earlier house, showing a slightly different orientation. Two rooms forming the western part of this earlier house are partly visible just below the walls of house VII. Just above the altitude of 11 m that corresponds to the first occupational floor of house VII, a more or less circular fireplace has been exposed against the southern wall of locus 53. The occupational deposits are about 0,35 m thick made of loose earth mixed with charcoal, ashes, bones, flints and many stones including burnt pebbles, hammer stones, fragmentary grinding stones and, in locus 33, a bone awl and two tools made from antlers.

### House IX (occupation Level 8) (fig. 13b)

Only the southern part of this house (Locus 66 and 67), with a north-south orientation, is visible. All its northern part was washed away by a gully (see previous reports).

### House XV (occupation Level 8) (fig. 13b)

This house, which is among the best preserved structures of this area, had been exposed in the course of the 1997 and 1998 seasons. The aim of the work was to reach in all the rooms the bottom of the walls that had been found at an altitude of about 10,30 m in locus 74. In Locus 71, where the excavation had not be completed down to the base of the wall, the presence of a small door blocked by bricks, allowing a communication between Locus 71 and Locus 62 (outside the house), has been evidenced. In the level corresponding to the base of this small door (between 10.48 and 10.30 m) were

found several artefacts including a perforated stone ball (fig. 80 A) and many flints and bone tools. In locus 73, a black steatite grooved stone polisher (fig. 77 J and fig. 273) was found along with bone awls. But these finds are to be related to a layer earlier than the foundation of the house. In Locus 74 where the excavation was stopped at an altitude of 10.00 m a double burial (T.282) has been exposed along and below the northern wall of House XV. This wall had been partly cut by the burial pit. This grave is therefore later than House XV and its occupation belongs to Graveyard 6. Below house XV, the walls of an earlier house are visible with an almost identical orientation. The top of the walls of the earlier house begins to be visible at an altitude of about 10,30 m.

#### House XIX (occupation Level 8) (fig. 13b)

This house has only been cleaned and no further excavation work has been conducted. (See report 1998).

#### House XXII (occupation Level 5) (fig. 10b)

This house has only been partially exposed. But it is obvious that it had a four-room plan. The top of its preserved walls is at an altitude of 11.80 m and the bases of the walls are found at an altitude of about 9.90 m. As a whole, the architectural remains are rather badly eroded and several later graves (T.266, T.269 and T.239) have also cut the walls. Occupational remains are mostly found between 10.35 m and 10.25 m in a reddish layer full of burnt stones, some bitumen fragments and several bone tools, a heap of accumulated pebbles has been exposed against the eastern wall of Locus 142.

#### House XXIV (occupation Level 5) (fig. 10b)

Only the south-west angle of this house has been exposed. The top of the preserved walls is between an altitude of 10,65 m and 10.75 m and the preserved height is 0.80 m. One grave from Graveyard 8 (T.265) has cut its walls and made it difficult to excavate the only room exposed.

#### Locus 146

The open spaces between Houses XXII and XXIV and XV and XIX were filled with fallen bricks and have been disturbed by several graves from Graveyards 7, 8 and 9 ( T.267, T.268, T.239, T.246 and T.262). The excavation was conducted from an altitude of 10.90 m (where the excavation was stopped in 1998) down to 10.30 m. This work has allowed us to expose the external western wall of house XV. The fill of fallen bricks was rather poor in finds, except for two bone points, one bone spatula and a broken small stone vase (fig. 80 B)

#### Locus 117

Below House III (altitude about 12 m.) two ashy layers representing a total thickness of about 0,60 m are covering the walls of House XXI. A polished stone axe and a polished pebble were found just below the foundation walls of House I (fig. 78 B, D and fig. 275).

#### House XXI (occupation Level 8) (fig. 13b)

Below House I (Level 9) and the open space Locus 117 and above House XXII (occupation Level 5), House XXI has so far an exceptional plan of only 2 rooms with a slightly trapezoidal shape (2,95 m -2,75 m x 4,40 m-4,15 m.). The maximum preserved height of its walls is only 0,45 m (between altitudes 11,65 m and 11,38 m). The width of its wall is limited to a single row of bricks. An occupation floor has been noticed at the altitude of 11,10 m. Several bone tools, one grinding stone apparently *in situ* and one stone polisher were found as well as many bones.

#### Locus 116

The space, which between House XV and House XIX formed a small street, has been excavated down to an altitude of 11.55 m where excavation was stopped in 1997. At an altitude of about 11.40 m

appears the top of a small wall following the orientation of the western wall of house XIX, and closing the space between House XIX and House XV. In a symmetrical way, a small wall with the same orientation of the eastern wall of House XIX creates a partition but with an apparent small passageway allowing a communication between Locus 116 and Locus 131. The top of this small wall has been preserved to a height corresponding to altitude 11.40 m and its base is at an altitude of 11.10 m. The space inside Locus 116 is filled with an accumulation of burnt pebbles and of many animal bones.



**IV: Jean-François Jarrige and Jérôme-F. Haquet during the excavation of the eastern part of MR.03 North**

#### **2.4. Western part of MR.03 North**

##### **House XVI (occupation Level 8) (fig. 13b)**

Excavated down to a floor at an altitude of 11.05 m, which represents the base of collapsed bricks filling the whole structure, this house measures 6,40 x 5,50 m, with rooms roughly 2,75 x 2,30 m. Its walls are preserved to a maximum height of 1,64 m.

This building was first cleared in 1997, but the sloping of the layers due to erosion on its western side prevented to underline a large part of its plan. Later sediments, possibly belonging to period IIA, were covering the eroded parts of this building

Deposits, between altitudes of 11.05, 11.55, 11.70 and 12.00 m., may correspond to phases of occupation and successive fillings. The most noteworthy deposit is, in Locus 92, an accumulation of butchered animal bones, many of them of the same kind (legs).

Other finds include bone tools, mostly awls. Fragments of a clay bull figurine come from Locus 126 (fig. 270), as well as a chisel covered with red ochre (fig. 77 C) and roughly shaped small blocs of calcite.

*Locus 90, 78 and 94*, east of House XVI, show a succession of prepared clay and ashy and burnt layers, common in the open communication spaces outside the buildings. From Locus 90 come a stone chisel (fig. 77 D) and a bead in bone.

*Locus 91*, south of House XVI, displays the same succession of layers as in Locus 90. It was later covered by collapsed bricks, probably coming from the destruction of House XVI and from later Period IIA remains covering also the western part of Locus 126. This area of the settlement underwent a very strong erosion process after its abandonment and displays a very steep slope towards west. A few objects coming from occupation Level 7 layers include a fragment of a figurine and a bone tablet (fig. 77 I), as well as bone and stone tools.

Successions of prepared floors are also encountered in the open communication spaces *Locus 100, 102 and 84*, which were levelled with fallen bricks in order to be used as a platform at the time of the building of House XIV (see report 1998). A small polygonal bead in calcite comes from a compact fill in locus 102.

#### House XVIII (occupation Level 8) (fig. 13b)

This house, preserved to a maximum height of 1,34 m was excavated during 1997-1998 season (see report). It measures 5,30 x 4,00 m, with rooms 2,30 and 2,20 x 1,50 m.

Excavation was carried on in Locus 105 and 107 down to the base of the building at an altitude of 11,30 m, where a hard floor was encountered, with traces of red ochre in Locus 107. Under this floor, lined up bricks belong to an earlier structure. A second floor level at an altitude of c. 11,60 m in both rooms has yielded a fairly large quantity of stone, bone or antler tools, a fragment of a clay figurine with applied coils suggesting a belt and a creeping snake (fig. 268), elements of a sickle as well as animal remains.

#### House XX (occupation Level 8) (fig. 13b)

This building measures 6,5 x 4,5 m with compartments roughly 2,7 x 1,8 m. The walls show a strong gradient, possibly the result of a phenomenon that led to its destruction. The ruins, which underwent an erosion process following a southwest-northeast slope, were subsequently thoroughly filled up with a very hard clay and mudbrick mixture that was used as an irregular base for the later House XIV.

The fill contains almost nothing except for a figurine along the eastern wall of Locus 123 (fig. 269) and a stone chisel with a pointed end (fig. 77 A and fig. 277). Neither the base nor a floor level of the house, have so far been reached.

#### House XI (occupation Level 8) (fig. 13b)

The dimensions of this house, roughly 5 x 4 m, are in fact rather irregular. This may be due to the fact that, as in House XX, the walls show a strong gradient. The building floor is at an altitude of 11,72 m, with an occupational layer just above in Locus 80 at 11,76 m and in Locus 81 at 11,93 m. A second important deposit layer 15-20 cm thick starts around 12,15 m, with a large quantity of faunal remains and bone tools, including some made out of wild animals like gazelle in locus 75, as well as a fragment of a clay figurine. The sloping ashy layers in locus 77 have also yielded several human figurines, including one, unfortunately headless but wearing applied necklace and belt (fig. 267), as well as animal remains. A last layer of occupation c. 12,45-12,50 m corresponds to the erosion of the ruins and has yielded fragments of figurines. Another large fragment with an applied belt was found outside, in Locus 78, against the eastern wall of house XI (alt. 12,44 m).

Gullies have eroded its northern area, washing away part of Locus 80, where a large fragment of an ochred stone vessel was found close to grave T.272 (fig. 79 B) and have opened a gap in the southern wall of Locus 81.

Close to the eastern wall of House XI at an altitude of 12,37m when this house was no longer in use an oval circular fire pit (30 x 25 cm for a depth of 12 cm), filled with ashes has been uncovered (fig. 234).

*Locus 139*, east of Houses XI and XII, has been mostly excavated along House XI where it shows a succession of prepared compact floors and ashy layers corresponding to the early occupation levels of House XI, which were later covered by thrash deposits.

House XIV (occupation Level 9) (fig. 14b)

This house was excavated in 1998. Measuring 6,50 x 4,50 m, it was preserved to a maximum height of 0,70 m in its southern part and washed away by gullies in its northern part. Doors with thresholds connect Room 85 to Room 87 and room 86 to Room 88 (see report 1998).

The work carried out during this field-season has shown that this house was built above House XX - except on its southern side where it was leaning against the southern wall of House XX, still emerging - but with a different alignment, contrary to many buildings usually built on earlier existing walls. The eroded ruins of House XX (see above) had been filled up and then partially concealed by an ashy layer which was used as a base for the new building, though following a south-west/north-east slope created by erosion, at altitudes ranging from 12,40 m to 12,15 m, with occupation floors at 12,52 and 12,64 m. This building was reinforced at an average altitude of 12,37 m. by coatings of bricks east of the external eastern and western walls. The reason for this is not clear, as it was not meant to anchor the building on former existing walls. It may, however, be due to the fact that the building level was following a south-west to north-east slope, thus creating a tendency for the building to be unstable and so necessitating some sort of buttresses.

Buttresses on either side also reinforced the openings between Locus 85 and 87. The successive floors have yielded a fair quantity of lithic material including mortars, pestles and stone axes. Fragments of clay figurines and objects were found in the fill in Locus 85. The floor of Locus 86 has yielded fine bone tools (from sheep) and a polished stone axe (fig. 275 left).

House XII (occupation Level 9) (fig. 14b)

This building, measuring 3,5 x 2,75 m, is very eroded and has been washed away in its north-western part by a ravine. It has yielded only two rooms, Locus 136 and 137, measuring 2,25 x 1,40 m. Built at an altitude of 12,38 m., with a floor level at 12,43 m., It was only preserved over 0,42 m.

Structure XXIII (fig. 14b)

This very eroded structure has a base at 12,35 m, with floors at 12,45 m and a maximum preserved height of 0,15 m. The whole structure cannot be measured, but a surface clearing has yielded traces of walls suggesting a compartmented building with at least six compartments 0,50 m wide. This compartmented building appears to be one of the prototypes of the numerous compartmented buildings of Period IIA, which have been interpreted as collective storehouses or granaries.

*Locus 138*, between structures XII and XXIII, has yielded, on the same occupation level, a series of flint debitage pieces coming from the same core along with elements of a sickle and a few bone tools.

*Locus 109*, this large area between the eastern and central parts of the settlement has not been used for building purpose at least during the occupational Levels 8 and 9. It extends on the western part of Locus 49 and 69/110 where erosion probably created a depression in this area devoid of any structural remains which was later on extensively used as a graveyard (see reports 1995-1996, 1996-1997 and 1997-1998).

A succession of thick, burnt and ashy layers are separated by clean spreads of clay and white deposits. They contain a very large quantity of animal remains. A succession of burials, of which their burial chamber walls were visible, has been partially excavated.

A few objects come from these deposits, including a fragment of a human figurine and one back portion of a clay animal that was found slightly fired inside burnt layers, as well as bone awls, a fragment of an eyed needle, a stone axe, an unfinished calcite bead and a shell bead.

### 3. BURIALS AND GRAVE GOODS

#### 3.1. The burials in Area MR.03 South

##### *Burials dug in Level 1*

As regard the burials, in the limits of the dig, three graves (T.277-6,17 m, T.276-5,95 m and T.275-5,98 m) had been dug through the successive layers and, in one case, through a wall of this Level 1. They belong to Graveyard 2 and have been dug by the inhabitants of the settlement when the ruined structure XL was completely buried in debris as well as the excavated structure from the following Level 2. The strong erosion of these two initial levels after the momentary abandonment of this part of the site as an occupation area may explain the deeper location of these graves, dug before the building of the Level 3 structures. A single grave belongs to Graveyard 1 (T.280) (fig. 312) and is so far the deepest ever found (5.42 m) below the modern surface).

The pit, dug through occupation Level 1 and partly in the natural sediment, contained the disturbed skeleton of a female. Three small bone tools, one of them decorated with incised lines, were associated with this skeleton (fig. 313). As for the above-mentioned burials, ornaments were also sometimes uncovered with the individuals. If the tall male found in grave T.277 (Graveyard 2) was adorned with a necklace and anklets made of shell beads (fig. 122), the grave T.275 (Graveyard 4) of a younger male was void of ornament. Nevertheless this burial is also interesting because, through its location in the excavation, the part of its pit visible in the section indicates the existence of a funerary chamber. Beads in cut *Dentalium* shells were found around the neck of the young female buried in grave T.276 (Graveyard 2) and, near the bones of her hand, lined up vertebrae from the tail of a bovine were disposed. Such tail may have been originally used as a flyswatter. In addition, four young goats were associated with this individual at the time of the inhumation (fig. 121 and fig. 303).

##### *Burials dug in Level 2*

At this level, two burials, partly in the section of the trench, were found in the eastern corner of the excavation (T.260-7,20 m and T.259-7,10 m). They belong also to Graveyard 3 and their pits had been dug when the upper ashy layers of the following occupation Level 3 had been spread over the surface of this part of the settlement. The ruined buildings from occupation Level 3 were then already buried in debris and the structures from the subsequent occupation level were not yet built. About half the skeletons contained in the graves were inside the section of this area of the excavation and no ornament was uncovered. Nevertheless, in one of the graves (T.259) (fig. 302) a baby goat was placed along the legs as an offering like in the already described grave T.276 (fig. 303).

Similar burials with offerings of young goats had already been excavated in the northern part of the trench in 1982 (see Field Report 1981-1982 in C. Jarrige et al. 1995, fig. 8.6 and 8.7). Since these graves were not close enough to the sections, only the edge of the pits, containing the animals arranged in semi-circle, could be recorded.

During this field-season, the section of the trench, which partly cut grave T.259, brought very significant information regarding the structure of such graves. The existence of a burial chamber was for the first time attested in this early context. The section clearly shows the existence of burial chamber left empty for the corpse and the offerings, dug on one side and at the bottom of the grave-pit; a small wall made of seven courses of mud bricks had been built to close the chamber before the pit was filled up (fig. 115). A thin layer of red ochre was found, just below the skeleton, on the floor of the burial chamber.

### ***Burials dug in Level 3***

In the limits of the trench, three burials from Graveyard 4 were also found (T.247-7,46 m, T.248-7,50 m and T.249-7,47 m). They had been dug when House XXXIX was already buried under debris and the area used as a graveyard. Contrary to the graves of two very young individuals (T.248 and T.249) buried almost at the same location, the grave of another very young infant (T.247) contained ornaments, particularly a necklace made of 53 beads of cut shells (fig. 167 A).

Two additional graves were also uncovered in Graveyard 5, (T.256 -7,34) m and T.250-7,42 m). Their deeper pits, visible in the section, show that they had been dug when the subsequent architectural level was abandoned and completely buried under accumulated trash. Most of the burial T.256 was inside the section and only the skull of an adult was visible in the trench and was adorned with numerous small *Dentalium* beads, probably elements of a headband. Among the grave deposits of the second grave (T.250) was one kid goat similar to those found in some of the earlier graves that we have already mentioned (fig. 298).

So far, this type of burial was supposed to be a characteristic feature of this earliest period. The female buried in grave T.250 was also richly adorned with a necklace of small *Dentalium* beads and a belt made of a set of cylinder beads embellished with six flattened polyhedral shell beads (*Conus* sp.) (fig. 168 and fig. 299).

Except for burial T.281 (7,96 m) that belongs to Graveyard 4 and burial T.261 (8,95m) that belongs to Graveyard 6, the other burials (T.251-8,65 m, T.252-8,60 m, T.273-8,50 m, T.74-8,28 m, T.278-8,29 m, T.279-8,15 m) belong to Graveyard 5. Their pits had been dug through occupation level 4 and a part of occupation level 3. Several burials previously excavated in 1984 in the nearby southern half of the deep trench MR.3S (area MR.03 South) are also to be included in Graveyard 5. They included the grave of an adult associated, in contrast to the others, to exceptional grave deposits including a *Dentalium* headband closed by at least two perforated sea shells (T.84.12) comparable to the very well preserved ornaments found this year on the heads of two females (T.274 and T.281) (fig. 120 and fig. 308, 309).

In burial T.274, the headband, 2,30 cm wide, was made up of woven rows of small *Dentalium* segments and was closed by two straps used as a clasp. Each of them was ornamented with four perforated natural shells (*Engina Mendicaria* sp.) (fig. 309). Around the neck a thin necklace was made of shell beads and at the waist, a belt-like ornament was made of cylindrical shell beads and of one flattened polyhedral shell bead. Hanging on the belt, an interlacing of numerous threaded *Dentalium* beads was found in front of the pelvis of the individual (fig. 120). In Burial T.281 (fig. 314), the headband, about 2,50 cm wide, is even more spectacular (fig. 315). The numerous *Dentalium* segments have been woven in a netting way and the straps, ornamented with perforated natural shells, were also made up of cut *Dentalium* shells. A broken necklace of shell beads was still around the neck.

A belt-like ornament was also uncovered around the waist of a male (T.279) (fig. 310). It consisted of 23 long cylindrical shell beads and of a lozenge-shaped mother-of-pearl pendant (fig. 175 B and fig. 311). A rather large rounded lapis lazuli bead found near the chin of the dead was another exceptional discovery in this grave (fig. 175 A).

### ***Burials dug in Level 4***

A thick mass of fallen bricks, coming from the upper part of the house XXXVII, was also scattered outside the ruined structure in the southern part of the excavation. The burial of an infant (T.244) belonging to Graveyard 6 had been dug through this hard layer.

The digging of the pit of another burial belonging to Graveyard 7 and containing a male, had partly destroyed the upper portion of a partition wall of House XXXVII (T.243).

### 3.2. The burials recovered in the vicinity of houses from the eastern part of Area MR.03 North

#### ***Graveyard 6***

##### Burial T.282

Double burial of an old female keeping in her arms an infant who has been dug along the northern wall of locus 75 in house XV, partly cutting through it (fig.316). The bottom of the grave is at an altitude of 10.00 m and therefore below the level of the foundations of the walls of house XV. A polyhedral shell (*Conus sp.*) cut into a cross-shaped ornament whose four branches are decorated with an incised circular motif was probably the central element of a belt in perishable material around the waist of the adult female (fig. 176 and fig. 317). Traces of red ochre. E.W orientation. Altitude: 10.00 m.

#### ***Graveyard 7***

##### Burial T.267

Only a few fragments of bones from a new-born infant. Altitude: 10.50 m.

##### Burial T.270

A few remains of a badly preserved skeleton of an infant. Altitude 10.40m.

#### ***Graveyard 8***

##### Burial T.253

Infant burial. Skeleton coloured with red ochre and bearing a necklace with about 50 cut *Dentalium* shell beads, 3 cylinder disc shell beads and one long cylinder shell bead. Orientation E.W. Altitude 11,50 m.

##### Burial T.254

This grave, like T.253, has cut the northern wall of house XV. An adult with a necklace of disc-shaped shell beads and one shell (*Conus sp.*) bead (fig. 169). Orientation E.W. Altitude 11.30 m.

##### Burial T.255

Poorly preserved and fragmentary skeleton of an infant with red ochre in grave dug along the northern wall of House XXII. Orientation E.W. Altitude 11.25 m.

##### Burial T.262

Grave of a female with traces of red ochre. A belt of 128 cut *Dentalium* beads and two flint cores close to the skull (fig. 171 and fig. 304, 305). Orientation E.W. Altitude 10.80 m.

##### Burial T.265

This grave and its wall closing the funerary chamber have cut the walls of locus 146 in the southern part of House XXI. An adult with close to his shoulder a spindle (24.70 cm long) in bone (fig. 117 and fig. 306, 307). At his feet, a basket coated with bitumen. Orientation E.W. Altitude 10.70m.

##### Burial T.266

Grave of a child whose bottom has cut the top of the western wall of house XXII. Strong traces of red ochre. E.W. orientation. Altitude: 10.80 m.

Burial T.268

Grave of a sub-adult, with his head against the western wall of house XXII. Strong traces of red ochre. An armlet made of 17 disc-shaped shell beads and 3 long cylinder shell beads. Two perforated pendants in mother of pearl, a small one and a bigger one, were found just against the skull and a necklace was made of 37 cut *Dentalium* shell beads (fig. 118, 172). E.W. orientation. Altitude: 10.85 m.

Burial T.269

Cutting the top of the preserved wall between locus 142 and 145 in house XXII, a female with strong traces of red ochre. A belt of 227 disc-shaped shell beads and one necklace made of 27 cut *Dentalium* shell beads and one bead (*Cardium/Anadara*), plus an isolated shell (fig. 119, 173). E.W. orientation. Altitude: 10.60 m.

**Graveyard 9**Burial T.246

Badly preserved skeleton of an infant. Altitude 11.80 m.

Burial T.239

Grave of an adult richly adorned with a necklace (82 beads), two armlets, a belt (154 beads) and two anklets, all made of beads of various sizes and different shapes from *Cardium/Anadara* shells. A butterfly-shaped bone object with ten holes was probably the central part of the belt.

Two lumps of red ochre were also associated to this grave (fig. 109, 165 and fig. 294, 295). S.N. orientation. Altitude: 12.05 m.

Burial T.240

Badly preserved adult in a burial chamber closed by a brick wall and wearing a necklace made of shell beads (*Cardium/Anadara*) (fig. 110). E.W. orientation. Altitude: 11.70 m.

Burial T.241

An infant in a burial chamber closed by a brick wall. A root has disturbed the grave containing two anklets, two armlets, one belt and two necklaces (fig. 111, 166 and fig. 296, 297). Except for one necklace made of cylinder disc-shaped shell (*Spondylus exilis*) beads, all the other beads are made from *Cardium/Anadara* shells. E.W. orientation. Altitude: 11.55 m.

Burial T.258

An adult female in a burial chamber closed by a mud-brick wall (fig. 113, 170 and fig. 300, 301). The grave has been disturbed by a gully. The skeleton is coloured with red ochre and was wearing a necklace made of cut *Dentalium* beads and with one bead in turquoise.

The belt has been cut by the gully, only one *Conus* bead and two disc-shaped beads and two others with cylinder shapes also in shell have been recorded.

This female was holding in her hands a red ochre coloured clay human figurine of the foot-shaped type of a rather large size (17 x 11.1 x 5.5 cm).

The surface of this figurine shows several small holes corresponding to perforations throughout its body. E.W. orientation. Altitude: 11.75m.

### **3.3. The burials recovered in the area where is located the earlier occupation level 8 (house XI) (Area MR.03 North)**

#### ***Graveyard 9***

##### Burial T.221

Remains of this burial dug in Locus 75 and excavated during 1997-98 season were taken out for anthropological study (alt. 12,45 m).

##### Burial T.271

This child burial, dug in Locus 77 at an altitude of 12,35 m, was incomplete, probably disturbed by animals. Remains of a goat-kid offering were found along the chamber wall, at the feet of the child.

##### Burial T.272

Little was left of this burial cleared at erosion level of locus 80 at an altitude of 12,44 m, where no trace of chamber or wall is visible.

### **3.4. The burials from Locus 109 (Area MR.03 North)**

#### ***Graveyard 9***

##### Burial T.229

This burial was excavated during 97/98 season, except for the feet and lower portion of the legs that remained unexcavated. West of the feet, a stone vessel had been deposited, 0,30 m north of the chamber wall (alt. 12,37 m) (fig. 108 right and fig. 164)

##### Burial T.238

The very eroded remains of a burial were cleared on the surface at an altitude of 12,63 m.

##### Burial T.242

This burial was cleared close to the surface at an altitude of 12,40 m. Two shell beads were associated with it.

##### Burial T.245

The wall of the funerary chamber of this burial had been cut by the later burial 229, but without damaging the skeleton. It contains a woman and a child (see anthropological report), at an altitude of 12,21 m (fig. 108 left). The grave goods consisted only of 9 shell beads.

### **3.5. Anthropological report (by A. Cucina)**

#### ***3.5.1. General report***

During the six weeks of the anthropological field season, human skeletal remains from 44 burials were excavated. Their state of preservation was generally very bad, the remains were extremely fragmented and the very hard cement-like soil prevented from recovering the bones thoroughly, despite the use of hardening solutions (*Paraloid* and *Primal*) dropped over them. In particular, the skulls were all smashed down, losing their original shapes and ratios. As a whole, only seven cases can be considered at least fairly well preserved.

A thing common to all the burial is the fact that the bones were in direct contact with each other. This induces to think that the bodies were decomposing in an empty space, where the bones had

enough space to fall down due to gravity. This may also be explained by the weight of the layers of soil on the burials over the millennia. Such huge pressure pushed down the bones, which were in fact almost all smashed, and by doing so it also put the skeletal segments in direct contact to each other. In case of decomposition in a full space, it must be said that the soil gradually substitutes the organic materials decomposing (muscular, skin, connective tissues) and this allows the soil to permeate among the bones creating a layer in between; such layer would be compressed like the bones but would always be there. So, the absence of such soil layers confirms the hypothesis of bodies decomposing in an empty space.

The burial pattern is usually single; this occurred in 36 cases, to which are to be added four cases of infant graves who provided the remains of only one individual, but whose grave patterns could not be determined due to the fact that their already fragile remains were reduced to powder in a surface saltish sediment.

Four cases, instead, can be considered double burials since the remains of two individuals were recovered from them, but only in one case it was possible to assess that the deposition occurred simultaneously. The first one is burial T.238. It can be hardly reconstructed since the few brittle bone fragments had been collected all together. An unsure case of double burial is T.254: in this context, some skull fragments of a new born have been collected at the feet of the adult individual. But since the remains of the new-born are very few and not in anatomical position, it can just be hypothesized the burial was double.

Two distinct individuals have been recovered in burial T.245. In this grave, a juvenile sub-adult was set on its left side, and at its feet there was the disturbed skeleton of a young infant. The taphonomic events which occurred in this grave indicate that individual 245A (the juvenile) was laid after 245B (the infant) whose bones were in fact disturbed and often no longer in connection. They were surely not laid down at the very same moment, because the event altering completely Ind. B would have affected somehow also Ind. A, at least in part. But this did not occur. Moreover, there is also the possibility that, despite the same grave number assigned to the two skeletons, Ind. A and Ind. B actually are from two different, distinct graves. In such case, burial 245 should not be a double either.

No doubt at all on the double nature of burial T.282, in which an old woman is clasping a young infant in her arms, with absolutely no evidence of any taphonomic event occurring to alter the deposition. The funerary event, interesting burial T.282, was single in the sense that the two individuals were laid down simultaneously. The particular position of the two skeletons and their respective entangling can be explained only with the simultaneity of the events, with no gap of time in between.

The presence of four double burial rises the total amount of individuals to 48, of which 24 are adults (at least 18 years old) and 24 are sub-adults (younger than 18). Among the adults, 14 can be considered females and 10 are males. The by-age distribution of the sub-adults highlights a very high rate of mortality during the early years of life (as expected in prehistoric populations). Among them, in fact, thirteen died at an age younger than six, being quite most of them aged two at oldest.

All but two of the graves excavated are primary depositions; only burial T.238 (as above) and burial T.263 were definitely secondary; in particular burial T.263, which gave back only the neurocranium of an infant, and no evidence at all of the other bones. As regards secondary burials, it is worth mentioning the recovery of a single very well preserved human mandible, not associated to any burial, under the floor of room 53, house 7. It is the complete mandible of a 5-7 years old individual, which has not been previously considered among the secondary burials for no burial number, was originally given to it. The total lack of any association to burials or other elements, a part from a couple of small animal-bone fragments induced to think of it more as part of soil filling a pit or similar.

The repetitiveness of funerary events allows to assess the presence of a rituality. This is the way bodies were usually laid down. The first one is the orientation of the skeletons, which were almost always East-West oriented, and the head was at East. The burials were North-South oriented in three cases only, as well as North/North West-South/South East (NNW-SSE), which occurred in two cases. Also the orientation of the skeleton is always the same. Apart from the differently oriented graves, the bodies were always set with the head at East, with the only exception of burial T.281. This body is in fact upside down, oriented towards West. Usually the heads of all the skeletons were turned left, themselves lying on left decubitus or on their back. This is indicative of the willingness to have them look left, and since the greatest majority was East-West oriented, to look south. And this hypothesized will to have them look towards the south is respected also in burial T.281. Notwithstanding its upside down orientation, the head is turned right. This is the opposite of all the other cases, but makes the individual look south too. Thus, this situation gives one more hint to consider the possibility of a will to have them facing south or about.

One of the major problems during the field analyses was the estimation of age at death. The very poorly preserved and fragmented conditions of the bones erased the possibility to take into account several indicators of age at death, like the cranial sutures (skulls are always smashed), the pubic symphysis, very often not present at all, the proximal epiphyses of both humerus and femur, and the sternal end of the ribs. All these skeletal segments were rarely preserved so to provide information about age. Instead, teeth, when present, were always sufficiently preserved to be studied for demographic analyses. The degree of dental wear allows to trace back to age at death using the standards by Lovejoy (1985). Since it was developed on an extensive population, it requires to be corrected according to the characteristics of each population. In this case it was very evident that dental wear was much stronger according to the same age at death of Lovejoy's tables. It was then necessary to calibrate it according to the degree of occlusal wear in the children. The age at death in the sub-adults can be easily estimated through the analysis of dental formation and eruption. Knowing the age in the sub-adult and comparing it to the one evidenced from dental wear, it was possible to calculate an approximate correction factor. For example, the degree of wear was particularly evident in the first permanent molar. Children younger than 15 years of age always showed the wear of the first permanent molar like a 25 and sometimes 30 years old individual from the standard table.

As regards stature, it has been calculated for every individual that provided at least one measure of long bones. Of course it must be considered only an approximated value since it comes from measures taken *in situ* always before the bone was removed. Stature has been calculated according to the methods set forth by Olivier et al. (1978) and by Trotter and Gleser (1952). As from the enclosed table, mean stature for the male individuals ranges between 171 and 173 cm with higher values as high as 181 cm. Females, instead, on an average, range between 159 and 162 with values as high as 170 cm.

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### 3.5.2. The burials in Area MR.03 North

#### **Graveyard 6**

##### Burial T.282 (fig. 316)

Burial T.282 is the first, real double burial. The grave was dug in the ruined house XV. It consists of an adult individual (sex determination indicates it is a female -F) hugging a young sub-adult. The woman looks to be very old from dental wear (>50 years old), while the sub-adult can be estimated to have died at an age of 1.5-2.5 years (from the degree of dental eruption and formation). The two individuals have been buried together, since the position of the bones shows that the adult woman, lying on her left side, keeps the child in her left arm. The arm passes below the neck of the child, to lap backward with the forearm above it. Such position can be obtained only if the two bodies are buried together. The infant, instead, is set on its right side and the two body are facing each other. Because of the old age of the woman and the very young one of the child, it is likely to think that she was not the mother, being too old to be pregnant. The bones, analyzed and photographed, have not been removed.

#### **Graveyard 7**

##### Burial T.267

Only a few fragments of bones were recovered from this burial. They indicate that the individual is a new-born, rather perinatal infant.

##### Burial T.270

Few information has been obtained from this grave. Bones belong to a very young individual. Two fragments of deciduous teeth show a perinatal, new-born age, also confirmed by the length of the humerus, which is consistent with such estimated age at death.

#### **Graveyard 8**

##### Burial T.253

Very little is left of this young individual. The state of preservation is in fact extremely bad. What is still visible is almost the silhouette. Part of the legs, hands, vertebrae and ribs has disappeared. From the approximated length of the tibia it can be assessed that age at death can be between 4 and 6 months.

##### Burial T.254

The skeleton unearthed from burial T.254 is very poorly preserved. E-W oriented, head at E, it was set on its dorsal side. Legs are flexed at left. Arms are no longer visible, but from the few fragments left, it can be deduced that the left one was originally along the body, while the right one was flexed and crossed the trunk towards the left one. Despite the bad state of preservation, sex can be determined to be a female (F??) aged 40-50 years old. Below the feet there are very few fragments of an infant (only the skull of a probable new-born). Because of the very poor conditions of both skeletons, it is not possible to assess anything about this single or double burial.

##### Burial T.255

The skeleton was partly removed when a big clay lump was pulled up. *In situ* there were only legs, the left arm and the skull. All the rest was included in the clay. It is likely that the water flooding inside the pit mixed up the primary deposition. The individual is an infant. Both ages from dental eruption and from long bones length show an age at death ranging between 1.5 and 2.5 years. Sex, because of the young age, cannot be determined.

Burial T.262 (fig. 304)

The individual in burial T.262 is lying on its left side, E-W oriented, head at E. Both arms are flexed, the left wrist is in direct contact with the chin and hand in front of the face. The other hand is slightly more off. Legs too are flexed, even though the right one is missing. The general state of preservation is not good, bones are fragmented and smashed. The dimorphic traits indicate that this individual is a female (F) who died at an age between 35 and 45 years. No measures but the humerus can be taken since all epiphyses are missing. The humerus provides an estimated stature of 154-160 cm.

Burial T.265 (fig. 306, 307)

The skeleton buried in T.265 is in very bad conditions. All bones are smashed and fragmented. The skull is like a thin layer of bones. It was E-W oriented, head at E, set on its left side. Legs are flexed and feet were close to the pelvic bones, particularly the left one. The left arm was along the body, the right one was crossing the thoracic cage. A long bone tool was set in front of the face, while at the bottom of the body there was a basket that left a clear mark on the ground.

Sex determination indicates the individual was a male (M) with very strong muscular insertions. Approximate field measures provide an estimation of 178-181 cm of stature. Dental wear is extreme, with the root as occlusal surface. This means that the individual died at an age of more than 50 years. But, since attrition is very high in this community, such intense attrition makes it difficult to trace back to the actual age at death which can be estimated to be at least older than 40.

Burial T.266

This burial is very particular. It was dug by partly cutting a wall. Because of the different hardness between the soil and the wall, the pit went deeper than the wall. The body, set on its left side, is E-W oriented, head at E. The head is in the lower part of the chamber, the rest goes upward across the wall. The legs, forcefully flexed backward and therefore implying the presence of something keeping them in tight position are set behind the wall. The body is in a bad state of preservation, and in anatomical connection. This means that the body was voluntarily put upward, and the different level between the head and the trunk (up to 17 cm.) was not due to any sort of collapse of the body occurred after decomposition.

Age at death, calculated from the length of long bones and from teeth formation and eruption indicates that the individual died 10-13 years old. Sex, because of the young age, cannot be determined.

Burial T.268 (fig. 118)

The individual buried in T.268 was a sub-adult, since all the epiphyses were not fused. The age at death, estimated from dental crown formation and eruption, was between 10-14 years. The body, E-W oriented head at E, was on its left side with both arms and legs flexed. Bones, smashed and much fragmented, are poorly preserved.

Burial T.269 (fig. 119)

The pit of burial T.269, like T.266, was excavated partly on a pre-existing wall. This prevented the chamber from being horizontal. The body, E-W oriented head at E, was set in a slanting position, the left side up the wall, the right one down of it. Trunk and pelvic bones were in the lower part of the burial, which was some 25 cm below the upper part. The skull was along the edge. Decubitus was dorsal, with both legs flexed left and going up on to the wall. The left arm was along the body, above the wall, the right one across the thoracic cage merging with the left one on the wall. The overall state of preservation was bad.

Determination of sex indicates the individual was a female (F) who passed away at an age between 22 and 28 years. Stature, from the humerus only can be approximately 160-167 cm.

## ***Graveyard 9***

### **Burial T.221**

Burial T.221 is one of those partly excavated during 1998 campaign. The body is in a very bad state of preservation. Half of it, the left side, is completely missing, so is the skull. The body seems to be on its dorsal side. The right arm is along the trunk, while the left hand is visible inside the pelvis. This indicates that originally the left arm too was along the trunk, partly flexed, with the hand set above the iliac bone. The legs were flexed rightward. Almost all the legs are inside the wall of the house. The age of the individual is adult (all the epiphyses are fused), while sex is female (F?).

### **Burial T.229** (fig. 108)

It is the remaining part of burial 229, which was excavated during the 1998 season. The skeletal remains left are represented only by the feet and the distal third portions of both tibiae and fibulae. The decubitus was definitely left. The left foot is in front of the right one. They were still *in situ* in their anatomical position and were smashed by a big mud-brick, which fell on them. The presence of this very brick induced to think, during the previous campaign, that burial 229 was cut by burial 245, but in fact, it is the opposite. It was previously identified as a male, c. 40 years old.

### **Burial T.238**

It is a very superficial burial, which was not actually excavated; rather, bones came up just by sweeping off the ground. The few bones available are very fragmented. Most of them are fragments of a long bone, likely a tibia, together with a small portion of a mandible. Few morphological and structural patterns could mean the individual was an adult, and likely a female (F??). Also, together with the small bunch of bones, there is a whole iliac bone of an infant of about 0.5 years of age.

### **Burial T.239** (fig. 109)

It is a single undisturbed burial, with the body oriented N-S, head at S. The body was on its right side, with legs flexed forward. Both arms are, instead, along the body, not flexed. The right one is set upward with the palm of the hand facing up. The left one, on the contrary, is facing down. Bones are very fragmented and, though hardened, they are in a bad state of preservation. Despite that, they still represent the 100% of the skeleton.

Bones are not strong; rather they look gracile, long and thin.

The analysis of all the dimorphic traits clearly indicates that the individual is a female (F). Plus, no particular muscular insertions can be put in evidence.

Age at death has been assessed only through the analysis of occlusal dental wear, since all the other parameters were no longer available because of the bad state of preservation. Attrition is very heavy, but despite that, age at death has been determined to be between 30 and 38 years.

Few measures of long bones were scored *in situ*. Although very approximate, they are indicative of a stature of about 167-170 cm.

### **Burial T.240** (fig. 110)

This skeleton, set on its left side, E-W oriented head at E, is very badly preserved. Legs are flexed in a natural, untight position. The left arm is flexed upward with the hand above the mandible, while the right one crosses the thoracic cage, merging the left at the elbow. Age at death, calculated from dental wear, ranges between 20 and 28 years. Sex is Male (M?). The few measures took allow to estimate an approximate stature of about 166-174 cm.

### **Burial T.241** (fig. 111, 296)

The deposition of burial T.241 belongs to an infant lying on its left side. Both the arms are flexed upward, the left partly in front of the rib cage, the right one above it with the hand almost touching the mandible. Legs are flexed too, the left almost in a foetal position, the right more

horizontal. The body is E-W oriented, head at E. A big root (now fossilized) cut the body in two and completely destroyed the lumbar part of the spine, but ran under the left leg. Apart from the missing spine, the body is complete and the overall state of preservation is sufficient but fragmentary. Age at death can be estimated between 6 and 8 years. The sub-adult age prevents from determining sex.

#### Burial T.242

The human skeletal remains unearthed from this grave correspond only to the lower limbs. The deposition has been heavily disturbed. Legs indicate a left side deposition, NW-SE oriented. The head was originally towards SE. The state of preservation is very badly fragmented. The few bone fragments indicate anyway that legs were much flexed backward, and this could indicate the presence of something keeping them in such a flexed position.

A small portion of the mandible allows tracing back to age at death which, from the degree of formation and eruption of permanent teeth, can be assessed to be about 10-11 years.

Traces of red ochre were clearly visible both above and below the bones, in direct contact with them. Because of the young age at death, it is impossible to determine sex, since during sub-adult ages the dimorphic traits have not clearly developed yet.

#### Burial T.245 (fig. 108 left)

Burial T.245 is the first of the double graves found in this season. It was cut by grave 229, though none of the skeletons inside was affected anyway by the disturbance. The two individuals have been labelled as Individual A and Individual B. Individual B is set at the bottom of the other one. The idea is that the two burials were not actually the same, but rather that they grave of Ind. A might have disturbed the one of Ind. B. It does not seem to be a continuity in the pits, the angle formed between the two skeleton's body axes is not straight, but rather angled, and the last brick blocking the entrance of the funerary chamber of Individual A ends well before Ind. B.

Individual A is in perfect anatomical position, while Ind. B is disturbed and mixed. A reconstruction of the three possible chronological events in the two depositions is as follows:

- 1) Individuals A and B were buried together in a double burial - this seems to be difficult for two reasons: first because the pits do not seem to be the same one; and second because since Ind. B is disturbed while Ind. A is not disturbed at all, it is hard, though not impossible, to think that the event disturbing Ind. B did not anyhow affect Ind. A.
- 2) Individual A was buried before Ind. B - this is very hard to explain too, since, again, what affected Ind. B later in time left Ind. A completely undisturbed;
- 3) Individual B was buried before Ind. A - this is the most easily explainable condition, since either the digging of the chamber for Ind. A did disturb Ind. B, or it found a situation that had been previously already disturbed by other causes not related to the digging of the new pit (be them animals, flooding water, or others).

Individual A: it is laid on its left side in flexed position. The arms are flexed and crossed in front of the body with the hands right below the mandible. The legs are flexed too, very much tightened to the pelvis. Such a forced, unnatural position might indicate the presence of something keeping the legs that way.

The skeleton is in very bad and fragmentary conditions, though it is complete in all its sections.

Determination of age at death indicates that it is a sub-adult. Measures of the long bones (humerus about 261 mm, femur about 330 mm) can be referred to an age at death of about 12-14 years. The degree of dental formation and eruption shows an age at death ranging from 10 to 13 years. It can thus be determined that the individual died at an age spanning between 10 and 14 years. Because of the young age at death, it is impossible to determine sex, since during sub-adult ages, the dimorphic traits have not clearly developed yet.

Individual B: it was laid in origin before Individual A. It is clearly disturbed, but the bones are in fairly good state of preservation. The skull is set apart from the rest of the skeleton, or at least from where it originally was, as well as some of the ribs which are spread around. Most of the ribs are instead *in situ*, as well as the right arm. Below the ribs, both *legs* were still *in situ*, and in their anatomical connection. This indicates that the decubitus was left, and that the head of the individual was originally close to Individual A, but now was completely at the other side of the body compared to the other individual's position.

Individual B is clearly an infant, so the determination of sex is impossible. Age at death has instead been calculated both from tooth crown formation and eruption and from the long bones length. The degree of tooth formation indicated the individual died at about 1 year of age (0.5-1.5 years). Such age is very much consistent with the one from long bones length. So, it is possible to assess that Individual B of burial 245 died between 0.5 and 1.5 years of age.

#### Burial T.246

Little information can be gathered from this burial. Bones were collected from a clay lump. They belong to a very young infant. From the thickness of the cranial table, it can be assessed to be an infant I (0-3 years). No teeth to better estimate age at death.

#### Burial T.258 (fig. 113, 300, 301)

This burial was right along the edge of the cliff. It is crossed by a small gully that cut the skeleton in two, and part of the thoracic and lumbar spine is therefore missing. The body is set on its left side, E-W oriented, head at E. Differently from what is usually found in the site, legs were not flexed frontward. They are in fact along the body axis, flexed at knee level with the forelegs originally going backward.

Forelegs are anyway missing. Both arms are instead flexed in front of the body, with the hands facing the mandible. The peculiarity of this burial is the presence of a clay figurine in the hands of the individual. The left hand is set below the figurine, catching it from its bottom.

The position of the fingers indicates that the clay object was not just put above the hand, rather it was almost wrapped by it. The right hand, instead, was on top of the figurine, covering and protecting this precious object. So the figurine was completely in between the hands.

The general state of preservation, despite the missing parts of the skeleton, was sufficient. Determination of sex indicates the individual was a female (F), who died at about 27-33 years of age.

#### Burial T.271

This burial was clearly disturbed since part of the skeleton is missing, exactly the skull, the bones shoulders (clavicles and scapulae), the spine, the right humerus and most of the pelvis. From the rest it can be determined that the body, E-W oriented, had the head at E, and was set on its left side. The left arm was along the body, the right one, instead, was originally across the thoracic cage and joining the left one at forearm's midshaft level. Legs were both flexed. Generally, the bones are well preserved. From the long bones length the individual died at 3-5 years of age, which is consistent with the age from the degree of formation of a mandibular incisor. Sex cannot be determined.

#### Burial T.272

The skeleton exposed in burial T.272 is practically completely destroyed. Only pelvis, left forearm, hands and feet are left, though in a very bad state of preservation. decubitus was dorsal, with legs flexed left, probably in a tight position since the right foot was very close to the femur. Orientation was E-W head at E. Sex was likely to be male (M?), and age at death: Adult.

### ***Human remains with no grave numbers***

#### **House 7, room 53**

Below the floor of house 7 room 53, a human mandible was unearthed. It belongs to an infant of 5-7 years of age from the degree of crown formation and eruption. According to some strong traits, it could be supposed that this child was a male (M???), but since dimorphic traits are not reliable in the young sub-adults, such determination of sex must be considered little indicative. The body of the mandible is broken in three parts, nevertheless it is very well preserved. A clear malformation affected the left condyle.

No other remains were associated to it a part from few animal bones fragments. It is likely that it was fortuitously inside the soil used to fill some pit.

Another burial has partly cut a buried wall. Very little is left of the skeleton, and anyway in very bad conditions. The skull was in the wall, while few ribs and both humeri were visible. Since all the rest of the skeleton was missing, the bones were recovered just to set the area free. The presence of parts of both mandible and maxilla provided to recover some teeth, which allowed to estimate age at death. It is a sub-adult of about 9-11 years old. Because of the young age, no sex determination is possible.

#### ***3.5.3. The burials in Area MR.03 South***

##### ***Graveyard 1***

###### **Burial T.263**

Only was the neurocranium of a skull unearthed from this grave. No sign of any other fragments of bones. The very thin tables allow estimating an age at death between 0 and 2 years.

###### **Burial T.280 (fig. 312)**

This burial is so far the deepest ever found. It was dug in the ground, no sign of the pit. The body is fairly well preserved, even though the skull is almost completely missing, as well as part of the right shoulder and the proximal mid-shaft of the right humerus. The burial seems to be disturbed, since other than the missing bones, legs are misplaced compared to were the feet (anatomically connected) are.

The body is E-W oriented, head originally at E. The decubitus was partly dorsal and partly lateral left. The left arm is along the body, the right one, on the ribs cage, crossed the body leftward. Legs are flexed too, and go left upward; they are not horizontal, with the knees some 15 cm higher. The part of the burial within the limits of the body shows many ash traces, probably part of the filling. The individual is a female (F). Dental wear is very strong, this means the individual died at an age older than 40 years (>40). Stature can be approximately 161-165 cm.

##### ***Graveyard 2***

###### **Burial T.275**

This primary deposition, SE-NW oriented with the head at SE and right decubitus is in a bad state of preservation. The upper part of the body, as well as the legs, is sufficiently preserved, but the trunk has disappeared. Legs are flexed in an untight, unforced position. The right arm is along the body, the left one, passing over the ribs, crosses the right one on the elbow. Sex determination indicates the individual as a male (M), and from dental wear, it was possible to estimate an age at death between 20 and 30 years. Approximate stature of this young male was about 167-172 cm.

Burial T.276 (fig. 121, 303)

Burial T.276 is outside a house, at the very corner of two walls. The peculiarity of this grave is that four goats were buried together with the individual. The body, very poorly preserved, is E-W oriented, head at E. It is lying on its right side. Arms and legs are both flexed. Arms are in front of the body with the hands touching the face. Legs, flexed frontward, appear to be in a very tight, forced position, so tight that femurs and tibias are very close to each other. One goat is set in front of the trunk; the second is below the first, at knee level. The third one, below the second, seems to delimit the lower part of the human body. The fourth goat, instead, is along the lower back of the human skeleton. Three vertebrae of the tail of a cattle have been found in front of the face of the human skeleton, probably a whip? Because of the bad conditions, information can be traced back only from the skull. The individual shows to be a female (F), while age at death can be estimated to be 16-20 years.

Burial T.277 (fig. 122)

This burial was dug inside the walls of a house. The body was E-W oriented, head at E, and set on its back. The right arm is above the ribs cage crossing the left one, set along the body, at its forearm mid-shaft. Bones are not smashed down, nevertheless the preservation is just sufficient. Legs are, as usual, flexed at left. Determination of sex clearly proves this individual was a male (M), who died between 25 and 30 years of age. Estimated stature is between 176-181 cm.

***Graveyard 3***Burial T.259 (fig. 115, 320)

Burial T.259 was partly excavated since about half of the skeleton was inside the section wall. Only the legs are visible, and next to them, the skeleton of a baby goat is clearly recognizable. The human bones were set flexed on their left side. It is impossible to determine the side the body was set, since the decubitus could be supposed to be left, but there is also the possibility of it being dorsal with the legs flexed left. The goat itself is lying on its left side, at the human bones right. Despite smashed, bones are in a fairly good state of preservation. The individual is doubtlessly an adult. Sex can be hardly determined, only can it be said M??? from the size. The few measurements taken indicate an approximate stature of 165-175 cm.

Burial T.260

Like T.259, also this burial is still partly in the section and only the lower limbs are visible. Legs are set on their left side, smashed and fairly well preserved. The individual is adult, and the gracile morphology and small size of the long bones would indicate the individual was a F???

***Graveyard 4***Burial T.247

Burial T.247 contains the body of a very young infant lying on its left side. Arms were along the body, while both legs were flexed frontward in a very natural position. The left humerus was under the thoracic cage, in front of the body, with the hand touching the left femur. The right one, instead, is set along the back of the trunk with the hand right behind the pelvic bone. The position of the whole body seems to indicate that no particular treatment was done during the funerary practices. The position of it, in fact, is very natural and none of the positions assumed by the single bones or limbs give any evidence of being forced that way. It is SE-NW oriented, with the head at SE. The skeleton is complete and well preserved, but the skull has been flattened by the weight of the above standing layers of soil.

The age at death has been calculated both from the length of the long bones (in this case only the right humerus and the right ulna were measurable) and from the degree of tooth crown formation. The long bones (humerus and ulna were respectively 132 mm and 124 mm long) indicate an age at death of about 3-4 years. No permanent teeth were erupted yet, and a conglomerate tightly kept the

maxilla and mandible together. Nevertheless, it was possible to analyze the left first permanent mandibular molar, and its degree of formation indicates an age of about 2-3 years. It is thus possible to estimate age at death between 2 and 4 years. Because of the young age at death, it is impossible to determine sex, since during sub-adult ages, the dimorphic traits have not clearly developed yet.

#### Burial T.248

The body is flexed in a foetal position. The right hand is below the mandible, the left one is in front of the face. Legs are extremely flexed backward, and this induces to think that they were kept tight in that position. Bones are well preserved and the body is almost 100% complete. Bones are covered by a hard conglomerate concretion that was very hard to remove. It was preferred not to try to remove the bones in order to prevent them from being destroyed. The individual is a sub-adult. The only long bone preserved enough to be measured was the left tibia (234 mm), the length of which can be turned into an age of 9-11 years old. Dental eruption and formation showed an age at death consistent with the previous one. Then, the final determination of age at death has been assessed as 9-12 years. Because of such a young age, sex was not determined.

#### Burial T.249

Burial T.249 was set a few centimetres below T.248, and slightly above the skull of such skeleton. The remains of a very young individual are clearly disturbed and mixed, probably by the deposition of T.248. Few bones are left: fragments of the skull, the femur, tibia and fibula. The position of the leg indicates that the orientation was likely E-W, head at E(?). The length of the lower limb's long bones (fibula 68; tibia 78) is consistent with an age at death of a new-born of few months.

#### Burial T.281 (fig. 314, 315)

The individual is the second one with a nice, well made and well preserved head band. Differently from most of the depositions, it is E-W oriented with the head at W. The body can be considered to lie on its back. The head is turned right, looking south. The left arm is above the body flexing upward in a V shape. The left one, V-shaped as well, is outside the perimeter of the trunk. The pelvis is flat, with the legs flexed right. Feet are very close to the pelvic bones, in a normal, untight position. Bones are sufficiently preserved, above all the long bones. They appear to be very long and thin, and measures taken allow calculating that the individual is 160-170 cm tall.

Determination of sex indicates the individual is a female (F) who died when she was about 30 years old (25-35).

#### *Graveyard 5*

#### Burial T.250 (fig. 298)

Primary undisturbed deposition at the very corner of two section walls. The body is set on its dorsal side, E-W oriented, head at E. The head is naturally turned left, since maxilla and mandible are firmly together in anatomical connection. Legs are flexed on the left side, with the feet very close to, but not in touch with, the right pelvic bone. The flexure between femur and tibia is extreme and tight, probably due to some kind of strap. Because of flexure, which forced the body in a non perfectly flat position in the grave, the right pelvic bone was higher than the other one, then, after decomposition, it fell down and opened, no longer in connection with the sacrum. A baby goat, partly disturbed, was set along the flexed legs, on the right side of the body. The skull of the goat was put above the right leg on its left side. A lot of red ochre was present below the skeletons. As regards the human individual, the ochre had been probably put as sort of a bed because it was not in direct contact with the bones, and was also spread slightly far from them.

Bones were very well preserved, very hard and firm. Apart from the skull, flattened and smashed, all the rest was perfect. The individual was a female (F) who died at an age of 18-22 years. Approximate stature was about 154-158 cm.

Burial T.251

This primary, undisturbed deposition was set along an E-W direction, head at East. The body was on its back, in a dorsal decubitus, even though the whole body was not originally completely flat on the ground. Legs are in fact flexed frontward with a 45° angle between them and the trunk axis, and this indicates a certain tilting of the body. Evidence of it also comes from the lumbar spine that shows a clear sign of articulation detachment for taphonomic reasons after death, following pelvis assuming a flat position. Arms are along the body, the right one partly covered by ribs and the left one instead more separated. Flexed legs are so forcefully folded (in an unnatural position) that the right hand is in touch with the feet. The head is left turned, with maxilla and mandible tightly together, to prove that such was the original position.

The state of preservation is discrete, 100% complete. Age at death can be estimated between 35 and 40 years, sex is male (M). From the long bones length, stature can be approximated to 168-173 cm.

Burial T.252

This primary deposition is not violated, nor disturbed. The body is set on its back, with a slight left side component. The left arm is along the body; the right crosses the trunk and joins the left at level of the elbow. The head is set on its left side, E-W oriented (head is at East). The mandible is tightly closed to the maxilla, so the left side rotation can be meant to have occurred at the moment of deposition and not after. Legs are flexed leftward, and the feet are very close to the sciatic bones.

Bones are heavily fragmented, though 100% of the skeleton is represented. Sex determination indicates a male (M), while age at death, both from teeth and from the bones can be estimated between 25 and 35 years.

Burial T.256

This burial has been excavated only in part since it is still completely in the section. Only the skull, protruding, was preferred to set taken out in order to prevent any sort of fortuitous destruction. Thus, no information at all can be deduced from the burial.

The skull is crashed and smashed. It is on its left side, looking south. The burial seems to be E-W oriented, head at E. The smashed, fragmentary conditions do not allow particular measurements or analyses. The few scorable morphological traits indicate it could be a male. But age from dental eruption and formation shows an age of 12-16 years. Nevertheless, it still could be assessed as M??.

Burial T.274 (fig. 308, 309)

The skeleton is the first one to show a wonderful set of head-band, necklaces and belts and other bead ornaments. The body, E-W oriented, head at E, is set on its left side. Legs are both flexed frontward, as well as arms. Bones are in a bad condition. Sex can be determined to be female (F), while age at death has been estimated between 22 and 28 years.

Bones are very long and gracile. As regards stature, the individual can be approximately calculated to be 149-153 cm tall. Part of the left femoral shaft had to be cut in order to remove an ornament made of many tiny beads, without disassembling it.

Burial T.278

This burial has just been numbered, but because it is in the section below the ramp, it has not been excavated.

Burial T.279 (fig. 310)

The skeletal remains in burial T.279 are well preserved. The body, EW oriented with the head at E is set on its left side. Actually, the scapula is very well visible on top of the thoracic cage, and this indicates that the decubitus can be considered left with a ventral component. Both arms are flexed in front of the body with hands together close to the face. Legs, flexed frontward, showed the feet very

close to the pelvic bones. The individual is doubtlessly a male (M) aged about 40-45 years old, from the degree of dental wear and the degree of rarefaction of the trabecular bones of both humerus' and femur's proximal epiphyses. Stature, calculated from the long bones, is approximately 170-175 cm.

### ***Graveyard 6***

#### **Burial T.244**

This is a single, disturbed burial of an infant of about 4-6 years of age. Determination of age at death is possible because of the degree of tooth crown formation. Moreover, also the length of the femur (about 210 millimetres) is consistent with such age. Because of the young age at death, it is impossible to determine sex, since during sub-adult ages; the dimorphic traits have not clearly developed yet.

The body lies on its right side, along a NNW-SSE direction, head at NNW. It is not 100% complete, since the left humerus and the lower part of the legs are missing. At the bottom of it, in fact, a hole filled with stones is visible, and the right foot is in proximity of it. It is likely that the digging of the hole disturbed the burial and is responsible for the missing bones. The state of preservation is fairly sufficient though very fragmented, as the solidity of the bones is fairly good.

From what remains, it is evident that the body was extremely flexed, almost in an unnatural position.

#### **Burial T.257**

Single burial of an infant on its left side, flexed frontward with the arms along the body in front of where the trunk originally was. In fact, both the trunk and the skull are no longer available. Orientation is E-W, head at E. The remaining bones are fairly well preserved. Long bones' length indicates an age at death of 1.0-2.0 years (femur: about 128 mm; tibia: about 110 mm; fibula: about 106 mm; radius: about 86 mm). Because of sub-adult age, no sex determination is possible.

#### **Burial T.261**

The individual exposed in burial T.261 corresponds to a sub-adult of about 7-10 years of age from the long bones length and dental crown formation and eruption. The overall state of preservation is good, but many bones are no longer *in situ*. Originally the decubitus was partly left. The left arm was along the body, the right one, passing over the ribs, crossed the left one on its elbow. Legs, left flexed, go deep into the section and only the femurs are visible and could be recovered. Some 30 cm from the body there was a large spot of red ochre, but it was hard to state if it was associated to it as burial plane of deposition or not. Because of the young age at death, sex cannot be determined.

### ***Graveyard 7***

#### **Burial T.243**

This burial is partly in a section, with the skull completely inside. The rest of the body is on its left side decubitus, although the position of the vertebrae induces to consider it more like a dorsal one. It lies in a much flexed, almost foetal position. State of preservation is fairly good. The right arm is flexed with the hand close to the hidden mandible, while the left one is along the body, flexing backward under the right leg, with the hand on the back of the pelvis. Sex is male (M), while age at death, because of the absence of teeth and the fragmentary conditions of the rest of the body can only be determined as adult between 20 and 40 years.

From the few measurements available, stature can be determined as about 173-178 cm.



**V: Work in progress in Area MR.03 South**

## CHAPTER 4

### REPORT 1999-2000

The 26th season of work at Mehrgarh, district Kachi, Balochistan, was conducted from December 1999 until March 2000 by the French Archaeological Mission, in collaboration with the Department of Archaeology and Museums, Government of Pakistan. In addition to the representatives of the Pakistan Government and Officers-in-Charge, Mr. Muhammad Ishaque, Field Officer, and Mr. Sardar Ali Sajid, Archaeological Conservator, Sub-Regional Office, Quetta, the field staff included: Jean-François Jarrige, Director of the project, Catherine Jarrige, C.N.R.S., archaeologist, Gonzague Quivron, C.N.R.S., archaeologist, Jérôme-F. Haquet, archaeologist, Jean-François Lefèvre, archaeologist and draftsman, Vincent Marcon, archaeologist in charge of lithics, Rozann Douaud, draftswoman, Margareta Tengberg, paleobotanist, Elise Alloin, object conservator and Andrea Cucina, University of Rome "La Sapienza", physical anthropologist.

#### 1. AREA MR.03 SOUTH

##### 1.1. Previous work in this area

An area, limited to the east by the edge of the cliff formed by the Bolan river and towards west by the large sounding MR.3S (area MR.03 South) dug between 1977 and 1984, was excavated during the two previous field seasons through the superimposed occupation levels of the Neolithic settlement of Period I (occupation 9 down to occupation 3).

Another area, the southern half of the deep trench MR.3S (area MR.03 South), had also been selected for excavations in 1999 because several metres of deposits belonging to the lowest levels of Period I were still directly accessible, undisturbed by earlier excavations (Level 3 down to Level 1). A building, then the oldest uncovered at Mehrgarh was found in this western part of MR.03 South. Unfortunately, the structure was very badly eroded.

The only preserved structural remains of this first phase of construction of Period I consisted in portions of three joined walls in a Z-shaped position.

##### 1.2. Excavations in the eastern part of MR.03 South

This year, the work was resumed in the eastern part of MR.03 South, where excavations of the deepest layers were extended in order to provide more data on the earlier settlement of Period I and also to complete the study of the stratigraphy of the aceramic mound down to the virgin soil. (fig. 6c, 7c, 16, 17).

###### 1.2.1. *The lowest occupation level of Period I (Level 1) (fig. 6c)*

Like in the other deepest excavated area of the site, the southern half of the trench MR.3S (area MR.03 South), the earliest cultural deposits were encountered at about 6 metres and consisted in series of brownish earth layers mixed with ash and resting on the natural alluvium deposits spreading under the whole site.

#### House XLIII

The remains of a mud-brick structure edified by the first inhabitants of Mehrgarh who settled in the area were uncovered. The bases of the walls rest directly on the above-mentioned blackish soil. All

the mud-bricks used to build the house are made from very fine clay and are approximately 60 cm long. The construction is composed of two large rectangular rooms north-south oriented, but only the western room was completely excavated within in the limits of the trench. The room measures 4,5 m north- south and 2,5 metres east-west. The outer walls are preserved to a height of about 60 cm and are made of one row of bricks placed lengthwise. The mud-brick wall dividing the two rooms is thicker and was constructed with two rows of bricks. A doorway, 40 cm wide and facing north, provided access into the exposed room. Several reddish traces of cooking areas or hearths were discovered on its floor made of fine yellowish compact earth.

Four hearths were located in the eastern area of the room and an additional one was found in clearing the northwest corner. A small L-shaped wall imbricated in the western wall and delimiting a small space probably used for storage also characterizes the room. The room was inside completely filled up with portions of collapsed walls and numerous fallen bricks. The outside of the structure was on the contrary buried in a less compact mixture of earth and ash.

#### Artefacts (fig. 81)

Many of the artefacts recovered this year come from the excavated house of Level 1 and its neighbourhood. The majority of objects consist of chert blades and flakes but also of stone items such as processors showing signs of grinding (MR.00.03.390.98) and other stone tools (MR.00.03.390.57 and MR.00.03.393.163). The room of House XLIII produced interesting artefacts like shell beads (MR.00.03.393.02) and several small pallets (MR.00.03.391.28 and MR.00.03.392.01). They are flat pre-shaped items bearing use-wear traces on both their flat surfaces. Almost similar pallets were also uncovered outside the structure (MR.00.03.390.101, MR.00.03.393.170 and MR.00.03.390.456). A stone pendant with a pierced hole (MR.00.03.393.169) (fig. 342, right) and a small stone bowl with bitumen (MR.00.03.393.171) were also found in the debris.

One small object deserves a special mention since it provides new information on the various materials used to manufacture figurines during this earlier period of the Neolithic settlement. It is a unique piece of thin shell carved in the shape of a human silhouette (MR.00.03.393.168) (fig. 278).

#### *1.2.2. The remains of the second occupation level (Level 2) (fig. 7c)*

While reaching the second occupation level of Period I, we came upon a very thick layer of debris made of dismantled structural remains, which once formed part of structures obviously located in the vicinity but outside the limits of the trench. The greater portion of the dig was filled with fragments of fallen walls and many broken bricks including pulverized bricks washed down from the nearby ruined structures forming altogether a very compact layer sometimes more than 1 metre thick.

#### Artefacts (fig. 82)

Objects in stone were also uncovered in Level 2: a flaked stone tool (MR.00.03.389.63) and a stone processor (MR.00.03.388.105) as well as a chisel (MR.00.03.388.01) and a pallet (MR.00.03.389.62).

#### *1.2.3. The third occupation level (Level 3) (fig. 8c)*

This third occupation level was reached this year below the remains of House XXXVII, which had been excavated in 1999. Several stone tools (MR.00.03.381.46 and MR.00.03.386.58) were found in the successive layers of ashes and of fallen bricks.

## 2. AREA MR.03 NORTH

### 2.1. Previous work in this area

Excavation was resumed in the area excavated during seasons 1996-97, 1997-98 and 1998-99, limited by gullies towards south and northwest and by the edge of the cliff formed by the Bolan River in the northeast (areas C, D and P of the grid-plan) (see reports 1996-97, 1997-98 and 1998-99).

Twenty-three buildings had been altogether excavated in these last three years in the occupation Levels 7, 8 and 9 representing the last period of the aceramic occupation (Period 1). The aim of the 1999-2000 season was to extend the excavation to the earlier levels, evidenced so far only in the area MR.03 South, in order to link the sequence of both areas and thus unify the stratigraphy of the whole Neolithic settlement, taking into account the building/abandonment phases as well as the successive graveyard levels throughout the extension of the occupation.

### 2.2. Excavations in the western, central and eastern parts of MR.03 North

In the western part of the area MR.03 North, work has been concentrated on four of the buildings and their adjacent spaces, belonging to period I, Levels 4, 5, 6, 7, 8 and 9, thus covering an area of roughly 425 sq. m occupied by buildings - most of them rectangular four-roomed houses - and open spaces, as well as burials dug in the eroded debris between the occupation phases (fig. 14 b, 19)

Excavation was resumed in houses no. XI, XX and undertaken in houses XXIX, XLIV and XLIX. They complete the plan of the settlement showing the successive building phases of occupation levels 4, 5, 6, 7, 8 and 9.

In the central part of MR.03 North, a deep trench was dug through the occupation layers of Period I from occupation Level 7 down to occupation Level 2.

In the eastern part of MR.03 North, excavation has been undertaken in an area of about 105 sq. m, where rectangular buildings (Houses XXII, XXIV, XXVIII, XLV, XLVI and XLVII) and burials were uncovered from level 8 down to Level 3.

#### 2.2.1. *The second occupation level (Level 2) (fig. 7b)*

There was no trace of any building in the limits of the dig because of the narrowness of the trench at this depth (about five metres below surface).

#### Artefacts (fig. 83)

Only thick superimposed layers of debris with ashes and a great deal of broken bricks were excavated, in which a fragment of a grinding stone (MR.00.03.189.92) and two stone tools (MR.00.03.189.89 and MR.00.03.189.91) were found.

#### 2.2.2. *The remains of the third occupation level (Level 3) (fig. 8b)*

#### House XXVI

Only a part of a room of this house was excavated within the limits of the dig. The original size of the structure is unknown, but due to the shape of the excavated room, the edifice was most probably a two-roomed house.

The cleared room measures 4,42 x 1,14 m. Its walls are preserved to a maximum height of about 95 cm and are made of two rows of bricks set lengthwise.

Of particular note is the outer coating of the longer wall, which was found covered with reddish black soot on its full preserved surface slanting down from west to east. A block of masonry had been built against and in the middle of this wall but inside the long rectangular room. Partly preserved, this large buttress was also made of mud-brick. Finally, a door linking the two rooms was partly excavated in the limits of the trench.

House XLV

A large structure (House XLV) was excavated in the eastern part of MR.03 North.

Despite the fact that part of this house is still inside the section, it seems organized in two rooms. The length of the structure is still unknown, but what was exposed of it shows a north-south orientation.

Their exposed lengths are 5,85 m. for the western wall and 4,60 m. for the eastern wall. The width of the building is 4,30 m. The walls are preserved to a maximum height of 1,50 m. The fill of the two rooms was made of successive very compact layers of clay from the base of the walls upwards.

House XLVI

This building is situated 1 m. north of House XLV, with the same orientation. As the previous structure, this one was only partially uncovered, the main part of it being still under the section; only the southern wall was completely exposed. It measures about 4,3 m. and the height of the preserved walls is approximately 50 cm. Only the external sides of the walls of this house have been exposed.

House XLVII

What is left of this structure consists of three fragments of walls, only one brick thick. They were discovered at the eastern edge of the excavation just above the cliff. The rest of this construction had collapsed in the Bolan river. About 3,55 m of the western wall were exposed and the beginning of a perpendicular partition wall towards east was found. Another part of a 1 m long wall has been recorded right on the edge of the cliff, and may correspond to a room of this building.

Artefacts (fig. 85, 86)

A complete grinding stone placed upside down was found in the occupation Level 3 against the burnt outside coating of House XXVI.

A stone chisel (MR.00.03.169.01) and a fragment of a perforated shell (MR.00.03.169.02) were uncovered in one of the rooms while three stone processors were found outside the house (MR.00.03.186.98, MR.00.03.186.61 and MR.00.03.186.159)

Among the artefacts collected in the eastern sector, the more noticeable objects came from Locus 188 in House XLV. A long implement in ivory, grooved on both sides whose tip is that of a spatula (MR.00.3N.188.191) (fig. 348) has been found along with a very fine stone grooved item probably used as bone points polisher (MR.00.3N.188.189) (fig. 345) and an unusual clay lump with an inserted flint blade (MR.00.3N.188.192) (fig. 346). A base of a clay human figurine (MR.00.3N.188.193) with perforations was found on this locus as well as a small container in clay with a flat base (MR.00.3N.188.190).

In the open spaces (Locus 172, 191), the layers around the structure yielded a stone muller (MR.00.3N.172.279), a fragment of a stone shallow bowl (MR.00.3N.172.278) and two bone awls (MR.00.3N.191.19 and 172.219). The upper part of schematic clay human figurine (MR.00.3N.191.20), a token in clay with a perforation (MR.00.3N.191.01) and a small polisher covered with ochre (MR.00.3N.172.186) were also discovered.

*2.2.3. The remains of the fourth occupation level (Level 4) (fig. 9b)*House XXV

Compared to the plan of the above-mentioned House XXVI, the plan of House XXV, built directly above it, is almost similar. It is also a two-roomed structure the walls of which are however slightly out of line with those of the ruined House XXVI buried just below. Located at the same place, there is also a pillar against the inner wall of the southern room and a doorway, which was found blocked up with bricks, in the opposite wall.

The east-west oriented house is 5 metres long and 4,14 metres wide and its walls are preserved to a height of about 110 cm. Only one of the two rectangular rooms has been completely excavated. The fill of the room consisted of ashy debris mixed with numerous pulverized and broken bricks.

#### House XXVII

Another large two-roomed structure (House XXVII) lying to the south of the one just described and separated from it by a narrow space was completely excavated.

The house is north-south oriented and its walls, approximately 30 cm wide, are preserved to a maximum height of 160 cm. The structure measures 6,15 x 4,45 m. The fill of the two rooms is made of successions of layers of compact and loose earth mixed with ash, pebbles and animal bones. Large portions of floors made up of clay covered with red ochre were still traceable at the southern extremity of each room. This floor level was found about 50 cm above the base of the walls.

#### House XLIV

A small part of another house (House XLIV), which also appeared to be a relic of the fourth occupation level, was excavated. There is little to say about the very small trench dug inside the structure in order to find the base of the walls buried in layers of clay and ash.

Excavation was also conducted in the open spaces west of this structure, in locus 181, 198, filled with ashy deposits, and 199, where a compact filling lined with pebbles rests against the southern wall of house XLIV.

#### House XXVIII

Only a very small part of the south-eastern angle of this building was uncovered in a corner of the trench. The space between the west and north sections was too narrow to dig up deep inside, the walls were preserved to a maximum height of about 60 cm. This angle could eventually be linked with a portion of wall excavated previously in the sounding MR.3T (1979) right on the north.

#### Artefacts (fig. 87, 88, 89)

Few objects including figurines were discovered in occupation Level 4. The excavated room of House XXV yielded interesting examples of such clay objects. They are small human figurines of the foot-shaped types. One of them, with an applied belt, was found slightly fired (MR.00.03.154.14). The other one, coloured with red ochre, had applied breasts (MR.00.03.154.48) (fig. 280). Two fragmentary bone points (MR.00.03.163.42 and MR.00.03.163.43) and several cylindrical beads in calcite and in shell (MR.00.03.163.44) were uncovered outside this house.

Fragments of human clay figurines (MR.00.03.176.01 and MR.00.03.180.68), the first one with a flat base and stumps featuring the arms and the head (fig. 279), were also found in the western and the eastern rooms of House XXVII belonging also to Level 4.

A small stone chisel coloured with red ochre was also discovered in the western one (MR.00.03.176.02). A bone awl (MR.00.03.177.64), a stone pestle covered with red ochre (MR.00.03.179.11), an elongated used pebble (MR.00.03.179.57), a grooved stone (MR.00.03.180.15), stone processors (MR.00.03.177.43, MR.00.03.177.44 and MR.00.03.180.63), a used red-ochre coloured pebble (MR.00.03.154.47), a flaked stone tool (MR.00.03.180.62) and a stone multifaceted item (MR.00.03.179.56) were also found in the rooms of this house. Two grinding stones (MR.00.03.178.58 and MR.00.03.190.150) were uncovered in the debris accumulated outside the house.

In the open spaces (loc. 181, 198, 199), most of the finds consist of fragmentary bone awls and heavy lithic material such as grinding stones, sometimes coloured with red ochre, and mullers.

Few artefacts were found in the eastern sector, but among them we can notice two stone chisels: one is intact (MR.00.3N.146.322) while the second one is fragmentary (MR.00.3N.146.330). A fragment of a perforated shell with three parallel carved lines (MR.00.3N.172.101), a fragment of a bone needle (MR.00.3N.172.25) and a portion of a human female figurine decorated with an applied belt (MR.00.3N.146.324) were found in these layers.

#### 2.2.4. The remains of the fifth occupation level (Level 5) (fig. 10b)

##### House XXIX (loc. 194, 195, 197)

Built on top of house XLIV, it is a rather irregular, rectangular (about 5 x 4,15 m.) four rooms structure preserved on a maximum height of 0,90 m, oriented north-south, with a reddened floor which was later filled with rather compact sediment, itself covered by an ashy layer on which the bricks of its superstructure collapsed at a later date (see Level 6). A few stone, horn (MR.00.3N.194.35) and bone tools were lying on the floor.

Next to this house a cluster of mud walls filled with lumps of clay mixed with ashes and stones rest on a floor with burnt remains. An open space, south of House XXIX, locus 199, shows a succession of reddened floors, later filled by alternate silt and ashy layers.

Remains from occupation Level 5 were also found in a narrow trench dug along the eastern outer wall of House XXVII. Numerous pebbles were discovered against this wall as well as layers of ashes accumulated there when the structure was in ruined conditions and in the process of being buried into debris.

##### House XXII

This house was built at the very location of House XLV (belonging to Level 3), with the same main north-south orientation and is partially buried under the southern section of the trench. It is most probably a four rooms structure, but only the two northern locus 142 (2,70 x 1,65 metres) and locus 143 (2,60 x 1,95 m.) were thoroughly excavated.

The structure was 4,70 metres wide and the western and eastern walls were respectively cleared on 4,50 and 4,30 metres long. Even if it was partially dug out with the partition walls inside it is possible to estimate the whole size of the construction that could have been reached 6,00/6,20 metres in length. The southern rooms (Locus 144 and 145) were almost half excavated.

##### House XXIV

Like House XXII, this one was constructed on the same place as a previous structure, but with the same position and the same size. It means that it could have been erected on the ruins of House XLVI. Two rooms, Locus 148 and Locus 152 (both of them were about 1,60 m wide) were partly accessible; the rest of the structure is buried inside the northern section of the trench. It appears that at this level the same layout as in Level 3 had been set up with this building.

##### Artefacts (fig. 90)

Half of a grinding stone was found on a floor of House XXIX (MR.00.03.194.46), as well as several fragmentary bone artefacts in the adjacent areas, Locus 181 (MR.00.03.181.71) and 182 (MR.00.03.182.35 and 182.44). An interesting bone pin found in Locus 199 (MR.00.03.199.88) is grooved at one end.

A small stone pestle (MR.00.03.190.01), a stone chisel (MR.00.03.190.78) and a grinding stone (MR.00.03.190.79) were found in the layers belonging to Level 5 near the ruined house XXVII.

In House XXII, all the noteworthy artefacts were discovered in the fill layers of Locus 143, where several bone objects were found: two bone awls (MR.00.3N.143.30 and 143.31), a bone spatula (MR.00.3N.143.01) and a fragment of a bone ring (MR.00.3N.143.33). A stone pendant (MR.00.3N.143.32) and a fragmentary stone vessel with traces of red ochre were coming from this room. A complete perforated shell in *Cardium* (MR.00.3N.144.01) was discovered in the southern room 144.

Other pieces were found in the layers around these structures, among them a bone awl (MR.00.3N.143.317) and a remarkable sherd with notches (MR.00.3N.146.349). In the intermediate Level 5/4, two ornaments were exposed, one is an unfinished bead in calcite (MR.00.3N.146.202) and the second one a fragment of shell pendant (MR.00.3N.146.203).

### 2.2.5. *The remains of the sixth occupation level (Level 6) (fig. 11b)*

#### House XXIX (loc. 185, 194)

The remains of house XXIX were still visible in Level 6, though its upper structure had apparently collapsed and filled it with bricks fallen on an ashy layer.

South of this structure, on the occupation level of Locus 49, large fragments of painted plaster decorated with red strokes and dots laid scattered among the fallen bricks (fig. 245).

#### Houses XVa (Level 6) and XVb (Level 7)

These two houses are superimposed structures with identical plans and orientation (fig. 242). This is the reason why they were wrongly considered as a single house (House XV) when they were exposed in the course of 97, 98 and 99 seasons. Since then a better knowledge of the stratigraphy of this area and of the structural remains excavated in the vicinity clearly indicate that the rather high walls are the result of two phases of construction. The double burial (T.282) excavated in Locus 74 had been dug when House XVa was buried into layers of debris. Only the upper parts of the ruined walls were visible when later on the inhabitants of the site decided to edify another structure (House XVb) directly on them.

#### Artefacts (fig. 91)

A thick accumulation of rubbish, broken pebbles and bricks was excavated to the east and south of House XVa where a small container made of shell (MR.00.03.163.41) was discovered. A perforated round pebble was also found near the then already ruined House XXVII (MR.00.03.178.12)

Layers of the eastern side of MR.03 North trench yielded clay artefacts including three clay balls (MR.00.3N.164.60, 164.61) of which one was perforated like a bead (MR.00.3N.164.59) and a fragmentary human figurine (MR.00.3N.164.63). A shell bead in *Dentalium* (MR.00.3N.164.63) and a very sharp bone point (MR.00.3N.164.47) were discovered too. Concerning the stone material else than flints, two halves of shallow bowls (MR.00.3N.164.70 and 164.64) were found as well as two used pebbles (MR.00.3N.164.151 and 164.154).

### 2.2.6. *The remains of the seventh occupation level (Level 7) (fig. 12b)*

#### House XLIX (locus 104b, 106b and 184)

This house had been levelled down when House XVIII was built and its ruins were subsequently disturbed by gullies and graves in its eastern part.

Partially excavated and oriented east-west, it is a four rooms rectangular structure, measuring 5,50 x 4 m.

A very wide area between the western and the central blocks was void of any construction, but was used as a graveyard for a long period covering several levels, at least 7, 8 and 9, the burying activities alternating with the spreading out of trash and ashes. Several location numbers have been attributed to this area, given its depth and extension (Locus 109, 110, 170, 171, 183).

Another area, locus 90, situated east of House XVI, whose lower part, excavated during 1998-99 season, belongs to occupation Level 7, has also yielded remains belonging to this level. They consist of small narrow (one brick wide) parallel walls, which may have been used as drains in a lane adjacent to this house; this seems corroborated by compact melted clay deposits between them.

#### Artefacts (fig. 92, 93, 94)

Only fragments of heavy lithics and a few flints were found in loc. 90.

A few objects were found in House XLIX, mostly in Locus 184. They consist of fragmentary or complete (MR.00.03.184.111) bone tools, heavy lithics and a few flints, as well as a fragment of a clay figurine which is possibly the hindquarters of a bull (MR.00.03.184.125).

The large area covering locus 109, 110, 170, 171 and 183, being a zone of refuse, has yielded a large quantity of objects such as flints, fragmentary bone awls, a horn tool (MR.00.03.170.37), half of a bone ring (MR.00.03.170.201), a fragmentary clay human figurine with traces of an applied belt (MR.00.03.170.82), two hind quarters of animal figurines, probably bulls (MR.00.03.170.200 and MR.00.03.183.74) and the rim of a small clay vessel with a hole (MR.00.03.170.07). A fragment of a sickle made of bladelets inserted in bitumen also belongs to locus 183 (MR.00.03.183.47), its original wooden frame was, as usual, not preserved.

The alternating layers of earth and ash discovered between House V and XVb and the broken bricks found between House VXa and XVb belong to occupation Level 7. In 1999, a grooved stone polisher was found along with bone awls just below the foundation of House XVa. This year, in the same area, an almost identical object (MR.00.03.160.72) was discovered outside House XVb, near its outer eastern wall. Nearby, two grinding stones (MR.00.03.159.21 and MR.00.03.160.70) and an elongated used pebble (MR.00.03.160.71) were also found.

Two lower parts of human figurines were found on the eastern edge of the excavation (Loc.174), one very simple (MR.00.3N.174.02), the other one decorated with a snake-shaped applied belt and showing traces of red ochre (MR.00.3N.174.01) (fig. 282). Bone tools include three awls (MR.00.3N.158.139, 158.211 and 158.149), another one was found in the intermediate Level 7/6 (MR.00.3N.164.02) as well as a bone chisel (MR.00.3N.158.179). Another chisel, this one in stone, was also discovered (MR.00.3N.174.03). The other notable artefacts were ornaments such as two calcite beads (MR.00.3N.158.66 and 158.227) and a flat and very thin unfinished heart-shaped bead in steatite (MR.00.3N.174.04). A clay token (MR.00.3N.158.137) was also found in these layers of Level 7.

#### *2.2.7. The remains of the eighth occupation level (Level 8) (fig. 13b)*

##### House XIa (loc. 75, 77, 81)

Excavation was undertaken under the floor level of a second occupation of this house, House XI b (see report 98/99). The stone layer considered as the floor of the second occupation was dismantled in Locus 75, as well as the wall of grave T.271 in locus 77. Large patches of red paint were uncovered on the floor of Locus 81.

Under the floor level, the filling of the former occupation consisted of a rather loose sediment, reddened at places, on top of a compact layer of melted bricks.

Two small openings were cleared between Locus 75 and 81 as well as between Locus 75 and 77.

##### House XX (locus 161)

Excavation of this 6,5 x 4,5 m building with compartments roughly 2,7 x 1,8 m was undertaken during season 1998-99. It was exposed to a maximum height of 0,75 m. The walls show a strong gradient, possibly the result of a phenomenon that led to its destruction. The ruins, which underwent erosion following a southwest-northeast slope, were subsequently thoroughly filled up with a very hard clay and mud brick mixture (see report 1998-99).

The eastern part of House XIV that had been built on top of House XX, during the next period (Level 9), was dismantled in order to demarcate and excavate properly the older remains in locus 161, filled with melted fallen bricks. This compact fill can be found both inside and outside the ruined house (Locus 162, 124 and 84), and is probably the result of a levelling of the ancient structures in order to build the new level of construction. The wide space between the western and the central blocks was used during the whole occupation of Level 8. It was used extensively as a graveyard and as a trash deposit and covers locus 69, 90, 109, 110.

##### Artefacts (fig. 95, 96)

In house XI, half of a grinding stone covered with ochre (MR.00.03.75.69) was found in the fill of locus 75, along with many fragmentary bone tools and stone implements in both Locus 75 and 77.

Most of the objects of this Level 8 come from the wide-open space used as a graveyard but where a lot of material seems to have been discarded. A very large quantity of bone tools, mostly awls, was recovered in the ashy and loose sediment covered with ochre (MR.00.03.109.194, 109.296, 109.416, 109.516, 109.517, 109.780, 109.875, 109.969, 110.146). A few stone chisels (MR.00.03.109.196, MR.00.03.110.147 and 341) and mortars were part of the assemblage as well as a few clay balls (MR.00.03.109.971 and 110.214).

Several figurines were found in the fill. A large human figurine of the foot-shaped type (MR.00.03.109.676) (fig. 283) was found in an ashy sediment 20 cm under grave 284, but no evidence suggests that it may have been associated with the burial, though it is big and perforated like the figurine in grave 258 (see report 98/99).

Another, smaller, clay human figurine found South of House XX is fragmentary, but shows an impression of an applied belt (MR.00.03.109.673).

A strange figurine in clay has the appearance of a canid head (MR.00.03.109.114).

In Locus 76, in a rather hard clay fill, a small straight clay figurine was found, 23 cm under grave T.283, covered with ochre and showing holes pierced through its body (MR.00.03.76.24) (fig. 281).

In the eastern part of MR.03 North, three bone tools were discovered in the open space Locus 187: a bone awl (MR.00.3N.187.02), a bone spatula (MR.00.3N.187.03) and a bone point (MR.00.3N.187.01).

Layers of ashes accumulated there when the structure was in ruined conditions and in the process of being buried into debris.

### 3. BURIALS AND GRAVE GOODS

Fifteen tombs were excavated this season in the southern trench MR.03 South and 51 tombs in the northern trench MR.03 North.

They had been dug in the deserted and eroded remains of former occupation levels thus cannot be associated with them. But as these burial episodes are intermingled with the occupation levels, each episode has followed a parallel classification, graveyard 1 being between occupation Level 3, and so on.

The observed depth of the pits leading to the funerary chambers is more or less 1 meter (less for the children); but since the graveyards have themselves been subjected to erosion or to accumulation of debris before the building of the architectures of the following level, one can by no means assert the exact elevation of the graves and therefore the precise altitude of the graveyards.

#### 3.1. The burials in Area MR.03 South

##### *Graveyard 1*

##### Burial T.514 (fig. 177, 318, 342)

A young female, 18-22 years old, adorned with a perforated stone pendant (MR.00.3S.514 01). Only the upper part of the body was excavated in the limits of the trench. It was found placed on a big lump of red ochre (MR.00.3S.514 02).

##### *Graveyard 2*

##### Burial T.513 (fig. 319, 336)

A male, more than 40 years old wearing two anklets made of calcite beads (MR.00.03 513 01 and MR.00.3S.513 02).

**Graveyard 3****Burial T.502** (fig. 139, 191, 337)

A male, 20-30 years old wearing a necklace made of cut *Dentalium* beads (MR.00.3S.502 05) and two anklets made of calcite beads (MR.00.3S.502 01 and 02).

The skeleton was also associated with a bone tool (MR.00.3S.502 04) and a disc-shaped stone object (MR.00.3S.50203).

**Burial T.504** (fig. 141)

A female, 16-20 years old, buried with three small caprids. The grave contained also a disc-shaped stone object (MR.00.3S.504.01).

The body was adorned with two necklaces made of shell and turquoise beads (MR.00.3S.504.02 and 03).

**Burial T.505** (fig. 142, 194)

An infant adorned with beads (MR.00.3S.505.01 and 02). A lump of red ochre was placed in the grave (MR.00.3S.505.03).

**Burial T.506**

An infant (0-6 months). Sex cannot be determined. Grave goods: a lump of red ochre.

**Burial T.507**

A female, 30-40 years old. No grave goods.

**Burial T.508** (fig. 143, 195, 320, 338)

An infant, 3-4 years old. Sex cannot be determined. The body was richly adorned with shell pendants (MR.00.3S.508.01 and 03), a belt made of shell and red stone and calcite beads (MR.00.3S.508.08) and an anklet and an armband made of shell beads (MR.00.3S.508.06 and 05).

Several flints and a lump of red ochre were also disposed near the skeleton.

**Burial T.509** (fig. 144, 196)

A male, 25-35 years old wearing a necklace made of stone beads (MR.00.3S.509.01).

A bone awl was also discovered in the tomb (MR.00.3S.509.02).

**Burial T.510** (fig. 321)

A male, more than 50 years old. No grave goods.

**Burial T.511** (fig. 322)

A male, 30-40 years old. A bone awl (MR.00.3S.511.01).

**Burial T.512** (fig. 323)

A female, 25-30 years old. No grave goods.

**Graveyard 4****Burial T.500** (fig. 137, 189)

An infant, 0,5-1,5 years old. Sex cannot be determined. A belt and a necklace made of shell beads were found on the skeleton (MR.00.3S.500.01 and 02)

**Burial T.501** (fig. 138, 190, 339)

An infant, 2-4 years old. Sex cannot be determined. A belt made of calcite beads and a lump of red ochre were found in the grave (MR.00.3S.501.01 and 04).

**Burial T.503** (fig. 140, 192)

A male, 20-25 years old. Apart from a shell bead, the imprint in bitumen of the centre of a basket was associated to this grave (MR.00.3S.503.02).

**3.2. The burials in Area MR.03 North*****Graveyard 3*****Burial T.572** (fig. 151, 207)

An infant, 1,5-2,5 years old. Sex cannot be determined. The ornaments consisted of a belt and a necklace made of shell beads (MR.00.3N.572.02 and 01). There was also a bone awl (MR.00.3N.572.03) and a tool made of antler (MR.00.3N.572.04).

**Burial T.578** (fig. 154, 212)

An infant, 0-0,5 years old. Sex cannot be determined. This individual was also richly adorned with two anklets made of calcite beads (MR.00.3N.578.01 and 06), with two necklaces made of shell (*Dentalium*) and stone (turquoise) beads (MR.00.3N.578.02 and 05) and with two armlets made of shell beads. The skull was found placed on a lump of red ochre (MR.00.3N.578.08).

**Burial T.579** (fig. 155, 213)

A male more than 40 years old and adorned with a belt made of calcite beads and a necklace made of shell (*Dentalium*) beads (MR.00.3N.579.01 and 02).

***Graveyard 4*****Burial T.582** (fig. 156, 215)

Altitude: 8,35 m. An infant, 1,5-2 years old, oriented E-W, head at East. Sex cannot be determined. Grave goods: This individual was richly adorned with two armlets (one at each arm), a necklace, a belt and an anklet made of shell beads (MR.00.3N.582.01, 02, 03, 04 and 05). There was also a large lump of red ochre (MR.00.3N.582.07).

**Burial T.583**

Altitude: 8,60 m. An infant, 0-6 months old, Sex and orientation cannot be determined. Grave goods: A set of 68 shell beads (MR.00.3N.583.01) was discovered; among them 59 were *Dentalium* sp.

***Graveyard 5*****Burial T.551** (fig. 146, 199)

An infant, 3-4 years old. Sex cannot be determined. Here also, the imprint in bitumen of the centre of a basket was found in the tomb (MR.00.3N.551.02) as well as a necklace made of shell beads (MR.00.3N.551.01).

**Burial T.552** (fig. 147, 200)

An infant, 1-2 years old. Sex cannot be determined. Several shell beads were parts of a necklace (MR.00.3N.552.01).

Burial T.556

A female, more than 40 years old. No grave goods.

Burial T.557

Foetus. No grave goods.

Burial T.561 (fig. 203, 324)

A female, more than 50 years old. One shell bead (MR.00.3N.561.01).

Burial T.575 (fig. 153, 210, 340)

Altitude: 9,30 m. A female, more than 40 years old, oriented E- W, head at East. Grave goods: The skeleton was uncovered with a necklace made of shell and steatite beads (MR.00.3N.575.04), a belt (MR.00.3N.575.03) made of shell and steatite beads.

There were some more isolated shell beads (MR.00.3N.575.01 and 02) and a fragment of a sickle made of two flint blades inserted in bitumen (MR.00.3N.575.05) (fig. 347).

Burial T.581 (fig. 214, 325)

Altitude: 9,05 m. A child, 3,5-5,5 years old, oriented E-W, head at East. Grave with wall. Grave goods: A young goat was deposited near the feet.

This individual was also buried with a necklace made of shell beads (MR.00.3N.581.01 and 02) and two stone objects (MR.00.3N.581.03 and 04).

The access pit to the funerary chamber is still visible in the section.

***Graveyard 6***Burial T.570

Altitude: 9,75 m. An infant. Secondary burial. Grave goods: a shell bead.

Burial T.576 (fig. 211)

An infant, 3-6 months old. Sex cannot be determined. The skeleton was adorned with a necklace, a belt and an armband made of shell beads (MR.00.3N.576.01, 02 and 03).

***Graveyard 7***Burial T.291 (fig. 132, 183)

Altitude: 10,55 m. A male, 25-30 years old, oriented E-W, head at East. Grave goods: 1 necklace made of shell beads (MR.00.3N.291.01).

Burial T.292 (fig. 133, 184, 326)

Altitude: 10,20 m. A male, 20-28 years old, oriented E-W, head at East. Grave with wall.

This individual was buried with a necklace made of shell beads (MR.00.3N.292.01).

Burial T.298

Altitude: 10,55 m. A perinatal. No grave goods.

Burial T.299

Altitude: 10,55 m. A perinatal. No grave goods.

**Burial T.550** (fig. 145, 198, 341)

Altitude: 10,43 m. A child, 3-4 years old, oriented NE-SW, head at Northeast. Grave goods: a necklace (MR.00.3N.550.03), a belt (MR.00.3N.550.01), 2 large anklets (MR.00.3N.550.04) made of shell beads and one small anklet made of shell and steatite beads (MR.00.3N.550.02).

**Burial T.558**

Altitude: 10,30 m. A young adolescent, oriented E- W, head at East. Sex cannot be determined because of the young age. No grave goods.

**Burial T.559** (fig. 327)

Altitude: 10,20 m. A female, 25-35 years old, oriented E-W, head at East. Grave goods: a lump of red ochre.

**Burial T.560** (fig. 149)

Altitude: 10,55 m. A male, more than 50 years old, oriented E- W, head at East.

Grave goods: 4 bone awls (MR.00.3N.560.01, 02, 03 and 05) and a pendant made of shell (MR.00.3N.560.04). This burial was buried above T.562

**Burial T.562** (fig. 149)

Altitude: 10,45 m. A young male, 14-17 years old, oriented N-S, the head was moved when the pit of T.560 was dug. No grave goods. This burial was perturbed T.560.

**Burial T.563** (fig. 205)

Altitude: 10,60 m. An infant, 6-9 months old, oriented NE-SW, head at Northeast.

Grave goods: a set of 3 beads made of shell and the imprint of a basket in bitumen.

**Burial T.566**

Altitude: 11,90 m. Perinatal, oriented N-S, head at South. The pit has cut the western wall of loc. 181. No grave goods.

**Burial T.567**

A female; more than 40 years old. No grave goods.

**Burial T.569** (fig. 328)

Altitude: 10,75 m. Infant, 9-15 months, oriented E-W, head at East, ochred. Grave goods: 3 beads.

**Burial T.573** (fig. 152, 208)

Altitude: 10,15 m. A female, 30-40 years old, oriented E-W, head at East. This individual was adorned with a belt with a pendant (MR.00.3N.573.02), an anklet (MR.00.3N.573.01) and headband (MR.00.3N.573.03) all three made of shell beads. A lump of red ochre was lying near the feet.

**Burial T.574** (fig. 209)

Altitude: 10,15 m. A female, more than 40 years old, oriented E- W, head at East.

Grave goods: A belt made of shell beads (MR.00.3N.574.01) and 2 flint blades (MR.00.3N.574.02 and 03).

**Burial T.580**

Altitude: 10,20 m. A female, 20-30-40 years old, oriented E-W, head at East. No grave goods.

### ***Graveyard 8***

#### **Burial T.232** (fig. 330)

Partially excavated in 1998.

Altitude: 11,37 m. Child, 8-10 years old, oriented E-W, head at East, ochred. Grave with wall. Grave goods: 1 necklace made of shell (*Cardium*) beads (MR.98.3N.232.01).

#### **Burial T.264** (fig. 125, 179, 329)

Altitude: 10,75 m. A female, of more than 40 years old, oriented E-W, head at East.

Grave with wall. Grave goods: a necklace (MR.00.3N.264.01) and a pendant (MR.00.3N.264.02) made of shell.

#### **Burial T.287**

Altitude: 11,10 m. An infant, 0-5 years old, oriented E-W, head at East. No grave goods.

#### **Burial T.288** (fig. 129, 331)

North, cutting through T.232. Ochred. Wall 1,25 m long, 0,20 m wide at the base, dislocated at the top; a broken, worn out grinding stone was incorporated in the wall. No grave goods.

#### **Burial T.289** (fig. 130, 181)

Altitude: 11,80 m. Infant (perinatal), oriented E-W, head at East, ochred. Grave with wall. Grave goods: 1 necklace made of shell (*Dentalium*) beads (MR.00.3N.289.04), 1 belt (MR.00.3N.289.01) and 2 anklets (MR.00.3N.289.02 and 03) made of shell (*Cardium*) beads.

#### **Burial T.293** (fig. 134, 185)

Altitude: 11,00 m. An infant, 2-4 years old, oriented E- W, head at East. Grave goods: a necklace made of shell beads (MR.00.3N.293.01).

#### **Burial T.294** (fig. 135, 186)

Altitude: 10,80 m. young female 14-16 years old, oriented E- W, head at East. Grave goods: a necklace made of shell beads (MR.00.3N.294.0 1) and a flint blade (MR.00.3N.294.02).

#### **Burial T.295** (fig. 136, 187)

Altitude: 10,85 m. A female, of 30-40 years old, oriented E-W, head at East. Grave goods: a headband (MR.00.3N.295.04), a necklace (MR.00.3N.295.01), a belt (MR.00.3N.295.02) and pendant (MR.00.3N.295.03) made of shell beads.

#### **Burial T.553** (fig. 201)

A female, more than 40 years old. Only one shell bead was associated with this individual.

#### **Burial T.554** (fig. 332)

Altitude: 11,62 m. Male, 30-40 years, oriented E- W, head at East. Grave with wall. No grave goods.

#### **Burial T.555** (fig. 148, 202, 343)

Altitude: 11,61 m. Male, over 50 years old, oriented E-W, head at East, ochred.

Grave with wall (partly collapsed on the dead). Grave goods: 2 baskets, 2 stone axes, and 1 small clay vessel.

Burial T.564

Altitude: 10,70 m. An infant, 5-7 months old, oriented E-W, head at East. No grave goods.

Burial T.565

Altitude: 11,60 m. Infant (perinatal), oriented E- W, head at East, lying on his back, ochred. Grave with wall. No grave goods.

Burial T.571 (fig. 150, 206)

Altitude: 11,27-11,33 m. Male, 30-35 years old, oriented E-W, head at East, ochred.

Grave with wall. Grave goods: 1 necklace made of shell beads (MR.00.3N.571.03), and 2 pendants in mother-of-pearl (MR.00.3N.571.01 and 02).

Burial T.577 (fig. 333)

Altitude: 11,35 m. Male?, 40-50 years old, oriented E- W, head at East, ochred. Grave with wall. Grave goods: 1 young goat.

***Graveyard 9***

Burial T.283 (fig. 334)

Altitude: 12,18 m. Child, 10-14, oriented SE-NW, head at Southeast, ochred. Grave with wall (partly collapsed on the dead). No grave goods.

Burial T.284 (fig. 126, 180)

Altitude: 12,25 m. Infant, oriented E- W, head at East, ochred. Grave with wall.

Grave goods: 1 (fragmentary) perforated clay vessel (MR.00.3N.284.01).

Burial T.285 (fig. 127)

Altitude: 11,97 m. Female?, c. 30 years old, oriented E-W, head at West. No grave goods.

Burial T.286 (fig. 128)

Altitude: 11,77 m. A female, of more than 50 years old, oriented E- W, head at East.

No grave goods.

Burial T.290 (fig. 131, 182, 335)

Altitude: 11,52 m. A male, of more than 50 years old, oriented E-W, head at East.

This individual was adorned with a necklace (MR.00.3N.290.02) and a belt (MR.00.3N.290.01) made of shell beads. A set of tools was found near the skull, partially covered by the wall. This set consists of two bone awls (MR.00.3N.290.06 and 09), two bone spatulas (MR.00.3N.290.04 and 10), two other bones objects, including a pendant with an incised decoration (MR.00.3N.290.07 and 08) (fig. 352), a flint blade (MR.00.3N.290.05), a chunk of galena (MR.00.3N.290.11) and a lump of red ochre.

Burial T.296

Altitude: 12,19 m. Perinatal, oriented E-W, head at East. Associated with grave T.229. No grave goods.

### Burial T.297 (fig. 188)

Altitude: 11,70 m. This feature consisted of a funerary deposit found without skeleton. This set comprised shell beads (MR.00.3N.297.01 and 02) a stone chisel (MR.00.3N.297.03) and a lump of red ochre (MR.00.3N.297.04).

### **3.3. Anthropological report (by A. Cucina)**

#### *3.3.1. Introduction*

The anthropological field season took place for a six-week-long period between January 12 and February 24, 2000, during which 66 human skeletal remains have been recovered. Overall state of preservation is not particularly good; bones are usually fragmented and frail and their consistency is often powder-like. Few remains were well preserved, in particular when the more fragile bones are concerned (i.e. ribs, vertebrae and pelvic bones). These skeletal segments are in fact hardly detectable in most cases.

Bones excavation was carried out by trying to increase the skeletal tissues' hardness and resistance with chemical solutions like Paraloid, which concentration was about 10.0%. Nonetheless the frail preservation, together with the hard consistency of the saltish soil, did not allow a complete and secure removal of the bones, which often broke down during the process. Bones were almost always flattened down, altering the ratios and often shape as well. Skulls in particular suffered from the above ground's pressure and, because of their inner shape and emptiness have always been recovered in smashed and broken conditions.

Burial patterns were various, nevertheless in all cases but one deposition was single. The only double case is anyway hardly detectable, for the state of preservation of the very young infant associated with the adult is extremely poor, only part of the skull is preserved, and this prevents from an accurate understanding of and reconstructing the whole funerary process.

Usually, the orientation of the skeletal remains is East-West, with the head set at the East side or about (cases of SE or ENE orientations are common in the necropolis). Rarely (five out of sixty-six), deposition was laid on a different orientation: two cases are North oriented, two others are South, and the fifth one is heading West. Decubitus, instead, does not show a common, highly repetitive pattern. The most frequently found side is the left, which occurred in 33 cases (50.0%), 10 out of 66 were on the right side, one case ventral, and as many as 15 deposition were laid on the dorsal side. Whereas decubitus was dorsal, arms and legs were almost anyway flexed or even crouched aside, usually leftward (only burial 506 showed an infant with both arms and legs straight along the dorsal-laid body). Head, as well, found always set on the side, it was looking frontward in grave 514 only. Very common is instead the evidence of red ochre around the body; only in four burials it was not detected. This colourful powder was usually found below the skeleton, particularly the skull, in several cases also above the bones. Ochre was not likely strewn on the body, rather it looked scattered around the burial, both below and above the individual.

A preliminary demographic analysis indicates that adults and sub-adults are equally represented. Thirty-one individuals are in fact adults, while two others show an age in between sub-adulthood and adulthood. The rest of the specimens (33/66) are clearly sub-adults. Within this group, most of them are younger than 5 years (27/33), with two foetal and four perinatal as well. Two individuals are between 5 and 10, and the last four are in their teen age. If the second individual, the infant found little represented and hardly detectable in burial 553, is considered, then the number of individuals recovered raises to 67, of which 34 are sub-adults.

Sex distribution indicates an equal presence of males (17 individuals) and female (18 individuals). Despite sex cannot be determined in sub-adults, two of them showed dimorphic traits clear enough to provide with sex estimation.

Clear and exhaustive determination of age at death was often prevented by the poor state of preservation. Indicators like cranial sutures, pubic symphysis, sternal end of the ribs, and proximal epiphyses of both humerus and femur were fragmented and missing in as good as all the cases. Teeth, on the contrary, were always sufficiently preserved to provide evidence of age at death. The degree of dental wear allows to infer age at death using the standards by Lovejoy (1985), but in this case it needed to be corrected since affected by their dietary intake and then higher than the Lovejoy's one. Calibration was done by comparing children's age at death from dental formation as well as long bones' length (both unaffected by diet) with their own degree of dental wear of already erupted crowns.

As regards stature, it has been calculated for all those individuals for whom it was possible to score at least one long bones' complete measure. Because of field measurements, calculated stature must be considered only approximate. It has been calculated according to the methods set forth by Olivier et al. (1978) and by Trotter and Gleser (1952). As from the enclosed table, mean stature for the male individuals ranges between 168 and 175 cm with higher values as high as 187 cm. Females, instead, range on average between 155 and 160 with values as high as 177 cm.

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### *3.3.2. The burials in Area MR.03 South*

#### ***Graveyard 1***

##### **Burial T.514 (fig. 318)**

Primary deposition of a young adult individual lying in a grave dug in the virgin soil (undertermined structure). The skeleton itself is still inside the section. Only the skull and the trunk from the elbows up has been excavated, all the rest still lies inside the ground. It is in a discrete state of preservation. Orientation is eastnortheast-westsouthwest, and head is at ENE. Decubitus is dorsal, arms, which are represented by the humeri only, seem to be crossing at stomach level. The body is laid over a very big clod of red ochre. Both shoulders are pretty much compressed laterally, indicating the short bound of the pit was even smaller than the actual body size, and it thus needed to be compressed in order to fit inside the grave. Cervical spine is bent upward, supporting the evidence of compression that forced the head to stay at a higher level.

Sex determination was assessed on the skull's and humerus' traits, and can be estimated to be female (F). Age at death, from dental eruption of the third molar, as well as from dental wear, is 18-22 years.

Measures from the humerus length indicate an approximate stature of 147-153 cm.

#### ***Graveyard 2***

##### **Burial T.513 (fig. 319)**

Primary deposition of an adult individual. The body, lying on its dorsal side, is East-West oriented, head at East, and shows evidence of red ochre. It is overall fairly sufficiently preserved, and almost complete, though bones are full of salt and concretions. Arms are crossing over the stomach, particularly the left one. The legs are flexed rightward, and their tightness points out evidence of forcefulness into such position. Feet are, in fact, close to the pelvic bones, mostly the left one. The skull was not smashed down, and is in a semi-vertical position. This could be due to either something working as a pillow below, or simply the bounds of the grave that kept it in place preventing from falling backward.

Sexual dimorphic traits indicate the individual is a male (M), whose age at death, estimated through the analysis of dental wear, is older than 40 years. Measures from the long bones' length indicate an approximate stature of 175-180 cm.

### *Graveyard 3*

#### Burial T.502 (fig. 139)

Primary deposition of an adult individual lying on its dorsal side, with both legs flexed rightward. Orientation is East-West, head at East. The skeleton is complete, though it is poorly preserved, brittle and completely smashed down by the above soil's pressure. Both arms and legs are flexed right-direction, and none of them shows evidence of forcefulness into such position, particularly when legs are considered. Pelvic bones are still in situ, they did not fall apart during decomposition. This indicated that the body was completely covered with soil while filling the grave (i.e. decomposition occurred in a filled space). Bones are completely reddish in color, because of the high amount of red ochre present.

Sexual dimorphic traits clearly indicate the individual was a male (M), who died at an age between 20 and 30 years, according to dental wear.

Long bones' measures indicate an approximate stature of 168-170 cm.

#### Burial T.504 (fig. 141)

Primary deposition of an individual. The individual lying on its right side, is East-West oriented, head at East, and surrounded by red ochre. The skeleton is complete, though the state of preservation is very poor and brittle, because of the pressure from above that smashed it down. The body is naturally flexed, both arms in front of the face, the right palm up, the left down. Legs are flexed too, frontward and one above the other. What makes this grave extremely peculiar is the presence of three young goats buried together with the individual. The goats are complete. The first goat is laid in front of the individual's face, and its skull is lying on the left hand's palm. The two other animals are instead along the legs, one (the second) right below the knee, in front of them; the third one is lying behind the individual.

Sex dimorphic traits clearly indicate the individual is a female (F). Age at death has been inferred from dental eruption, long bones length and iliac crest fusion. Dentition shows the third molar well erupted (20.24 years), while the iliac crest is still undergoing the fusion process (14-16 years). But such second range is too young for this individual since long bones are by far too long to match this age. Thus, age at death, considering all the above indications, can be estimated between 16 and 20 years.

Long bones' measures indicate an approximate stature of 173-177 cm.

#### Burial T.505 (fig. 142)

Primary deposition of an infant set on its right decubitus, East-West oriented, head at East. State of preservation is discrete, but the skeleton is not fully represented, since tibias, fibulas and feet are missing, as well as the left forearm. Red ochre can be easily noted below and all around the body. Following a common funerary pattern, the skeleton is flexed in a very natural position.

Long bones length indicates 1.0-1.5 years of age, while a half-year underestimation is evidenced by dental formation and eruption. For this reason, age at death can be estimated to be between 0.5 and 1.5 years. Such infant age prevents from sex determination.

#### Burial T.506

Primary deposition of a very young infant, lying on its dorsal side, arms along the body, outside the rib cage's volume. Contrary to the common deposition pattern, legs are straight and not flexed. The skeleton, East-West oriented and with head at East, is sufficiently preserved and almost complete; only feet are missing. The skull is very brittle, and completely smashed down and hard to investigate for rotation. A very big clod of red ochre is set close to the head. The grave is close to burial 507, but is not related to it anyway, and must be considered as two independent events. The filling is in fact completely different, as well as the direction of the body. Secondly, burial 506 is set at the back of individual lying in grave 507, which is unusual for a double burial, at least in this context. Third, the two skeletons are relatively too far from each other, which is a further evidence of the two being separate, single burials.

Age at death has been inferred through the analysis of both long bones length, and dental formation and eruption. Results are consistent with each other, and indicate an age at death between new-born and six months (0.0-0.5 years). Infant age prevents any inference on sex.

#### Burial T.507

Primary deposition of an adult individual lying on its left side, East-West oriented, head at East. The skeleton, surrounded by red ochre, and still partly in the section, is fairly sufficiently preserved. What is visible is the skull, ribs cage, left arm, part of the hip bones and left femur. All the rest is hidden inside. Despite this, legs provide evidence of flexure frontward.

Sex determination indicates the individual is a female (F?). Inference of age at death has been possible only through the investigation of dental wear. Teeth, as often occurs in this context, are affected by a faster rate of attrition than present standard, and in the case of burial 507, this differential rate is evident from the molars. Age spans between 30 and 50 years, according to which molar is considered (the third being less worn than the first). Because of the higher attrition rate, in this case age at death can be estimated between 30 and 40 years.

Long bones' measures indicate an approximate stature of 165-170 cm.

#### Burial T.508 (fig. 143)

Primary deposition of a 3-4 years old child. The body, complete in all its segments, and well preserved, is surrounded by a lot of red ochre. Both arms are straight in front of the body, legs naturally flexed. The peculiarity of the grave is the huge amount of ornaments, as well as flints and a flint core laid as funerary objects. The young age of the individual indicates these objects (flints and flint core) were not related to its activity; rather they could be thought to witness more its parents' role and/or the individual's future role inside the group. But there is no evidence yet to support anyway this hypothesis, which must be considered as a mere assumption.

Age at death was estimated according to dental formation and eruption times, as well as long bones length. The former indicates a 2-4 years old child, while the latter 3-5. Thus, final age has been estimated as 3-4 years. Young age prevents any inference of sex.

#### Burial T.509 (fig. 144)

Primary deposition of an individual, with little evidence of red ochre, still partly in the section for at least half of its skeleton. The body, incomplete but in a good state of preservation, lies on its dorsal side, arms crossing over the stomach. Legs, instead, are evidently flexed rightward, as well as the skull. As for the lower limbs, only the left foot is detectable, and it shows a strong, forceful flexure of the legs, almost in an unnatural position.

Sex can be determined both from the skull and the arm, and the evidences detectable are of a male (M). Age at death, instead, can be investigated only from dental wear, which, corrected because of the higher rate of attrition, indicates an age at death between 25 and 35 years.

Measures of the humerus length indicate an approximate stature of 167-173 cm.

#### Burial T.510 (fig. 321)

Primary deposition of an individual. The skeleton is in a discrete state of preservation, surrounded by red ochre, and is East-West oriented, head at East. Almost all the body segments are well represented; only the left knee, the right femur and right hip bone are missing. The lack of the knee and femur is due to excavation process. The body is set on its dorsal side, hands crossing over each other at stomach level. Legs, curiously are flexed leftward-upward. In fact, they are not flat, at the same level as the rest of the skeleton, rather they are leaning up-left. Originally, the hands were lying below the right femur. Both legs are forcibly flexed into such position, one foot above the other and very close, almost in touch with the pelvis. This curled position seems to indicate that the individual was either wrapped with some organic fabric (no direct evidence of it is left), or was pushed inside a pit, which could have been too small to fit inside.

Sex determination clearly indicates the individual was a male (M). The extreme attrition affecting the occlusal surface of the dental crown can be referred to a more-than-50 years of age.

Measures of the long bones' length indicate an approximate stature of 165-170 cm.

#### Burial T.511 (fig. 322)

Primary deposition of a very well preserved individual. The skeleton, showing evidence of red ochre and with the lower limbs still partly in the section, is Southeast-Northwest oriented, head at SE. The decubitus is left, with a minor dorsal component, mostly at pelvic level, which is clearly flat. The trunk, on the contrary, is left, with both arms crouched one above the other, hands in front of the face. Forearms have fallen down, as well as many other skeletal segments, indicating the presence of an empty space into which decomposition occurred; nonetheless, no evidence is visible from the above section. This is put in evidence also by the lumbar spine that looks dislocated. Legs are crouched too, leftward, despite only the distal fourth of the tibias and the feet are outside the section.

All sexual dimorphic traits clearly indicate the individual was a male (M), who died at an approximate age of 30-40 years, calculated from the degree of dental wear, and slightly underestimated because of the usual higher-than-actual-age degree of attrition.

Measures from the long bones' length indicate an approximate stature of 183-187 cm.

#### Burial T.512 (fig. 328)

Primary deposition of an adult individual. The body, Southeast-Northwest oriented, head at SE, shows little evidence of red ochre. The skeleton is very well preserved, with very hard and compact bones. It is as good as 100% complete; only the skull and the right hand still inside the section. Side was dorsal, with a minor left component; arms were both flexed left, as well as the legs. The mandible is dislocated as to the skull, which seems to have fallen backward, but this cannot be confirmed since it is still in the section, and not well detectable.

The right part of the body, along the northern side of it, is clearly limited by the grave's bound. Bones are kept in position, without falling down.

The analysis of sexual dimorphic traits provides evidence of a female (F), whose age at death, estimated from the degree of dental wear, was between 25-30 years.

Measures from the long bones' length indicate an approximate stature of 155-160 cm.

#### Burial T.572 (fig. 151)

Primary deposition of a child. The skeleton, ENE-WSW oriented, shows the head at ENE. It is complete, surrounded by red ochre, and overall state of preservation is discrete but fragmentary. It lies on its right side, the right arm is along the body, the left one runs along the rib cage and merges right

so that hands cross each other at wrist level. Legs are flexed frontward, and the overall position is very natural and unforced at all.

Determination of age at death was assessed through the analysis of dental formation and eruption as well as long bones' length. Both results are consistent with a 1.5-2.5 years of age. Sex, because of the young age, cannot be determined.

#### ***Graveyard 4***

##### **Burial T.500** (fig. 137)

Primary deposition, altered in ancient times, of a 0.5-1.5 years old infant. The skeleton looks to be East-West oriented, head at East. It is poorly preserved, and frail. Part of the skeleton is still in the section, and the segments represented outside are part of the skull, the right arm, some ribs and vertebrae; little evidence of red ochre can be noted only below the skull. The rest of the body is still inside, and the section itself does not show any evidence of walls close to the body. This means it was laid in a normal grave. Body's position can be hardly detected, because of the state of preservation. Anyway, it could be dorsal (???) according to the relative position of right arm and ribs.

Age at death was estimated through the analysis of long bones length. Sex, because of the very young age, cannot be determined.

##### **Burial T.501** (fig. 138)

Primary deposition of a 2-4 years old child. The body, poorly preserved, is set on its left side, East-West oriented and with the head at East. Despite the overall preservation, the skull has maintained its shape and is well preserved. Red ochre can be noted on the bones, but not around, though this could be due to the process of excavation. The left arm is straight, along the body, in front of it. The right one, instead, runs above the rib cage, and merges 90° towards the left forearm. Both legs are flexed, one above the other. Limbs position does not seem to be forced anyway.

Age at death, calculated according to dental mineralization and eruption, indicates 2-3 years, while from long bones it can be estimated to be 2-4 years, which can be considered the proper, more reliable final range. Sex, because of the young age of the child, cannot be determined.

##### **Burial T.503** (fig. 140)

Primary deposition of a young adult male set on its left side. The skeleton is complete, but its state of preservation is fragile and poor. The body, covered with red ochre, is Southeast-Northwest oriented, and the head is at Southeast. Arms are tightly bent, with both hands in front of the face. Legs are flexed one above the other, showing no evidence of forcefulness into such position.

Age at death has been estimated according to dental wear, and to the degree of morphological remodelling of the pubic symphyseal face. Both indicators indicate the individual deceased when he was 20-25 years old. Sex, according to many indicators, can be assessed as male (M).

Long bones' measures indicate an approximate stature of 173-178 cm.

### ***3.3.3. The burials in Area MR.03 North***

#### ***Graveyard 3***

##### **Burial T.578** (fig. 154)

Primary deposition of an infant individual set on its right side. The skeleton, little represented and poorly preserved, is East-West oriented, head at East. Arms are along the body, the right in front of the rib cage, the left behind. The head lies on a base pillow-like made from a red ochre clod.

Age at death has been determined through long bones' length, and corresponds to 0.0-0.5 years (birth – 6 months). Sex, because of infant age cannot be determined.

##### **Burial T.579** (fig. 155)

Primary deposition of an adult individual. The skeleton, East-West oriented, head at East, shows evidence of red ochre. Decubitus is right, the right arm running straight along the body in front of the rib cage, the left one instead partly flexed rightward shows the hand in touch with the right forearm. Legs, instead, are flexed rightward, one above the other, tightly bent though not forced. Part of the skeleton, theoretically complete, is still in the section. It is poorly preserved, brittle and smashed down. Sex estimation indicates it was a male (M??), who deceased at an age older than 40, according to dental occlusal wear.

Long bones measures indicate an approximate stature of 170-177 cm.

#### ***Graveyard 4***

##### **Burial T.582** (fig. 156)

Primary deposition of an infant. The skeleton is laid down on its right side, East-West oriented, head at East. State of preservation is poor and fragile; skull ribs, upper and lower limbs are the only remains. Left humerus is along the rib cage, the forearm flexing right, while the right arm is fully along the body throughout its whole length. Legs are bent, and the overall position looks very natural.

A very big clod of red ochre is set in front of the skull. Determination of age at death was assessed through the analysis of both long bones' length and dental formation and eruption. Both indicators provide consistent results, thus age can be estimated to be 1.5-2.0 years. Sex, because of the young age, cannot be determined.

##### **Burial T.583**

Bones from burial T.583 were indeed recovered among the flotation materials. This could have been caused by an unwilling and unnoticed removal of the burial. The few bones available, fragments of the skull, ribs and long bones, are well preserved. The ulna's and femur's length indicate an approximate age at death between 0.0 and 0.5 years (birth – 6 months). Nothing else can be inferred from it.

#### ***Graveyard 5***

##### **Burial T.551** (fig. 146)

Primary deposition of a child laid on its left decubitus, East-West oriented, head at East. The skeleton is fragile and fairly complete, distal half of the left femur, knees and left hand missing. It lies on a layer of red ochre. Both arms are along the body, the right one lying on the trunk and the hand behind the hip bone; the left one runs straight in front of the body. Femurs are crouched frontward, tibias forming a 45° angle with them. Lower limbs' flexure is anyway very natural and unforced. The right foot is set below a bitumen basket which still covers it.

Estimation of age at death, assessed through the analysis of both dental formation and eruption, and long bones length, indicates the child died when it was 3-4 years old. Sex, on the contrary, hasn't been determined because of skeletal sexual traits haven't developed yet.

##### **Burial T.552** (fig. 147)

Primary deposition of a child set on its left side, but with a ventral component as well since the right scapula is well above the rib cage. The grave is East-West oriented, head at East and is along a corridor in between two burials houses. The skeleton is theoretically complete, but state of preservation is less than sufficient. It lies on a layer of red ochre. Left arm moves straight in front of the body, the right one, flexed, crosses the left and its hand is in front of the face. Legs are flexed, the right above the left one, feet in contact with each other, and position looks very natural, unforced.

Estimation of age at death, assessed through the analysis of both dental formation and eruption, and long bones length, indicates the child died when it was 1-2 years old. Sex, on the contrary, hasn't been determined because of skeletal sexual traits haven't developed yet.

Burial T.556

Primary deposition of an adult individual. The deposition has an East-West orientation and the head is at East. The skeleton, very poorly preserved, is represented by the skull, upper limbs and few fragments of the lower limbs and hip bones. Despite the state of preservation, it was possible to detect the relative position; the decubitus was left, arms flexed upward, and hands were in front of the face, but flexure did not look to be tight. On the contrary, legs seemed to be forcibly flexed backward.

Some 25-30 cm above the chest of this individual, the remains of an infant came to light while picking and removing the soil. Unwillingly, the infant was completely removed and set apart. This prevented any possible investigation of the relationship between the two graves. An *a-posteriori* deduction would support the hypothesis that the two are independent events, and burial 556 is not to be considered a double one. This because 30 cm distance between the two remains seem to be too many for a double deposition.

Sex determination is based mostly on the general appearance and texture of the bones which look smooth and not sturdy. This could indicate the individual was a female (F??), who died when she was older than 40 years, according to the degree of dental wear.

Burial T.557

Very few frail remains from a very young individual came to light during the excavation. They were unwillingly removed by the pick. This prevents any kind of information and assessment about the typology of the burial, orientation and so on. The clod was removed about 25-30 cm above the level of burial T.556. The humerus, a small portion of radius, ulna, femur, pelvis, as well as few fragments of the vertebral body remain; all sufficiently preserved. The length of the humerus indicates it was a foetal individual of course of unknown sex.

Burial T.561 (fig. 324)

Primary deposition of an individual. The skeleton is East-West oriented and the head is set at East. The body, in a poor state of preservation, and little surrounded by red ochre, is lying on its left side, face looking south. It is as good as fully complete, only the right forearm and the right pelvic bones are missing. The left arm is flexed upward, with the hand touching the forehead; the right one, instead, runs along the body just to merge left below the rib cage. Interestingly, despite the absence of the forearm, it can be noted that the hand is forcibly flexed backward, in a very unnatural position, almost to disarticulate the wrist. On the contrary legs, which are flexed leftward as well, are in a natural position.

Determination of sex indicates the individual is a female (F), who can be assessed to have died older than 50, according to dental wear.

Long bones' measures indicate an approximate stature of 164-170 cm.

Burial T.575 (fig. 153, 340)

Primary deposition of an adult individual East-West oriented, head at East. The skeleton, slightly surrounded by red ochre, is very poorly preserved; the brittle and extremely fragile bones present correspond to all the skeletal districts, though not complete. The body lies on its dorsal side, the vertebral spinous and transverse processes are in fact face-down. Legs and arms are leftward, the first ones are flexed tight but likely unforced, the second ones instead run along the body, in front of it.

Sex determination was assessed through the analysis of pelvic and mandibular bones. Both clearly indicate the individual is a female (F), who, according to dental wear, deceased when she was older than 40.

Long bones' measures indicate an approximate stature of 150-155 cm.

Burial T.581 (fig. 325)

Primary, sufficiently preserved deposition of a child, whose grave consists of a pit, wall and funerary chamber. The skeleton, lying on its left side, is East-West oriented, head at East. It is almost

complete and shows evidence of red ochre. Part of the wall fell over the body, which is anyway detectable for its position. Left arm is along the body, slightly flexed frontward, the right humerus runs along the rib cage and the forearm merges left touching its left counterpart. Legs are flexed too, one almost above the other, with no evidence of forced position. The remains of a goat cover the feet.

Age at death, according to long bones' length corresponds to 4-6 years, while dental formation and eruption provide an estimation of 3-5 years. Overall, it can be estimated to be a 3.5-5.5 year old child, whose sex, because of the young age, cannot be determined.

### ***Graveyard 6***

#### **Burial T.570**

Secondary deposition of an infant showing only the skull, and part of the iliac bone. The turf was removed all together, and this prevents any assessment of its position and orientation. The state of preservation of the few bones available is sufficient. Its small size indicates it is an infant, but neither precise age at death, nor sex can be estimated.

#### **Burial T.576**

Burial T.576 can hardly be detected whether being primary or altered deposition. The skeletal remains belong to an infant in a very poor and fragmentary state of preservation, which prevents detailed investigations. Only orientation can be estimated, East-West – head at East, since allowed by the presence of part of the skull, few ribs and the humerus. A pick during the excavation made the matter even worse. Bone position also indicate the decubitus was likely left. As common in this site, red ochre could be detected in the grave.

Humerus measure was taken from the bone's silhouette and indicates the infant died at an approximate age of 3-9 months. Sex, because of the infant age, cannot be estimated.

### ***Graveyard 7***

#### **Burial T.291 (fig. 132)**

Primary deposition of an individual set in a grave which was probably associated with a wall. A very fragile and poorly preserved skeleton, surrounded by red ochre, is East-West oriented, head at East. All the skeletal portions are anyway represented. It is lying on its left side, with both arms and legs flexed. Legs are one above the other, in a natural, unforced flexure. Left arm is bent upward, the right one is along the trunk, above the ribs, and 90° flexed frontward. The right hand, in particular, shows evidence of a forced, unnatural flexure downward. This indicates the presence of a possible element delimiting the chamber. From the section, such element is likely to be the wall, the same as in burial T.232 where the similar position was indeed confirmed by the evidence of a wall.

Sex determination indicates the individual is a male (M??). Age at death has been calculated from the degree of dental wear which, considering the calibration due to the excessive wear on the posterior teeth, can be estimated between 25 and 30 years. This can be confirmed by the presence of the line of fusion of the humerus' head.

Long bones' measures indicate an approximate stature of 172-175 cm.

#### **Burial T.292 (fig. 133, 326)**

Primary deposition of an individual whose grave is associated with a structure consisting of a pit, wall and funerary chamber. The skeleton, surrounded by red ochre, East-West oriented, head at East, is well preserved and completely represented. It is set on its left side with a strong ventral component, since the right scapula and the vertebral spines are clearly visible above the rib cage. Both arms and legs flexed left towards the entrance of the chamber. Both arms are bent upward with the left hand in front of the face, while the right one is forcibly bent with humerus and forearm bones in touch with one another. Such is the only evidence of forceful position; the rest is naturally flexed.

Sex determination indicates that the individual is a male (M), Age at death has been calculated through the analysis of the degree of dental wear. The very heterogeneous rate of attrition indicates a range between 20 and 35 years of age. At the same time, unfused distal epiphyses of both radii and ulnae, and the clear fusion marks along the iliac crest, indicate a much younger age than from teeth. On average, the individual can be estimated to have died between 20 and 28 years. Long bones' measures indicate an approximate stature of 155-160 cm.

#### Burial T. 298

Primary disturbed deposition of a very young infant. Burial is likely to have been commingled in ancient times. Only few fragments of the skull, left arm and hand are left. These indicate the orientation as West-East, head at West. The position of the left arm, still in anatomical connection, support the evidence of it being primary, but disturbed. Such disturbance occurred anyway in antiquity, since the humerus is split in two parts, slightly separated from each other; the marks left in the soil by the two mid-shafts clearly indicate the event was not caused by accident during the excavation. Long bones indicate an age at death as foetal/perinatal.

#### Burial T.299

Primary deposition of an infant which was unwillingly removed for most of its body during the excavation. Only the humerus, a small portion of ulna in connection with the humerus, few ribs and vertebrae remained in situ. Orientation is no longer detectable. Preservation is sufficient, though bones are frail. Red ochre is clearly visible below the bones. Age at death, from humerus length, is perinatal.

#### Burial T.550 (fig. 145)

Primary deposition of a child laid on its right side, Northeast-Southwest oriented, head at NE. The skeleton, almost complete and in a fairly good state of preservation, lies on a large layer of red ochre. Both arms are along the body, crossing over in front of the pelvis. Femurs are crouched frontward, tibias forming a 90° angle with them. Both upper and lower limbs' flexure is anyway very natural and unforced.

The child, showing a lot of ornaments, has been estimated to be 3-4 years old, both from dental formation and eruption, and from long bones length. Sex, on the contrary, hasn't been determined because of skeletal sexual traits haven't developed yet.

#### Burial T.558

Burial T.558 was partly under a house wall, so that only the skull, the mandible and few ribs and vertebrae are available, all in a poor state of preservation. The original position is hardly detectable, as well as the presence of red ochre, but orientation is East-West, head at East. Bones look slightly commingled, so that the deposition can be considered primary but disturbed. Age at death has been assessed through the analysis of the third molars eruption stage. They indicate the individual died when it was 14-16 years old; sex because of the young age, cannot be estimated.

#### Burial T.559 (fig. 327)

Primary deposition. The individual, lying on its left side, is East-West oriented, and head is at East. Skeletal segments are all represented, but very frail and little preserved. Position looks foetal, both arms and legs are bent frontward; none of them shows evidence of forcefulness into position. Red ochre was evident, as well as a big clod of it below the left foot.

Estimation of sex was assessed as female (F), who died when she was 25-35 years old, according to dental wear.

Long bones' measures indicate an approximate stature of 155-160 cm.

Burial T.560 (fig. 149)

Primary deposition of an adult individual inside the ruined house XXIV. The skeleton, surrounded by red ochre, in sufficient, but frail state of preservation, lay on its dorsal side, East-West oriented, head at East. Grade of completeness is as good as 90%, only the distal portions of the femurs, as well as the proximal ones of the tibias are missing. Left arm runs along the body, flat onto the deposition plane, the right one merging towards the left. Legs are both flexed leftward; although knees are missing, it can be stressed that feet were forcibly backward, close to the pelvis. The digging of this grave disturbed another pre-existing one, set below (T.562), and caused the removal of the skull of the first one, which was set apart. The head looks to have partly collapsed down, towards the chest, probably due to the presence of something below working as a pillow.

Sexual dimorphic traits clearly indicate the individual was a male (M), who deceased when he was older than 50, according to the degree of dental occlusal attrition. Long bones' measures indicate an approximate stature of 161-167 cm.

Burial T.562 (fig. 149)

Primary deposition of a sub-adult individual whose grave was dug inside the ruined house XXIV. The skeleton, East-West oriented head at East, shows evidence of red ochre around.

It is almost complete, only the knee and part of the skull are missing, nonetheless it is well preserved. The skull was removed from its original position and set aside when, in ancient times, burial T.560 was excavated. This is also confirmed by the presence of the cervical spine, mostly the atlas and the second one, spread in the tomb. The body lies on its dorsal side, left hand set on the trunk, the right one bent upward and close to where the head originally was. Legs, instead, are naturally flexed right, higher than the rest of the body.

Age at death has been estimated through the analysis of dental formation and eruption, as well as from the degree of epiphyses fusion. These indicators are consistent with each other, and provide an age of 14-17 years. Despite the juvenile age, sex has been determined as well, though with some degree of uncertainty, and corresponds to a male (M???)

Burial T.563

Primary deposition of an infant individual. The skeleton, very poorly preserved and completely smashed down, is Northeast-Southwest oriented, head at NE. The body, fully surrounded by red ochre, is represented by the skull, ribs, humerus, femurs and portions of both tibias. State of preservation allows to detect the body's position only, which is on its right side. Only femur's length can be measured, and its dimension indicates the infant died when it was 6-9 months old. Sex, because of the infant age, cannot be determined.

Burial T.566

Primary disturbed deposition of an infant individual laid on its left side. The grave is Southwest-Northeast oriented and the head is at SW, it was dug very close to a house wall. The skeleton, surrounded by red ochre, is very poorly preserved, partly because of the frail conditions, and partly because it was unwillingly removed by a pick. Several fractures in the ground affected the remains which so far consist of part of the skull, a portion of the left forearm, of the femur and both tibias, and few bones from the feet. Age at death has been calculated through the analysis of both femur's length, and of dental formation. Results are in agreement with each other, and estimate a perinatal age. Sex, because of the infant age cannot be detected.

Burial T.567

Primary deposition of an adult individual laid on its left decubitus. The grave is East-West oriented, head at East, and shows clear evidence of red ochre. It was dug inside house 27, room 180. The skeleton is very poorly preserved, and is not complete. The skull, as well as feet, hands, part of the

pelvis and the right humerus are missing. Arms are tightly flexed, hands close to the skull. Legs are flexed too, but they don't show evidence of forced position, rather it looks very natural.

Determination of age at death was assessed through the investigation of dental occlusal wear, which indicates the individual died when it was older than 40. Sex, instead, is more hardly determinable, for the state of preservation prevents from accurate analyses. Despite this, general robusticity, as well as some minor indications from the silhouette, could indicate the individual as a female (F???)

Long bones measures indicate an approximate stature of 161-167 cm.

#### Burial T.569 (fig. 328)

Primary deposition of an infant individual. The skeleton, lying on its left side, is East-West oriented, head at East. It is brittle and poorly preserved, though complete. Both arms are straight in front of the body, while legs are slightly flexed. The overall position is anyway very natural. The pit was excavated on an already-existing wall, and such evidence comes from the slightly different levels on which the body, still in anatomical connection, lies. A large layer of red ochre is evident, from the hands down. It looks thick and covering the body. It may likely represent a fabric or leather, ochre dye red, that covered the body at the moment of deposition.

Age at death was estimated by analyzing both dental formation and eruption, and long bones' length. Both results are consistent with an 9-15 months age at death. Sex, because of the infant age, cannot be determined.

#### Burial T.573 (fig. 152)

Primary deposition of an adult individual. The skeleton, lying on its left side, is almost complete, but brittle, fragmentary and poorly preserved. Orientation is East-West, head at East. A lot of red ochre can be noted around the body, and a big clod of it is below the legs. Both legs and arms are flexed, the latter going upward, forearms being in front of the face.

Sex was determined as female (F), who died when she was 30-40 years old, according to dental wear.

Long bones' measures indicate an approximate stature of 145-155 cm.

#### Burial T.574

Primary deposition of an adult individual, still partly in the section. The grave is East-West oriented, head at East. The skeleton is very poorly preserved, and bones, surrounded by red ochre, are brittle and smashed down. Only arms, femurs, skull and few ribs are present. It lies on its left side, arms flexed upward, both palm facing the skull; legs are flexed too, and all looks to be in a natural, unforced position.

Dimorphic traits do not show clear evidence of sex, they tend to be neutral. Nevertheless, the overall gracility of the bones indicates it could be a female (F???), who died when she was older than 40, according to dental occlusal wear.

#### Burial T.580

Primary deposition of an adult individual East-West oriented, head at East. The skeleton, laid on its left side and showing evidence of red ochre, is extremely poorly preserved and little represented. Only are part of the skull, arms, legs and hip bones present. Arms are flexed upward, the left one particularly tight. Legs are flexed too, though position looks natural. The vary bad consistency prevents particular investigations.

Sex has been detected to be female (F?) from several dimorphic indicators. Age at death, on the contrary, has been estimated only through the analysis of the only tooth left, the maxillary right canine, the wear of which indicates an approximate age between 20 and 30 years.

Measures of the femur's length indicate an approximate stature of 155-160 cm.

**Graveyard 8****Burial T.232** (fig. 330)

Burial T.232 is a primary deposition originally excavated during the 1998 season. Only the skull and the trunk were unearthed at that time. During this season, the rest of the body has been uncovered. The grave is associated with a wall. It is a primary deposition in which the body, in a good state of preservation, was represented by both forearms, the hip bones and the legs. It was lying on its left side, East-West oriented, head at East looking South; the left arm was palm up along the wall, the right one was 90 degrees bent frontward, and the hand was forced in its bent position. It in fact forms a 90 degrees angle with the forearm. It seems the hand was forced into such position, at the limits of de-articulation, in order to seal the chamber with the wall. Both legs are instead flexed backward but not forced. Decomposition occurred in an empty space, as witnessed by the presence of the wall and associated funerary chamber

The previous (1998) determination assessed an age at death of 6-8 years, from dental formation and eruption; the age estimation from long bones length is instead between 8 and 10 years of age. On the contrary, sex determination cannot be assessed because of the young age of the individual.

**Burial T.264** (fig. 125, 329)

Burial T.264 was detected and its number assigned during the 1999 field season, but indeed excavated during the 2000 year season. The grave is associated with a funerary structure represented by a pit, wall and funerary chamber. The skeleton, surrounded by red ochre, is frail and poorly preserved, though it is fully represented in all its districts. Primary deposition of an individual lying on its left side, East-West oriented, head at East and looking South. Both arms are bent upward, hands tightly close to each other in front of the splanchnocranium. Legs are also bent, forming a 45° angle with the hip bones do not show any evidence of forcing into such position, which rather seem to be very natural. Decomposition occurred in an empty space, as witnessed by the presence of the wall and associated funerary chamber.

Despite the poor preservation, it was possible to detect many indicators of sexual dimorphism, which, together with the overall bones robustness, indicate the individual is a male (M). On the contrary, the state of preservation prevented from a clear determination of age at death. Only did dental wear provide with some information on age of the individual who can thus be estimated to be over 40 years old.

Long bones' measures indicate an approximate stature of 170-175 cm.

**Burial T.287**

Primary deposition of a very young infant whose skeleton was deeply affected and almost completely removed by a pick stroke that pulled out the whole turf. The skeleton, East-West oriented, head at East, is frail and poorly preserved; only few ribs, vertebral bodies, right and left arms, metacarpal bones were left in situ. The position of the arms indicates the decubitus was left. Removing the bones revealed the presence of red ochre.

Age at death was estimated through the analysis of bones length which indicates an age between 0.0 and 0.5 years. Such very young age prevents from determining sex.

**Burial T.288** (fig. 129, 331)

Primary deposition of an individual whose grave is associated with a structure consisting of a pit, wall and funerary chamber. Sex can be clearly determined as male (M), though a few indicators from the skull show a morphology more typical of females, but that can be due to normal inter-population biological variability. Age determination was calculated basing upon the degree of dental attrition, and can be estimated to be over 40 years.

The skeleton, surrounded by a big quantity of red ochre, lays partly dorsal partly left sided, South-North oriented head South and face is turned left. The skeleton is very well preserved, particularly the skull, which, opposite to the frequently smashed ones, still preserves its original shape,

particularly the forehead and the right parietal bone. Despite the left parietal bone is flattened down by the weight of the above soil, the skull is clearly dolichomorphic in shape, and the face is not prognathic with teeth protruding outward a little, though no measure can be taken. The back is lying dorsally, the left arm along the body. It is not perfectly flat, the shoulders look forced into such position, as well as the hand which is left-bent. The right arm was originally crossing the rib cage, but taphonomic reasons erased the presence of the humerus. The forearm slipped down following the decomposition, and the radius separated from the ulna. It in fact fell between the 6th and the 7th ribs, together with the hand which was found still in anatomically connected and in articulation with it, while the ulna between the 8th and 9th ribs. The presence of the hand in connection with the radius indicates the event occurred while the wrist ligaments were still strong enough to keep the articulation together. The rest of the body does not show particular evidences, even though body's compression inside the chamber can be noted. Such taphonomic evidence indicates decomposition occurred in an empty space.

The chamber cuts the pit of burial T.232 (excavated during the 1998 field season), some 30 cm above the bottom of the other one and along its west end. Contrarily to the rest of the soil, the one below the body is particularly hard and compact, which may due to some chemical elements during decomposition.

As long as the body's preservation allows, no evidence of traumas, diseases or fractures can be noted.

Long bones' measures indicate an approximate stature of 165-170 cm.

#### Burial T.289 (fig. 130)

Primary deposition of an individual whose grave is associated with a structure represented by a pit, wall and funerary chamber. The skeleton, extremely brittle and fragile, is East-West oriented, head at East; it is represented by the upper and lower limbs, ribs and few vertebrae. The left side can be understood by investigating the position of the legs which are semi-flexed frontward.

The body, showing clear evidence of red ochre all around, was lying on a ash layer, together with many animal bones. No ashes commingled to the volume of the body indicate it was set on them, and they were not part of the filling of the chamber. Arms position isn't clear, since they are likely to have been disturbed.

Age at death has been estimated through the analysis of both long bones length, and dental crown formation and eruption. Results are not consistent with each other, since long bones indicate a foetal age, while teeth a perinatal one. Of course, sex cannot be determined in such a young individual.

#### Burial T.293 (fig. 134)

Primary deposition of an infant, altered through time. Part of the skeleton was unwillingly removed during the excavation, and only the left arm is still in anatomical connection (which confirms the deposition as primary). Decubitus can hardly be assessed, while orientation is likely to be East-West, head at East. The skeleton is represented by the left arm, clavicle, fragments of ribs, vertebrae and mandible. What left is sufficiently preserved. Despite the commingled state, presence of red ochre can still be detected. Age at death was calculated according to long bones' length, as well as from dental formation and eruption. The former indicates an age between 2 and 3 years, the latter between 2 and 4 years. Hence, it can be estimated to be 2-4 years. The young age prevents from assessing sex.

#### Burial T.294 (fig. 135)

Primary inhumation of a very well preserved individual. The skeleton, East-West oriented, head at East, is clearly surrounded by red ochre all around the bones. State of preservation is very good, and all the body segments are represented, with the only exception of tibiae, fibulae and feet that had been cut out during 1999's season. The body was set on its left side, indeed flattened down by the above soil pressure. Both arms and legs are naturally flexed, no evidence of forcefulness.

Age at death was determined according to both dental formation and eruption, and to long bones length. Dentition indicates an age of about 15 year (14-16 years - third molars' roots formation), which is consistent with long bones, which indicate more than 14 year. Overall, age at death can thus be

considered to be 14-16 years. This age does not yet provide a reliable determination of sex, for sexual dimorphic traits are not yet fully developed; nonetheless, according to the greater sciatic notch, the individual is likely to be a female (F??).

#### Burial T.295 (fig. 136)

Burial T.295 is a primary deposition which has been only partly excavated because about half the body is still in the section. The body, East-West oriented, head at East, is fairly sufficiently preserved. Only the skull, trunk and the left arm are outside the section. The skull, not completely smashed down, shows to be dolichocranic, though no measure can be taken.

All sexual traits can be investigated from the skull since the pelvis is hidden inside, and they all indicate the individual is a female (F). Age at death, estimated only through the degree of dental occlusal attrition, and corrected mostly basing upon posterior teeth, is between 30 and 40 years.

The skull has been removed all in one bulky piece, in order to preserve a head-band decorating the head.

Long bones' measures indicate an approximate stature of 150-160 cm.

#### Burial T.553

Primary, double burial found set inside the walls of a buried house. It incidentally came to light during the work inside the room. It was partly removed while picking, so that few bones remained in situ. State of preservation is very poor, only part of the skull, right hip bone, femur and arm are left. The deposition is East-West oriented, head at East, and shows evidence of red ochre. The right arm is tightly flexed upward, and lies on a higher level than the rest of the body. It was likely laid on sort of a step or an already existing structure. About 15 cm below the right elbow, it was found the skull of a very young infant if not perinatal, very poorly presented, and extremely fragmented. Since only the infant's neurocranium was found, it is hard to assess for sure if the burial was indeed a double one; it seems anyway to be the most likely explanation.

The poor preservation does not allow the investigation of reliable sex indicators, the few ones present indicate the individual was a female (F???), who died at more than 40 years of age, according to the degree of dental wear.

#### Burial T.554 (fig. 332)

Primary deposition of an individual whose grave is associated with a structure consisting of a pit, wall and funerary chamber. The skeleton, showing little evidence of red ochre, is Southeast-Northwest oriented, and head is at SE. Decubitus is dorsal, with both legs and arms flexed leftward. Arms are very close to the skull, particularly the right one; the left one, on its own, is forcibly crouched upward (i.e. humerus and forearm bones are parallel and in touch with one another). Legs position, on the contrary, is naturally flexed. State of preservation is poor, all bones are flattened down by the above ground pressure, even though all skeletal segments are represented. A very interesting mark can be put in evidence at gum level, where it is clearly noticeable a deep, clean and smooth groove running all along the maxilla and mandible. It is artificially done, likely with a stick, possibly for cleaning purposes and after to relieve from itching.

Estimation of age at death has been estimated through the analysis of the degree of dental wear, which shows anyway several discrepancies throughout both arcades. Overall, it has been estimated to be between 30 and 40 years. Sex, basing upon few indicators and the general robusticity, is male (M).

Long bones' measures indicate an approximate stature of 167-173 cm.

#### Burial T.555 (fig. 148, 202, 343)

Primary deposition of an individual whose grave is associated with a structure which consists of a pit, wall and funerary chamber. The skeleton, showing evidence of red ochre, is East-West oriented, head at East, and lies on its left side. It is very poorly preserved; theoretically, all segments are present, but actually only the most resistant ones are somehow detectable. Right arm is bent upward, while the

left is laid along the body, almost to bound the limit of the chamber. Legs are flexed backward, and feet are almost in touch with the pelvis.

Sex has been determined as male (M), and age at death, according to the very high rate of dental wear, is older than 50.

#### Burial T.564

Primary deposition of a child lying in a grave associated with a funerary structure consisting of a pit, wall and funerary chamber. The skeleton is represented by lower limbs only, and their position indicates a East-West orientation with head originally at East, as well as a left decubitus. Overall state of preservation is sufficient. Age at death has been approximately estimated from femur's length, since part of the proximal epiphysis is missing. It anyway indicates a 5-7 years old child of unknown sex.

#### Burial T.565

Primary deposition of an infant. The grave is East-West oriented, and the skeleton has the head at East. The body is in a sufficient state of preservation, part of the skull, arms, legs, few ribs and vertebrae are present. It is surrounded by red ochre, and is set on its left side. The left arm is straight along the body, the right one instead going straight backward, although its position looks to have been slightly altered through time. Some taphonomic events occurred inside the grave, for feet are missing because of the presence of an animal den.

Long bones length indicates the infant died during its first year of life (0.0-1.0 years); sex undetermined because of the young age of the individual.

#### Burial T.571 (fig. 150)

Primary deposition of an adult individual whose grave is associated with a structure which consists of a pit, wall and funerary chamber. The skeleton, East-West oriented, head at East, shows evidence of red ochre underneath, and lies on its dorsal side. It is complete, but only long bones are sufficiently preserved; the more brittle bones of the rest of the body are evident but destroyed. Legs are left flexed, naturally set down. Flexure and forced position is instead evident in the left arm, which is bent upward, with humerus in contact with the forearm throughout its length. The right arm, on the contrary, is laid on the body, almost straight, hand on the pelvis.

Sex determination indicates the individual is clearly male. Age at death was assessed by dental wear and pubic symphysis remodelling. Both indicators show an age younger than 30 years; more precisely, dentition indicates about 30 years, the symphysis more than 30. Thus, age can be assessed to be between 30 and 35 years.

Long bones' measures indicate an approximate stature of 173-177 cm.

#### Burial T.577 (fig. 333)

Primary deposition of an adult individual whose grave clearly consisted of a pit, wall and funerary chamber. Moreover, a goat was laid at the individual's feet, the head above the tibia. The skeleton is East-West oriented, head at East, and is set on its left side. It is theoretically complete, in spite of the very poor and fragmented preservation. Bones are powder-like in a very saltish soil. Red ochre surrounded the body, indicating the depositional level. Despite part of wall collapsed over the bones, position can be detected as well. Arms seem to be flexed upward, while legs, flexed leftward, are not forced into position.

The goat itself was laid on its left side.

Sex determination likely indicates a male (M??), who passed away at an age older than 50, according to the very high rate of dental wear.

**Graveyard 9****Burial T.283** (fig. 334)

Primary deposition of a young individual set on its left side, southeast - Northwest oriented with head at SE. The grave is associated with a funerary structure represented by a pit, wall and funerary chamber. In such deposition the body, sufficiently preserved, and completely surrounded by red-ochre, is almost complete. Only the right hand and both feet were missing.

The individual, whose body's decomposition occurred in an empty space, showed both legs forcibly bent backward, with feet (when present) close to the hip bones. The right arm is 90° flexed frontward, while the left one, running straight along the body, delimited the space closed by the wall. This, in ancient times, had collapsed above the bones, completely covering the left arm, but being stopped by the rib cage.

Age at death was estimated through dental formation and eruption stages, as well as from long bones length. The first indicated an age between 10 and 12 years, while long bones between 12 and 14 years. Though dental formation is likely to be more stable than bones length, the final age at death can be estimated to be 10-14 years. Such young age, anyway, prevents from determining sex, since sexual dimorphic traits have not yet formed on the skeleton.

**Burial T.284** (fig. 126)

Primary deposition of an individual whose grave is associated with a funerary structure represented by a pit, wall and funerary chamber. The skeleton, East-West oriented, head at East, is frail and poorly preserved; left arm, hip bones, and lower limbs are completely missing. The body was set face down, ventral side with the head turned left and looking south. Both arms are on the back of the body, crossing each other at wrist level. The funerary chamber was filled with red ochre, and the mud-and-straw bricks closing it were also partly coated by ochre. Such coating cannot be related to decomposition that might have spread the ochre around, rather it seems intentional since the color on the wall can be found also at higher-than-the-body level. The wall slightly slipped toward the body and the more eastern brick fell over an uncooked clay tray, which is set in front of the skull.

Age at death was estimated through the analysis of both bones length and dental formation and eruption stages. Both indicate the individual died between 0.5 and 1.5 years. Such very young age prevents from determining sex.

**Burial T.285** (fig. 127)

Primary deposition of an individual. The skeleton, sufficiently preserved despite the superficiality, is set on the right decubitus, though the position of the trunk is almost dorsal. Left forearm and right hand are both missing. Arms are both straight, frontally-oriented, the right one flexed 90° upward. Legs are bent, and extremely forced backward. The left foot is in touch with the pelvic bones, the right one is slightly below. The feet show clear evidence of having been forced into such position since the angle they form with tibias and fibulas is 180°. They were very likely kept in such position by the end of the grave or by a fabric tightly wrapping at least the lower part of the body.

Sexual dimorphic traits do not show a clear evidence of it being either male or female, but the overall estimation indicates sex to be female (F??). Age at death was determined through the analysis of dental wear, corrected according to the higher rate of attrition shown by those teeth erupting earlier (M1 versus M3 for example). It indicates the individual likely died between 30 and 35 years of age, and the evidence of no fusion line around the head of the femur (line which disappears before age 30) confirms the individual died at about such age.

Long bones' measures indicate an approximate stature of 150-156 cm.

**Burial T.286** (fig. 128)

Primary deposition of an individual. The skeleton is very poorly preserved, and what remains is almost like the silhouette. Only the mandible, few ribs and the left humerus do remain in situ, and can be somehow analyzed, indicating this part of the body was not altered from its original primary

position. From this, it can be deduced that the decubitus was left, East-West oriented, head at East, though nothing can be assessed about head rotation. The position of the mandible indicates the face could have been southward. What remains of the left arm indicates it was 45° flexed frontward, with the humerus staying along the body; few cm of diaphyseal bone represent the ulna. Despite the preservation, removing the bones showed the presence of some red ochre below the body.

Very little can be said about sex, the few dimorphic traits from the mandible indicate it could be a female (F??). Age at death, instead, has been calculated through the analysis of dental wear, the very high rate of which indicates the individual died when she was over 50.

#### Burial T.290 (fig. 131, 335)

Primary deposition of an individual whose grave is associated with a structure consisting of a pit, wall and funerary chamber. The skeleton, surrounded by red ochre, East-West oriented, head at East, is very poorly preserved, brittle and very saltish. What remains of the body is the skull, arms, legs and some ribs. It is set on its dorsal side, except for the legs which are bent left towards the entrance of the chamber. The left arm is straight along the body, the right one is above the trunk and crosses it, with its forearm almost touching the left one. Legs are flexed too, particularly the right one which shows to have been forced into such position. It seems that this was due to the delimitation of the back side of the chamber and that the body was pushed inside, forcing to have it fit the narrow space. In such case, the funerary chamber would have been about 50 cm deep.

Sex determination indicates the individual is a female (F?), Age at death, instead, has been calculated through the analysis of dental wear, the very high rate of which indicates the individual died when she was over 50.

Long bones' measures indicate an approximate stature of 153-163 cm.

#### Burial T.296

Burial T.296 seems to have been strictly associated with burial T.229, excavated during the 1999's season. The reciprocal position of both burials does not clearly indicate whether they were actually associated or whether T.229 was dug close to T.296 but in a second, more recent time. The skeleton of 296, Southeast - Northwest oriented, head at SE, is completely surrounded by red ochre. Preservation is just sufficient and only upper limbs, some ribs and vertebrae remain, but enough to allow to detect position. The decubitus is left, with both arms along the body. The left one, straight and in front of the rib cage, the right one on the body and straight too. Vertebrae are behind the right arm, which confirms the position. Face was looking south, according to the mandible's orientation. Age at death can be estimated by taking into consideration both dental formation and eruption time, and long bones length. Dentition indicates the individual is perinatal/six months, long bones instead confirm the perinatal age. Thus, overall, the individual can be considered to have been in the perinatal class of age, which prevents from assessing sex.



Neolithic structures with the Kirthar Range in the background

- Third PART -

**THE EARLY NEOLITHIC PERIOD:  
AN OVERVIEW**



## CHAPTER 1

### THE KACHI/BOLAN AREA

#### 1. THE QUESTION OF THE LOCAL ARCHAEOLOGICAL ANTECEDENTS OF MEHRGARH IN THE KACHI/BOLAN AREA

It can be briefly recalled that when we undertook excavations at Mehrgarh in the 1974-75 winter, the existence of an aceramic Neolithic stage in the Indo-Iranian borderlands had been a long debated question. But so far the attempt made by W.F. Fairservis to convince his colleagues of the existence of an aceramic occupation in the deepest layers of the trench that he conducted at Kili Gul Mohammad, near Quetta, was not very successful. Though the successive layers of Period I, sealed by the later Chalcolithic deposits of Periods II and III, were 4 m thick, they were exposed at the bottom of the trench which was not larger than 1 sq. m (Fairservis 1956).

After the discovery in 1977 of the aceramic Neolithic settlement in area MR.03 at Mehrgarh, we began surveying the whole region in order to eventually spot similar or earlier occupations. Considering that the earliest levels of Period I in MR.03 area were found between 6 and 10 m below the present surface of the plain, the chance of discovering an earlier or even a contemporary settlement was very limited. Vast expanses of pebbles and black-varnished stones are covering the rocky slopes of the Bolan Basin. Even if the hilly areas overlooking the Bolan-Kachi basin must have offered favourable spots for hunting-gathering groups, the remains that they could have eventually left on the ground would not be easy to find.

However, Luc Wengler, when he was carrying his geomorphological analyse of the region, noticed the presence, above the three Holocene terraces forming the Bolan Basin, of a glacia of accumulated heterometric blocs mixed with gravels. This glacia is much older than the Holocene terraces. On the surface of this glacia, L. Wengler has collected about sixty tools probably coming, according to his sedimentological study, from nearby open sites. These tools (see the appendix) are made from a coarse chalcedony and include cores, flakes and blades among which some are of a Levallois type. As a whole these tools appear to belong to a mid-paleolithic industry very different and without any connection with the much later lithic industry of the Neolithic period of Mehrgarh (Jarrige 1986: 131, fig. 26, Wengler 1988).

Springs of bitumen have been located in the Bolan Pass in the oasis of Gokhurt, situated in the lower part of the Bolan Pass. The ground, around the bitumen springs, are strewn with flints. The flint-chipping technics seem more archaic than is the case in the earliest Neolithic levels at Mehrgarh. The archaic features of these lithic pieces are not enough to prove that they are very old. According to local tradition, caravans used to stop at Gokhurt to collect bitumen and, in some cases, to use it as unguent to cure some of the diseases of their dromedaries. These caravans could have produced some rather coarse blades to be used for some specific activities. But such an explanation, for which there is no record in the local traditions, seems unlikely. The debitage of the collected proto-blades, many of them with a black-varnished surface and obvious traces of use, combines several features indicating that this lithic industry pertains to a period earlier than the beginning of Period I at Mehrgarh. It can therefore be assumed that some people exploiting the resources of the piedmonts and of the slopes of the hills have conducted some activities near the bitumen springs of Gokhurt. But it is not possible to date precisely these surface collected flints. They nevertheless indicate the existence of local populations living in the Kachi-Bolan region in periods earlier than the beginning of the Neolithic occupation at Mehrgarh.

## 2 THE ENVIRONMENT OF THE KACHI/BOLAN AREA IN THE EARLY HOLOCENE

### 2.1. Climate and vegetation

The 1997-2000 program of excavations in the MR.03 area gave the opportunity to extend soil samplings in the Neolithic deposits within a palynological project, which had started as early as 1988. Lorenzo Costantini in collaboration with Alessandro Lentini, during the 1997-98 and the 1998-1999 field-seasons, could investigate the earliest levels of the Neolithic sequence in order to study the evolution of the vegetation cover in Central Balochistan during the Holocene period. As for quite a long time, extracting pollens in very arid areas had not been very successful, there was an obvious lack of information about Balochistan before L. Costantini and A. Lentini undertook the Mehrgarh project. They presented a summary of their work at the South Asian Archaeology Conference in Rome in 1997 (Costantini, Lentini 2001). More recently L. Costantini has published a synthesis on the environment in the Kachi/Bolan area in the early-middle Holocene (Costantini 2006: 167-178).

The question of possible climatic changes in what is often referred today as the Greater Indus system, including Balochistan, has been debated since the discovery of the Indus civilisation in the 1920s. For Sir Aurel Stein, the occurrence of many prehistorical sites, discovered by him in the hilly valleys and plateaus of Balochistan, implied better climatic conditions than today. But later on, many specialists thought that the climatic conditions had not varied to a large extent since the beginning of the Holocene. The probable degradation of the vegetation cover was, according to them, due more to human exploitation such as deforestation and overgrazing than to climatic variations. Therefore the palynological studies carried under L. Costantini's direction have brought a major contribution before the recent development of several paleoclimatic projects in different parts of the Indo-Pakistani subcontinent.

Resuming work in the MR.03 area after 1996 gave the opportunity to extend soil samplings from the cliff cut by the Bolan river, displaying in section the successive Neolithic layers and to set three columns cut in the sections inside the Neolithic occupations. We can just briefly sum up some of the results of this still on-going research. According to L. Costantini, the total count of pollen grains is quite significant, considering the nature of the deposit. As it could be expected, the pollen analysis shows that, from a palynological point of view, there is a common uniformity among the three columns. The results of the pollen analysis also show that, from the beginning of Period I till the beginning of Period IIA, the region was dominated by a semi-lacustrine or humid environment with a riparian vegetation, characterised by *Populus*, *Salix*, *Fraxinus*, *Ulmus* and *Vitis*, associated in a typical hydrophitic complex, arranged in dense gallery forests. A part of the Kachi/Bolan region was covered by annual herbaceous vegetation (mainly Gramineae and Leguminosae) forming large open areas, while stands of oak forest still probably grew in the upper slopes. This pollen analysis modifies to some extent the results of an anthracological program, which has been conducted by Stéphanie Thiébault. Her analysis indicated that *Tamarix* and *Mimosacea* were dominating during the Neolithic period and that species such as *Populus*, *Vitis*, *Salvadori* and *Oleacea* would occur only after the Neolithic, maybe in connection with the development of irrigation systems (Thiébault, 1988, 1989, 1992). From the pollens analysis we know that these species were already present in the early Neolithic levels. The occurrence of *Vitis* in the early Neolithic levels is worth noticing. But it is much later, during period VII at Mehrgarh in the early 3<sup>rd</sup> millennium BC, that a large amount of grape seeds and imprints of grapes were recovered.

No similar pollen analyses have been conducted in Balochistan. But L. Costantini and A. Lentini mention in their conclusion the pioneering studies by Gurdip Singh of the pollens and sediments from lakes in Rajasthan (Singh *et al.* 1974). Other researches have been carried out, east of the Indus Valley, in the paleolakes of the Thar Desert, at Lunkaransar, Didwana and Sambar. These lakes were filled with permanent water between 10.000 and 4800 BP due to winter precipitations brought by currents from the Mediterranean Sea, before a phase of desiccation marked by a strong

lowering down of the water table (Enzel *et al.* 1999). Pollen analyses from offshore cores in the Arabian Sea have provided more information on climate and vegetation changes from the Pakistani hinterland and Balochistan in particular. From two corings off the coast of the Indus Delta, one in 1990 and the other in 1993, pollen diagrams were obtained, providing a continuous sequence of climate and vegetation changes over the last 30.000 years (Ansari, Vink 2007). With the beginning of the Holocene, the spectacular increase of Gramineae is an indicator of the setting of a humid environment, which reaches its peak between 9000 and 7000 BP (7000 and 5000 BC). For the more recent periods, which do not directly concern us in this publication, the pollen diagram obtained from the cores from the continental margin off the Indus Delta indicates, according to Ansari and Vink, a gradual reduction of humidity between 5000 BP and 4000 BP. A more recent paper (Gupta *et al.* 2006) sums up the possible correlations between the Indian summer monsoon variations and the available archaeological data for the last 10.000 years. All these studies tend to confirm the existence of a humid phase between 8000 BC and 5000 BC which corresponds to the Neolithic of Mehrgarh, and then a transitional phase between 5000 BC and 2000 BC followed by a significant decrease of the rainfall, partly due to the weakening of the south-western monsoon.

## 2.2. The subsistence pattern

The 1997-2000 program of excavations has not brought major changes regarding the question of the early agricultural economy at Mehrgarh. In our previous excavations, the recovery of plant remains, charred seeds and other macro remains had been collected using a dry sieving method. A special effort was made in the four last seasons to conduct systematic water sieving tests under Margareta Tenberg's control. But such tests were not successful as regard plant remains as was already the case for the water sieving tests carried out during the 1978-79 season. They in fact yielded bits of charcoal, bones of small rodents and a huge amount of small fresh-water gastropods.

For the earliest levels, the documentation is mostly based upon plant impressions found on and inside mud bricks, which were collected, in the sounding MR.3T (Costantini, 1984). This sounding was one of the only places where the deepest Neolithic layers were reached before excavations were resumed in the 1996-97 winter. Lorenzo Costantini identified about 90% of the so far recorded imprints as naked six-row barley (*Hordeum vulgare nudum*). Less than 10% of the imprints are two-row barley (*Hordeum spontaneum* and/or *distichum*), six-row barley (*Hordeum vulgare*), einkorn/emmer (*Triticum monococcum/dicoccum*), emmer (*Triticum dicoccum*) and free-threshing wheat (*Triticum durum*).

The same results were obtained in the large trench MR.3S (formally MR.03 A1A) where the natural soil was also reached. The imprints of *triticum durum-aestivum* mark the beginning of cultivation of the tetraploid-hexaploid naked wheat, which will become an important crop by the end of the Neolithic. "By the end of the Neolithic the process of cereal cultivation was complete and the grain and barley underwent the peculiar local adaptation leading to a morphological convergence of the kernels of the two cereals today classified as *Triticum sphaerococcum* and *Hordeum sphaerococcum*." (Costantini, Costantini Biasini 1985: 26).

As regards the origin of cereal cultivation, we can quote L. Costantini again: « If we consider the earliest plant evidences from Mehrgarh we may assume that only a set of information (imprints of *Hordeum spontaneum*) still uncertain can be interpreted as an indicator of a possible exploitation of a wild local resource, while all the others indicate that agriculture was founded on domesticated species. This could mean that the first farmers reached the plain south of the Bolan river when the evolution of the main crops (mainly barley) already had happened, or that the evidence of a previous step in the selection of food plants from wild stands is still buried in the plain or in some other place in the region. » (Costantini 2006: 170). As regards cotton (*Gossypium* sp.), charred seeds have been identified by L. Costantini in the late Neolithic level of Period IIB in area MR.04. More recently, mineralized fibers of *Gossypium* have been identified in a copper bead from a burial of Graveyard 8

(Moulherat *et al.*, 2002). This is so far the earliest identification of cotton in the archaeological records.

One of the aims in resuming excavations in the MR.03 Neolithic area was also to extend the reference collection of faunal remains, especially from the early levels. Due to time limitation in the field, it was decided to shift the boxes of bones to Harappa with the American Mission, where R.H. Meadow was planning to study them. Unfortunately R.H. Meadow had to postpone the planned missions to Harappa. But it is worth pointing out that the water sieving tests that supplemented the traditional earth sieving failed to provide any significant amount of fishbone or small birds bones. Nevertheless the faunal remains from the early exposed levels in the course of the 1997-2000 program have brought, according to R.H. Meadow, confirmation of what he had noticed in a trench (MR.3T) where in 1979 and 1980 the natural soil was reached for the first time in the MR.03 area.

Therefore the work carried out during the 1997-2000 program confirms that hunting activities provided most of the meat in the early levels as it had been already stated long ago (Meadow 1981, 1984). The region of Mehrgarh offered a very favourable ground for hunting activities. As already mentioned, the site was located in an alluvial plain characterized in the early Holocene by a semi-lacustrine or riverine humid environment with riparian vegetation. An impressive amphitheatre of mountains surrounds the region with successive ecological zones from the plain and the foothills up to the slopes of ranges culminating more than 2000 m above the sea level. This geographical situation has enabled a community based at the Neolithic site of Mehrgarh to maximize variability in resources while minimizing the degree of mobility to exploit them.

Quoting Meadow (1998: 16) about the diversity of animal resources within the surrounding ecological zones of the Mehrgarh site: “the wild animal remains that dominate the earliest levels of the “aceramic Neolithic”...reflect this situation with 12 forms of “big game” represented: wild sheep (*Ovis orientalis*) and goats (*Capra aegagrus*) from the hills, gazelle (*Gazella bennetti*) from the foothills and plains, wild asses (*Equus hemionus*) and blackbuck (*Antilope cervicapra*) from drier plains, and nilgai (*Boselaphus tragocamelus*), large deer (*Cervus(?)duvauceli*), smaller deer (*Axis(?)axis*), boar (*Sus scrofa*), water buffalo (*Bubalus arnee*), wild cattle (*Bos namadicus*), and possibly elephant (*Elaphas maximus*) from better-watered areas». Due to the extension of the excavation in MR.03 area, the stratigraphy of the MR.3T trench, as it was recorded in the 1978-79 and 1979-80 reports (C. Jarrige *et al.* 1995: 244-246; 276-277, fig. 6.1), has now been included in the updated sequence. The layers from 17 to 13 of MR.3T belong to Level 1. In the diagram published by R.H. Meadow (1981: 149-179) we can see that between Level 1 (MR.3T 13 to 17) and the following levels there is a very significant decrease in the amount of bones of gazelles and other wild animals. Nevertheless the percentage of bones from wild species remains important till Level 7 (former layer 4 in the sequence of MR.3T), even if 50% of the fauna belong to goat, sheep and bovid.

Besides hunting activities, the first evidence of pastoralism is limited in the earliest levels to a few goats. In the 1981-82 report (C. Jarrige *et al.* 1995: 368, fig. 8.6, 8.7) two graves (T.287 and T.288), from Graveyard 3 in the updated sequence, contained each five complete skeletons of kids that had been disposed in a semi-circle around the legs of adult females. R.H. Meadow concluded that these juvenile goats were likely to have been domesticated. In the 1997-2000 program of excavations, a few more burials from Graveyards 2 and 3 contained juvenile goats also associated with females, a fact which may have some implication to understand the social context of the beginning of pastoralism. The presence of bones from relatively small subadult and adult animals in the trash deposits of the early levels confirms, according to R.H. Meadow, the domestic status of at least some of the goats. Meadow insists also on the fact that: “ though in the course of Period I at Mehrgarh, the remains of sheep and cattle became to increasingly dominate the faunal assemblages of the successive strata, at the same time, the animal represented grew smaller in body size” (Meadow 1998: 16). By the end of Period I, cattle bones amount for over 50% of the faunal remains. « This coincident pair of trends – increasing representation and decreasing body size – strongly supports a hypothesis of local

domestication » (Meadow 1998: 16). It is worth recalling that, in the case of sheep, the decrease in body size throughout Period I is much less noticeable than is the case with goat and cattle. As regard the buffaloes, the sizes of the bones collected throughout Period I tend to indicate that this animal was not fully domesticated before the end of the Neolithic.

Osteological studies as well as a few clay figurines indicate that zebu cattle (*Bos indicus*) is well attested in Period I to the extent of becoming the predominant animal in the upper levels of Period I. Mehrgarh provides evidence for an indigenous domestication of the South Asian zebu. It is now well established that *Bos indicus* and *Bos Taurus*, the non-humped bull from the Middle East, have a different genetic origin. The ancestor of the domestic non-humped bull of the Middle East and Europe is the aurochs (*Bos primiginus*); the zebu (*Bos indicus*) has as ancestor *Bos namadicus* (Meadow 1998: 16; Shanyan Chen *et al.*, 2009).

### **2.3. Pastoralism and the hypothesis of seasonal mobility**

All the geographical studies of the Kachi/Bolan region have described the seasonal mobility practiced by some semi-nomadic groups and their folks between the winter pastures in lowlands and the summer pastures in the highlands. Every year at the end of February, thousands of goats and sheep, own by semi-nomadic pastoralists from Kachi/Bolan, move to the Quetta plateau and return to the plain in September. It cannot be excluded that the abundant summer pastures in the mountains could have been considered as an attractive resource for the incipient farmers of Mehrgarh. In the study of the layout of the occupation, we have already noted that the core of the settlement was surrounded by large open spaces with ashy deposits and fireplaces indicative of non-permanent activities. Today in this region, permanent villages are often surrounded by spaces occupied by semi-nomadic groups during the winter season. Could we assume the existence of a group of people whose activities would imply seasonal mobility in the early context of the Neolithic?

One of R. H. Meadow's students, C.P. Glew, undertook a study of sheep and goat teeth from Period I, aiming to identify pattern in the season of death of these animals (Glew 1996). This study was based on the analysis of petrographic thin sections of sheep and goat teeth, looking at the cementum increments. C.P. Glew studied twelve mandibles of goats and sheep from the early levels of Period I. Among them, eight were sufficiently preserved to indicate that they belonged to animals killed at the end of summer and in winter. C.P. Glew came to the same conclusion for the sixteen mandibles from the upper levels of Period I. Whenever age determination was possible, the animals had been killed when they were about one and half year old. For the inhabitants, slaughtering their livestock only during the late summer and the early winter could be due to the fact that the food provisions from the previous year's harvest could be decreasing and would need to be complemented by eating more meat. But it seems more likely for C.P. Glew that the result of his study of the cementum increments of goat and sheep teeth that the slaughtering time could be explained by strategies implying a seasonal mobility comparable with what is still observed in this region.



## **CHAPTER 2**

### **THE SETTLEMENT OF PERIOD I**

#### **1. THE MOUND OF PERIOD I**

##### **1.1. The formation of the aceramic mound of Period I**

The reports of the four last seasons of fieldwork in the MR.03 area show that the resumption of work from winter 1996-97 to spring 2000 provided a much larger documentation for a better understanding of the general configuration of the Neolithic area. In the reports from 1974 to 1985 published in 1995, we pointed out that nothing in the landscape of the Mehrgarh area could at first suggest the existence of Neolithic settlements. A mound (MR.01 area), with its surface littered with potsherds dating from the 4<sup>th</sup> millennium to the mid-3<sup>rd</sup> millennium BC. first attracted our attention. It is only in the course of the 1977 season that the Neolithic area, some 2 km north of the MR.01 mound, was spotted. This Neolithic area was then included in the general grid-plan of the site as MR.03, adjacent to the MR.04 area (fig. 4). It should be remembered that the numbering of the various areas of the entire Mehrgarh site does not follow its archaeological sequence but the order of their recording in the course of the topographical survey.



**VI: The cliff cut by the Bolan River with the Neolithic site in the background**

In several of the previous reports it was pointed out that the general configuration of the Neolithic area was to a large extent the result of a relatively recent event dating to the end of 19<sup>th</sup> century AD. When we began our work at Mehrgarh the memory of this event was still kept in the local tradition.

The Bolan river, instead of flowing as it does today towards south after a bend near Pir Dopasi village and before cutting its bed through the Neolithic deposits of the MR.03 area, was flowing to the west towards Dhadar. One can still see the old bed going through this small town. Due to a major flood with probably some landslides in the Bolan Pass acting as dams, the Bolan river suddenly changed its course and overflowed a canal irrigating the fields where MR.03 is situated. Due to this change of course, it cut its new bed through the Neolithic deposits of MR.03, which since then are visible in a 10 m. high cliff overlooking the river.

The former canal suddenly no longer irrigated the area where MR.03 is situated, standing several meters above the Bolan river. The whole area became barren and was subjected to a strong process of erosion. Many gullies cut the still visible traces of formally ploughed fields. The entire area is today occasionally used in winter as a grazing-ground for goats and sheep roaming in the river bed of the Bolan and on top of the cliff, eating leaves cut by shepherds from few trees growing after occasional rains. The whole surface is trampled and covered with goat and sheep droppings. But sometimes after a rainy day, salt comes up to the surface revealing the outlines of ancient buildings.

A careful examination of the cliff cut by the Bolan and cleaned by us (fig. 15, 16, 17, 18, 19) and of the sections of the rather extensive excavations conducted in the different sectors of MR.03 (fig. 20) and MR.04 areas (fig. 4b) have provided a clear indication that we were dealing with the remains of several erased mounds surrounding and partly overlapping the slopes of an early aceramic Neolithic buried mound. It became also obvious that the whole surface of MR.03 and MR.04 areas had been flattened down at a much later time by a flood as if a razor blade had cut horizontally all the upper parts of the mounds formed by the accumulated ruins of the successive Neolithic occupations (Periods I, IIA and IIB). This phenomenon explains why it is possible to reach, directly below the modern surface of MR.03 and MR.04 areas, around the central core formed by the aceramic Neolithic remains (Period I), a series of broad semi-concentric areas containing deposits belonging first to Period IIA, then to Period IIB (fig. 4b) and, further at the periphery, to Period III (Chalcolithic).

In the introduction to these reports, we have insisted on the fact that the work conducted during the 1997-2000 program of excavations had allowed to establish an updated sequence. We have already referred to the article presented at the South Asian Archaeology Conference in 2000 (Jarrige J. -F, Jarrige C., Quivron G. 2005: 129-142). In this article, we have defined a stratigraphic sequence for the aceramic Period I based upon the distinction of 9 major consecutive levels of architectures and of graveyards. The four reports of the 1997-2000 program of excavations indicate that the earliest levels have been reached on a much larger surface than in the previous excavations from 1977 to 1985. The southern part of the sounding MR.3S, where the natural sediment had been reached on a very small space, was still offering several meters of undisturbed early deposits. Since they were directly accessible, it was decided to undertake new excavations down to the natural sediment on a much larger scale than before. In the northern part of MR.03, the excavations were rather extensive but had to be stopped in 2000 just before reaching the earliest level (Level 1). But it became possible to connect the excavations with a trench (MR.3T), which had been dug in 1980 at the northern limit of this area down to the natural soil. Due to this work, the earliest layers, 13 to 17, of the MR.3T trench were included in the occupation level 1 according to the updated sequence.

The reports have also emphasized the fact that each major building level included several phases. The much larger scale of the excavations has provided us with the clear evidence that each of these 9 major building levels (fig. 6, 6b, 6c to fig. 14, 14b, 14c) was to be interpreted within a rather striking identical process of successive phases of occupation and abandonment throughout a long span

of time. Even if each level reveals a distinct internal stratigraphy implying a variable length of time, the successive main episodes of the Neolithic sequence have followed a similar process. It first begins with the edification of mud brick houses. Then, these houses were subjected to modifications in the course of time. It has been noted that, in a few cases, a house could be abandoned when other adjoining houses were still occupied. The next stage in each of the 9 major episodes of occupation would occur whenever the settlement area was shifted to another area of the site. While the abandoned buildings were collapsing, they were progressively filled up with dump thrown by people living in another more or less adjacent area. Over an indefinite period of time, burials were dug in the accumulated waste mixed with the debris of the collapsing walls of the abandoned houses. As the grave pits have very seldom cut through the walls of the ruined houses, it can be assumed that many crumbling walls were still visible when the deserted area was used as a graveyard.

After a time lapse, the burial activity, possibly due to the density of the graves, would come to an end. Then, after some time, levelling operations were carried out in preparation for the edification of new domestic dwellings. The same process would occur again when, after at least two or three generations, the inhabitants of the area would decide to move to a new location. When the walls of the abandoned buildings had again crumbled down and were progressively buried in dump and mud brick debris, the area was again used as a graveyard, following the already described process.

Similar occupation patterns can still be discerned today in traditional settlements in this region where the structures are still built in sun-dried mud bricks. It is well known that after 30 or 40 years, bricks tend to become brittle. The local people are all well aware that the lifetime of a mud brick is limited. It is only when the walls are buried that they can keep their compactness for several millennia, as is the case at the site of Mehrgarh. We have also to keep into account that, in the past as well as today, the accumulations of different types of debris make an area occupied for many years rather insalubrious, inciting people to move to a new location. The previously inhabited area, often forming heaps of accumulated debris, would be used as dump before being selected to become a graveyard area. But modern examples also show that after some time a group of inhabitants or even all of them would move back to the former ruined settlement in order to build their new houses, after levelling and cleaning the surface. In case of a series of floods, the use of a former ruined area, often forming a mound, offers also the advantage to put the new dwelling area above the flooded zone. As mentioned above, this type of shifting pattern of occupation is still today well attested in several traditional towns of the Kachi/Bolan area. But, when we undertook excavations in MR.03 area, we did not expect that we would be able to so distinctly identify this type of occupation pattern in the very early context of the aceramic Neolithic settlement of Mehrgarh. The regularity of this repetitive process during the whole Neolithic period has a deep significance for our understanding of the occupation pattern of the so far earliest settlement in the north-western part of the Indo-Pakistani subcontinent.

## **1.2. The size of the Period I settlement**

It is very difficult to know where the location of the dwelling areas could have been when the sector exposed by the excavations was abandoned and used as trash area and as cemeteries before being occupied again. It is indeed impossible to have an exact idea of the overall plan of the Neolithic settlement or even to estimate what could have been its total size. We have already pointed out that the Bolan river destroyed a substantial part of the Neolithic settlement of Periods I, IIA and IIB.

The excavations conducted along the cliff cut by the Bolan river have shown that the core area of the aceramic settlement was resting on a natural alluvial terrace forming a small hillock, about 3 m higher than the level of the plain at that time, which is today 10 m below the modern surface (fig. 15, 17). But the general topographical survey of the archaeological area of Mehrgarh and a systematic examination of the sections cut by the Bolan river clearly show that the Neolithic remains, belonging to Period I, have extended well beyond the limits of the alluvial terrace on which the first structures of the Neolithic settlement were built (C. Jarrige *et al*, 1995: 99). Ashy layers, in some cases associated

with fireplaces, circular ovens and a few flints, have been located at the bottom of these natural sections. These ashy layers are sealed by the same alluvial strata that have buried the lower parts of the slopes of the aceramic mound in the main excavated area. In front of MR.03 area, the riverbed of the Bolan is about 250 m wide. In the lower part of the cliff of the left bank of the river, opposite to the right bank where the MR.03 area is situated, ashy layers have been recorded. They are to be connected with the same early Neolithic ashy layers found in the lower part of the cliff on the right bank of the river, just above the natural sediment (fig. 4). On the top of the left bank, potsherds typical of the late Neolithic Period IIB have been collected. The rather thin ashy layers at the bottom of the left bank of the Bolan are an indicator of the maximum extension of the Neolithic settlement. It is therefore obvious that the Bolan river has taken away several hectares of Neolithic deposits.

After joining together, on the topographical plan of the site, the different locations where remains of Period I have been recorded in MR.03, MR.06 and on the other side of the Bolan river, it appears that the Neolithic settlement spreads over more than 25 hectares (fig. 4). But it must be kept into account that the ashy layers and the fire-places, found rather far away from the core area of the aceramic settlement, may represent peripheral spaces used for temporary installations. Nevertheless the fact that, after their abandonment, the houses and the open spaces around them served as dumps for refuse implies that people did not move very far away from their former dwelling place.

It is also important to insist on the fact that, in the huge and complex archaeological area of Mehrgarh spreading over 300 hectares, the reference to natural or virgin soil has to be dealt with cautiously. As shown by the general topographical survey, the modern surface of the plain is rather flat all over the archaeological area. But in MR.03, Neolithic remains are found down to 10 m below the modern surface. In the early Chalcolithic area (MR.02) the archaeological deposits rest on natural sediments some 4 m below the modern surface and in MR.01 (late Chalcolithic/Bronze Age) the archaeological remains do not go deeper than 2 m below the modern plain.<sup>2</sup>

## **2. THE GENERAL LAYOUT OF THE NEOLITHIC SETTLEMENT**

### **2.1. The dwellings and the painted plasters**

To the twenty-four buildings exposed in the course of the fieldwork conducted from 1977 to 1985, fifty-three have been added during the last four field seasons (fig. 5). Therefore seventy-seven buildings have been entirely or partially exposed in the nine levels of occupation of Period I. Most of them belong to the upper 7,8 and 9 Levels, which have been excavated over a wider surface. All our reports have clearly shown that all the buildings, even the earliest ones, have quadrangular plans. No circular structures have been exposed, as was the case for several earlier settlements in the Near East. But there is nevertheless one exception; in a section cut by the Bolan river close to the trench MR.3T, the remains of a circular wall made of pebbles set in mud, about 0.50 m wide and preserved to a height of 1.50 m, were visible. The maximum diameter of this rather impressive circular structure must have been about 3 m. Unfortunately a section of the cliff collapsed before a proper recording of this structure could be done. Further cleaning of this area became too dangerous. This structure belongs to the earliest occupation of Period I.

All the excavated buildings are multi-roomed structures. Four different types of plans have been recorded: two-roomed, four-roomed, six-roomed and a few multi-compartmented buildings. Most of the walls of these buildings were composed of two rows of longitudinally laid hand-moulded mudbricks. These long and narrow bricks measure 62 x 12 x 8 cm, with generally on their upper faces a herringbone pattern of impressions of the brick-makers thumbs to provide a keying for the mud-mortar in which they were set. In some cases, reed mat impressions replace the thumb imprints. The earliest occupation, Level 1, directly on the natural soil, includes a two-roomed building (fig. 6c, 235). Seven other structures of this type have been unearthed. In Level 3, Houses XLV and XLVI have only

been partially exposed (fig. 8b, 237). The best-preserved and completely excavated ones, House XXVII in Level 4 measures 6,25 x 4,50 m, and House XXV, also in Level 4, measures 4 5 x 4,20 m and are composed of two long rectangular rooms (fig. 9b). By their sizes, these buildings seem to have been dwelling places. Another two-roomed house (House XXXVI) was found in Level 6 (fig. 11c). In level 8, a two-roomed structure (XXXIII) is too small to be a house and must have been used as a storing facility.

Rather standardized four-room buildings are the most commonly found structures. They were uncovered in all the levels from Levels 3 (fig. 229) to Level 9 (fig. 8c, 9b, 9c, 10b, 10c, 11b, 11c, 12 b, 12c, 13b, 13c, 14b, 14c). Considering the rather limited exposure of the early Levels 1 and 2, it is not possible to know if the four-roomed buildings existed before Level 3. The mud-brick walls are approximately 30 cm wide (two rows of bricks) and the average size of the structures is 5,50 x 3,75 m. The four rooms have more or less the same size, though, in several cases, two rooms on one side are smaller than the two rooms on the other side. Small openings connect the rooms between themselves and to the outside (fig. 238, 240, 241, 242). But as the walls have often been raised in the course of time, the doors have been regularly filled up with bricks and plastered. It is therefore quite difficult to find them.

Concerning their orientations, the structures can be divided into two groups, one with an east-west axis and another one with a north-south axis (fig. 6 to 14, 248, 240). Some of these structures have been preserved to a height of 7 or 8 courses of bricks, but they were never high enough to allow us to know how they were roofed. From fallen chaff-tempered mud fragments bearing impressions of fibrous stems of reeds found in the fill of some houses, it can be assumed that the roofs were made of a flat layer of mud laid over reed mats resting on beams (C. Jarrige *et al.* 1995: 335, fig. 7.6).



**VII: Structures of the upper levels during excavation.**

We have identified as dwelling houses most of the structures whose sizes were apparently adapted to the space needed for a family unit. We have already said that, due to consecutive reconstructions of the houses, the doors have been filled and plastered in a way making it difficult to locate them. But enough of these doors have been found to indicate that they allowed communication between the rooms and that at least one of them would insure communication with outside. These doors are about 30 cm above the floor and are about 60 cm high and 40 cm wide.

Inside the rooms, successive floors have been cleared out. On most of them, hearths, either flat or slightly hollow, have been exposed. These hearths are situated close to the corners of the rooms and are associated with burnt pebbles. In the 1996-97 report we have noted that, on the first occupation floor of House VI (Level 9), a small hearth was found in three rooms and two in another room. This means that firing activities, most probably related to cooking as indicated by the occurrence of bones with butchered marks and other domestic remains, were not located in a particular room inside the house. We don't know how smoke was evacuated, possibly by narrow openings between the top of the walls and the roofs. But this is just conjectural since no house is preserved to a sufficient height to prove or rule out this hypothesis. With the exception of the uppermost levels, the occupation floors were kept relatively clean, though several grinding stones, a few flints and in one case a sickle with its bitumen frame (locus 71 in House XV) as well as many bone tools, have been recovered.

The mud-brick walls of the houses were plastered inside and outside with a 2 cm thick clay mortar. But one of the significant contributions brought by the work conducted in the 1997-2000 program was to provide evidence that the coatings of the external walls of several houses were coloured in red or even adorned with paintings. We have seen in the 1998-1999 report that portion of a collapsed wall from building XL (fig.6c, 228)), belonging to Level 1, was coloured in plain red ochre. The first example of painted motifs has been recorded to the south of structure XXIX, from Level 5, (fig.10b) but still visible in Level 6, on the occupation level of Locus 49 from Level 6, where large fragments of painted plaster decorated with red strokes and dots laid scattered among the fallen bricks (fig. 11B, 245). A similar decoration was found on fallen fragments from the external plaster from House VII (Level 8) showing red V-shaped motifs associated with dots painted in red, white and black (fig. 21). In one case, a large fragment of plaster, probably fallen along with the external wall of House XV in Level 8, displays a complex geometrical pattern of red lines and red and black dots. Are these lines and dots a representation of stylized trees with fruits? It is difficult to answer due to the limited size of this painted fragment (fig. 22, 227). Some floors made of packed and rammed earth were also covered with red ochre. Several fallen fragments from the interior walls of some houses (for instance locus 72 in House XV) were also coloured with red ochre.

Therefore the uniform brown colour of the ruined mud brick walls does not give an exact idea of what the settlement was looking like in the Neolithic period. If we know that several houses had their external walls plastered with red ochre, it is nevertheless difficult to estimate how many of them could have been decorated with polychrome motifs. The paintings were found fallen and facing down the ground. It is only by carefully removing the clay plaster, which was used as support of the painted motives, that the back of the paint could be reached. So the chance to discover such paintings was very limited. When the houses were no longer occupied, the remains of painting must have quickly been washed away from the walls. But nevertheless a closer examination of the walls has allowed us to see faint traces of polychrome paintings still *in situ* on the external walls of some houses, for instance of House VII. The houses to which some of the fallen paintings can be associated are four-roomed buildings showing nothing particular when compared with other houses. Several houses of Level 9 (Houses XI, XII and XIII) are directly built on a continuous thick layer of red ochre (fig. 14b, 226). This layer is so homogeneous and so thick that it cannot be compared with the numerous floors with dense patches of red ochre left by various craft activities.

It is indeed difficult to understand the exact meaning of the few painted decorations on the walls of the houses of Period I. We have just seen that the motif of painted lines with clusters of dots was too

fragmentary to be interpreted but we can say that it is too complex for being only decorative. Red ochre is obviously a major component of the Neolithic culture at Mehrgarh. Red ochre is indeed omnipresent on the walls and floors of the houses, on many tools and domestic items, as well as on the walls and floors of the burial chambers and on the dead bodies. Besides its utilitarian use, for instance most probably for leather work, red ochre must have been considered by the Neolithic population as a kind of prophylactic and symbolic matter relating together almost all the aspects of the daily and *post-mortem* life.

## 2.2. The storing structures

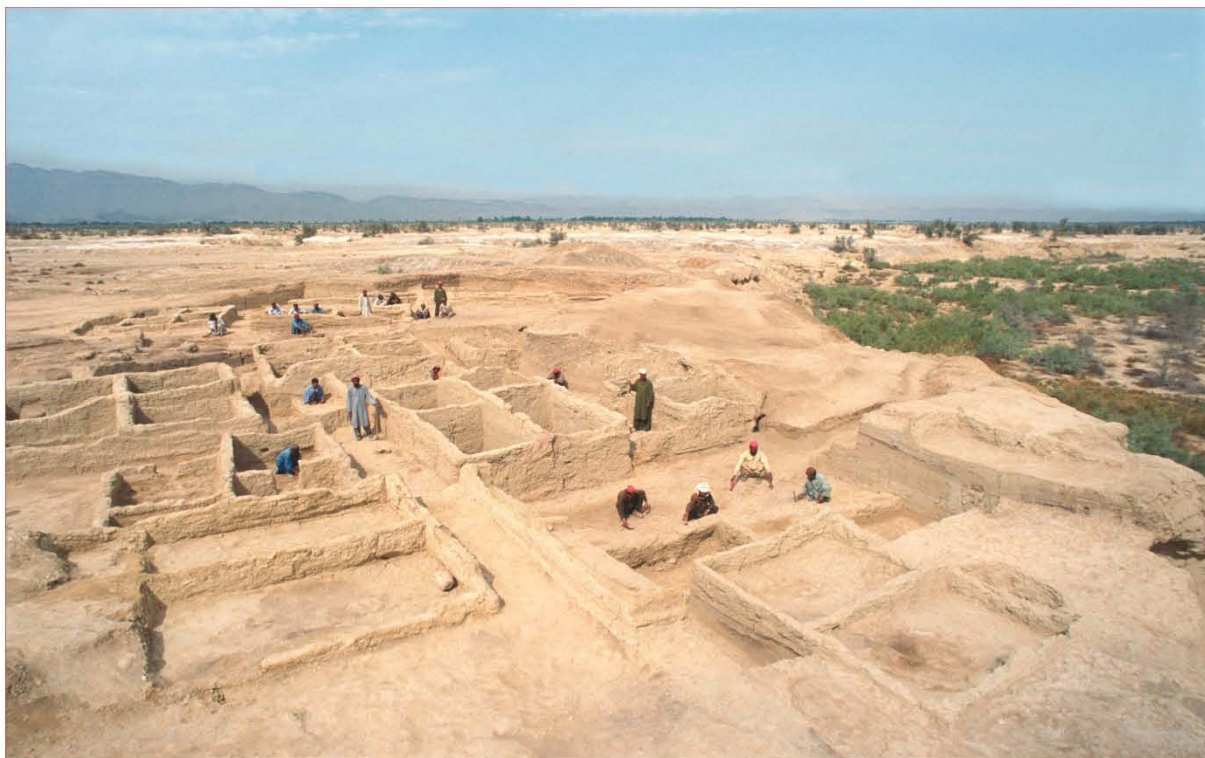
No storing structures were identified in the early levels of Period I. No circular bins or compartments dividing a room have been exposed. Among the plans of the structures, two six-roomed buildings have been exposed. One (structure N) has been found in 1982 (1981-82 report in C. Jarrige *et al.* 1995: 388, fig. 8.10) and can be added to the plan of Level 7 (fig. 12b). Though the walls were preserved to a height of about 1.50 m no traces of doors between the rooms and with the outside have been found. In the long and narrow rooms, no evidence of hearth or any significant cluster of remains connected with domestic activities have been recorded. This would support the assumption that this six-roomed building could be a prototype of the compartmented buildings dating from the end of Period I and from Period II A, which were used as large-sized granaries or storage facilities. Another six-roomed building had already been found in 1979 (1978-79 report in C. Jarrige *et al.* 1995: 258, fig. 5.5). This building B has now been replaced in the general plan of Level 9 (fig. 14). Though eroded, it was preserved to a sufficient height to show that there was no door connecting the rooms and no external opening. Several rooms were entirely filled by hundreds of more or less burnt pebbles mixed with faunal remains, grinding stones, mullers, bone tools and flints. Several fire-places were also noticed. But it is evident that this very dense filling of domestic remains is subsequent to the abandonment of the structure. The pebbles found in the structure were related to an impressive heap of thousands of pebbles extending outside of the south-western corner of structure B. It should be recalled that in 1978 (1977-78 report in C. Jarrige *et al.* 1995, fig. 4.1a, 4.2), at the southern limit of the level 9 houses, the very eroded building A (fig. 14c,) displayed traces of eight compartments symmetrically disposed on each side of four small central cells. This building, when almost completely eroded, was filled up by ashy trash in connection with a series of circular fire-pits filled with burnt pebbles. Later this area was included in Graveyard 9.

Also in Level 9, the very eroded remains of building XXIII, exposed in 1999, show six compartments that could have originally belonged to a twelve-compartmented structure at the northern limit of the area occupied by four-roomed houses (fig. 14b). It seems therefore that, at the northern and southern periphery of the area occupied by mostly four-roomed houses, several eroded compartmented structures, most probably used as collective storage facilities, can be interpreted as prototypes of the "granaries" of Period IIA.

## 2.3. Structures of the uppermost levels and the working surface of the final phase of Period I

As indicated in the 1996-97 report, several structures, which had already been exposed in this area during the 1980-81 season (Structure H, Structure I renumbered as VIb, Structure J, Structure K renumbered as IV and Structure L renumbered as VIII,) can now be included in the architectural plans of Levels 8 and 9 (fig. 13, 14). Gonzague Quivron described in the 1980-81 report several structures that are not integrated in the Level 9 plan (C. Jarrige *et al.*: 316-317). Since 1996, several more structures belonging to Levels 8 and 9 have been exposed increasing our documentation about the domestic and craft activities carried out inside and outside (Fig. 13b, 13c, 14b, 14c). Many artefacts and domestic remains were scattered all over the floors of these houses when they were abandoned. For instance, we have seen that in Level 9, the living floors of House I were littered with a large amount of animal bones connected with butchering activities. In room 4, a high concentration of bone tools, including many awls, and stone tools, such as pestles, mortars and saddle-shaped grinding

stones, was mixed with thick ashy deposits (fig. 218). In room 6 of this house, twenty-four flint drills (fig. 246) and a stone chisel were found in association with seven chips of calcite. Room 7 yielded a rough calcite bead and a large quantity of flint debitage. In another house (House X), in room 57, many stone tools including three stone axes, two large grinding stones, three pestles, several hammer stones, and pebbles used as polishers have been found along with nine fragments of cuttings of calcite including two rough beads (fig. 248, 249). The clustering of specific artefacts in some of the rooms



**VIII: View of the Neolithic settlement from the South-East**

suggests the existence, inside the quadrangular houses, of specialised activities such as calcite bead making.

An important part of the activities were carried out in the open spaces between the structures where several circular fire-pits have been uncovered. Their diameters range between 40 and 60 cm and their maximum depth is about 35 cm (fig. 234). Most of them contain heavily burnt cracked pebbles. It is obvious that the burnt pebbles were used for indirect heating as is still the case today in Balochistan, where heated stones are occasionally used for cooking bread.

Regarding the open spaces and the passageways between the houses, they have been subjected to modifications in the course of time. If originally all the four-room houses were standing isolated one from each other, later on low partition brick walls were built between them, creating new small enclosed spaces. Narrow passageways between the houses were often later on closed at one of their ends by a brick walls. This type of modifications of the original plans is well visible in the occupation Level 7 (fig. 12b). On the plan of occupation Level 8, one can see the addition of low walls between Houses U, VIb, VIIb and XV (fig. 13b). These low walls could have been used to delimit an open space related to these houses.

We have already mentioned the fact that the upper structures of Level 9, including the compartmented buildings at the periphery of the dwelling area, were filled up by trash associated with series of hearths, fire-pits and ovens, sometimes dug in the walls of the ruined settlement (1977-78 report in C. Jarrige *et al.* 1995: 220, fig. 4.2). All over the former settlement of Level 9, the surface is

littered by thousands of burnt and cracked pebbles associated to many hearths, fire-pits and ovens with, in between, broad bands of reddish burnt earth and impressive accumulations of ashes. The firing activities carried out in a wide open space seems to be well beyond the cooking requirement of a family unit. Cooking or other firing activities were apparently carried out at a collective scale in this vast area extending over the ruins of the settlement. This area was probably at the margin of a new dwelling place whose remains could have been taken away by the Bolan River. The broad reddish bands of heavily burnt soils and the extensive and very thick ashy layers are due to activities still difficult to identify. But we have noticed that the inhabitants of the modern villages around Mehrgarh occasionally gather to collect and pile up huge heaps of shrubs and burn them in order to collect soda ash that they use for washing. It cannot be excluded that similar practices could find their roots in an early Neolithic background.

As already said, it is only after this intensive episode of firing activities that the whole area was converted into Graveyard 9.

#### **2.4. An early architectural planning**

To sum up, clearance of the occupation levels on a wide scale has resulted in the recovery of a relatively large number of structures and associated features. It has also allowed to discern a relative regularity in plans, sizes and orientation, as well as spatial relationship of different types of structures and features within the settlement. The architectural plans show that it would be improper to talk of a strict planning. As already mentioned, small partition walls have often in the course of time modified the original plans. The orientations of the structures do not follow a tight pattern, even if they respect the broad lines that we have just mentioned above. Nevertheless this layout with its more or less symmetrically disposed houses, with in between rather regular passageways and open spaces (fig. 232, 233), forms a marked contrast with the plans of several Neolithic settlements from Western and Central Asia, where the houses cluster tightly together without spaces for alleys or large open spaces.

#### **2.5. The question of a surrounding wall or fence**

No evidence of a surrounding wall dating from Period I has been found. For the following Period IIA, impressive mud-brick curving walls (1981-82 report in C. Jarrige *et al.* 1995: 389, fig.8.11) have been built at the southern periphery of the settlement (fig. 4b). Another huge curving wall has also been exposed at the north-western limit of the Period IIA settlement, close to the compartmented building U (1980-81 report in C. Jarrige *et al.* 1995: 338, 339: fig. 7.9, 7.10). The main purpose of these massive structures built on the slopes surrounding the Period IIA settlement was to act as retaining walls. But they were originally high enough to delimit the settlement from outside. As erosion has taken away the peripheral areas of the Period I settlement, it is impossible to know if structures comparable to the retaining walls of Period IIA were already built in the course of Period I. Nevertheless we have pointed out the occurrence of heaps of animal bones in the fills of several houses and open spaces of Period I. Considering the number of scavengers which must have been rooming in the area, these heaps of bone would have disappeared during the night. Therefore we can suppose that the settlement was at least protected by a fence if not by a brick wall.



## CHAPTER 3

### ARTEFACTS

#### 1. TOOLS

##### 1.1. The lithic industry

Several studies concerning the flints recorded in the excavations from 1977 to 1985 have already been published (Marcon, Lechevallier 2000, Lechevallier 2003). But because the deepest levels had been reached only on a very limited surface, Monique Lechevallier decided to study the collection of about 20.000 pieces from Period I as a single entity characterized by a debitage typical of a blade industry. Monique Lechevallier and Marie-Louise Inizan have identified a pressure debitage, which, according to them, implied a heating process of the core (Inizan, Lechevallier 1985, 1990). The 1997-2000 excavations have enabled to increase the collection of flints, in particular from the so far very poorly documented early levels. All flint pieces can now be classified according to the updated stratigraphy. Vincent Marcon has conducted a first study, which was limited to MR.03 South and its sequence of 9 occupation levels. This analyse, still to be published, demonstrates the main stages of the evolution of the lithic technology in the course of Period I.

Vincent Marcon points out some obvious changes in the flintknapping techniques from the earlier levels (fig. 96b, 96c, 96d) to the later ones. In Levels 1 and 2, the use of pressure debitage is not clearly attested and the tools are made either on blades or on flakes, the flakes being more numerous than the blades. The most characteristic tools from Level 1 to Level 4 are lunates, trapezes, borers and scrapers. It is worth noticing that, after Level 4, the disappearance of lunates and the decrease in number of trapezes coincide with the apparent diminishing contribution of hunting activities to provide meat. Level 3 is a transitional period when flakes are still used to make tools but much less than the blades which attest the use of the pressure debitage. From Level 4, this technique becomes predominant. Several antler points that were probably fixed on a stick in order to press on the cores have been recovered. In one case an antler point was found in a grave (T.234) associated with a core, a few flakes and blades (fig. 291, 292)

From Level 4 to Level 9 the lithic assemblage is homogeneous and includes more than 80% blades. From Level 4, the length of the blades also increases in a significant way; about 50% of them have a length over 5 cm. In the upper levels, from Level 5 to Level 8, the dominant tools are truncated blades, drills and trapezes with a concave back. The replacement of borers by drills and of scrapers by truncated blades in the upper levels is also an indication of an increasing specialization in craft activities. A better-controlled and standardized debitage allows the production of very regular blades. The fact that the leftover cores become very small indicates also a maximum use of the raw material. From Level 7, the material utilised attests of a more careful selection of the raw flint, characterized either by a fine grey texture or by an also fine brown texture. The lack of raw pebbles of flint and the very limited number of cortical flakes in all the levels of Period I would suggest a first shaping of the cores by indirect percussion near the areas where they were collected. The recovering in House V, from occupation Level 7, of nine large flint cores found grouped together in the middle of the room (fig. 219) supports this assumption. These cores with a height between 87 mm and 130 mm for a thickness between 65 mm and 90 mm have just been preformed in order to be ready for blade debitage. The total weight of these cores is 7950 gr. Therefore they can have been brought by one person to the house from the place where they had been extracted and prepared (Lechevallier, Marcon 1999). These cores are comparable to three cores from a funerary deposit in grave 114 from Graveyard

9 where sixteen blades coming from a similar core were also found (Report 1978-79 in C. Jarrige *et al.* 1995: fig. 5.8).

The relationship between the flints and the hunting, butchering and farming activities has still to be more extensively studied. Nevertheless, as already said, the diminishing number of lunates and trapezes, as early as Level 4, apparently corresponds to a decrease in the hunting activities. Patrick Vaughan who carried out a functional analysis of the flints collected from 1977 to 1985 (Vaughan 1995: 614-625) had noticed that the lunates were mostly used as sickle elements to cut soft plant material. But later on the lunates were replaced by bladlets still set in bitumen inserted in a wooden handle (fig. 277) The regular trapezes and the concave-backed trapezes display microwear resulting from use both in sickles and in hunting projectiles. The trapezes used as projectiles: "must have been set longitudinally as barbs on the sides of the arrow shaft since hide, meat or bone polishes on the longer non-retouched side indicate a motion parallel to the edge." (Vaughan 1995: 620). This excludes, according to P. Vaughan, the use of trapezes set as the tip of the shaft in the manner of transverse arrowheads. If the number of trapezes decreases in the course of Period I, a new type of trapeze begins occurring from Level 6 and is well attested in the uppermost levels of Period I (fig. 258) and in the next Period IIA. These trapezes have a concave back and are very similar to trapezes ("horned-shaped trapeze") found at several "Mesolithic" sites by Vinogradov in his survey along the sand dunes bordering the Amu Darya plain in northwestern Afghanistan (Vinogradov 1979). If several of the concave-backed trapezes have been used for hunting activities, one of them "bears dry hide polish the distribution of which cannot be the result of cutting leather but must rather be from rubbing against dry hide in a manner such as one would expect for arrow transported in a leather quiver." (Vaughan 1995: 619).

## 1.2. The Stone tools

The stone tools from the earlier levels - big chisels, picks, polishers- are usually rougher than in the later ones. The first stone axes have a very rough pecked surface with just a polished cutting edge (fig. 274). It is only in a later stage, from Level 7 to Level 9, that some of the axes are entirely polished. The finer examples in diorite come mostly from graves of Graveyards 8 and 9. In a funerary context, they seem to be more prestigious objects than utilitarian tools.

Due to the larger exposure of structures and open spaces, many grinding stones of various sizes, oval hammer stones and mortars, have been collected inside and outside the houses (fig. 31, 33, 34, 35, 36, 37, 38). The pebbles and boulders from the riverbed of the Bolan provided an unlimited quantity of raw materials. Most of the heavy, utilitarian artifacts appear to be shaped primarily through use. In many cases, the central parts of the saddle-shaped grinding stones have become very thin due to a long use. Several grinding stones or grinding slabs were not only used for grinding cereals, since they often bear on their surface traces of red ochre. The pebble mortars have a 3 or 4 cm deep central depression and they quite often bear traces of red ochre, though in a few cases they contain a deposit of bitumen (fig. 32). In Level 2, half a stone perforated on both sides has been recovered. Several circular stone pellets show traces of use on their edges (fig.41). In the fills of houses and of open spaces, in particular from Level 8 and 9, many natural pebbles, often with a cylindrical shape and a more or less tapered end, also bear traces of use on at least one of their edges (fig. 46, 47).

An intact perforated stone looking like a mace-head has been found in Level 9. A spherical object in a reddish limestone with a diameter between 7,1 cm and 7,5 cm has a 6 cm deep central perforation (Fig. 80).

The 1997-2000 program of excavations has also yielded many spatulas, chisels and grooved stones from all the levels. But, as mentioned above, in Level 1 and 2, these objects are rather roughly shaped. Chisels are just elongated natural stones with a cutting edge (fig, 84, 53, 66). In the upper levels, the spatulas and chisels are much finer (fig. 77, 87) and their surfaces are often decorated with

incised lines in zigzag (fig. 162. B). Several simple grooved pebbles come from the lower levels (fig. 61. D, 272). The 1996-97 report mentions the discovery of one of these objects from room 45 in House VI (Level 2), bearing a decoration of incised lines on each side of the groove (fig. 28-4, 247). A few similar grooved stones have been recorded at several Neolithic settlements in Western Asia and even in an earlier context such as the spectacular grooved stone with incised animals found at Jerf el Ahmar in Syria in the PPNA context (Stordeur, Jammous 1995). In the upper levels, fine polishers in black steatite replace the grooved pebbles (fig. 256, 273).

### 1.3. The bone tool industry

Nerissa Russell has studied the bone tools collected from 1977 to 1985 (Russel 1995: 583-591). Even if many more tools have been collected in the course of the last four seasons of fieldwork, Nerissa Russell's study can still be used as a reference. The excavations in the deepest levels have yielded many points on distal metapodials from goat, sheep and gazelle (fig. 26, 51, 72, fig.96)). Among the new elements provided by the 1997-2000 program of excavations, one notes the discovery of several broken rounded points probably made on the shaft of a large mammal long bone of about 1 cm diameter and about 20 cm long, with one pointed end and the other with a groove probably used to facilitate the attachment of a thread or a filament. In the reports these objects have been described as shuttles or as spindles, though they are rather likely to have been used as spindles. Several of them had been found during the earlier excavations at Mehrgarh in the levels of Period IIA, in the areas where compartment storage structures have been exposed (1984-85 report in C. Jarrige et al. 1995; Russel in C. Jarrige et al.: 514, fig. 11.15a 1995: 584, fig. 17). But these objects, probably used as spindles, had never been found before in the levels of Period I. Several graves from Graveyard 8 (T.555, T.265, T.226, T.306) contained intact or complete but broken long points with a groove, identical by their sizes and shapes to the specimens dating from Period IIA (fig. 161)

Many small points must have been used as pins, including a very few eyed-pins. Several antlers with a bevelled tip show microwear traces indicating that they were used as striking picks in the soil. One of these picks, about 40 cm long, has been found on the floor of a room in structure XXXV, a four-roomed house from level 6 (fig. 254). In the different levels of Period I, needles, scrapers made of split sheep/goat, gazelle long bones, can be added to those collected from 1977 to 1985. Antlers and long bones have also been used as a blade puncher or percussion flaker. Several antlers and animal ribs have been used to pressure flake flint.

A so far exceptional find is a chisel, from Level 3, made from an elephant bone with a bevelled tip and a groove on each of its sides (fig. 86, 348). The use of this object, 18,3 cm in length with 2 mm grooves starting on each side of the bevelled tip on a length of 8 cm, is difficult to assess. This is so far the earliest object in ivory found at Mehrgarh, older than an elephant tusk with three grooves, which was lying inside structure L1 dated from Period IIA (1980-81 report in C. Jarrige *et al.* 1995: 318, fig. 7.10). A bone leg in ivory had been found in the lower layers of trench MR.3T. But it was too fragmentary to assert that it was part of an object. (Report 1980-81, in C. Jarrige *et al.* 1995: 318).

### 1.4. Small (apparently) non-utilitarian objects

All the levels of Period I have yielded a big amount of small stone balls (fig. 39,40). If many spherical pebbles have been used as hammerstones, these balls are too small for any obvious utilitarian use. Many small balls were also made of hardened clay. Several balls in stone or in clay have a diameter of not more than 1,5 cm, but the majority has a diameter between 2 and 3 cm. They are found in big numbers in the upper levels where they are often concentrated in one spot. They have in many cases a shiny surface of various colours, indicating that they were carefully selected in riverbeds; some of them had been coloured with ochre. We have just mentioned that other stones were collected for their shapes similar to the sitting figurines. Why did the inhabitants of the Neolithic settlements collect sets of multicolour small pebbles? These stone balls must have had some function, since seven small

finely polished and yellow ochre-coloured balls were found just below the skulls of an adult female in burial T.106 from Graveyard 9.

Some other small pebbles have obviously been selected for their conical, pyramidal or tetrahedral shapes. They recall the oldest "token" collected on several sites in the Near East and which have been interpreted as the prototypes of the calculi. But nothing sustains such an interpretation in the case of Mehrgarh where we have no evidence of calculi in the following periods. It is interesting to point out that these peculiar shaped pebbles have also been copied in clay. In grave T.69 from Graveyard 9, a small tetrahedral object in clay has been found associated with a skeleton of a richly adorned male. It is also important to stress the fact that the inhabitants of Mehrgarh collected natural objects that attracted their attention. It was the case for several belemnite rostrums. These fossils, from the Cretaceous formation, are looking like very finely polished points. Were they collected just for their aesthetic aspect? Did the inhabitants of Mehrgarh attribute some specific significance to what is still for us a natural curiosity? It is worth pointing out that in one burial of Graveyard 8 (T.254) a 40/50 years old female is buried with a rostrum of belemnite (fig.169). The Neolithic inhabitants of Mehrgarh also collected many nodules of hematite.

## 2. CONTAINERS AND LUMPS OF BITUMEN

The 1997-2000 program of excavations has confirmed the total absence of pottery in the 9 occupation levels and in the 9 graveyards. No potsherds were found before the beginning of Period IIA. The only terracotta objects are limited to a very few figurines. We have reported the presence of stone mortars but some of these objects without any specific deposit inside could be classified as stone vessels (fig. 59, 80 B, 164). In some of the burials (T.153, 1982-83 report in C. Jarrige *et al.* 1995: fig. 9.4) and in particular in burial T.229 (Report 1998-99), shallow stone bowls (fig. 164c) have been found. In the case of the stone vessel from burial T.153, the internal surface was entirely coloured with red ochre. It is only in Period IIA that stone bowls begin to be found in significant numbers in association with the first pottery.

As regards the existence of unbaked clay vessels, very few have been recorded in Period I. A very minute container from Level 3 was filled with red ochre (fig. 86.10). Some vessels in clay have also been found in a grave of Graveyard 8, and two, one broken, the other complete, from two infant graves of Graveyard 9. In another grave of Graveyard 9, another minute vessel with holes, maybe a sort of strainer, has been found at the feet of an infant (fig. 180). The predominant containers during Period I are the baskets coated with bitumen of which traces or imprints have been recorded. But the imprints of bitumen are found on the bottom or on the rim of the baskets and so far not on their walls.

Many fragments or small lumps of bitumen as well as crusts at the bottom of several stone mortars have been collected from Level 1 to Level 9. They are very abundant in the trash deposits. We have just reported the importance of bitumen in partly coating baskets, in shafting sickle elements or arrowheads. As previously mentioned, seams of bitumen often associated with asphalt springs have been located in the foothills surrounding the Bolan Basin, in particular at Gokhurt in the lower part of the Bolan Pass. A 6 cm diameter ball of bitumen in which a bladelet is set remains so far a unique find (fig. 86).

## 3. FIGURINES

### 3.1. The human figurines

The extensive exposure of structural remains has not led to the discovery of buildings to which a religious function could have been attributed as is the case at many Neolithic settlements throughout Near East and Central Asia. We have seen that some buildings were decorated with painted motifs, but

nothing in their internal layout or among the objects found inside distinguish them from other houses. The only items to which a possible magical or religious function could be ascribed are the figurines. It is well known that Mehrgarh has yielded many human figurines from the early Neolithic till the mid-3rd millennium B.C. For Period I, in spite of the limited exposure of the deepest layers, seventy-nine human figurines have been recorded. Two papers, published by Catherine Jarrige, provide the first analysis of the Neolithic figurines which are used here as a reference (C. Jarrige 2005, 2008). It can be stated that the Neolithic figurines, as was the case for figurines of later periods, have been found, with only one exception in Period I, either in trash or in non-specific fillings in and outside the buildings.

Catherine Jarrige has shown that, in the successive periods of the sequence of several sites of Central Balochistan, figurines have evolved combining significant attributes within distinctive distribution areas where ideological elements were most probably shared. But for the Neolithic period in the Indo-Iranian Borderlands, Mehrgarh still remains the only site with figurines, which therefore deserve a special attention since they are the ancestors and the prototypes of the later periods figurines.

The corpus of the human figurines of Period I has been considerably increased during the 1997-2000 program of excavations. Sixty human figurines have been recorded for Period I and sixteen for Period IIA. The 1999-2000 report mentions the discovery of the first human representation. So far unique, it was carved in a mother-of-pearl in the shape of a standing human silhouette (fig. 81, 278). The other figurines are modelled in unbaked clay. Catherine Jarrige has divided the figurines published in the previous reports and in the four reports of the 1997-2000 program into two groups, the straight and the sitting figurines (C. Jarrige 2005: 30, fig.6,7). The straight figurines, often coloured with red ochre, account, from Level 1 to Level 8, for 16 items, 9 with a rounded base and 7 with a flat base. In Level 1, a conical figurine with a rounded base shows the first instance of an applied clay decoration that can be interpreted as a belt (1982-83 report in C. Jarrige *et al.* 1995: 433, fig. 9.3)). In Level 2, we have noted the first attempt to represent a face on a fragment of a figurine with a pinch at the top that is probably meant to stand for the nose (fig. 61b, 262). The head is also clearly represented in a figurine of Level 8 with a rounded base, with a shaped nose and slit eyes (fig. 95.1, 281). From Level 4 comes the first figurine displaying definite feminine features with its realistic breasts and a rounded base (fig. 89.5, 280), but its head is unfortunately broken. It has also been noticed that physical features - either breasts or stumps of arms brought towards the front - were also present in a figurine from Level 8 (fig 260), with a pointed face and a rounded base. It should be recalled that this figurine is not in clay but in a poorly baked terracotta, as is a similar fragment with a flat base from Level 3 (fig. 86.11). Both show clear marks of piercing with weeds throughout the body. Other plain straight figurines, one with a flat triangular base, have stylised stumps of arms (fig. 86.8), with either a flat top or, in most cases, a very small pinch for the head.

Fifty-six sitting or flexed figurines have been recorded in Period I. Some are very small, other of medium sizes and several are big. They are often bearing traces of red ochre. In period I, the smallest item, from level I, 6 measures 2cm, the largest one, from Graveyard 9, 17 cm (fig. 301). The first sitting (or flexed) figurines appear in Level 3, Period I. Most of the large sitting figurines belong to the upper levels. They are schematic; their shape is biconical, one end for the head, the other for the feet, with a large and flexed central part representing the hips. Most of them are bare, without any application (fig. 23, 49, 261).

In the reports, it has been pointed out that many small sitting or flexed figurines bear applied elements. These are mostly coils, which are meant to represent ornaments, most of the time a belt, as is the case for figurines from Level 4 (fig. 89.1. 6), from Level 7 (fig. 75b, 265), from Level 8 (fig. 269) but sometimes a necklace as well (fig. 267). There is also one instance of a figurine with applied straight hair adorned with small circular pellets, wearing a belt on a protruding belly from Level 6 (fig. 48b, 259); its base is unfortunately broken, thus showing no evidence of flexion.

In a few cases, a coil originates from the tip of the legs and evokes a snake creeping up the body (fig. 92.2, 252.a). As stated by C. Jarrige (2007-2008: 160): “The snake is an important element which assigns a “chthonian” status to these figurines. This association with human representations is widespread during the Neolithic on a very large geographical area, from Central or even Western Europe to Central Asia and has drawn controversy on the kind of value it was carrying (Gimbutas 1974)”.

Excavation work from 1997-2000 allowed the recovery of many small polished river pebbles whose shapes and sizes were identical with either straight or more often with small clay sitting figurines (fig. 24, 253). The identification of these stones items with figurines is supported by the discovery of a small polished pebble in the shape of a sitting or flexed figurine bearing on its surface a painted motif in red ochre obviously depicting a coiling snake (fig. 252, right).

Since C. Jarrige began a general study of the figurines of the Kachi/Bolan area from Neolithic to Indus and post-Indus periods, she has been confronted to the question of the function, either religious or magical or both, of these figurines. The function of these figurines may have been subjected to change due to social and ideological transformations in the course of several millennia. For the Neolithic, we have insisted on the important significance of the fact that several figurines had been pierced. It is during the field season 1996-97 that during the cleaning process of a figurine with a rounded base from Level 7, a few holes appeared on the surface. Further cleaning of this figurine hardened by fire showed that the holes were running through the figurine and had been made by thin vegetal sticks which had left their imprint in the clay (fig. 259). Small twigs cut straight through the figurine several times, going to and fro when the clay was still soft. A careful examination of several other figurines, some of them of the standing type (fig. 281.d), the majority being of the medium and large sitting types, from Level 3 to Level 9, were also perforated by many holes (fig. 261).

We reported that, with only one exception, the figurines are among objects, which, after being used, have been discarded. They have mostly been found in trash and in secondary fillings of the ruins and seldom on a floor. Considering this situation, a great importance has been attached to the discovery, in the 1998-99 season, of burial T.258 from Graveyard 9. This grave contained the remains of a 30 years old woman, adorned with a belt and a necklace, who was holding in her clasped hands, close to her face, a large-sized sitting figurine (fig. 300, 301) This figurine, covered with red ochre, was pierced in several places. The association of this figurine with this woman has evidently an important meaning supporting the assumption that some figurines were used in magical rituals, probably practised by very few selected individuals.

### **3.2. The animal figurines**

Only a small number of animal figurines in clay have been found. In most of the case they just feature not easily identifiable quadrupeds (fig. 48.D, 92.5, 6). One head of an animal with two big ears comes from Level 8 (fig. 95.3). It has often been suggested that human figurines and bull figurines formed a typical association of a Near-Eastern Neolithic ideology of fecundity or fertility. It is not apparently the case at Mehrgarh. In spite of the increasing importance of cattle in the faunal assemblage in the course of Period I it is only in the uppermost level (Level 8 and 9) that a few horns and a fragment of humped bull have been recorded, mostly in the excavations conducted before 1985. The 1998-99 report points out the discovery of two big fragments of clay horns and the body of a quadruped found in a fill of Level 9 (fig. 270).

## CHAPTER 4

### BURIALS

#### 1. THE GRAVEYARDS

One of the main achievements of the 1997-2000 program of excavations has been to fix clearly the sequence of successive graveyards in the general updated sequence of Period I (fig. 3 and 3b). Nine levels of graveyards have been recorded alternating with the nine building levels. We have already pointed out, in the paragraph dealing with the formation of the aceramic mound of Period I, that, after the abandonment of an occupation level and its filling with rubbles from the ruined structures and trash deposits, the whole area was then used as a graveyard. We have used the same numbering system for the successive occupation levels and for the successive graveyards. But a graveyard bearing the same number as an occupation level is always later. The earliest graveyard is numbered as Graveyard 1 but its grave pits were dug through the ruins of occupation Level 1. They belong therefore to a later period. This is true for all occupation levels and graveyards from 1 to 9. Just as an example, relevant for all the graveyards, we know that the inhabitants of the occupation Level 7 structures were not buried in Graveyard 7, but in a graveyard located outside the excavated area. The people who were later to be buried in Graveyard 7 were living in a new settlement area outside the ruined occupation Level 7. As indicated in the more detailed descriptions of the graves in the four reports, the average depth of the grave pits is about 1 m. In the case of infant/children graves the burial pit can be less than 1 m deep. But on the series of architectural plans (fig. 6c to fig. 14c) the blue ovals are indicating not the locations of the top of the pits but the locations of the buried burial chambers, which were exposed when excavating the structures.

As already stated, the graves to which the burial chambers belong, are dating from a period when these structures were abandoned. The sections (fig. 15, 16, 17) clearly show that the surfaces of the abandoned occupation levels were uneven with ruined dwellings forming a succession of hollows and bumps. Due to these uneven and eroded surfaces from which the burials were dug and the variable thickness of the archaeological deposits, it occurs that, on the same architectural plan, the blue ovals are marking the locations of burial chambers, with variable altitudes, which, in several cases, belong to two different graveyards. One can see in section (fig. 16) a few graves with their pit and burial chamber cutting several levels. In the case of graveyard 1, one of the graves (T.280) cutting the occupation layers of Level 1 has its burial chamber partly dug into the natural sediment. As far as Graveyard 9 is concerned, its uneven original surface has been flattened down by a major episode of erosion. Therefore only the burial chambers, whose bottoms were slightly lower than the general erosion level, have not been destroyed.

The total number of recorded burials is 315. A total of 175 burials have been exposed during the 1997-2000 program of excavations. Several of these burials have been spotted just under the surface and, due to erosion, were fragmentary. Only 246 burials were intact, out of which 179 (72%) were associated with grave goods, and 71 (28%) contained only a skeleton without any burial good. The burials published in the reports from 1977 to 1985 (C. Jarrige *et al.* 1995) can now be included in the nine successive graveyards as fixed by the updated sequence (see the chart: fig. 3 and 3b). Before the full publication of the burials, we will just sum up in this concluding chapter some of the main features of the graveyards in order to complement the information contained in the reports, keeping in mind that the burials may provide some indications of the social and economic organization.

Though it has clearly been shown that all the exposed burials were included in large-sized graveyards and were never isolated, the number of burials exposed is proportional to the size of the excavated surface. In Level 1, only 3 burials have been exposed. In Level 2, 8 burials, in Level 3, 19 burials, in Level 4, 15 burials, in Level 5, 23 burials, in Level 6, 12 burials, in Level 7, 18 burials, in Level 8, 29 burials. For Graveyard 9, just below the surface, 118 burials have been recorded over an area of about 2000 m<sup>2</sup>. Some gaps can be noticed in the distribution pattern of burials of graveyard 9. These burials, as already stated, were dug into the buildings of Period 9 when they had been left in ruins for already some time. These gaps in the distribution pattern of the graves did not exist when Graveyard 9 was in full use. They are in fact the result of a long process of erosion through the heaps of accumulated ruins forming an uneven surface with areas higher than others. This uneven surface was flattened done by the general erosion that has already been described when we talked of the MR.03 mound formation. Only the burials that were originally dug into areas slightly lower in the eroded ruins and trash of occupation Level 9 have not been destroyed. The Bolan river has also taken many other burials away, as it can be seen from the cliff where several skeletons are visible in section. Just overlooking the cliff cut by the Bolan river, a small deposit containing a necklace and two fine stone chisels has also yielded a polished bone amulet with a rather elegant shape (fig. 286). This deposit was almost surely associated with a burial of Graveyard 9 that fell down in the river during a relatively recent summer flood.

The shapes of the burials have been described in the reports from 1977 to 1985. The drawing of one of the typical burials reconstructed by G. Quivron from his own excavation has been published in the 1983-84 report (C. Jarrige *et al.* 1995: fig. 10.5). This proposed reconstruction has been confirmed during the field season 1998-99 by a cross-section through grave T.259 from Graveyard 3, as we shall see later (fig. 115). At the bottom of a pit about 1 m deep, a small vaulted space dug on one side of the pit was used as a burial chamber. Then, the burial chamber, after the disposal of the dead in flexed position, was sealed by a brick wall - more seldom by blocks of hard clay - and the pit was filled with earth. Red ochre had been previously spread on the floor and the walls of the chamber. Brick walls, closing the burial chamber, have been identified in 110 burials. The walls were mostly made of long mud bricks laid in alternate headers and stretchers, but also, in a few cases, the walls were made of two rows of bricks placed lengthwise one above the other. Usually between 4 or 8 courses of bricks were still preserved. But even in the upper levels, for instance in Graveyard 8, blocks of clay instead of bricks were used to close a few burial chambers. In a very few cases, the trench sections show that some of the burial pits, after being filled, were capped by a low heap of earth, apparently not higher than 20 or 30 cm, indicating the location of the burials. Such a modest upper structure shows no great concern to keep the memory of the location of the burial places in contrast with the great care used in the edification of the burials themselves often associated with rich offerings.

Before the 1997-2000 program of excavations, it was assumed that, in the burials from the earlier graveyards, the corpse was simply placed at the bottom of a single pit. But the existence of a burial chamber during the earlier periods has now been evidenced, as we have just mentioned it, in the cross-section through grave T.259 from Graveyard 3. A narrow wall made of seven courses of mud bricks closed its funerary chamber (fig. 115). Most of the burial was cut by the section wall of the southern deep trench, but a baby goat was found placed near the tightly flexed lower limbs. Due to the small-excavated surface, it cannot be excluded that other goats could have been displayed around the dead (fig. 114).

We have indicated in the reports that more than 81% of the burials have an east-west orientation. The heads are in 79% of the cases facing east and in 2% facing west. Other burials (7.03%) are north-south oriented. But within these general lines of orientation, many variations have been evidenced. It can be added that, in most of the cases (83%), the burial chamber is on the northern side of the pit and of the closing wall.

In the course of Period I, the burial practices remained rather homogeneous. Only 3 cases of double burial have been recorded. In Graveyard 2 (T.39/42), two children, one 5-6 years old and the other about 10 years old were buried together (1982-83 report in C. Jarrige *et al.* 1995: 428). In Graveyard 6 (T.282) a woman older than 50 years was keeping in her arms a child about 4 years old (fig. 316). A few secondary burials have also been recorded. In Graveyard 9, 2 skulls and human bones placed with some order were found in a burial chamber (T.151) closed by a brick wall. But in other cases, the bones found in secondary burials belonged to a same individual. It is difficult to know the reason of these secondary burials. In the first reports, several cases of reburials have been mentioned. But after a closer examination of each of these cases, it appears that in graveyards used for a long span of time, some burials have accidentally cut some older ones. Disarticulated skeletons mainly resulted from the addition of bodies, which caused damage to prior interments. Good examples of this type of situation are found in Graveyard 9, for instance with the burial of an adult (T.229) that has partly destroyed the brick wall closing the chamber in which a 12-14 year old child had been previously buried with, at his feet, the disturbed skeleton of an infant (fig. 108)



**IX: Catherine Jarrige and Andrea Cucina during the excavation of a burial in MR.03 North**

## **2. THE ANTHROPOLOGICAL STUDIES**

### **2.1. The deceased**

In our different reports, we insisted on the fact that the skeletons were very poorly preserved. For instance the skeletons of the lower graveyards have been compressed by the weight of the sediments and the collapse of the internal faces of the originally empty burial chambers. As a consequence, most of the skulls had been crushed and the skeletons have been flattened down. In the upper levels, in particular in Graveyard 9, the skeletons were included in crusts of salty soils and some

of them, directly below the surface, were just powdery imprints. The first anthropologist attached to the mission studied the skeletons exposed before 1985, but he never communicated the detailed results of his work and never provided us with the eventual sex identifications that he may have done. Later on, Alfredo Coppa, from La Sapienza University of Rome went through the skeletons of the Neolithic period collected before 1985 and was able to make some sex and age determinations for which we have, for the time, being mostly oral information.

For the 1997-2000 program of excavations, Pier Paolo Petrone, Luciano Fattore and Andrea Cucina have carried out the anthropological study of 150 individuals. P.P. Petrone has presented at the South Asian Archaeological Conference in 1997 in Rome a first account of this study of the skeletons exposed in the course of the 1996-1997 season (Petrone 2001). At the South Asian Archaeological Conference in 2000 in Paris, Andrea Cucina and Pietro Paolo Petrone, with the collaboration of Luciano Fattore, gave a more complete account of the anthropological work conducted during the 1997-2000 program of excavations. These anthropological studies are still going on, with the collaboration, for the laboratory analyses, of Alfredo Coppa, Roberto Macchiarelli and Luca Bondioli (Cucina, Petrone 2005).

The anthropological studies have confirmed that the decomposition of the dead bodies occurred in an empty space inside the burial chambers. In most of the burials, the skeletons were laid on one side, more than 63% on the left side and a little less than 16% on the right side, with lower limbs always flexed and in many cases in very tightly way. The bodies of the newborns are lying on the back with their limbs extended. The 1999-2000 report mentions that almost 20% of their skeletons, though in flexed position, were in dorsal position. In fact, considering that the chambers were empty, the torsos of individuals lying on their sides are likely to have collapsed on their back in the course of their decomposition process.

The bodies of the deceased were put in graves after being covered with red ochre. In several burials (for instance in Burials T.102 and T.103) a narrow line of red ochre draws the profile of the body before the decomposition process. It is worth pointing out that only the ornaments, which were in direct contact with the skin of the dead, bear traces of red ochre on their surface. Therefore it can be assumed that the body of the dead was covered with red ochre before being adorned with ornaments or eventually before being wrapped in a shroud or a cloth. In the very salty soil of Mehrgarh, perishable materials had little chance to be preserved. The 1977-1978 report (C. Jarrige *et al.* 1995: 211, fig. 4.5) indicated the presence, in front of its pelvis, of a textile impression in red and black in the grave of an adult (T.62), buried with a basket coated with bitumen and wearing a necklace of steatite and turquoise beads. In another grave (T.17) exposed in the 1978-79 season from Level 14 in trench MR.03 T, corresponding in the updated sequence to Graveyard 4, textile impressions were visible on the bones of the skeleton, suggesting the existence of a shroud (1978-79 report in C. Jarrige *et al.* 1995: 244, fig. 5.3).

When working on the database of the graveyards, Gonzague Quivron has proposed a hypothesis concerning sex determination based on the posture of the upper limbs of the individuals. Two main postures can be distinguished. In the first posture, the upper limbs are flexed in front of the torso or the face and the skull. In the second posture, at least one of the two arms is extended; the other can be flexed sometime up to the bones of the shoulder. Gonzague Quivron, using the anthropological study by Andrea Cucina of the skeletons of the 1999-2000 season of excavations, including the sex determination of the individuals from the better-preserved graveyards of the lower levels, has suggested with rather solid statistical arguments that the first of the two main postures of the upper limbs corresponds to females and the second one to males. Since these two postures are also recorded in the case of children, for whom no sex determination is possible, it could be a way of distinguishing girls and boys. When sex determinations by the anthropologist were available it turned out that 83% of the individuals identified as males fit the hypothesis proposed by G. Quivron. For the females it works

only for 62% of the anthropological identifications. But it should be kept into account that, when sex determination was very difficult and when the recorded number of burials was still limited, the occurrence of certain categories of tools could have favoured a male identification no longer justified by a more extensive study of the grave goods.

Out of the 177 skeletons for which the anthropologists have provided us with age estimation, 28 are infants up to about 2,5 year, 26 are about between 2,5 and 9 years, 12 between about 9 and 14 years, 47 between about 14 and 35 years and 74 between about 35 and 55 (and more) years. The sex distribution indicates an equal presence of males and females. As regards stature, according to Cucina and his colleagues, the male individuals range between 168 and 175 cm, with a higher value such as 187 cm. Females range on average between 155 and 160 cm with values as high as 177 cm. These rather high statures may be an indicator of overall good health, good diet and low exposure to developmental stress (Cucina, Petrone 2005: 83)

Considering the bad state of preservation of the skeletons, the dental remains provide also a reliable set of information. The dental remains collected before 1985 have been studied by John R. Lukacs, from Oregon University. He focussed his work mostly on the Neolithic graveyards. The 1984-85 report included a first note on this program (Lukacs in C. Jarrige *et al.* 1995: 522-523). John Lukacs studied the jaws of 92 individuals, more than 80% coming from the graveyards of the Neolithic period. He first noticed a very low rate of caries, which is for him a feature often found among hunter-gatherers or incipient farmers (Lukacs 1983: 390-392). Lukacs, in collaboration with Robert F. Pastor, noticed the occurrence of interproximal grooves on five individuals. Using the updated sequence of MR.03, Period I, one individual comes from Graveyard 4, another from Graveyard 5 and three more from Graveyard 9. Such grooves have been attributed to pulling back and forth fibrous material, sinew or cordage between the teeth (Lukacs, Pastore 1988: 398-378). The same authors have also studied the dental abrasion resulting in the spatulate shape of the teeth that cannot be only explained by masticatory activity. In one case they think that: “ the abrasion could result to the pressure required to anchor the mouthpiece of a bow-drill between the anterior teeth” (Lukacs, Pastore 1988: 395).

John Lukacs has also undertaken a more general study of the biological affinities from dental morphology using the data available from sites in Western Asia and in South Asia. The teeth of the individuals buried in the graveyards of Period I at Mehrgarh show no evident morphological relationships with the so far recorded dental remains from sites from Western Asia. A few studies carried out at several sites in Pakistan have convinced John Lukacs of the existence of an “Asian gene pool” to which belong the dental remains of the Neolithic Period of Mehrgarh (Lukacs 1989; Lukacs, Hamphill 1991). It is only in the advanced phase of the Chalcolithic Period III at Mehrgarh that the dental remains from the graveyard in MR.02 area display morphological affinities with West Asian populations, at a time of increasing exchanges and communication between Western Asia and the Greater Indus region (Lukacs, Minderman 1992).

## **2.2. Early dentistry at Mehrgarh**

Since the final season of excavation at Mehrgarh in 2000, a significant part of the anthropological studies conducted by the group of Italian experts is devoted to the odontoskeletal material. A major discovery has resulted from this on-going work. The Neolithic graveyards of Period I provide the earliest evidence of dentistry in the archaeological records. Eleven drilled molar crowns from nine individuals (four females, two males and three unidentified) have been recorded. One individual has three drilled teeth; another one has the same tooth drilled twice. Experimentation shows that a bow-drill tipped with a flinthead required less than a minute to produce such holes in human enamel (Coppa *et al.* 2006). This major discovery is the result of an on-going program of anthropological studies that is presently conducted in the Section of Anthropology of the National Museum of Prehistory and Ethnography “Luigi Pigorini” of Rome.

### 3. THE GRAVE GOODS

#### 3.1. The funerary offerings

The description of many of the burials and their funerary offerings exposed from 1977 to 1985 are to be found in the reports of the successive field seasons (C. Jarrige *et al.* 1995). As indicated before, B. Barthélemy de Saizieu has brought two contributions about the funerary offerings from the burials exposed before 1985 (Barthélemy de Saizieu 1990; 1991). Many more burials have been recorded in the course of the 1997-2000 excavations, in particular in the early levels for which very little information was available. Most of the funerary offerings or grave goods have been recorded in the reports from 1997 to 2000. The database of all the burials and associated finds has been to a large extent completed by G. Quivron with the collaboration of J. Haquet. In the meantime, keeping in mind the socio-economic implications of the distribution pattern of the funerary offerings, it can be useful to point out some of the new data contributing to extend our documentation since the previous excavations conducted in the MR.03 area.

We have already reported that 315 burials have been recorded but only 305 have been excavated. Keeping into account the number of burials that were excavated though they were very disturbed and incomplete due to erosion and gullies, only 246 were intact. Out of the 246 intact burials, 179 (72%) have yielded funerary offerings and 71 (28%) contained only skeletons without any kind of grave goods. The study of the funerary offerings or grave goods can contribute to shed some light about the social and economic organization during Period I. It can also provide some information about the belief of the inhabitants of the Neolithic site of Mehrgarh concerning the *post-mortem* life. It cannot be excluded that the graves with only skeletons could have contained perishable matters that would not have left any visible trace. We can just say that they offer no specific characters as regard sex and age determination. Nevertheless, in the upper Graveyard 9 exposed on a rather large surface, a few graves without any grave goods (T.1979/106, T.1979/107, T.1979/109, T.1979/108, T.1980/123, T.1984/160) form an apparent cluster. It should also be pointed out that all the skeletons identified as foetus have been buried on their back in extended position and are not associated with any grave good.

Even if for the Neolithic period so many burials have been seldom exposed in a sequence of well-stratified graveyards, it remains difficult to assess how the different associations of grave goods could be for us a reliable indicator of the social organization in the course of Period I. But even if we keep into account G. Quivron's proposal about a sex distinction based upon the positions of upper limbs, the interpretation of the funerary offerings remains an uneasy task.

The different reports have shown that, besides the rather rich diversity of personal ornaments, the burials also contain many utilitarian objects, which were part of the daily life. We have noted the occurrence in several burials of raw materials such as ochre lumps, bitumen lumps or small blocks of galena. Some burials are documenting various stages of flint debitage from preformed cores to blades and microliths, some of them with clear traces of use. Other stone objects include tools such as spatulas, chisels and stone axes, rounded pebbles, chipped disc stones, hammerstones, pestles and different types of grinding slabs and mortars. But several stone tools are also conspicuous by their absence. No borer, no drill, no polishing stone have been recorded in the burials. Many bone tools were also found in the burials, but so far no eyed-needle. In many burials, fragments of baskets, most of the time coated with bitumen, have been disposed often along the lower limbs or at the feet of skeletons. It can be assumed that baskets could contain perishable offerings such as food, though in some cases they contained sets of beads.

From a first inventory of the well-diversified funerary offerings and grave goods, one could have been tempted to believe that the inhabitants of the site, in the Neolithic period, had conceived their after-life as following a social and economic organization to some extent similar to their present life. The funerary deposits could have been a way to provide the dead with the utilitarian objects and

the prestigious items needed for the functioning of the afterlife society. The distribution pattern of preformed flint cores and of different types of flint and stone and of bone tools could be good indicators of the activities carried out by the different individuals buried with such items. When we began excavating the Neolithic burials, the recoveries in burials of preformed cores, blades and other elements related to flint debitage were thought to indicate the graves of flint makers. In the case of missing or very uncertain sex determination, it was tempting to think that individuals buried with such objects were males who have been recognized in their lifetime as skilled experts. As regards the practice of burying several juvenile goats at the feet of mostly young adult females, in the early Graveyards 2 and 3, when hunting activities were still the main provider of meat, it could point out the existence of individuals who would be more specifically involved in pastoral activities.

This type of interpretation that we tentatively adopted in our first reports, when the documentation concerning the burials was still limited, can only be partially true. It became indeed rapidly evident that the reality must have been much more complex. For instance it is obvious that the manufacturing of a great diversity of personal ornaments have been a very significant activity of the inhabitants of Mehrgarh. It is therefore worth stressing again the fact that, in spite of the large number of exposed burials, no tool or object connected with beadmaking –borers, drills, grooved polishing stones, raw blocks of steatite or of calcite - has been recorded among the grave goods. Even if there is still some question about shell working at the site of Mehrgarh itself, it is evident that the production of stone beads has been a time consuming activity requiring a great skill. We have seen that the practice of early dentistry required for tooth drillings a good mastery in the use of a bow-drill (Vidale, Biondoli nd). It also shows that the skill of the beadmakers was not limited to the production of ornaments.

One of the most obvious characteristics of the funerary offerings or grave goods is the fact that their combinations in each grave are almost never repetitive, except for 2 or 3 burials containing just a lump of ochre. It is therefore very difficult to make a classification that could help identify some groups or families involved in one specific activity or enjoying a special social status. It should also be kept into account that in the context of a funerary ideology, some tools or utilitarian objects may be invested with a symbolical value that goes beyond being simple markers of specific activities or of particular domestic tasks.

In a funerary context, flint cores and blades could also have a symbolic value, not limited to a specific group of craftsmen. It should be recalled that a rather famous grave, published in the 1978-79 report (C. Jarrige 1995: 246, fig. 5.8) had been interpreted by Marie-Louis Inizan and Monique Lechevallier as the grave of a highly skilled specialist of pressure debitage (Inizan, Lechevallier 1985). This grave can now be attributed to Graveyard 9. The sex of the skeleton has not been determined but the position of the upper limbs in front of the face would support an adult female identification, according to the statistical study made by G. Quivron. The anthropologist, Alfredo Coppa, many years afterward, has re-examined the very poorly preserved bones of this skeleton and has indicated that some elements were suggesting a female identification (Coppa personal communication). Sixteen long non-retouched blades, all cut from the same core, were positioned in two parallel rows along the spine of the skeleton. The two rows of blades are disposed between a stone polished axe at one end and four turquoise beads in line at the other end. Nine trapezes probably from a barbed arrowhead (Vaughan 1995: 620) were placed near the feet. Near the skull, the imprints of a basket coated with bitumen was visible as well as, above the skull, three flint cores. The way the two rows of blades have been set is probably not intended to just display the technical skill of the individual, probably a woman, buried in the grave. The rows of blades could have been arranged as a sort of magical or symbolical protection along the back of an individual who could have had some distinctive character in the society.

Another grave (T.234) from Graveyard 9, exposed in 1998 (fig. 291), also deserves a special notice. The skeleton was badly preserved and sex determination was not possible. Nevertheless the position of the upper limbs supports an identification as an adult female, adorned with a few turquoise

beads and holding in her hands, against her skull, a cluster of tools including four stone axes, a stone pick, one flint core, a stone chisel decorated with incised criss-crossed lines and two points made from antlers (fig. 162, 163, 292). Could such a cluster of diversified tools be only an indicator of a specific activity carried out by this individual? The answer is probably not so simple. It is interesting to note that the compact position of the stone axes indicates clearly that these objects were disposed in the burials without their handles. There are several cases of females buried with flint cores. For instance burial T.262, from Graveyard 8, (fig.116), contains an adult female between 35 and 45 years, wearing a long necklace of disc-shaped shell beads and buried with two flint cores (fig. 71). In graveyard 7, an adult female, more than 40 years, was holding two flint blades in her hands (Burial T.574).

### 3.2. Burials with juvenile goats

When discussing the question of the beginning of pastoralism, we recalled that the exposure, during the 1981-82 season (Report 1981-82: 368-369, fig.8.6, B.7 in C. Jarrige *et al.* 1995) of two burials with five juvenile goats laid at the feet of the skeletons was considered as a major discovery. Since then, the two burials have been attributed to Graveyard 3 in the updated sequence. The skeleton in burial T.287 has been identified as an about 18-19 years old woman who was wearing ornaments in lapis lazuli, turquoise and seashells and two anklets in calcite. The other skeleton in burial T.288 has been identified as an older woman, between 40 and 60 year, who was wearing no ornament. During the 1997-2000 excavations, more examples of burials associated with juvenile goats were recorded. Four juvenile goats surrounded the lower limbs of a young female, between 16 and 20 years, wearing a necklace made of seashells in burial T.276 from Graveyard 2. One of the goats had its skull very close to the hand of the female as well as lined up vertebrae from the tail of a bovine (fig. 121, 303). This tail may have originally been used as a flyswatter. In burial T.259 from Graveyard 3, only one goat has been recorded in the very limited excavated space but it is very likely that other goats may have been associated to the very partially exposed skeleton (fig. 114, 115). Still in Graveyard 3, another burial, T.504, contained a young female, between 16 and 20 years, wearing a necklace of *Dentalium* beads and some turquoise beads. The skeleton was surrounded by 3 juvenile goats, one in her back, one against her tightly flexed lower limbs and one clasped in her hands just in front of her face (fig. 141). The presence of several burials containing each of them several complete skeletons of juvenile goats is a characteristic feature of the early Graveyards 2 and 3, the more so when considering the very limited space excavated. We have already indicated that these burials with goats date from periods when hunting activities were providing most of the meat, when pastoralism was just beginning to develop at Mehrgarh. We have also noted that all the skeletons found in burials associated with several goats have been identified as young women, with one exception in T.288 where the woman is between 40 and 60 years old. What was exactly the meaning of such offerings of kids? In all the cases the kids are complete and surround the lower limbs of the dead. In one case one of them, as we have seen, had its skull more or less kept in the clasped hands of the woman in front of her face in a way implying probably some symbolic meaning.

From Graveyard 5 in burial T.82-281, a very poorly preserved skeleton of an adult is associated with a kid (Report 1981-82 in C. Jarrige *et al.* 1995: 367). In burial T.581 (Report 1999-2000) from Graveyard 5, an infant between 3,5 and 5,5 years, is buried with one kid at his feet (fig. 325). He is also associated with one stone mortar and one stone spatula. Still from Graveyard 5 in burials T.250 (Report 1998-99), a young woman, between 18 and 22 years, is buried with a kid at her feet (fig. 122). Two burials from Graveyard 8 are also associated with kids. In burial T.107 a kid has been disposed at the feet of an infant between 18 and 24 months (fig. 101, 284). In another burial T.149, exposed in 1981, an adult without sex determination but with the position of upper limbs attributed to males, has just in front of his skull a sickle with two blades set in bitumen that was used to fix them into a wooden handle, and under his lower limbs a complete caprid. Therefore in the same burial we have the so far unique combination of a sickle, the emblematic tool for harvesting activities and a goat, representative of pastoralism (1980-81 report in C. Jarrige *et al.* 1995: 317, fig. 7.7). In burial T.228

containing an about 45 year old adult male, a heap formed by the entangled bones of at least two kids was disposed against the tibias of the dead (fig. 289)

One can add also from Graveyard 9 one grave (1981 T.146) in which ribs of a young ovid, most probably a food offering, have been found under the flexed lower limbs of an adult adorned with a few turquoise beads near his skull and with the imprints of a basket at his feet (1980-81 report in C. Jarrige *et al.* 1995: 317, fig. 7.8).

The presence of juvenile goats is attested in all the graveyards from 2 to 9. After the discovery of the first two burials containing each five kids we wondered if this important number of animals was not a way for the females buried with them to take into the after-life world a flock for the benefice of the *post-mortem* society. This is maybe a plausible explanation but so far limited to Graveyards 2 and 3. In the upper graveyards only a single kid is disposed in the burials with the exception, as we have just mentioned it, of grave T.228 where two kids are not disposed in a semi-circular way but form a heap of bones which got mixed during the decay process. It can nevertheless be assumed that the burials of several kids, carefully laid down around dead females, must have had a special meaning in the context of the beginning of pastoralism in this region. In Graveyards 2 and 3, the way the animals were disposed, forming a semi-circular line around the buried females, two of them keeping in their hands the head of a kids, also suggest a symbolical meaning difficult for us to interpret. It is worth pointing out that the two females with five kids found in the same area of graveyard, burial T.287 and T.288, have to be differentiated since the young adult female (T.287) wears several ornaments including a bead in lapis lazuli, a semi-precious stone very rarely found at Mehrgarh, while the older adult female (T.288) is not associated with any ornament.

### 3.3. The grave with a human figurine

As regard the human figurines at Mehrgarh during Period I, it was stated that these objects to which is evidently attached a symbolical value and even, in the case of the pierced ones, a probable magical role, were never found in graves, but with a noteworthy exception. The report of 1998-99 gives a description of a grave from Graveyard 9 (T.258) in which an about 30 years old female, adorned with a necklace of *Dentalium* beads with one turquoise bead and a belt made of shells, holds a red ochre coloured clay figurine close to her face in her clasped hands (fig. 170, 300, 301). This big-sized figurine belongs to the sitting type with holes throughout the body. As it was already mentioned when we dealt with the human figurines, this burial is exceptional enough in the context of Mehrgarh to let us assume that this woman holding an object probably connected to some magico-religious ritual, could have played a distinctive role in the Neolithic society.

### 3.4. Graves with bone spindles

Two burials, all from the same area of Graveyard 8 exposed in the course of the 1997-2000 excavations, deserve a special notice. Both of them contain one or two bone tools that were defined as spindle. In burial T.226, an about 30 year old badly preserved male (fig. 290) is buried with two spindles, one complete, the other broken, just in front of his face (fig. 161 b, c). In burial T.265, an adult male, older than 40 years, was buried with a spindle and with a basket coated with bitumen (fig. 306-307). Are these two examples significant enough to assume that spinning was an activity devoted to males?

### 3.5. Graves with a rich display of personal ornaments

The different ways the skeletons were adorned are raising many questions difficult to answer. In the previous excavations from 1977 to 1985, we noticed the existence of burials with a large number of ornaments combining diversified materials: shells, stones including semi-precious stones and even copper beads. Some of the most adorned dead were infants, children and adult females.

As early as Graveyard 2, an infant between 0 and 2 years was buried with a great wealth of ornaments in various seashells, black steatite, turquoise and with a bangle in conch shell. The necklace made of disc-shaped shell beads has two pendants each of them made of four small *Enginera mendicaria* shells, looking like two flowers and bearing testimony of an evident aesthetic care. Two rings, apparently in leather, and one block of galena were also found (1979-80 report in C. Jarrige *et al.* 1995: 290, fig. 6.2).

Another burial, T.84-12, exposed in 1984 attracted the attention for the quality of a headband made of ten rows of *Dentalium* beads. This was the first example at Mehrgarh of the use of the bead weaving technique (1983-84 report in C. Jarrige *et al.* 1995: 467, fig. 10.2). We thought that this burial of an adult female was exceptional due to the number of personal ornaments including, not only the very fine headband, but also a diamond-shaped mother of pearl pendant in a necklace made of seashell beads and a belt made also of many seashell beads. This rich set of ornaments did not exclude the presence of a tool, a stone chisel coloured with red ochre.

In the course of the 1996-2000 excavations, MR.03 South area, where burial 84.12 had been exposed, was excavated on a much larger scale allowing to incorporate this burial in Graveyard 5. In this same MR.03 South area, several burials are exceptional and comparable to burial T.84-12 by the quality of the ornaments and, in particular, of the headbands. The earliest headband has been found on a skeleton of a female between 25 and 30 years old from burial T.281 of Graveyard 4. This headband, as stated in the 1999 report, is formed of several hundreds very finely woven segmented *Dentalium* beads (fig. 314).

More skeletons of adult females have been found wearing similar headbands in the same area of Graveyard 5. Burial T.274 (fig. 308), containing a female between 22 and 28 years old, is also remarkable as far as the work of *Dentalium* is concerned. The headband was made of woven rows of small *Dentalium* segments closed by two straps decorated with shells (fig. 120, 309). This burial provides also a unique example of a belt in seashell to which is attached an interlacing of numerous threaded *Dentalium* segments beads on the pelvis of the dead, in a way suggesting a sort of loincloth.

Also from Graveyard 5 and close to the female burial T.274, another burial T.279 (fig. 310) contained the skeleton of a male between 40 and 50 years old, bearing a belt of tubular seashells with, as central ornament, a diamond-shaped mother of pearl. A globular bead in lapis lazuli was found close to his chin (fig. 311). Headbands made of hundreds of *Dentalium* segments have also been found in upper graveyards. In burial T.573, from Graveyard 7, in sector MR.03 North, a between 30 and 40 years old female was adorned with a belt of disc-shaped seashells including a complete *Cardium* shell and with a headband of *Dentalium* segmented beads in staggered rows. In Graveyard 8, burial T.295 (fig. 136) an adult female, between 30 and 40 years, is adorned with a necklace and a belt of seashells and wears a headband of *Dentalium* segments also set in staggered rows.

### 3.6. Infant/children burials with tools and adult ornaments

The field-reports from 1977 to 1985 mentioned several burials of infants and children yielding abundant funerary offerings, including full sets of ornaments. It was also the case during the 1997-2000 program of excavations when several very young children were richly adorned and often associated with flint cores, blades and lumps of red ochre. For instance in Graveyard 3, burial T.508 (fig. 143, 320) contained a 3-4 years old infant richly adorned with shell pendants, a belt made of shell, red stone and calcite beads, an anklet and an armband of shell beads as well as a lump of red ochre against his back and flint debitage remains, including a core, some blades struck off the core and a small heap of flakes (fig. 338). This infant is therefore adorned with a set of rather rich ornaments and on the other side by a set of flints illustrating different stages of the debitage process. This set of flints having nothing to do with the activity of a 3-4 years old infant could indicate that he belonged to a

family involved in flint debitage. But the position of these objects against the dorsal spin of the infant is also likely to have a symbolical meaning that is difficult to assess.

A grave from the same Graveyard 3 deserves a special attention. In this grave (T.578) is buried an infant, not older than 0,5 months according to the sizes of the long bones, with two lumps of red ochre on each side of the skull. He is also richly adorned with necklaces made of black steatite, shell and turquoise beads, with bracelets of *Dentalium* beads and with anklets made of hexagonal beads in calcite. The large size of the beads of the anklet indicates that originally this ornament was made for an adult. The anklet had not been arranged around the limbs of the child, but simply placed on his body as to cover his lower limbs (fig. 154, 212).

Another infant, about 3-4 years old, from Graveyard 4 (T.550), wears several ornaments including a necklace and a belt made of seashells as well as a set of tabular shell beads forming a single anklet made for an adult around both legs (fig. 145). Burial, T.289, from Graveyard 8 (fig. 130), contained the lower part of a perinatal infant with a belt and anklets of *Cardium/Anudara* beads that were originally made for an adult.

### 3.7. The question of the distribution pattern of the grave goods

The burials from Period I have provided a huge amount of information but they remain hard to interpret. The total corpus of each funerary offering or grave deposit, though quite extensive, can be easily listed, but the combination of all these elements, in a way almost never exactly repetitive, makes all attempts to find convincing explanations rather difficult. It is also obvious that the same type of objects can be arranged in several different ways in the graves, for instance in the hands, above the skull, in the back, along the upper limbs or the lower limbs or under the feet.

From the database established by G. Quivron, we know that ornaments are found in 147 burials. Seashell beads and pendants are present in 133 burials and in 78 burials the ornaments are exclusively in seashell. 69% of burials of infants/children contain ornaments and 55% in the case of adults. Concerning the tools, 12% of the infant/children burials contain tools against 25% in the case of female and male adults. Sickle elements have only been found in association with adult males. Even if the infant/children display more ornaments than the adults, many adults, females and males, are well adorned. The very elaborated headbands in *Dentalium* are apparently distinctive of females. Infants, children and females wear more often bracelets and anklets than males. In Graveyard 5, we have noticed a group of well-adorned females associated with a male (T.279) (fig. 310) also wearing a belt made of 23 long cylindrical shell beads and of a lozenge-shaped mother-of-pearl pendant (fig. 175b and fig. 311) and with, close to the chin, a rather large rounded lapis lazuli bead (fig. 175a). Keeping in mind the small space excavated it is difficult to know if this group was exceptional or were only representative of the funerary offering of Graveyard 5. Were these very elaborate ornaments indicative of a special status of a few individuals or of some families, considering that some infant/children wear ornaments made for adults? We have seen that nothing in the layout of the buildings and the fill of the different houses could help distinguish elements of possible social distinctions. It is nevertheless probable, even if we have not got the key to understand the distribution pattern of the funerary offerings, that some burials points out a distinction between some individuals and others by the rich combination of ornaments that they were wearing, or by their association with rather unique objects, like for instance the figurine found in grave T.258. What is also the meaning of the presence in only three burials of lapis lazuli beads and in two burials of copper beads?

If we keep in mind the amount of specialised labour required for manufacturing so many ornaments in seashells, imported from the far away coastal area of the Arabian Sea, as well as rows of thousands minute steatite beads and finely carved stone pendants, one can be impressed by the total amount of time investment that was buried by the successive generations. From traces of wear and attrition on many seashell pendants and beads, we know that the deceased were buried with ornaments

that were worn for quite some time. Burying so many ornaments could also have been a way to keep on the value attached to these objects and to stimulate this very active craft activity. We have seen that the various combinations of grave goods and the several distinct ways to arrange them in the burial chambers in relation with different categories of individuals must have implied the existence of a symbolical system of which we don't possess the key. The apparent complexity of this system goes evidently beyond a simple status marker. It is quite significant that, after the end of Period I, individuals are still buried in flexed position in small burial chambers. But a major change occurs at the beginning of Period IIA when no more funerary offerings or any kind of grave goods are associated with the burials, if we except a very few beads.

#### 4. THE ORNAMENTS OF THE DECEASED

##### 4.1. The ornament manufacturing

The question of the ornaments is closely connected to the study of the funerary offerings or grave-goods, since most of them come from graves. Blanche Barthélemy de Saizieu has conducted a general study of the beads and ornaments of the different periods of the whole sequence of Mehrgarh. This study has been carried out in close collaboration with the "*Centre de recherche et de restauration des musées de France*" (Barthélemy de Saizieu 2003). As far as Period I is concerned, B. Barthélemy de Saizieu has limited her study to the ornaments found in the excavations conducted from 1977 to 1985. Her study was concerning 9336 items out of which 5946 were coming from what has now been defined in the updated sequence as Graveyard 9. Only 11% of the beads were in limestone and calcite and 9% in steatite. The 1997-2000 program of excavation has considerably extended this documentation. It appears first that the statistics based on the excavations conducted from 1977 to 1985 have to be modified. Previous studies indicated that the number of black steatite beads was increasing in the upper levels of Period I to the extent of becoming more numerous than the shell beads. In the excavations conducted before 1985, 11 graves from what is now defined as Graveyard 9 have yielded 2484 beads in black steatite to which could be added 200 beads in white steatite. In the 1997-2000 program of excavation in the same Graveyard 9, no grave contained ornaments in steatite and 17 graves have yielded ornaments made of a very large number of seashell elements. This is an indication that different areas of a same graveyard show variations in the funerary offerings. In spite of the need to revise some of the statistics, it is nevertheless evident that the number of steatite beads increases in a very significant way in the upper Graveyards 8 and 9.

##### 4.2. The shell ornaments

A first identification of shells and a study of shell working have been done by J.M. Kenoyer (1995: 566-582). This work can be used as a reference for the important amount of shell ornaments collected during the 1997-2000 program of excavations. Let us just briefly recall that the shells, according to J.M. Kenoyer, belong to species found along the Makran coast but from different habitats indicating the exploitation of different coastal resource areas. The list established by Kenoyer of shells exploited in manufacturing the ornaments found at Mehrgarh includes *Spondylus* sp. coming from rocky shores, *Pinctada* sp. (mother of pearl) from shallow sandy areas or reefs, *Callista* sp. from sandy beaches, lagoons and estuaries, *Turbinella pyrum* from shallow bays. Other shells, including *Dentalium*, *Cardium/Anadara* and *Conus* are associated with different types of rocky and sandy coastal areas. In the case of mother-of-pearl (*Pinctada* sp.), often used for making pendants, J.M. Kenoyer suggests that these shells "may have come from even more distant sources than the coastal areas of Makran across the Arabian Gulf in Oman" (Kenoyer 1998: 38).

The 1997-2000 program of excavations have provided us with a very large amount of ornaments in shell coming mostly from the graves, in particular from the early graveyards which were so far very poorly documented. The much larger amount of beads and pendants in seashell from the successive

levels confirms the existence of a standardized and well-developed manufacturing tradition. Tiny cylinder disc beads, made of *Spondylus exilis*, are predominant. They have been produced using a now well-documented process. After breaking the shells, small fragments were drilled and strung on a fiber cord or sinew, before being rubbed against a grinding stone using sand as an abrasive and water. The process has allowed the massive production of tiny disc-shaped beads with diameters varying from 3,8mm to 7,4 mm for a thickness between 0.7mm and 1.8 mm. J.M. Kenoyer is referring to the replicative experiments of R. Foreman who demonstrated that it takes between two and four months to produce a stand of tiny disc beads (Foreman 1978: 22). In several cases the shells were used almost without being modified like *Cardium* or bivalves, which were just drilled and polished to be used as pendants for necklaces or belts. Different shells, *Conus*, *Cardium/Andara* and *Turbinella pyrum*, were used to produce tabular hexagonal beads. In the case of *Dentalium*, used in a considerable quantity, for instance for headbands, the shell was just slightly modified by cutting its tip and sometime polishing its surface

It is well known that the shells, in particular *Turbinella pyrum* (conch shell) were widely used to produce bangles, especially during the Indus period. In the 1979-80 report (C. Jarrige *et al*, 1995: 290, fig. 6.2) we have pointed out the discovery of the so far earliest specimen of a thick bangle cut out from a conch shell (*Turbinella pyrum*) found in a child burial and which, in the updated sequence, has been integrated in Graveyard 2. But no more examples of bangles in *Turbinella pyrum* have been recorded before Period IIB, when conch shell bangle manufacturing becomes well attested.

As regards shell manufacturing, J.M. Kenoyer has pointed out the fact that no remains suggested the existence of workshops at Mehrgarh in the early Neolithic. It would mean that the ornaments in shell had been manufactured near the areas where they were collected. The work conducted by the French Mission to Makran, under the direction of Roland Besenval, has shown that this region had been very active as far as craft activities were concerned. Due to the study carried out by the late Jean Desse and his wife Nathalie Desse-Berset, many coastal sites have been recorded in Makran. But no site along the coast or inland is so far earlier than the end of the 5<sup>th</sup> millennium BC. As far as the coastal areas are concerned, it is well known that, in the course of the Holocene period, the level of the sea has changed and it is most likely that the areas where seashells were collected during the Neolithic period are today under the sea level. At Mehrgarh, no remains of what could have been a shell workshop area dating from Period I has been spotted. Nevertheless it should be pointed out that fragments of shells were found in limited quantity in the fills and in trash of Period I. It can also be noticed that a few shells to be used as pendants have been discarded before the drilling of their suspension hole had been completed. Since the shells were coming from far away, it cannot be excluded that they were utilized as much as possible, even eventually for making shell powder for some specific use.

#### 4.3. Ornaments in stone

The manufacturing of seashell beads and pendants cannot be dissociated from the production of stone beads and pendants. From Graveyard 2, tiny disc-shaped beads in black steatite are combined with disc-shaped shell beads. The black and white beads were strung together, forming contrasting patterns. It can be assumed that the black steatite disc-shaped beads have been produced following the same manufacturing process as the disc-shaped shell beads. Before the resumption of work in MR.03, the first evidence of a workshop for producing black steatite beads came from Period IIB (1978-79 report in C. Jarrige 1995: 248, fig.5.13). The 1998-99 report mentions the discovery, from the fill of a house of Level 4, of about forty steatite elements illustrating the entire process of steatite bead making, from raw blocks and drilled unshaped flakes to a finished small bead of a type often found in the grave goods (fig. 271). The 1996-97 report points out the existence of remains associated with calcite bead makings, for instance in House I and in House X, from occupation level 9.

Beads in semi-precious stones have been found in limited numbers, most of them in burials. Five lapis lazuli beads come from burials of Graveyards 3,5 and 9. Disc-shaped or cylindrical beads in turquoise have been recorded among the ornaments from 27 burials, from Graveyard 2 to Graveyard 9. Chalcedony, including cornelian, are the hardest stones that have been worked by craftsmen, most of them have been found the upper levels of Period I, except for a chalcedony bead found in a grave of Graveyard 5.



**X: Two anklets made of calcite beads (Burial T. 578 - Graveyard 3)**

Animal bones have also been used in particular for making rings. In the upper levels, a production of highly polished pendants with very complex shapes begins and will be developed in Period IIA and IIB (fig. 286).

We have already indicated that the ornament manufacturing displays an evident homogeneity in the course of Period I. It is very likely that the same tool kit, hammerstones, grinding stones, blades, borer replaced by drills, have been used for processing shells and different types of stones in order to produce a wide range of ornaments, headbands, necklaces, armlets, bracelets and anklets. Many elements imply that bow drills were used not only for drilling beads but, also, as said above, for drilling the teeth of a few individuals. Even if no specific tools can be associated with any particular production, the craftsmen have obviously developed an evident technical qualification, also requiring a significant time investment, if we take into account the production of several thousands of disc-shaped beads in shell or in steatite. It is also important to note that the craftsmen managed to produce tabular hexagonal pendants in calcite imitating similar pendants in *Conus*.

#### **4.4. A miniaturisation process in bead manufacturing**

It should also be stressed that the production of personal ornaments has been subjected to progressive changes in the course of Period I. An evolution can be noticed in the shapes of some of the beads. But the most conspicuous phenomenon is a miniaturization process concerning in particular the disc-shaped beads. In the early levels, the disc-shaped beads in shell have a diameter between 5 et 6

mm, even in a few cases 7 mm; the calcite beads have a diameter between 6 and 8 mm and the beads in steatite between 4 mm and 6 mm. The diameters of the drilled holes are the same, between 2 mm and 3 mm, irrespective of the different materials. In the upper levels, in particular in Graveyard 9, the diameters of the disc-shaped beads in shell are between 3 mm and 5 mm, and only 2 mm and 3 mm in the case of steatite beads. The holes are often between 1 mm and 1,5 mm diameter, as it is also the case for the turquoise beads. A few technical changes, which have been for instance noticed in the lithic industry with the replacement of borers by drills in levels 4 and 5, must have played an important role in the growing skill of the craftsmen.

#### 4.5. The white steatite beads

Another important step in the bead manufacturing is the occurrence, mostly in Graveyard 8 and 9, of small disc-shaped beads in white steatite. These beads are the earliest known fired steatite in South Asia. We have already noted the skill of the craftsmen in imitating the shells collected from far away, in particular the *Conus*, with locally available stones such as calcite. But the transformation of black beads into white beads by a heating process is a very important step in the history of craft activities in South Asia, as it has been well illustrated at Mehrgarh where, in Chalcolithic Period III, the first glazed steatite beads appeared (Barthélemy de Saizieu 2001). The increasing importance played by the steatite work with the production of white steatite beads alternating with black steatite beads in the strings of the personal ornaments marks the decrease of the use of shells at the end of Period I. This is also the beginning of technical experiments that will become one of the main characteristics of the craft activities of these regions from the end of the Neolithic till the Indus civilization.

#### 4.6. The copper beads

In the burials exposed from 1997 to 2000, as well as in the fills of the settled areas, no new evidence of copper has been found. It can be recalled that one grave (T.84-158) from Graveyard 9 (C. Jarrige *et al.* 1995: 467), uncovered in 1984, has yielded a small bracelet with 8 copper beads with, as it has already been mentioned, the imprint of a cotton thread inside. These beads are in copper and are made from small hammered strips. A cylindrical bead had also been found in another grave (T.1979-101) of Graveyard 9 (1978-79 report in C. Jarrige 1995: 262, fig. 5.9c).

Without the discovery of many graves, our knowledge of the craft activities would have been very limited. A few broken shells, very few steatite and calcite beads from the fills could not have provided a proper estimate of the scale of a very active and skilled production of diversified ornaments, combining various materials and displaying as well an evident aesthetic care. The careful use of the imported raw materials indicates the value attached to them, explaining the fact that only very few discarded elements from the ornament production have been found in the fills from the houses and the open spaces. The excavations conducted at Mehrgarh indicate the existence as early as Period I of groups of skilled craftsmen, still working at the scale of domestic workshops, but already using technics which represent the background of the future technical achievements of the later periods.

#### 4.7. The sources of raw materials for the ornaments

For the manufacturing of ornaments during Period I at Mehrgarh, we have seen that raw materials were collected from various sources in a rather wide geographical range. According to J.M. Kenoyer, the different possible sources of shells along the coast of Makran, and even from further away in the case of mother-of-pearl, have been listed. As regard the semi-precious stones, Badakhshan is the best-known mining area for lapis lazuli. But we were told long ago that some lapis lazuli seams in the Chagai hills, north of Dalbandin, just at the border with Afghanistan, were still exploited for a local market in Quetta. Since the area was not accessible to foreigners, the late Brigadier Usman Hassan, then Secretary of agriculture for Balochistan as well as a distinguished amateur archaeologist

visited the area at our request. In spite of the reluctance of local people, not very eager to see officials taking interest in their rather discreet exploitation, Brigadier Usman was able to see the place where some seams of lapis lazuli were visible and to bring back a few blocks which have since been identified as lapis lazuli. South of Chagai, one of us (J.-F. Jarrige) saw some holes corresponding to ancient exploitation of copper. Though some of the blocks from this area showed some turquoise blue seams, it turned out that it was only malachite without true turquoise. The question of the provenience of turquoise still remains open. As far as steatite is concerned, R.W. Law has suggested that the stone could have been collected in the case of Mehrgarh in the area of Muslimbagh, in the southern Zhob district in Baluchistan, some 150 km north Mehrgarh as the crow flies, or from the deposits from Las Bela District in southern Balochistan (Law 2011: 193-199).

## 5. THE FUNERARY IDEOLOGY

The nine graveyards of Period I have provided us with a very rich documentation and also with many questions difficult to be answered. Without the graveyards, the few calcite, steatite or seashell beads found in the fillings of the occupation levels would never have reflected the richness, the diversity and the aesthetic qualities of the ornaments produced by skilled craftsmen, able, as stated above, to use their technical expertise in the practices of early dentistry. If the excavations had been limited to exposing a few burials, we might have found simple explanations connecting the ornaments with the social status of the dead and the tools with some specialized activities. But after exposing more than 300 burials, it remains very difficult to find convincing recurrent patterns which could help define categories in relation with age and sex or with an eventual social stratification. Except the burials with no visible grave goods, all the other burials display a great diversity as regard the objects selected as funerary offerings and also the way they are arranged in relation with the dead inside the burial chambers. We have pointed out the occurrence of few neighbouring graves sharing the same kind of grave goods, for instance several kids in Graveyard 3 (T.1982/258, T.1982/259 and T.1999/259), or elaborate headbands in Graveyard 5 (T.1984/12, T.1999/256, T.1999/274). In Graveyard 9, 3 graves in the same area contained skeletons buried with one basket (T.1978/198, T.1984/158, T.185/166). Another group of 3 graves contained each a stone axe, a basket and a lump of red ochre.

To sum up, it has not been possible to single out burial zones that could be clearly differentiated by categories such as age, sex or specific grave goods and funerary offerings. One has the feeling that each individual has been treated in a distinctive way, as if someone, either from the family or from the society would have decided what was proper for the dead in keeping into account various parameters. Many factors in such possible choices could have been involved, including sex, age, cause of the death, status of the dead or of his family. But as already stated, the distribution pattern of ornaments, tools and other types of funerary offerings was not repetitive enough to single out determinant factors that could have reflected a clearly established social stratification. We have pointed out that, as far as the tools and several other items were concerned and the way they were arranged in relation with the dead, a great diversity has been noticed. We have also pointed out that, in several cases, the positions of the grave goods and in particular of the tools suggest that, in funerary context, series of symbolic elements could have completed and even replaced the significance they could have in daily life.

If it remains difficult to understand what could have been the funerary ideology of the Neolithic community of Mehrgarh, there is no doubt that the graveyards and the funerary offerings reflect the existence of a very complex society. Like in many societies all over the world, it can be expected that some individuals, among them those supposed to talk to the spirits and to have contact with the after-life world, could have played an important role in the setting of the graves and the grave goods for the different members of the Neolithic community, according to a distribution pattern with some symbolical or magical implications. Was the woman from grave T.258 (fig. 300, 301) holding in her clasped hands a pierced human figurine belonging to an eventual category of individuals invested with some distinctive powers?

## CHAPTER 5

### TOWARDS PERIOD II

#### 1. THE END OF PERIOD I

As mentioned above, the last episode of burials of Period I, cemetery 9, took place when the mound formed by the accumulated remains of the successive aceramic Neolithic occupations had been deserted by its inhabitants. We have insisted on the fact that the positions of some of the graves on the already eroded slopes of the Neolithic mound of Period I, as well as the graves which were obviously dug in an uneven surface, proved that a rather long span of time occurred between the last level of occupation (Level 9) and the setting of the last graveyard (Graveyard 9) of the same Period I. When Graveyard 9 was still in use, a huge scale process of erosion of the Neolithic mound had already begun. The sections cut along a north-south axis distinctly show several sloping layers of ashy deposits resulting from the erosion of the building levels of Period I (in dark on the section drawings fig. 15, 16). The thickness of the trash deposits, accumulated between the final stages of the Period I occupation and the beginning of Period IIA occupation, is also clearly visible in the southern section of MR.03 South (fig. 17). In the profiles of the sections, throughout the Period I mound, one can see successive alluvial strata that came to rest slanting against the sides of the trash deposits from the Period I mound. According to Michelle Drin, who studied carefully the sections in 1977 and 1978, when she was a visiting geologist at Quetta University, this rather impressive alluvial process implying several flooding episodes, with in between thin layers of ashy deposits, has slowly buried the mound and raised by several meters the level of the surrounding plain, before the inhabitants of the following Period IIA began to build their settlement. Luc Wengler, when he was conducting his geomorphological study of the Mehrgarh area, dug a small section in the cliff of the Bolan, south of the MR.03 mound, and came to the same conclusion as Michelle Drin concerning the gradual flooding process of the eroded Period I mound slopes.

The updated sequence resulting from the work conducted between 1997 and 2000 has allowed a more accurate interpretation of trench MR3/4 described in the 1984-85 report (C. Jarrige *et al.* 1995: fig. 11.5, 6, 7). This trench, now referred as trench MR.03 in the updated sequence (fig. 4b), had been dug from the upper building level of Period IIA, in an area occupied by several compartmented structures, down to the natural sediment. On the general plan of the MR.03 area, one can see that this trench has been dug in a space located to the west of the western slopes of the Period I mound. This explains that the silting deposits and the ashy layers are horizontally spread. The deposits from Period I, in their marginal extension towards the west from the core area, are not thicker than 2 m just above the natural sediment. Between the deposits of Period I and the first building level of Period IIA, the section shows 5 meters of successive flooding strata alternating with ashy layers. One of these layers contained a rather well preserved circular fireplace. In the 1984-85 report, the 5 m thick deposits between Period I and Period IIA were attributed to an elusive Period IB. What was called in the previous reports Period IB can just be considered as an intermediary period between Period I and II when the settlement area moved away from the eroded MR.03 mound progressively submerged by successive flood deposits. For this period we have no more information than the occurrence in the section of trench MR.03 of ashy layers with occasionally remains of fireplaces.

It is only when the formation process of the alluvial terrace which submerged the remains of Period I mound was completed that the inhabitants of Period IIA settled again over the ruined top of Period I mound (fig. 4b). The whole process must have taken a long time, probably several centuries.

## 2. PERIOD IIA

Though these reports concern mostly the aceramic Period I of Mehrgarh, we shall limit ourselves to a few comments regarding Period IIA within the updated sequence of the Neolithic. The beginning of Period IIA is marked by the first occurrence, probably around 6000 BC, of a few crudely made shaff-tempered sherds from pots, mostly bowls and basins, constructed by assembling pieces of clay. This sequential slab construction is well attested at several Near-Eastern sites at the end of the 7th millennium BC and around 6000 BC (Vandiver 1995).

During the 1997-2000 program of excavation, only one structure with a buttress dating from Period IIA (fig. 221) had been exposed in area MR.03 South. This wall is probably one of the several retaining structures (fig. 4b) that have been described in the previous field reports (1981-82 report in C. Jarrige *et al.* 1995). Let us just recall that the building of Period II structures over the topmost ruins of Period I and on the alluvial terrace which had buried most of the Period I mound, has implied the construction of a rather impressive system of platforms and retaining walls, some of them with rows of mud-brick pilasters, located on the edge of the slopes of the earlier mound (C. Jarrige *et al.* 1995: 389, fig. 8.10, 8.11).



**XI: Granaries of Period IIA**

The excavations of Period IIA levels have mostly exposed a large number of quadrangular buildings divided geometrically in narrow compartments (fig. 4b). Some of these buildings, with walls heightened several times, were still preserved to a height of 3 meters. The compartments were filled with fallen bricks and a huge quantity of imprints of cereals, mostly barley (*Hordeum vulgare*). These buildings were obviously granaries, mainly for storing cereals. It can be assumed that they were originally between 1.70 m and 2 m high. Therefore structure F2 with 30 square compartments, each of them about 1 sq. m, had the capacity to store about 1500 cu. M of cereals (1983/84 report: 483, fig. 10.15 in C. Jarrige *et al.* 1995). Some others similar buildings in the same area are even bigger. The

managing of proper storing and conservation of huge quantities of cereals and then of their distribution require a solid social organization.

The flood deposits, visible in the section against the slopes of the Neolithic settlements, indicate that the settlement was surrounded by highly fertile soils, explaining the impressive number of the storing structures. But it is also evident that a large-scale exploitation of cereals in flooded areas required also collective efforts well beyond the capacity of simple family units.

We also exposed, in the spaces around the storage structures, several rows of standardized circular fire structures surrounded by thick deposits of ashes mixed with remains of domestic and craft activities (see "The working surfaces and platforms" in Report 1983-84 in C. Jarrige *et al.* 1995: 455). The scale of these working surfaces seems to be well beyond simple family units.

Several prototypes of compartmented buildings have already been exposed, as stated before, at the periphery of the settlement of Level 9 in Period I. As for the prevalent plan of the four-roomed houses of Period I, one could believe that it was absent in Period IIA. But in the report of 1983-84 (C. Jarrige *et al.* 1995: 456) the existence of quadrangular four-roomed structures was pointed out, but only in a limited space just above the ruins of Period I (see structure A1, fig. 4b). This space, which originally was slightly higher than the area of compartmented buildings, has been preserved over a narrow surface. Due to its position, this part of the settlement has escaped to the erosion process which most probably has destroyed several other four-roomed houses belonging to Period IIA.

The number and the sizes of these storehouses, mostly storing barley and wheat, provide us with an idea of the scale of the agricultural efficiency of the inhabitants of the Period IIA settlement. The impressive plans of compartmented buildings of Period IIA can be compared with similar buildings from West Asian sites such as Tell el Oueili or Umm Dabaghiyah, at the end of the 7<sup>th</sup> millennium BC. It is probably not a mere chance if one notices the occurrence at Umm Dabaghiyah (Kirkbride 1972) and at Mehrgarh, Period II A, of some potsherds not only built according to the same sequential slab construction, but also bearing similar applied designs (1984-85 report in C. Jarrige *et al.* 1995: 539: fig. 11.14b).

### **3. A MAJOR CHANGE IN THE BURIAL PRACTICES BETWEEN PERIOD I AND PERIOD IIA**

As a whole, most of the finds associated with Period IIA show a great continuity with those from the upper levels of Period I. As regard the funerary practices, the 1979-80 Report (C. Jarrige *et al.*: 281) mentioned the discovery within a limited space in the MR.03 North area of 15 skeletons in flexed position. Traces of walls indicate the existence of burial chambers and two multiple burials were also recorded for the first time at Mehrgarh. No grave goods or ornaments were associated with these burials dug in a Period IIA level. The space was indeed limited, but we noticed on the other side of the deep gully bordering to the north area MR.03 that this graveyard extended to the MR.06 area (fig.4). In the section cut by the Bolan river, it was easy to follow a layer of graves with many human bones including fragments of skulls. But no grave goods were visible either in the section or fallen at the foot of the cliff. It can therefore be assumed that a very significant ideological change occurred in the funerary practices and in the beliefs about life after death at the beginning of Period IIA. The distribution pattern of grave goods that has been functioning without major changes during the whole Period I no longer responded to the ideological and religious requirements of the society. We have pointed out that the number and the sizes of the storehouses of Period IIA gave not only an idea of the agricultural efficiency of the inhabitants of the settlement but also implied a social organization able to coordinate collective activities on a much larger scale than it was apparently the case during Period I. It can well explain the fact that several of the Period I symbolical, religious and ideological references were no longer adapted to a changing society. The symbolical values that may have been attached to

the seashells and to some categories of objects found in association with the dead buried in the Period I graveyards have probably lost their efficiency in a society who is likely to have adopted a more religious and a less magical conception of the after-life. As regard the human figurines, if the standing types disappear in Period IIA, the sitting types show an evident continuity with Period I. But one notices that the perforated figurines to which we have attributed a magical role are no more attested in Period IIA as well as in the later periods of Mehrgarh.



**XII: Part of MR.03 North seen from the East**

## CHAPTER 6

### CHRONOLOGY AND CONTEXT

#### 1. THE DATING

In several other publications we have pointed out that many radiocarbon dates were not in accordance with the stratigraphy of the site (Jarrige 2000). Many years ago it came as a surprise that charcoals collected from the same very early layer of the MR.3T sounding, could give dates such as 9835 $\pm$ 120 BP (Beta 1721) and 5830  $\pm$  190 BP (Ly. 1947). The result of the first date with one sigma cal. is between 8827, 8261 BC and with two sigma between 8950 and 8090 BC. The second one is with one sigma cal. is 6139 and 5670 BC and with two sigma between 6467 and 5441 BC.

Out of the twenty-six dates available from Period I to Period III, fifteen are between 6000 and 5000 BP, regardless their stratigraphic context and the period they belong to (C. Jarrige *et al.* 1995: 555-556). For Period I, dates such as 7928 $\pm$ 173 BP, 9385 $\pm$ 120 BP, 7115 $\pm$ 290 BP, 8440 $\pm$ 250 BP have been obtained. Some of these radiocarbon dates are therefore well before and others around 7000 BC. These results are not in accordance with other dates ranging between 6000 and 5000 BP. For Period IIA, the three dates available are 5620 $\pm$ 100 BP, 5490 $\pm$ 70 BP and 5400 $\pm$ 90 BP. For Period IIB, the Neolithic phase associated with the fine lustrous red ware, dates are 7115 $\pm$ 120 BP, 5490 $\pm$ 70 BP, 5400 $\pm$ 90 BP. For period III, which corresponds to the early Chalcolithic period we have a date of 6500 $\pm$ 80 BP, which is earlier than the majority of the results for the aceramic Neolithic period. A new dating from a sample taken in one house of Level 2 exposed in the course of the 1997 excavation has given a result of 5930 $\pm$ 50 BP, which also comes within the cluster of dates between 6000 and 5500 BP.

Let us just mention that more recently J.-F. Saliège, specialist of radiocarbon dating, being puzzled by the series of dates not reflecting the stratigraphic sequence of the Neolithic site, made a new attempt with two AMS datings with one sample coming from Level 1, just above the natural sediment, and another one from Level 2. The results were far from convincing with two dates of about 3035 BP for Level 1 and 4555 BP for Level 2. When discussing these results, J.-F. Saliège pointed out the fact that floods had submerged the MR.03 mound in the past and until recently and that a huge amount of water must have regularly impregnated the sediments. The studies of the sections have shown that the Neolithic deposits have been indeed flooded many times and were, until recently, buried under a dense network of irrigated fields, also used as grazing ground. From top to bottom, the archaeological deposits revealed the existence of a very dense and ancient network of more or less fossilized roots as well as holes and galleries made by rodents and insects. This dense circulation of organic matters throughout the deposits in the course of several millennia have to be kept into account to explain some of the discrepancies between dates from samples often collected in the same level. C.P. Glew, when studying the caprine teeth of the early Neolithic noted that in the same mandible the age estimation would be different (2 and 4) for two teeth and was wondering if this anomaly could be connected with the very complex site formation processes which could have also affected the radiocarbon dating.

There is indeed no reason not to keep into account the early radiocarbon dates, even if several other dates provide later datings, which are in total contradiction with the stratigraphic sequence of the site and the comparisons that we have established between Mehrgarh and several other West-Asian Neolithic sites. By doing so, we agree with G. L. Possehl's statement: "Taken as a whole, the dates from Mehrgarh I and II seem to indicate that there was a settlement there at the beginning of the eighth

millennium BC." (Possehl 1999: 447). At least it can safely be assumed that the early levels of Mehrgarh are not posterior to the 8<sup>th</sup> millennium BC.

## 2. MEHRGARH NEOLITHIC IN THE GENERAL CONTEXT OF MIDDLE AND SOUTH ASIA

In the past years no new elements have contributed to break the geographic isolation of the Neolithic settlement of Mehrgarh. The archaeological researches conducted in Pakistan, in particular in Balochistan, have not provided any new information about the Neolithic period. We have already mentioned that Kili Ghul Mohammad, in the Quetta Valley, where an expedition in 1950-51, under the leadership of W.F. Fairservis, conducted a trial trench, still remains the only site with a possible aceramic Neolithic phase (Fairservis 1956). At the bottom of the trench, 4 m thick deposits (KGM I), down to the natural sediment, yielded no ceramics. Layers associated with the Kili Ghul Mohammad II, III and IV pottery were sealing the earliest deposits. The Kili Ghul Mohammad II and III pottery has close relationships with the Period III pottery at Mehrgarh. Therefore it can be assumed that the Kili Ghul Mohammad I layers are earlier than the beginning of the Chalcolithic Period in Balochistan. But, as the natural soil was reached in a trench not wider than 1 or 2 m<sup>2</sup>, we just know that no potsherds were found. Considering that only very few potsherds were collected in the Period IIA layers at Mehrgarh as well as in Period IIB layers, it is difficult to be sure, on account of the very small excavated surface, that the Kili Ghul Mohammad I layers were entirely aceramic. Nevertheless the great importance of Kili Ghul Mohammad is to indicate that a Neolithic stage did exist not only in the lowlands of the Kachi/Bolan basin but also in the highlands, in particular in the Quetta Valley. But the network of Neolithic sites from the hills and the piedmont valleys of Central Balochistan is probably, in most of the cases, buried under several meters of alluvial strata or sealed by thick later deposits. It should also be kept into account that if, by any chance, the apex of a buried aceramic mound reaches the surface, a few flints are much more difficult to locate than an area littered by hundreds of potsherds.

In southern Balochistan, where the French Mission to Makran, directed by R. Besenval, was working until recently, no site earlier than the fifth millennium BC has been recorded. It can be expected that the Iranian archaeologists working in eastern Iran will fill some blanks on the archaeological map between Western Iran and the Indus Valley. Several aceramic sites have been discovered in the Bam District in the Kerman province. The largest one, Tell-e Atashi, has been subjected to a limited excavation. A few mud brick structures have been exposed with no association with pottery (Garazhian 2009). But in Makran, a region not so far from Kerman province, the sites remain aceramic till the end of the 5<sup>th</sup> millennium BC, while sites in northern and Central Balochistan are characterized by an already long tradition of pottery. It is therefore quite possible that some aceramic sites in the south-eastern parts of the Iranian Plateau could have coexisted side by side with other sites in Northern and Central Iran pertaining to the "transitional Neolithic-Chalcolithic Period", between about 5200 and 4300 BC, like for instance Cheshmeh Ali (Wong *et al.* 2010). These Iranian sites, dating from the end of the 6th millennium and the first half of 5th millennium BC, correspond in time to the end of the Neolithic Period at Mehrgarh (Period IIB) and to the beginning of the Chalcolithic Period (Period III), as indicated by several convincing parallels (Jarrige *et al.* 2011: 10-11).

The early Neolithic settlement at Mehrgarh displays some similarities with several Neolithic settlements in the hilly regions forming the western border of Mesopotamia. The quadrangular houses of Period I at Mehrgarh are built with 60 cm long narrow bricks with a herringbone pattern of impressions of thumbs to provide a keying for the mud-mortar. These bricks by their shapes and sizes are very similar to the bricks used to build the architectures of several aceramic Neolithic sites in the Zagros area, such as Ganj Dareh or Ali Kosh in the Deh Luran region of Iran. At Mehrgarh, traces of paintings have been noticed on the walls of a few houses as is the case for several sites of the Near

East. The lithic industries also show evident parallels from a stage characterized by microliths and flakes to a fine blade industry. The polished-stone axes begin occurring at several sites of the Deh Luran area, such as Ali Kosh, only in an advanced phase of the aceramic Neolithic along with an increasing number of stone vessels (Hole *et al.* 1962). It is the same at Mehrgarh where the fine polished stone axes in black diorite are found only in the upper levels of Period I, mostly as grave goods. From Period II at Mehrgarh, the polished or ground stone axes are no longer found in the Kachi-Bolan area and elsewhere in Balochistan. In several contributions, Catherine Jarrige has pointed out the originality of the Neolithic figurines though she has also shown that some of them displayed common features with figurines from Neolithic sites of western Iran and of the Zagros areas (C. Jarrige 2005, 2008)

But after pointing out the occurrence of some similar features between Mehrgarh and several Neolithic sites of the eastern border of Mesopotamia, we have to recall that the Period I settlement at Mehrgarh also displays definite original features which, in particular, exclude the hypothesis of the introduction of a full-fledged farming economy by groups of settlers coming directly from western Asia. The domestication process of goats and sheep by a population still deeply involved in hunting wild animals, among which are recorded a significant number of wild goats and sheep, does not fit the assumption of new settlers introducing an already well-developed pastoralism. As said before, it is now admitted that the domestication of *Bos indicus* is a local process. We all remember the famous sentence of Sir Mortimer Wheeler: “the *idea* of civilisation came to the Indus from the Euphrates and Tigris” (Wheeler 1953: 93). Paraphrasing this statement, could we say that the *idea* of domestication and cereal cultivation came to Balochistan from West Asian sites? But it is not very easy to understand how an idea could have flown over such long distances in an early Neolithic context. It seems to us much more likely, as suggested above by Lorenzo Costantini, that the inhabitants of the Level 1 settlement at Mehrgarh must have had local antecedents whose remains have not so far been found. We have seen that John Lukacs, on the basis of his morphological study of the teeth, suggested that the Mehrgarh population belonged to a regional “Asian gene pool”.

As a whole one of the major contributions of Mehrgarh has been to reveal for the first time the existence of an early and well-developed Neolithic stage in the Greater Indus region. This impressive Neolithic stage provides a very significant local background for the local Chalcolithic and Bronze Age cultures until the emergence of the Indus Civilization. It is worth to insist once more on the fact that the original features that we have pointed out, in particular the internal dynamism of craft activities displaying consecutive technical innovations in the course of Period I, indicate that Balochistan and the Indus Valley can no longer be interpreted as the “backwater” of the Neolithic cultures of the Near-East. The simplistic diffusionist models that had been prevailing for interpreting the archaeological remains of the north-western regions of the Indo-Pakistani subcontinent have to be replaced by models keeping into account the long archaeological sequence of this region.

Further east towards modern India, one progressively enters other geographical contexts, in particular those affected by the monsoon. As early as 1867, A.C.L. Carlyle, of the Archaeological Survey of India, discovered in Uttar Pradesh and in Madhya Pradesh (dist. Mirzapur and Rewa) many sites with microliths and rock shelters, some decorated with paintings. Since then, thousand “Mesolithic” sites have been recorded as well as many “Neolithic” settlements close to lakes left by ancient meanders of the Ganges, in areas of distribution of wild cereals such as rice. As well as for Mehrgarh, there are sometimes some problems with the radiocarbon dates from such sites, but there is no reason to discard systematically early dating. Let us recall that, before the discovery of Mehrgarh, the first settlements in Balochistan and the Indus valley were thought to be not earlier than 4000 BC and were interpreted as the result of an eastern diffusion of an Iranian or Central Asian socio-cultural model.

Due to the limited amount of information about an eventual Neolithic phase in Balochistan and in the Indus Valley, the Mesolithic and Neolithic sites of the Ganga system, with their specific aspects

such as the availability of wild rice, were often studied within a purely “Indian” context. The work conducted at Mehrgarh, as we have seen, has brought to light the presence, in the north-western regions of the Indo-Pakistani subcontinent, of communities which were involved, probably as early as the 8<sup>th</sup> millennium BC, in more or less incipient farming activities, based on the cultivation of cereals, in particular, barley and a process of animal domestication. On-going researches in the Gangetic regions, for instance in Uttar Pradesh, in particular at Lahuradewa, a site providing early evidence of rice exploitation, and at several other sites expanding to the north of Vindhya hills, have greatly extended our knowledge of the early more or less incipient farming communities of the Middle Ganga Plain (Tewari *et al.* 2004-2005). The now available data collected in the course of the last thirty years at Mehrgarh, a Neolithic settlement of the Greater Indus system, as well as at the many Mesolithic and Neolithic sites of the Greater Ganga system, should help to reach a more comprehensive understanding of the interaction between groups of hunter-gatherers, incipient farmers or early farmers all over the northern part of the subcontinent from Balochistan to the Middle Ganga Plain.



**XIII: The archaeological excavation camp at Mehrgarh, 1998.**

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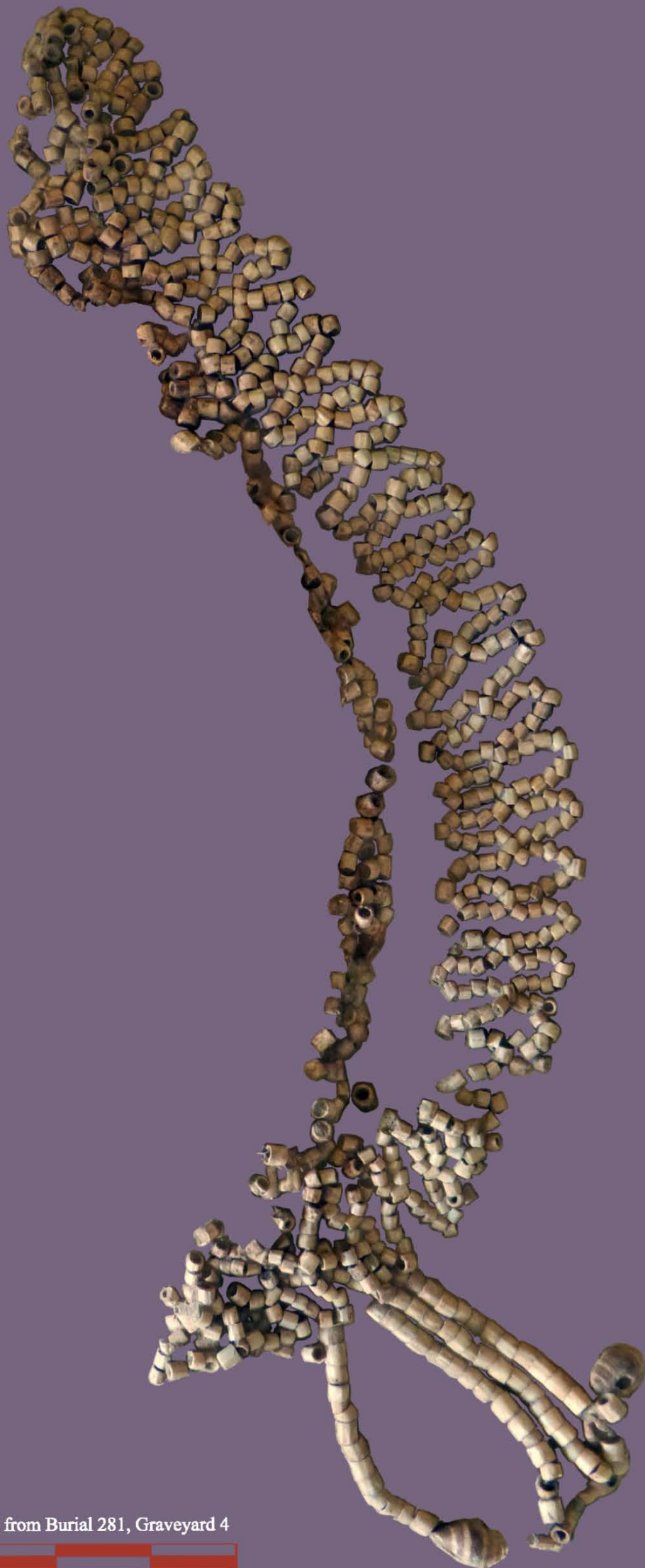
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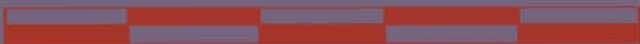
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Head ornament in sea shell from Burial 281, Graveyard 4

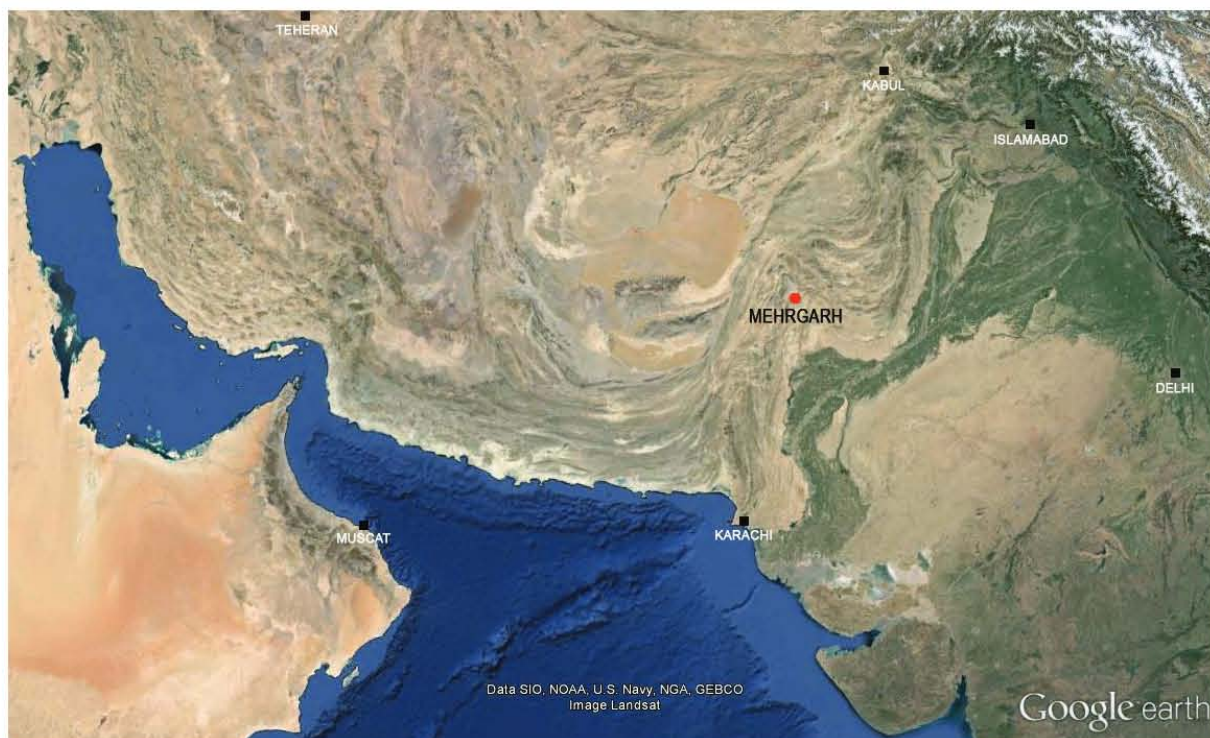


# ILLUSTRATIONS

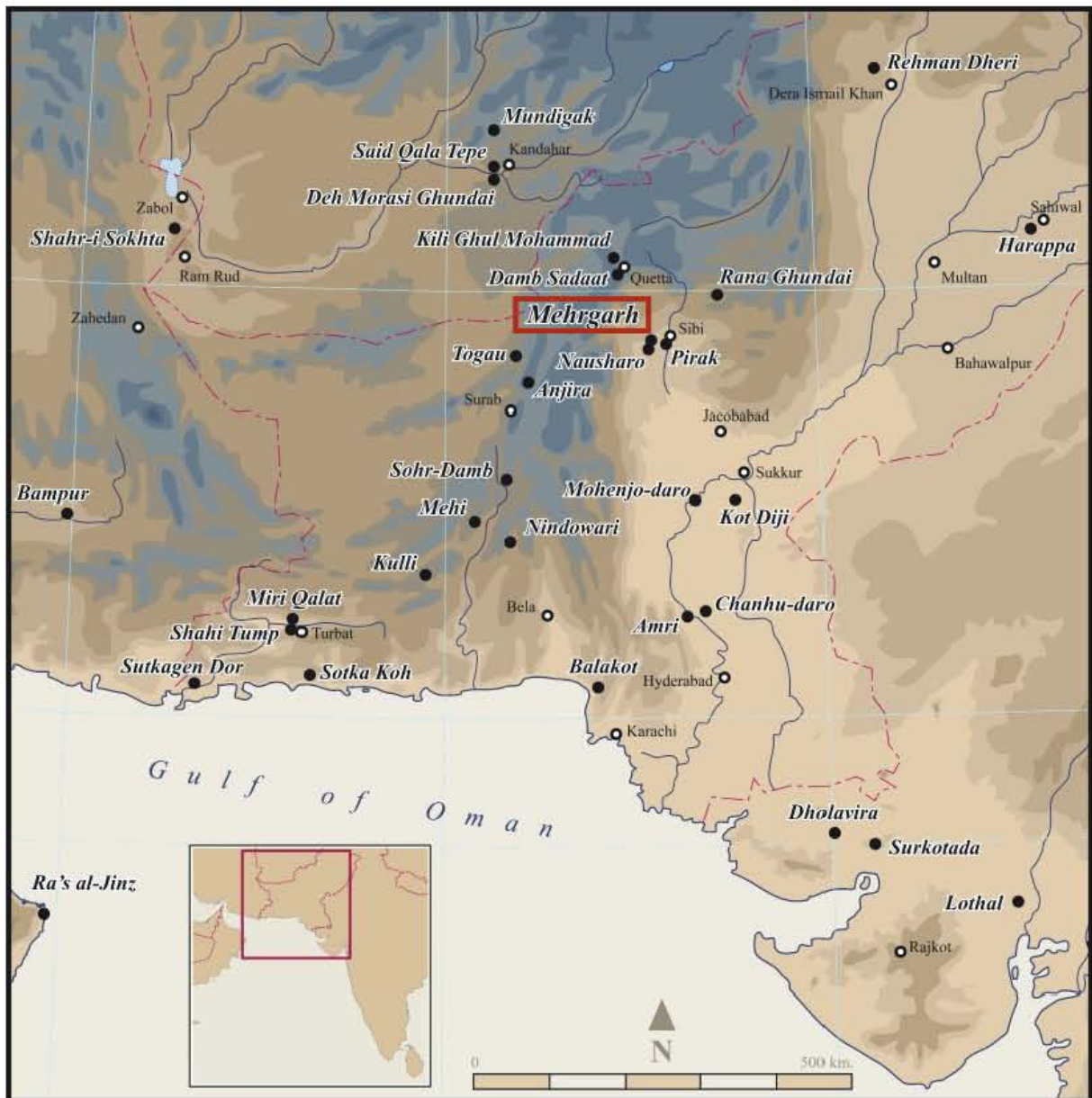


**MAPS  
CHARTS  
AND  
SITE PLANS**





Satellite image with the location of Mehrgarh. Photo: Google Earth.



**Figure 1: General Map. Location of Mehrgarh and other archaeological sites in the north-western region of the Indo-Pakistani subcontinent.**

MR3 S		MR3 T		MR3 D-Bolan MR3 F	MR3 ARCHITECTURAL LEVELS
1977/1978	1978/1979	1978/1979	1979/1980	1982/1983	1996/1997 1997/1998 1998/1999 1999/2000
	1979/1980				
	1980/1981				
	1981/1982				
	1982/1983				
	1983/1984				
	1984/1985				
	<b>PERIOD IA</b>	<b>PERIOD IA</b>	<b>PERIOD IA</b>	<b>PERIOD IA</b>	<b>PERIOD I</b>
9/10	1/2	13/14/15/16/17	1/2	1/2	1
8	3	8/9/10/11/12	3/4	3	2
7	4	5/6/7	5/6/7	4	3
5/6/7	4/5/6	5	7	5	4
5	6/7	5	8	6	5
	<b>PERIODS IB/IIA</b>				
4B/5	1/2	4	9	7	6
4A	3	3/4	9/10	8	7
3	4	3/2/1	10/11	9/10	8
2	5	1	11	11	9
				<b>PERIOD IB</b>	
1	6/7/8			1/2/3	Trash levels
1	8/9/10/11			3/4/5	<b>PERIOD IIA</b>
<b>OLD TERMINOLOGY</b>					<b>NEW TERMINOLOGY</b>

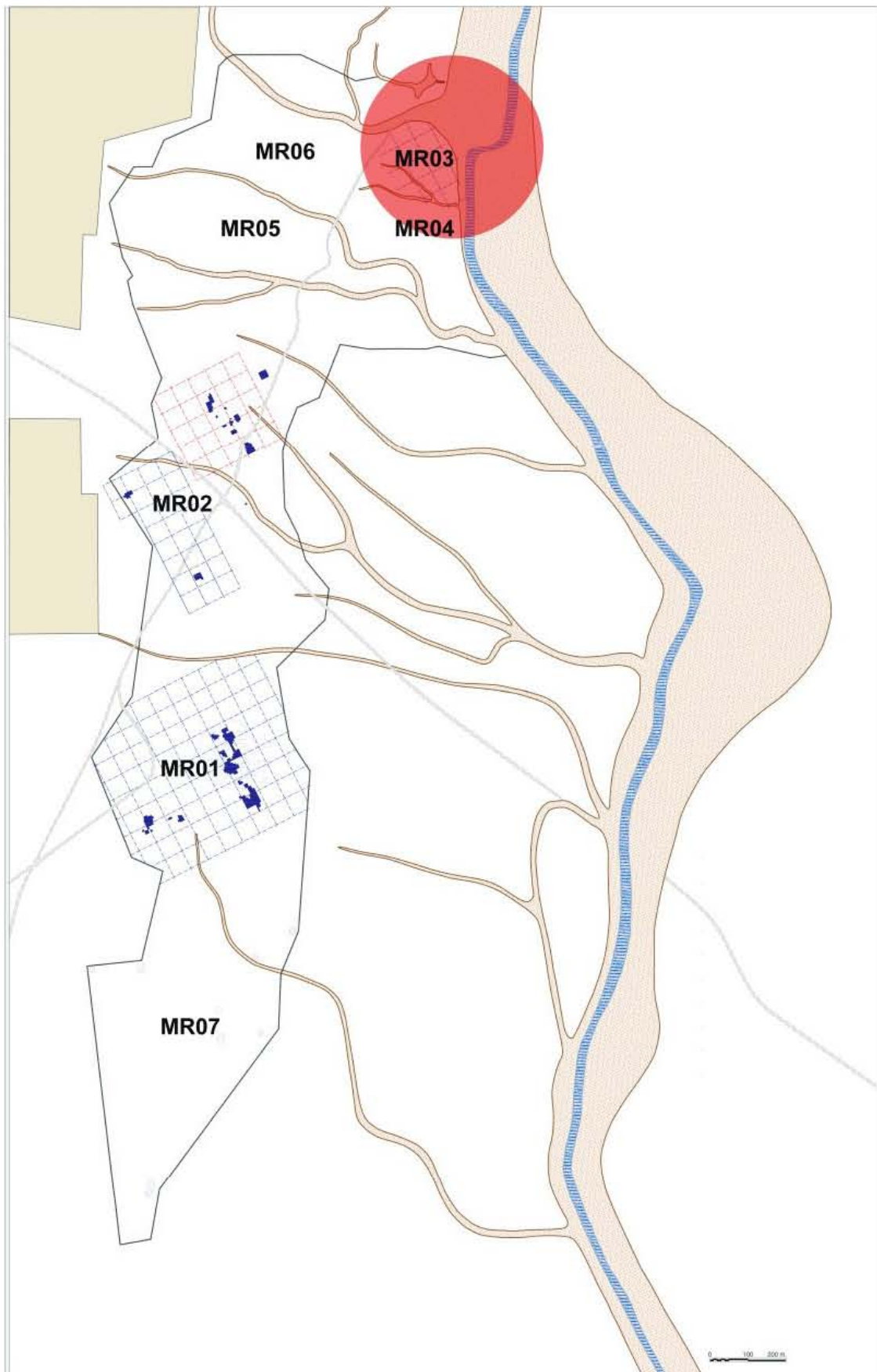
Figure 2 : Chart of concordance between the New Terminology of the architectural levels (Seasons 1997-2000) and the Old Terminology (Seasons 1979-1985)

BURIALS	GRAVEYARDS	BURIALS	GRAVEYARDS	BURIALS	GRAVEYARDS	BURIALS	GRAVEYARDS	BURIALS	GRAVEYARDS	BURIALS	GRAVEYARDS
1-1983	9	18-1983	9	41-1983	4	84/11-1984	5	112-1979	9	156-1983	9
2-1983	9	19-1983	9	43-1983	3	84/12-1984	5	112-1997	8	157-1984	9
3-1983	8	20-1980	2	44-1983	9	90-1979	9	113-1979	9	158-1984	9
4-1983	8	20-1983	6	62-1978	9	91-1979	9	113-1997	8	159-1983	9
5-1979	8	21-1980	2	63-1978	9	93-1979	9	114-1979	9	160-1984	9
5-1983	9	21-1983	6	65-1978	9	101-1979	9	114-1997	8	161-1984	9
6-1983	9	22-1980	1	66-1978	9	101-1997	9	115-1997	8	162-1984	9
7-1983	7	22-1983	6	71-1978	9	102-1979	9	116-1980	9	163-1984	9
8-1979	8	23-1983	9	72-1978	9	102-1997	9	116-1997	8	164-1984	9
8-1983	9	24-1983	9	77-1978	9	103-1979	9	117-1980	9	165-1984	9
9-1983	9	25-1983	9	78-1978	9	103-1997	9	119-1980	9	166-1985	9
10-1983	9	26-1983	9	79-1978	9	104-1979	9	121-1980	9	167-1985	9
11-1983	9	27-1983	5	80-1978	9	104-1997	9	122-1980	9	168-1985	9
12-1979	7	28-1983	5	81-1978	9	105-1979	9	123-1980	9	169-1985	9
12-1983	9	29-1983	6	83-1978	9	105-1997	9	124-1980	9	170-1985	9
13-1979	5	30-1983	5	84-1978	9	106-1979	9	125-1981	9	171-1985	9
13-1983	9	31-1983	5	84/1-1984	9	106-1997	9	134-1981	9	172-1985	9
14-1979	5	32-1983	5	84/2-1984	9	107-1979	9	146-1981	9	173-1985	9
14-1983	9	33-1983	6	84/3-1984	9	107-1997	8	148-1981	9	174-1985	9
15-1979	5	34-1983	5	84/4-1984	9	108-1979	9	149-1981	9	175-1985	9
15-1983	9	35-1983	5	84/5-1984	9	108-1997	8	150-1981	9	176-1985	9
16-1979	4	36-1983	4	84/6-1984	9	109-1979	9	151-1983	9	177-1985	9
16-1983	9	37-1983	5	84/7-1984	9	109-1997	8	152-1983	9	178-1985	9
17-1979	4	38-1983	2	84/8-1984	9	110-1997	9	153-1983	9	179-1985	9
17-1983	9	39/42-1983	4	84/9-1984	9	111-1979	9	154-1983	9	180-1985	9
18-1980	2	40-1983	4	84/10-1984	5	111-1997	8	155-1983	9	181-1985	9

**Figure 3: MR.03 Period I. Burials and graveyards (Seasons 1979-1985 and 1997-2000)**

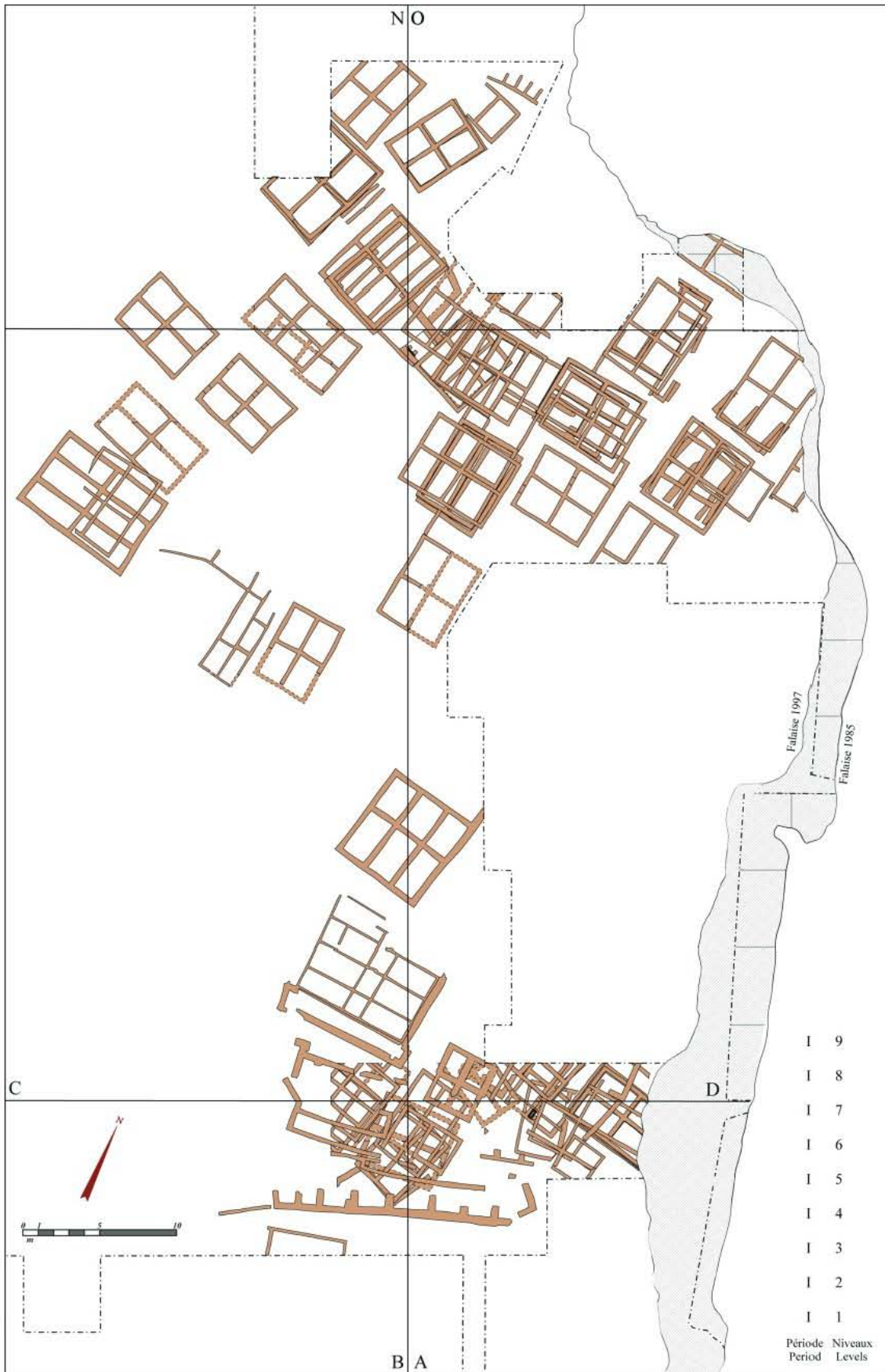
BURIALS	GRAVEYARDS	BURIALS	GRAVEYARDS	BURIALS	GRAVEYARDS	BURIALS	GRAVEYARDS	BURIALS	GRAVEYARDS	BURIALS	GRAVEYARDS
182-1985	9	237-1998	6	258-1999	9	277-1999	2	295-2000	8	557-2000	5
183-1985	9	238-1999	9	259-1981	6	278-1999	5	296-2000	9	558-2000	7
184-1985	9	239-1999	9	259-1999	3	279-1999	5	297-2000	9	559-2000	7
185-1985	9	240-1999	9	260-1981	6	280-1999	1	298-2000	7	560-2000	7
186-1985	9	241-1999	9	260-1999	3	281-1982	4	299-2000	7	561-2000	5
187-1985	9	242-1999	9	261-1981	5	281-1999	4	500-2000	4	562-2000	7
188-1985	9	243-1999	7	261-1999	6	282-1982	3	501-2000	4	563-2000	7
189-1985	9	244-1999	6	262-1981	5	282-1999	6	502-2000	3	564-2000	8
218-1998	9	245-1999	9	262-1999	8	283-1982	3	503-2000	4	565-2000	8
219-1998	9	246-1999	9	263-1981	5	283-2000	9	504-2000	3	566-2000	7
220-1998	9	247-1999	4	263-1999	1	284-1982	4	505-2000	3	567-2000	7
221-1998	9	248-1999	4	264-2000	8	284-2000	9	506-2000	3	568-2000	5
222-1998	8	249-1999	4	265-1999	8	285-1982	3	507-2000	3	569-2000	7
223-1998	9	250-1999	5	266-1999	8	285-2000	9	508-2000	3	570-2000	6
224-1998	9	251-1999	5	267-1999	7	286-1982	2	509-2000	3	571-2000	8
225-1998	9	252-1999	5	268-1999	8	286-2000	9	510-2000	3	572-2000	3
226-1998	8	253-1999	8	269-1999	8	287-1982	3	511-2000	3	573-2000	7
228-1998	9	254-1980	7	270-1999	7	287-2000	8	512-2000	3	574-2000	7
229-1998	9	254-1999	8	271-1999	9	288-1982	3	513-2000	2	575-2000	5
230-1998	9	255-1980	7	272-1999	9	288-2000	8	514-2000	1	576-2000	6
231-1998	8	255-1999	8	273-1999	5	289-2000	8	550-2000	7	577-2000	8
232-1998	8	256-1981	6	274-1981	6	290-1982	3	551-2000	5	578-2000	3
233-1998	9	256-1999	5	274-1999	5	290-2000	9	552-2000	5	579-2000	3
234-1998	9	257-1981	6	275-1982	4	291-2000	7	553-2000	8	580-2000	7
235-1998	7	257-1999	6	275-1999	2	292-2000	7	554-2000	8	581-2000	5
236-1998	8	258-1981	6	276-1999	2	293-2000	8	555-2000	8	582-2000	4
						294-2000	8	556-2000	5	583-2000	4

**Figure 3b : MR.03 Period I. Burials and graveyards (Seasons 1979-1985 and 1997-2000)**

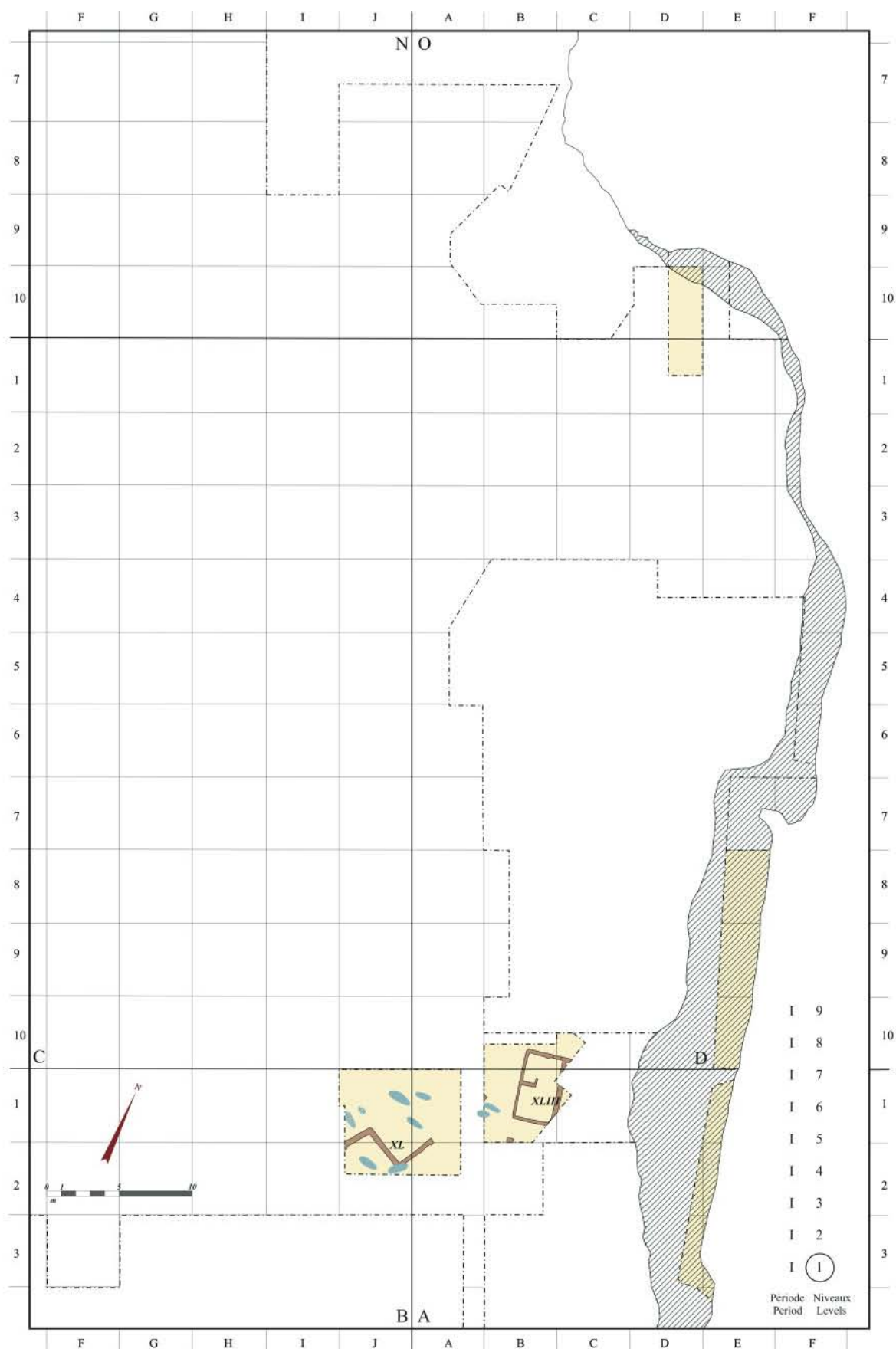


**Figure 4:** In red, the location of the Neolithic remains





**Figure 5:** Plan of the Neolithic Site MR.03. Period I, Levels 1 to 9.



**Figure 6: MR.03. Period I, Level 1**

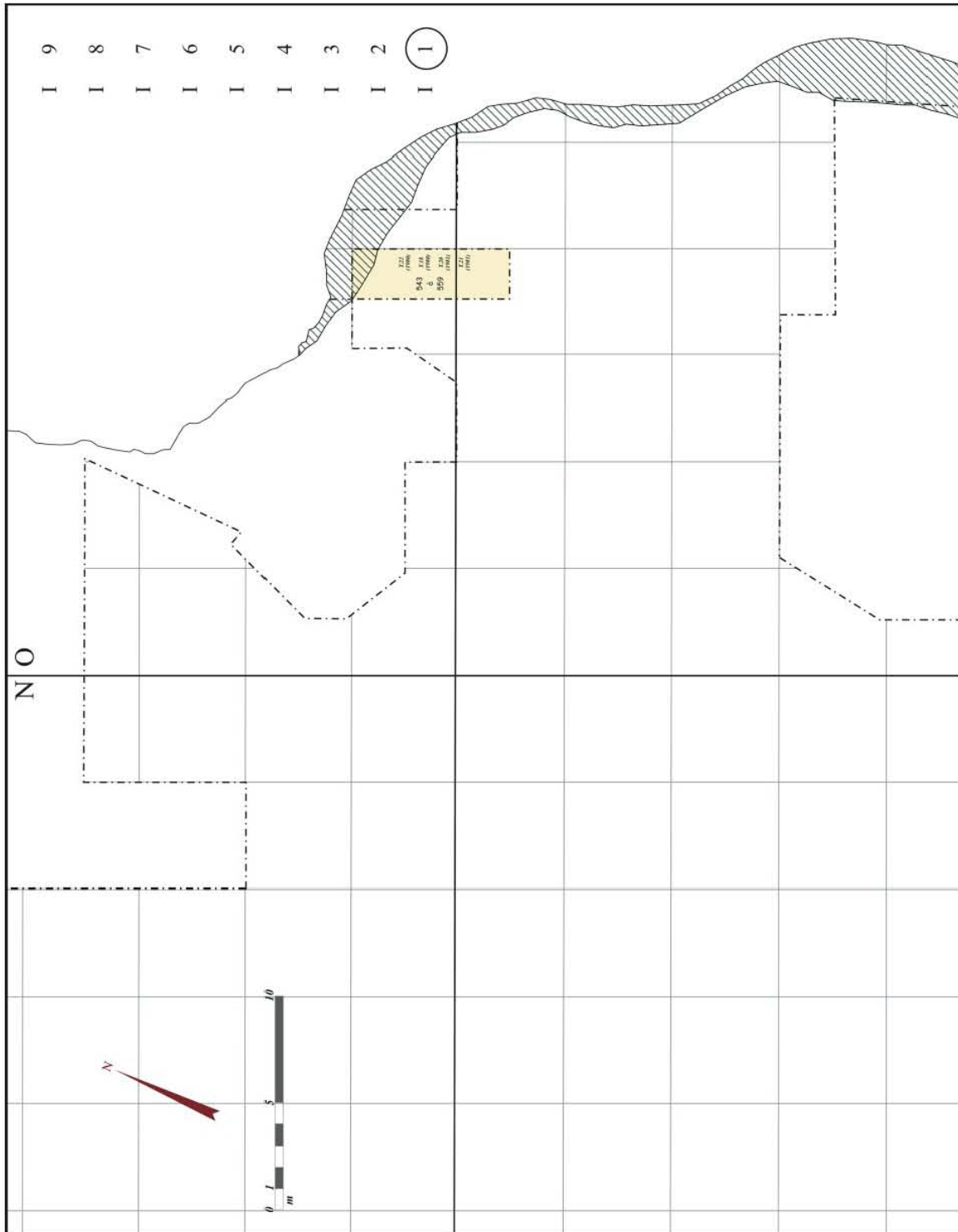


Figure 6b: MR.03. Period I, Level 1 North.

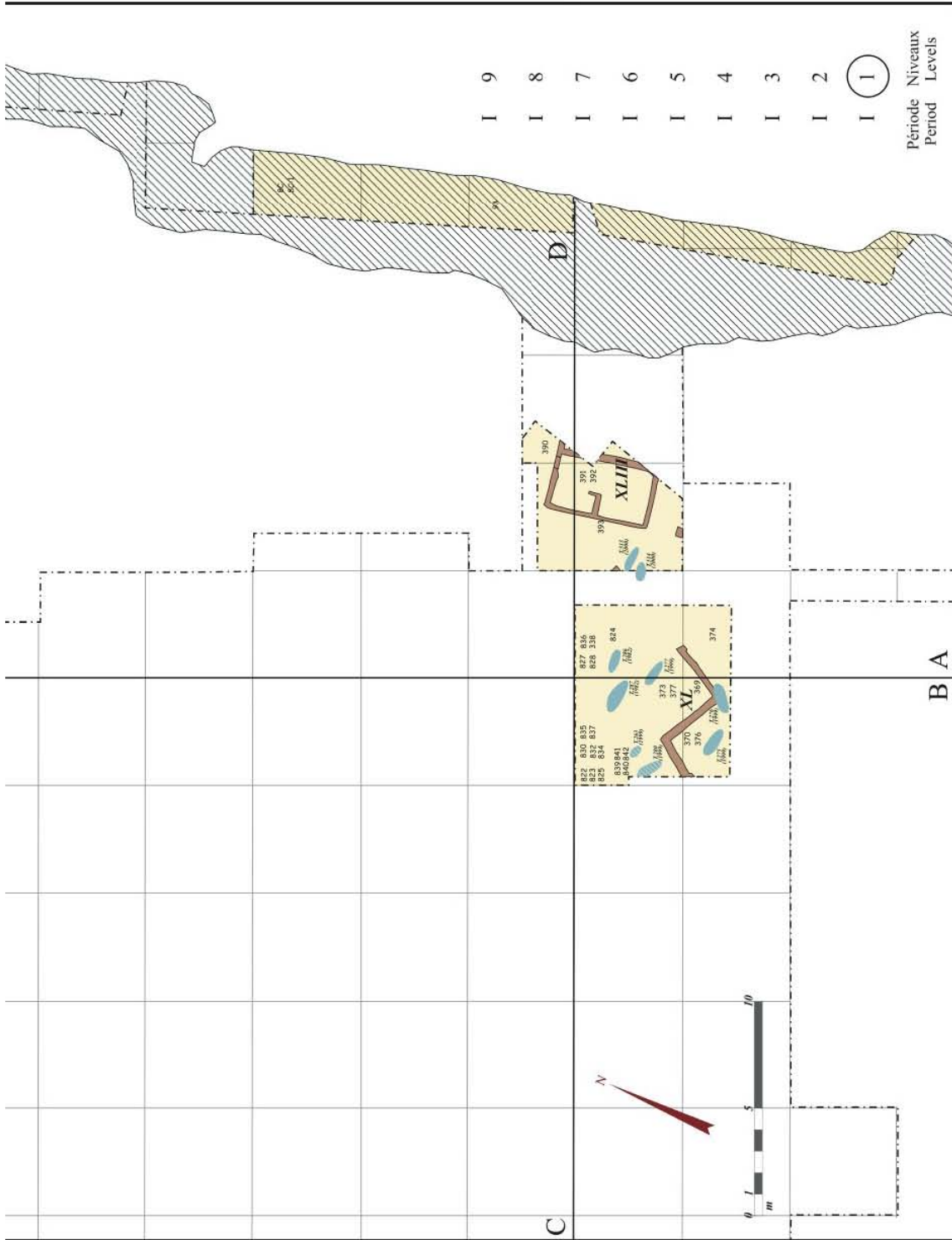


Figure 6c: MR.03. Period I, Level 1 South.



Figure 7: MR.03. Period I, Level 2

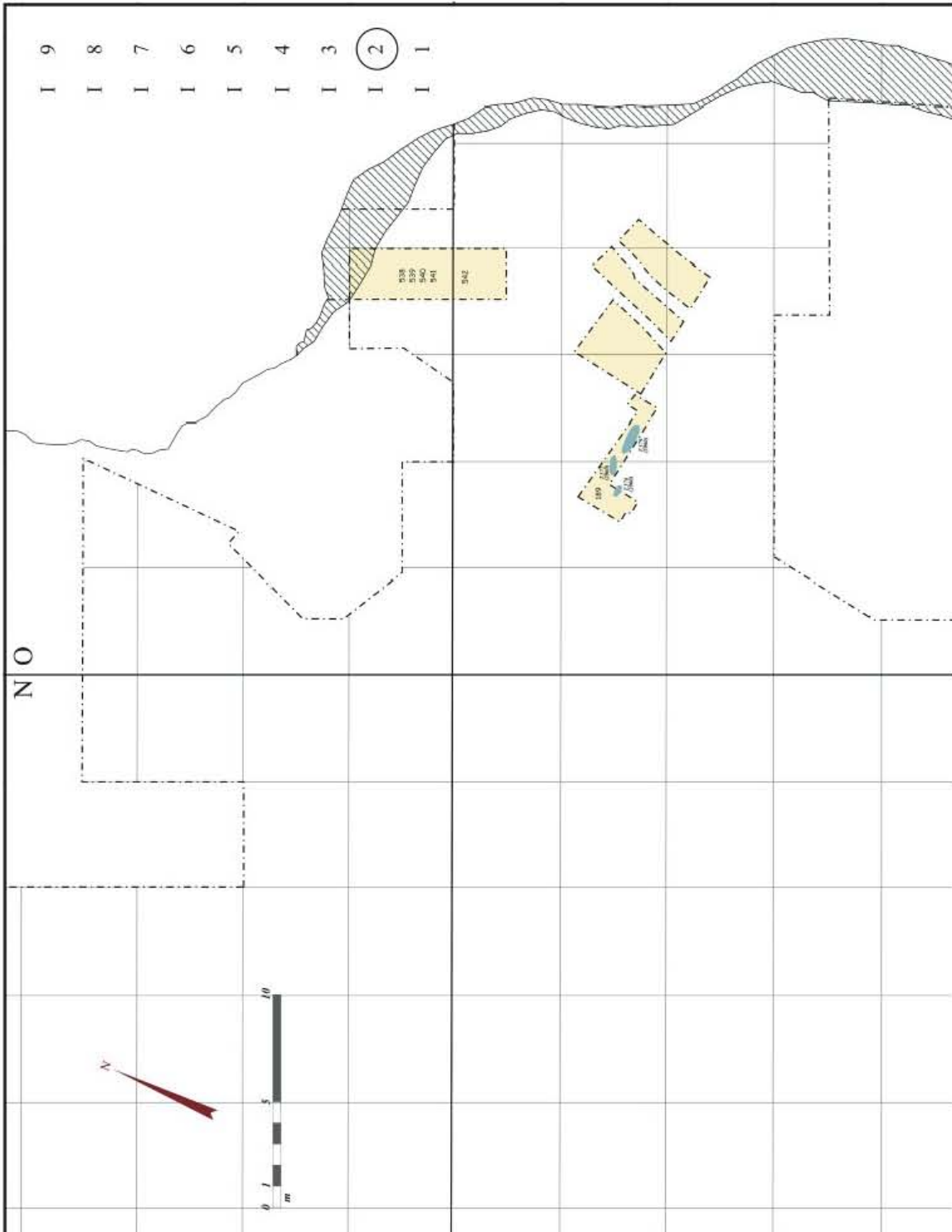


Figure 7b: MR.03. Period I, Level 2 North.

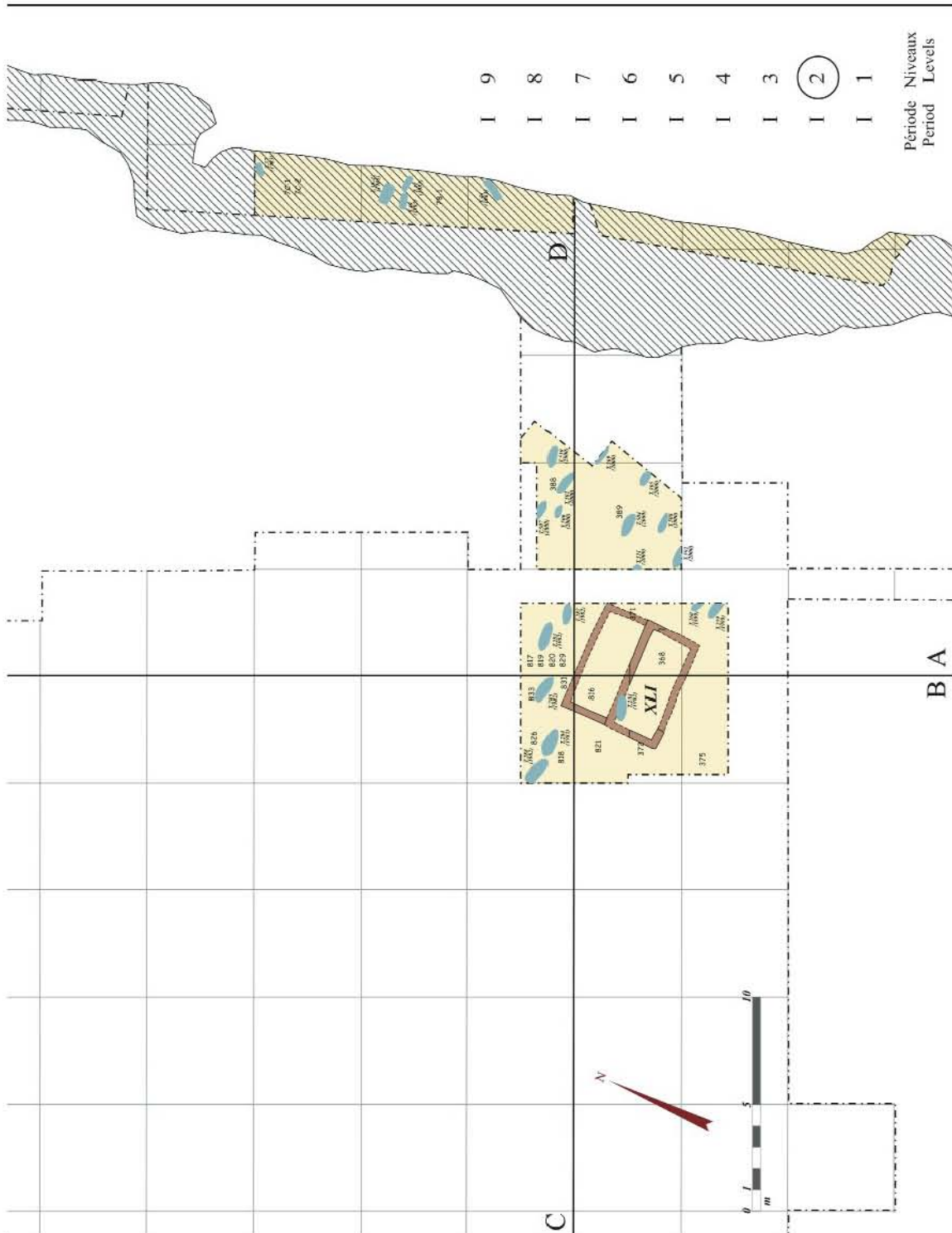
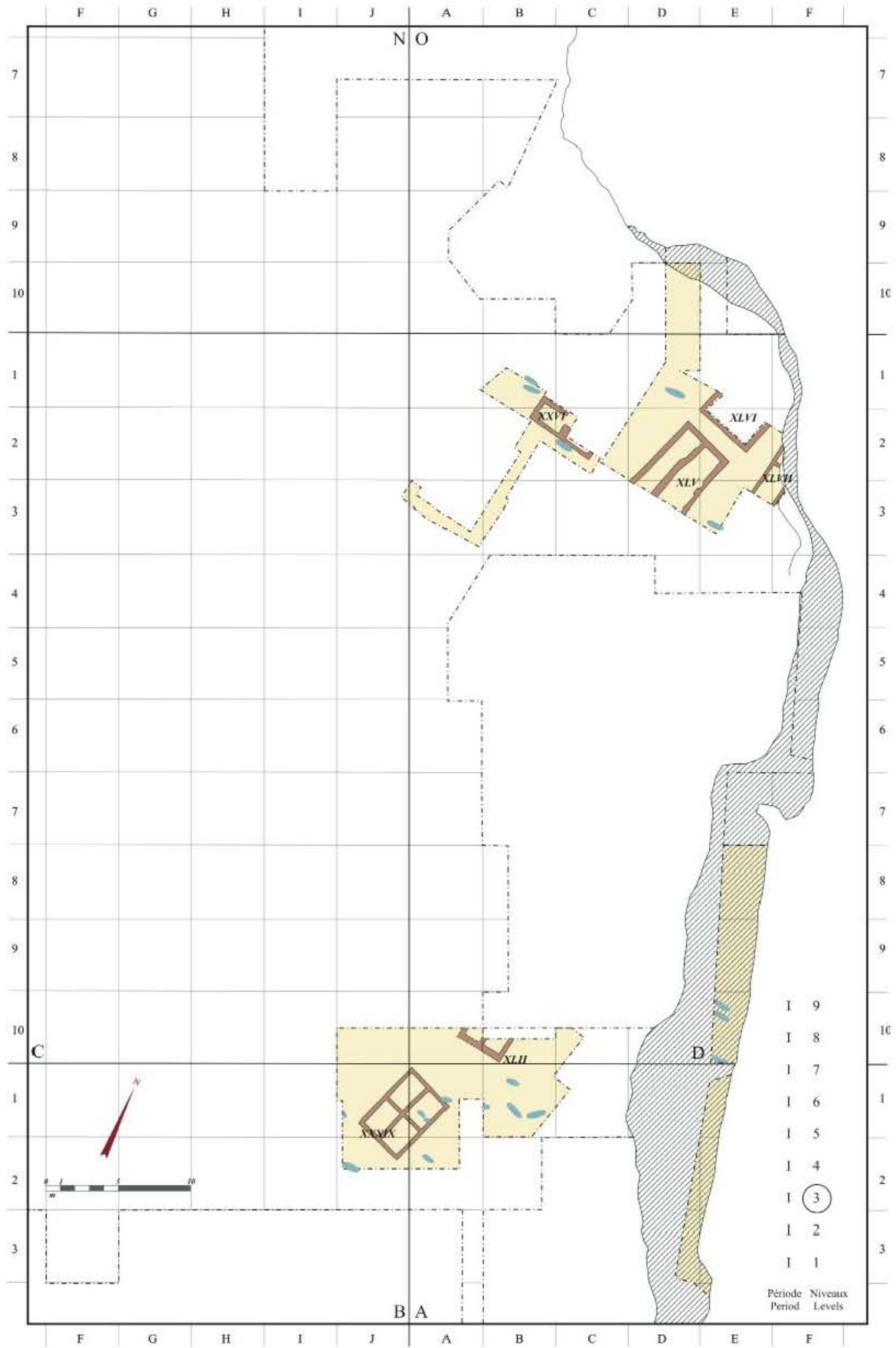


Figure 7c: MR.03. Period I, Level 2 South.



**Figure 8: MR.03. Period I, Level 3**

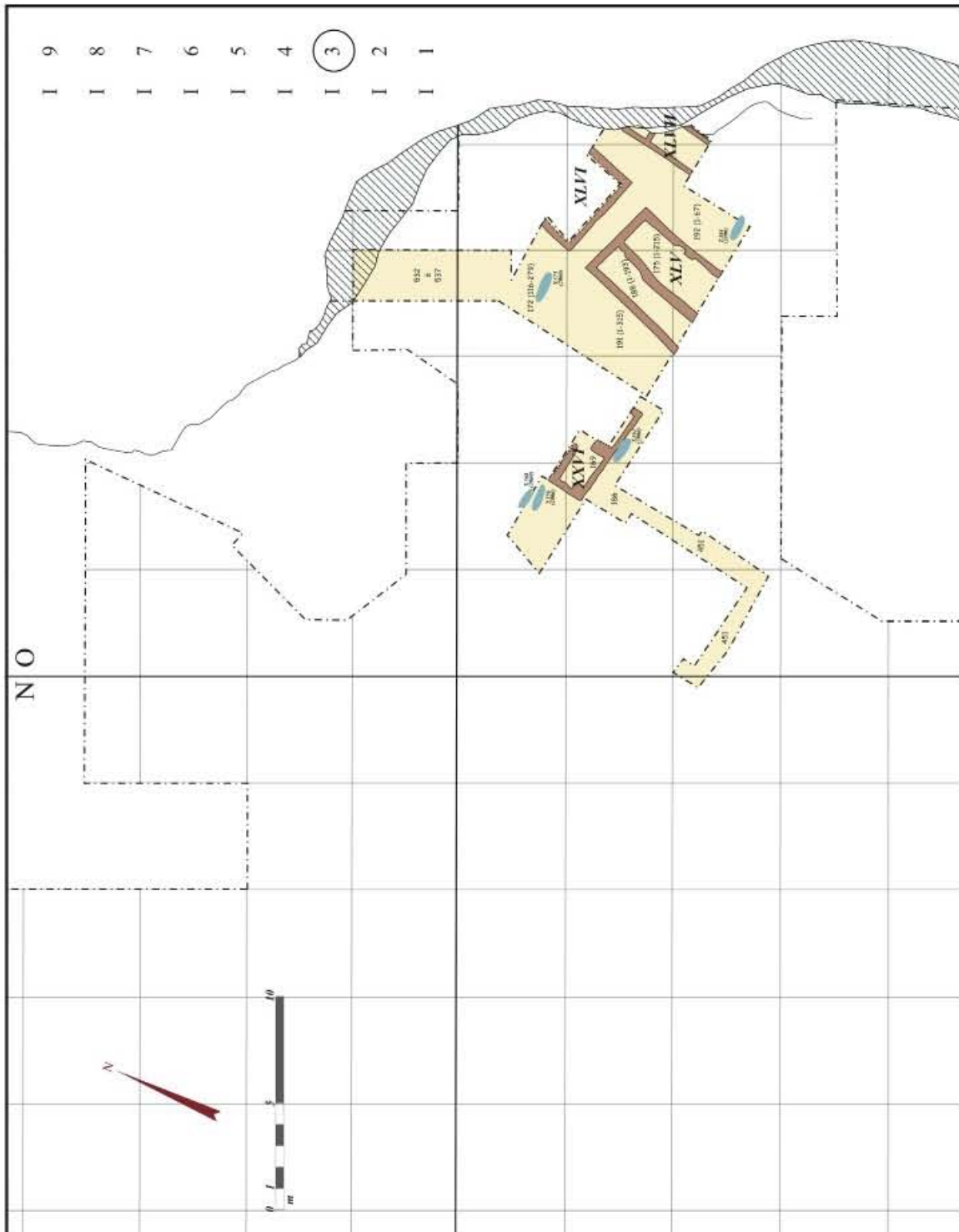
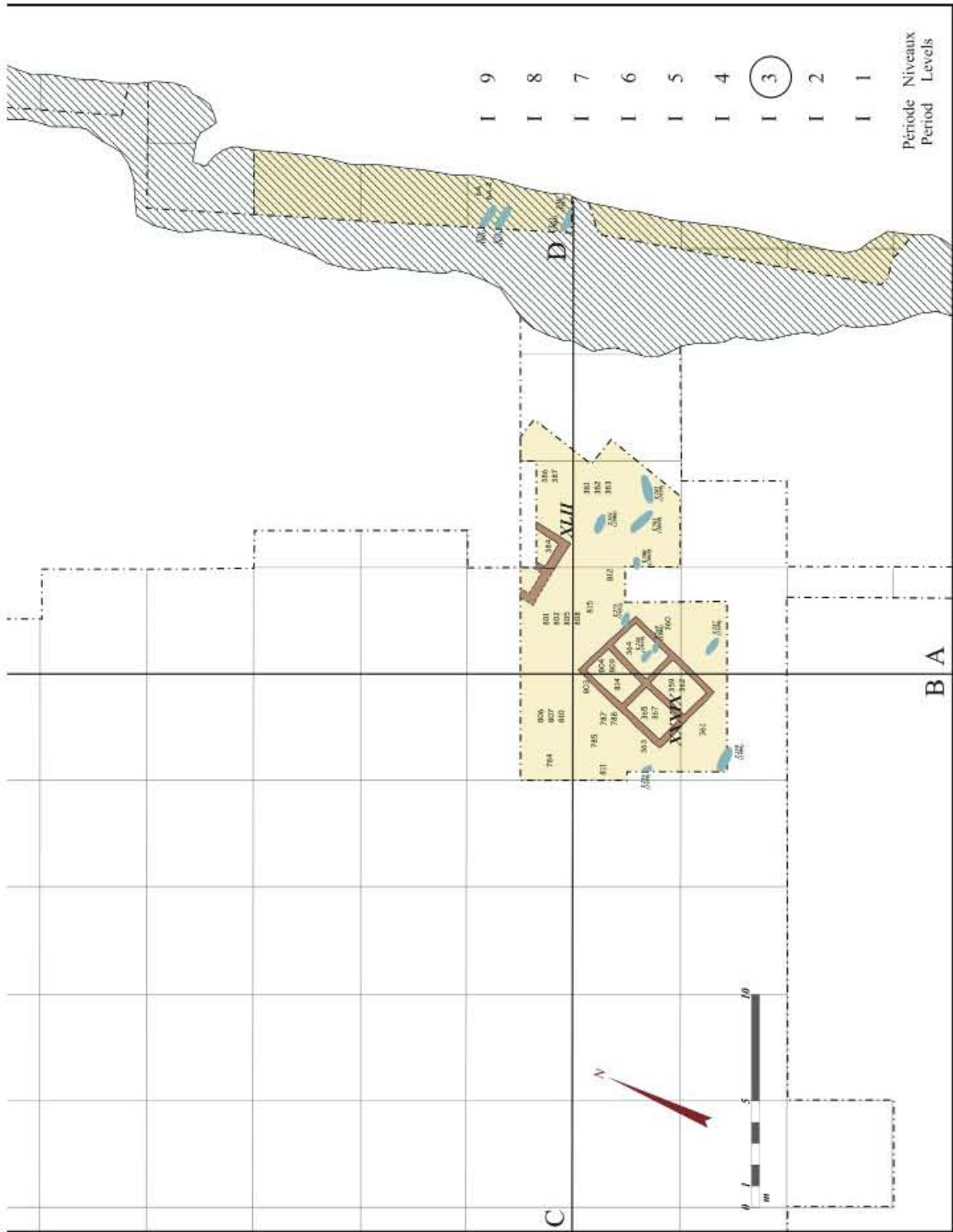


Figure 8b: MR.03. Period I, Level 3 North



**Figure 8c: MR.03, Period I, Level 3 South**

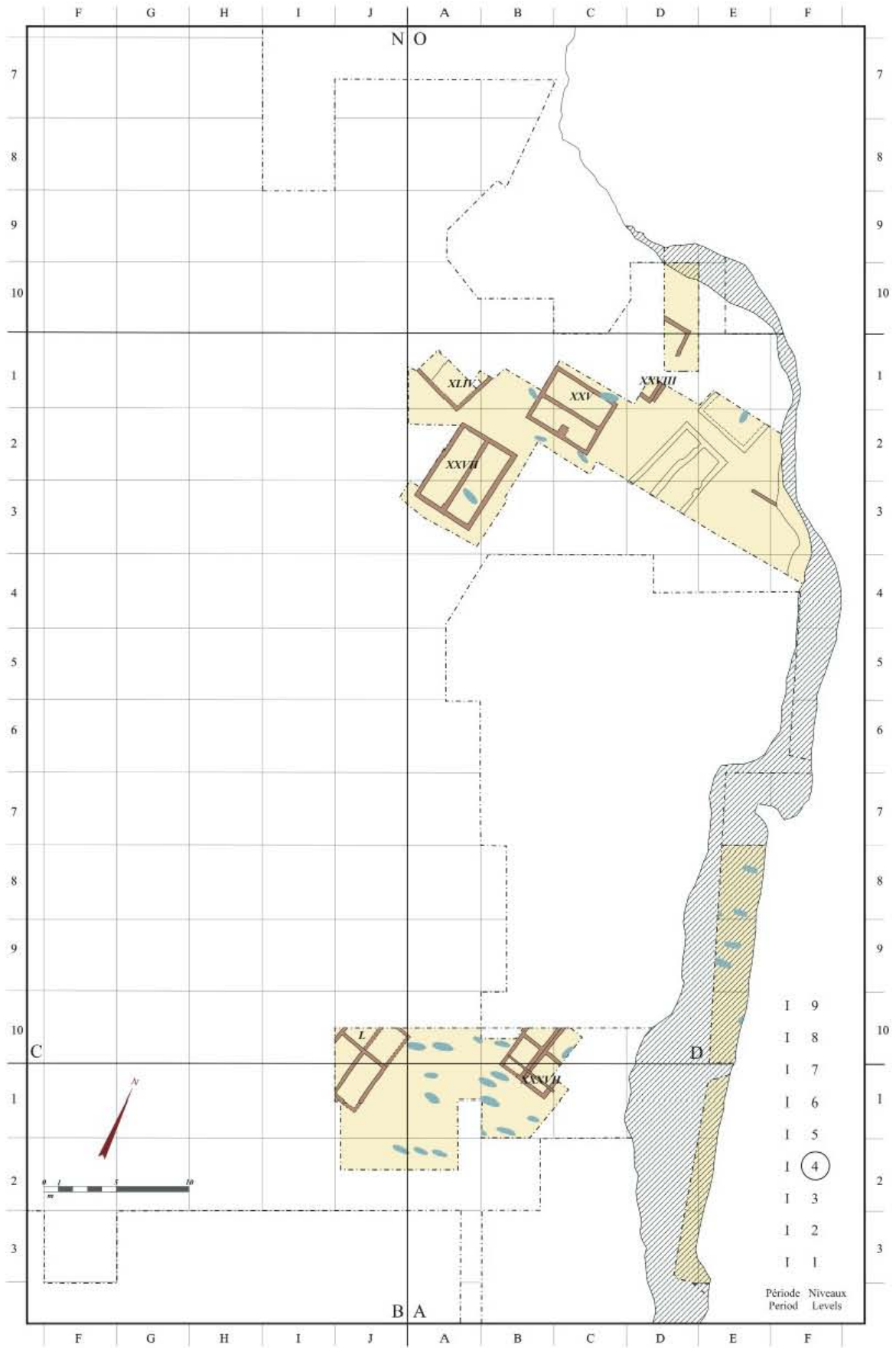


Figure 9: MR.03. Period I, Level 4

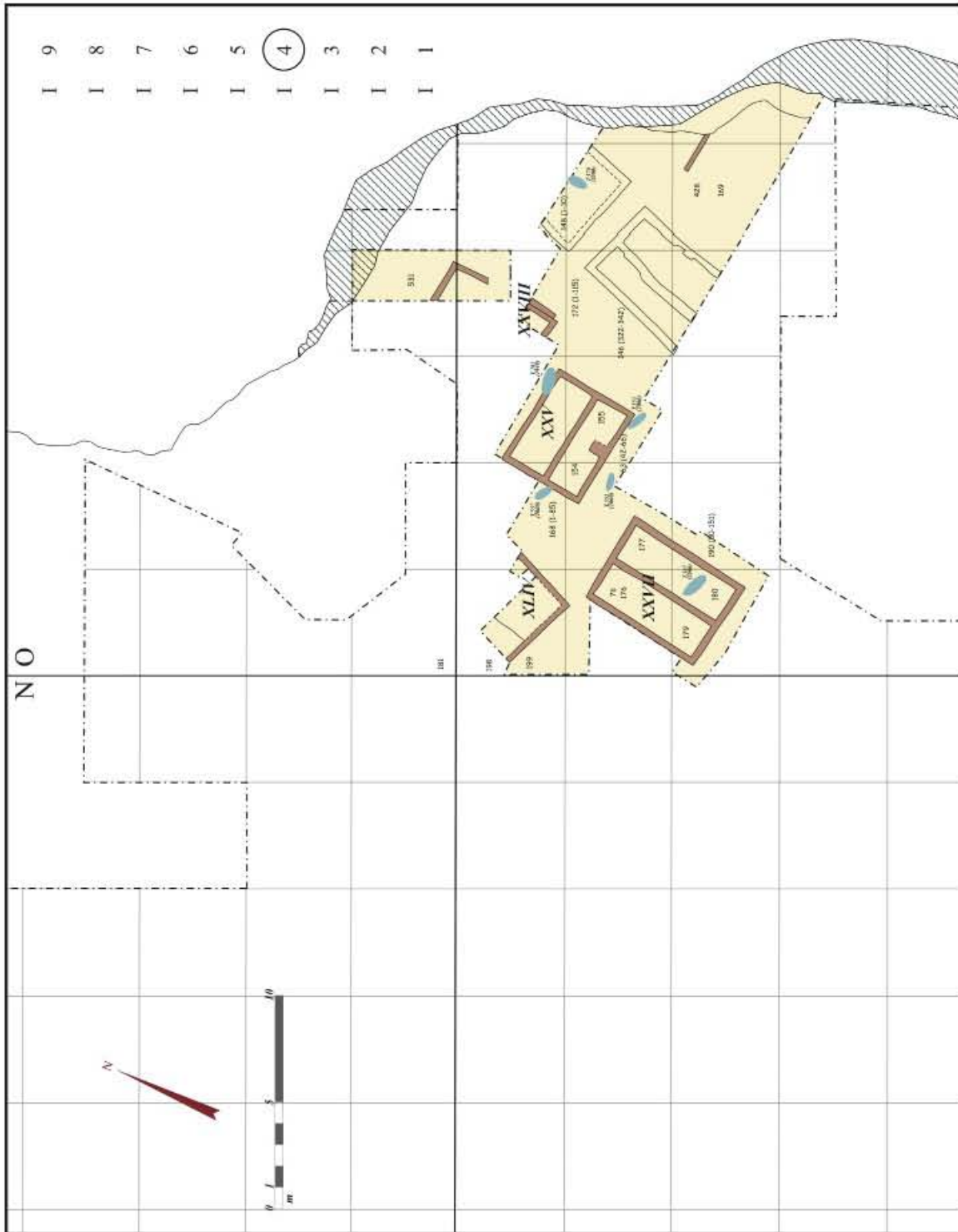


Figure 9b: MR.03. Period I, Level 4 North

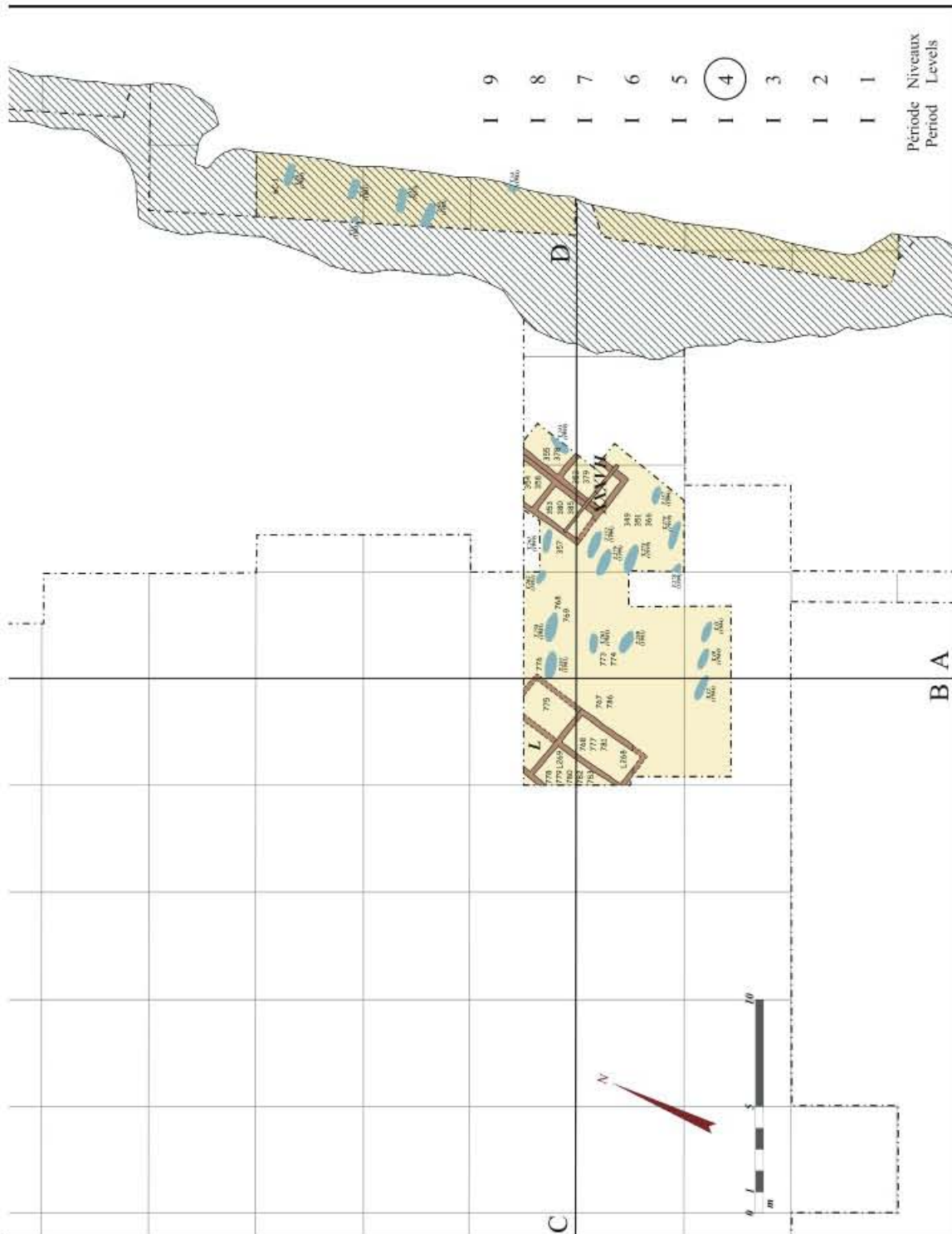


Figure 9c: MR.03, Period I, Level 4 South

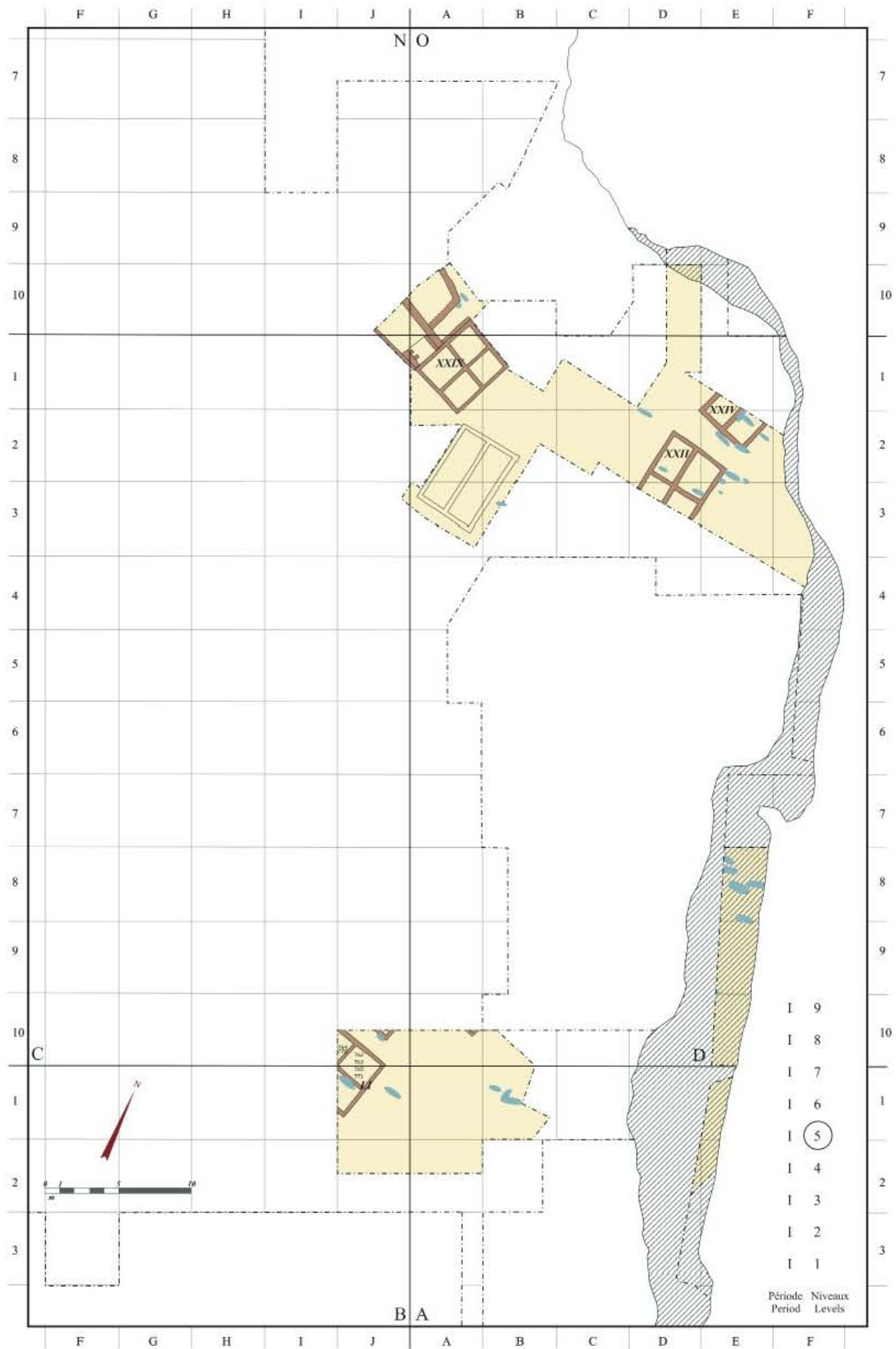


Figure 10: MR.03. Period I, Level 5

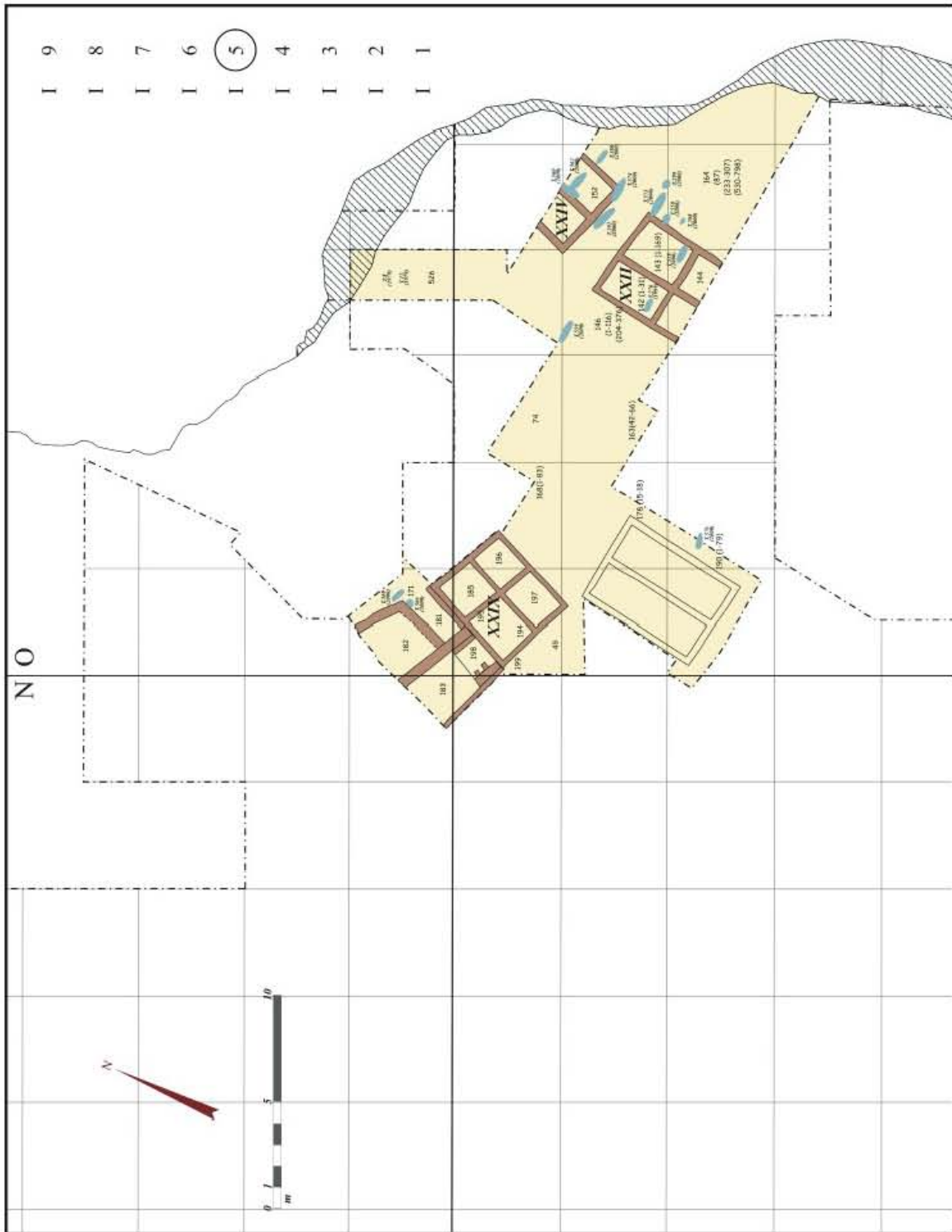


Figure 10b: MR.03. Period I, Level 5 North

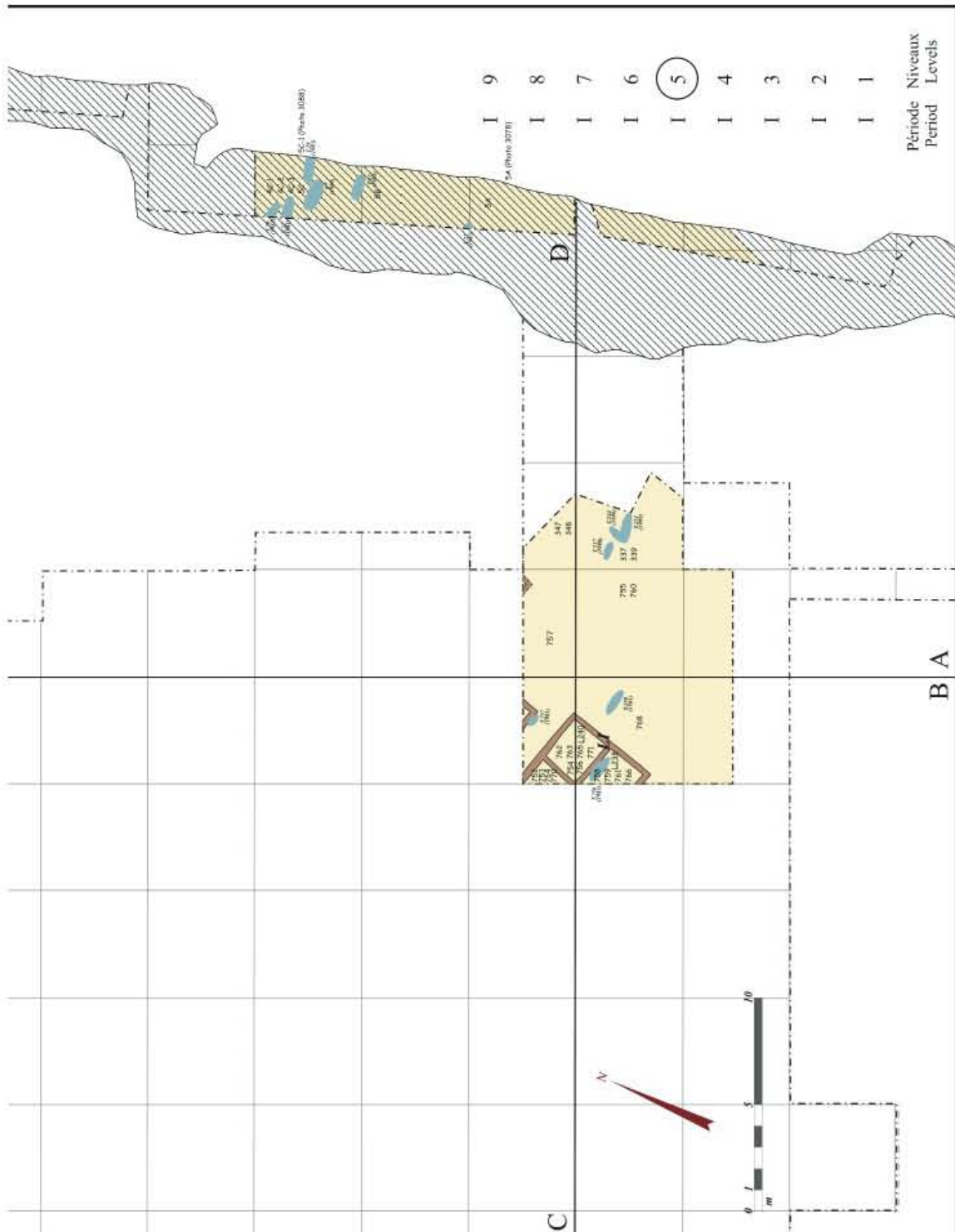


Figure 10c: MR-03. Period I, Level 5 South



Figure 11: MR.03. Period I, Level 6

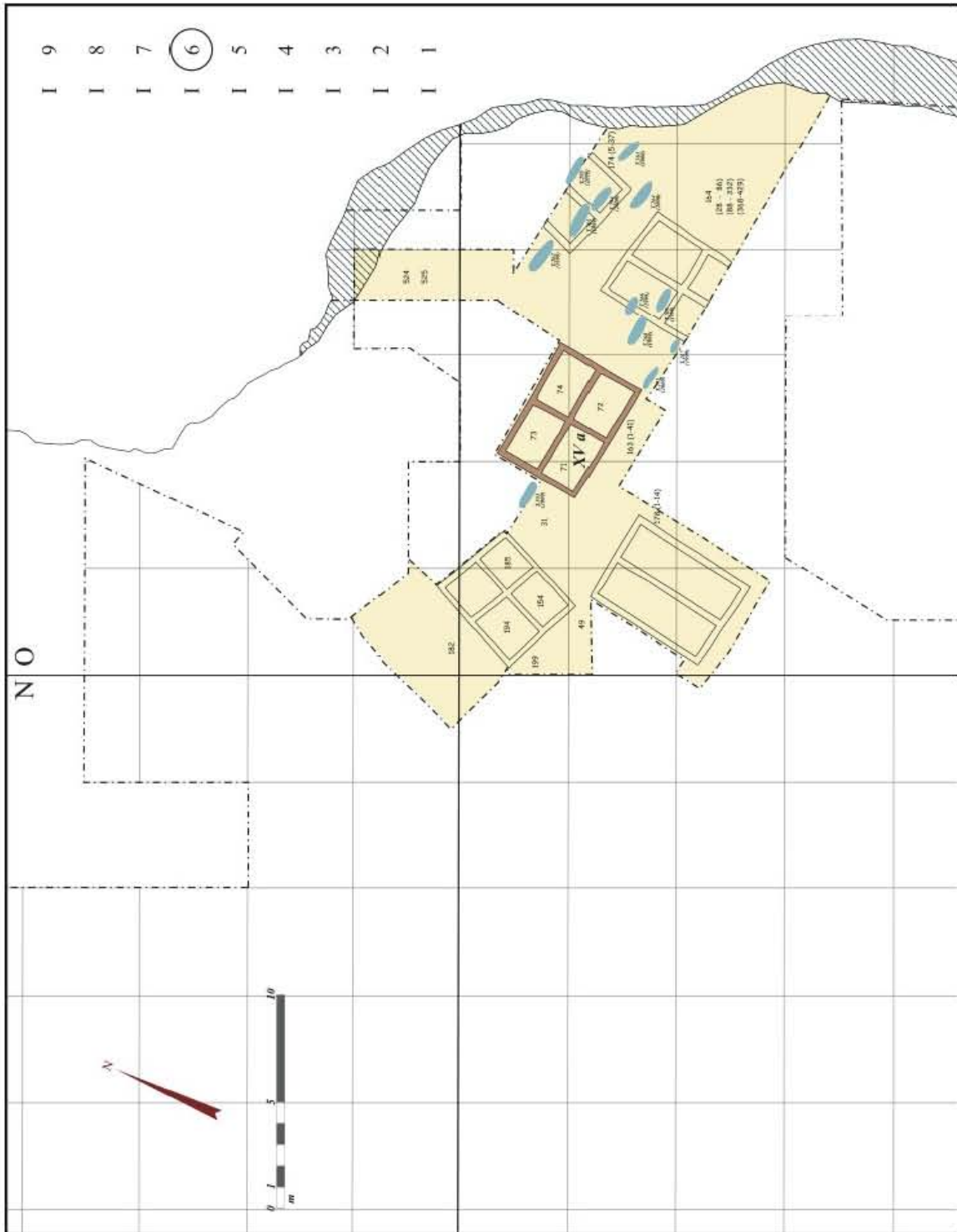


Figure 11b: MR.03. Period I, Level 6 North

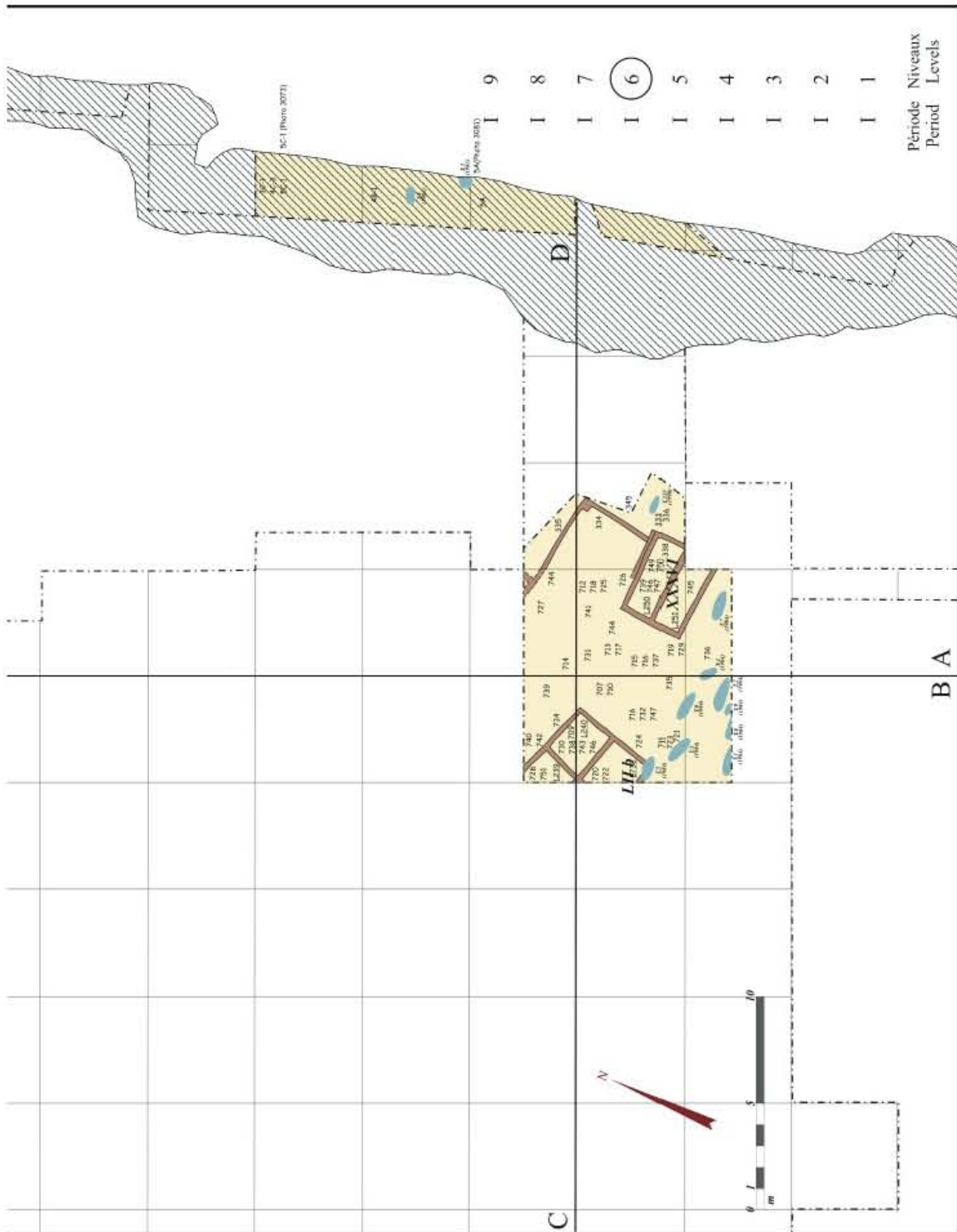


Figure 11c: MR.03. Period I, Level 6 South



Figure 12: MR.03. Period I, Level 7

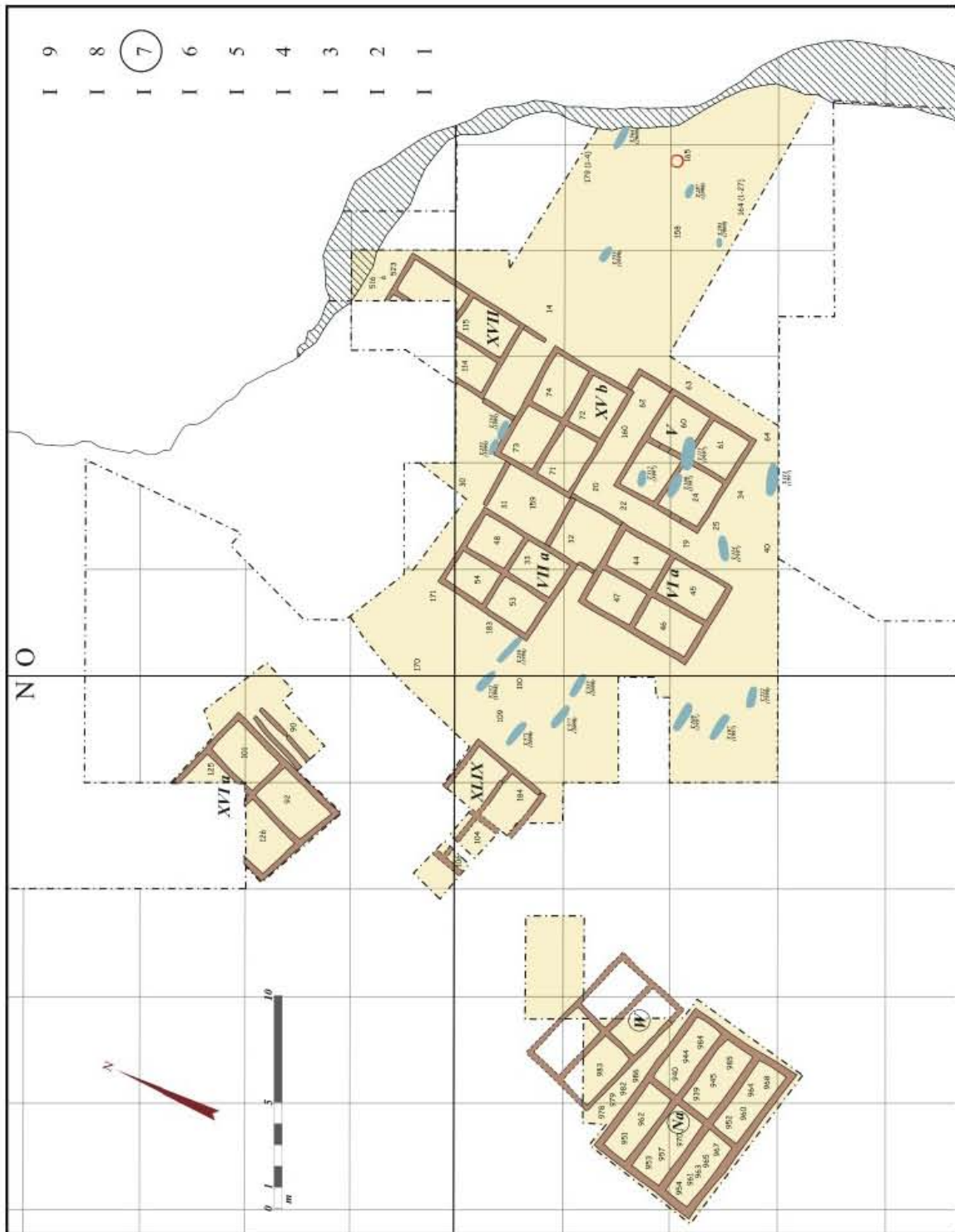


Figure 12b: MR.03. Period I, Level 7 North

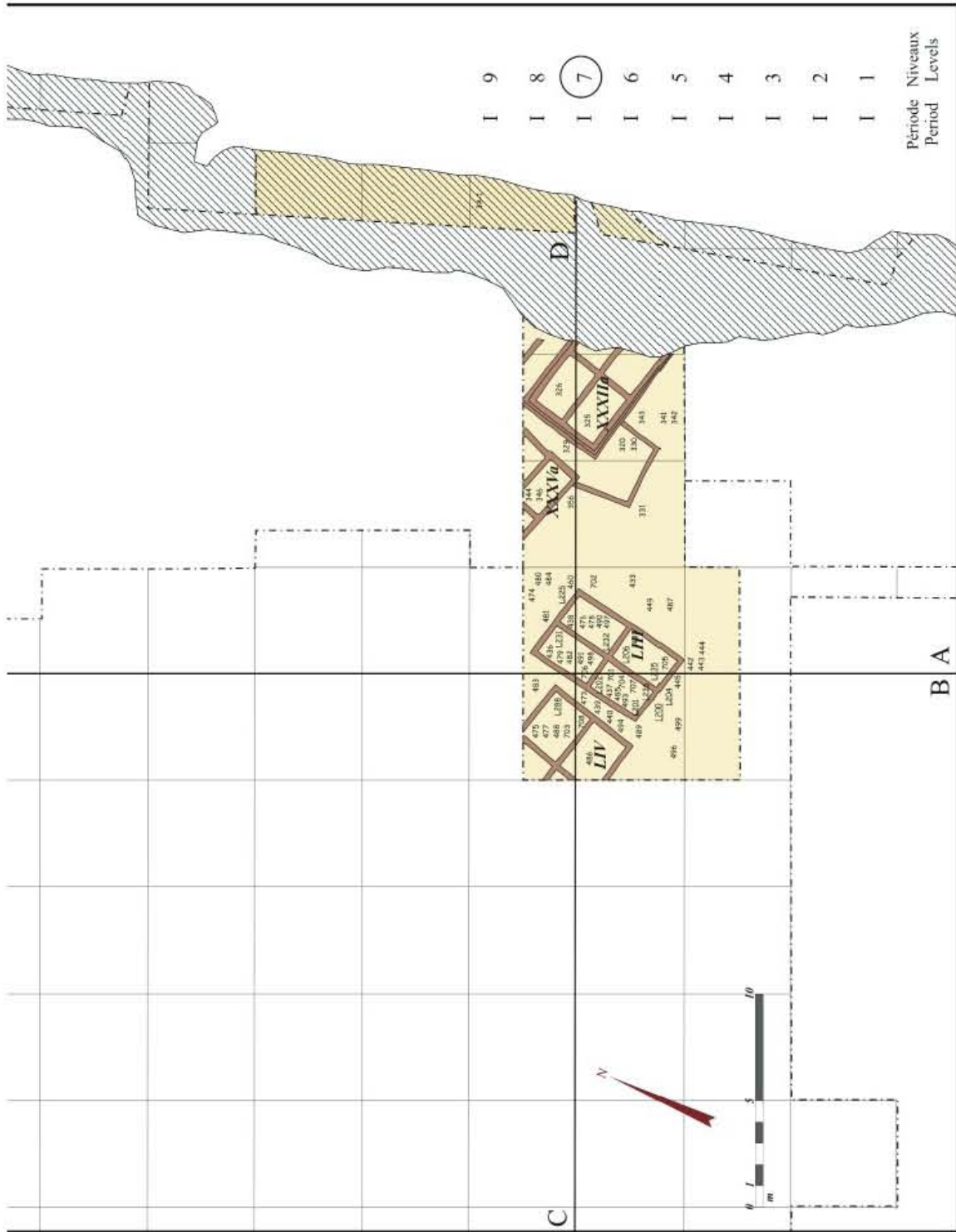


Figure 12c: MR.03. Period I, Level 7 South

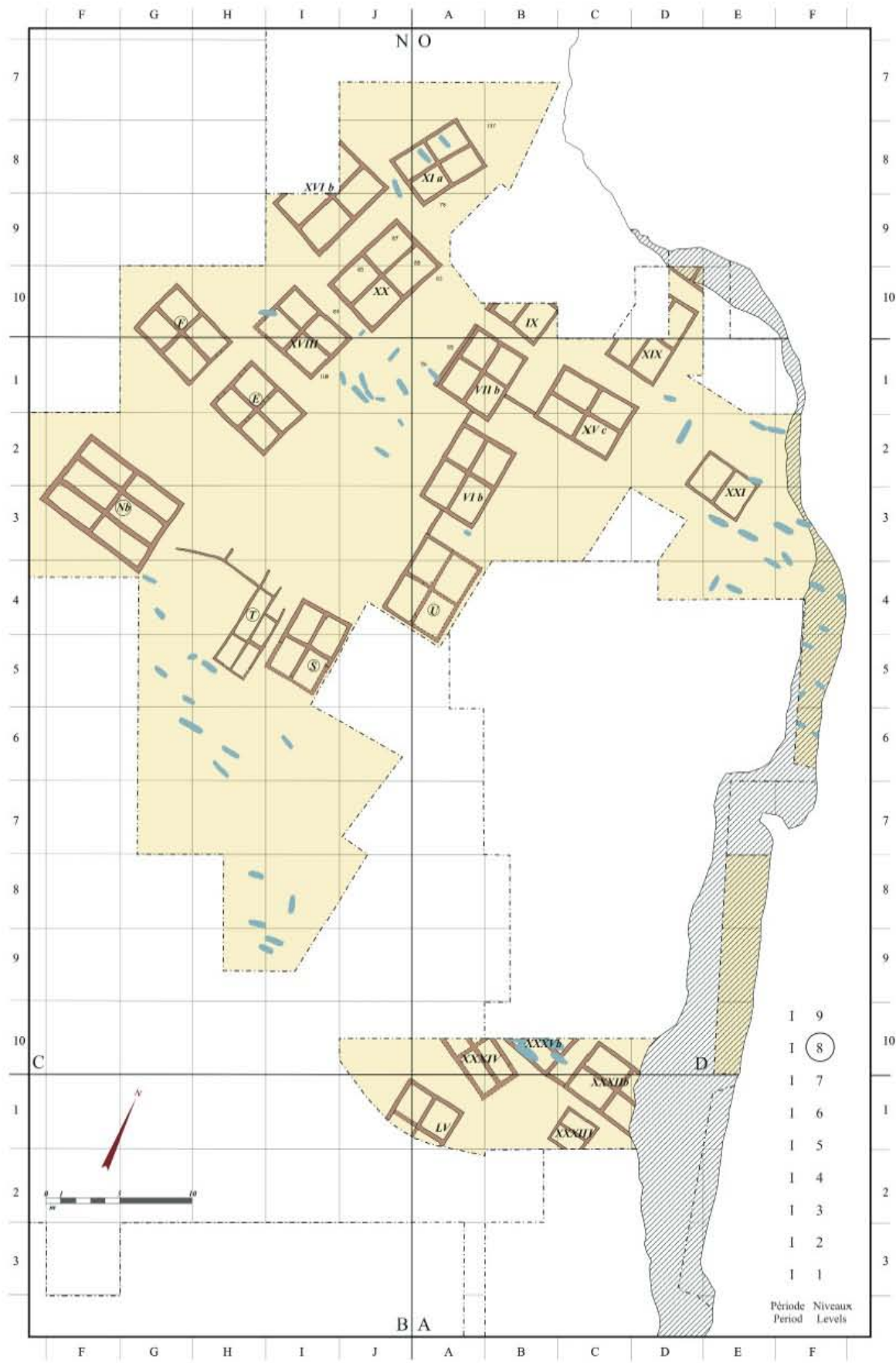


Figure 13: MR.03. Period I, Level 8

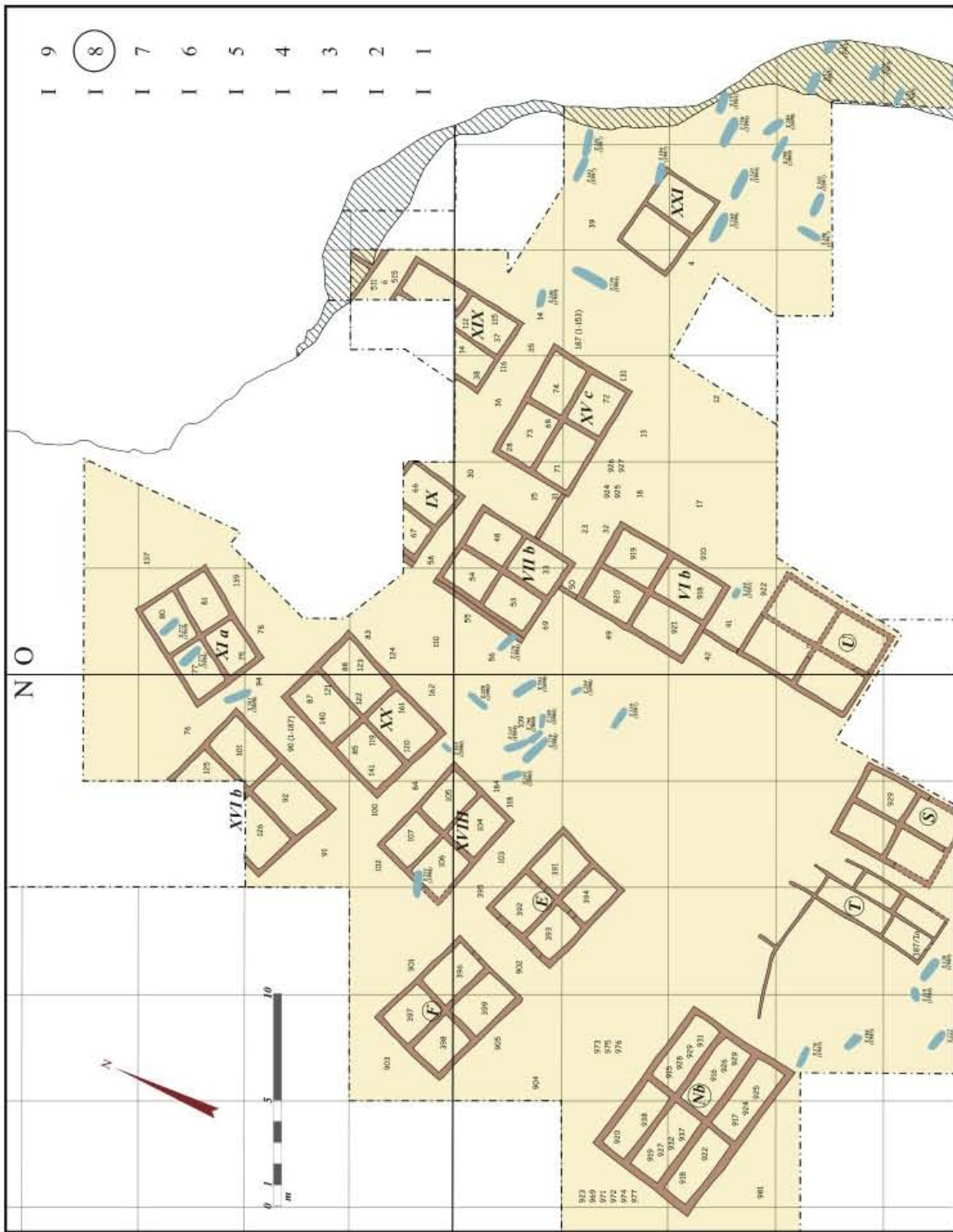


Figure 13b: MR.03. Period I, Level 8 North

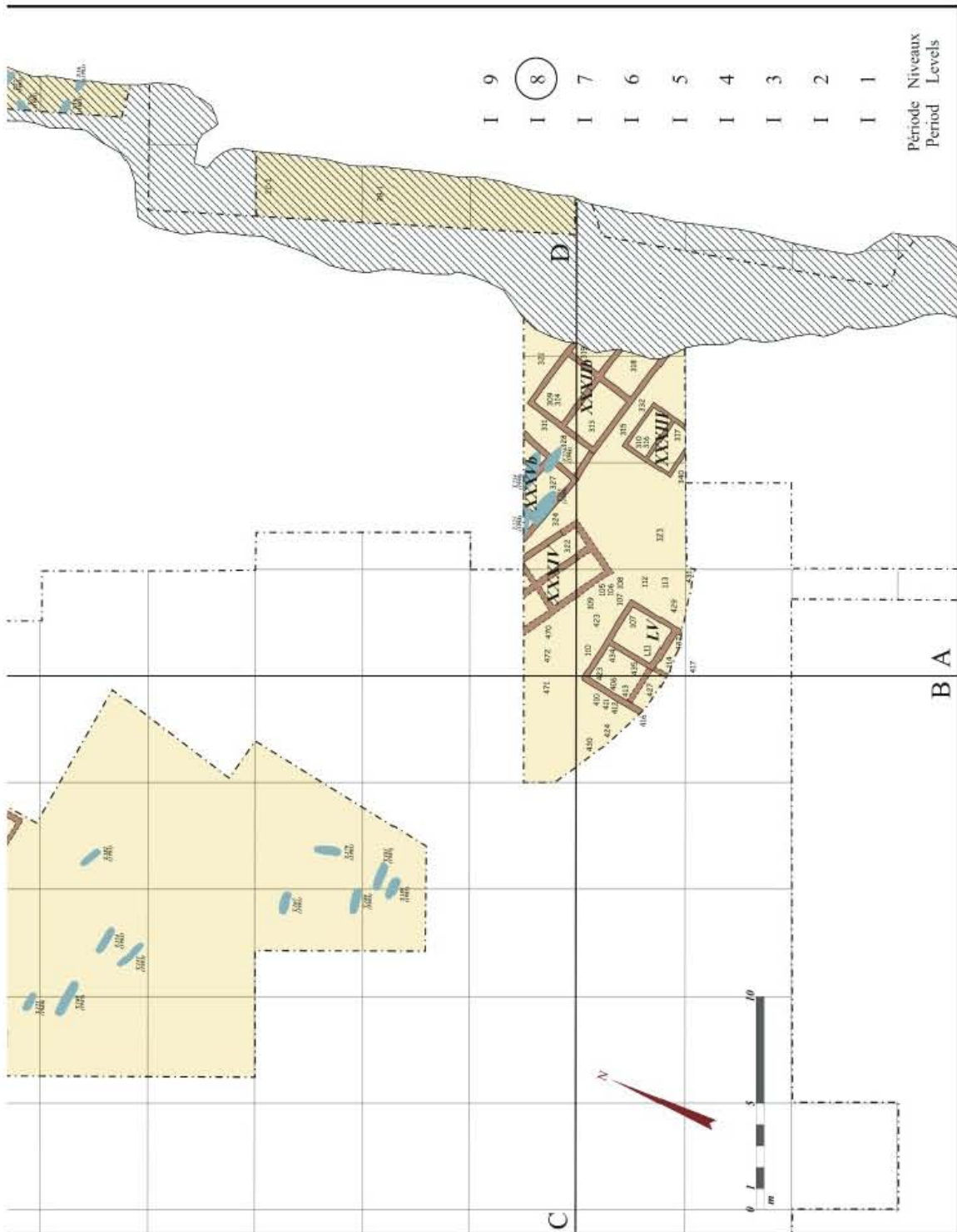


Figure 13c: MR.03. Period I, Level 8South

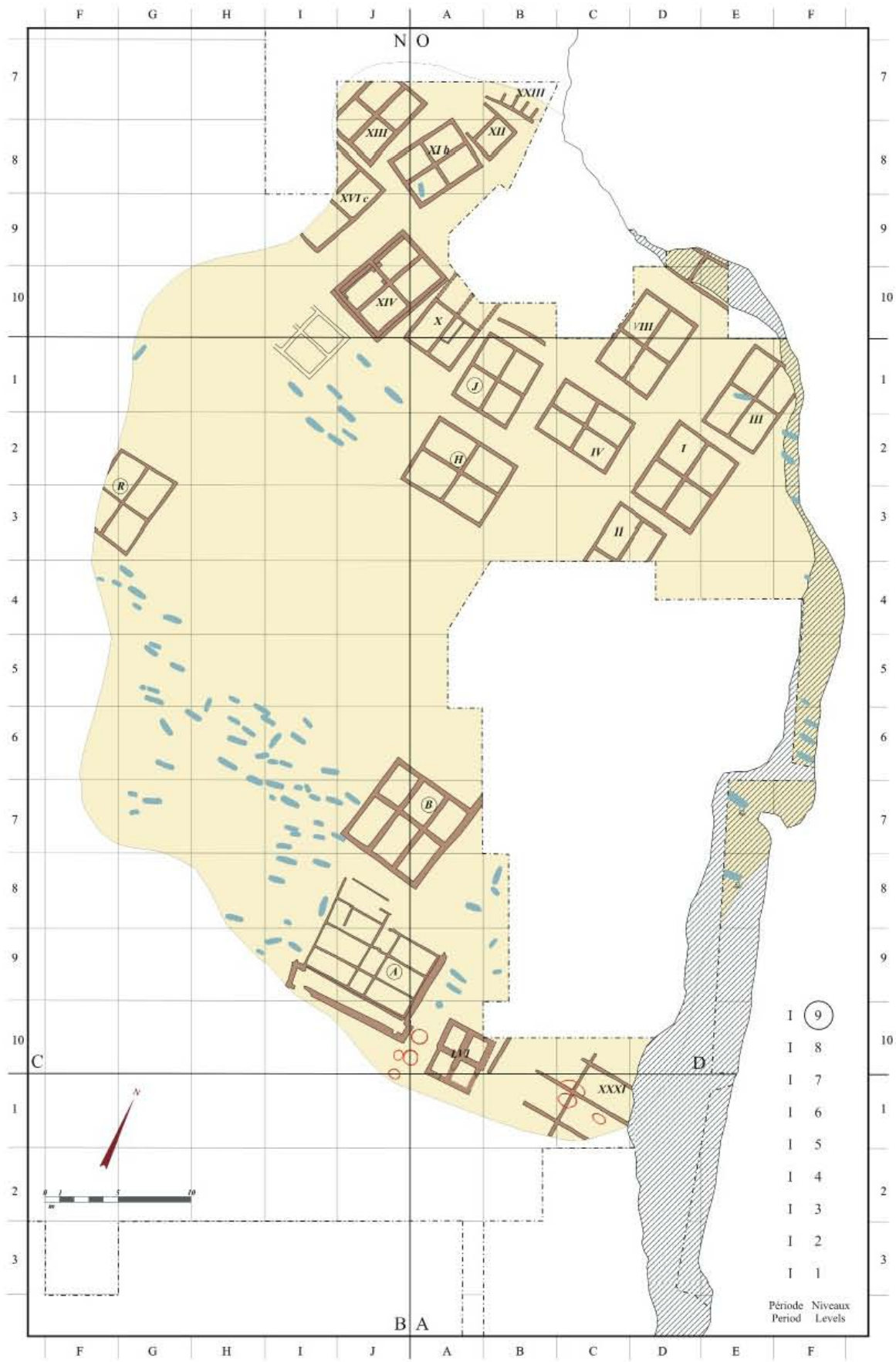


Figure 14: MR.03. Period I, Level 9

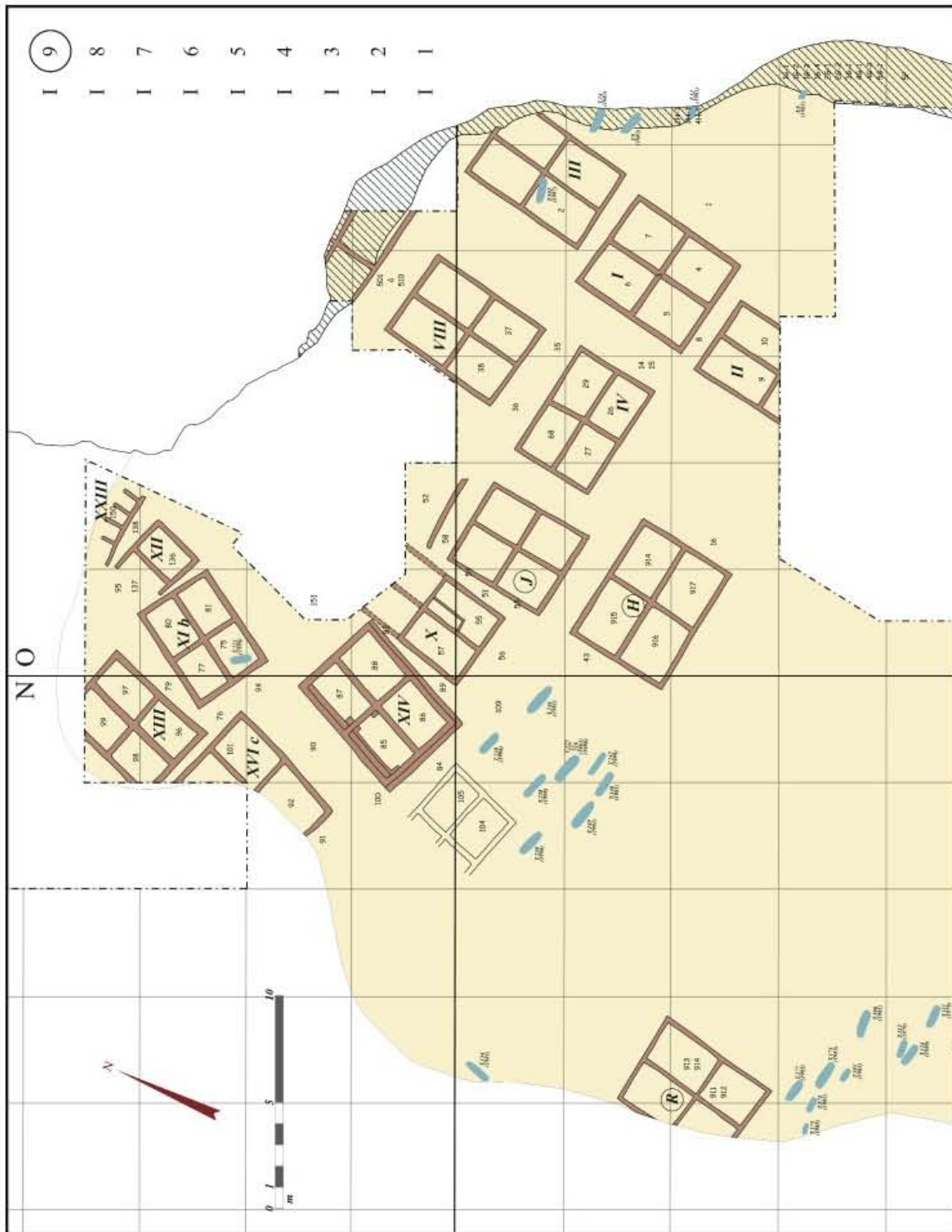


Figure 14b: MR.03. Period I, Level 9 North

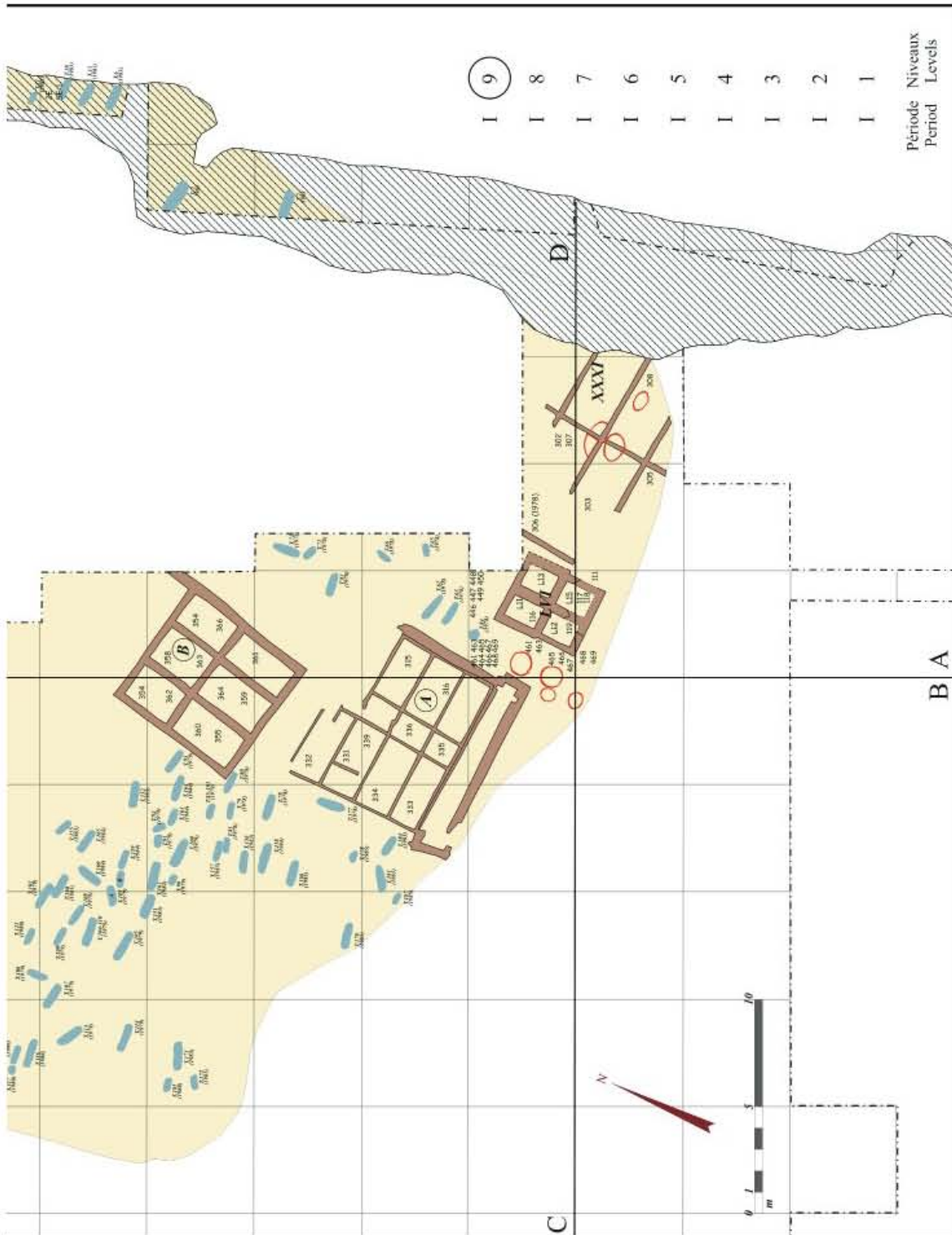


Figure 14c: MR.03. Period I, Level 9 South



# **SECTIONS**



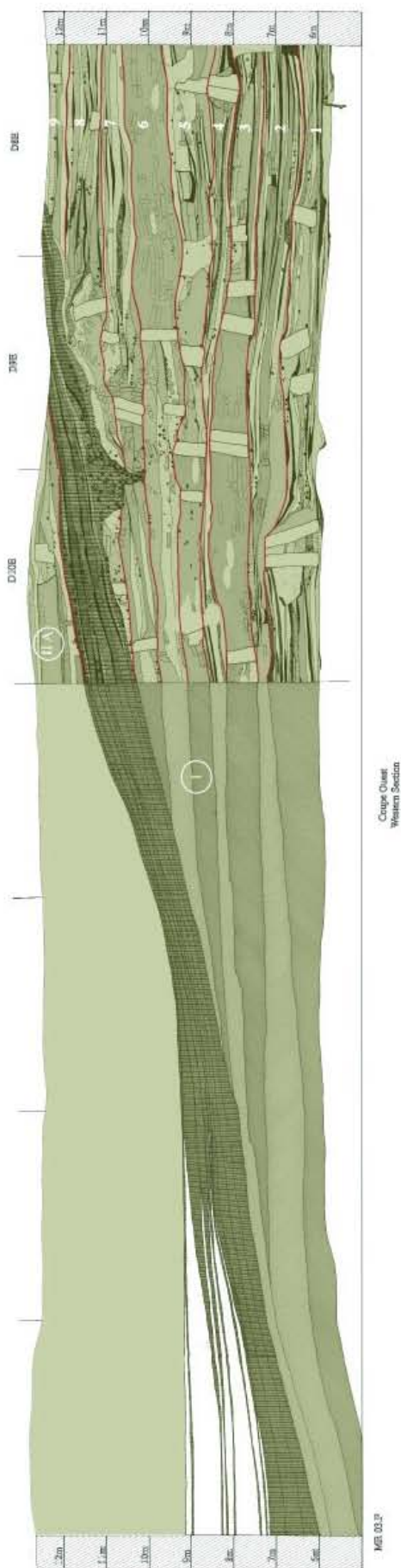


Figure 15: MR-03. Periods I and IIA. Western Section

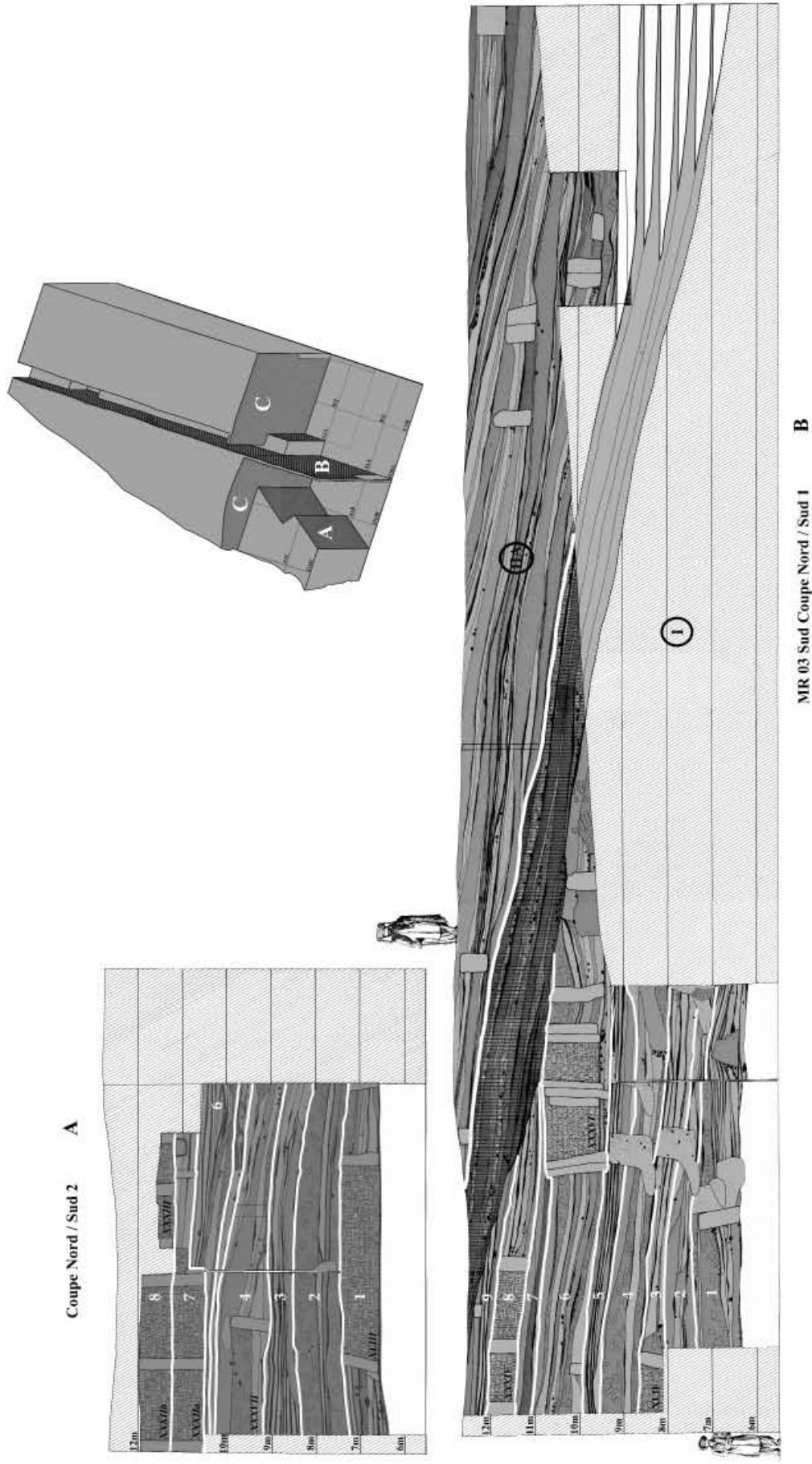


Figure 16: MR.03 South (Sounding MR.3S). Periods I and IIA. N-S Sections

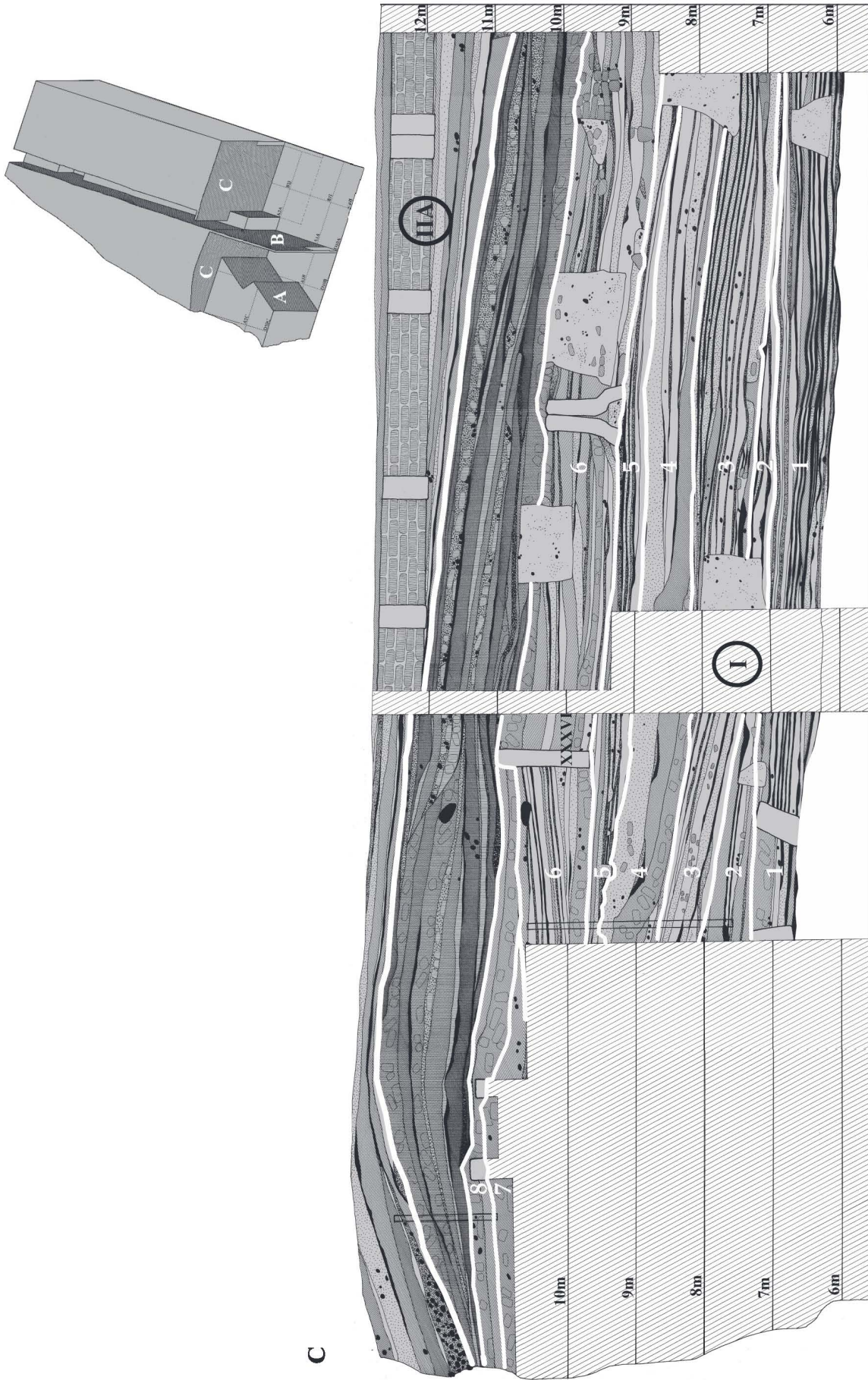


Figure 17: MR.03 South(Sounding MR.3S). Periods I and IIA. E-W Section.

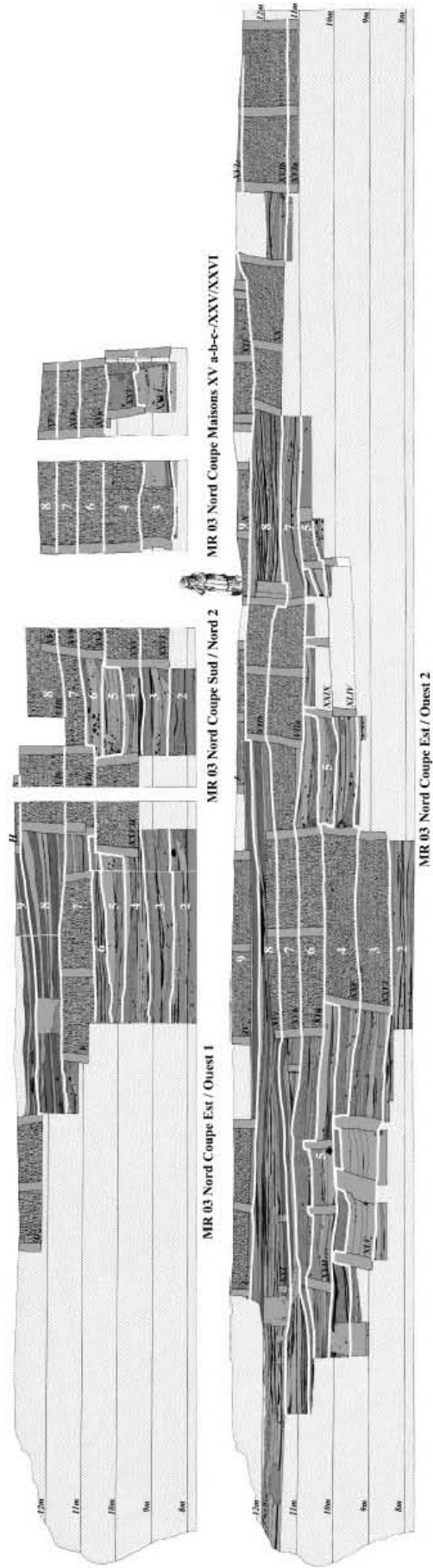
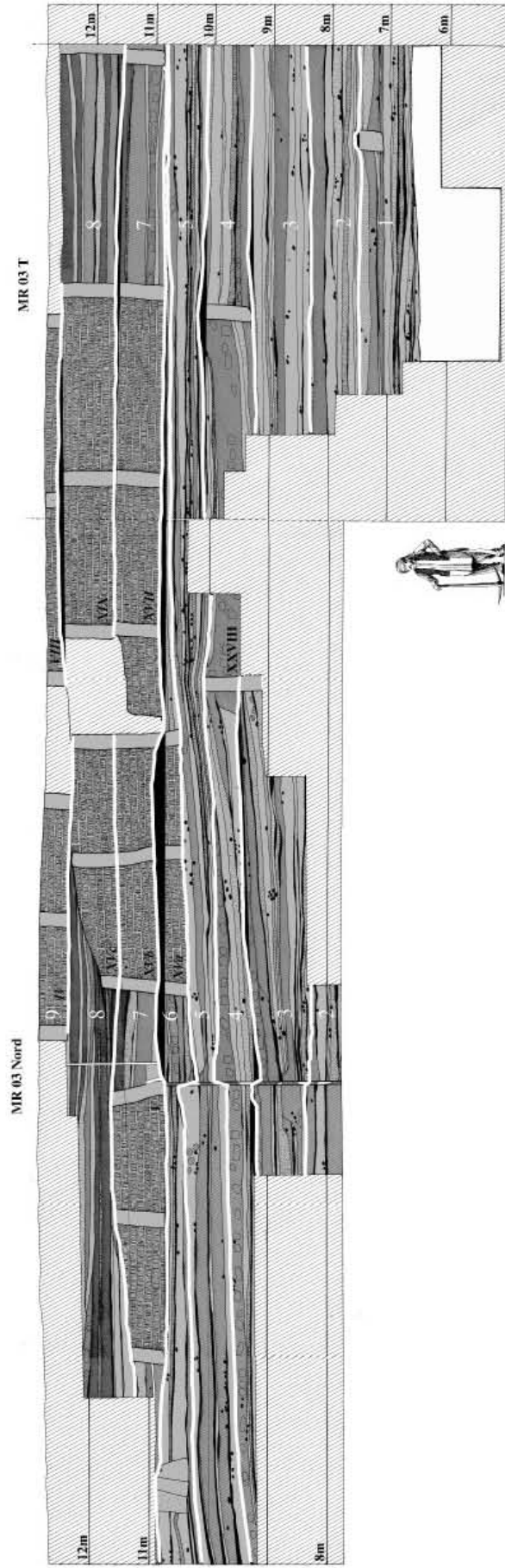


Figure 18: MR.03 North. E-W Sections showing the successions of levels 2 to 9 from period I. (See figure 20)



MR 03 Nord Coupe Sud / Nord I

Figure 19: MR.03 North. S-N Section showing the successions of levels 1 to 9 from period I.(See Figure 20)

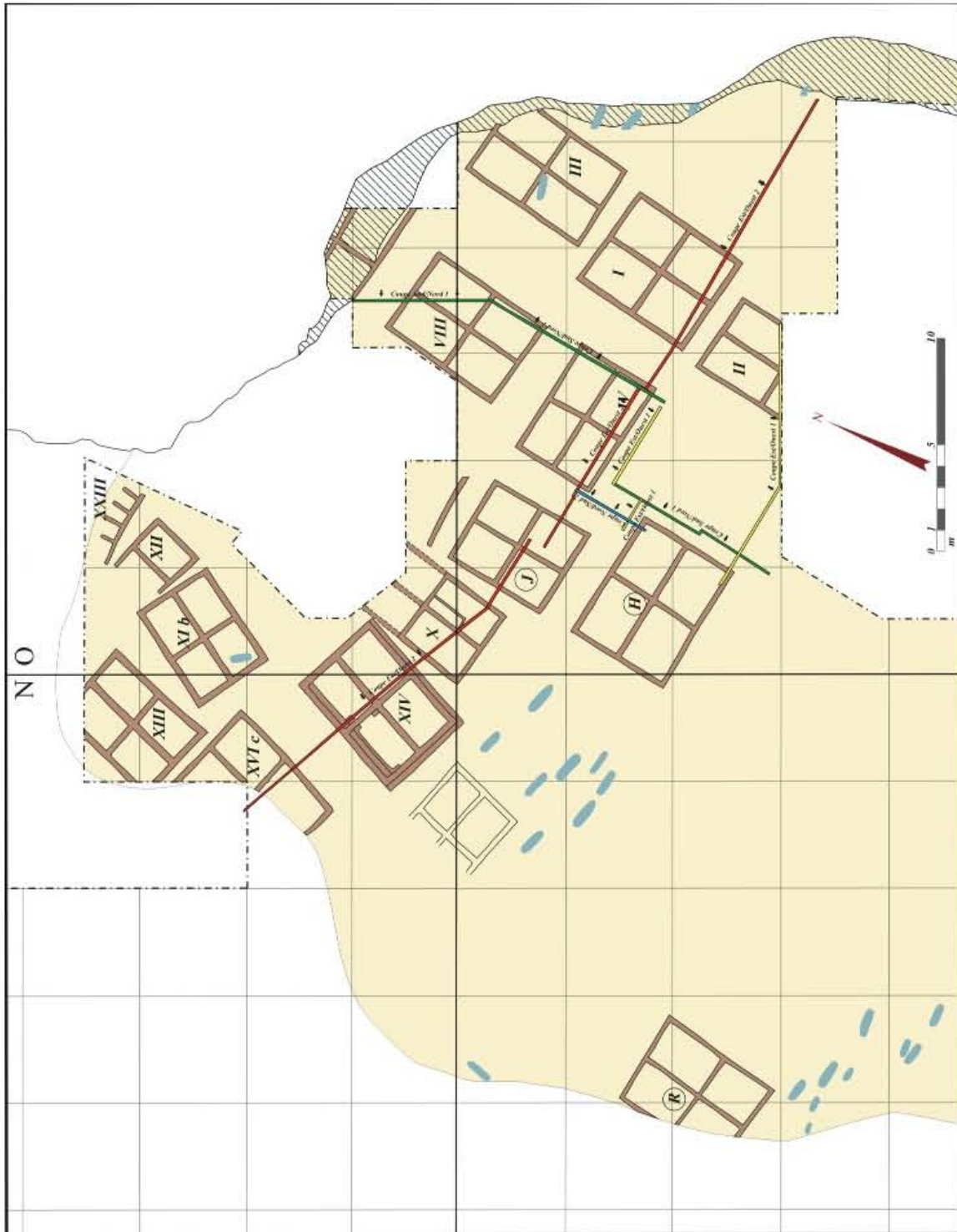


Figure 20: MR.03, Period I, Level 9. Plan of Area MR.03 North showing the location of the different sections.

**PAINTED  
MUD PLASTER**





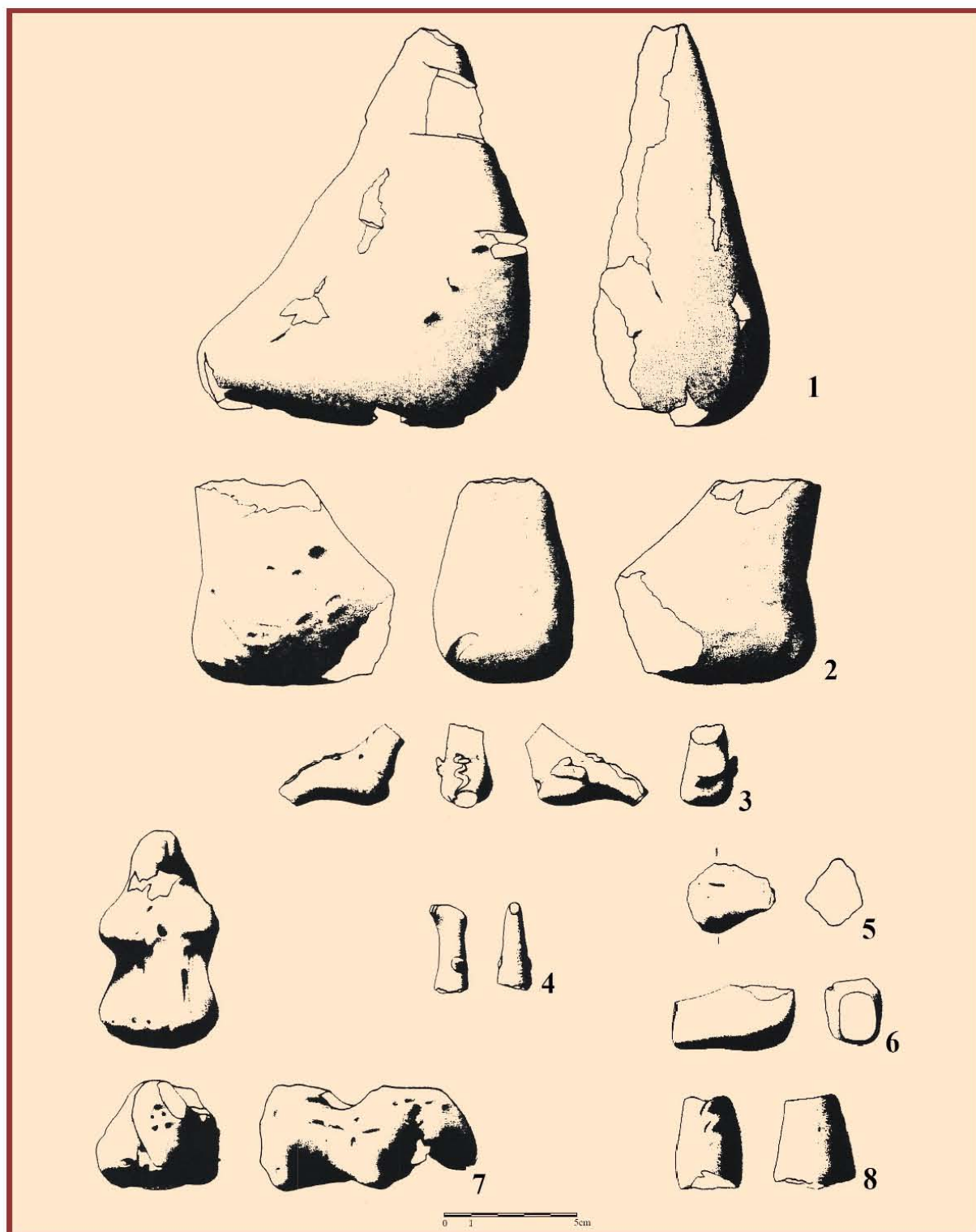
Figure 21: MR.03 Drawing of painted mud plaster fragments from locus 49 (see figures 244 and 245)



**Figure 22:** MR.03 Drawing of painted mud plaster found on the ground between Houses 15 and 19 (see figure 227)

**ARTEFACTS**  
**1997**





**Figure 23:** Merhgarh 1997. Unbaked clay figurines. 1- MR 97 03 35 70; 2- MR 97 03 60 42; 3-MR 97 03 49-50; 4- MR 97 03 01 01; 5- MR 97 03 40 05; 6- MR 97 03 40 04; 7- MR 97 03 40 05; 8- MR 97 03 40 03.

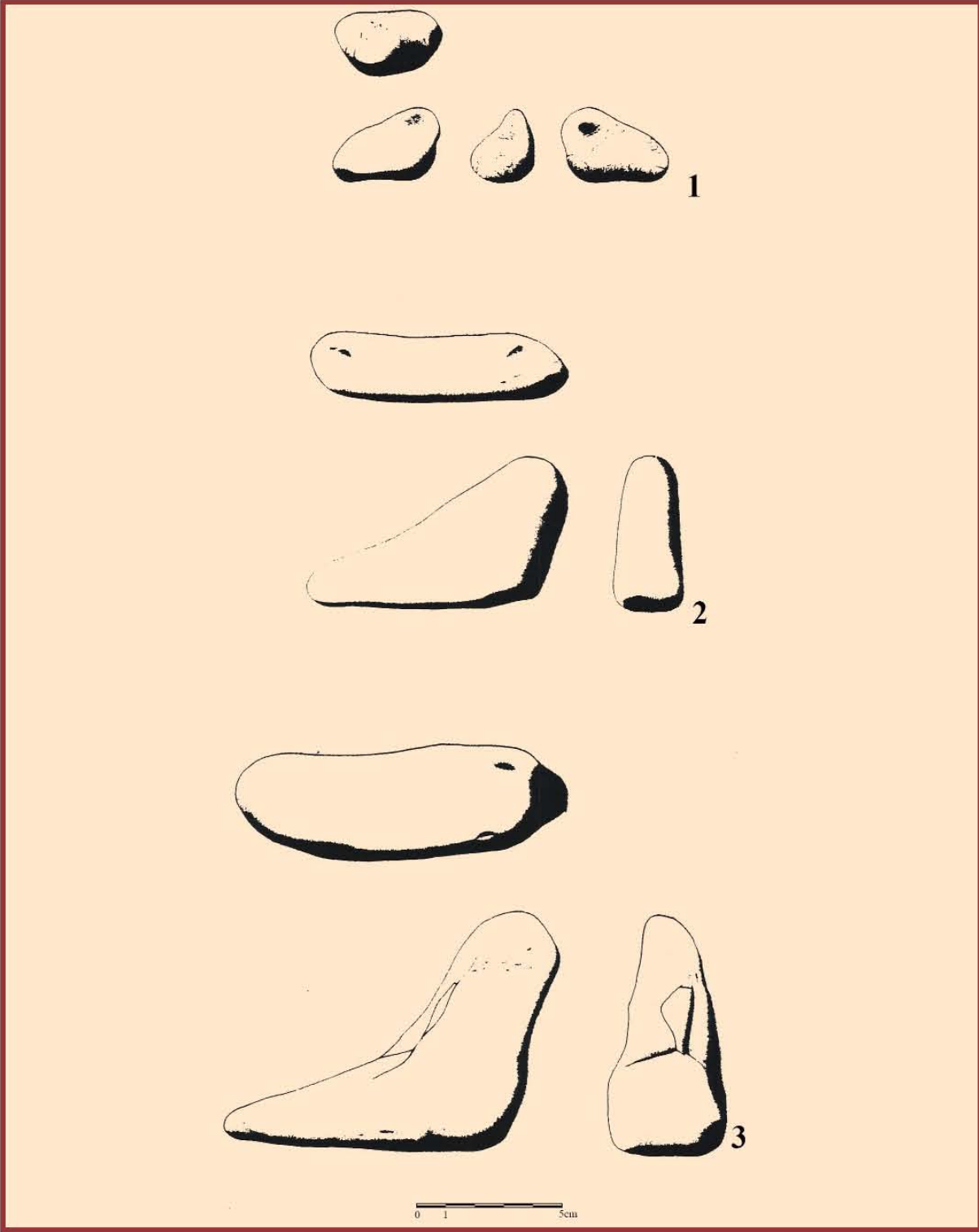
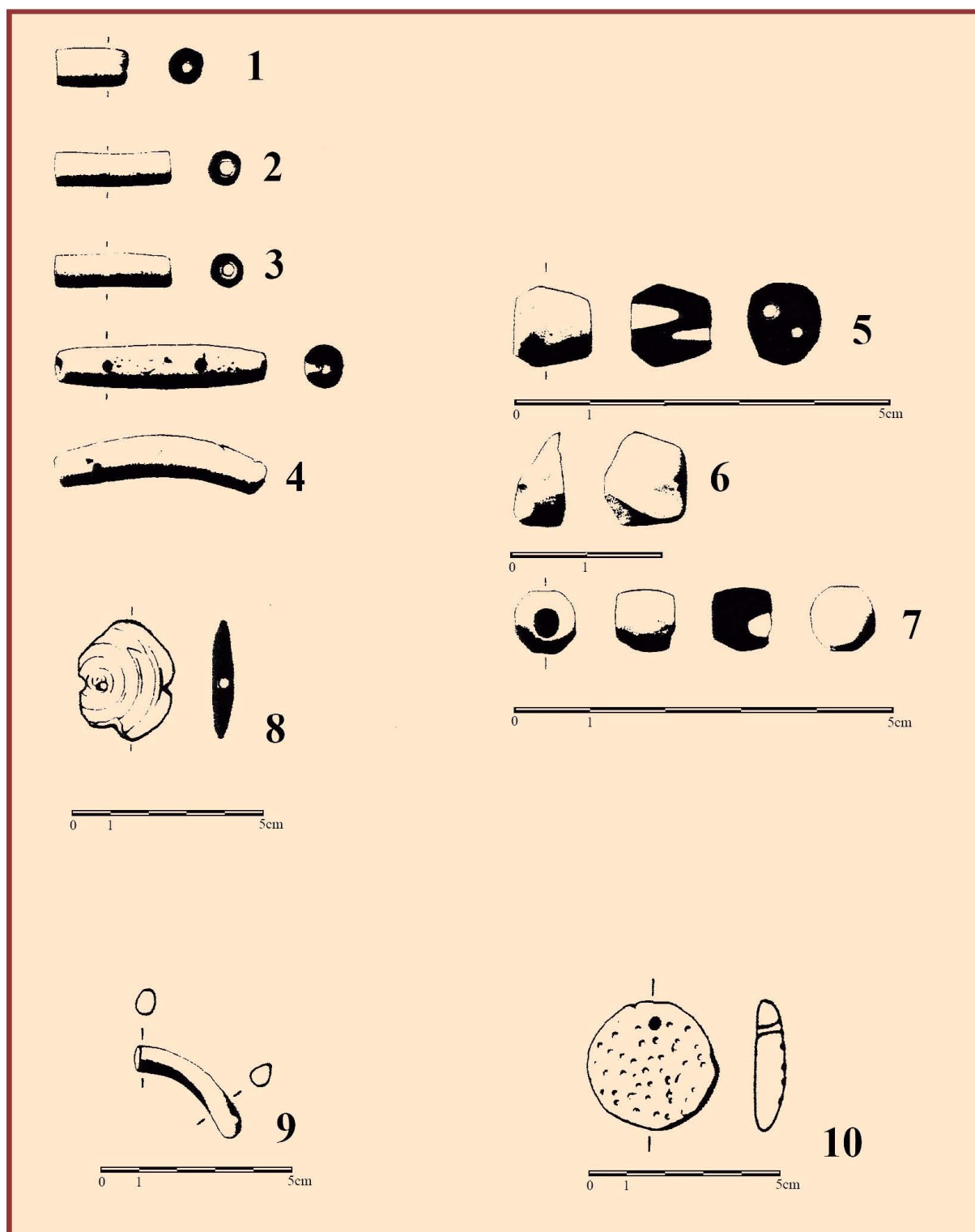
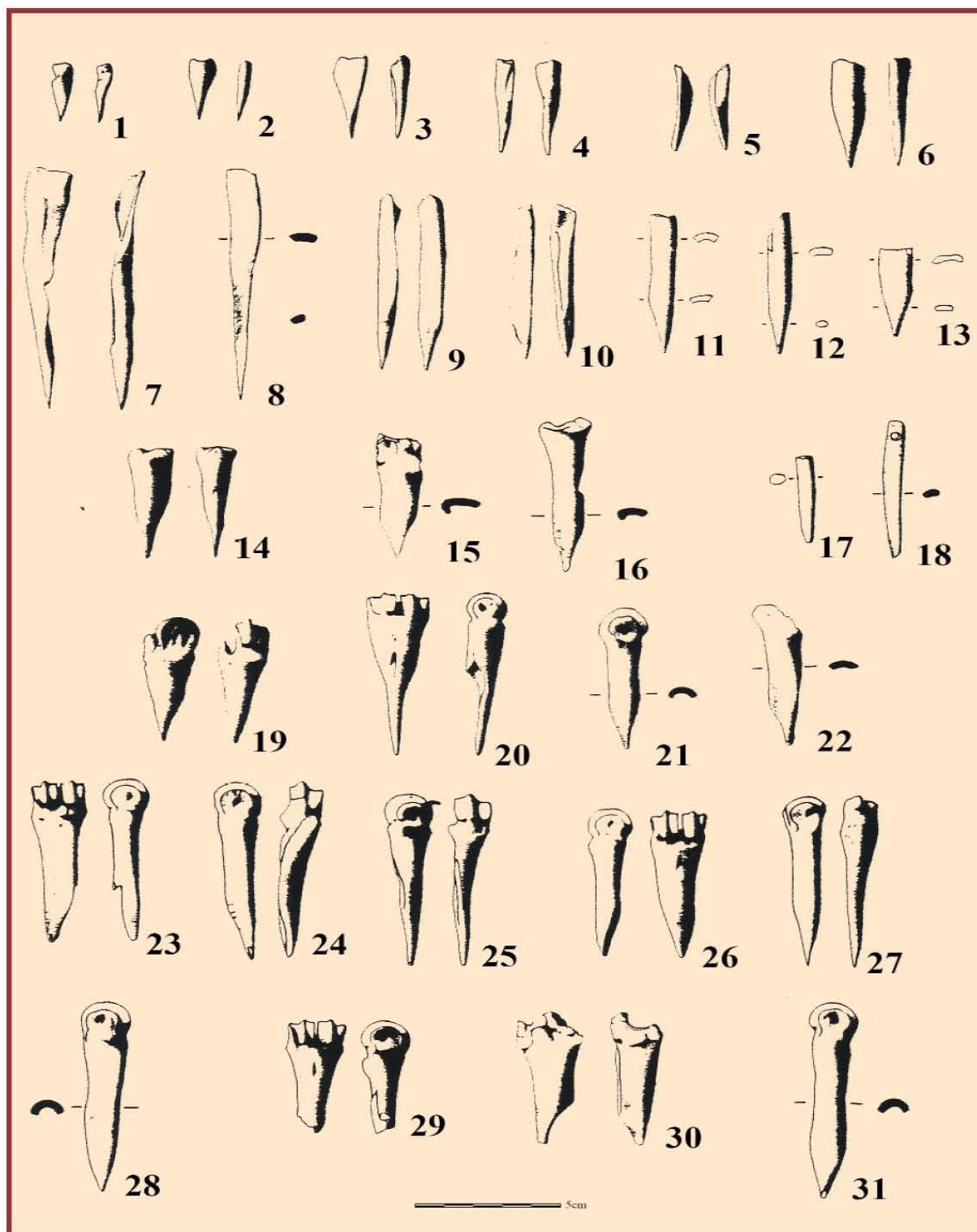


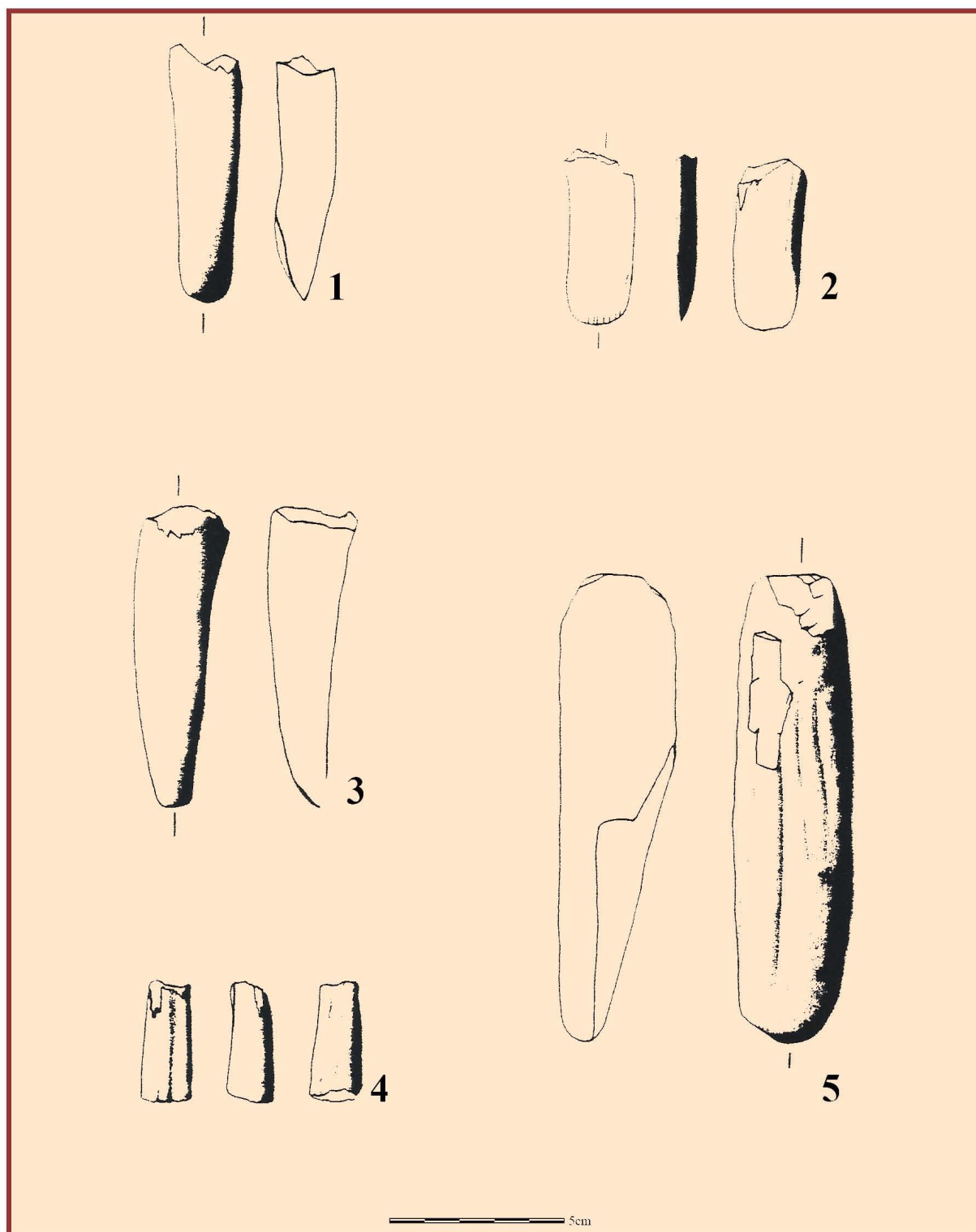
Figure 24: Merhgarh 1997. Stone human figurines. 1- MR 97 03 33 31; 2- MR 97 03 45 10; 3- MR 97 03 49 47.



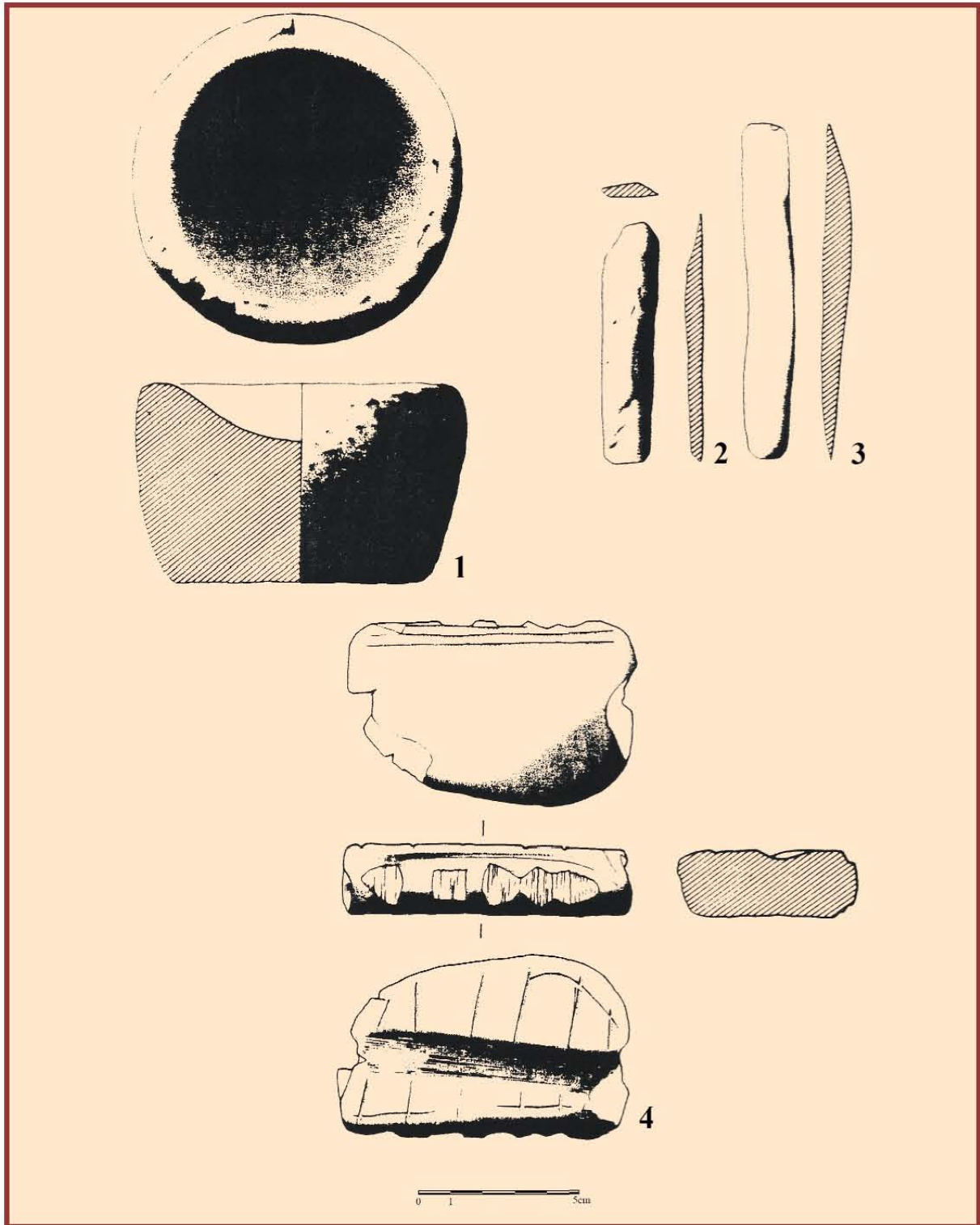
**Figure 25:** Mehrgarh 1997. Beards and ornaments. 1- MR 97 03 48 70; 2- MR 97 03 47 135; 3- MR 97 03 43 148; 4- MR 97 03 56 125; 5- MR 97 03 71 06; 6- MR 97 03 33 06; 7- MR 97 03 54 68; 8- MR 97 03 07 37; 9- MR 97 03 40 06; 10- MR 97 03 33 25.



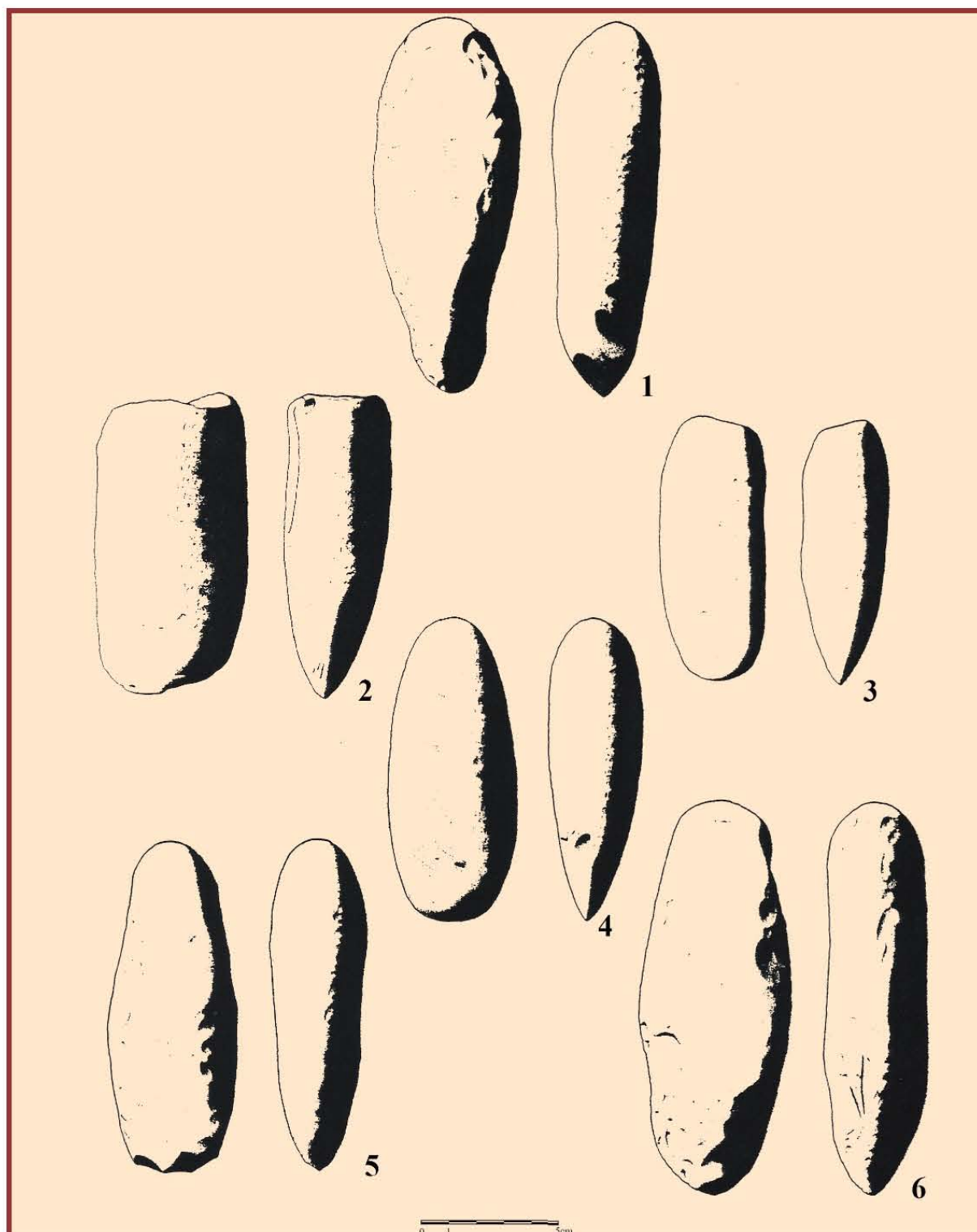
**Figure 26:** Mehrgarh 1997. Bone tools. 1- MR 97 03 62 81; 2- MR 97 03 30 550; 3- MR 97 03 30 549; 4- MR 97 03 49 101; 5- MR 97 03 71 05; 6- MR 97 03 30 01; 7- MR 97 03 56 423; 8- MR 97 03 31 57; 9- MR 97 03 49 100; 10- MR 97 03 01 19; 11- MR 97 03 42 176; 12- MR 97 03 42 177; 13- MR 97 03 42 178; 14- MR 97 03 26 01; 15- MR 97 03 31 127; 16- MR 97 03 04 70; 17- MR 97 03 46 170; 18- MR 97 03 30 186; 19- MR 97 03 01 10; 20- MR 97 03 24 76; 21- MR 97 03 37 38; 22- MR 97 03 56 319; 23- MR 97 03 49 99; 24 - MR 97 03 47 138; 25- MR 97 03 42 179; 26- MR 97 03 47 136; 27- MR 97 03 49 137; 28- MR 97 03 56 118; 29- MR 97 03 45 21; 30- MR 97 03 61 72; 31- MR 97 03 46 174.



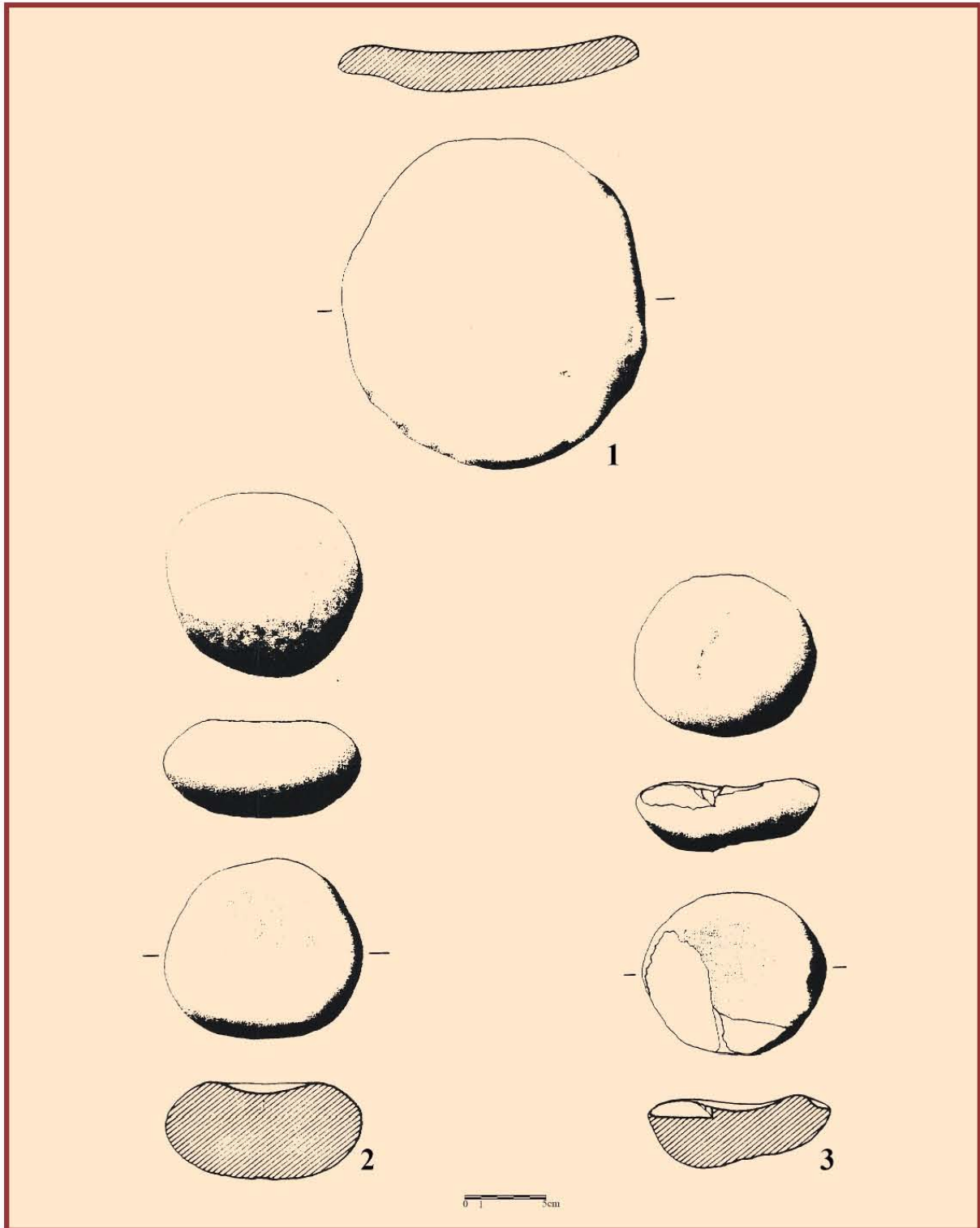
**Figure 27:** Mehrgarh 1997. Bone tools. 1- MR 97 03 56 220; 2- MR 97 03 54 95; 3- MR 97 03 56 117; 4- MR 97 03 56 116; 5- MR 97 03 31 126.



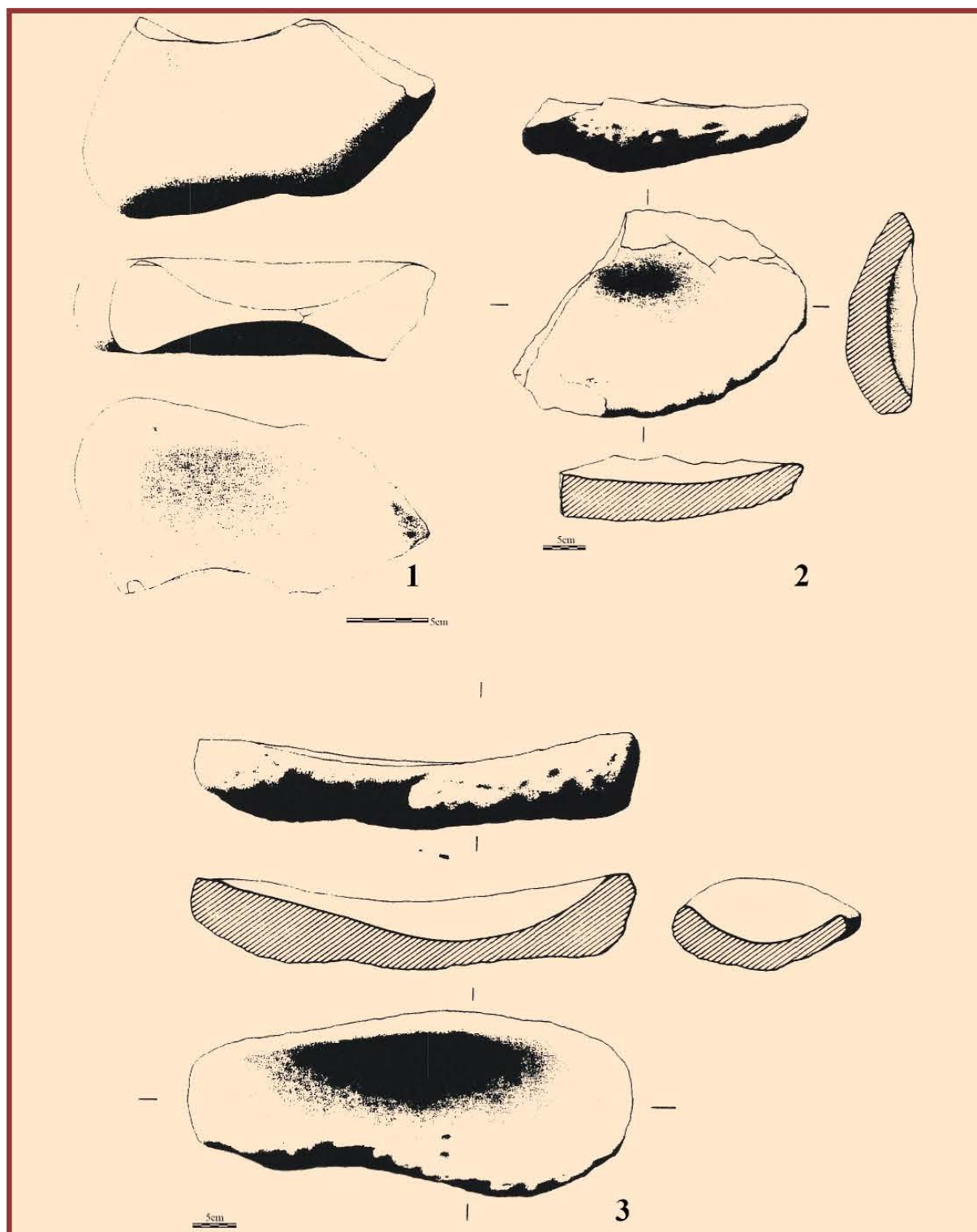
**Figure 28:** Mehrgarh 1997. Stone objects. Period IIA: 1- MR 97 03 20 01. Period I: 2- MR 97 03 06 57; 3- MR 97 03 30 47; 4- MR 97 03 45 11.



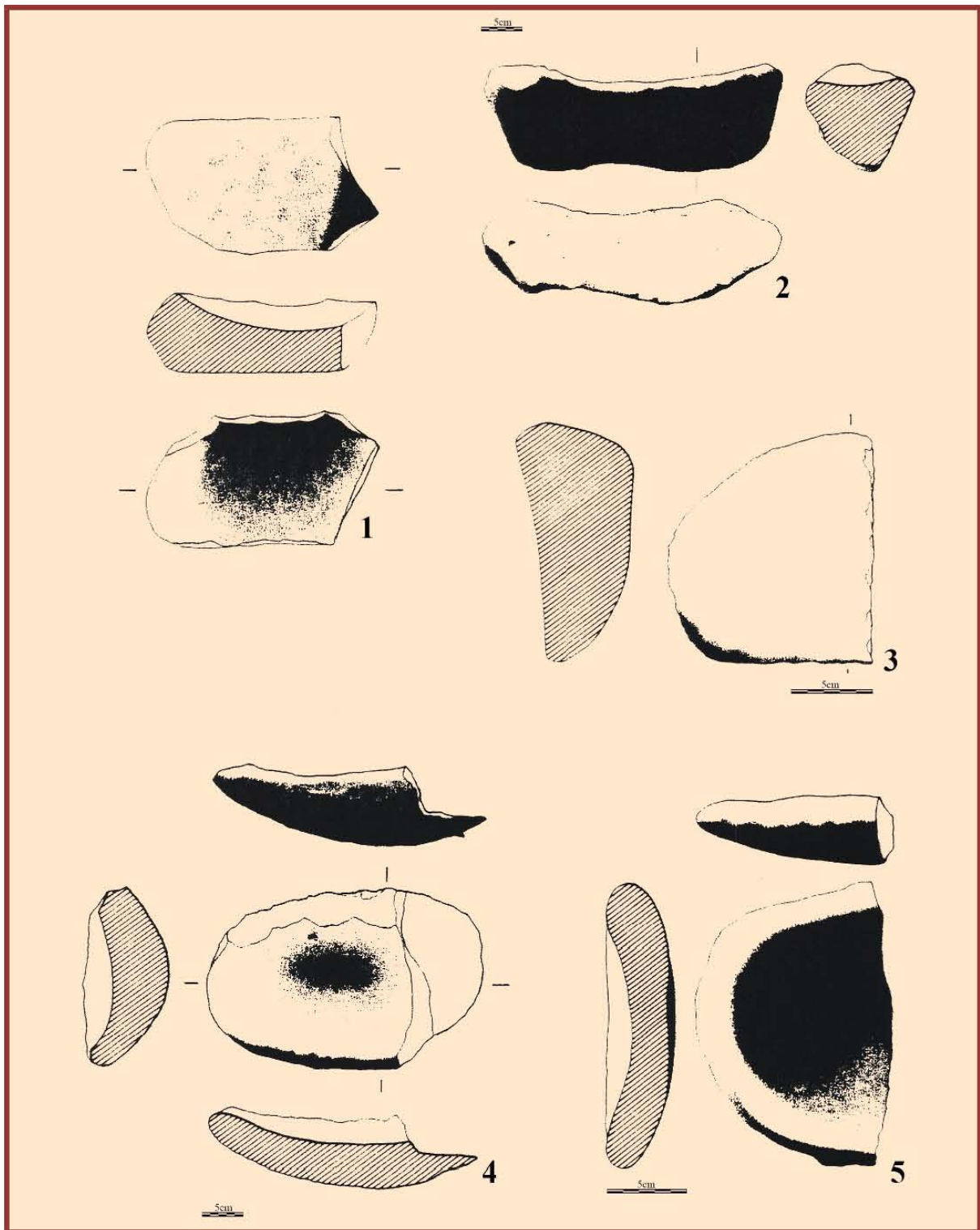
**Figure 29:** Mehrgarh 1997. Stone axes, Period I. 1- MR 97 03 57 78; 2- MR 97 03 55 44; 3- MR 97 03 57 80; 4- MR 97 03 02 11; 5- MR 97 03 54 69; 6- MR 97 03 57 79.



**Figure 30:** Mehrgarh 1997. Stone objects, Period I. 1- MR 97 03 07 66; 2- MR 97 03 47 133; 3- MR 97 03 59 10.



**Figure 31:** Mehrgarh 1997. Grinding stones, Period I. 1- MR 97 03 46 168; 2- MR 97 03 43 139; 3- MR 97 03 40 01.



**Figure 32:** Mehrgarh 1997. Grinding stones, Period I. 1- MR 97 03 42 79; 2- MR 97 03 57 81; 3- MR 97 03 43 152; 4- MR 97 03 43 153; 5- MR 97 03 28 18.

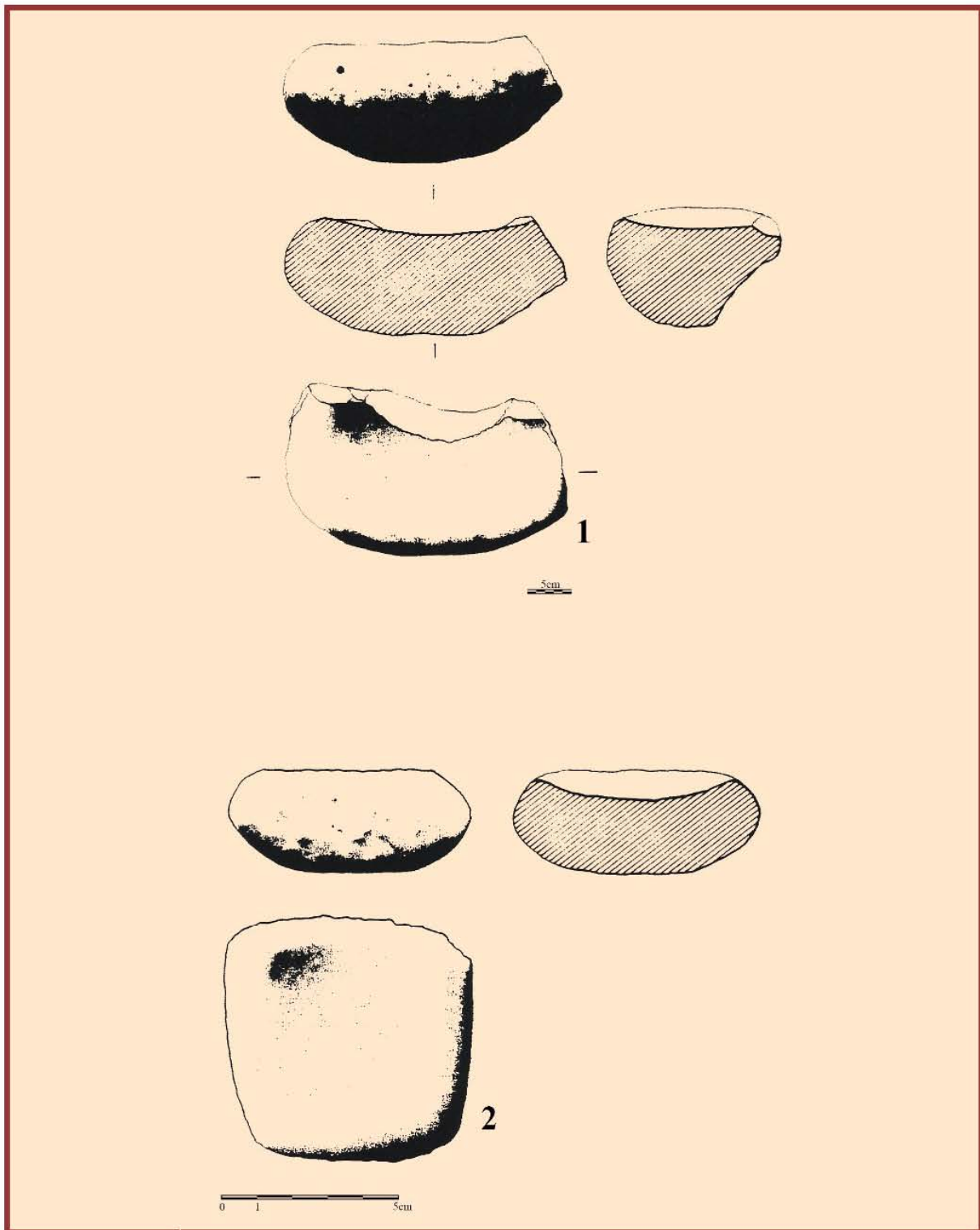
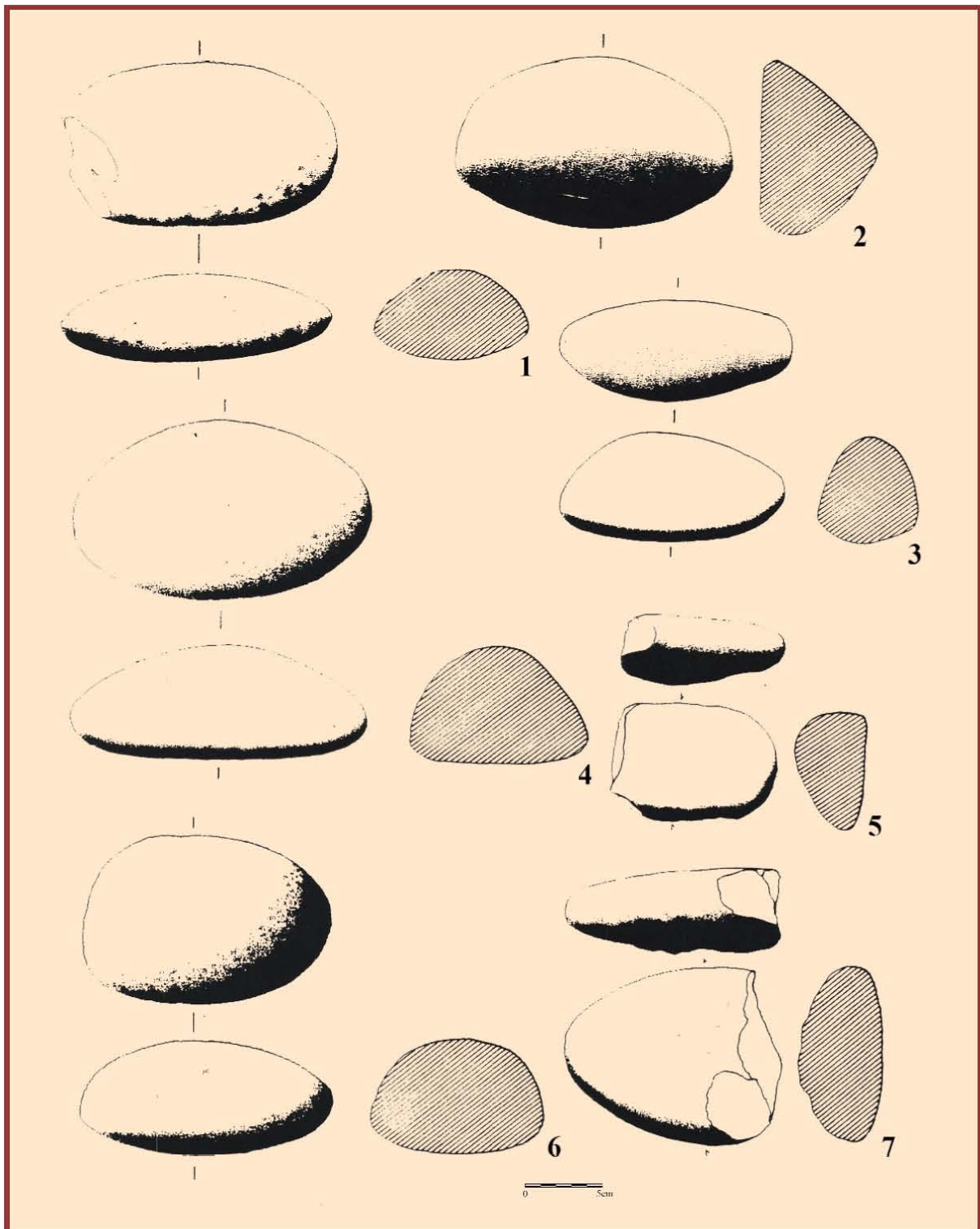
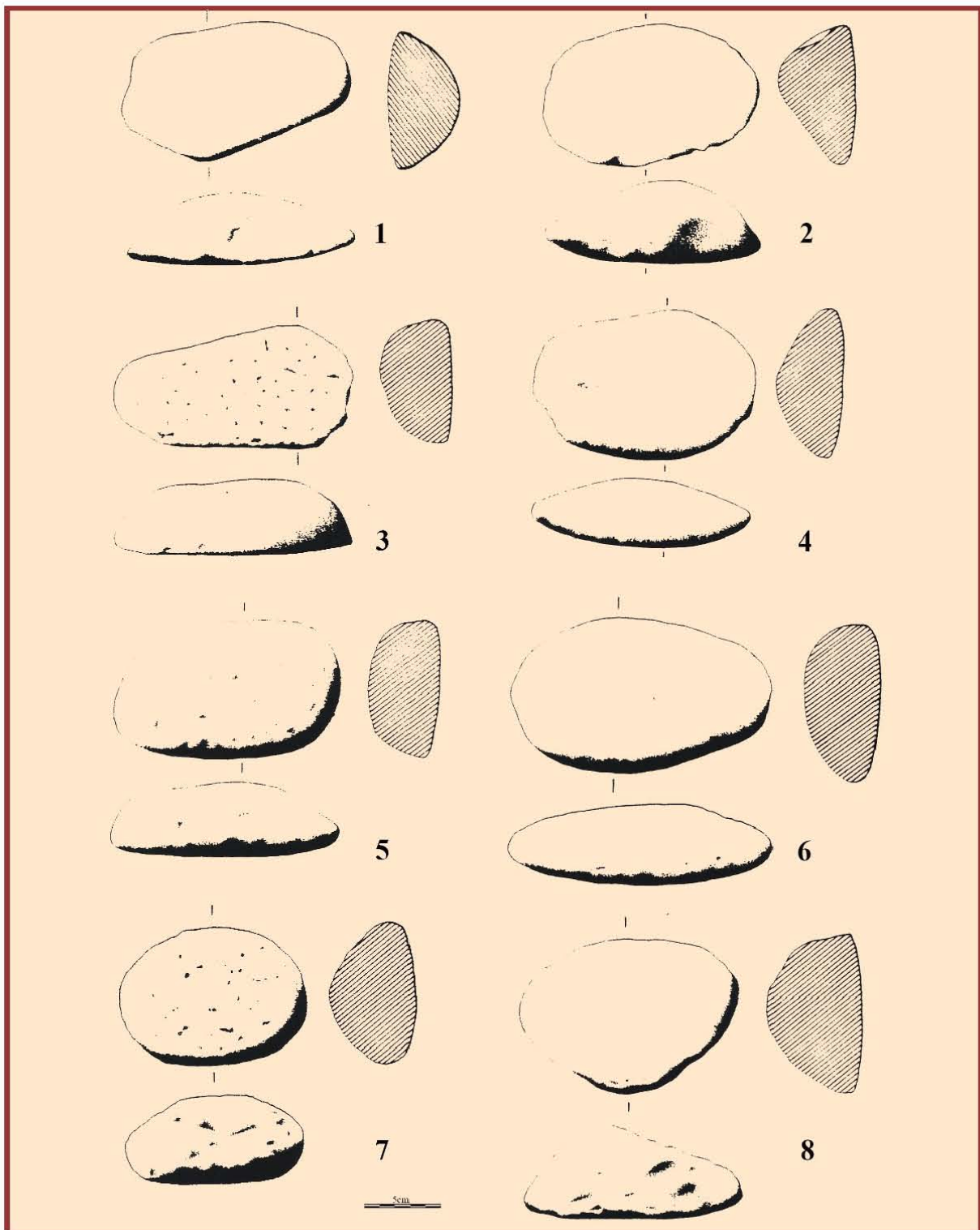


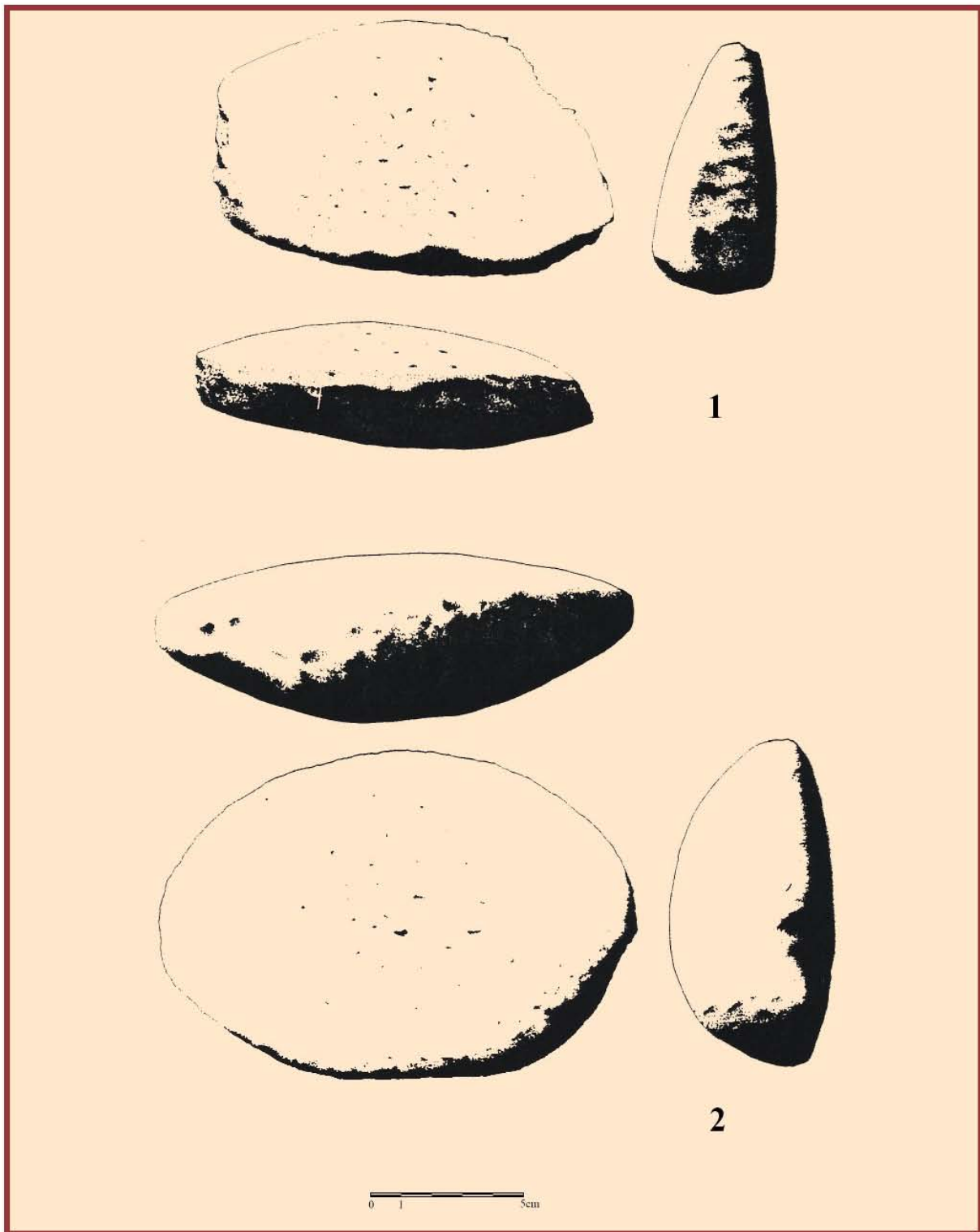
Figure 33: Mehrgarh 1997. Grinding stones, Period I. 1- MR 97 03 43 154; 2- MR 97 03 50 04.



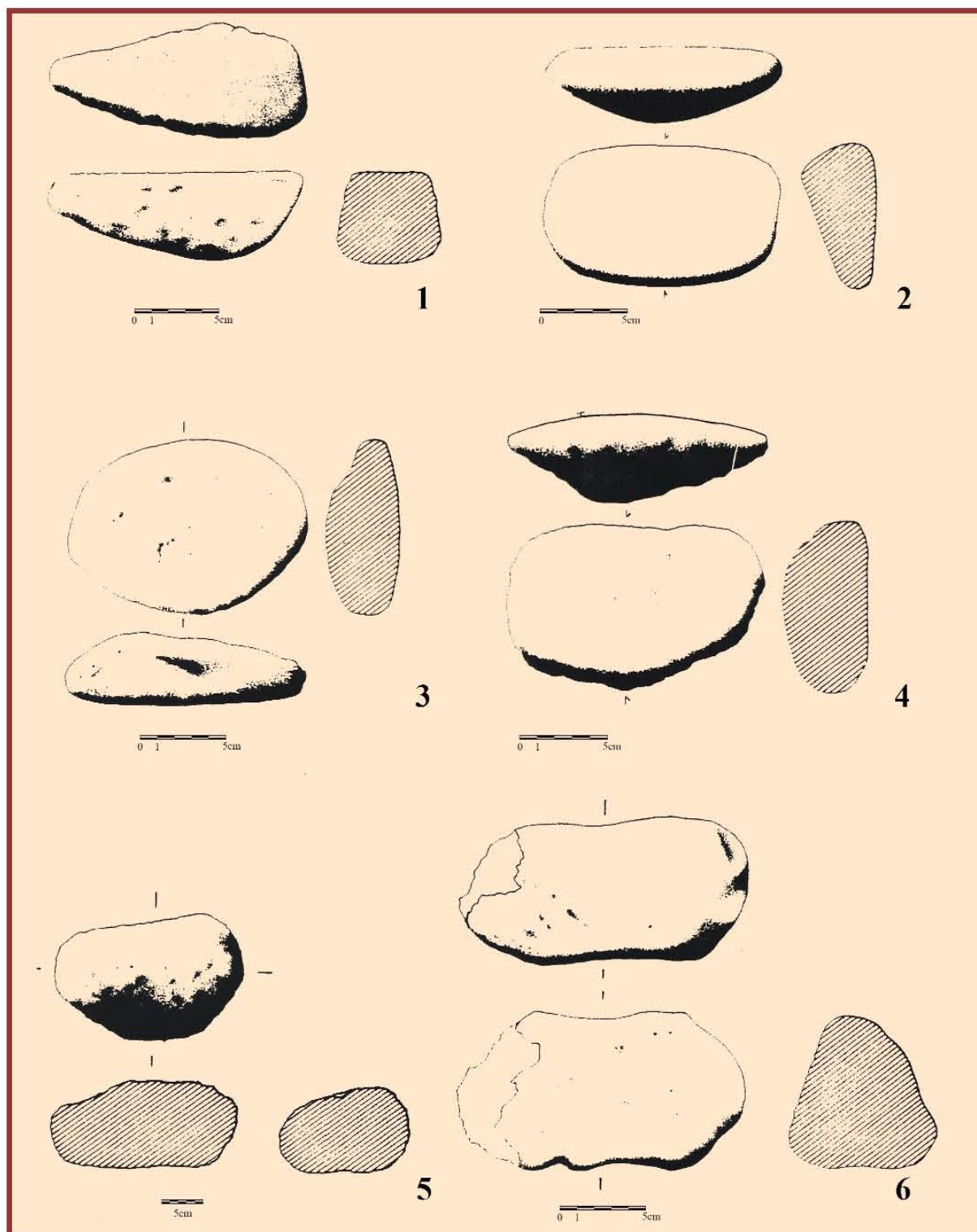
**Figure 34:** Mehrgarh 1997. Stone objects, Period I. 1- MR 97 03 15 08; 2- MR 97 03 47 78; 3- MR 97 03 42 191; 4- MR 97 03 42 190; 5- MR 97 03 17 18; 6- MR 97 03 45 07; 6- MR 97 03 07 20.



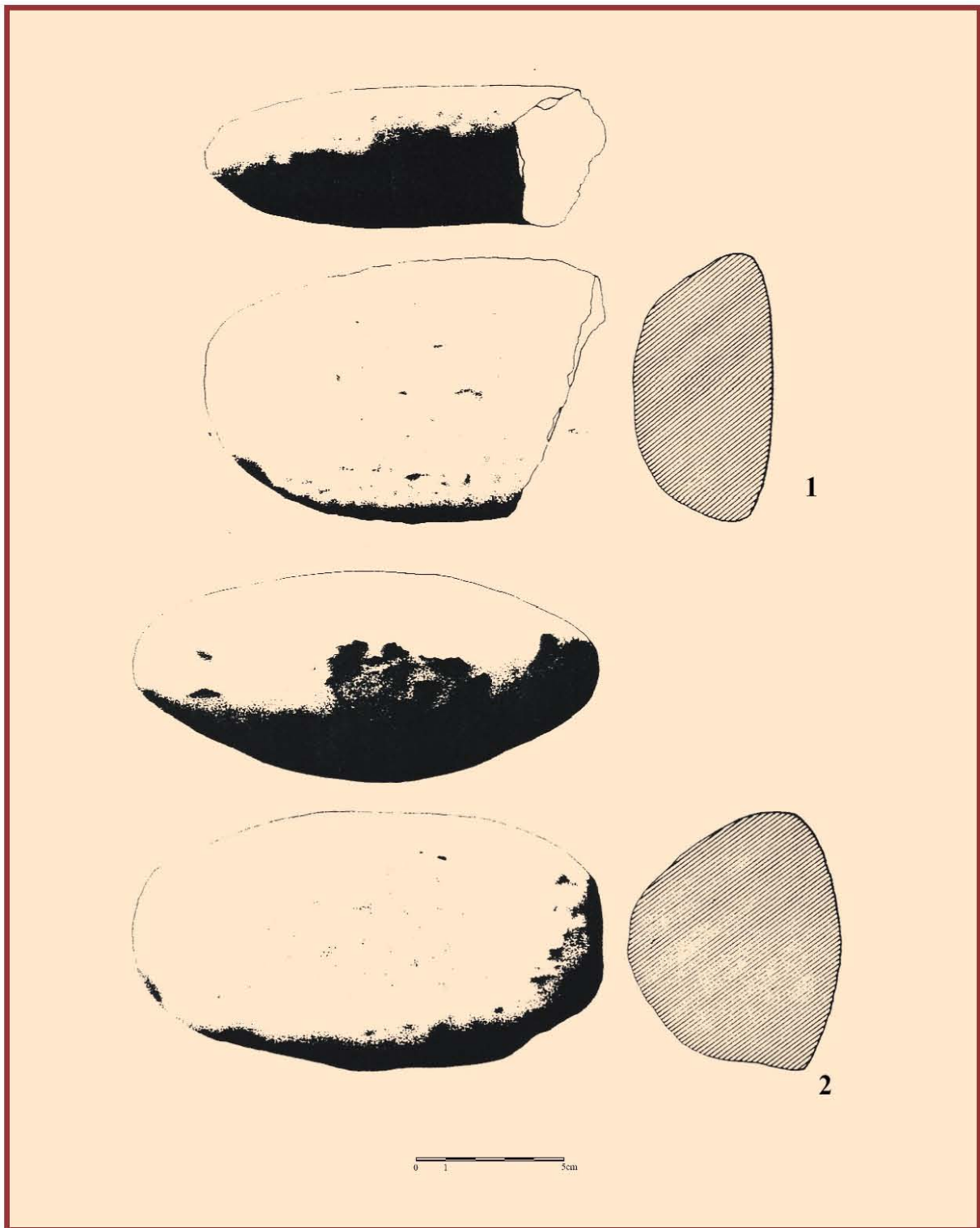
**Figure 35:** Mehrgarh 1997. Stone objects, Period I. 1- MR 97 03 57 82; 2- MR 97 03 02 05; 3- MR 97 03 42 173; 4- MR 97 03 01 20; 5- MR 97 03 43 149; 6- MR 97 03 42 124; 7- MR 97 03 43 78; 8- MR 97 03 49 49.



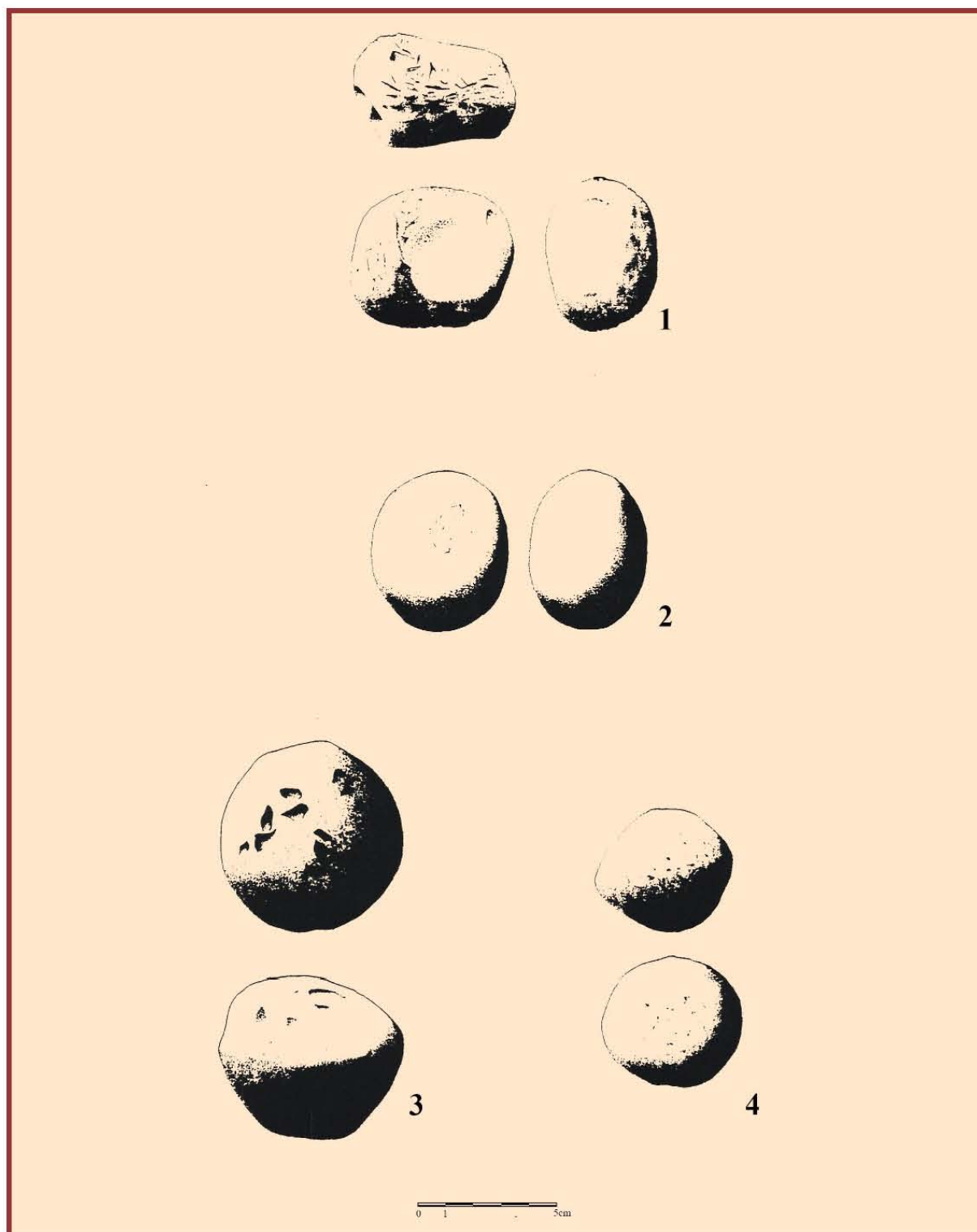
**Figure 36:** Mehrgarh 1997. Stone objects, Period I. 1- MR 97 03 12 36; 2- MR 97 03 12 37.



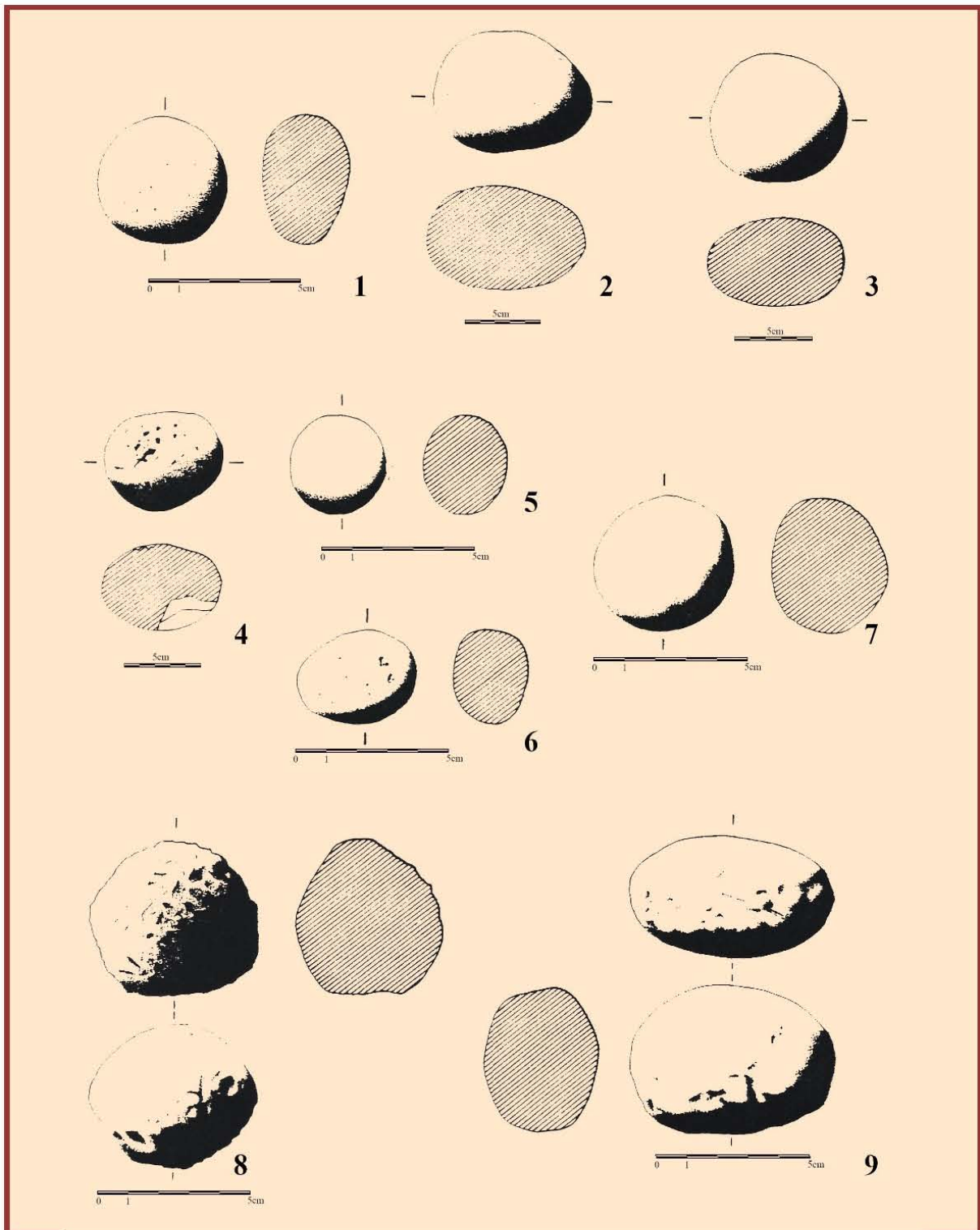
**Figure 37:** Mehrgarh 1997. Stone objects, Period I. 1- MR 97 03 45 09; 2- MR 97 03 04 07; 3- MR 97 03 22 66; 4- MR 97 03 24 68; 5- MR 97 03 40 02; 6- MR 97 03 43 150.



**Figure 38:** Mehrgarh 1997. Stone objects, Period I. 1- MR 97 03 13 01; 2- MR 97 03 10 33.



**Figure 39:** Mehrgarh 1997. Stone balls, Period I. 1- MR 97 03 12 35; 2- MR 97 03 19 49; 3- MR 97 03 12 34; 4- MR 97 03 14 28.



**Figure 40:** Mehrgarh 1997. Stone balls, Period I. 1- MR 97 03 42 126; 2- MR 97 03 49 45; 3- MR 97 03 49 97; 4- MR 97 03 46 167; 5- MR 97 03 43 77; 6- MR 97 03 30 48; 7- MR 97 03 27 29; 8- MR 97 03 22 65; 9- MR 97 03 22 64.

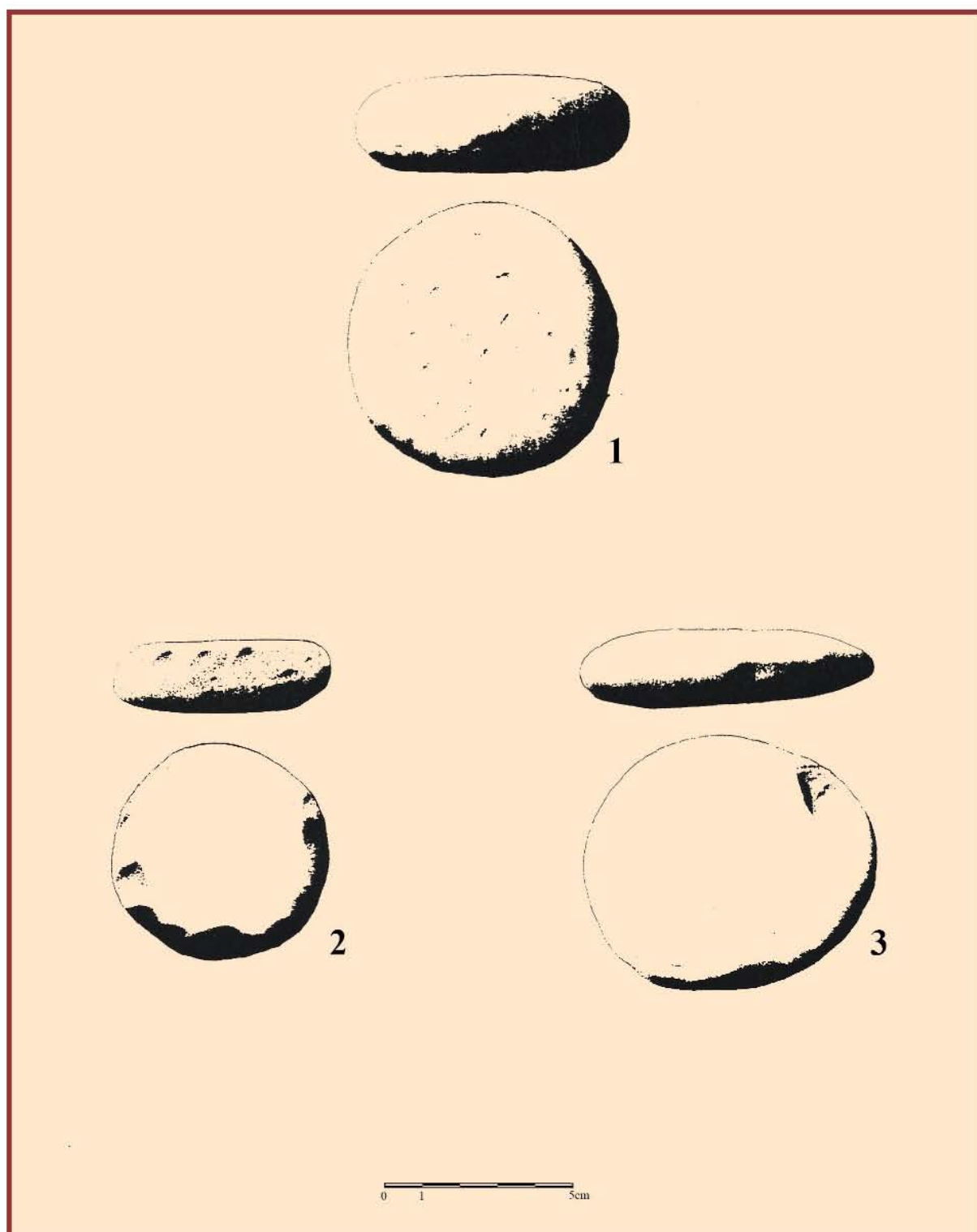
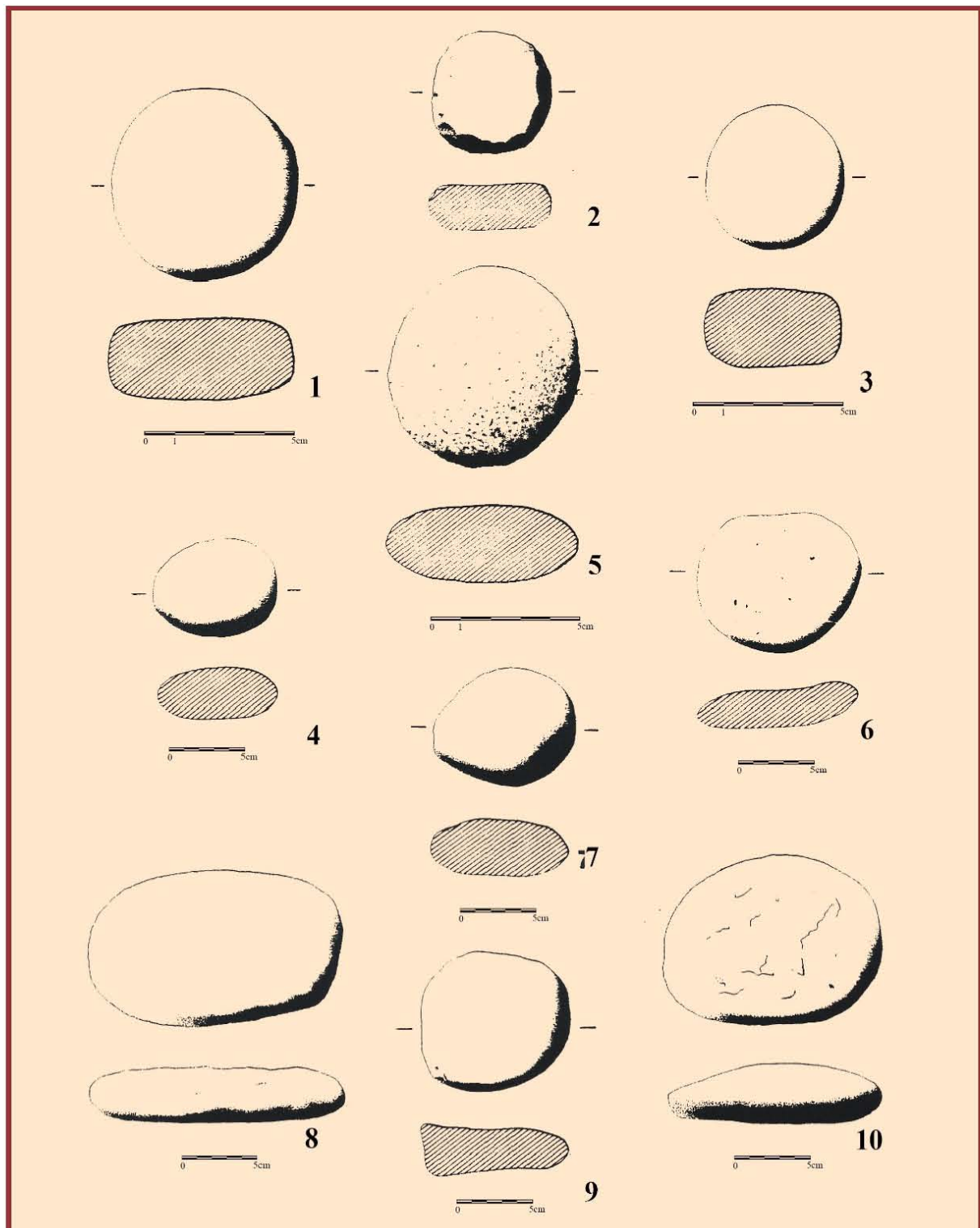
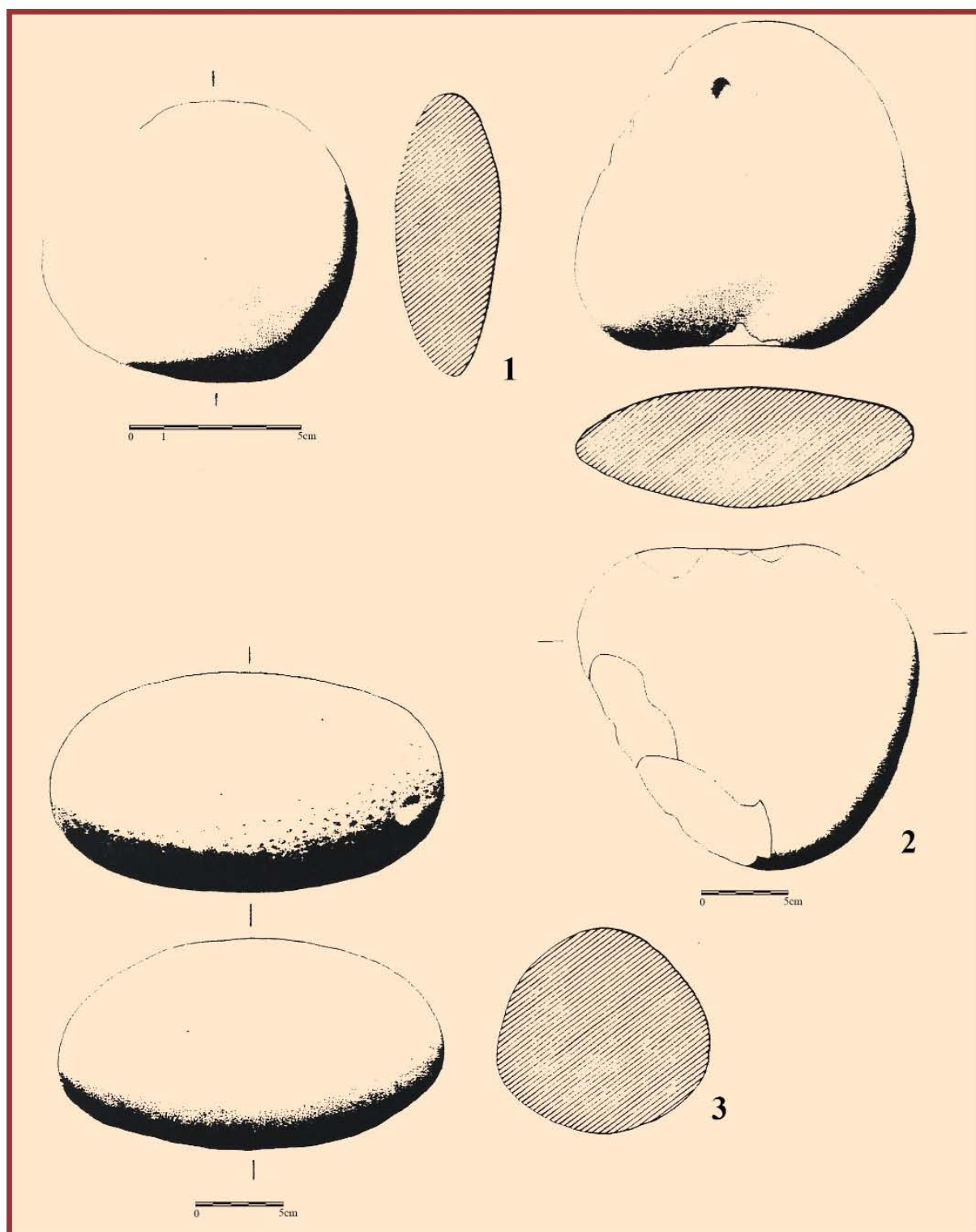


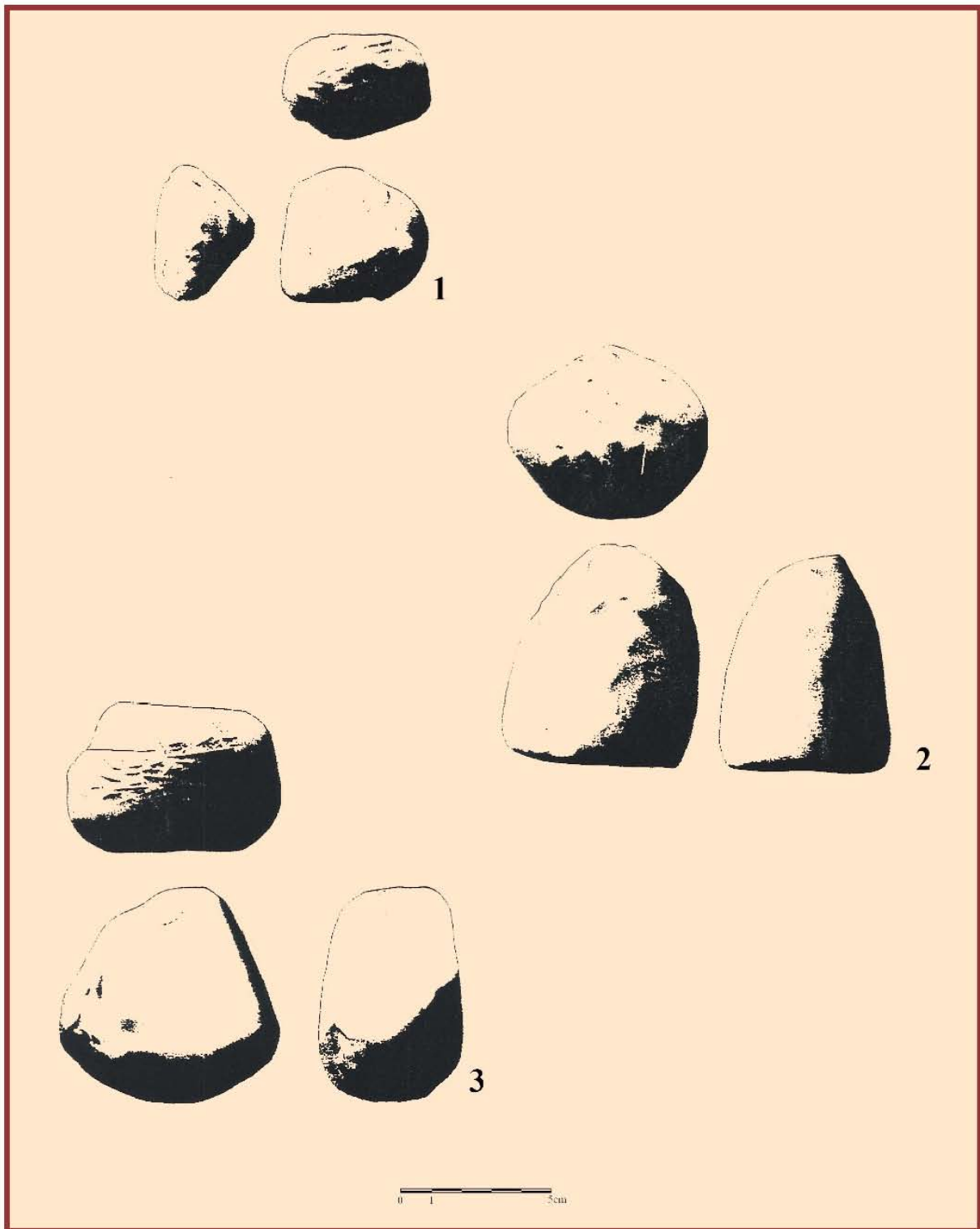
Figure 41: Mehrgarh 1997. Stone objects Period I. 1- MR 97 03 09 48; 2- MR 97 03 10 34; 3- MR 97 03 20 35.



**Figure 42:** Mehrgarh 1997. Stone objects, Period I. 1- MR 97 03 52 05; 2- MR 97 03 42 176; 3- MR 97 03 37 41; 4- MR 97 03 46 70; 5- MR 97 03 30 159; 6- MR 97 03 42 193; 7- MR 97 03 42 177; 8- MR 97 03 49 48; 9- MR 97 03 07 67; 10- MR 97 03 46 69.



**Figure 43:** Mehrgarh 1997. Stone objects Period I. 1- MR 97 03 28 01; 2- MR 97 03 60 34; 3- MR 97 03 12 38.



**Figure 44:** Mehrgarh 1997. Stone objects Period I. 1- MR 97 03 08 15; 2- MR 97 03 18 49; 3- MR 97 03 20 37.

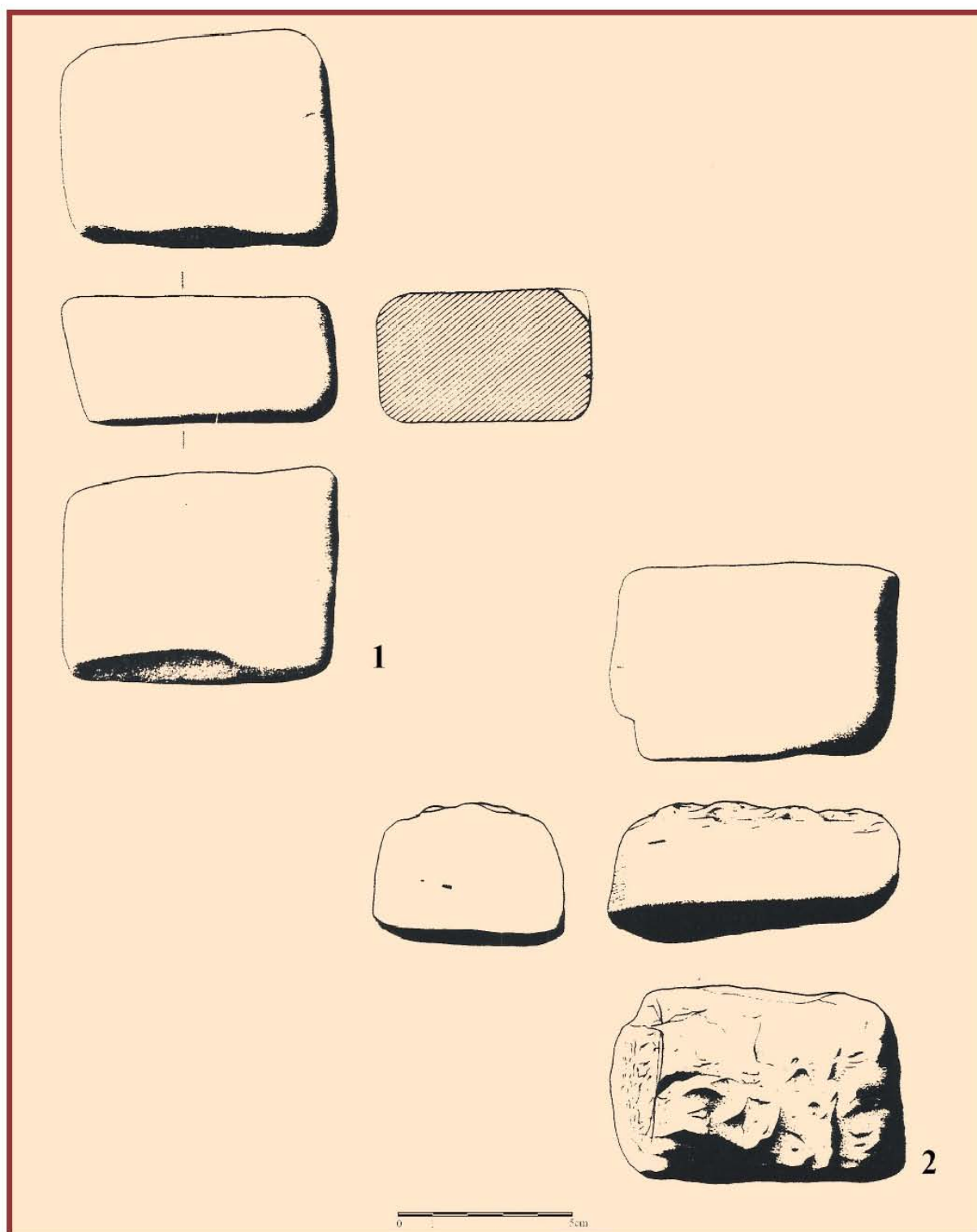
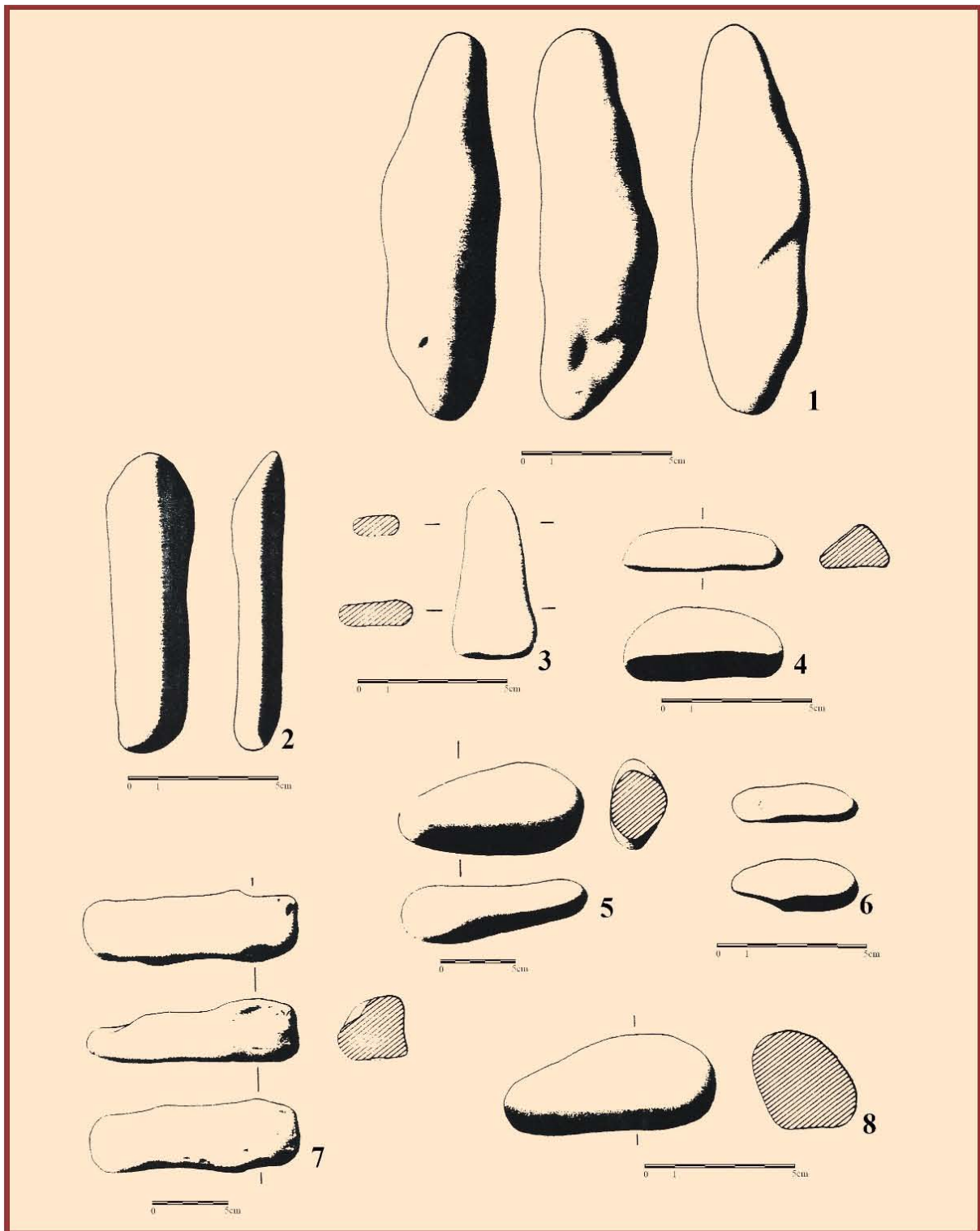
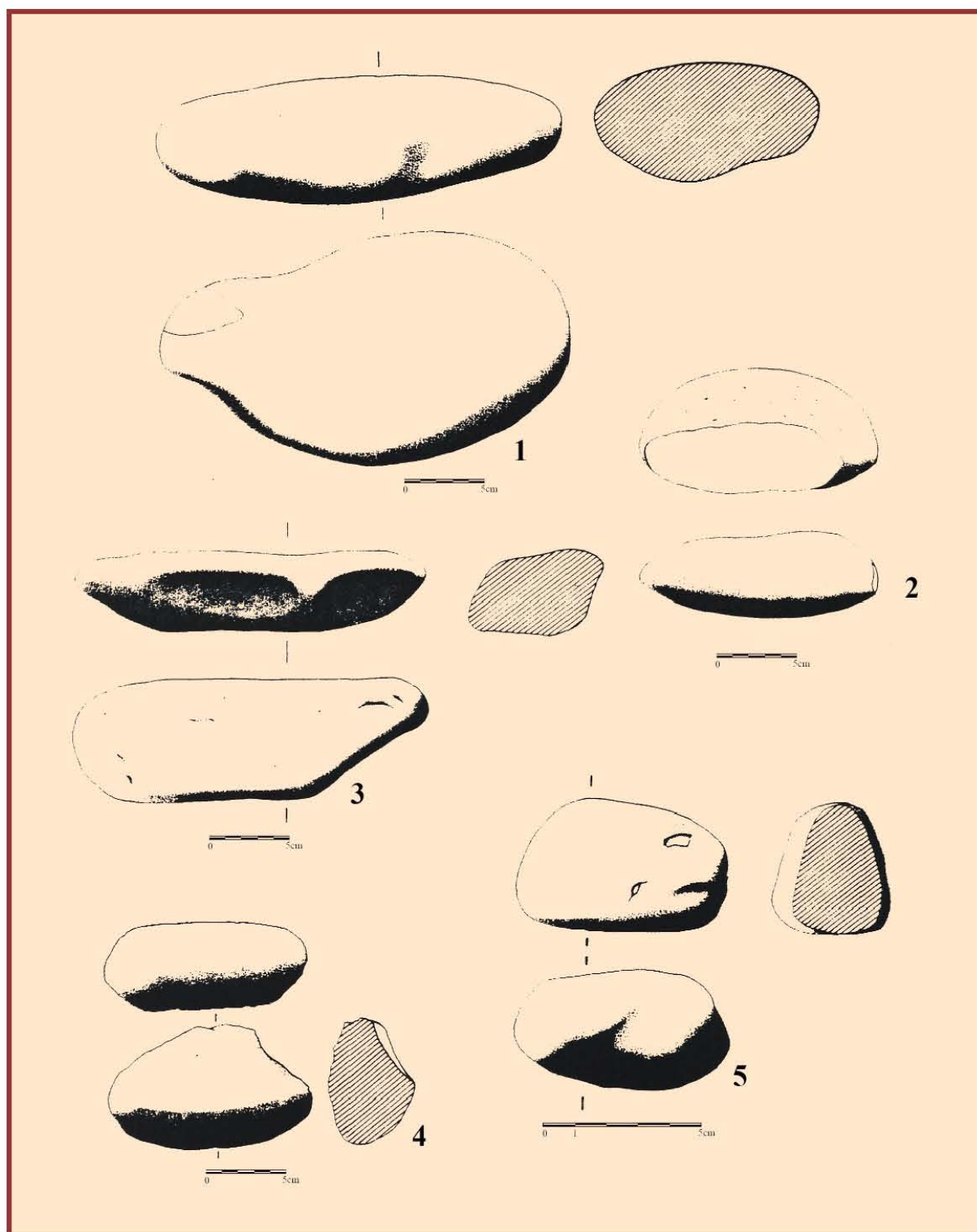


Figure 45: Mehrgarh 1997. Stone objects Period I. 1- MR 97 03 56 50; 2- MR 97 03 59 08.



**Figure 46:** Mehrgarh 1997. Stone objects, Period I. 1- MR 97 03 59 09; 2- MR 97 03 30 161; 3- MR 97 03 42 194; 4- MR 97 03 48 34; 5- MR 97 03 43 136; 6- MR 97 03 36 19; 7- MR 97 03 49 46; 8- MR 97 03 03 31.

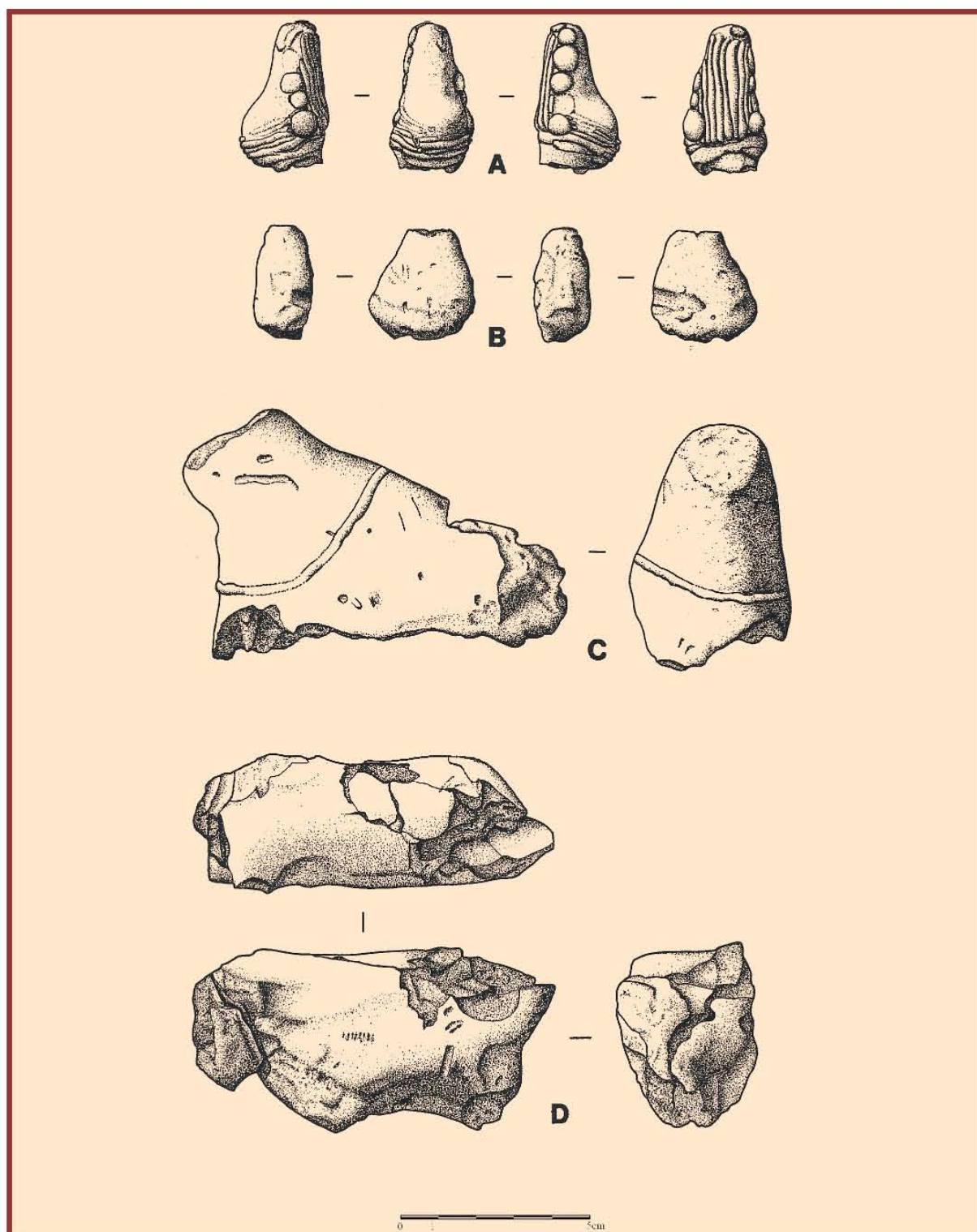


**Figure 47:** Mehrgarh 1997. Stone objects, Period I. 1- MR 97 03 43 151; 2- MR 97 03 42 192; 3- MR 97 03 49 96; 4- MR 97 03 07 68; 5- MR 97 03 03 35.

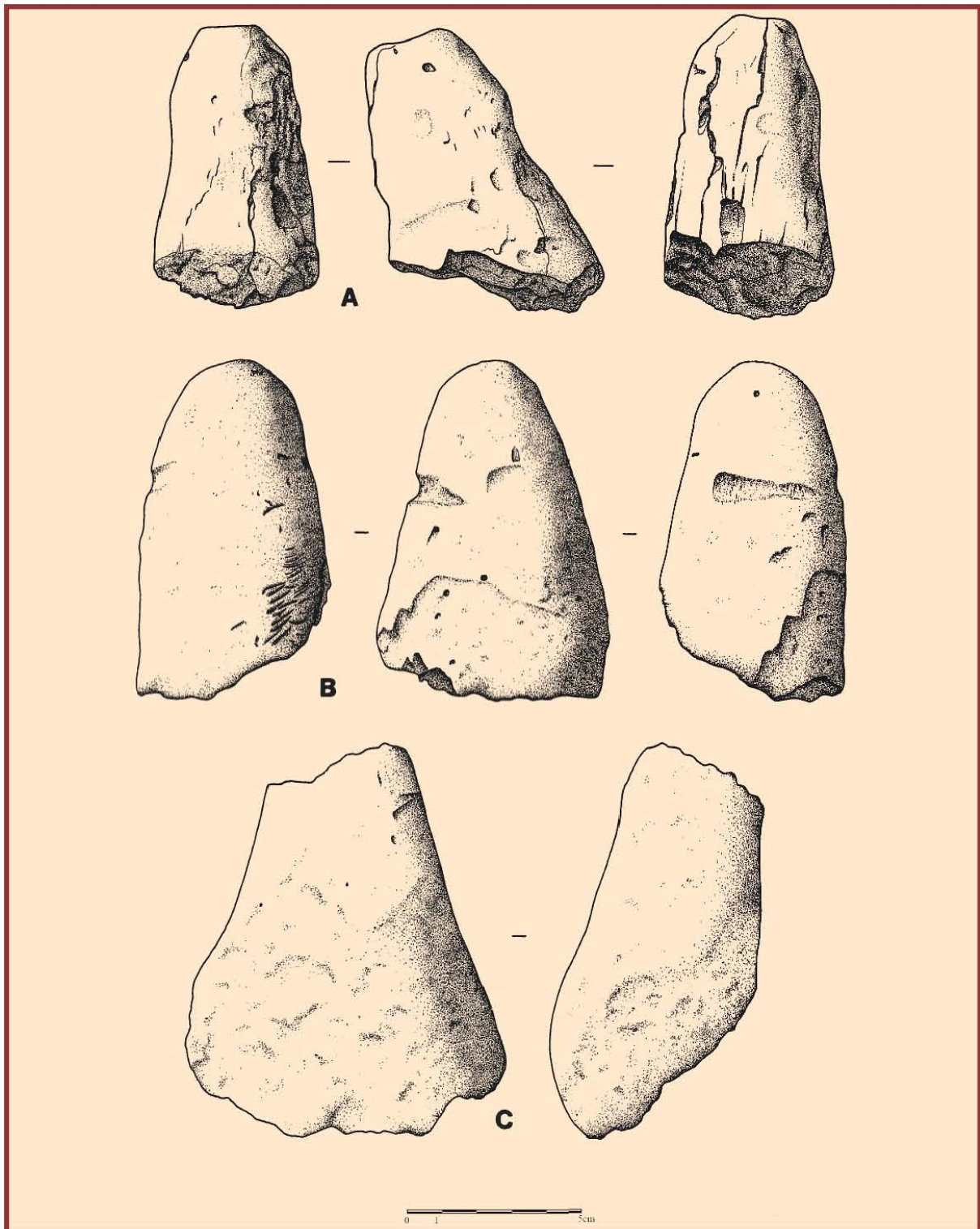


**ARTEFACTS**  
**1998**

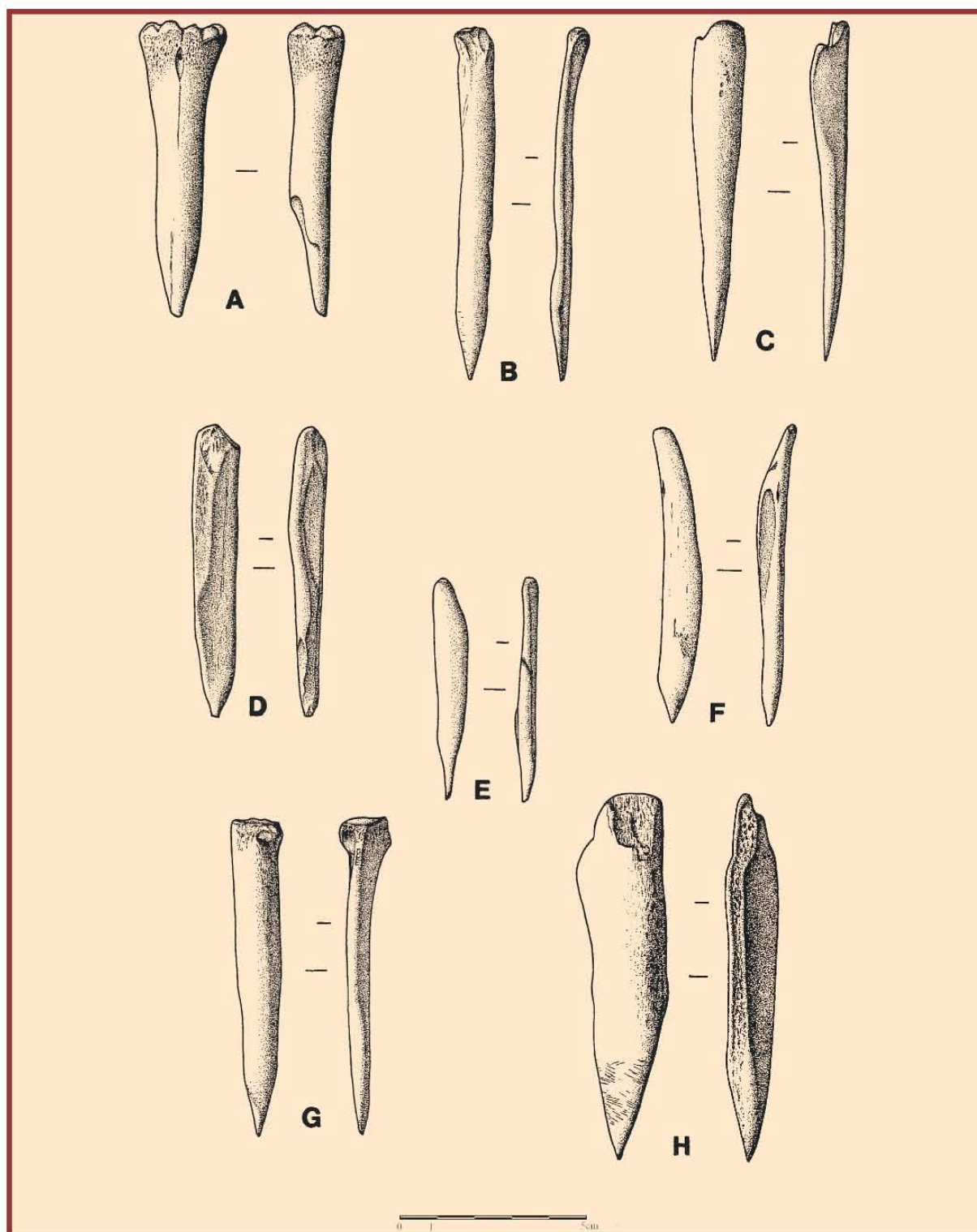




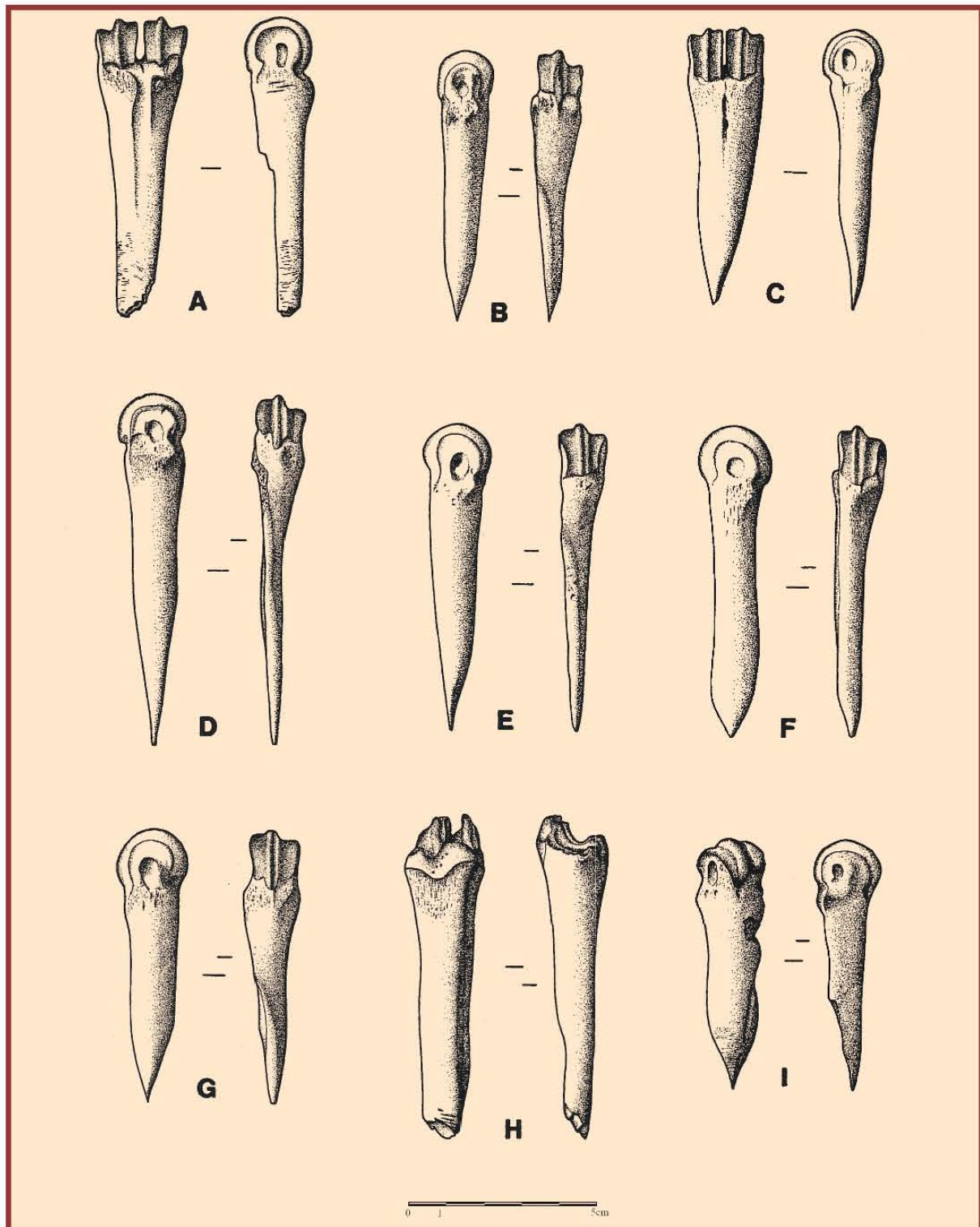
**Figure 48.** Mehrgarh 1998. Unbaked clay figurines, Period I. A- MR 98 03 72 49; B- MR 98 03 71 90; C- MR 98 03 71 92; D- MR 98 03 67 35.



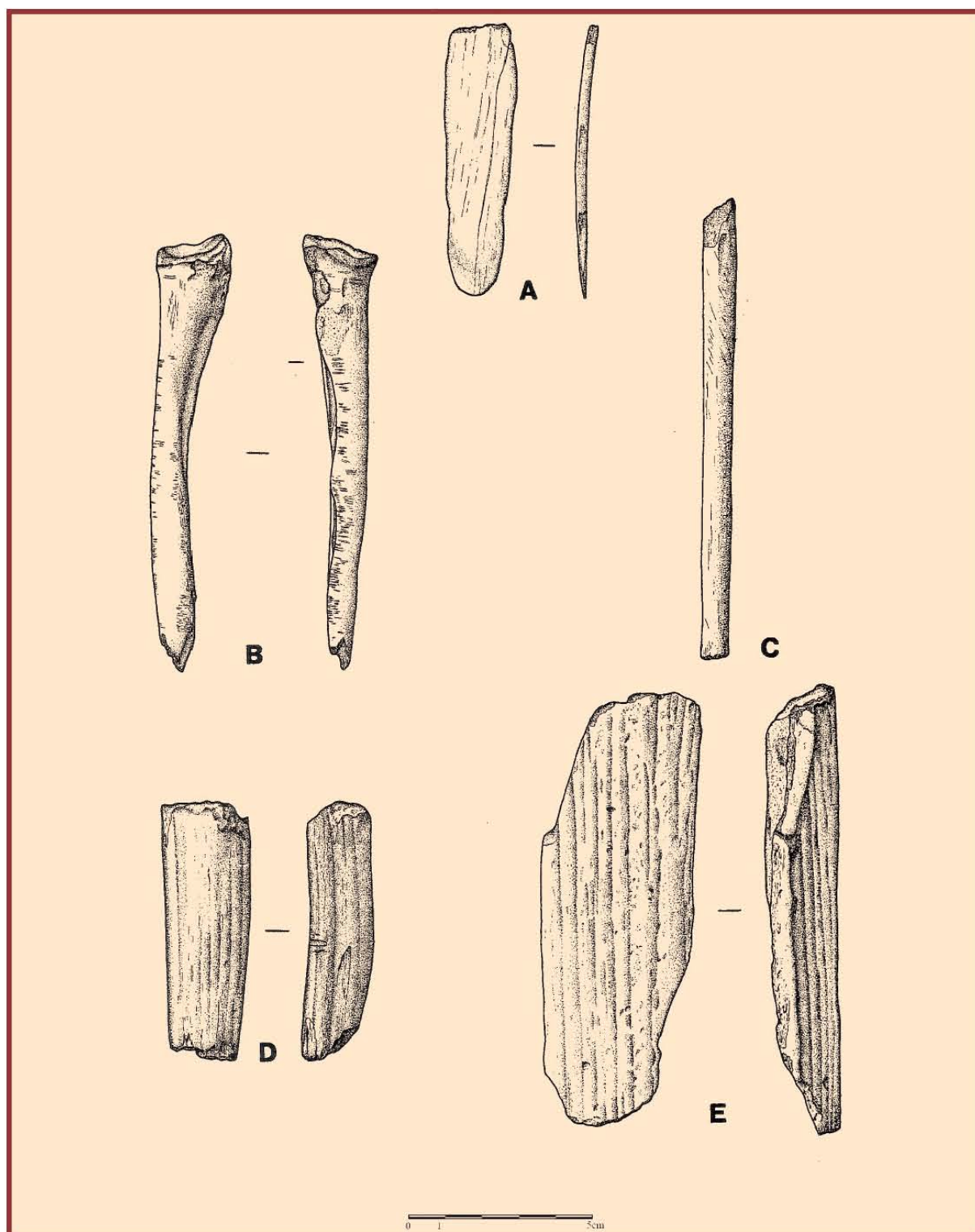
**Figure 49.** Mehrgarh 1998. Unbaked clay figurines, Period I. A- MR 98 03 30 88; B- MR 98 03 71 91; C- MR 98 03 31 37.



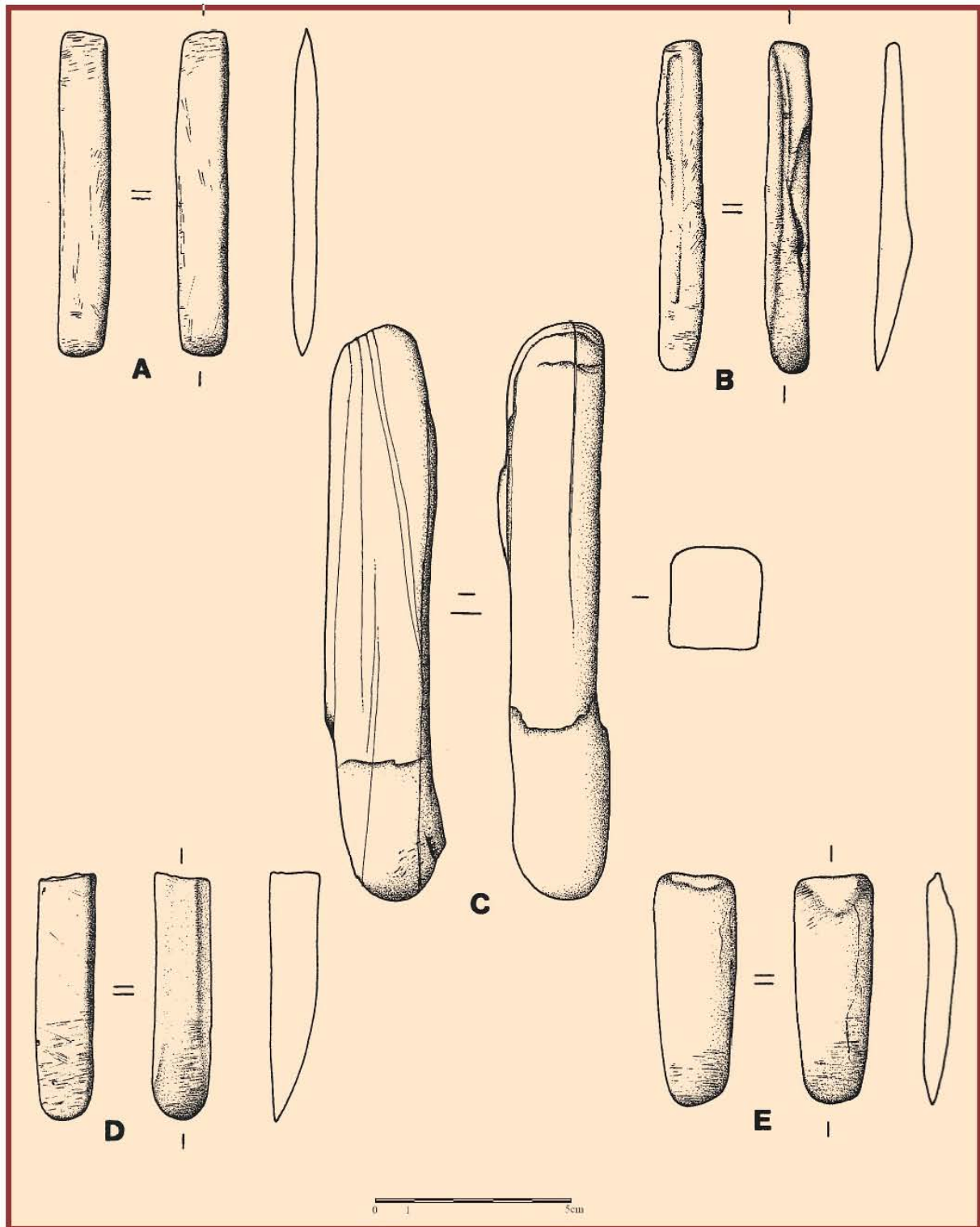
**Figure 50:** Mehrgarh 1998. Bone tools, Period I. A- MR 98 03 31 317; B- MR 98 03 10 387; C- MR 98 03 97 34; D- MR 98 03 31 592; E- MR 98 03 104 112; F- MR 98 03 108 29; G- MR 98 03 106 117; H- MR 98 03 71 171.



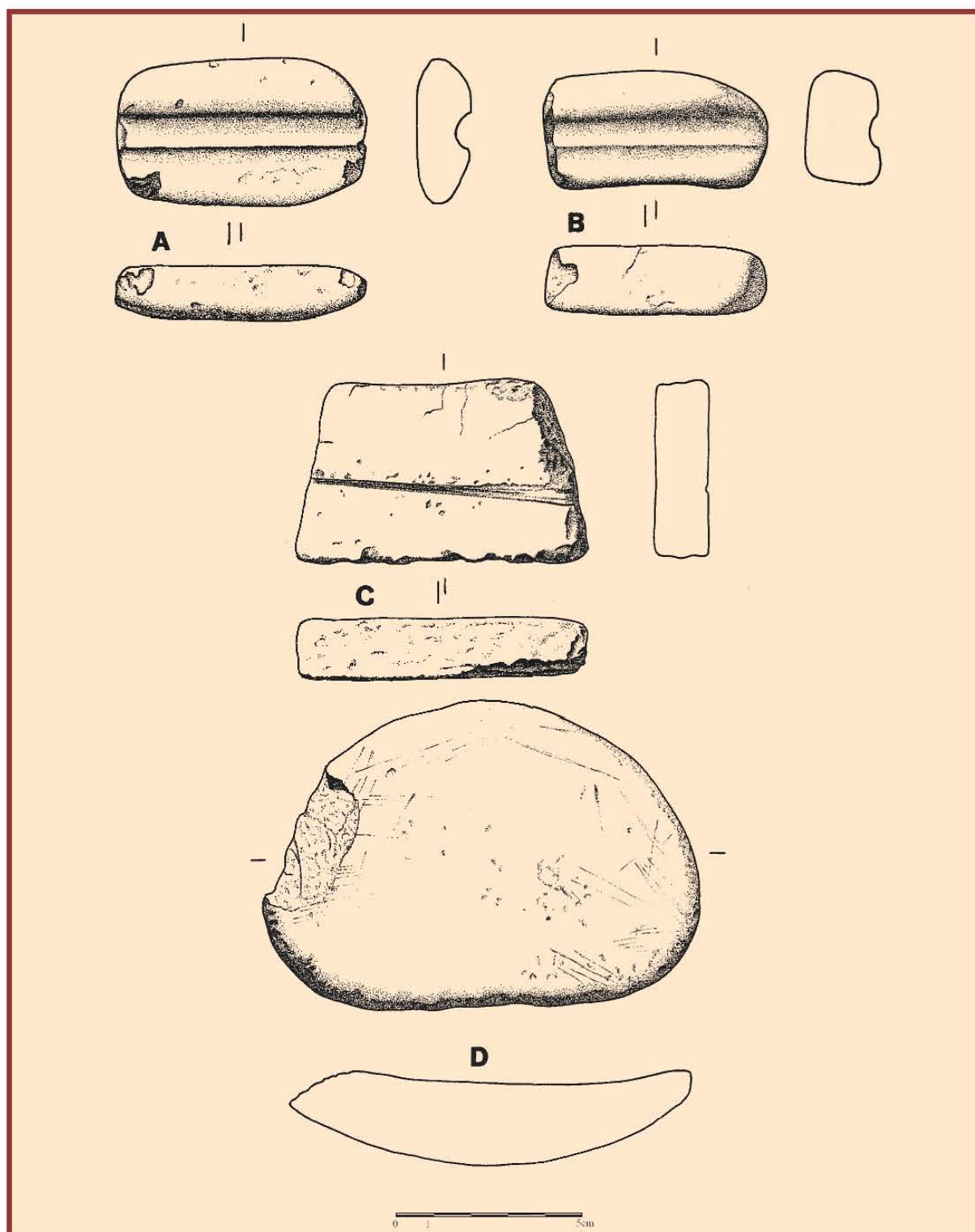
**Figure 51:** Mehrgarh 1998. Bone tools, Period I. A- MR 98 03 53 252; B- MR 98 03 69 672; C- MR 98 03 104 113; D- MR 98 03 69 220; E- MR 98 03 79 48 ;F- MR 98 03 86 56; G- MR 98 03 98 44; H- MR 98 03 106 82; I- MR 98 03 69 536.



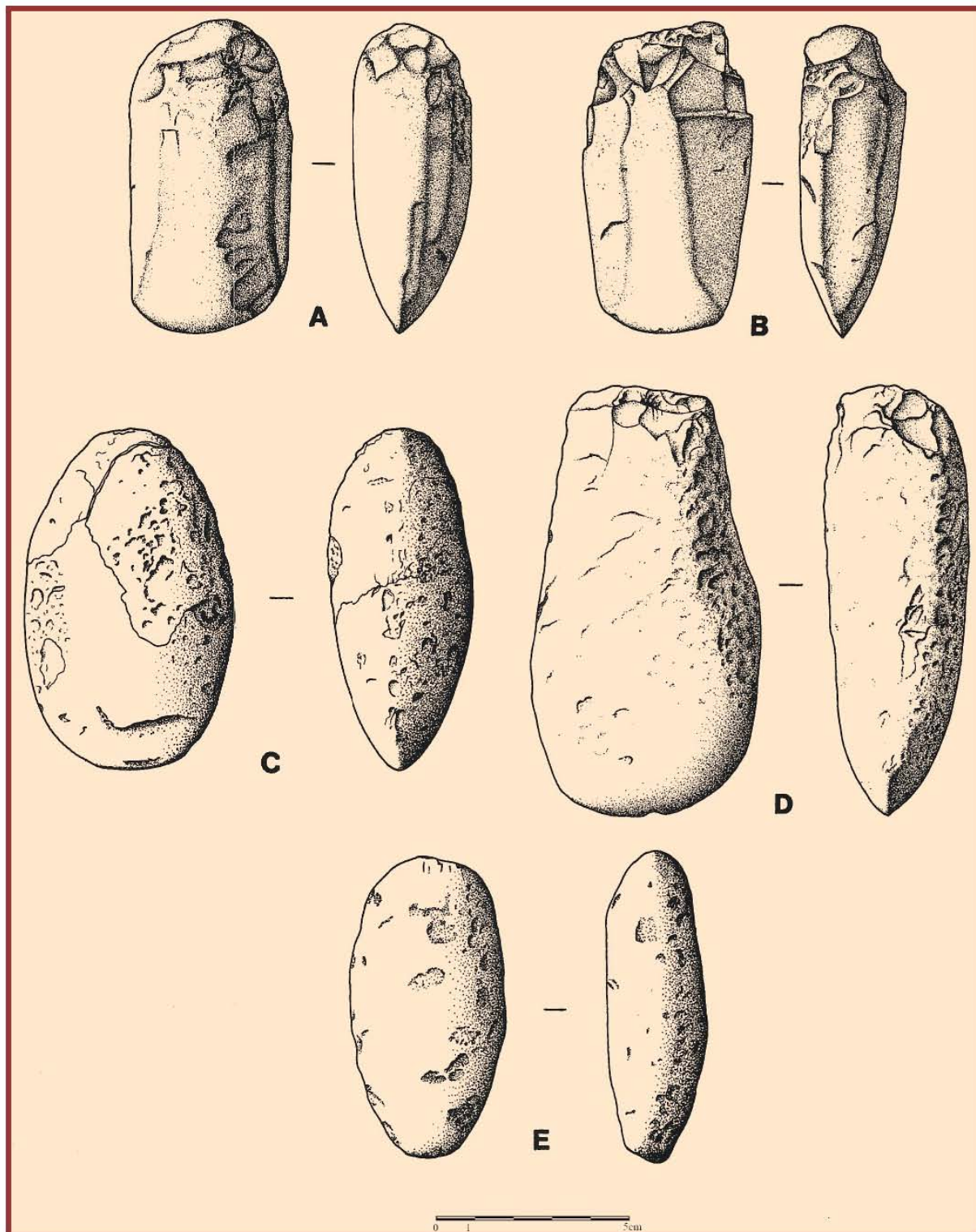
**Figure 52:** Mehrgarh 1998. Bone tools, Period I. A- MR 98 03 53 254; B- MR 98 03 53 118; C- MR 98 03 99 51; D- MR 98 03 103 117; E- MR 98 03 104 75.



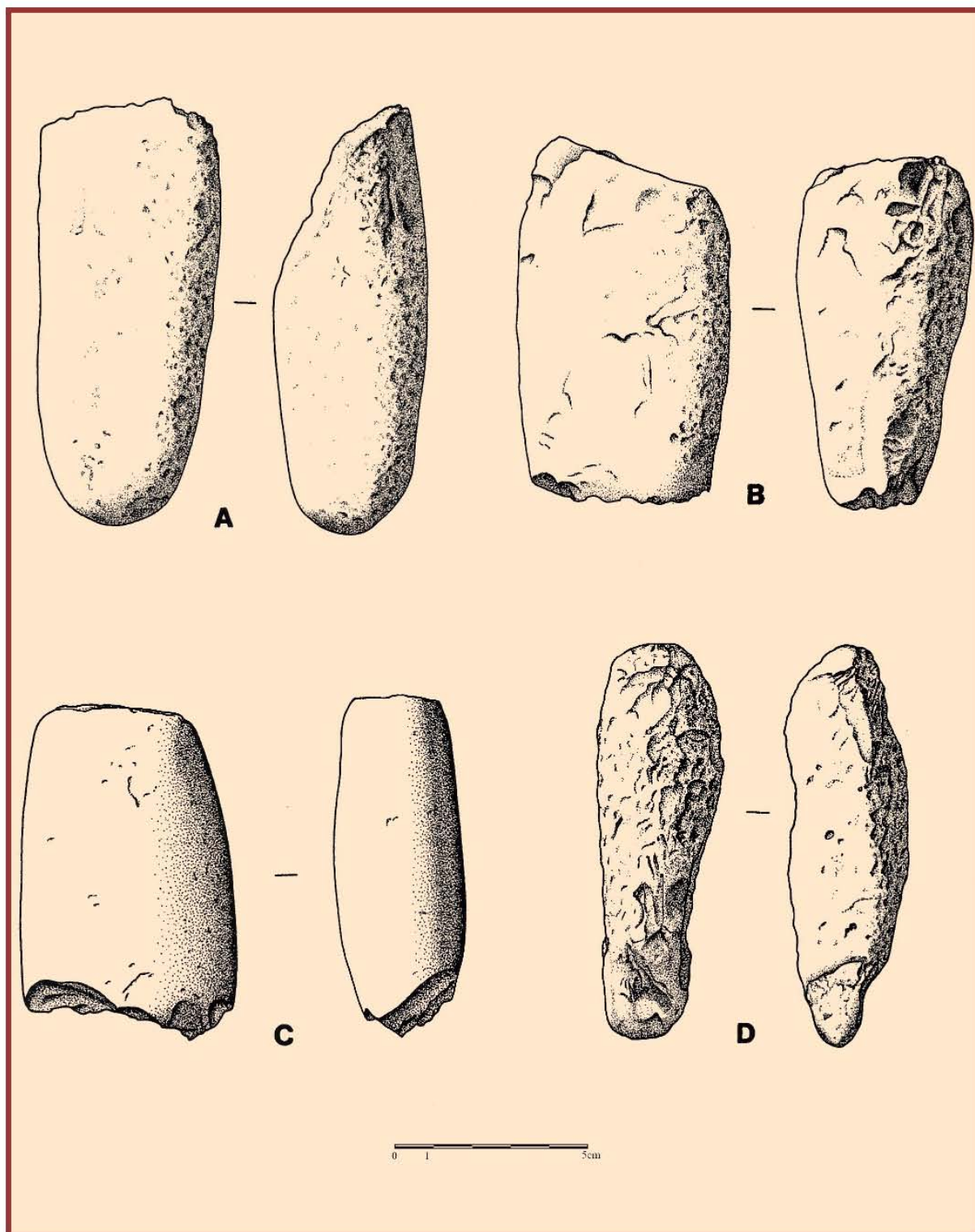
**Figure 53:** Mehrgarh 1998. Stone objects, Period I. A- MR 98 03 31 118; B- MR 98 03 54 55; C- MR 98 03 33 907; D- MR 98 03 107 65 E- MR 98 03 73 33.



**Figure 54:** Mehrgarh 1998. Stone objects, Period I. A- MR 98 03 11 216; B- MR 98 03 11 126; C- MR 98 03 330 01; D- MR 98 03 336 72.



**Figure 55:** Mehrgarh 1998. Stone axes, Period I. A- MR 98 03 86 23; B- MR 98 03 109 55; C- MR 98 03 320 122; D- MR 98 03 329 01; E- MR 98 03 310 162.



**Figure 56:** Mehrgarh 1998. Stone tools, Period I. A- MR 98 03 79 15; B- MR 98 03 325 31; C- MR 98 03 302 106; D- MR 98 03 310 163.

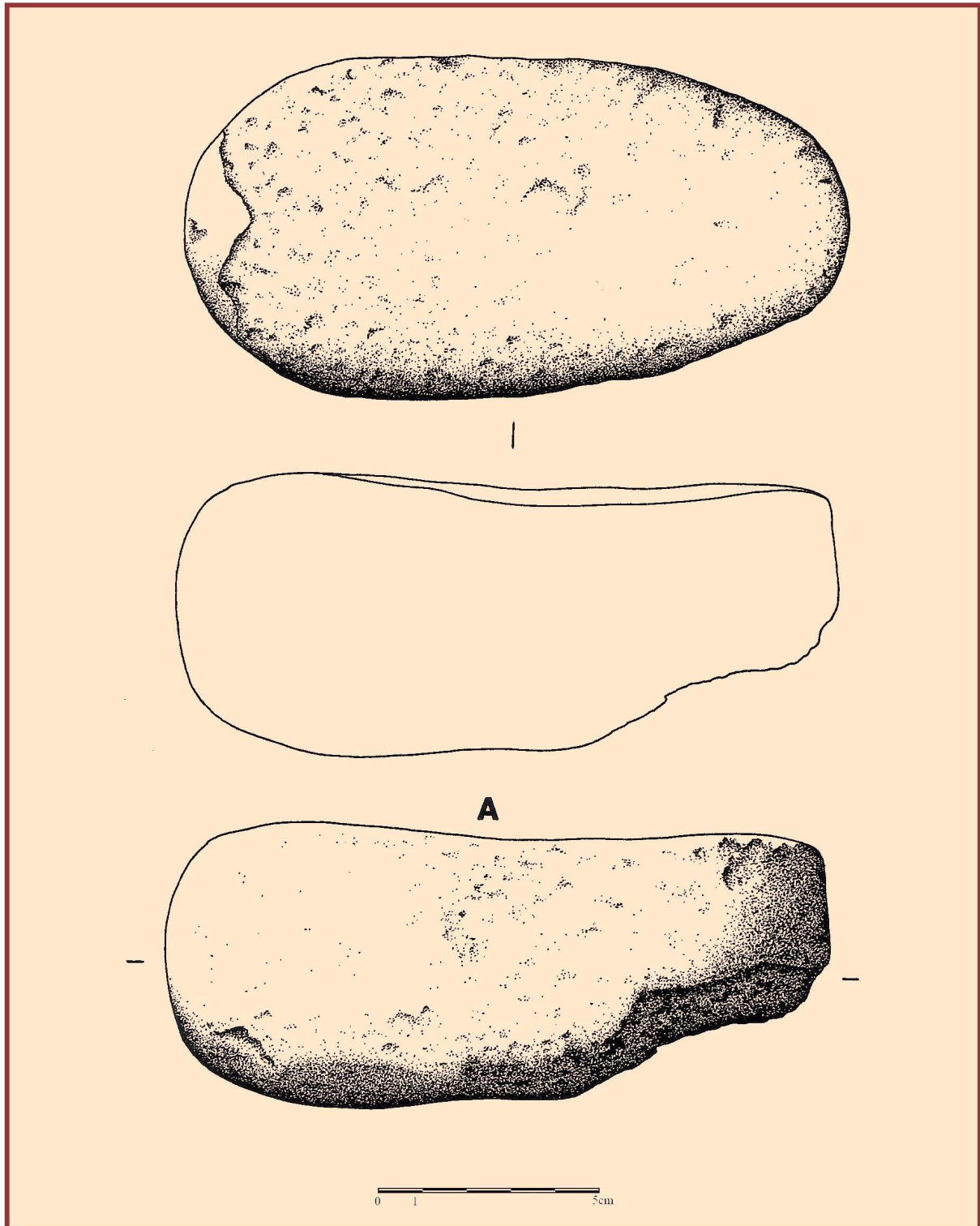
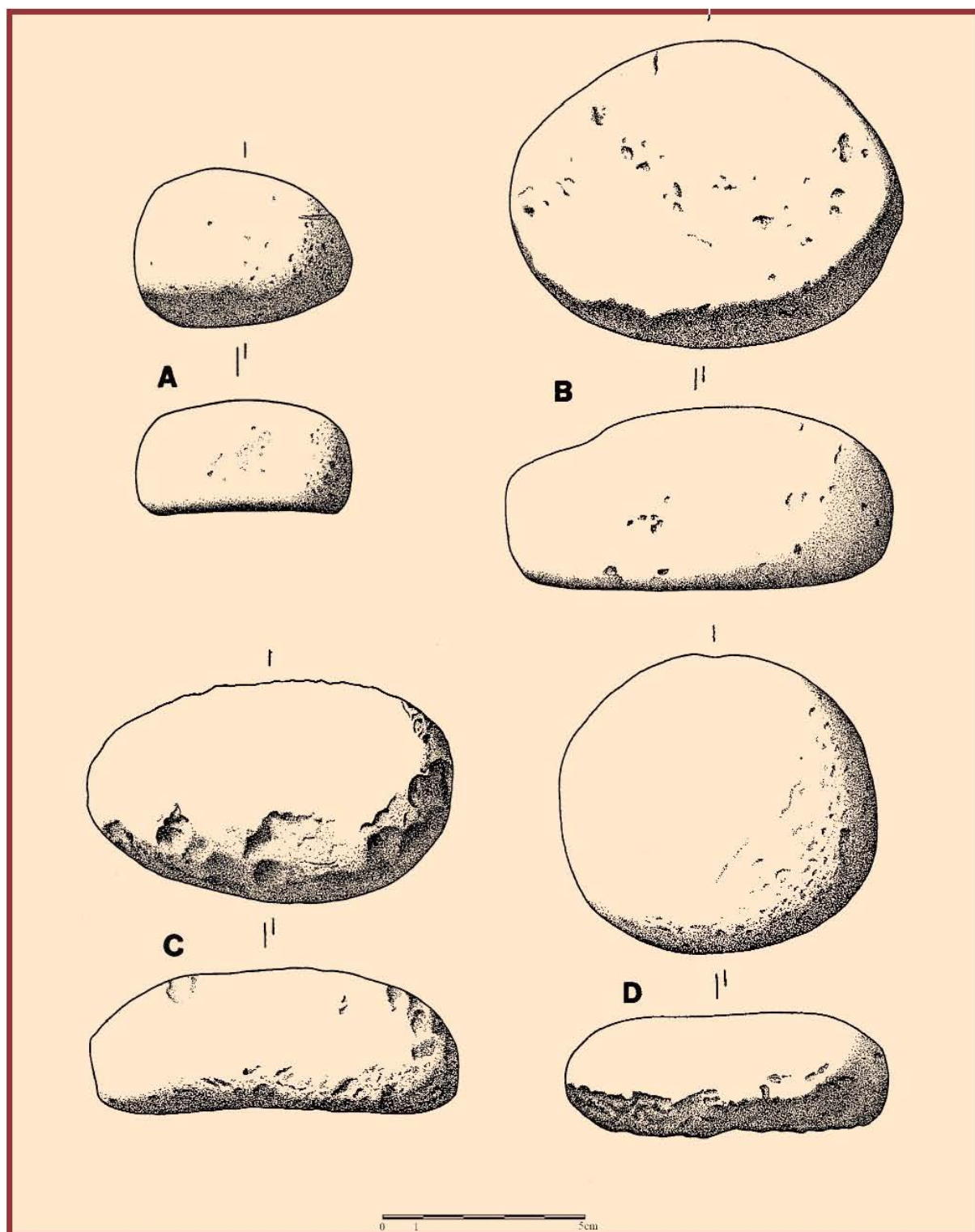
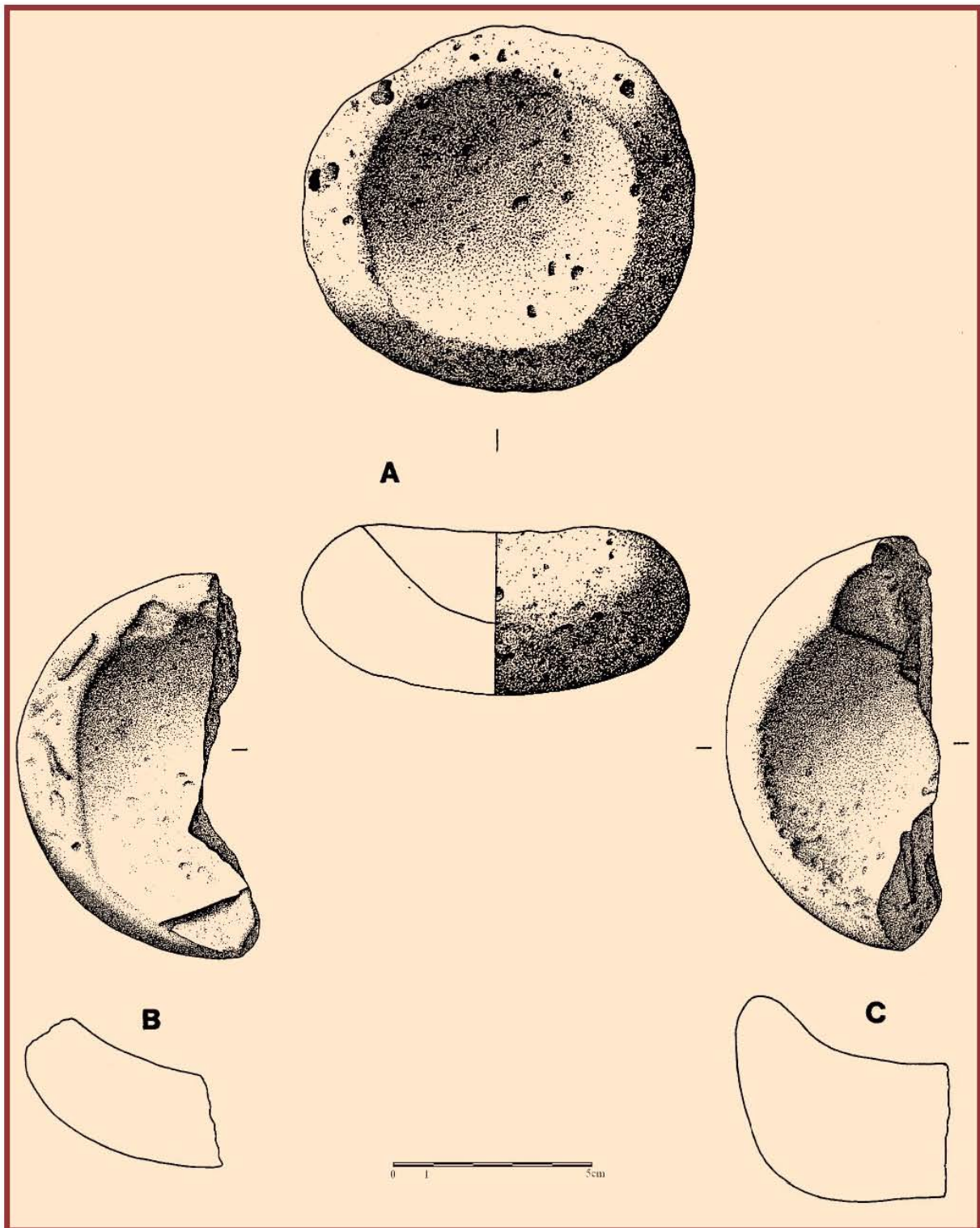


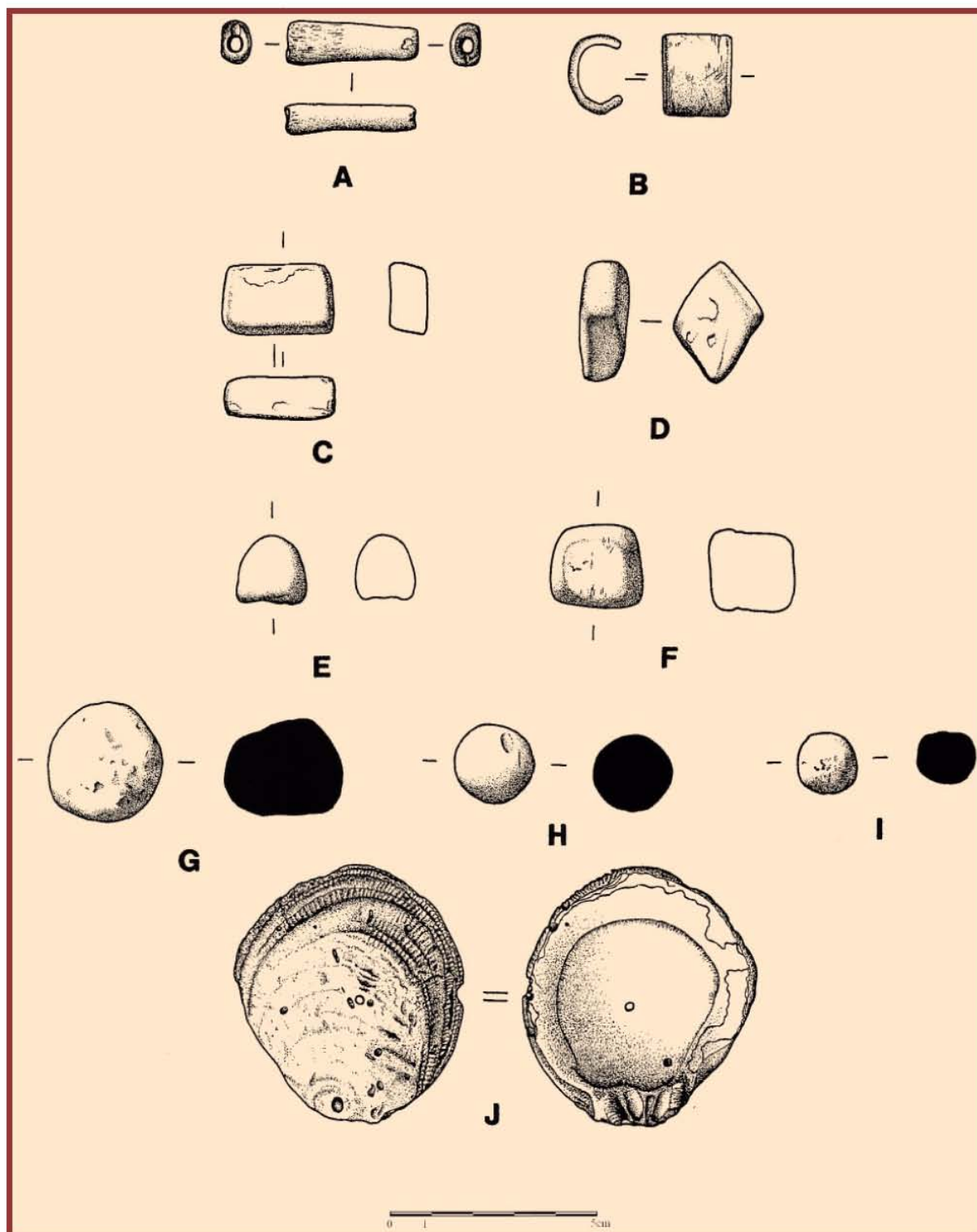
Figure 57: Mehrgarh 1998. Grinding stones, Period I. A- MR 98 03 334 32.



**Figure 58:** Mehrgarh 1998. Stone objects, Period I. A- MR 98 03 310 163; B- MR 98 03 320 123; C- MR 98 03 302 107; D- MR 98 03 309 29.



**Figure 59:** Mehrgarh 1998. Stone vessels, Period I. A- MR 98 03 532 64; B- MR 98 03 335 01; C- MR 98 03 66 45.

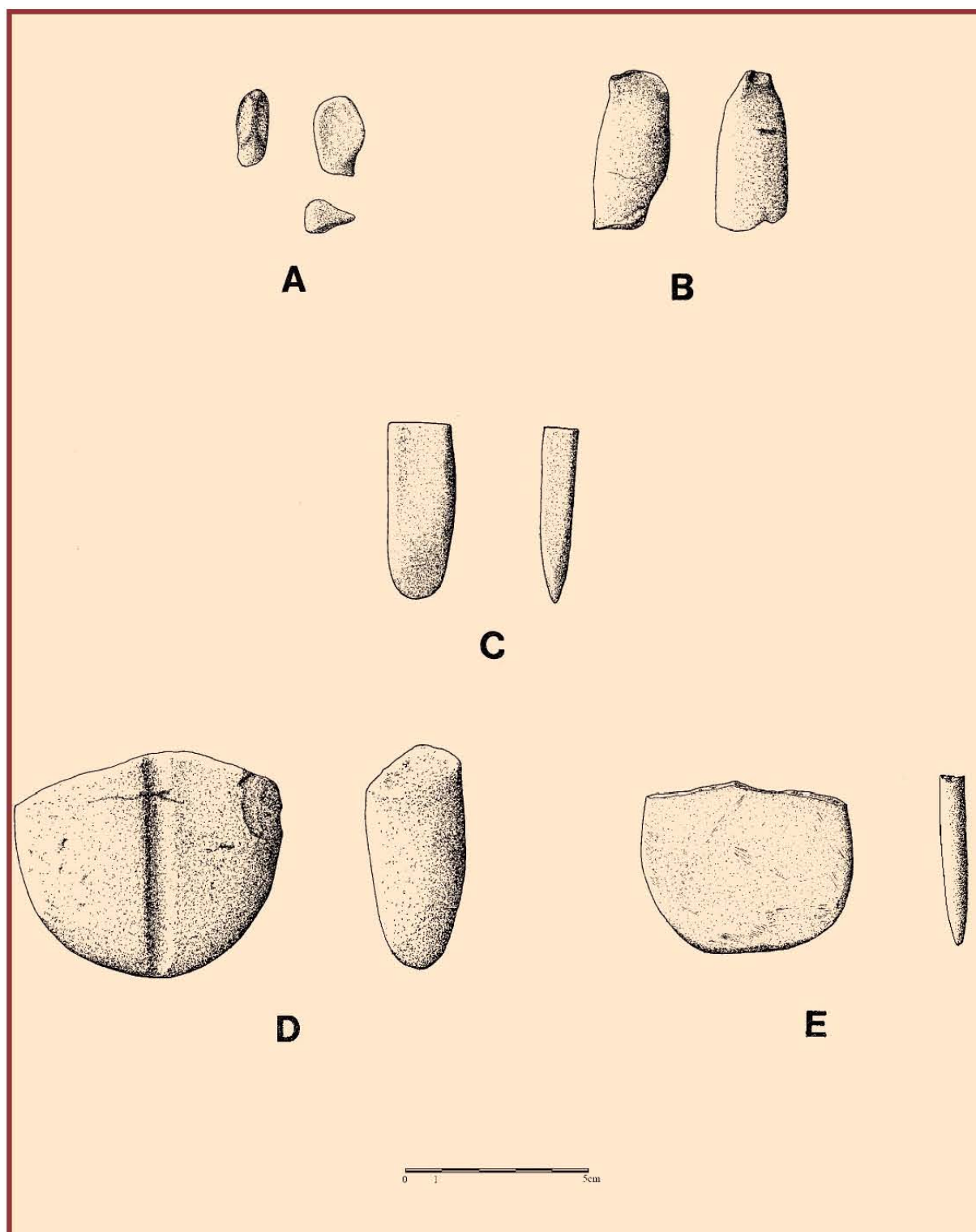


**Figure 60:** Mehrgarh 1998. Miscellaneous objects, Period I. A- MR 98 03 97 33; B- MR 98 03 711 175; C- MR 98 03 83 55; D- MR 98 03 97 35; E- MR 98 03 325 30; F- MR 98 03 107 64; G- MR 98 03 103 178; H- MR 98 03 103 96; I- MR 98 03 69 179; J- MR 98 03 302 105.



**ARTEFACTS**  
**1999**





**Figure 61:** Mehrgarh 1999. Unbaked clay figurines, Period I. A- MR 99 03 372 04; B- MR- MR 99 03 372 01. Stone tools, Period I. C- MR 99 03 372 49; D- MR 99 03 373 01; E- MR 99 03 372 53.

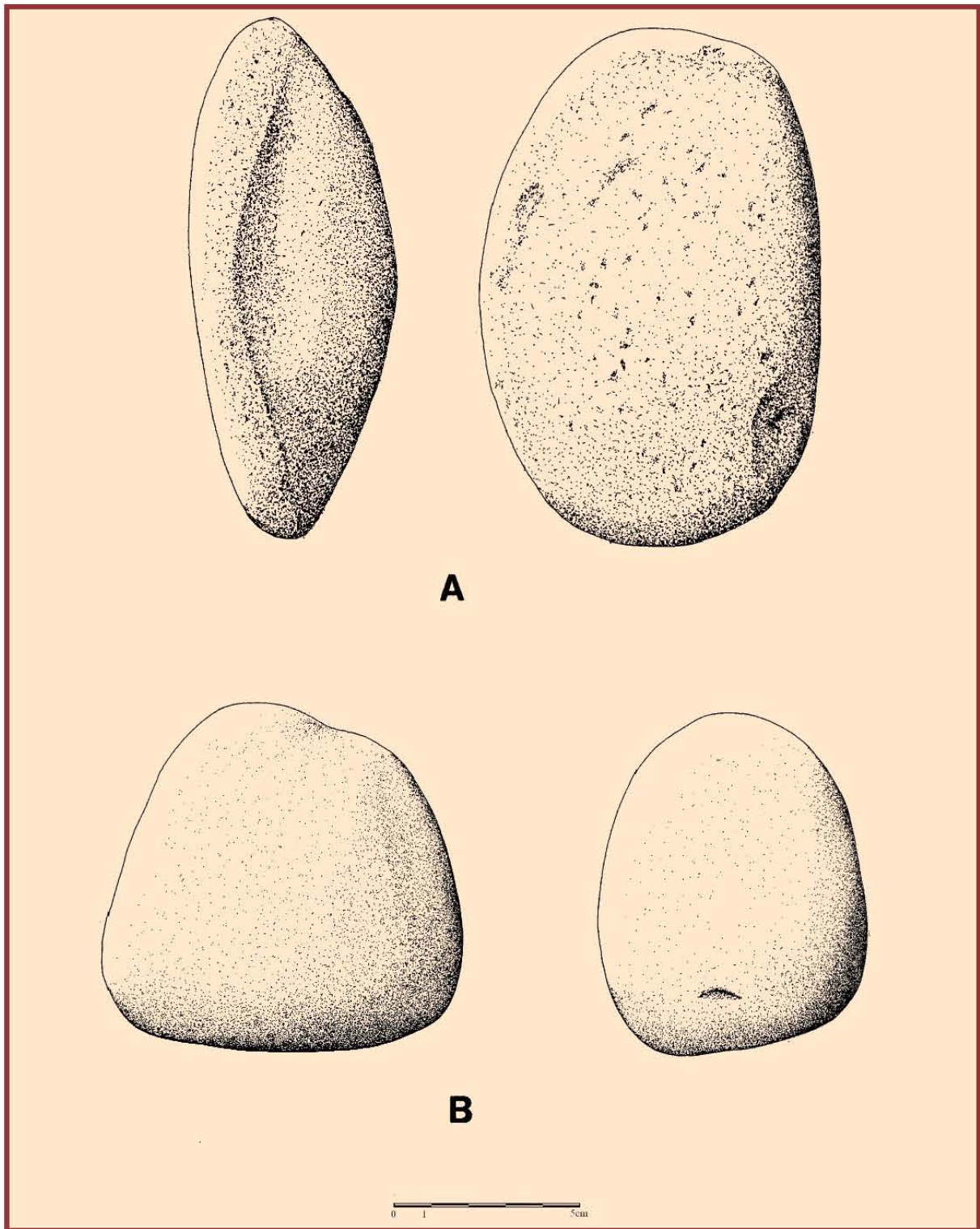
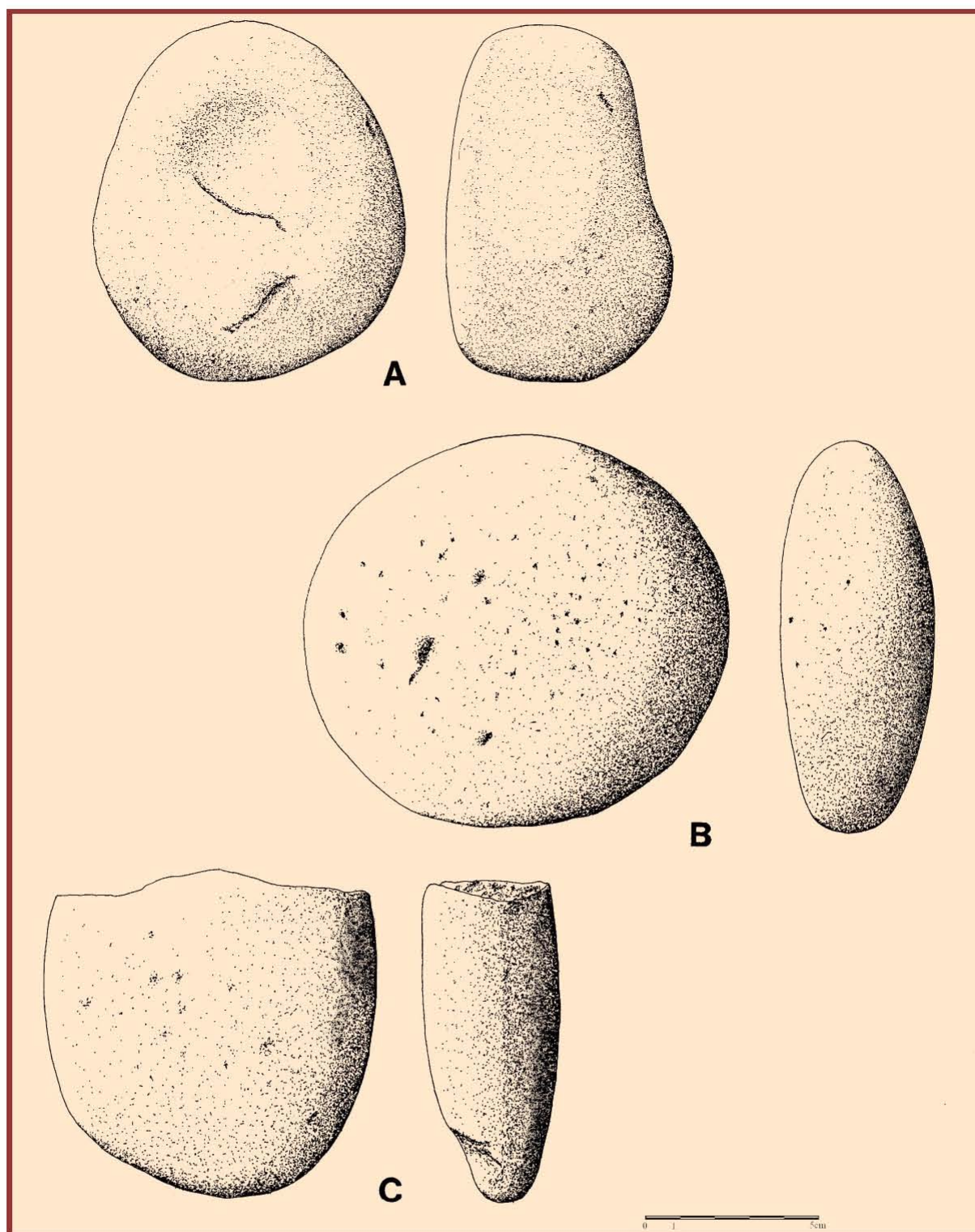
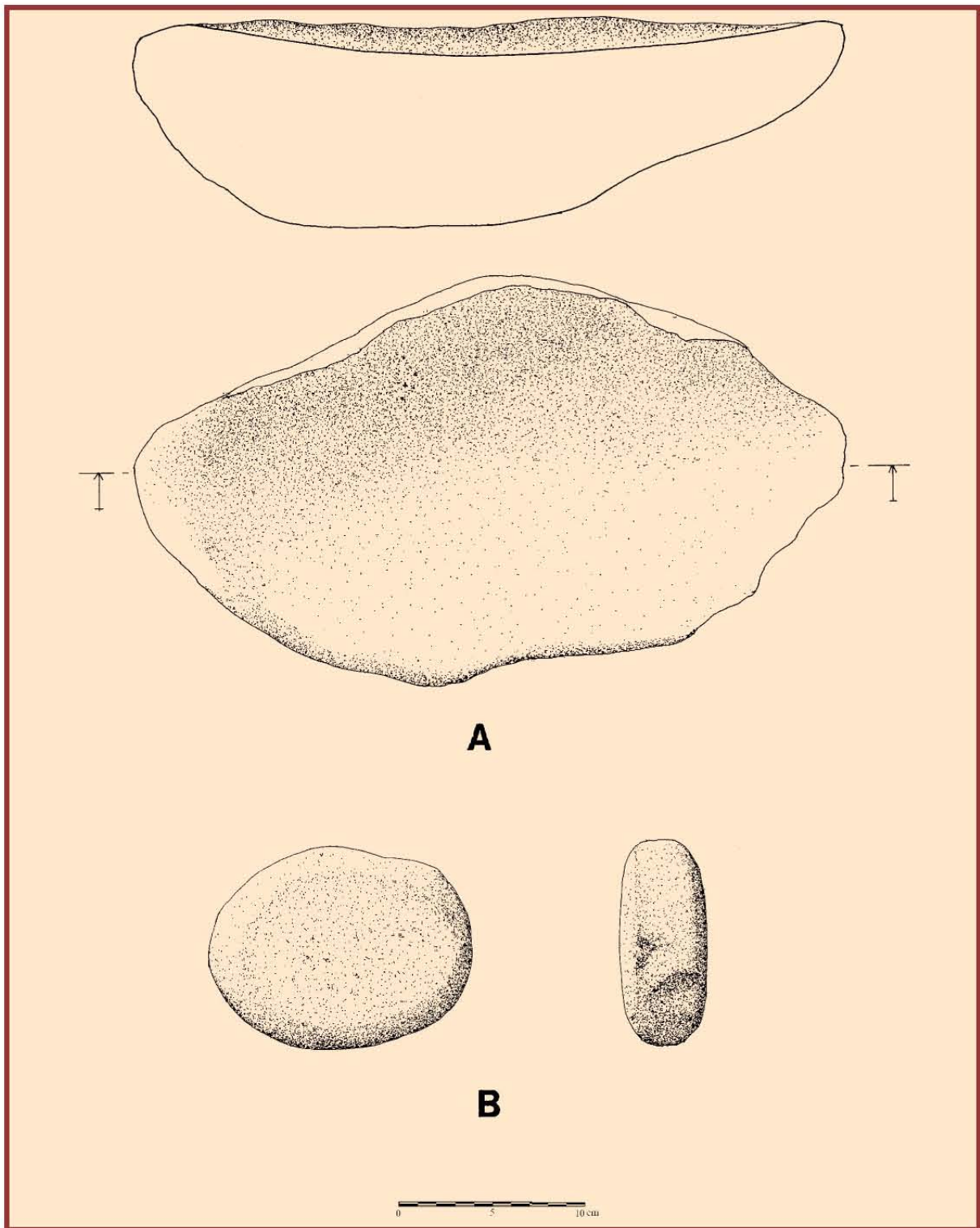


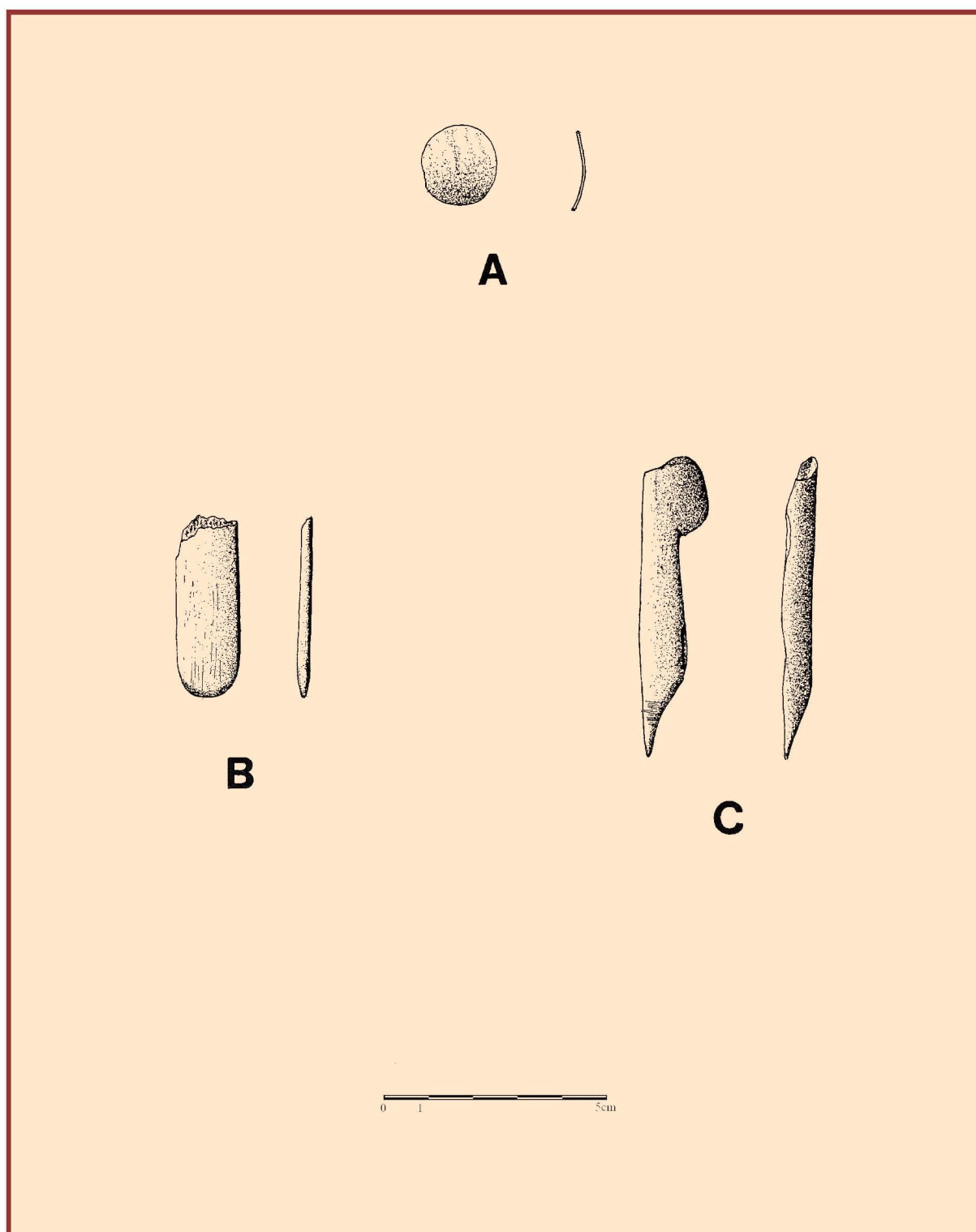
Figure 62: Mehrgarh 1999. Stone objects, Period I. A- MR 99 03 372 51; B- MR 99 03 372 52.



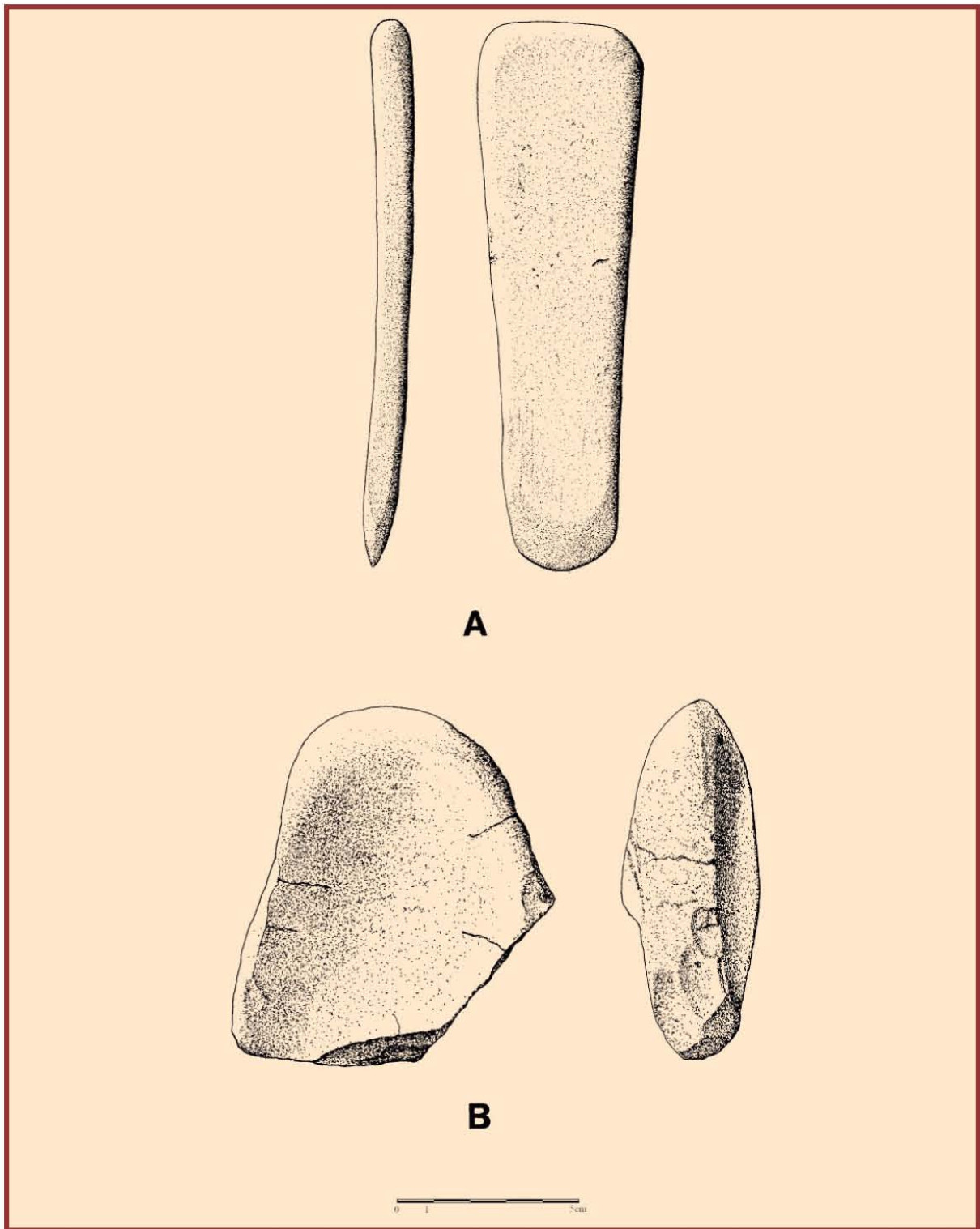
**Figure 63:** Mehrgarh 1999. Stone objects, Period I. A- MR 99 03 374 36; B- MR 99 03 369 50; C- MR 99 03 374 134.



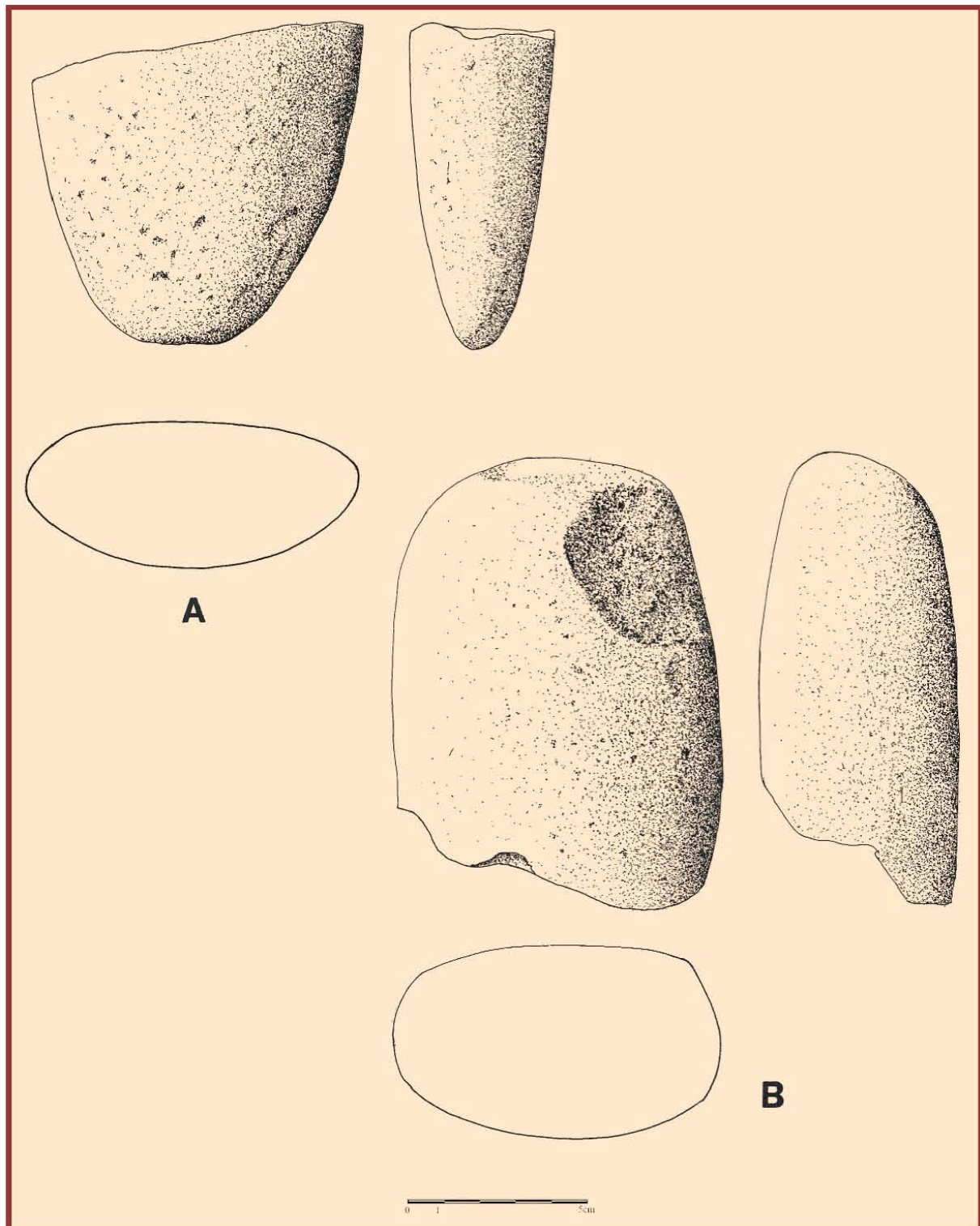
**Figure 64:** Mehrgarh 1999. Grinding stones, Period I. A- MR 99 03 372 02. Associated Muller B- MR 99 03 372 03.



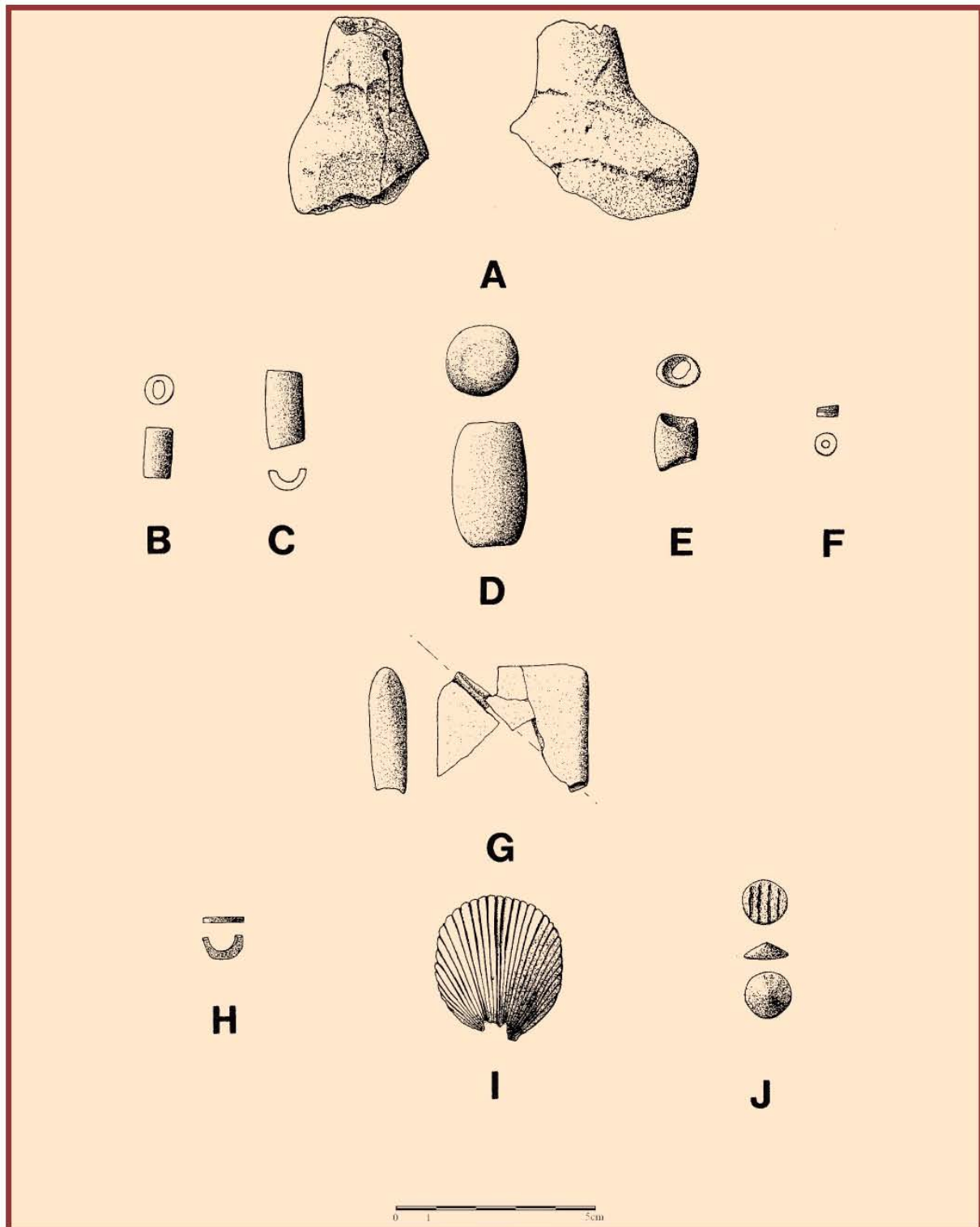
**Figure 65:** Mehrgarh 1999. Mother of Pearl Object, Period I. A- MR 99 03 371 137. Bone Tools, period I. B- MR 99 03 368 133; C- MR 99 03 371 132.



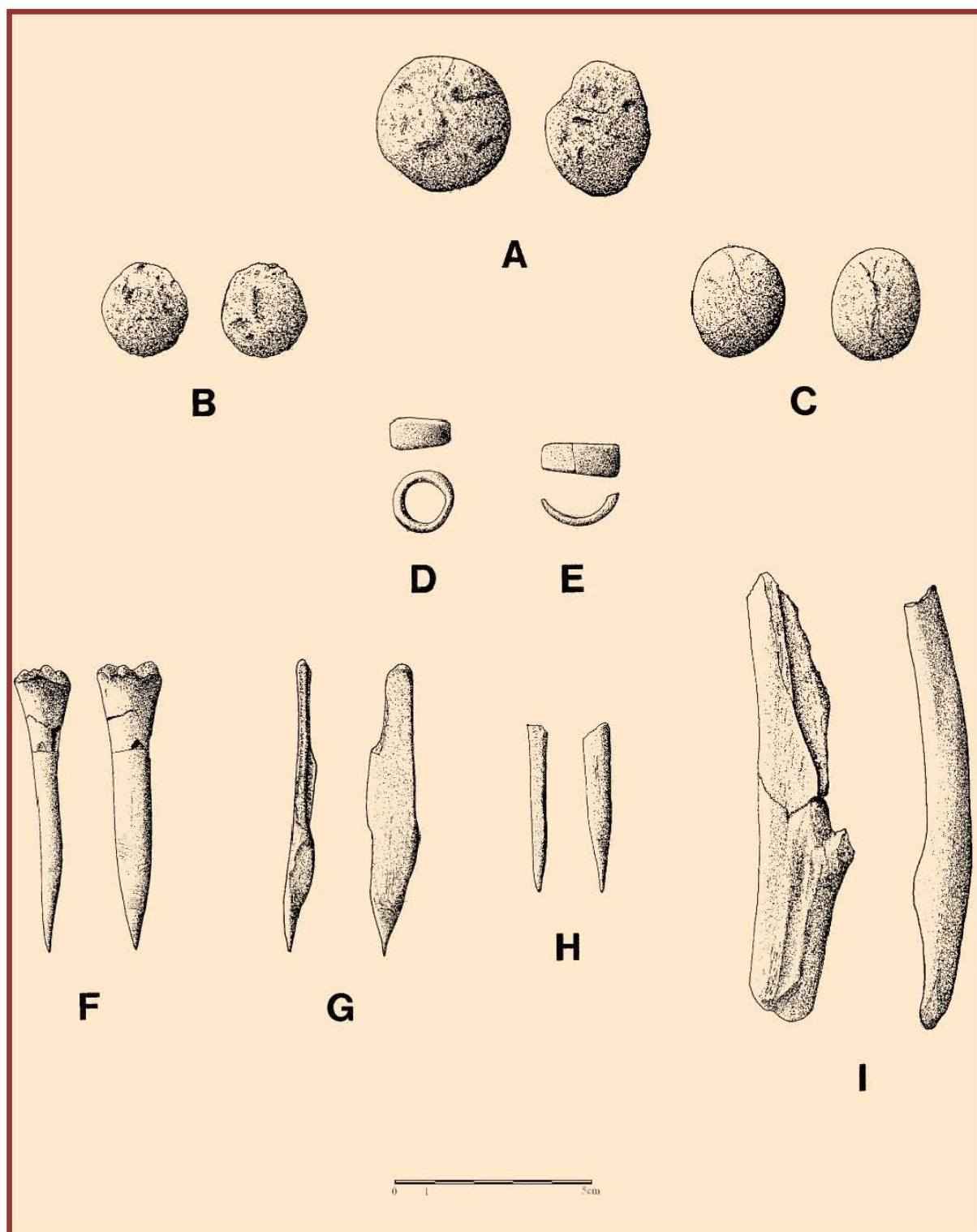
**Figure 66:** Mehrgarh 1999. Stone Tool, Period I. A- MR 99 03 368 01. Grinding stone, period I. B- MR 99 03 368 56.



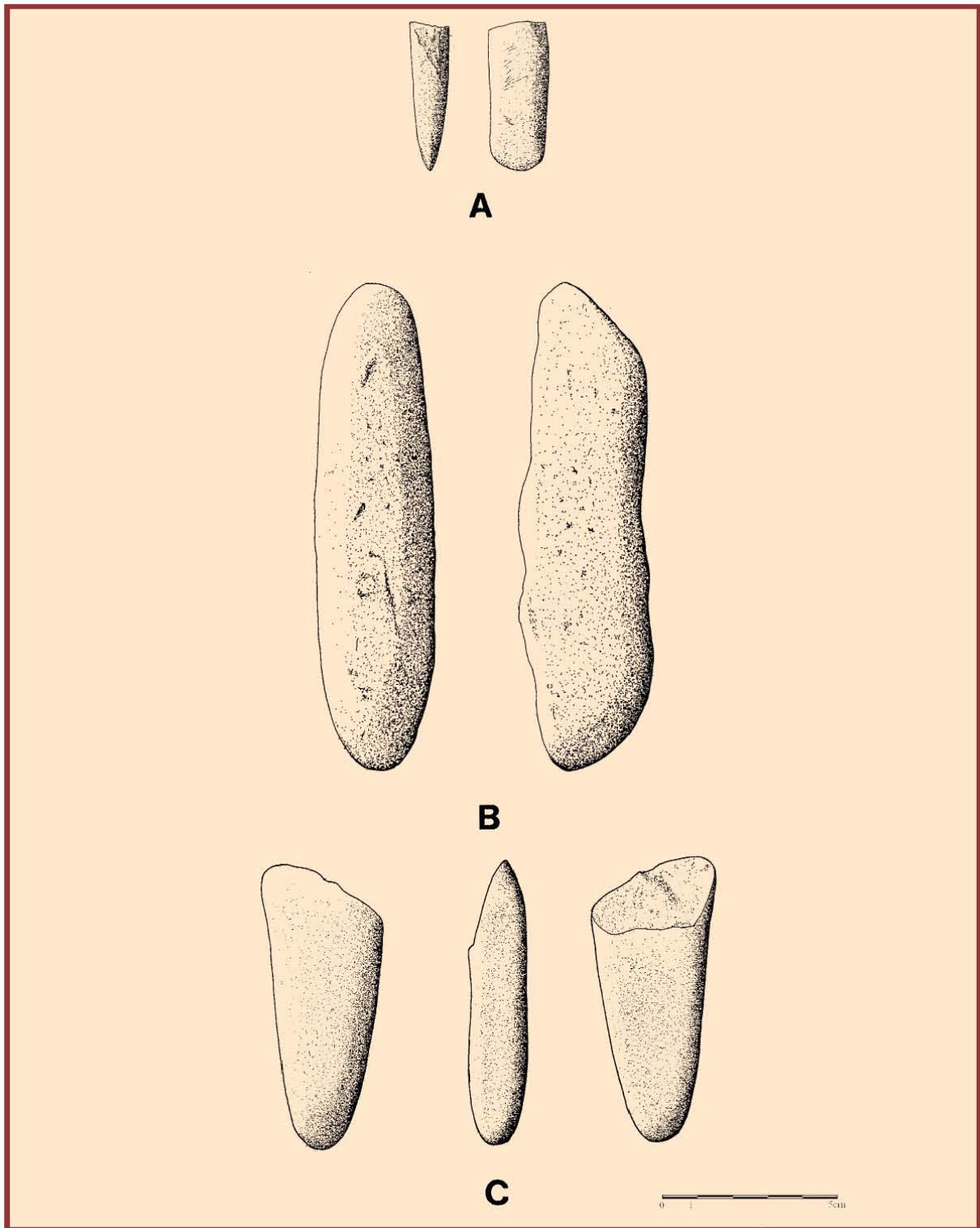
**Figure 67:** Mehrgarh 1999. Stone objects, Period I. A- MR 99 03 368 134; B- MR 99 03 371 133.



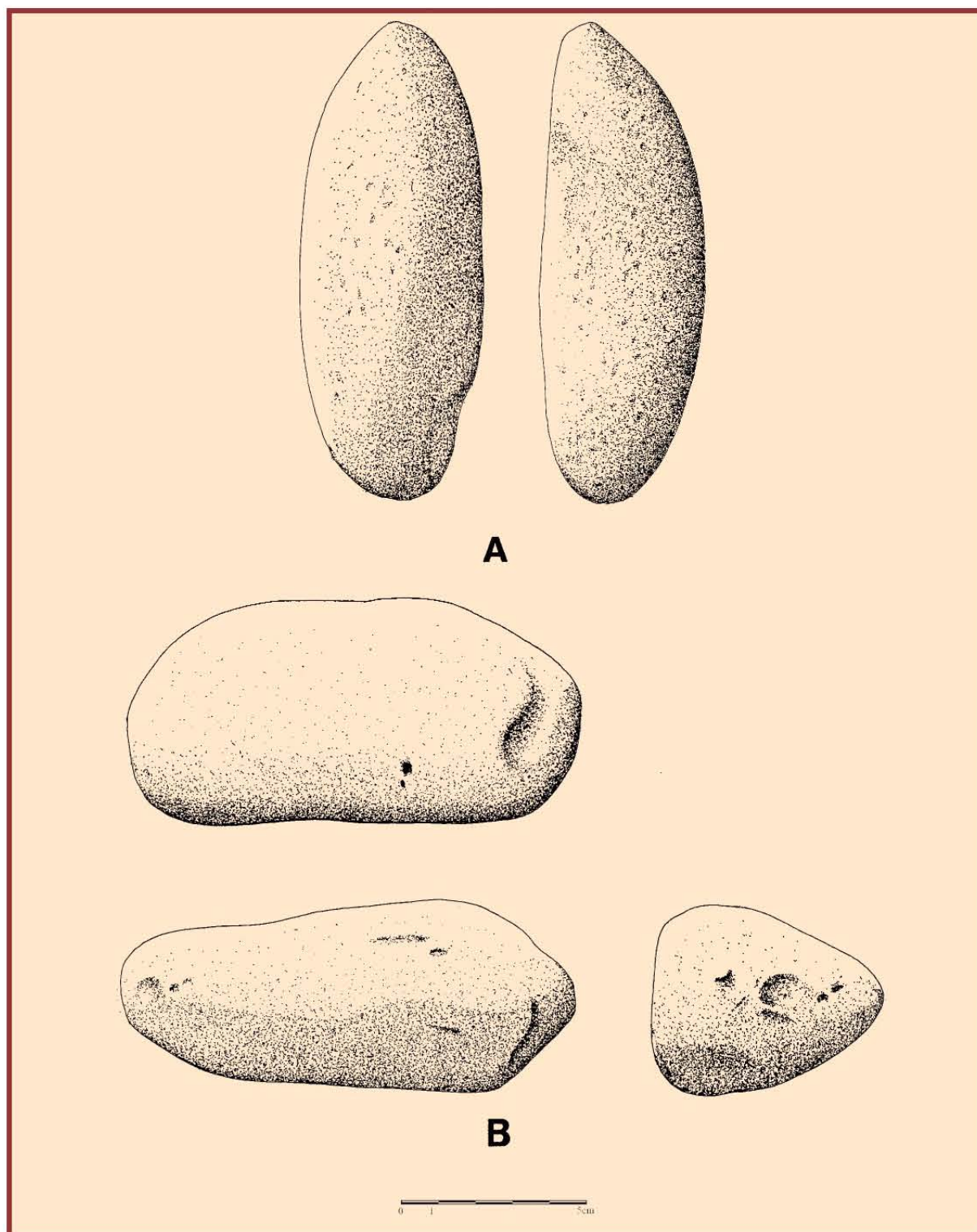
**Figure 68:** Mehrgarh 1999. Unbaked Clay Figurine, Period I. A- MR 99 03 361 86; Beads B- MR 99 03 359 67; C- MR 99 03 363 26; D- MR 99 03 359 01; E- MR 99 03 359 58; F- MR 99 03 361 82; G- MR 99 03 383 52; H- MR 99 03 350 84; Shell Objects I- MR 99 03 360 82; J- MR 99 03 360 01.



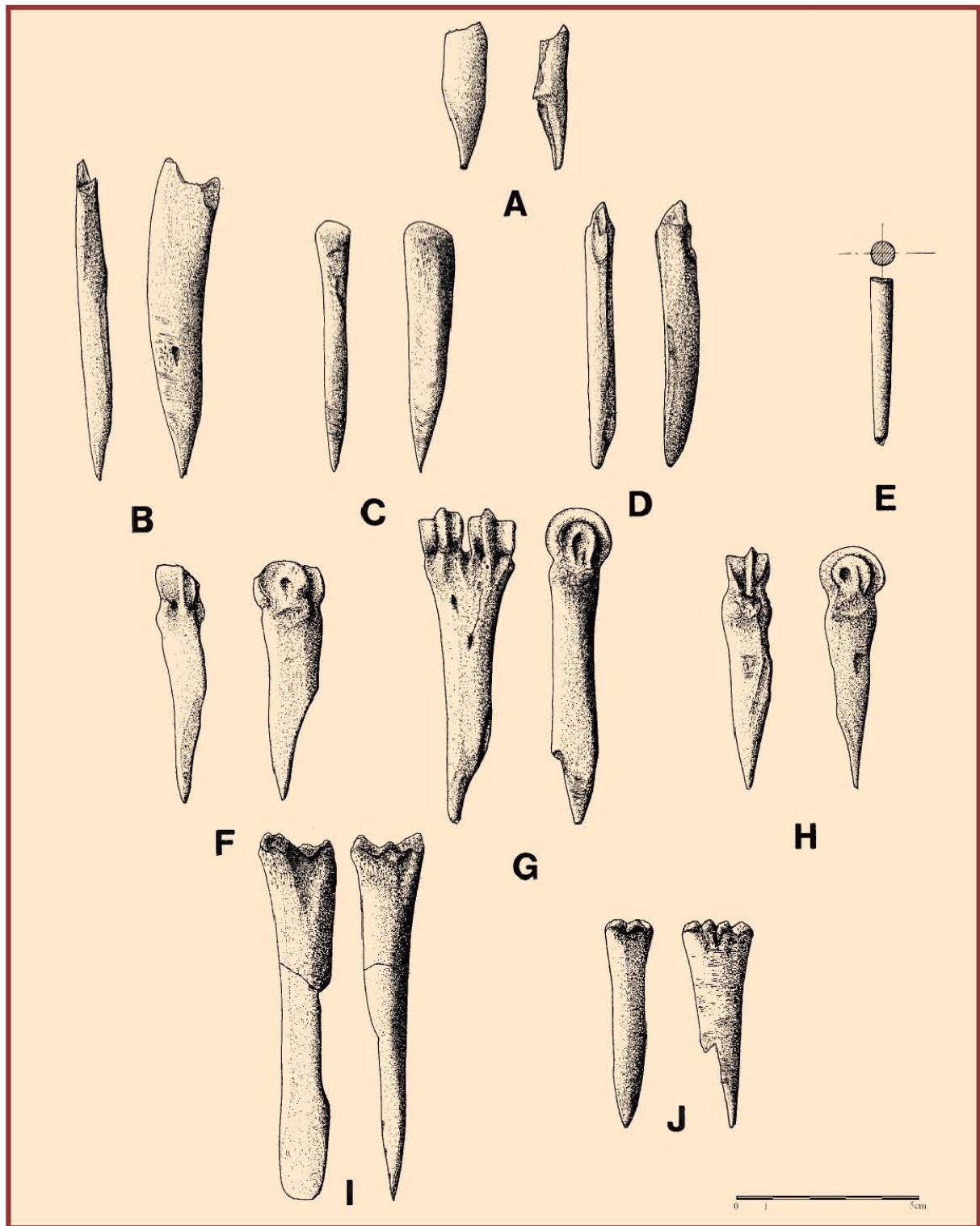
**Figure 69:** Mehrgarh 1999. Unbaked Clay Balls, Period I. A- MR 99 03 359 54; B- MR 99 03 359 56; C- MR 99 03 359 55. Bone Rings, Period I. D- MR 99 03 367 33; E- MR 99 03 365 01. Bone Tools, Period I. F- MR 99 03 361 83; G- MR 99 03 360 81; H- MR 99 03 364 13. Tool made of antler, Period I. I- MR 99 03 364 12.



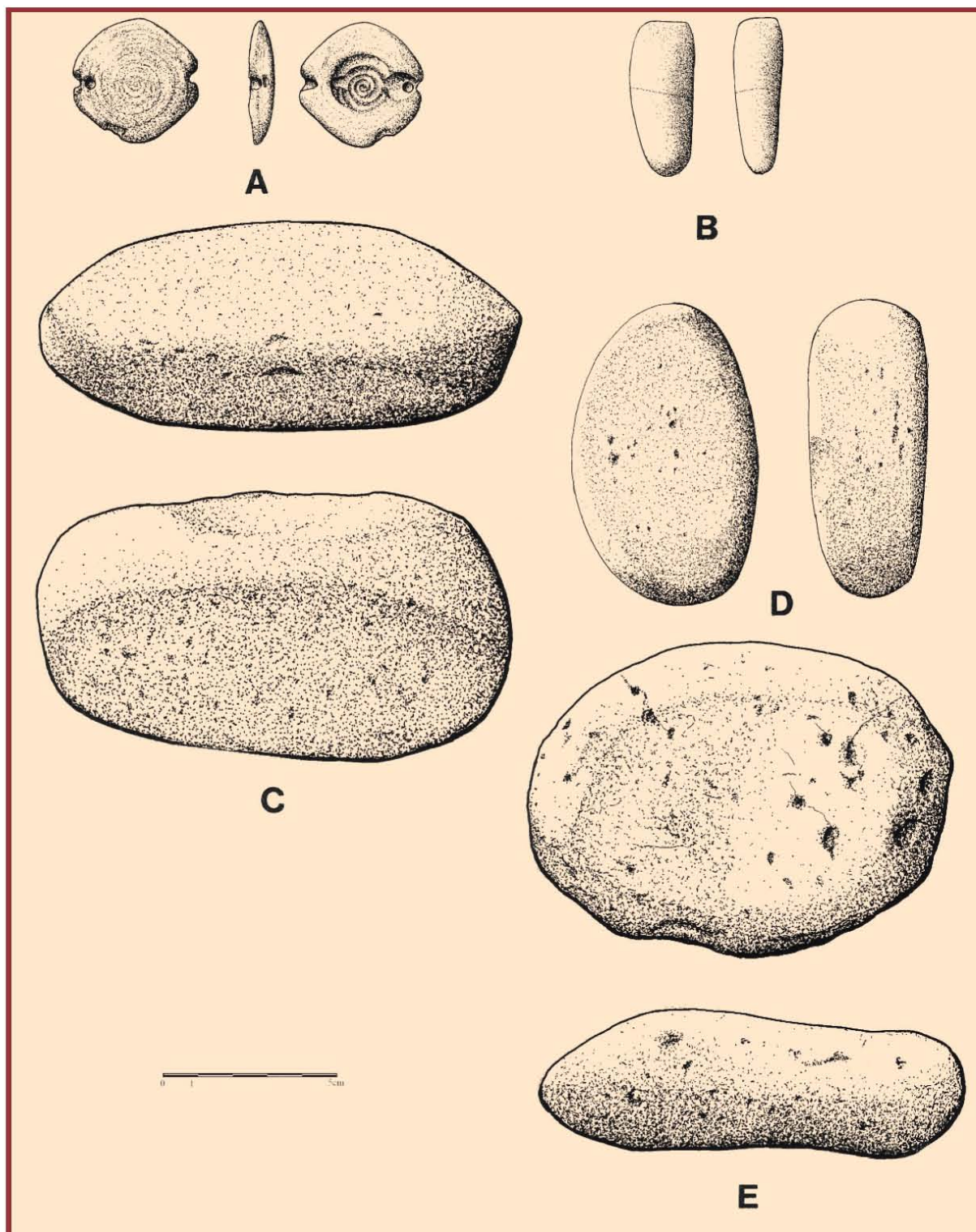
**Figure 70:** Mehrgarh 1999. Stone Objects, Period I. A- MR 99 03 382 80; B- MR 99 03 367 34; C- MR 99 03 359 60.



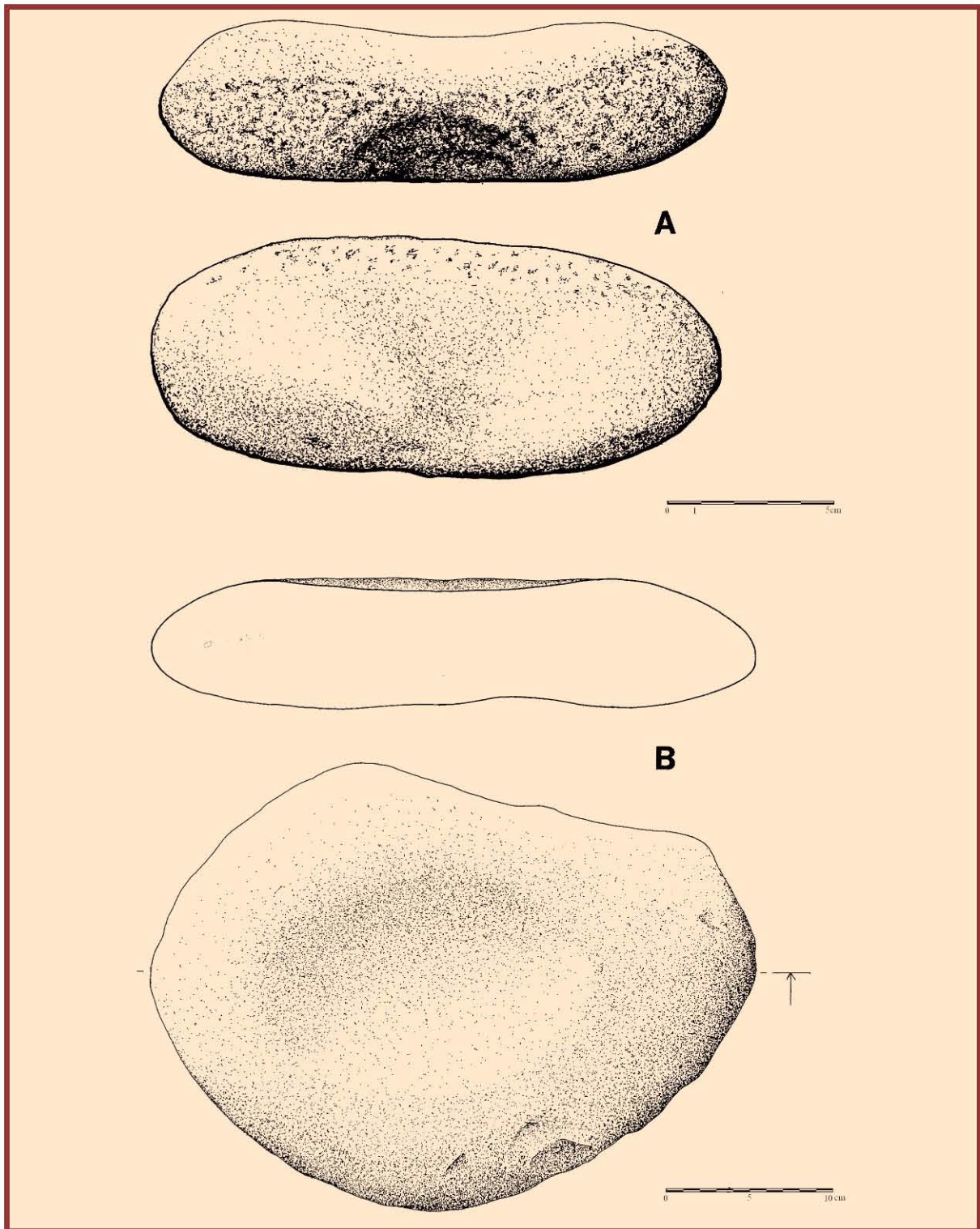
**Figure 71:** Mehrgarh 1999. Stone Objects, Period I. A- MR 99 03 382 78; B- MR 99 03 361 85.



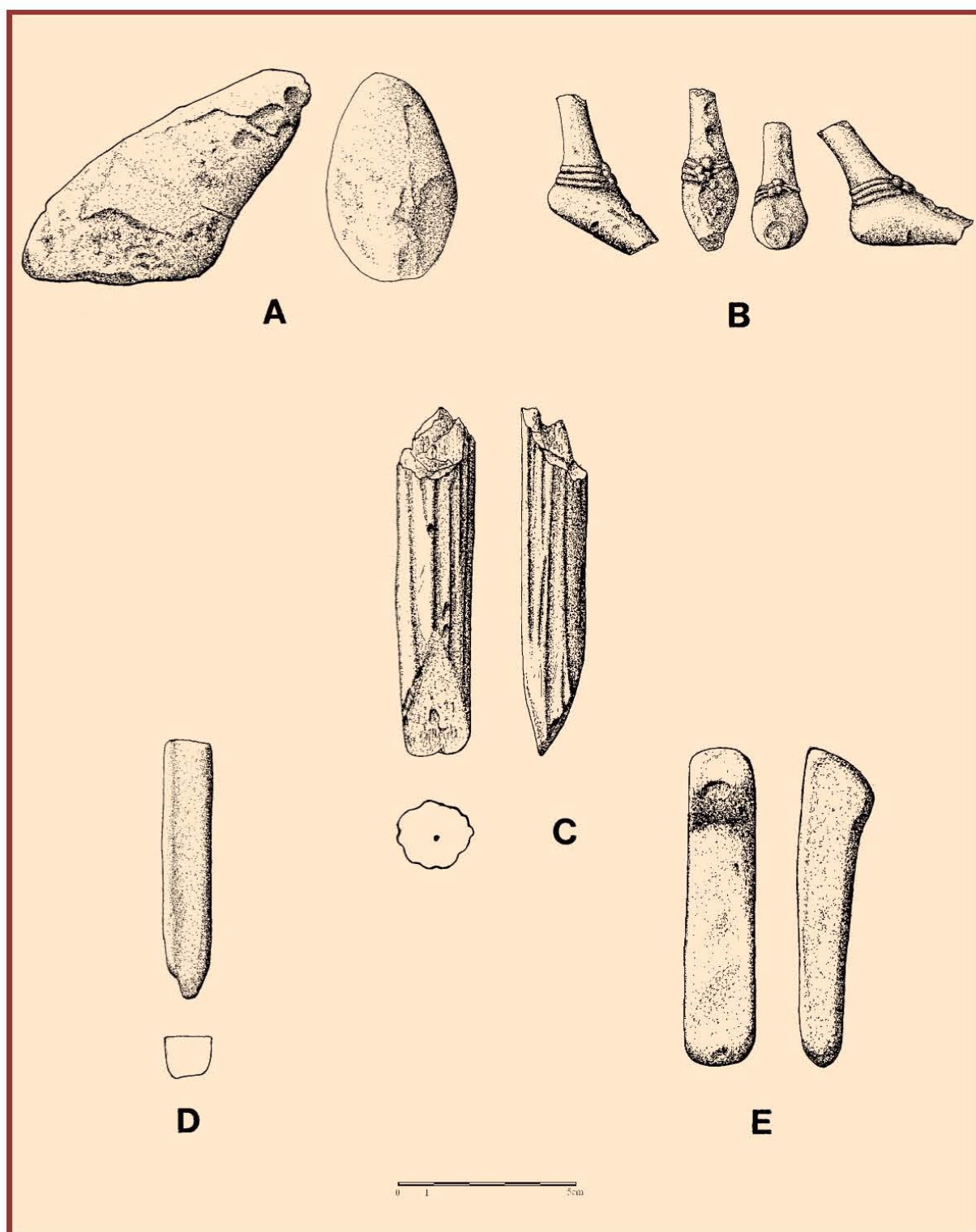
**Figure 72:** Mehrgarh 1999. Bone Tools, Period I. A- MR 99 03 358 32; B- MR 99 03 347 89; C- MR 99 03 353 22; D- MR 99 03 352 11; E- MR 99 03 355 09; F- MR 99 03 366 29; G- MR 99 03 349 33; H- MR 99 03 355 08; I- MR 99 03 347 88; J- MR 99 03 358 31.



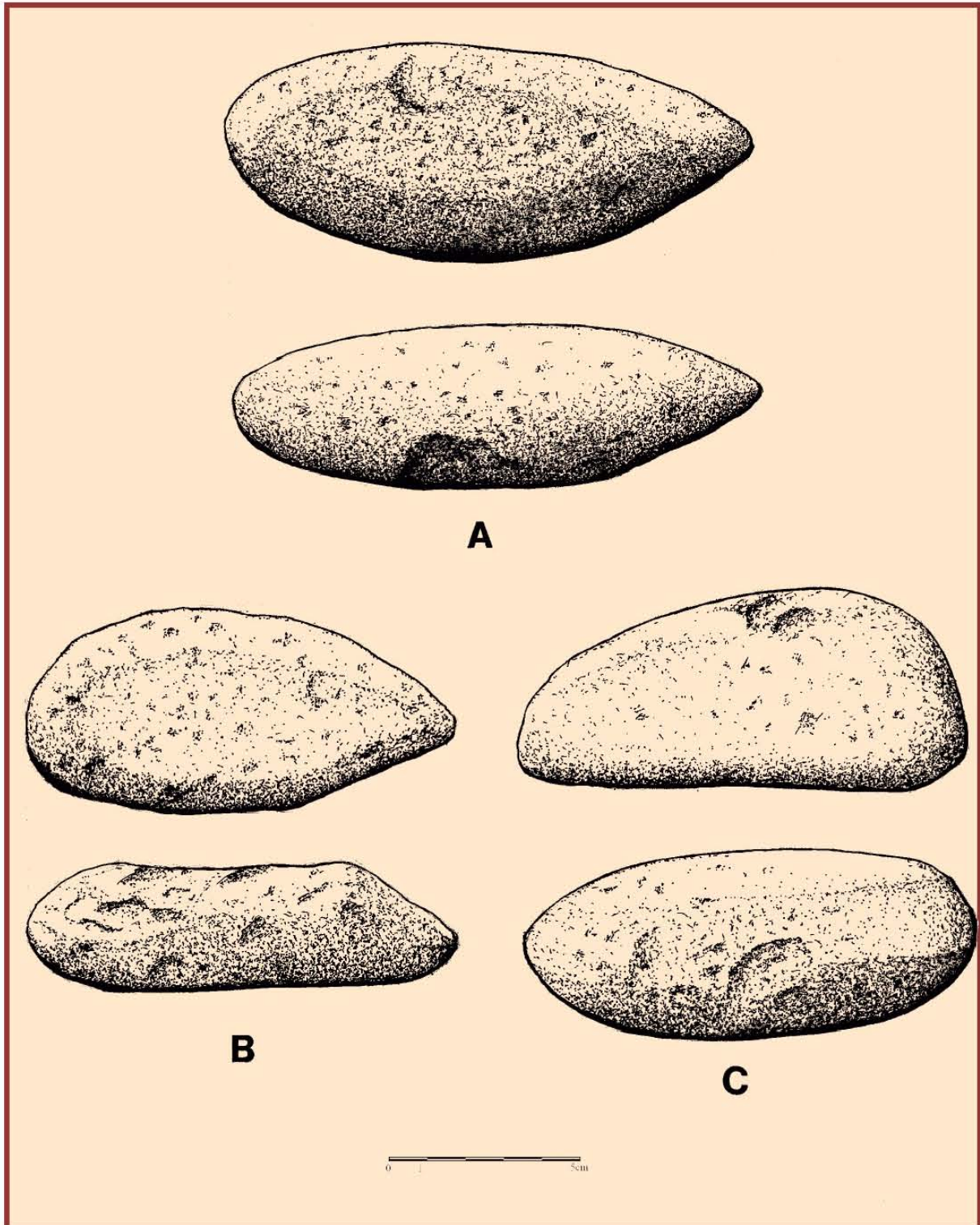
**Figure 73:** Mehrgarh 1999. Shell Beads and Stone Objects, Period I. A- MR 99 03 347 01; B- MR 99 03 355 10; C- MR 99 03 347 47; D- MR 99 03 366 33; E- MR 99 03 347 93.



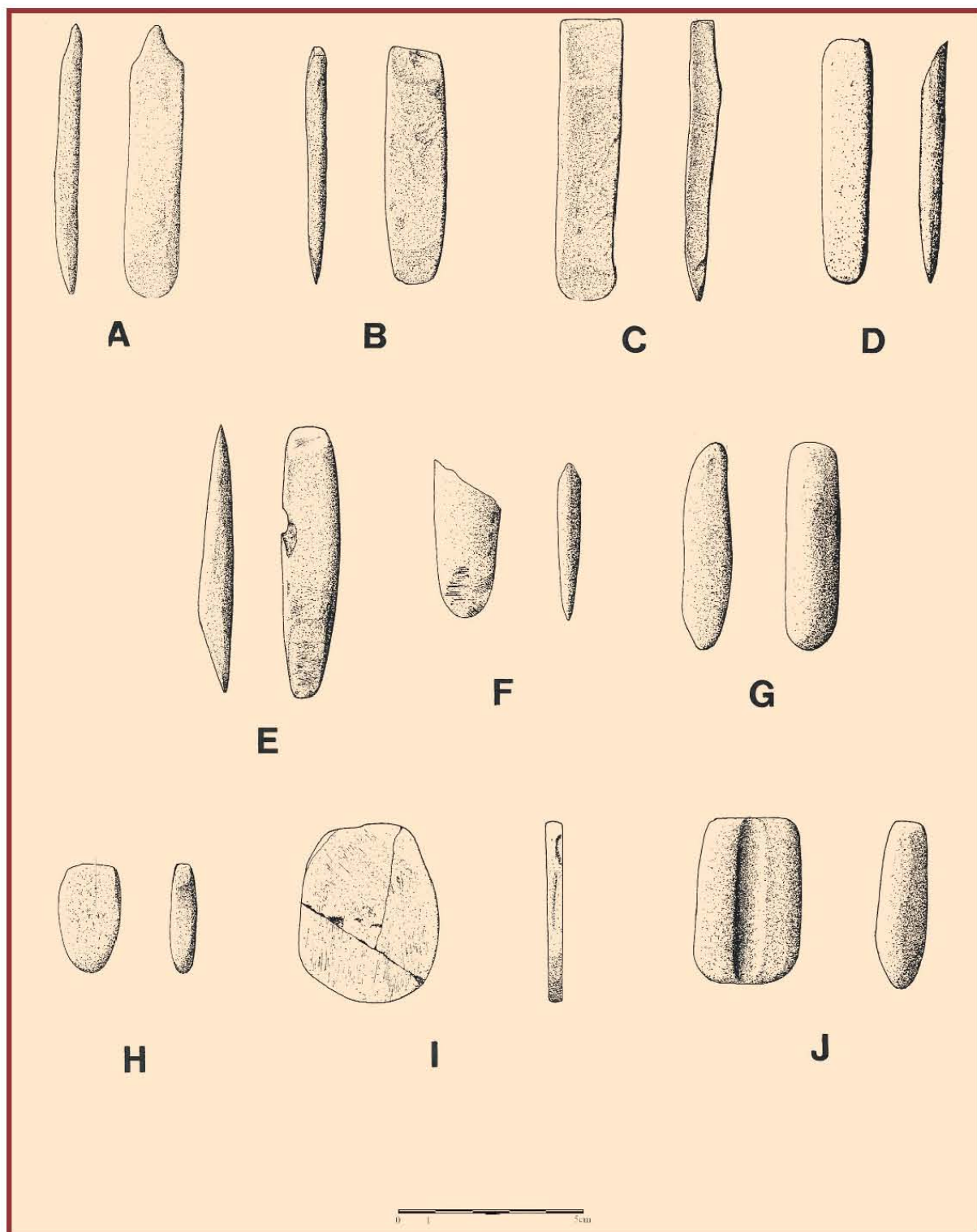
**Figure 74:** Mehrgarh 1999. Stone Objects, Period I. A- MR 99 03 347 48; B- MR 99 03 366 01.



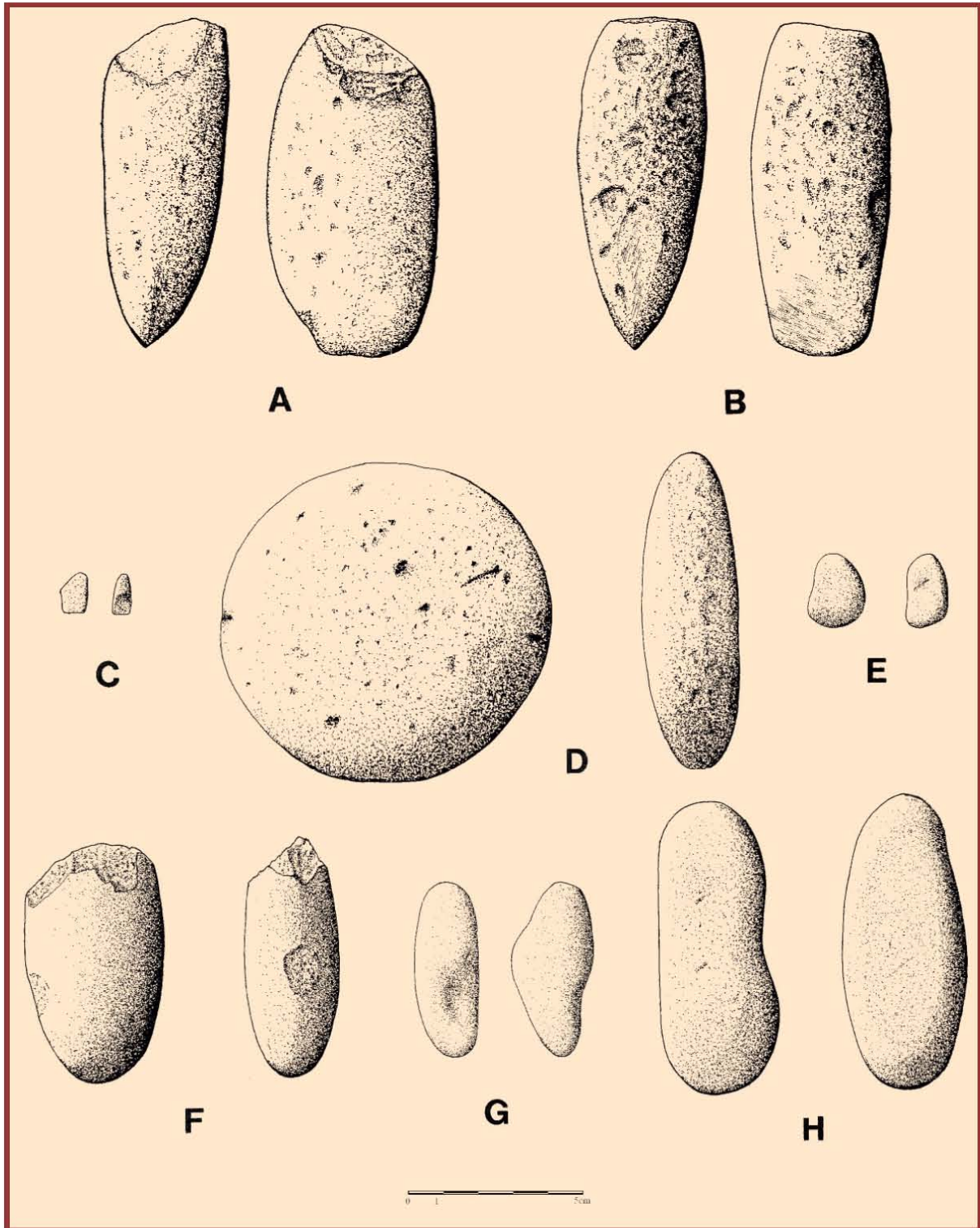
**Figure 75:** Mehrgarh 1999. Unbaked Clay Figurines, Period I. A- MR 99 03 356 01; B- MR 99 03 344 28. Tool made of Antler. C: 99 03 334 23. Stone Tools. D- MR 99 03 344 117; E- MR 99 03 344 25.



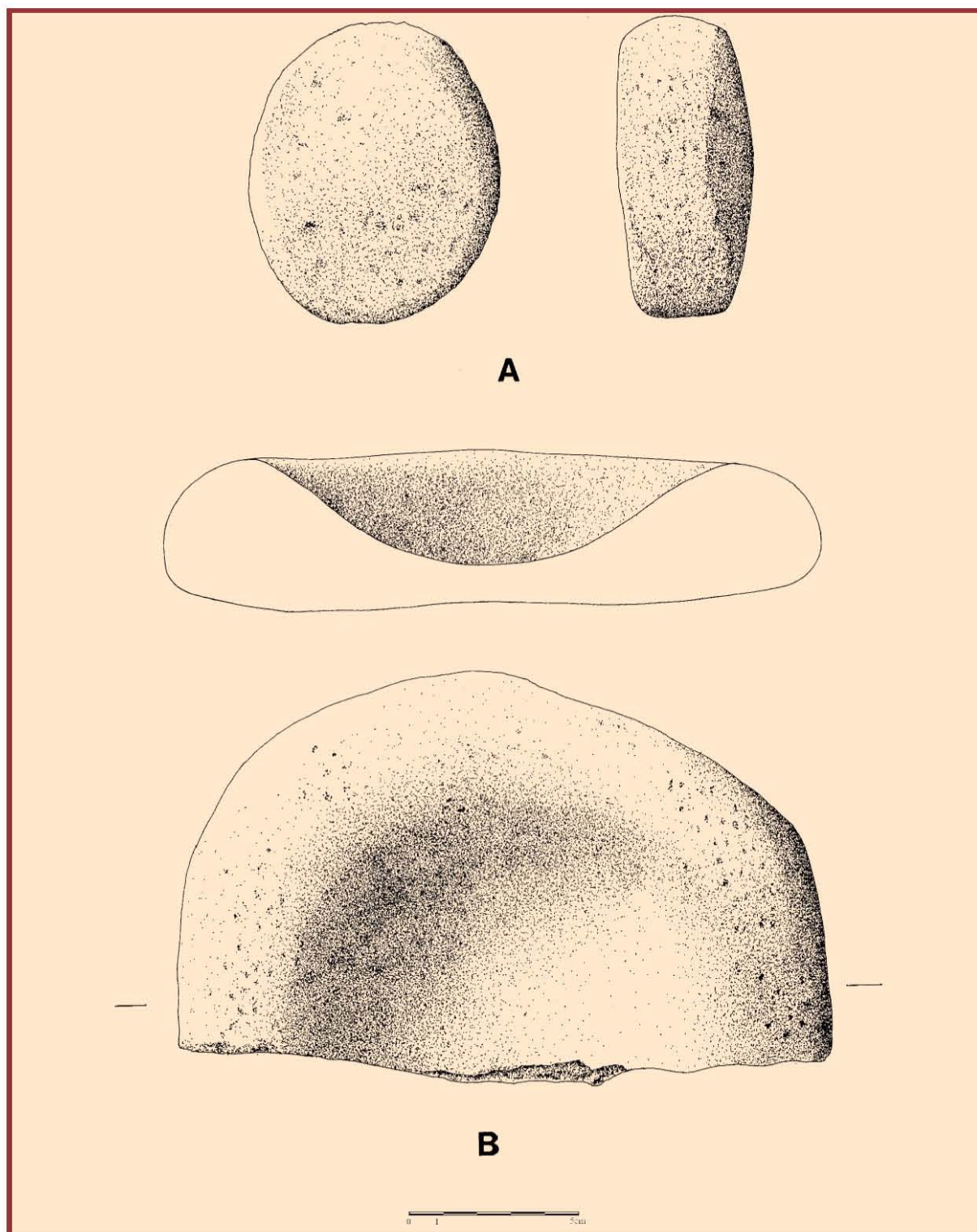
**Figure 76:** Mehrgarh 1999. Stone Objects, Period I. A- MR 99 03 344 24; B- MR 99 03 344 118; C- MR 03 99 344 26.



**Figure 77:** Mehrgarh 1999. Stone Tools, Period I. A- MR 99 03 123 18; B- MR 99 03 128 22; C- MR 99 03 126 28; D- MR 99 03 90 01; E- MR 99 03 85 49; F- MR 99 03 145 09; G- MR 99 03 127 20; H- MR 99 03 116 38; I- MR 99 03 91 210; J- MR 99 03 73 01.



**Figure 78:** Mehrgarh 1999. Stone Tools, Period I. A- MR 99 03 86 38; B- MR 99 03 117 01; C- MR 99 03 116 39; D- MR 99 03 117 03; E- MR 99 03 14 02; F- MR 99 03 109 174; G- MR 99 03 48 50; H- MR 99 03 62 84.



**Figure 79:** Mehrgarh 1999. Stone Objects, Period I. A- MR 99 03 110 39; B- MR 99 03 80 30.

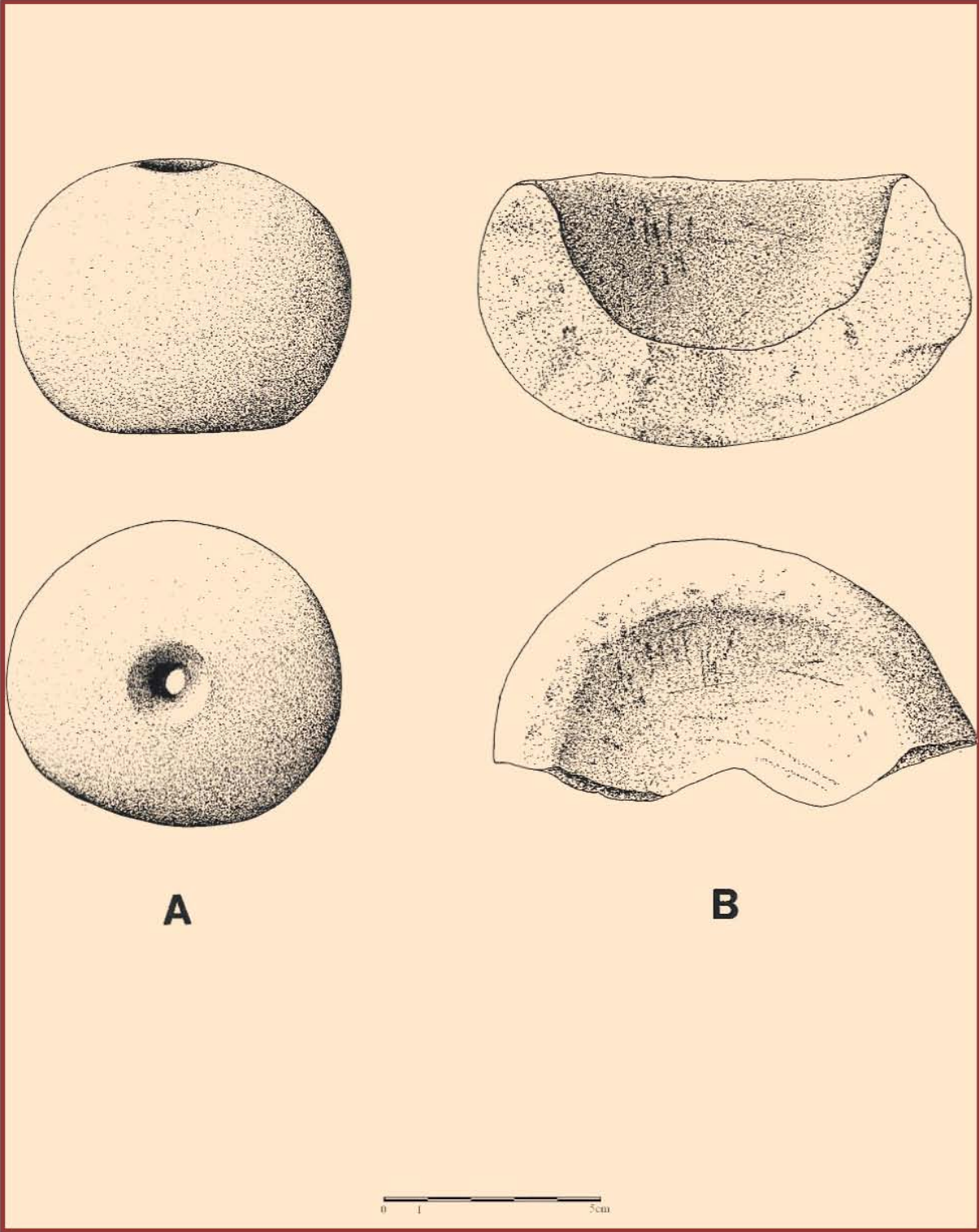
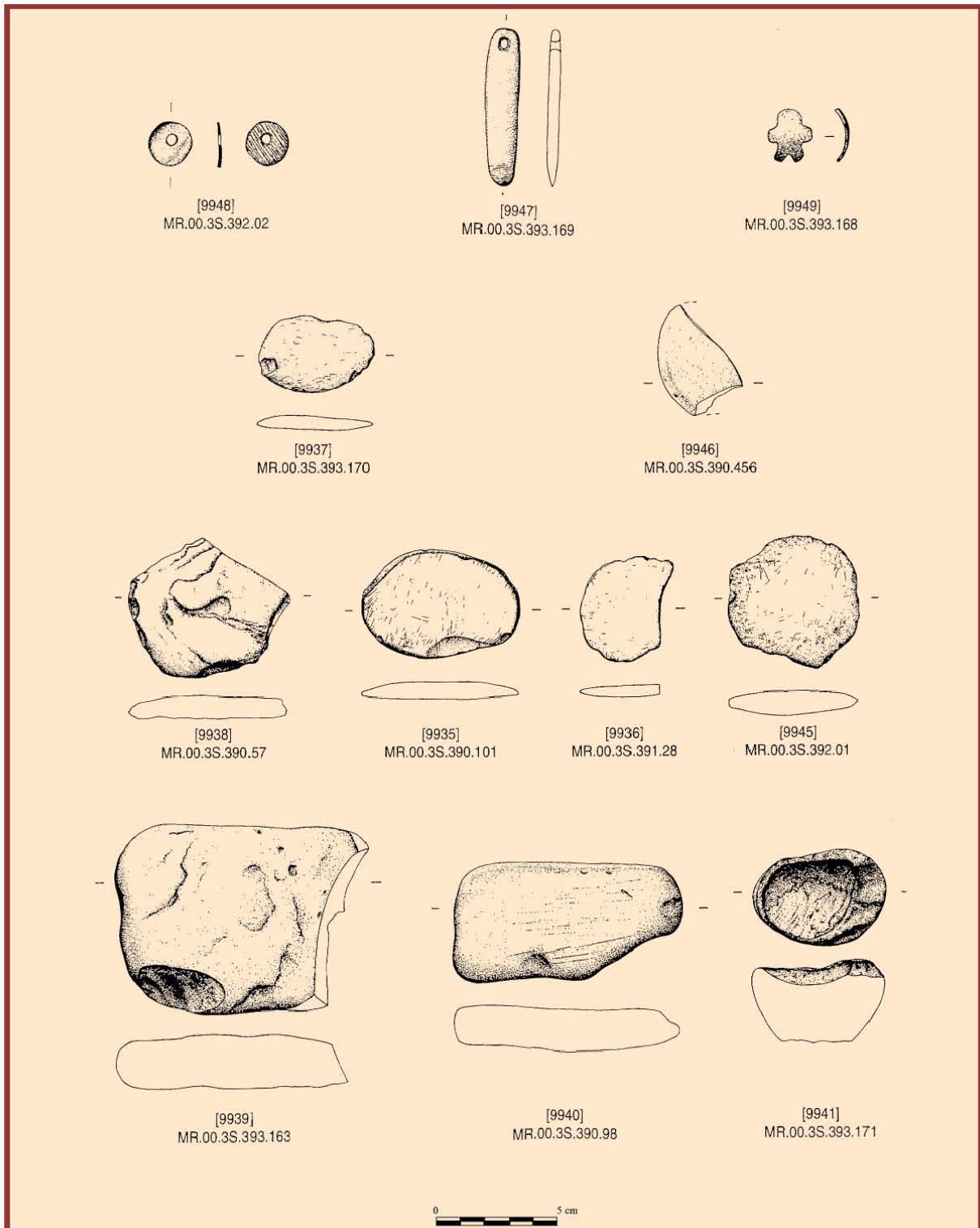


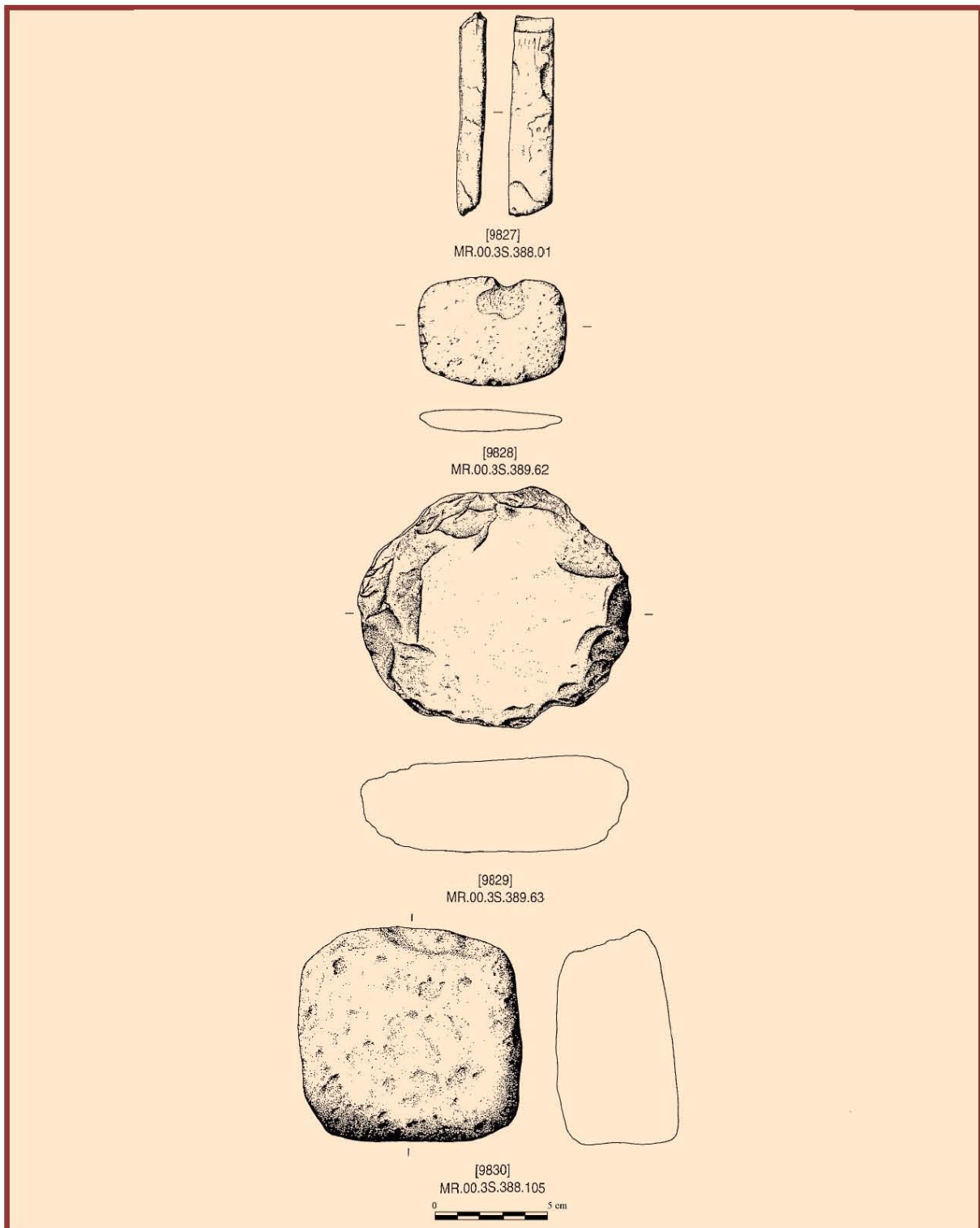
Figure 80: Mehrgarh 1999. Stone Objects, Period I. A- MR 99 03 71 01; B- MR 99 03 146 119.

**ARTEFACTS**  
**2000**

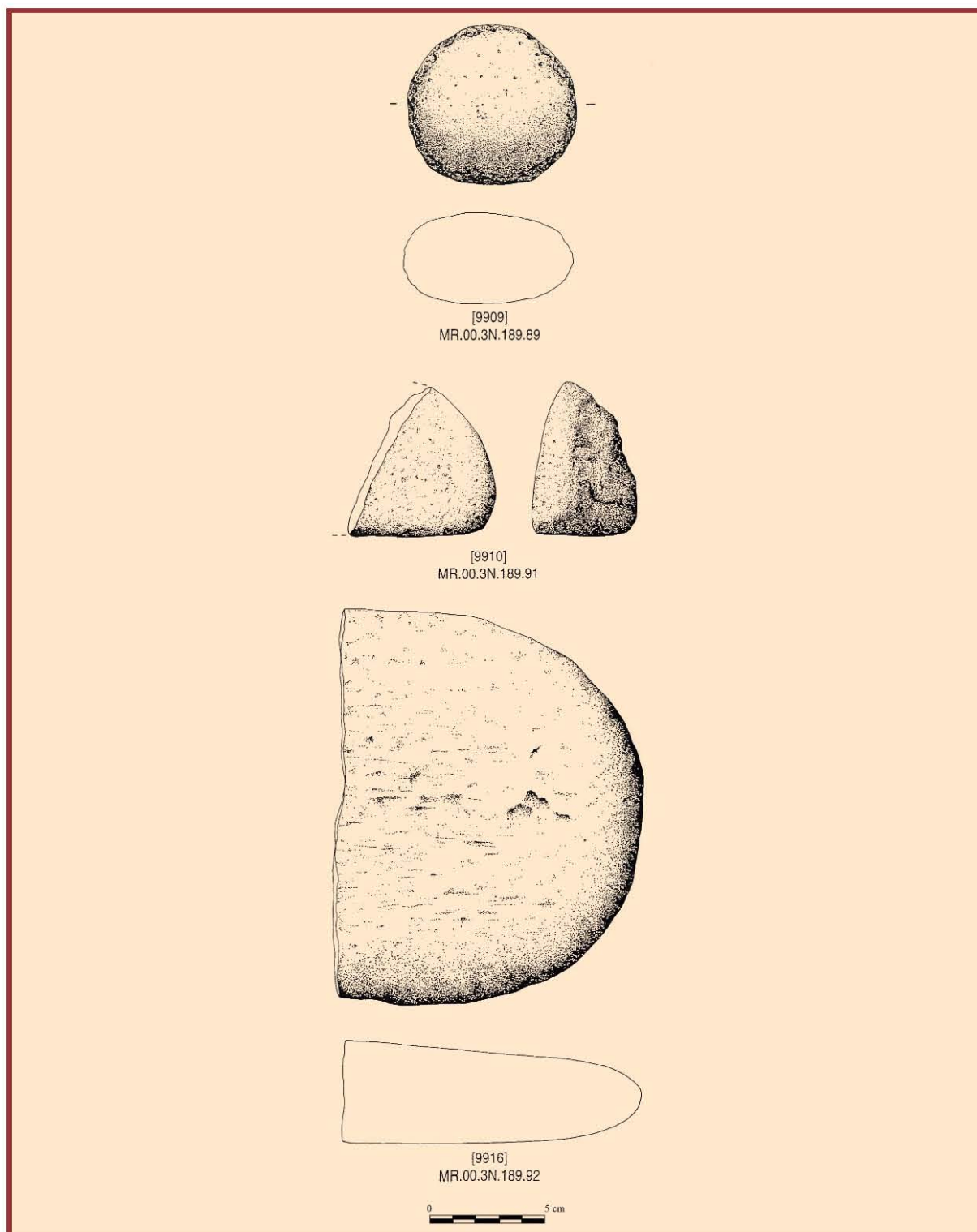




**Figure 81:** Mehrgarh 2000. Shell and Stone Objects, Period I, (level 1).



**Figure 82:** Mehrgarh 2000. Stone Objects, Period I (level 2).



**Figure 83:** Mehrgarh 2000. Stone Objects, Period I (level 2).

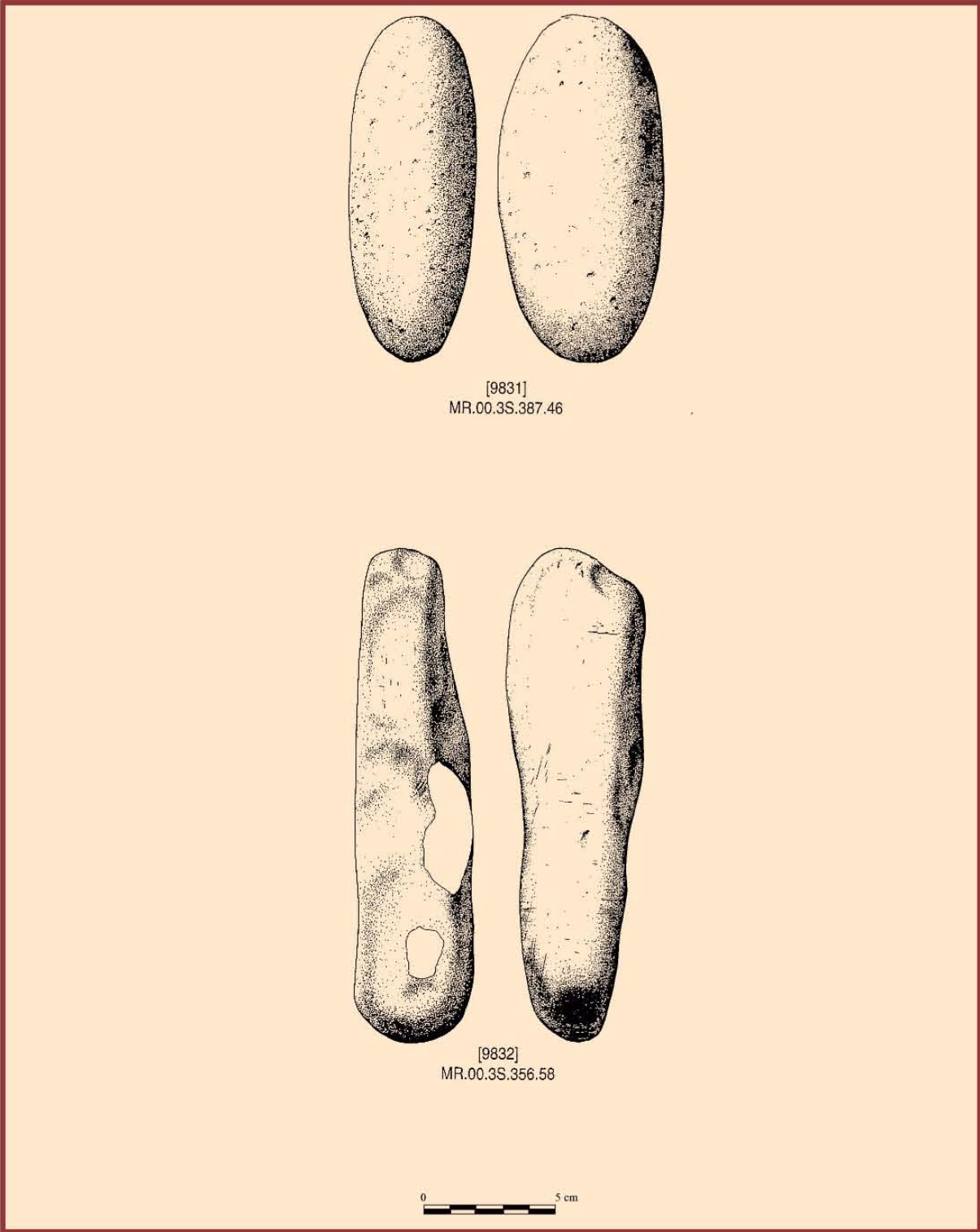


Figure 84: Mehrgarh 2000. Stone Objects, Period I (level 3).

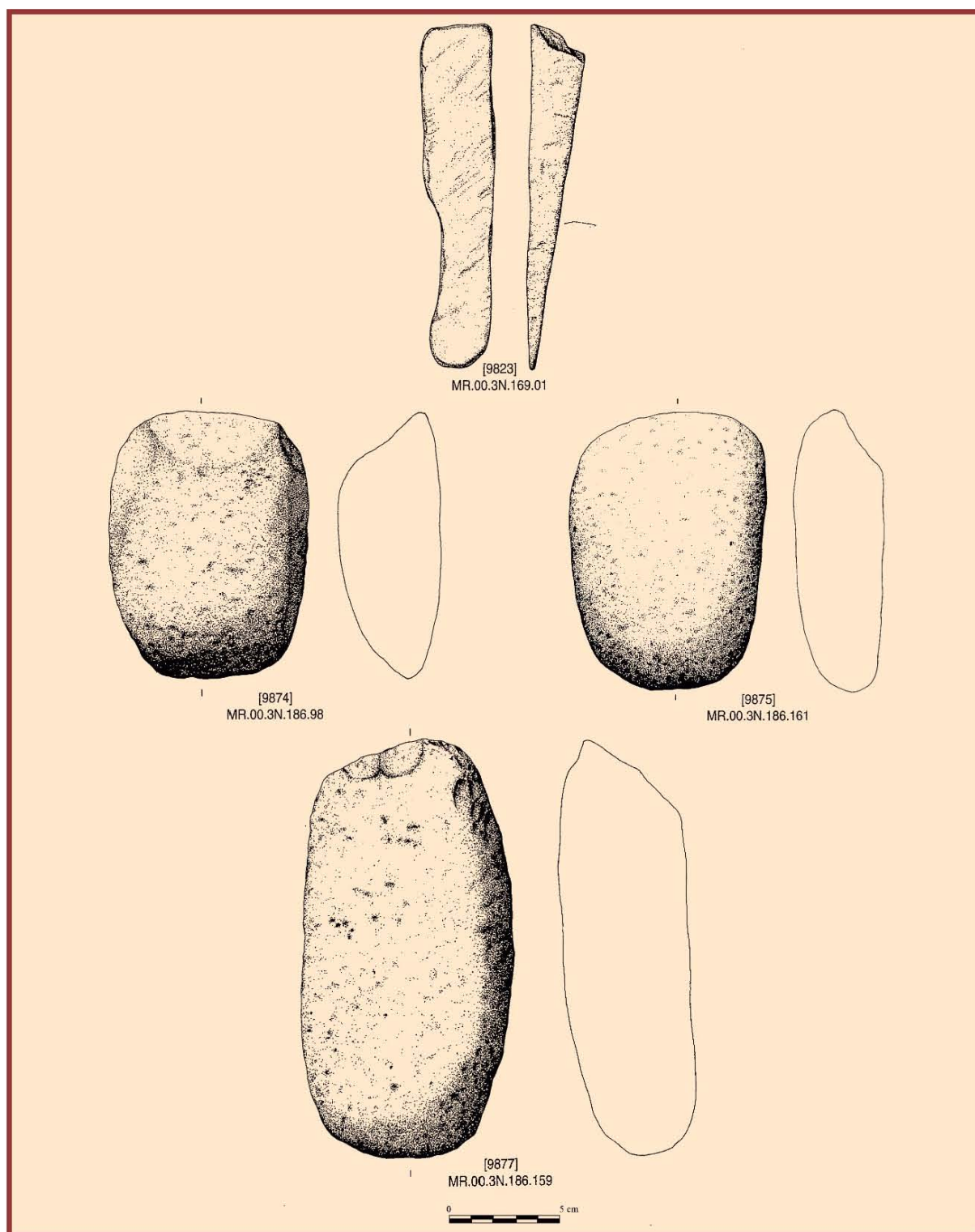


Figure 85: Mehrgarh 2000. Stone Objects, Period I (level 3).

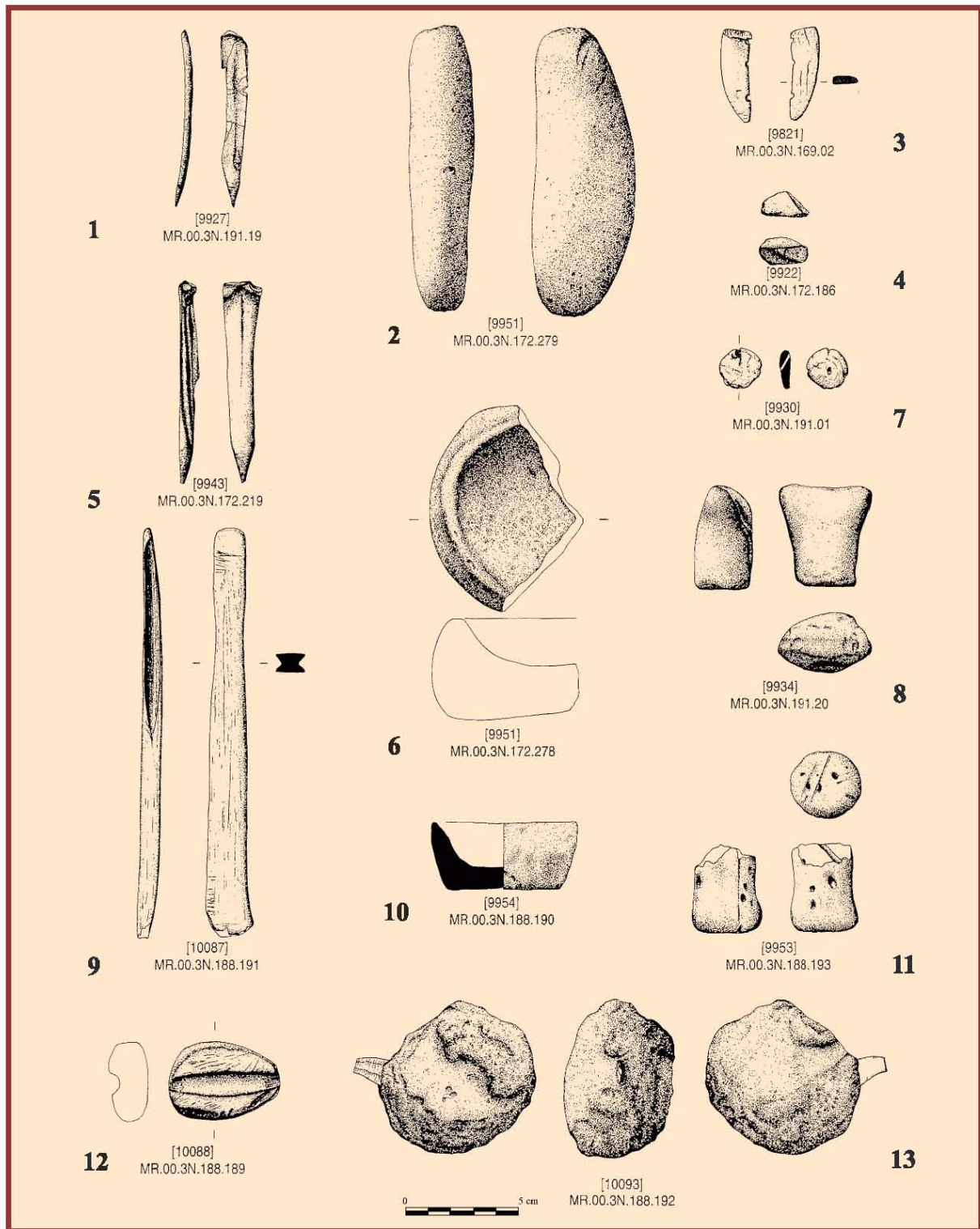
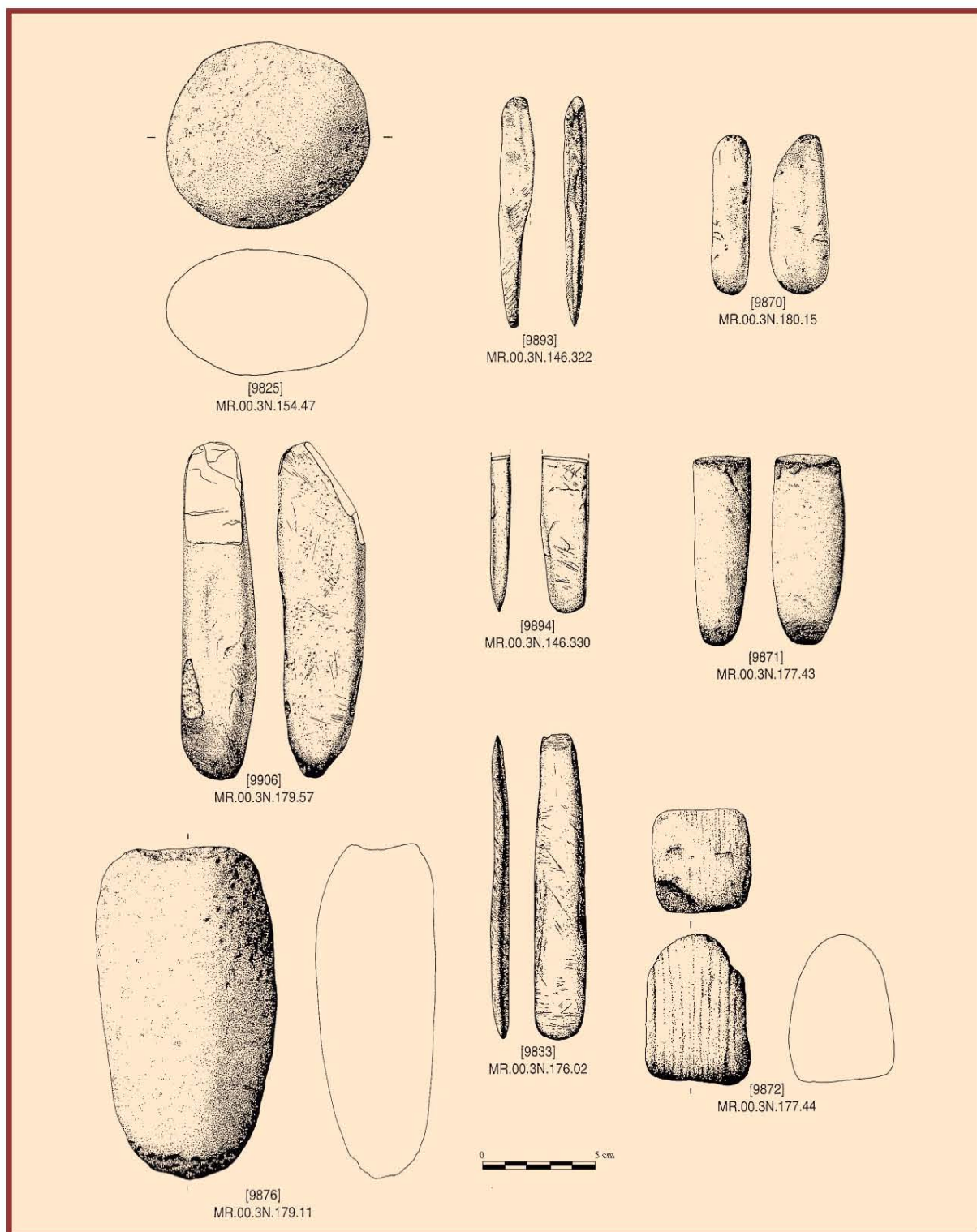
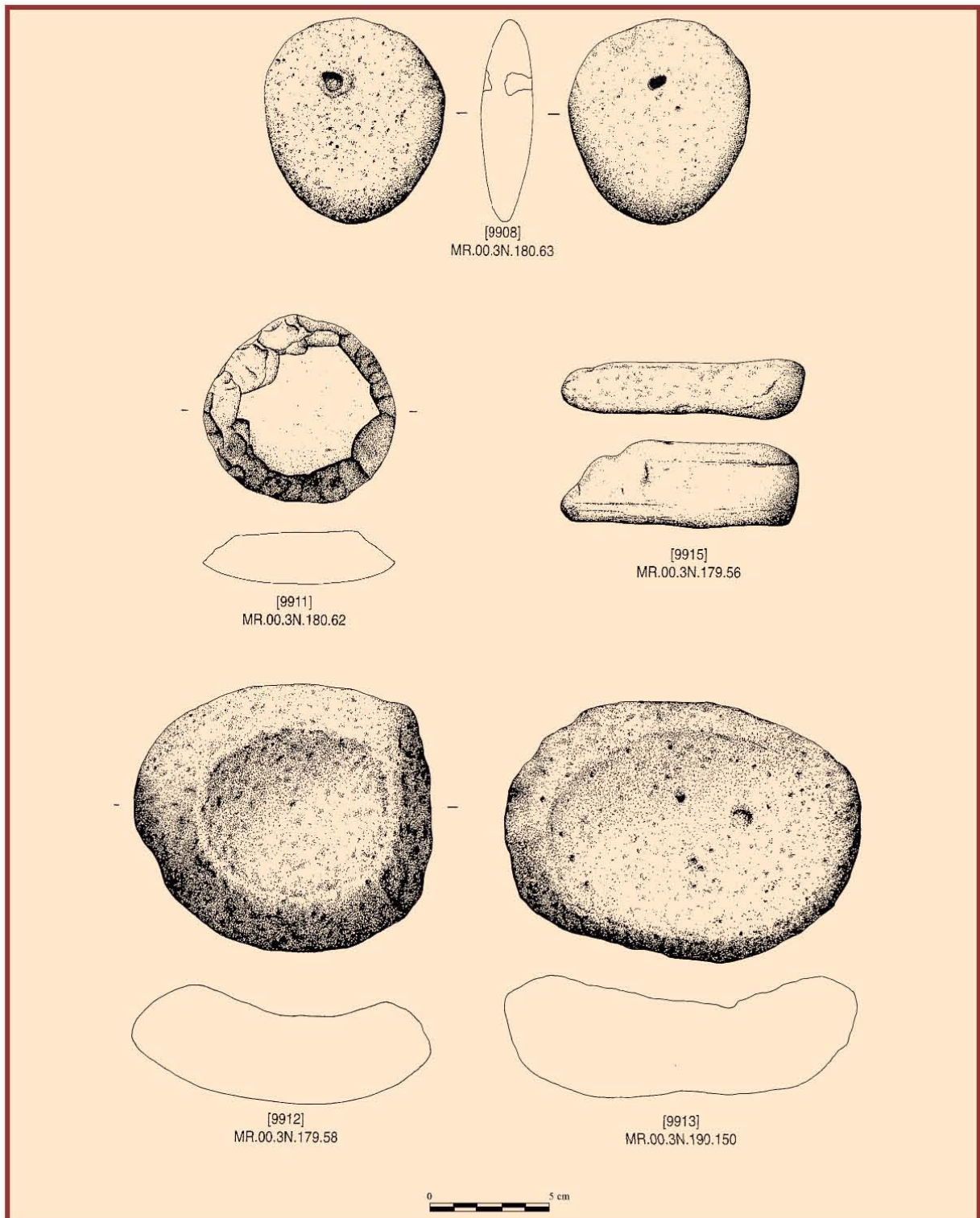


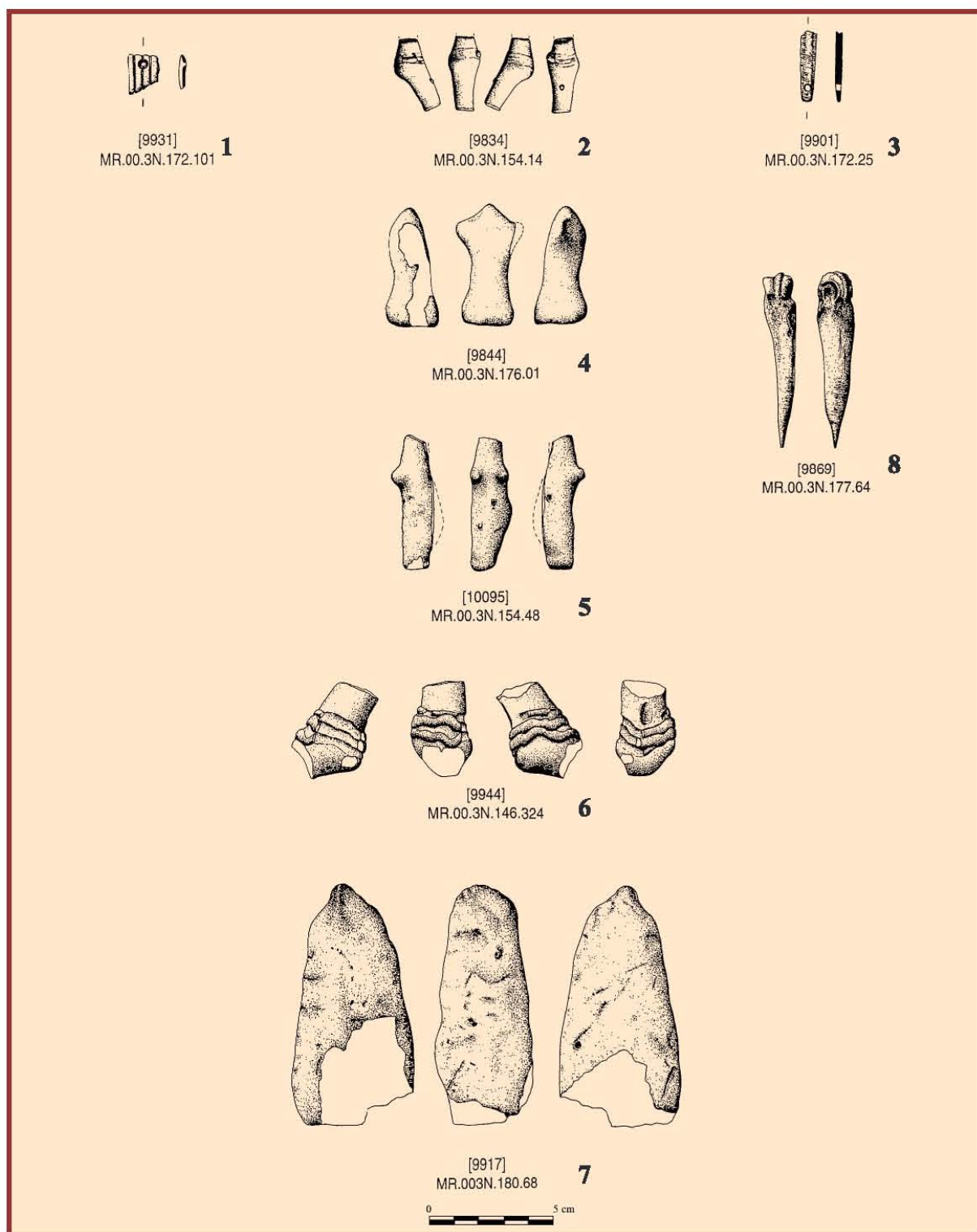
Figure 86: Mehrgarh 2000. Stone, bone, clay and shell objects, Period I (level 3).



**Figure 87:** Mehrgarh 2000. Stone Objects, Period I (level 4).



**Figure 88:** Mehrgarh 2000. Stone Objects, Period I (level 4).



**Figure 89:** Mehrgarh 2000. Shell, bone and clay objects, Period I (level 4).

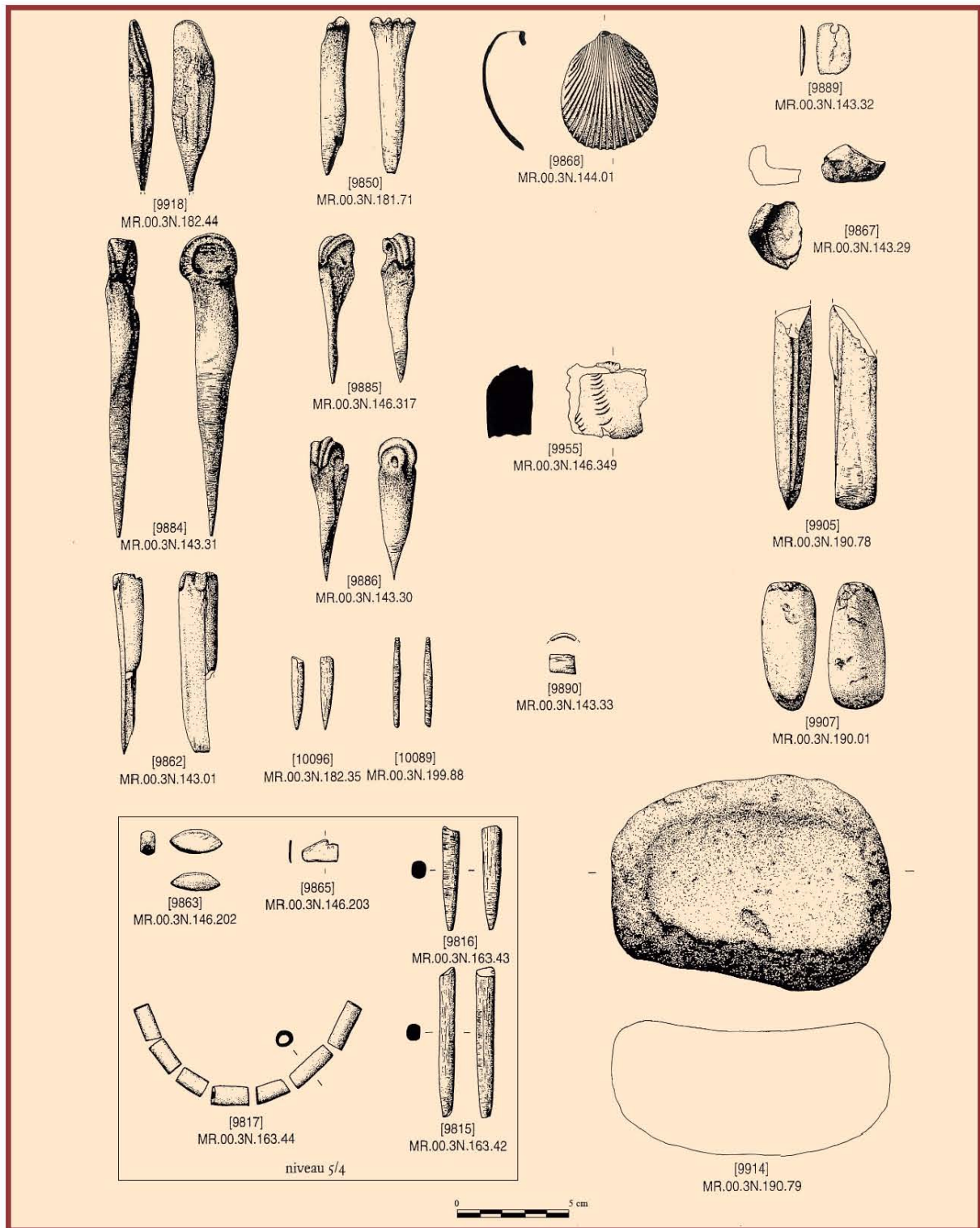
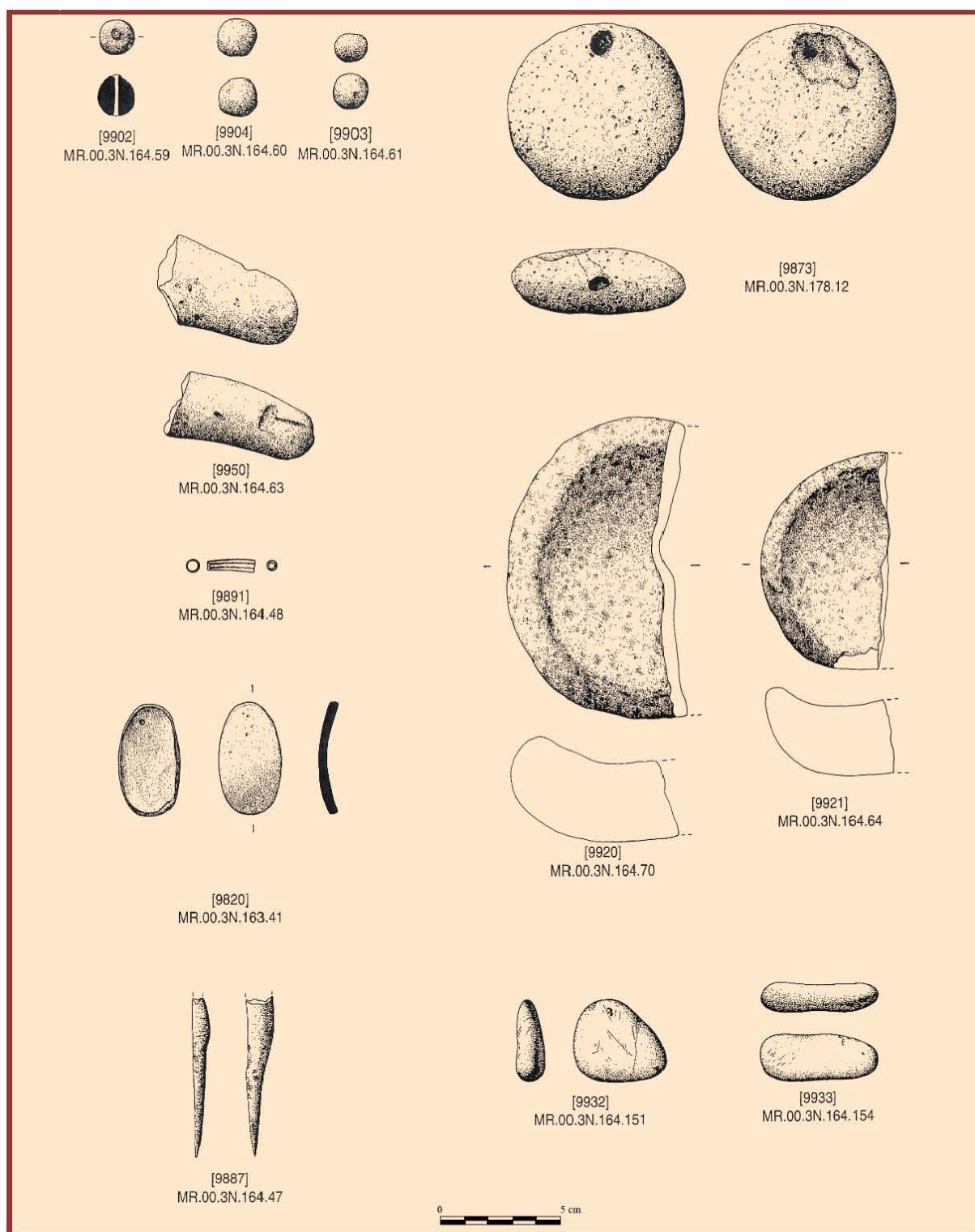
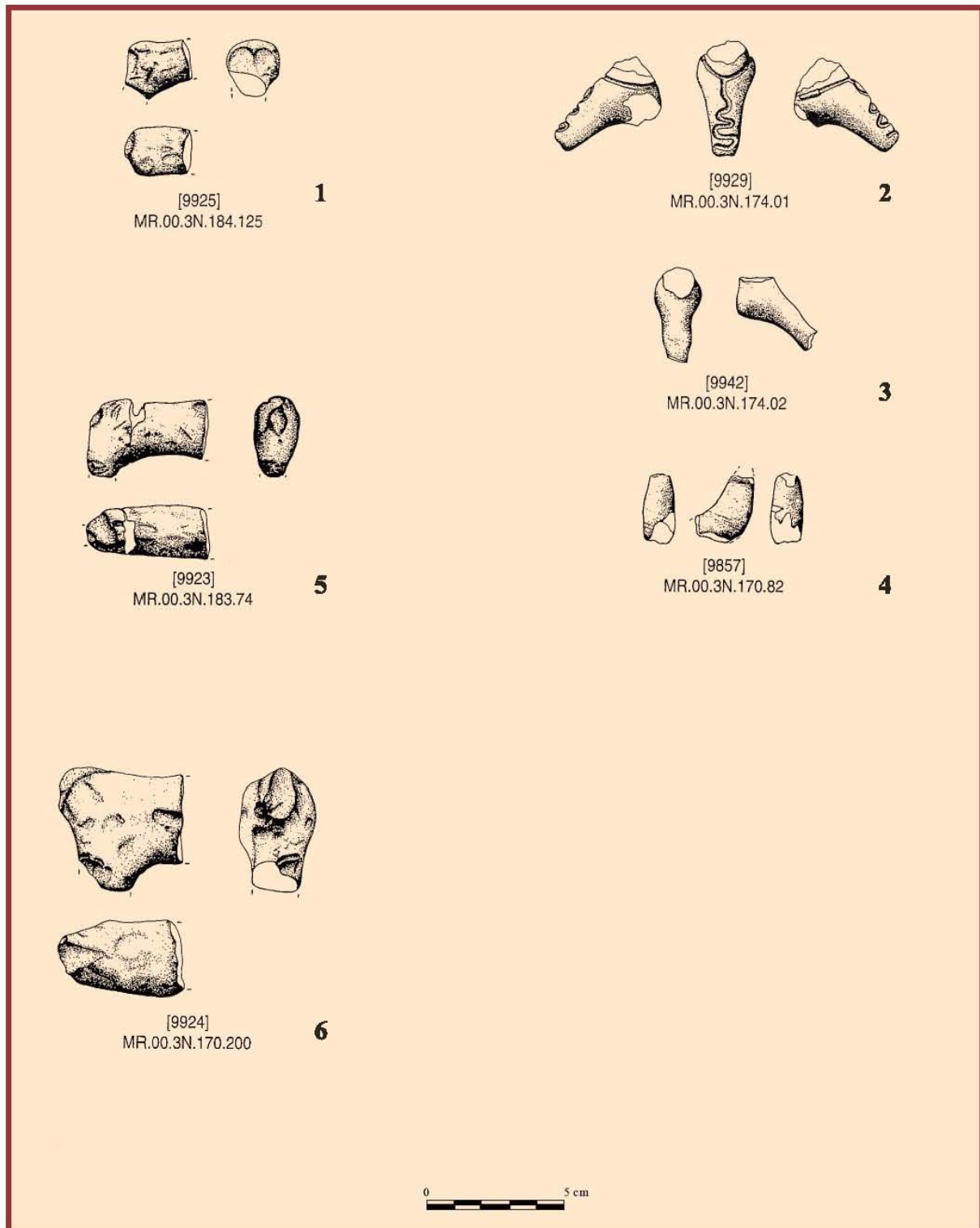


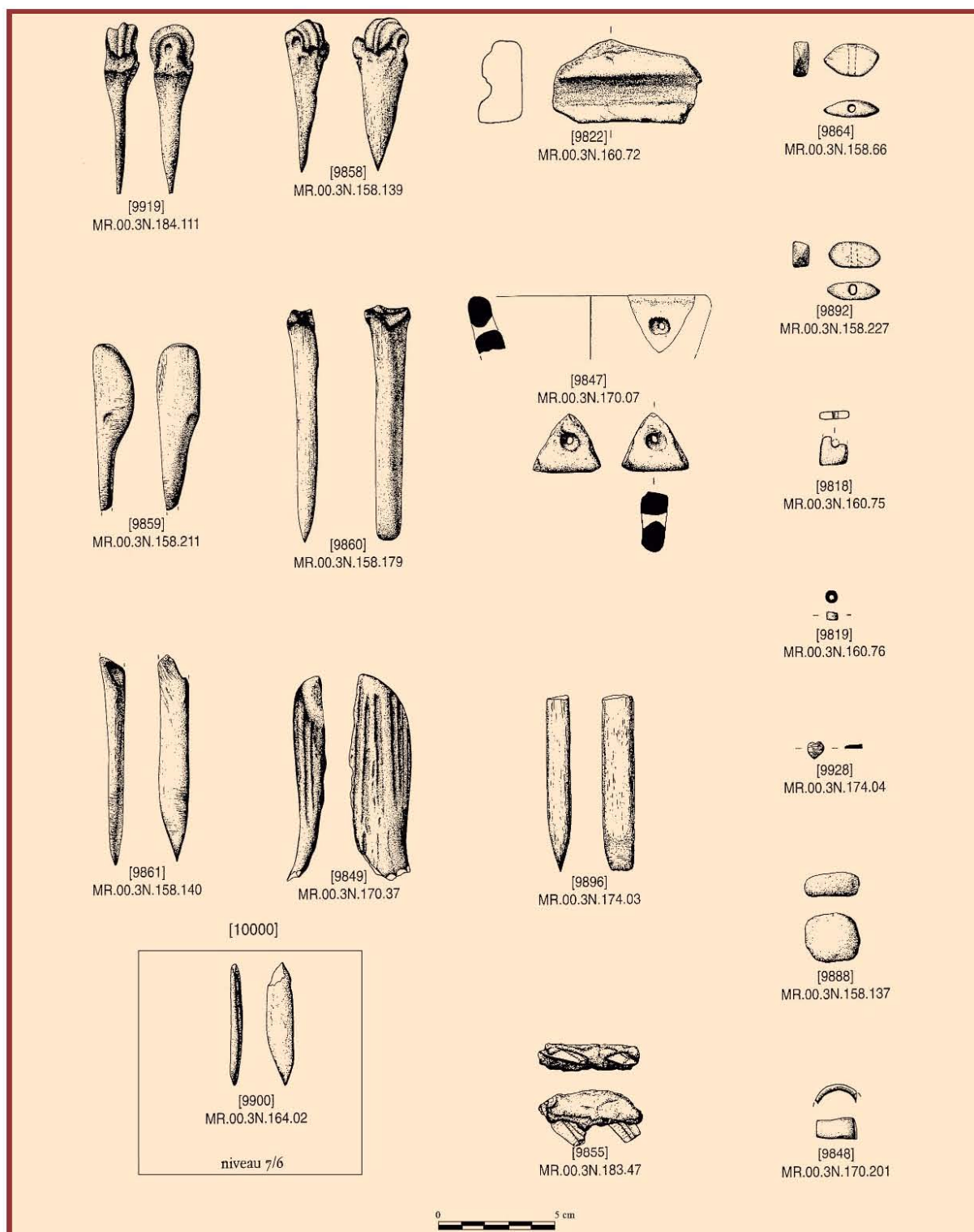
Figure 90: Mehrgarh 2000. Shell, bone, clay and stone objects, Period I (level 5).



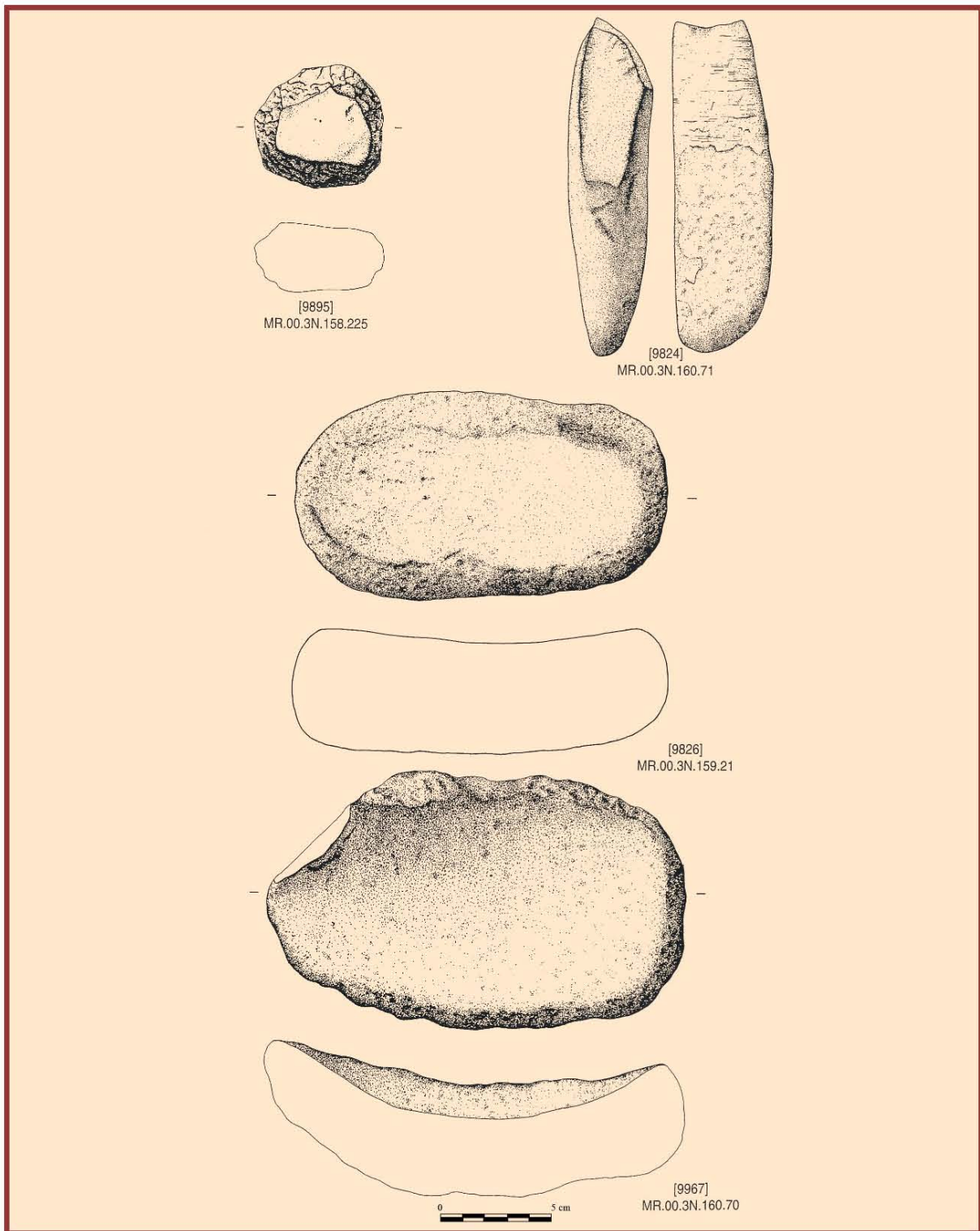
**Figure 91:** Mehrgarh 2000. Clay, bone, shell and stone objects, Period I (level 6).



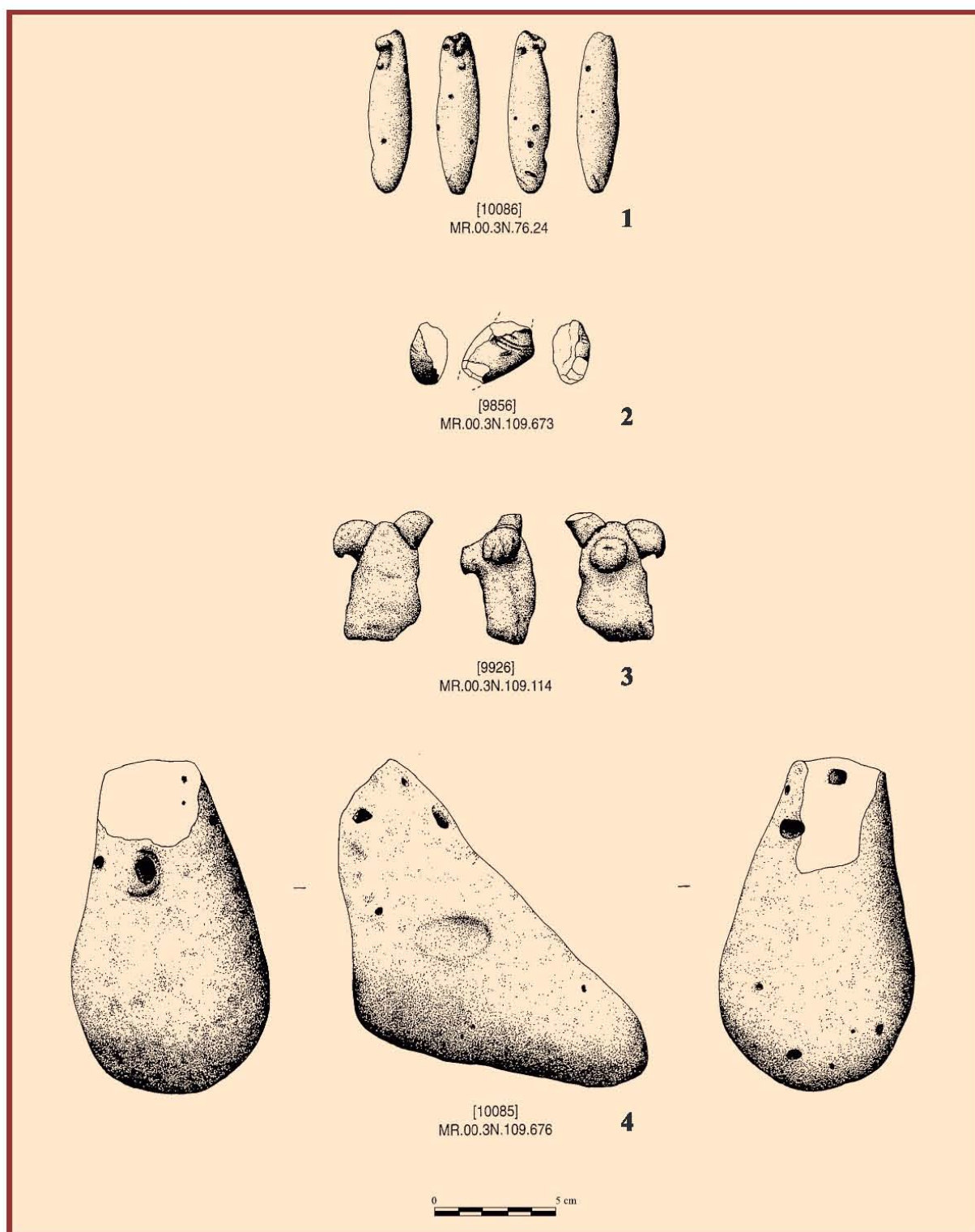
**Figure 92:** Mehrgarh 2000. Clay figurines, Period I (level 7).



**Figure 93:** Mehrgarh 2000. Clay, bone and stone objects, Period I (level 7).



**Figure 94:** Mehrgarh 2000. Stone objects, Period I (level 7).



**Figure 95:** Mehrgarh 2000. Clay figurines, Period I (level 8).

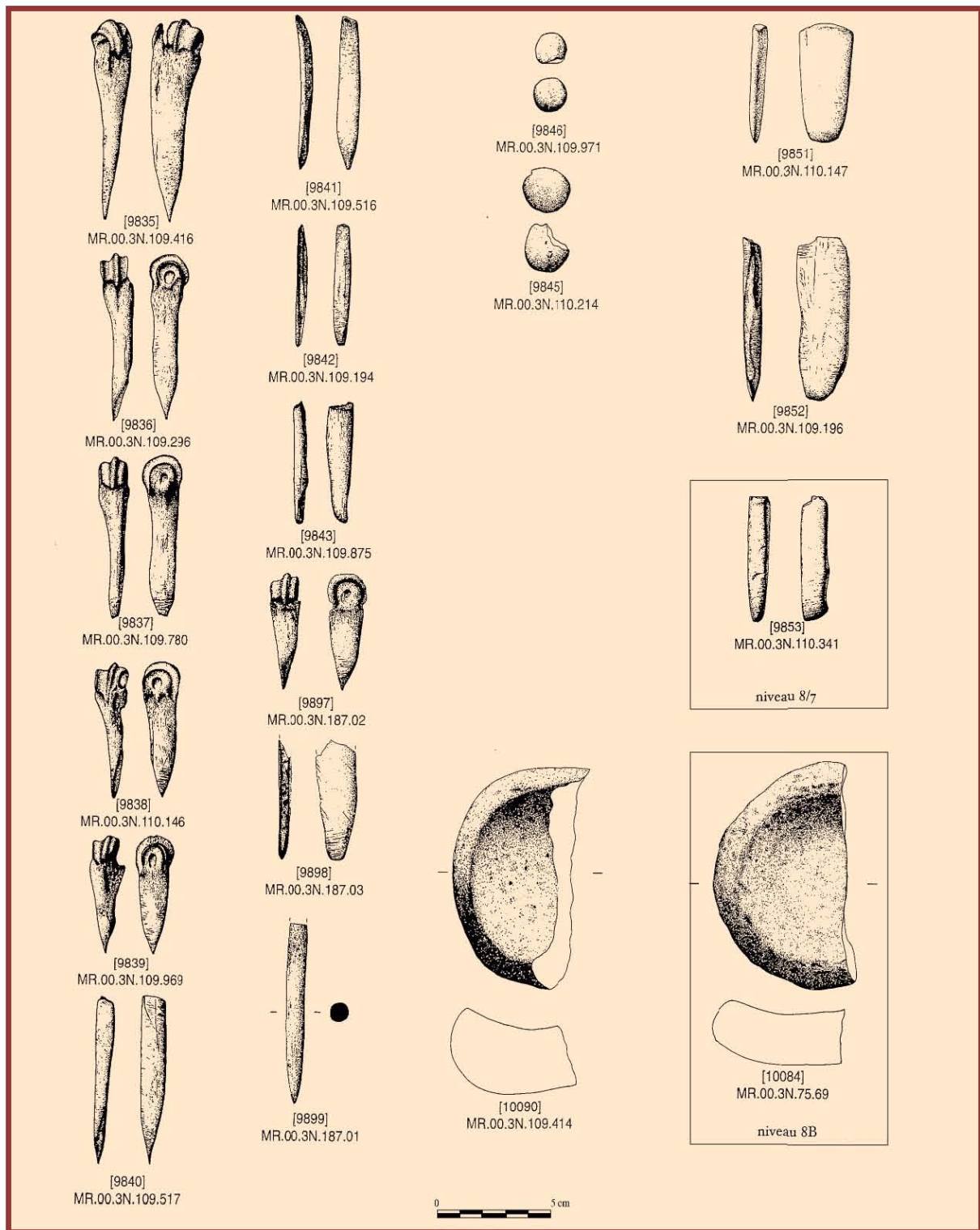


Figure 96: Mehrgarh 2000. Stone, bone and clay objects Period I (level 8).

**FLINTS**  
**1999**



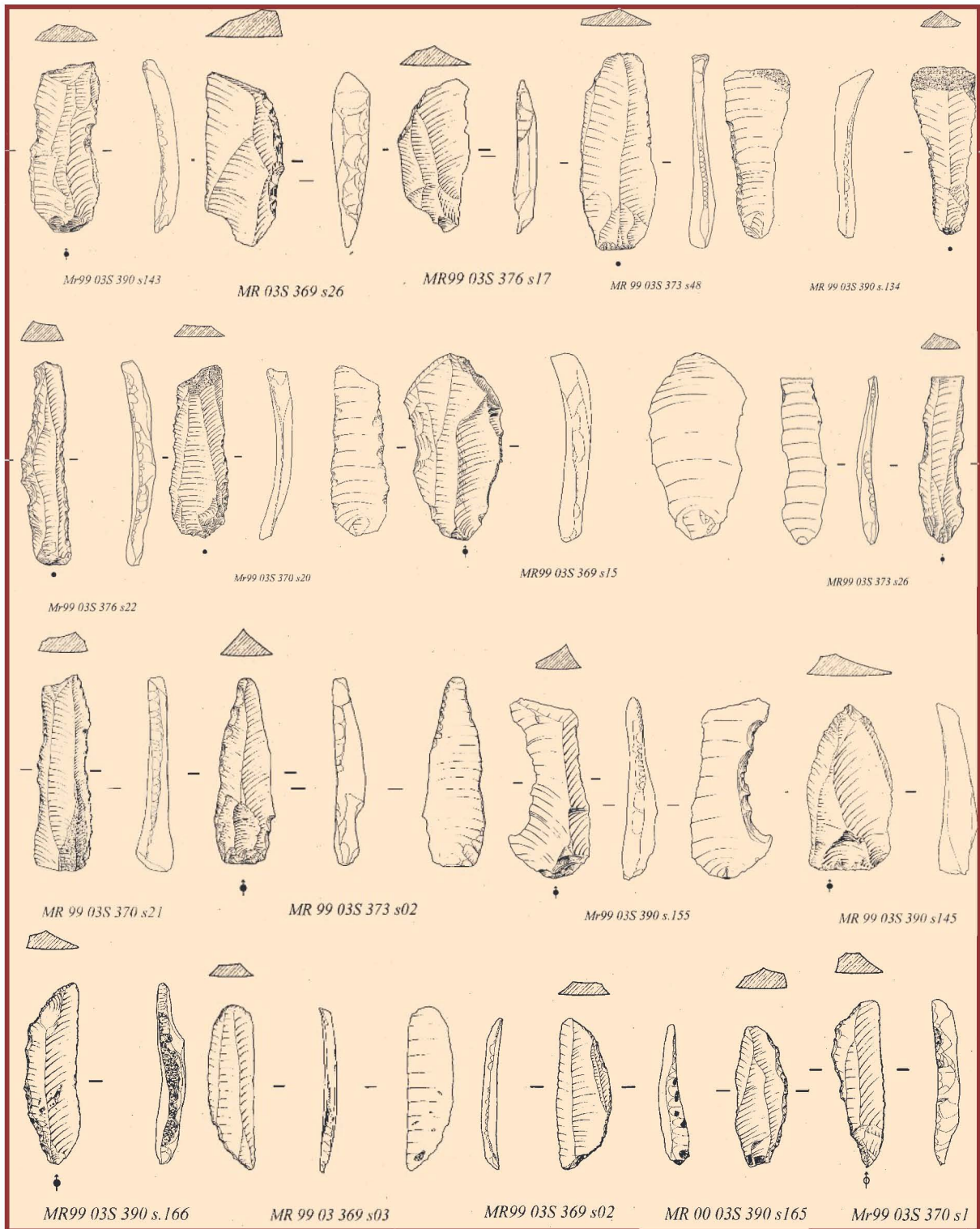


Figure 96b: Mehrgarh 1999. Flints from MR.03 South, Level 1.

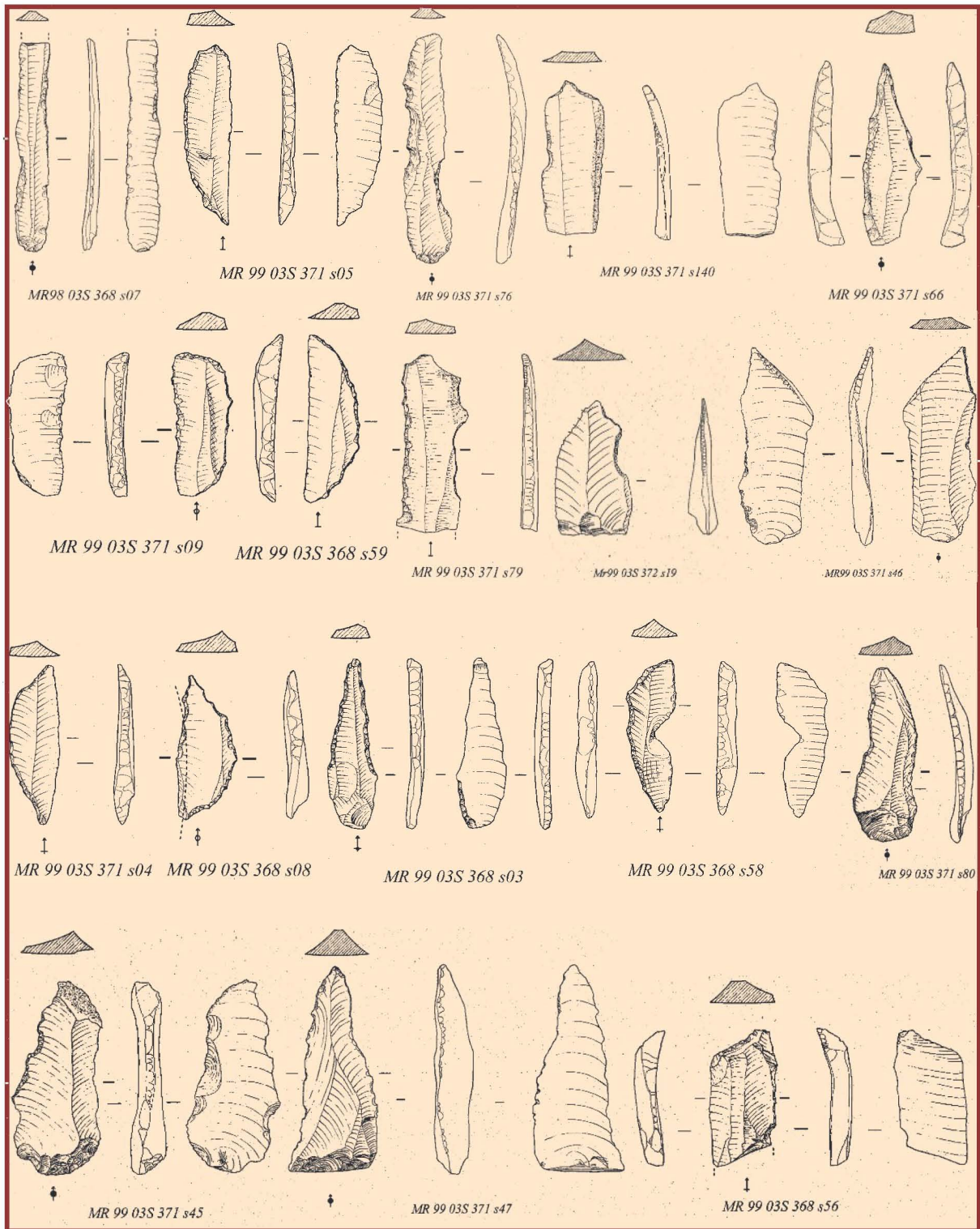
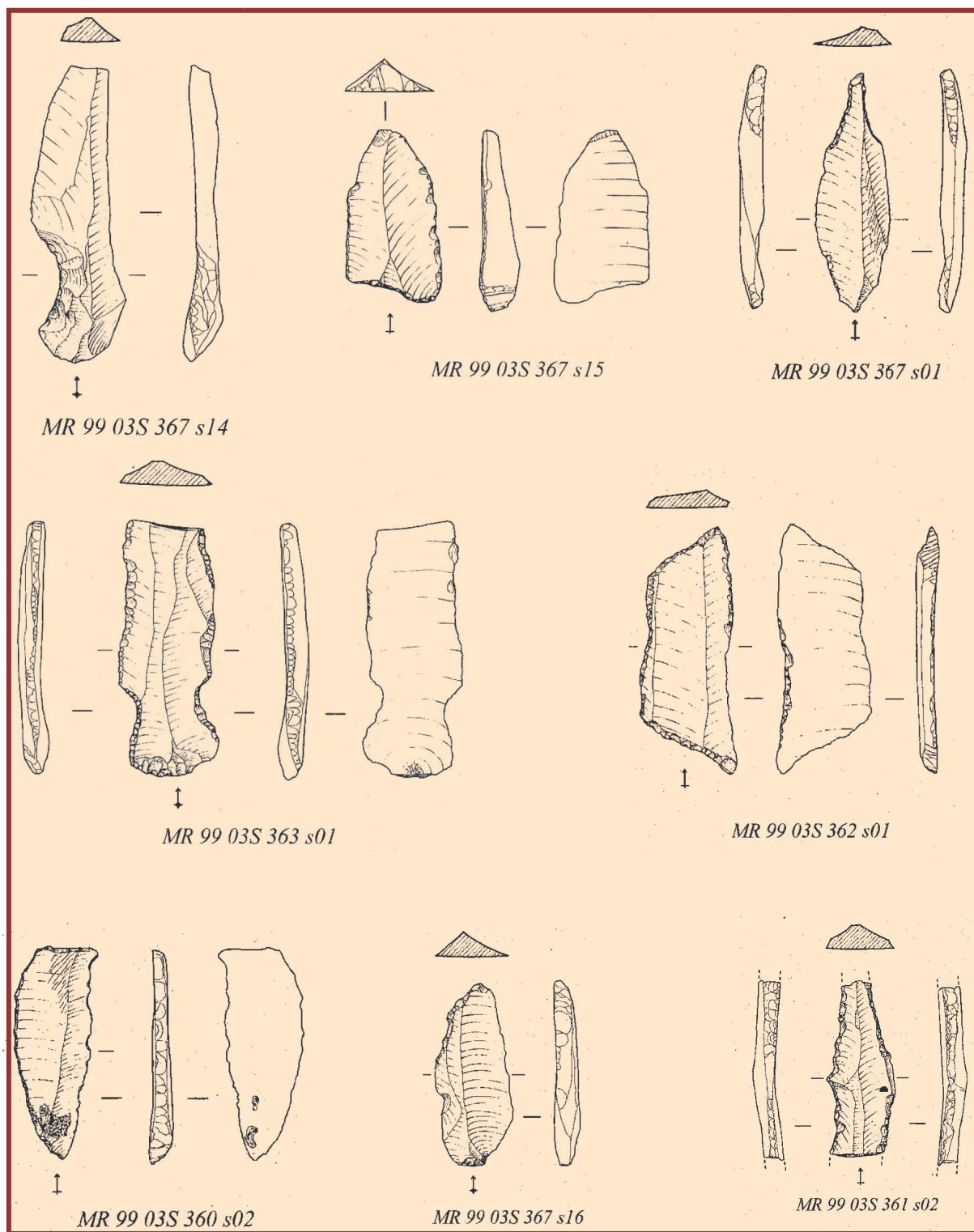


Figure 96c: Mehrgarh 1999. Flints from MR.03 South. Level 2.



**Figure 96d:** Mehrgarh 1999. Flints from MR.03 South. Level 3.



**BURIALS  
AND  
GRAVE GOODS  
1997 - 2000**



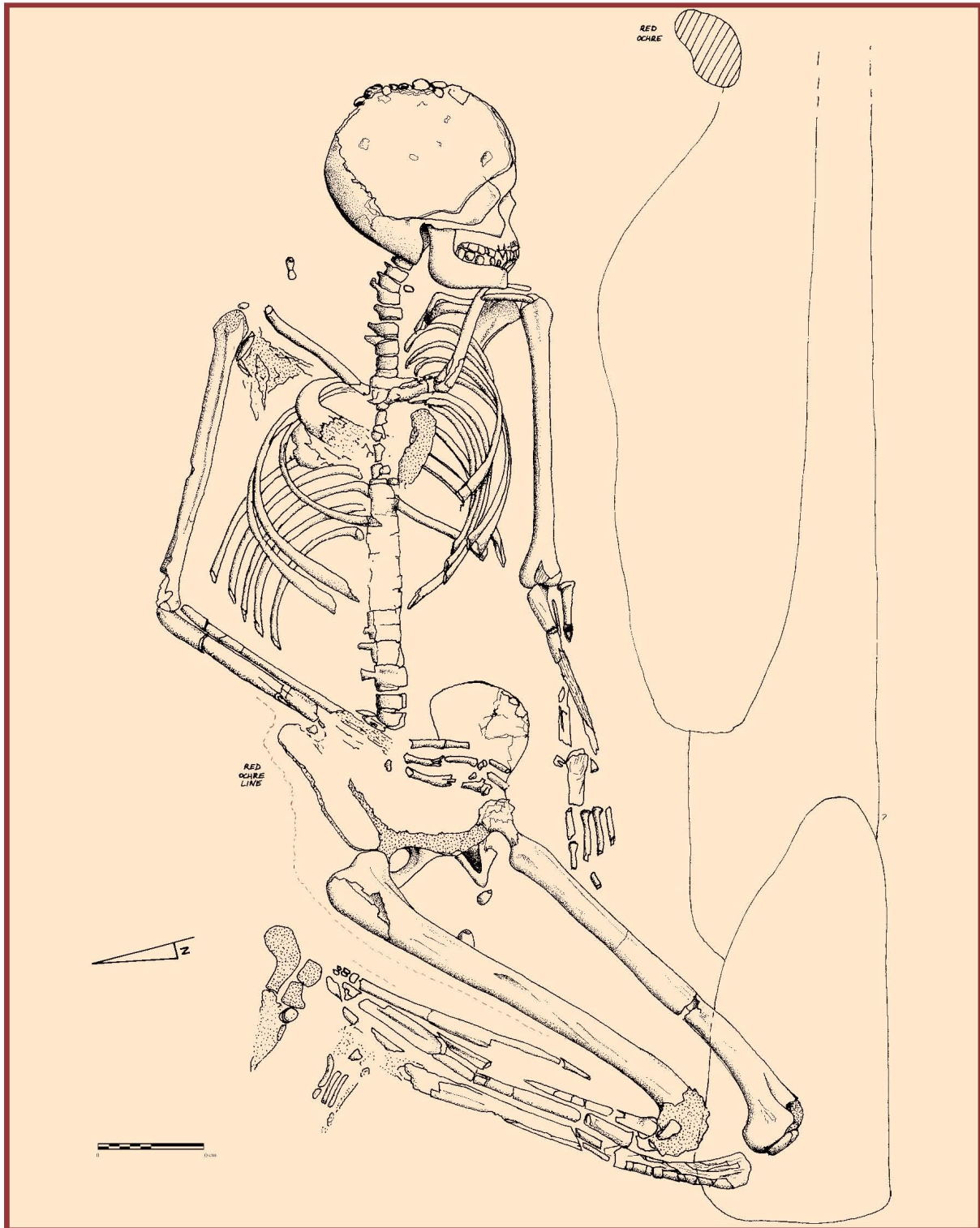


Figure 97: Mehrgarh 1997. Burial 102, Graveyard 9. Period I.

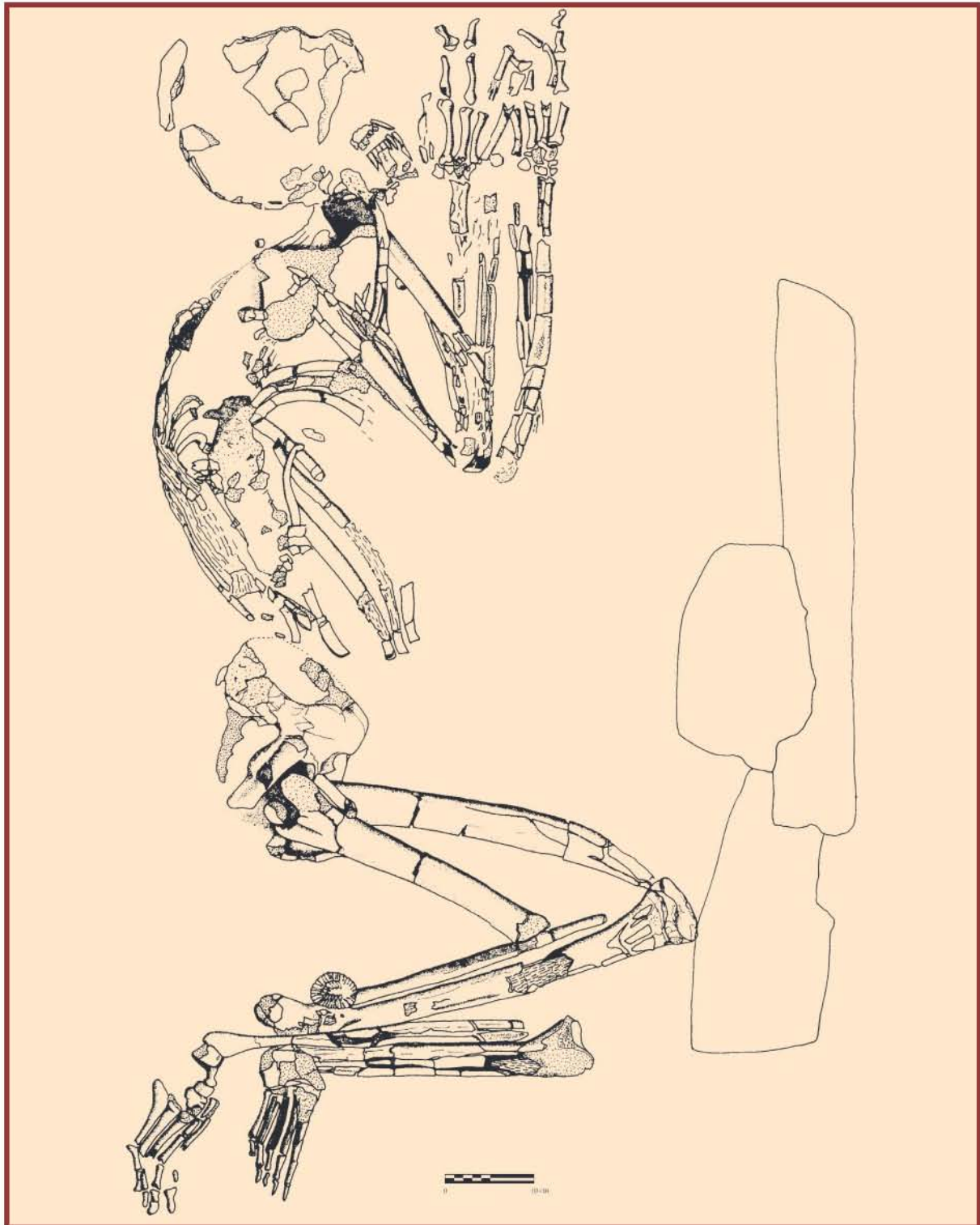


Figure 98: Mehrgarh 1997. Burial 103, Graveyard 9. Period I.

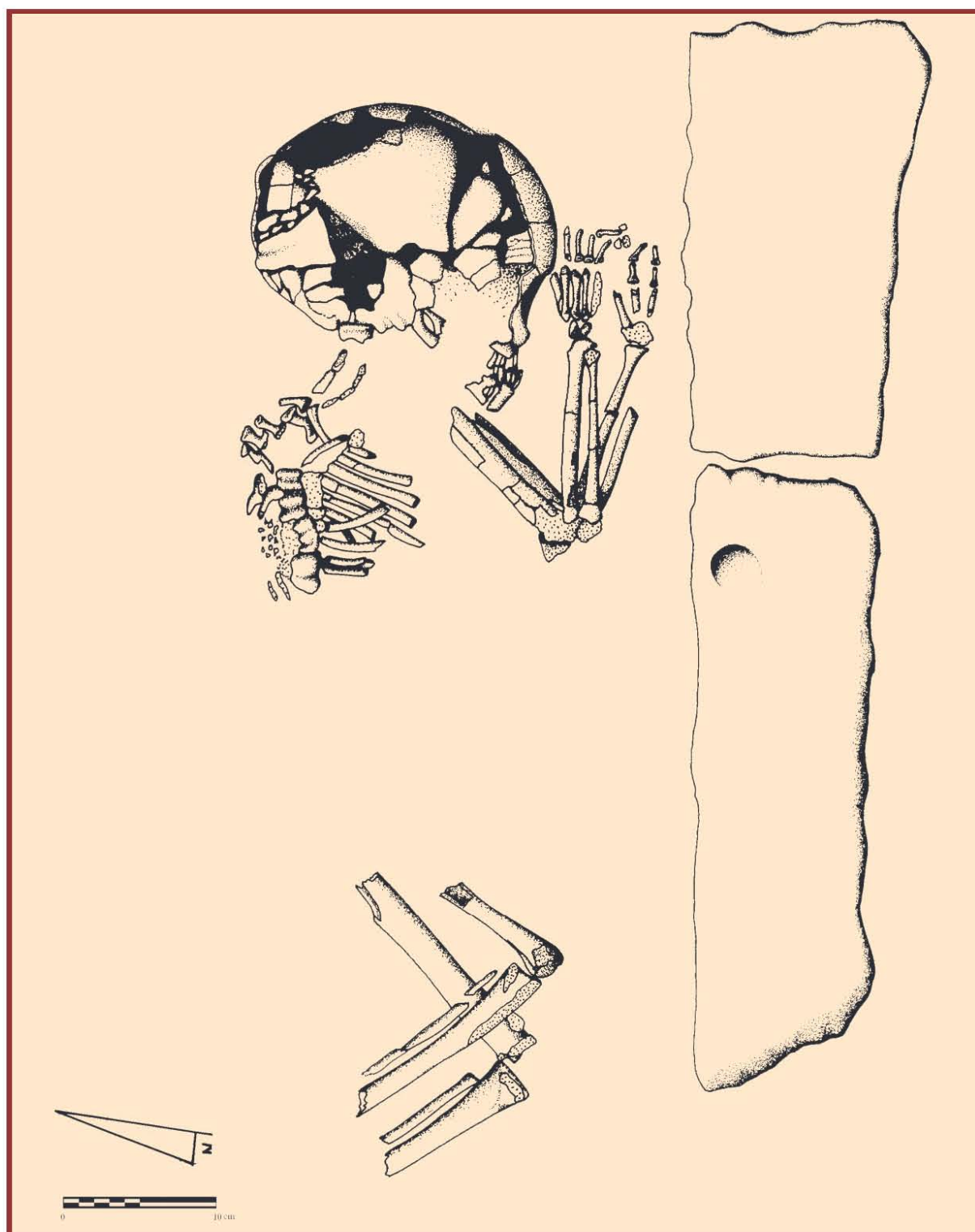


Figure 99: Mehrgarh 1997. Burial 105, Graveyard 9. Period I.

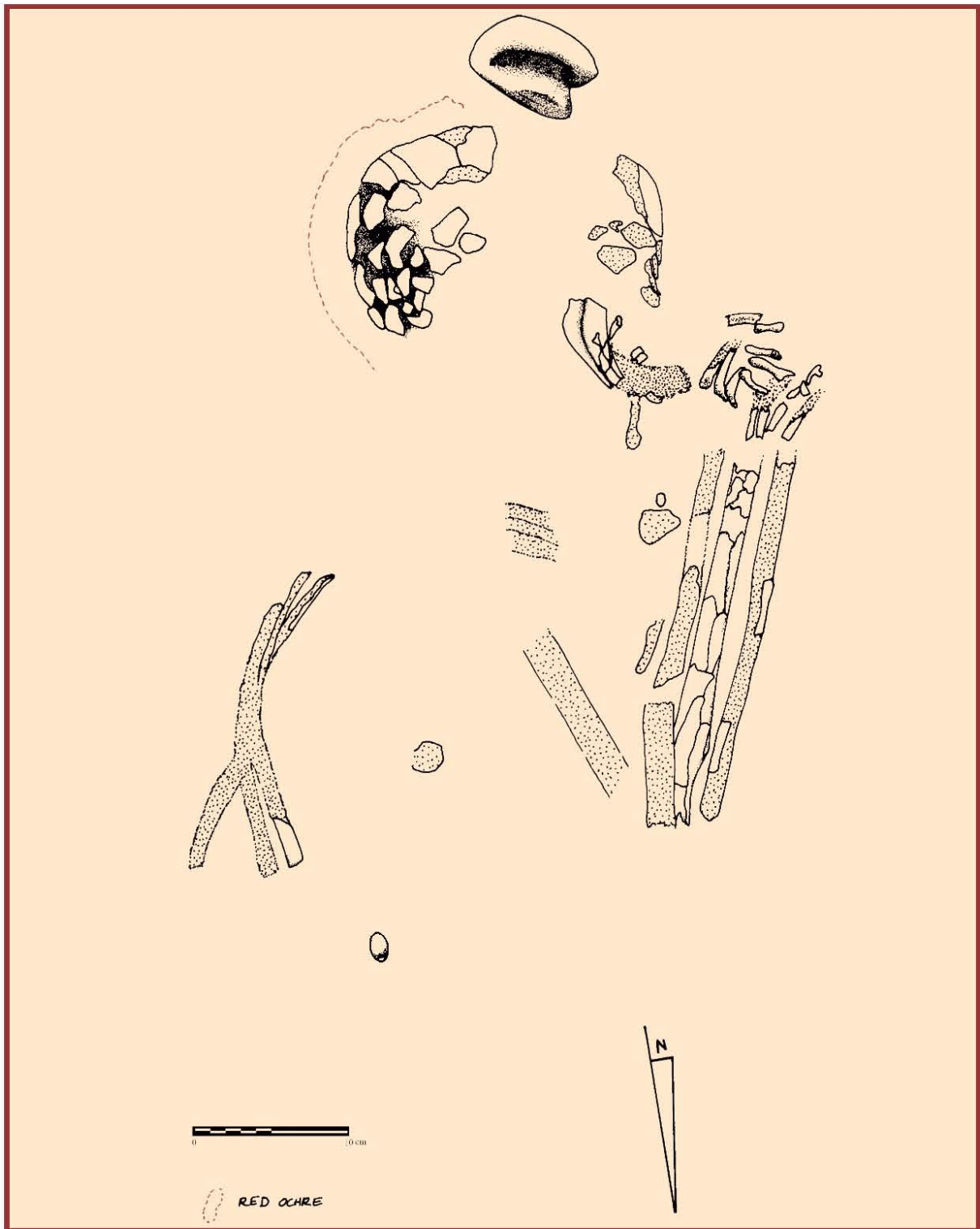


Figure 100: Mehrgarh 1997. Burial 106, Graveyard 9. Period I.

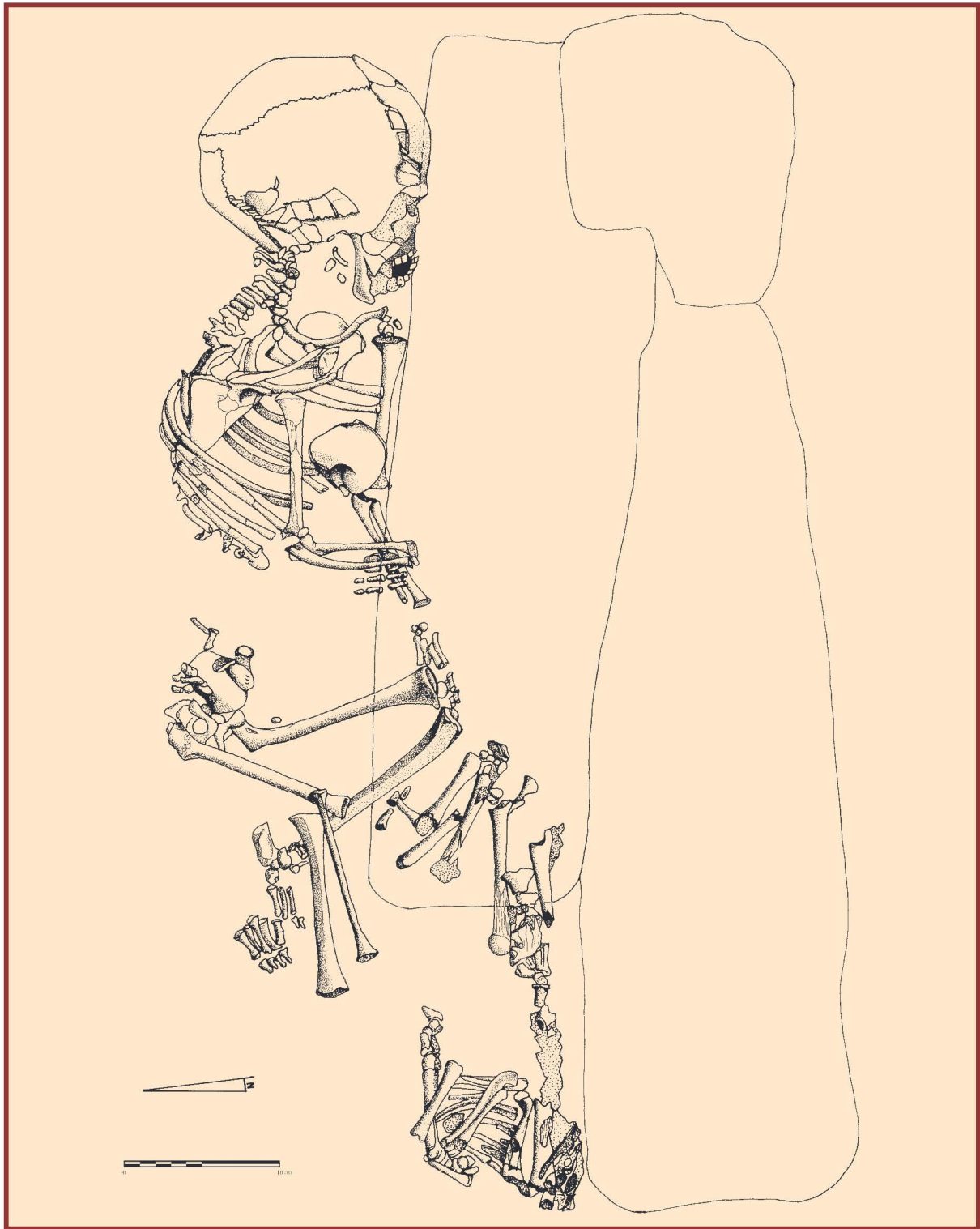


Figure 101: Mehrgarh 1997. Burial 107, Graveyard 8. Period I.

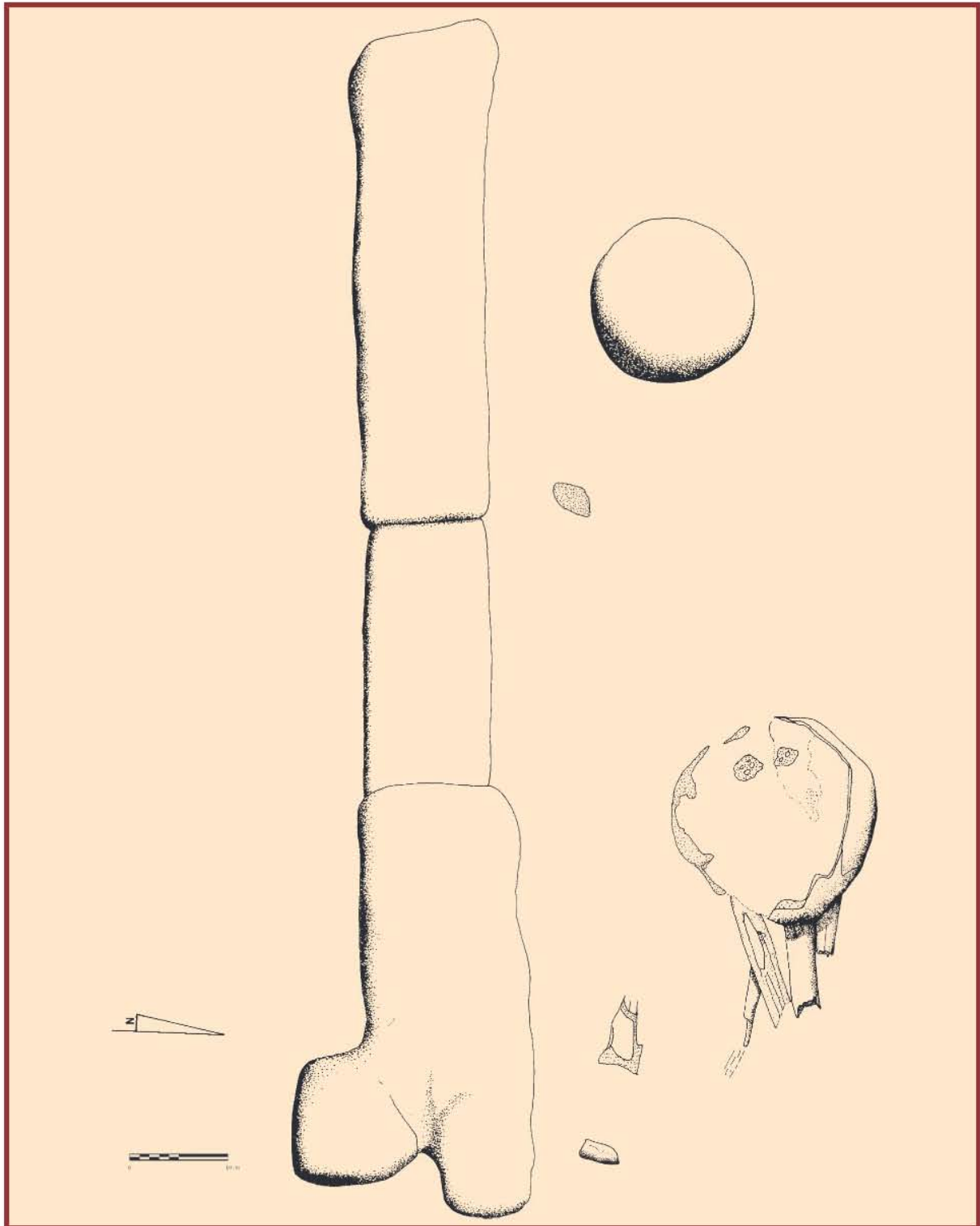


Figure 102: Mehrgarh 1997. Burial 109, Graveyard 8. Period I.

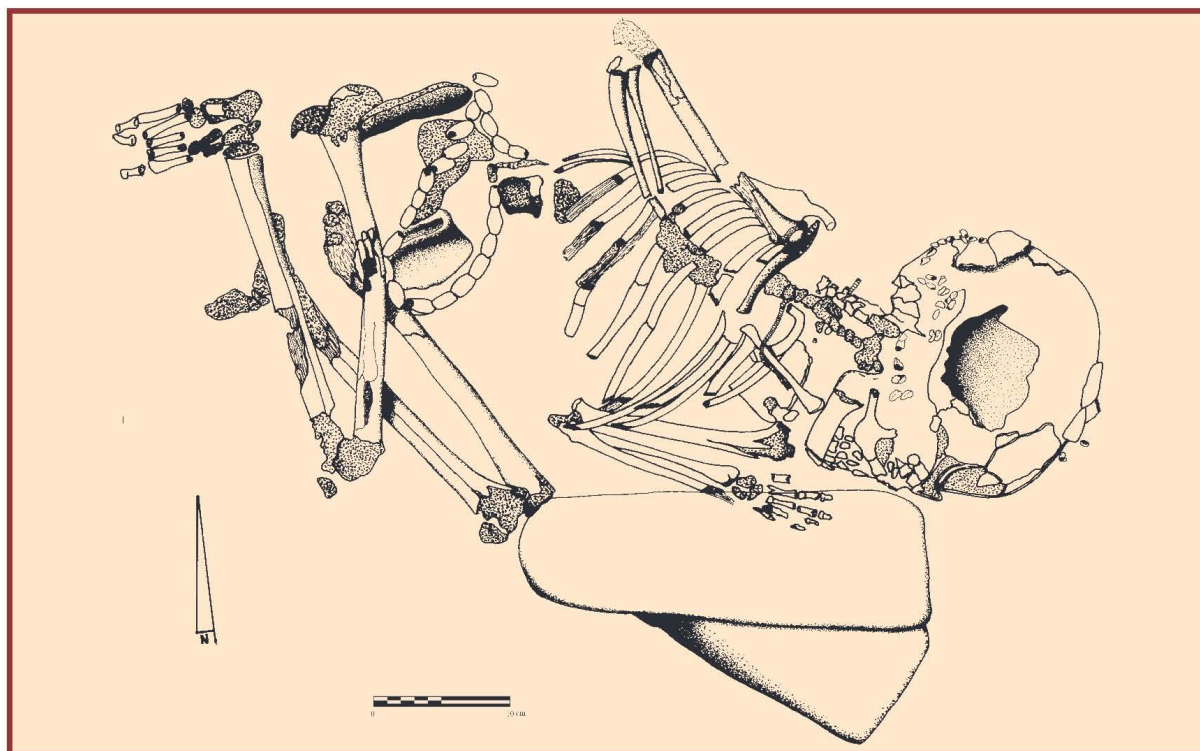


Figure 103: Mehrgarh 1997. Burial 110, Graveyard 9. Period I.

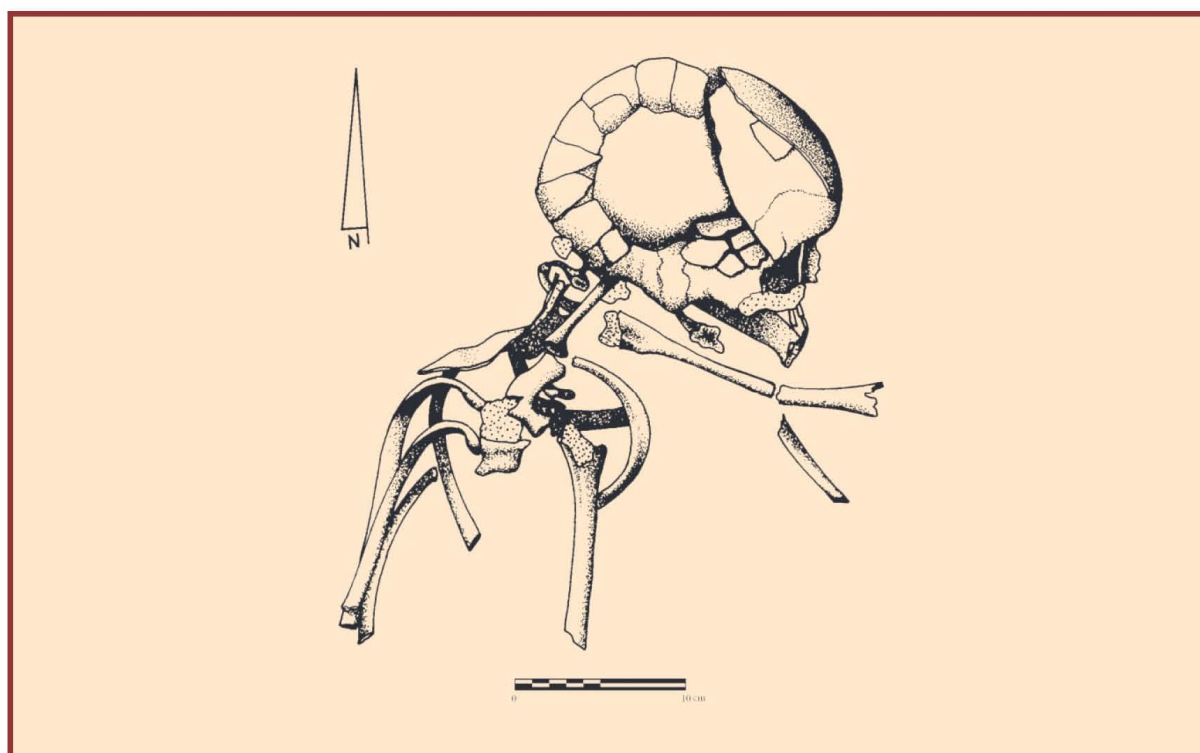


Figure 104: Mehrgarh 1997. Burial 112, Graveyard 8. Period I.

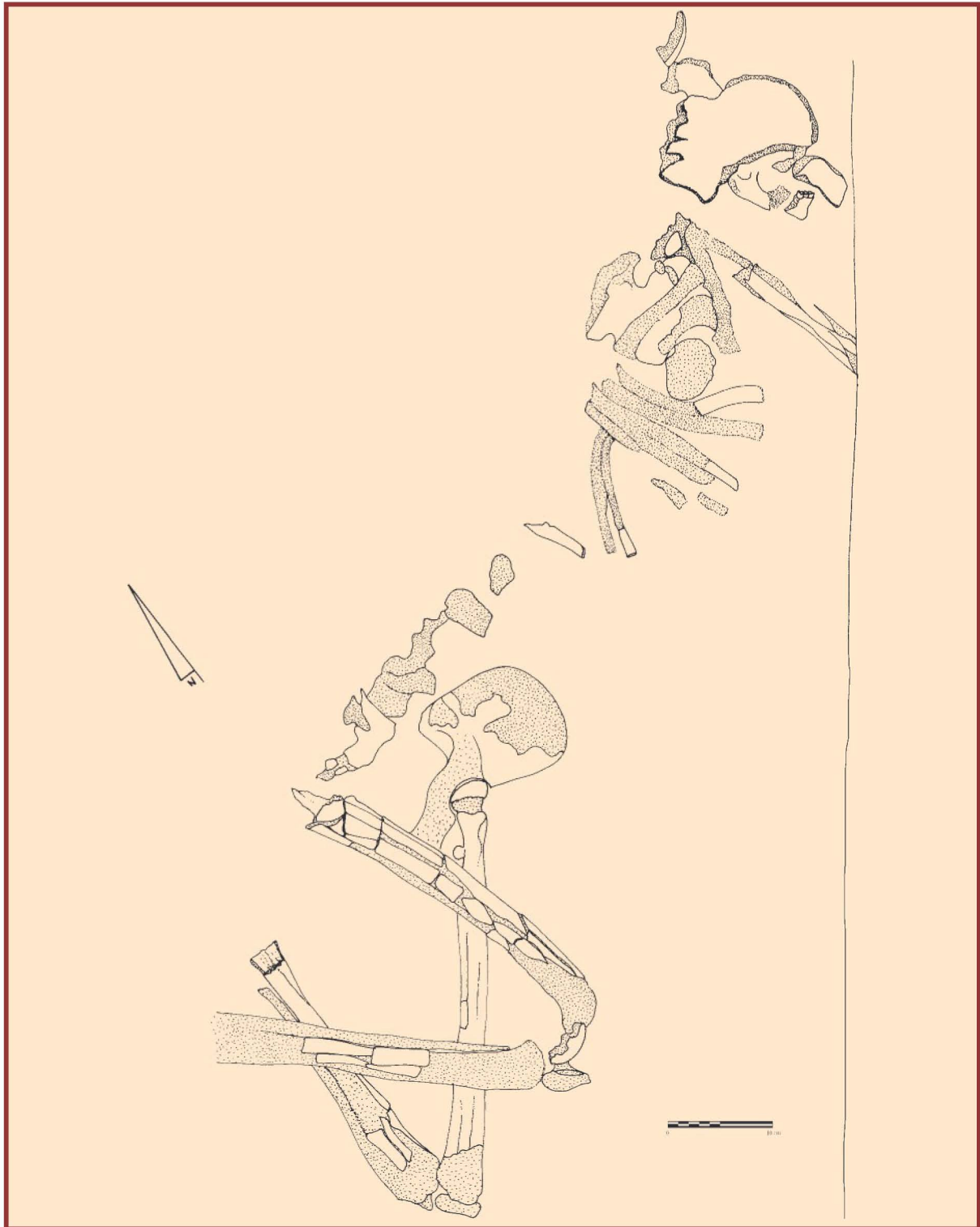


Figure 105: Mehrgarh 1997. Burial 113, Graveyard 8. Period I.

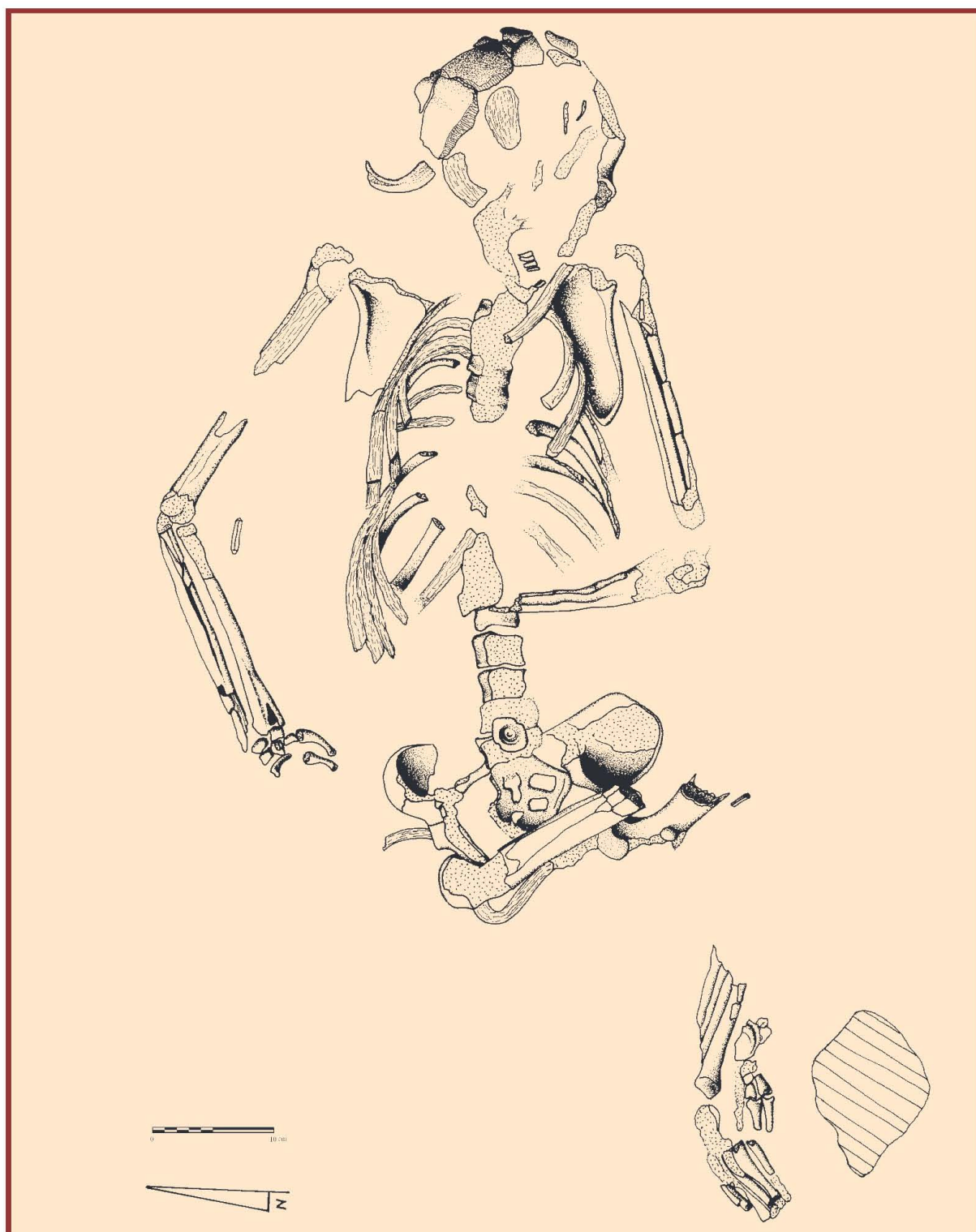


Figure 106: Mehrgarh 1997. Burial 114, Graveyard 8. Period I.

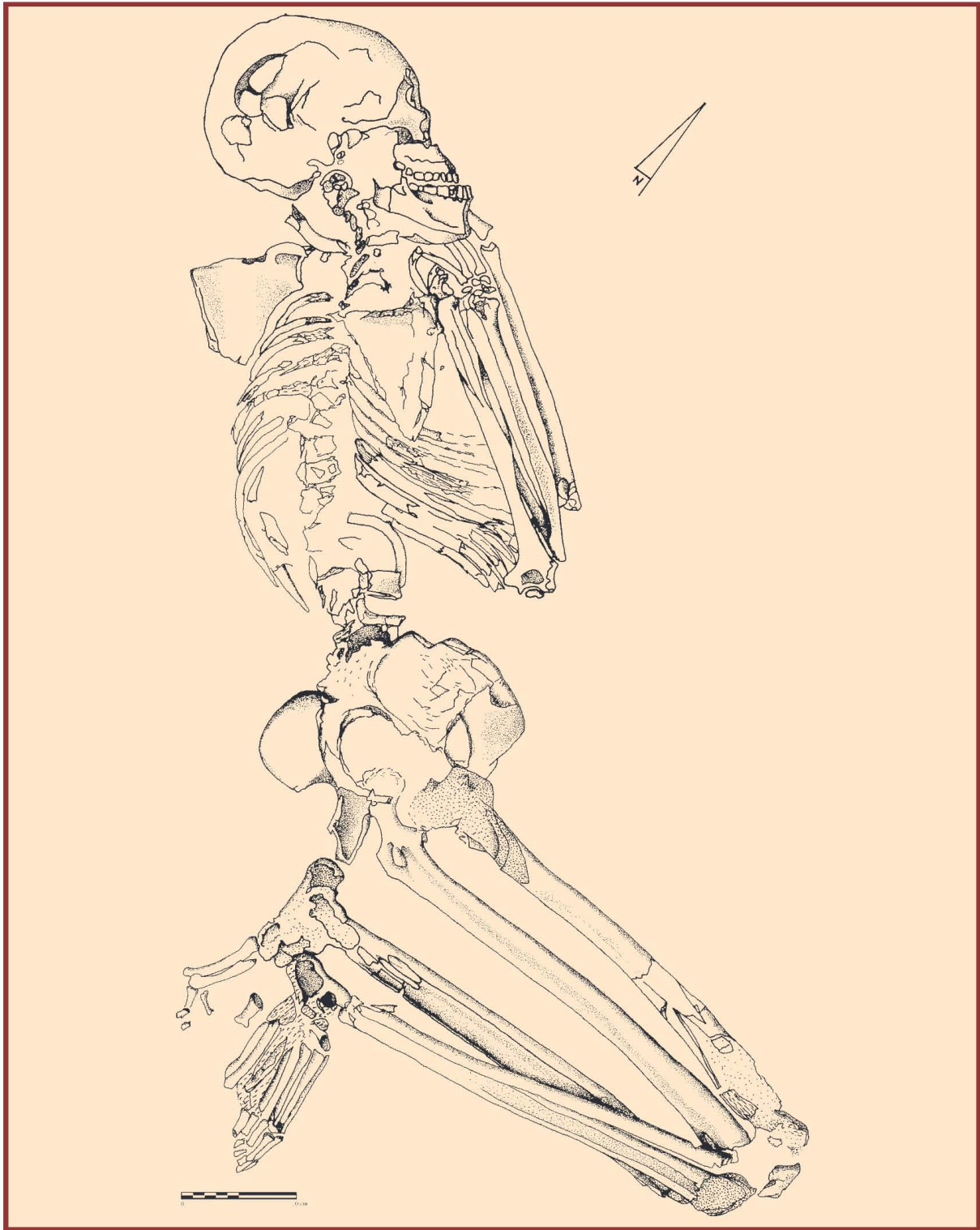
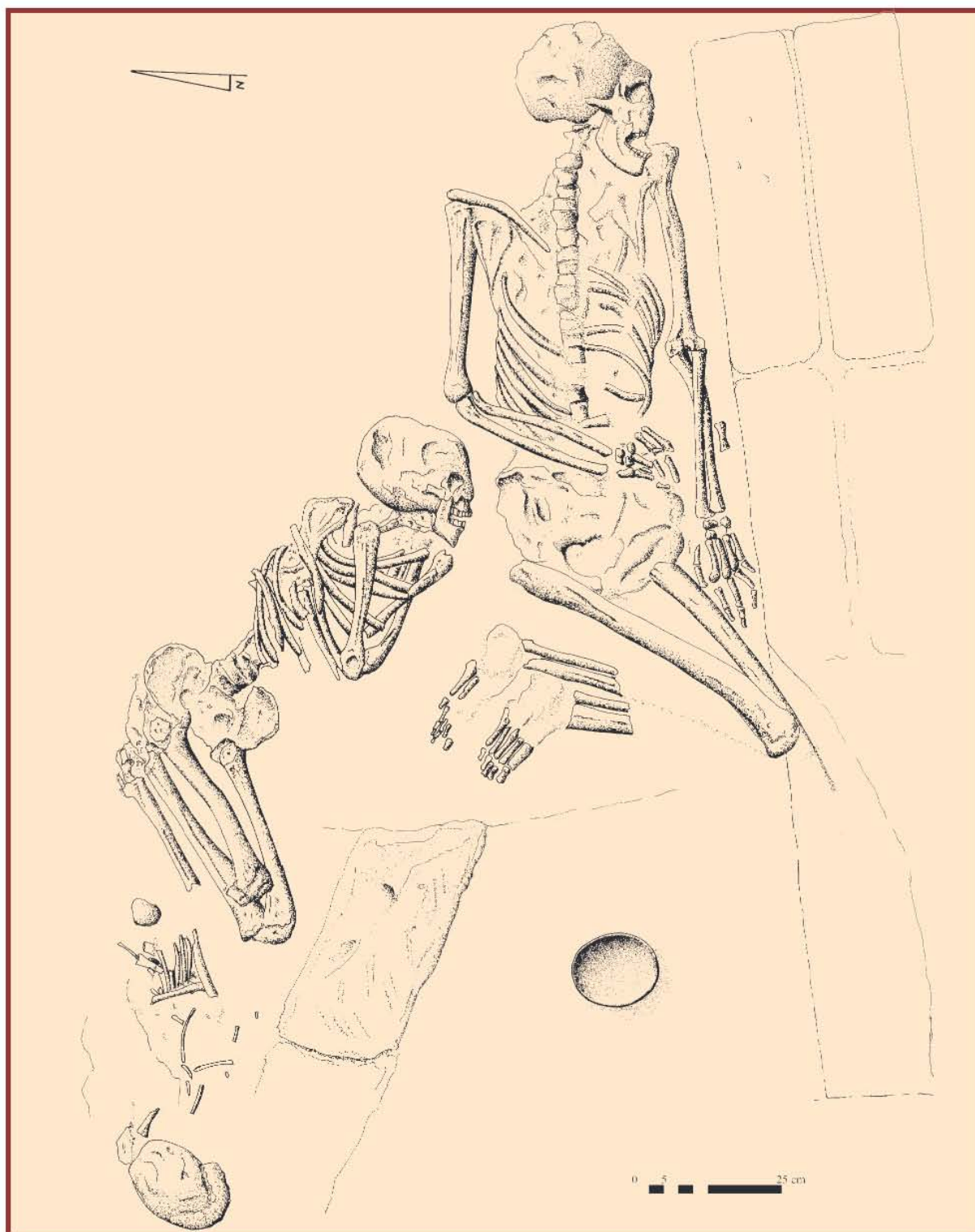


Figure 107: Mehrgarh 1997. Burial 300, Period II A.



**Figure 108:** Mehrgarh 1999. Burials 229 and 245, Graveyard 9, Period I.

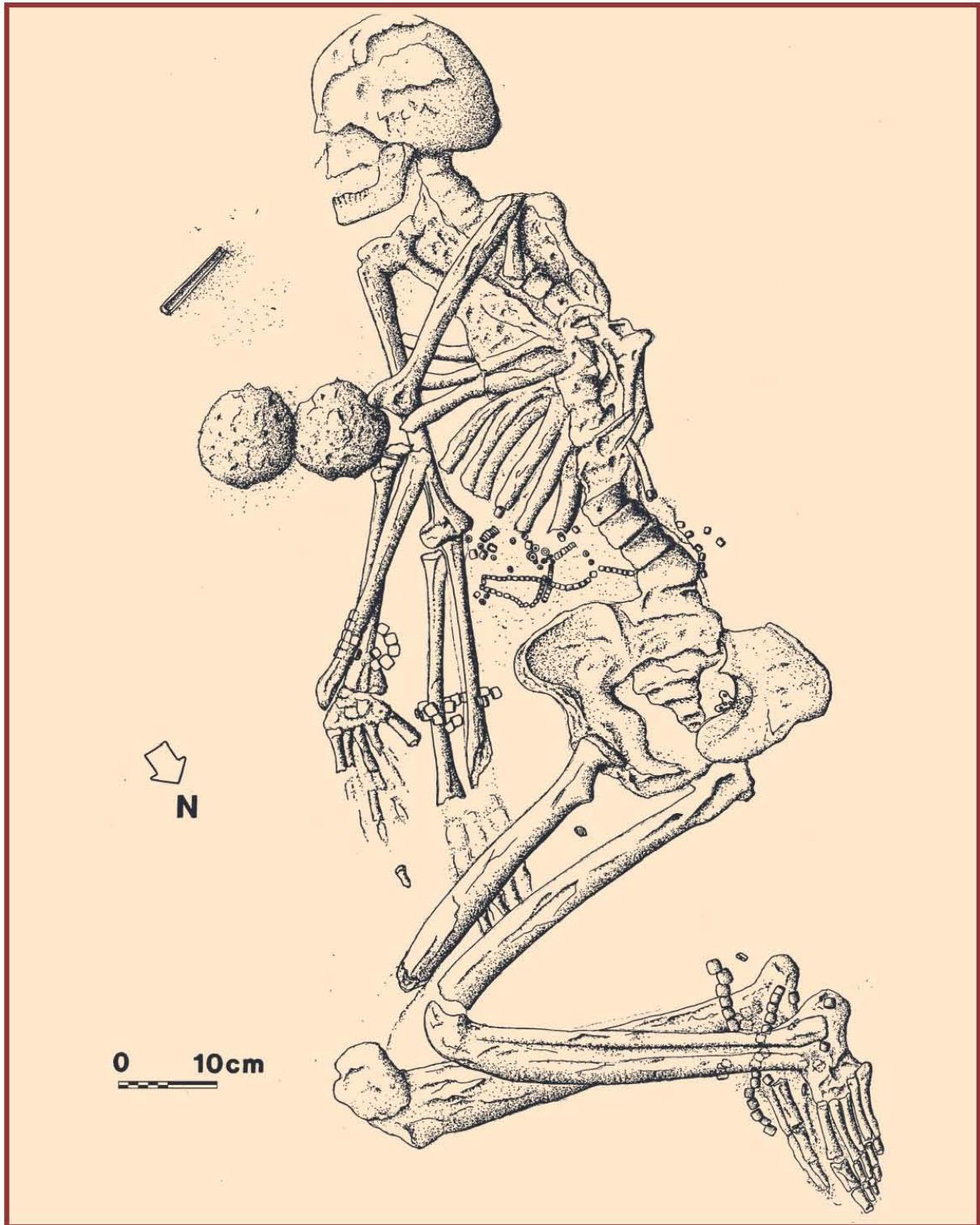


Figure 109: Mehrgarh 1999. Burial 239, Graveyard 9, Period I.

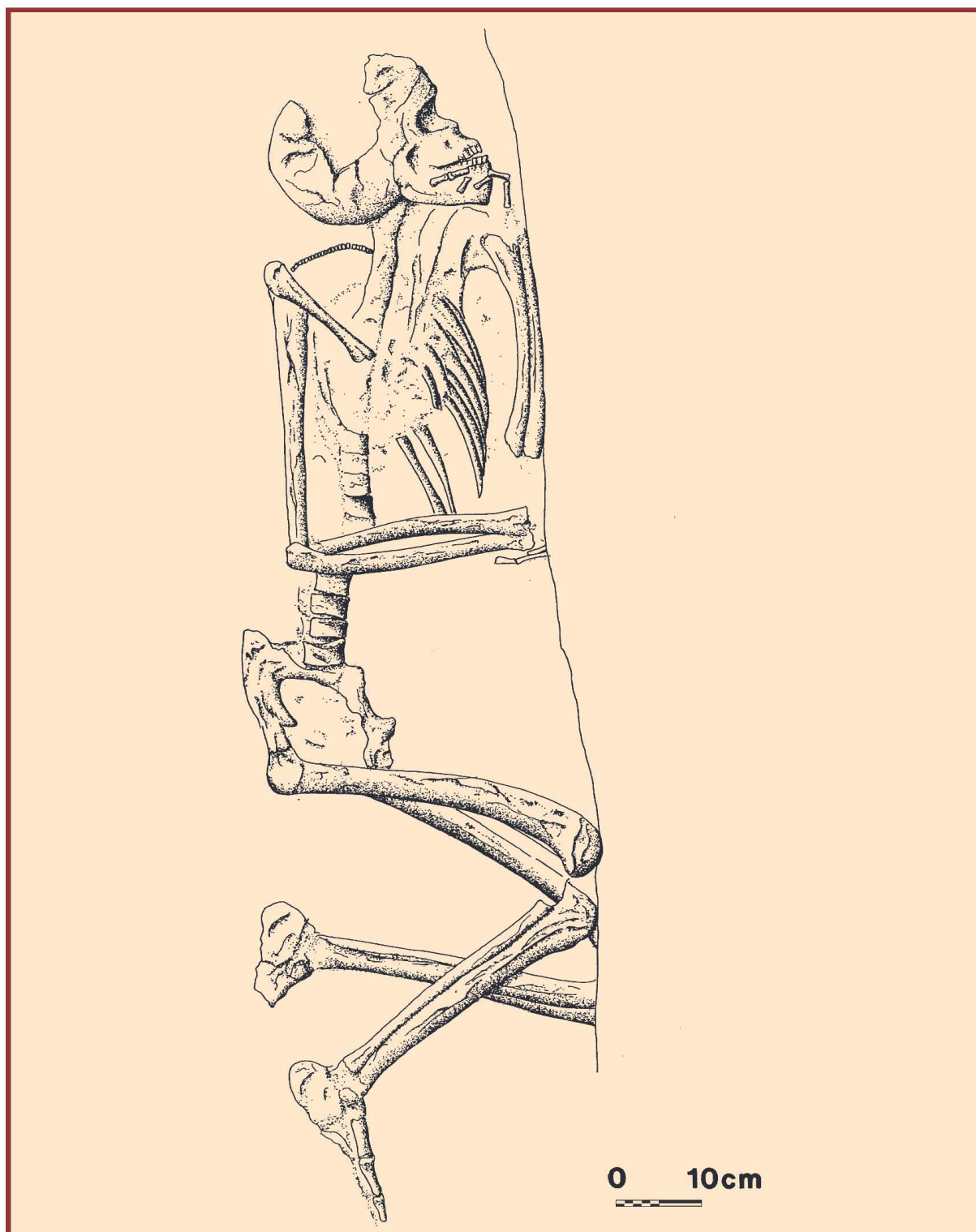


Figure 110: Mehrgarh 1999. Burial 240, Graveyard 9, Period I.

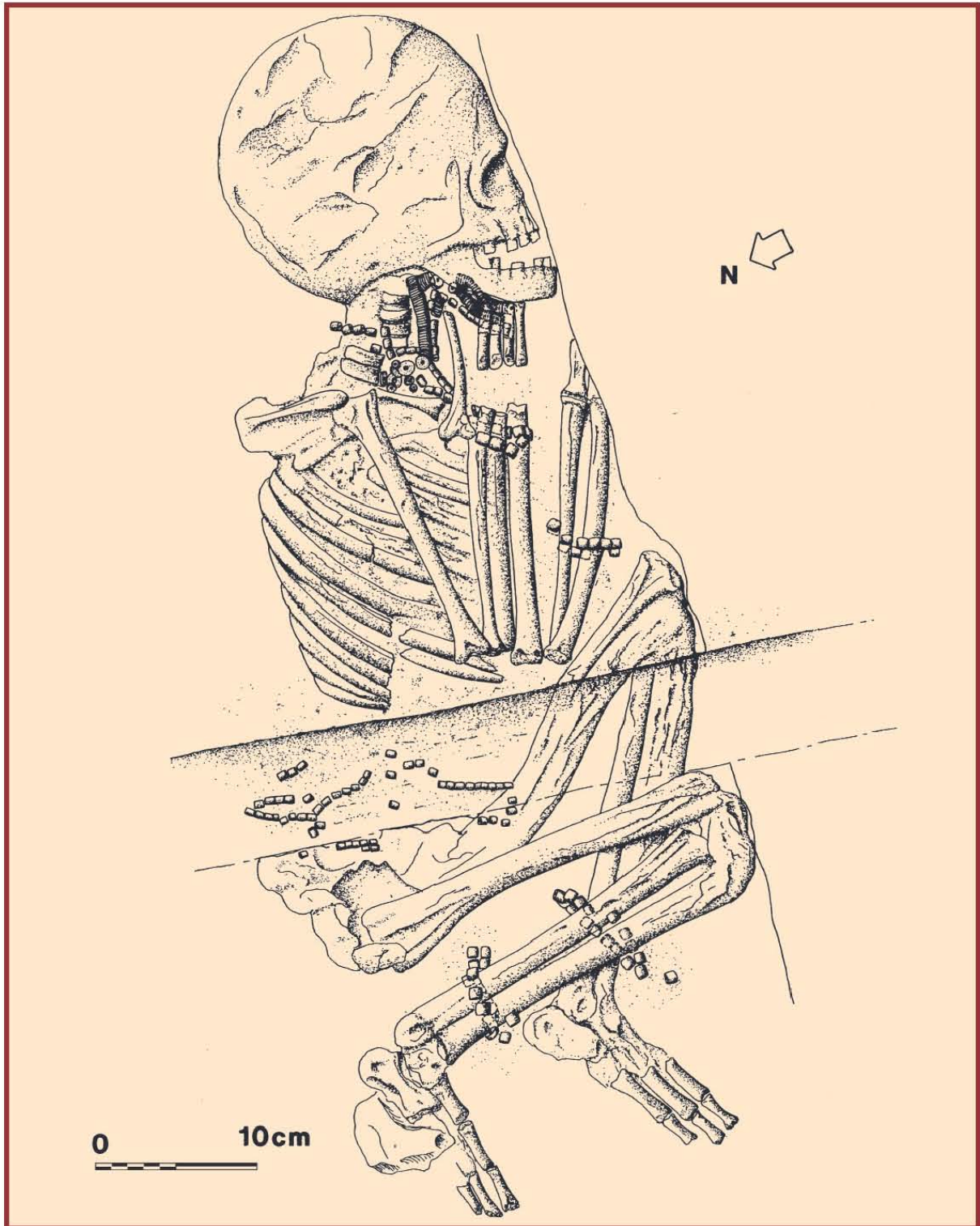


Figure 111: Mehrgarh 1999. Burial 241, Graveyard 9, Period I.

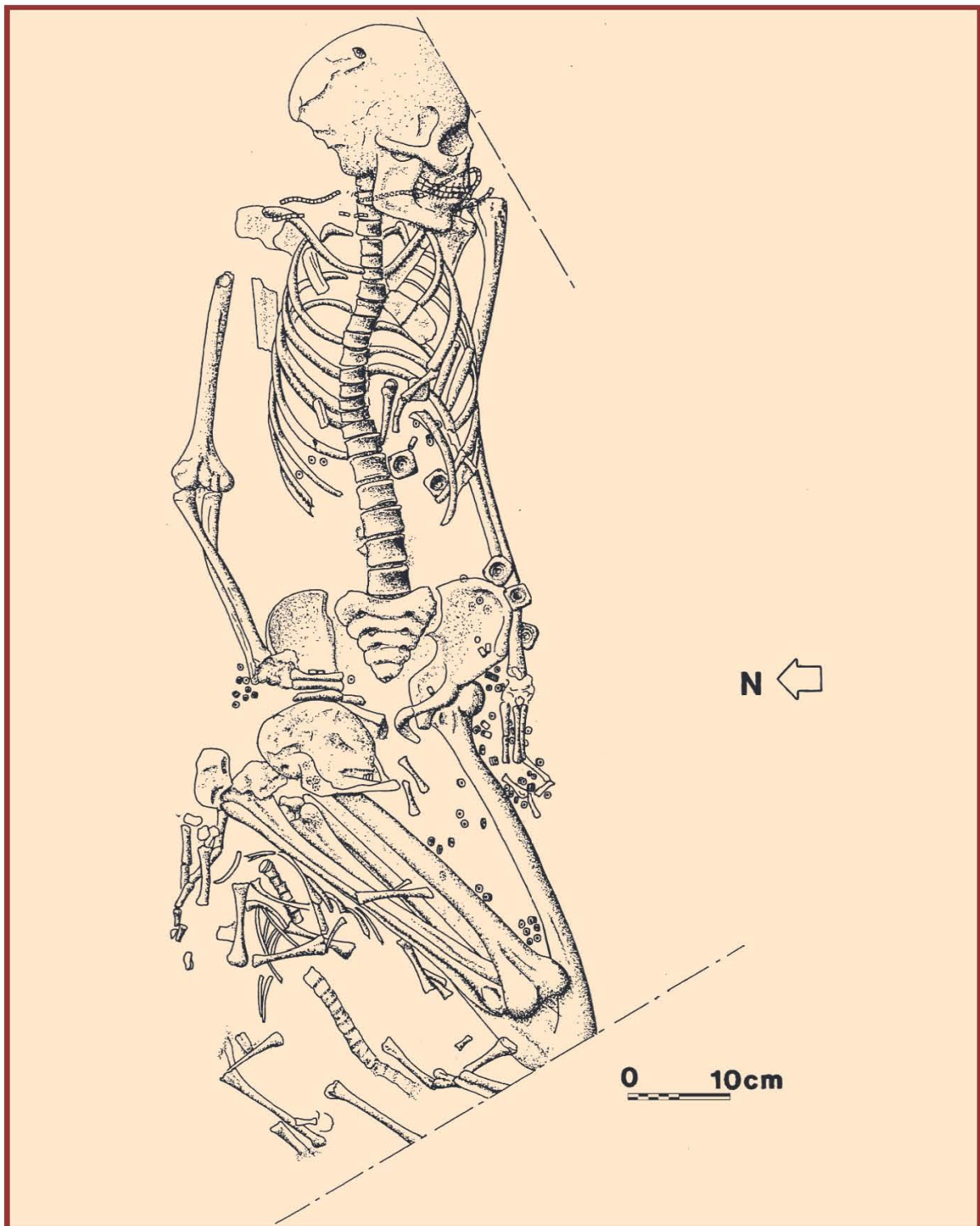


Figure 112: Mehrgarh 1999. Burial 250, Graveyard 5, Period I.

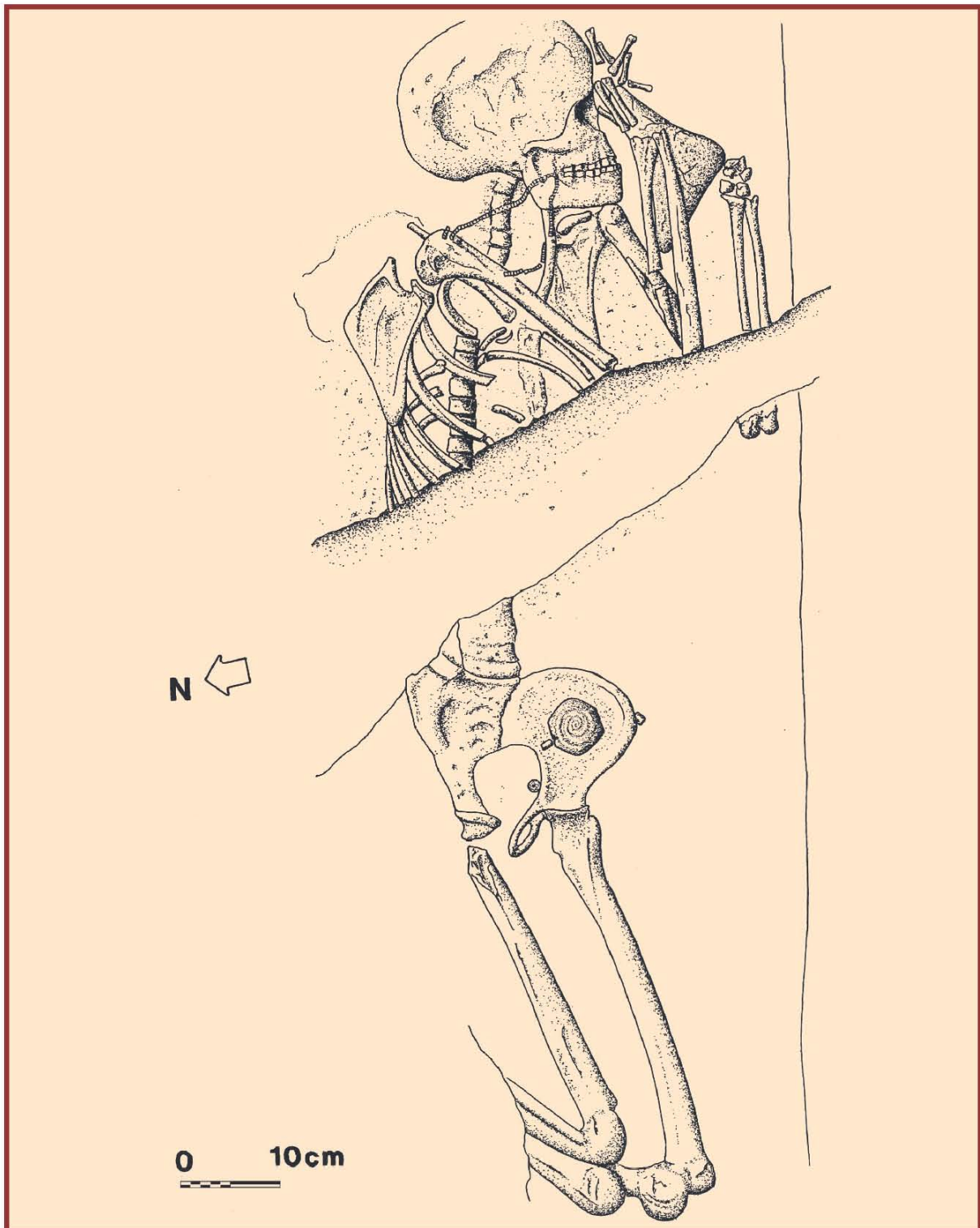


Figure 113: Mehrgarh 1999. Burial 258, Graveyard 9, Period I.

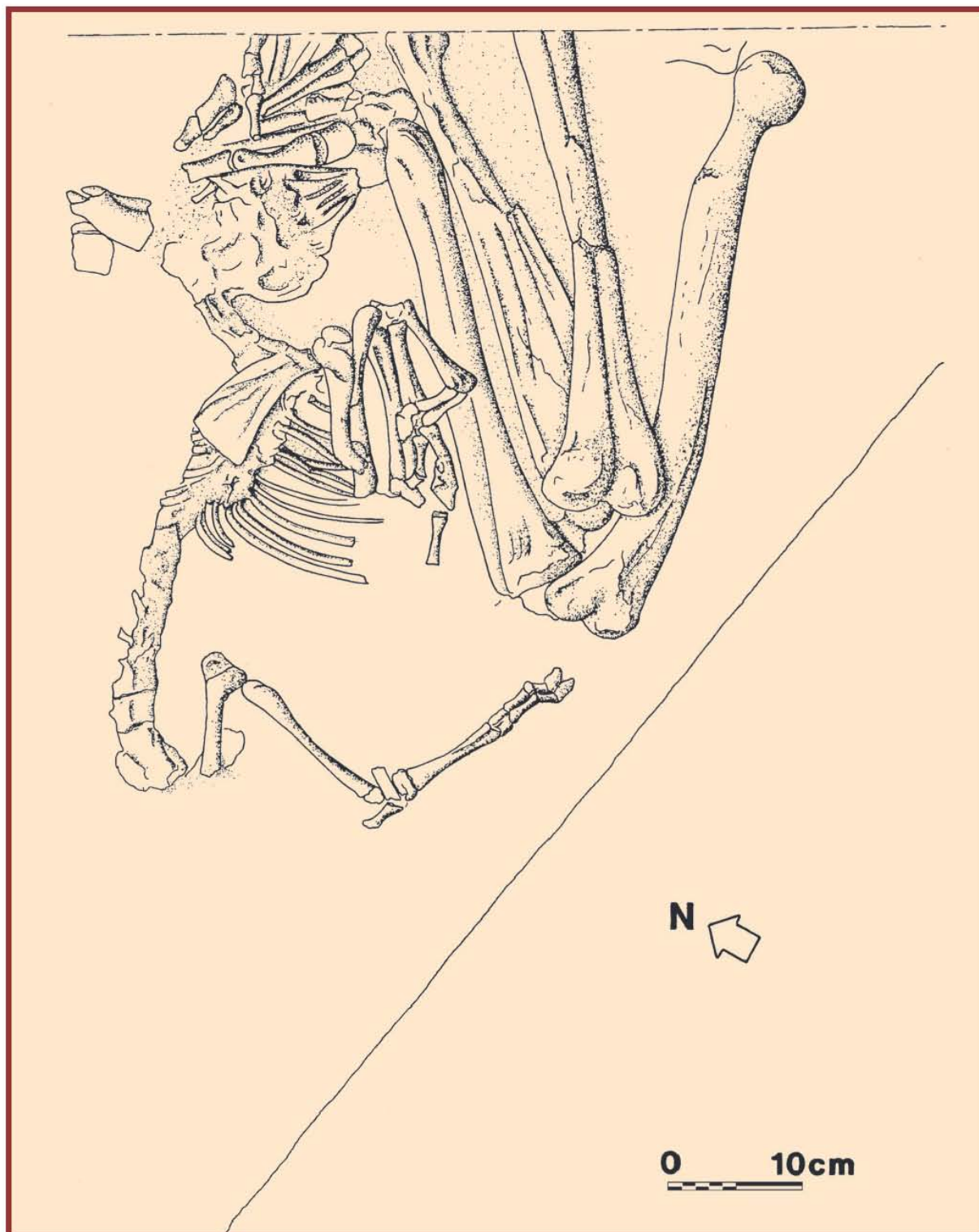
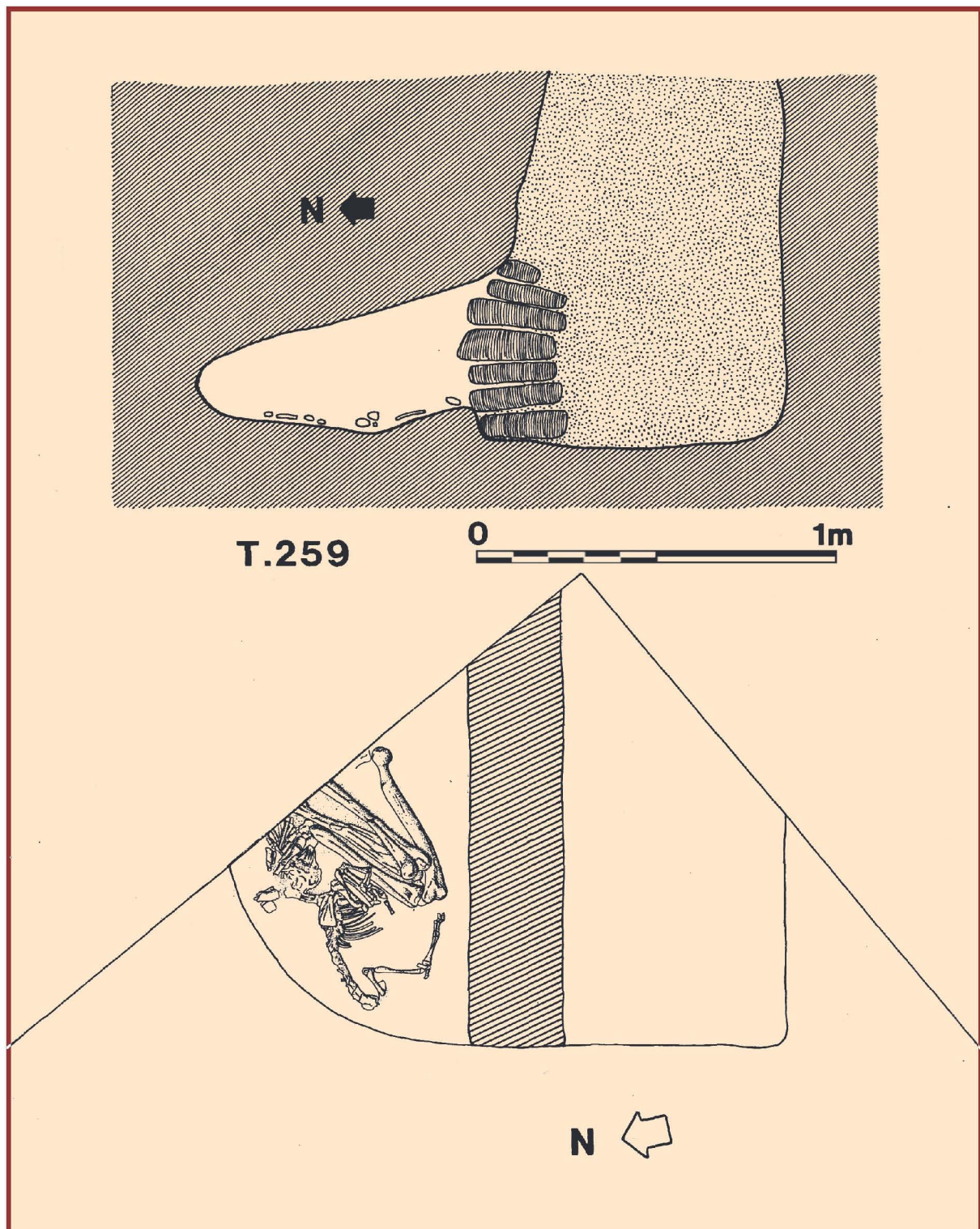


Figure 114: Mehrgarh 1999. Burial 259, Graveyard 3, Period I.



**Figure 115:** Mehrgarh 1999. Cross-section (transverse South-North) viewed from the West at the level of the feet of the deceased and plan of Burial 259. Graveyard 3, Period I.

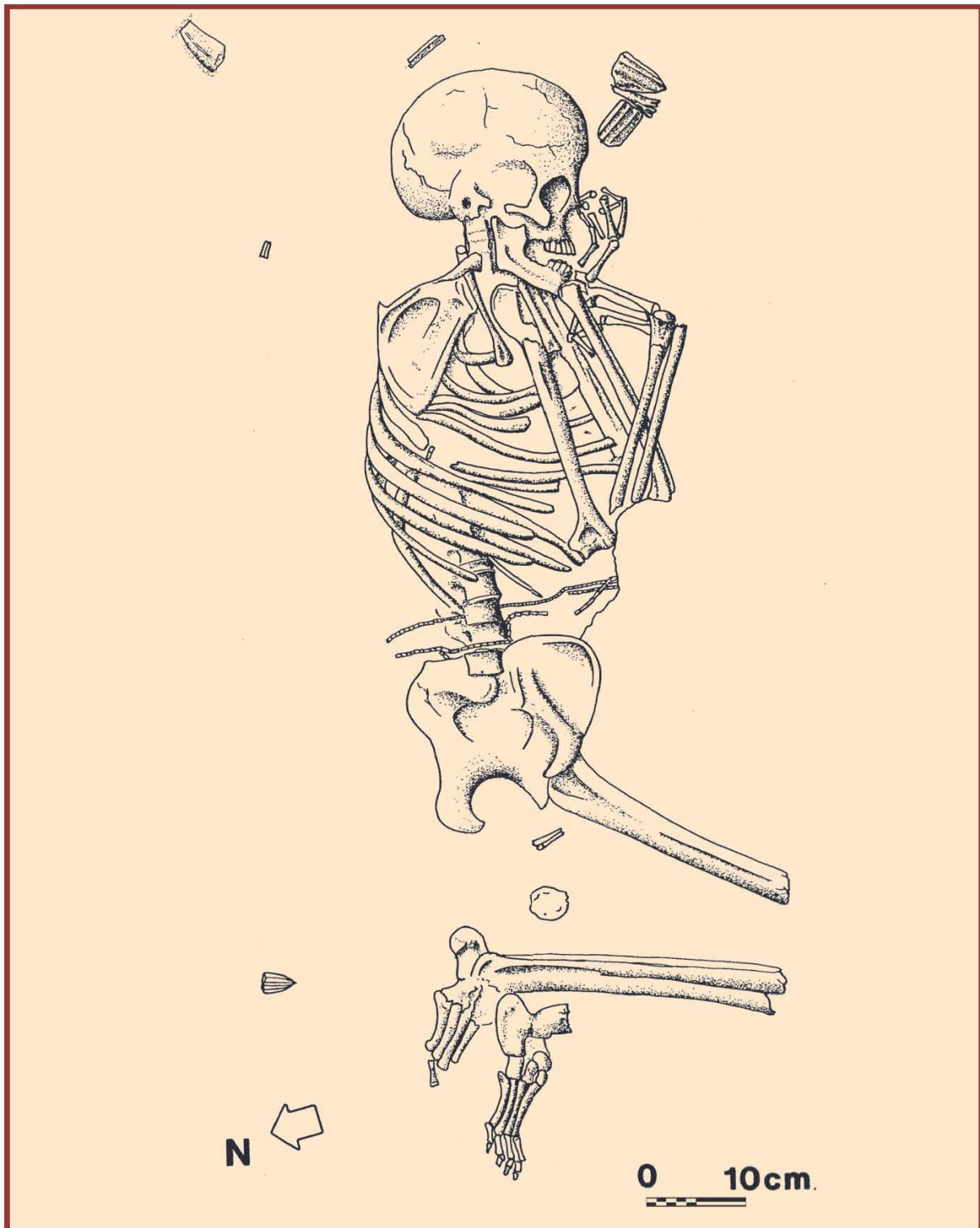


Figure 116: Mehrgarh 1999. Burial 262, Graveyard 8, Period I.

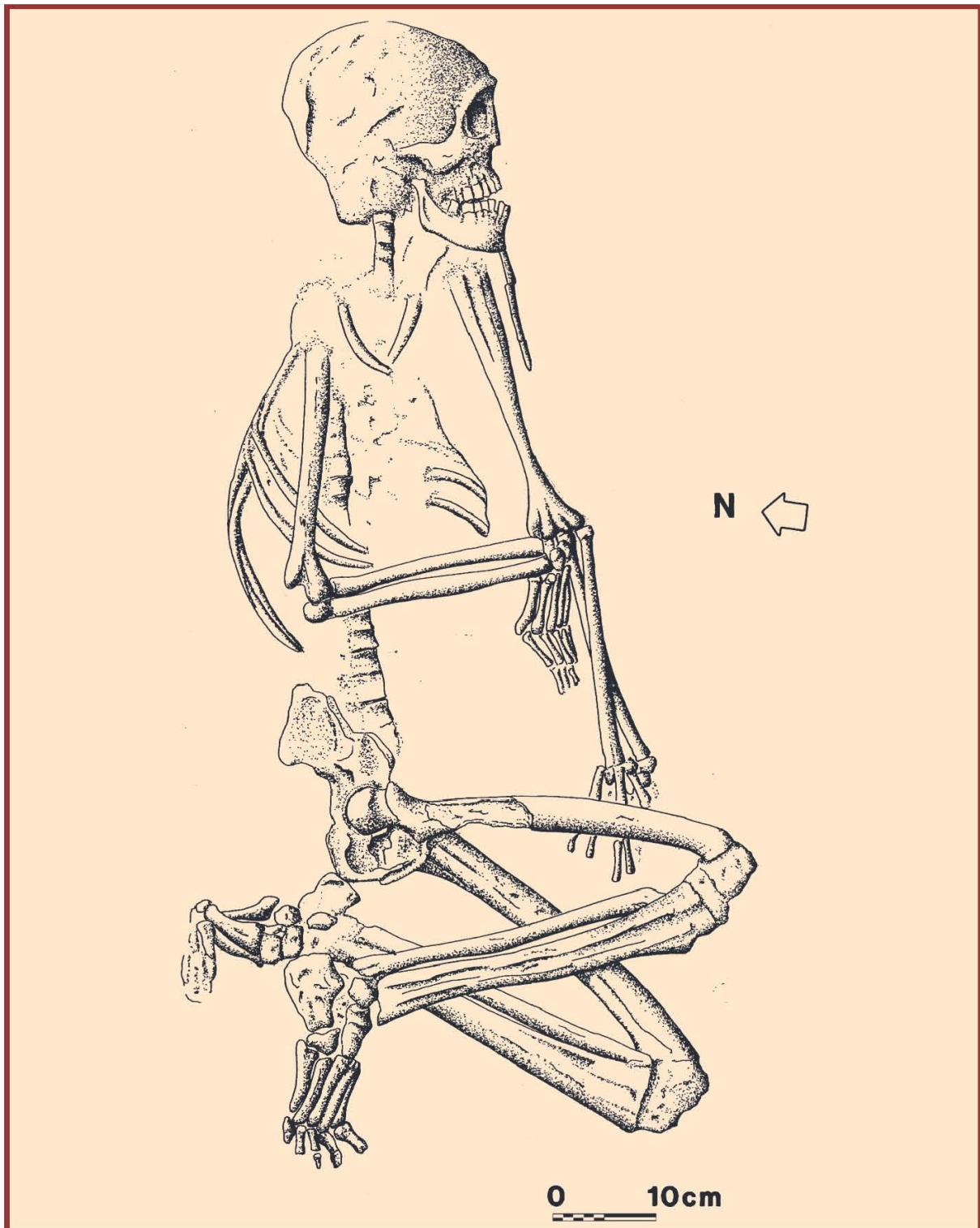


Figure 117: Mehrgarh 1999. Burial 265, Graveyard 8, Period I.

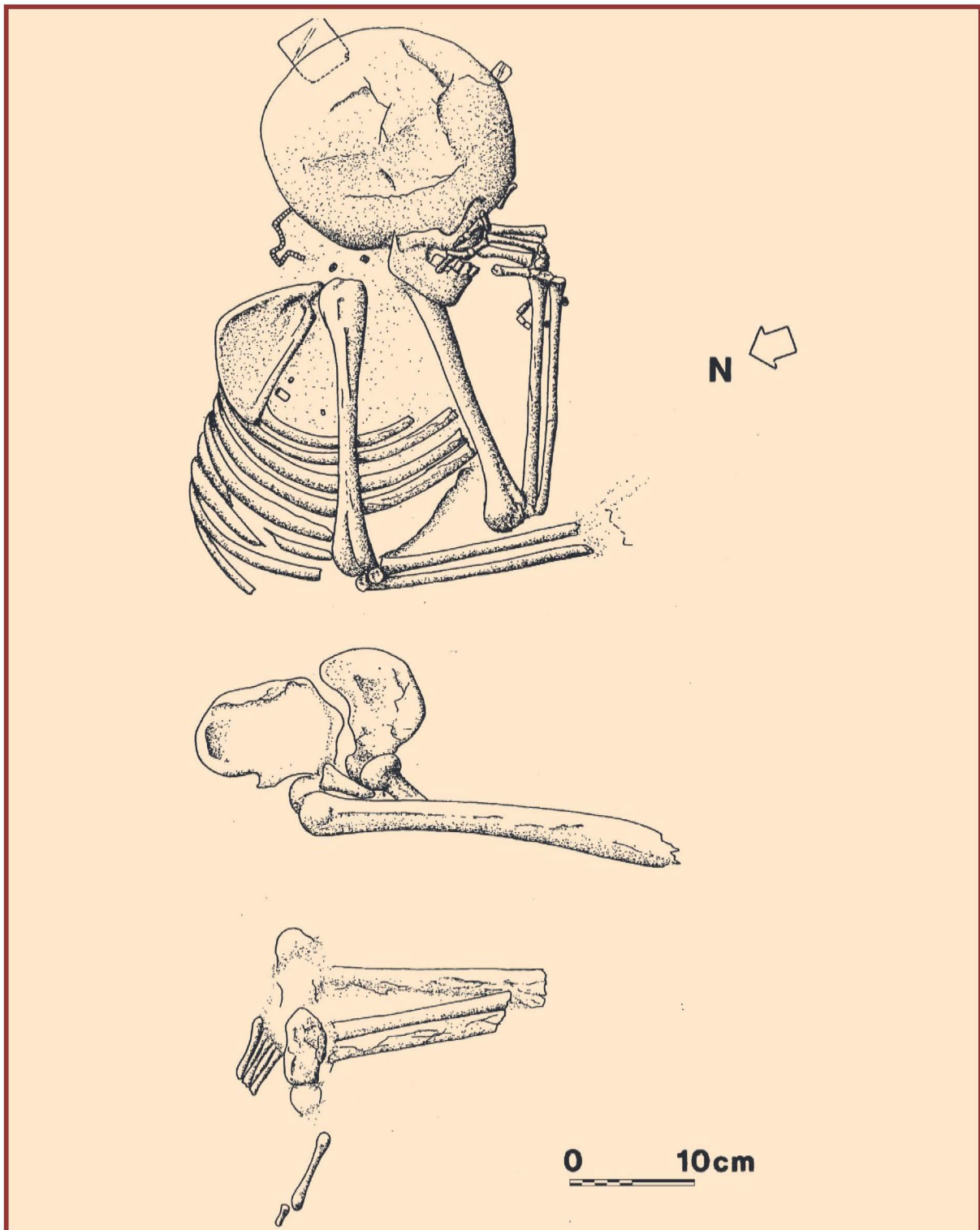


Figure 118: Mehrgarh 1999. Burial 268, Graveyard 8, Period I.

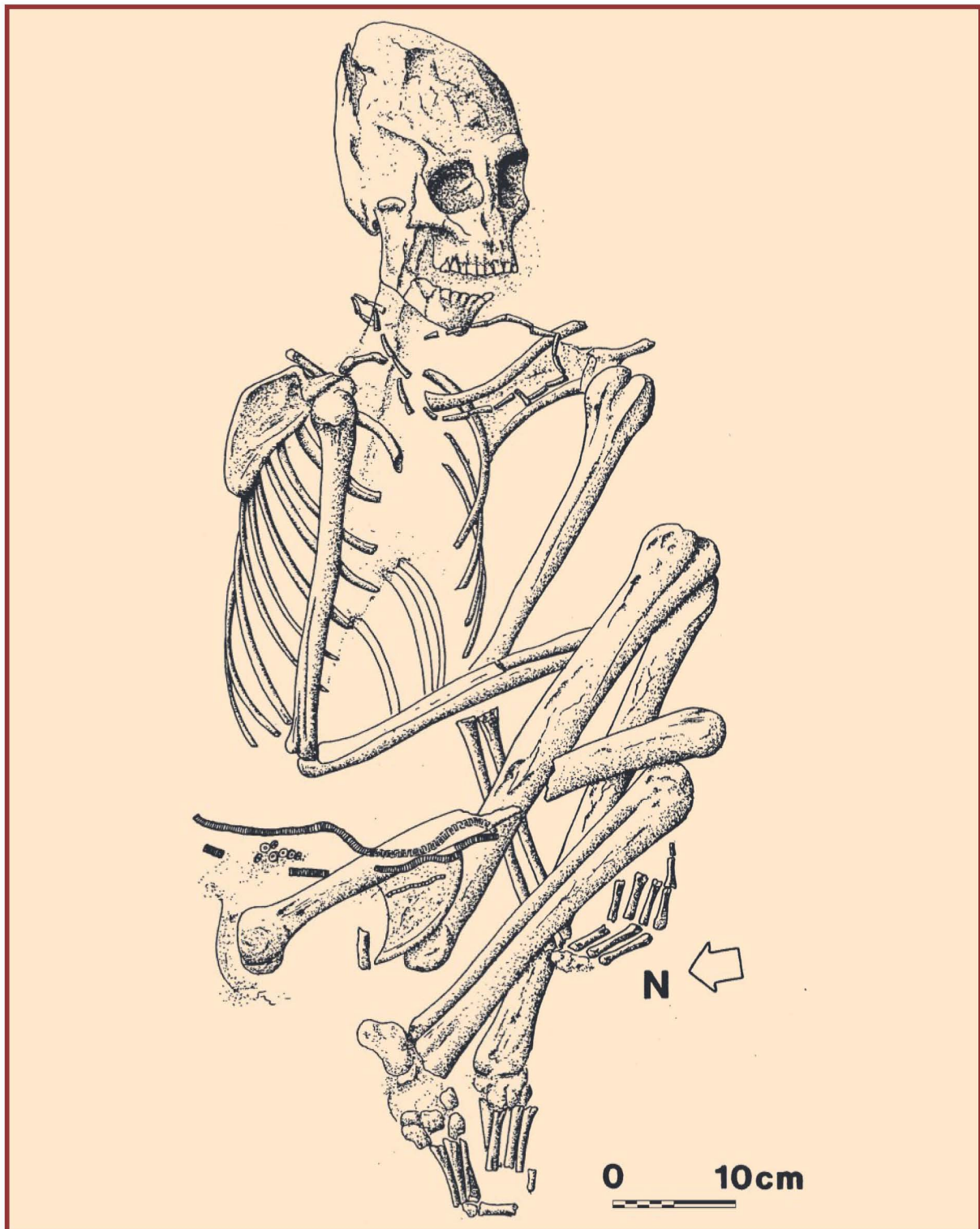


Figure 119: Mehrgarh 1999. Burial 269, Graveyard 8, Period I.

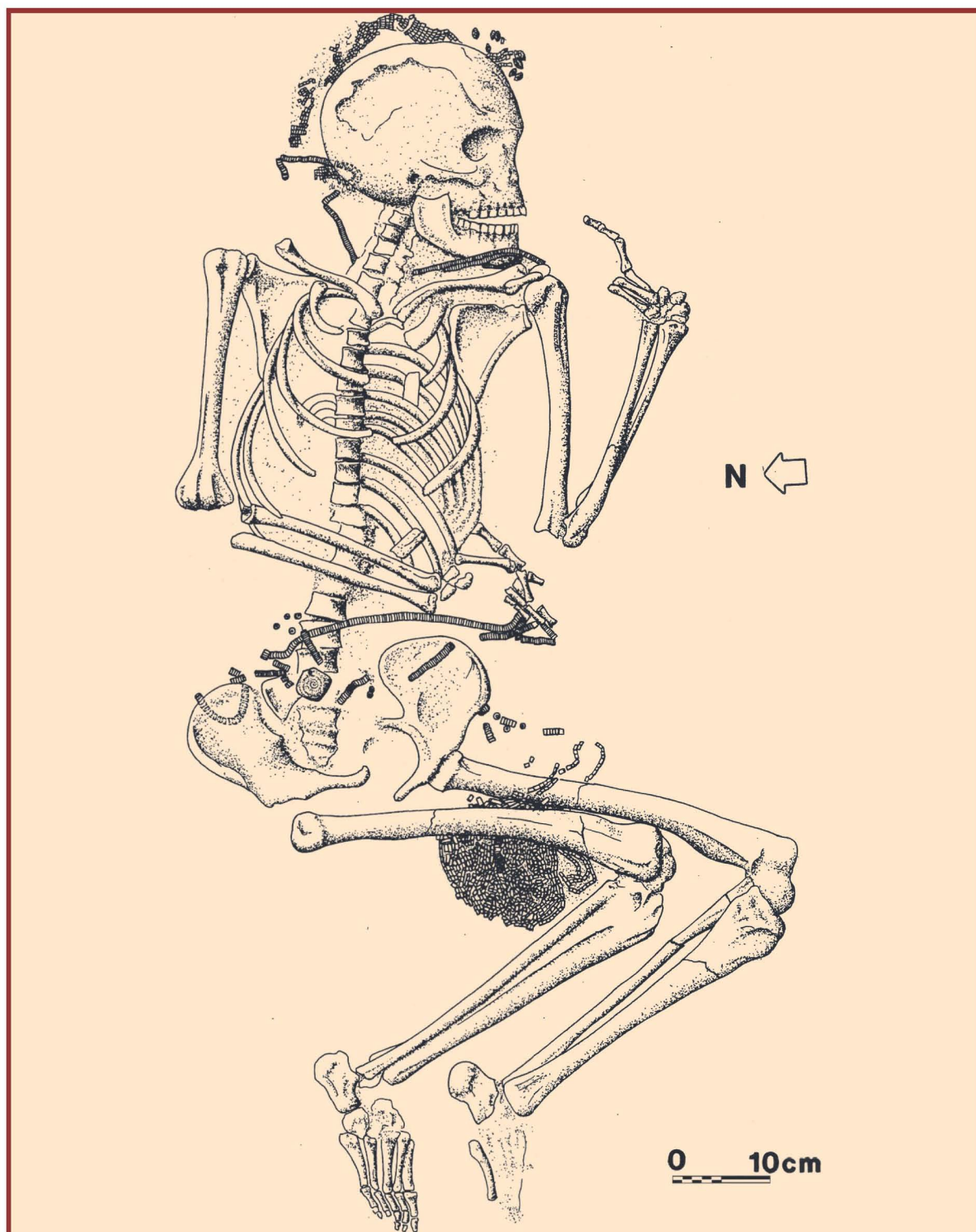


Figure 120: Mehrgarh 1999. Burial 274, Graveyard 5, Period I.

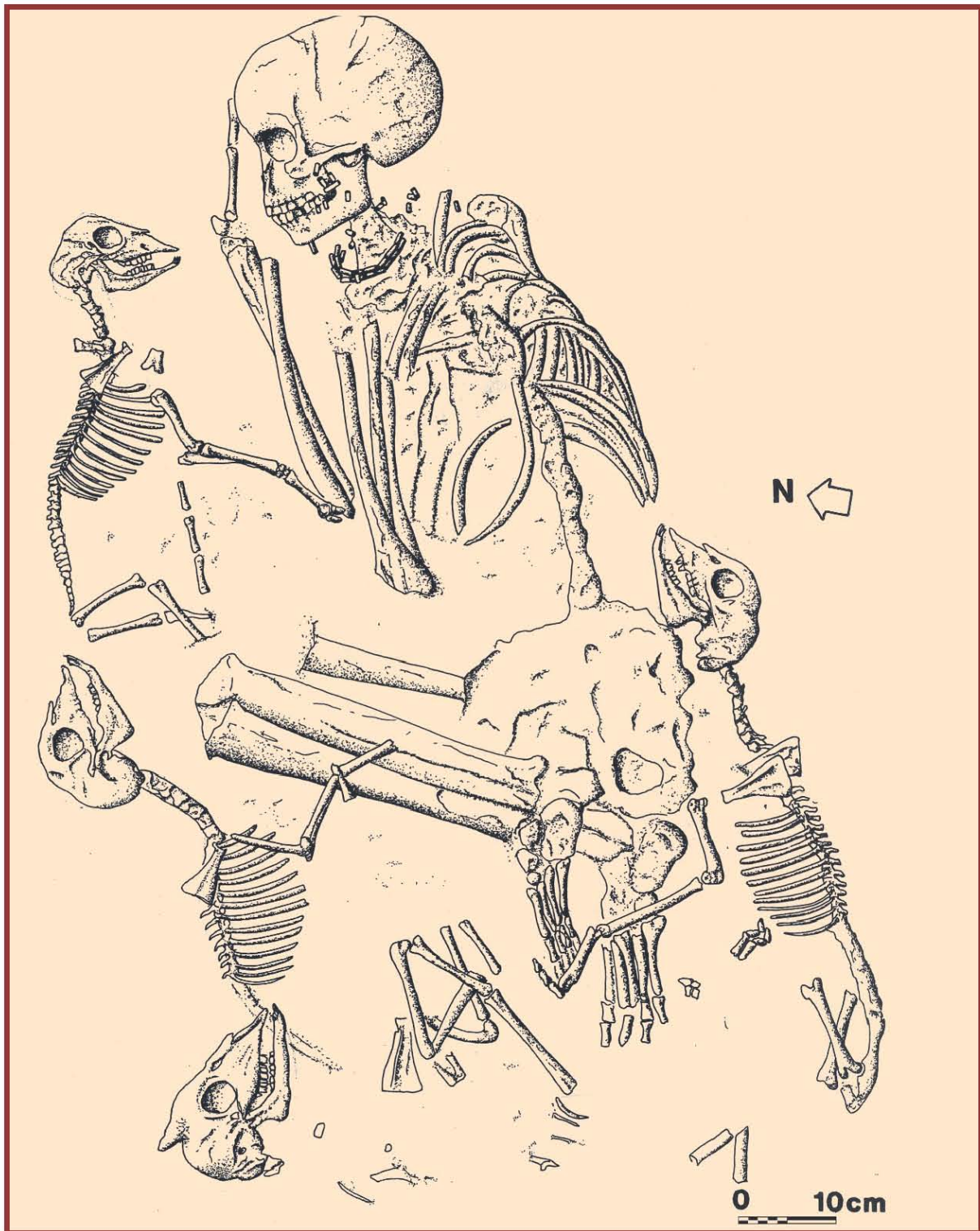


Figure 121: Mehrgarh 1999. Burial 276, Graveyard 2, Period I.

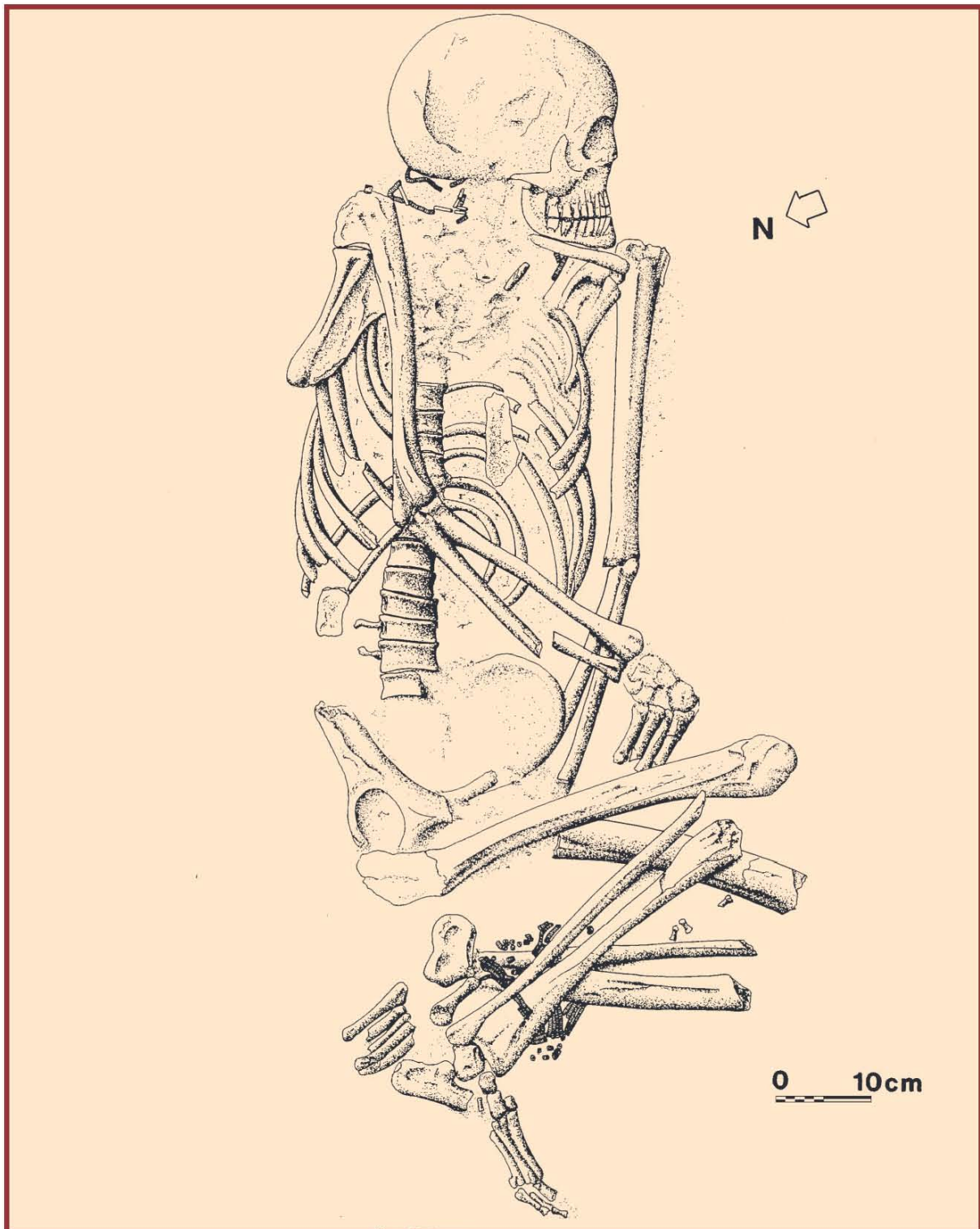


Figure 122: Mehrgarh 1999. Burial 277, Graveyard 2, Period I.

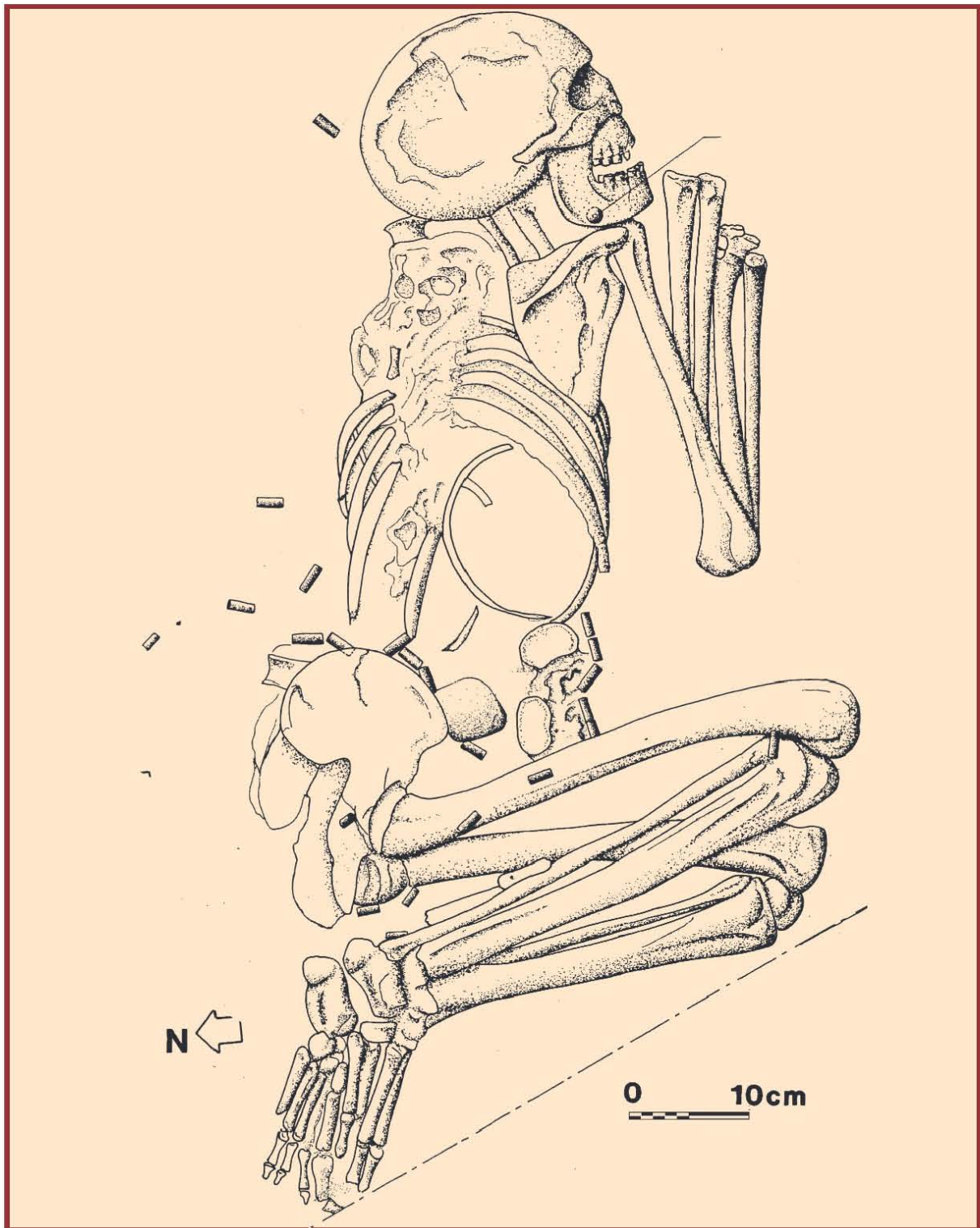


Figure 123: Mehrgarh 1999. Burial 279, Graveyard 5, Period I.

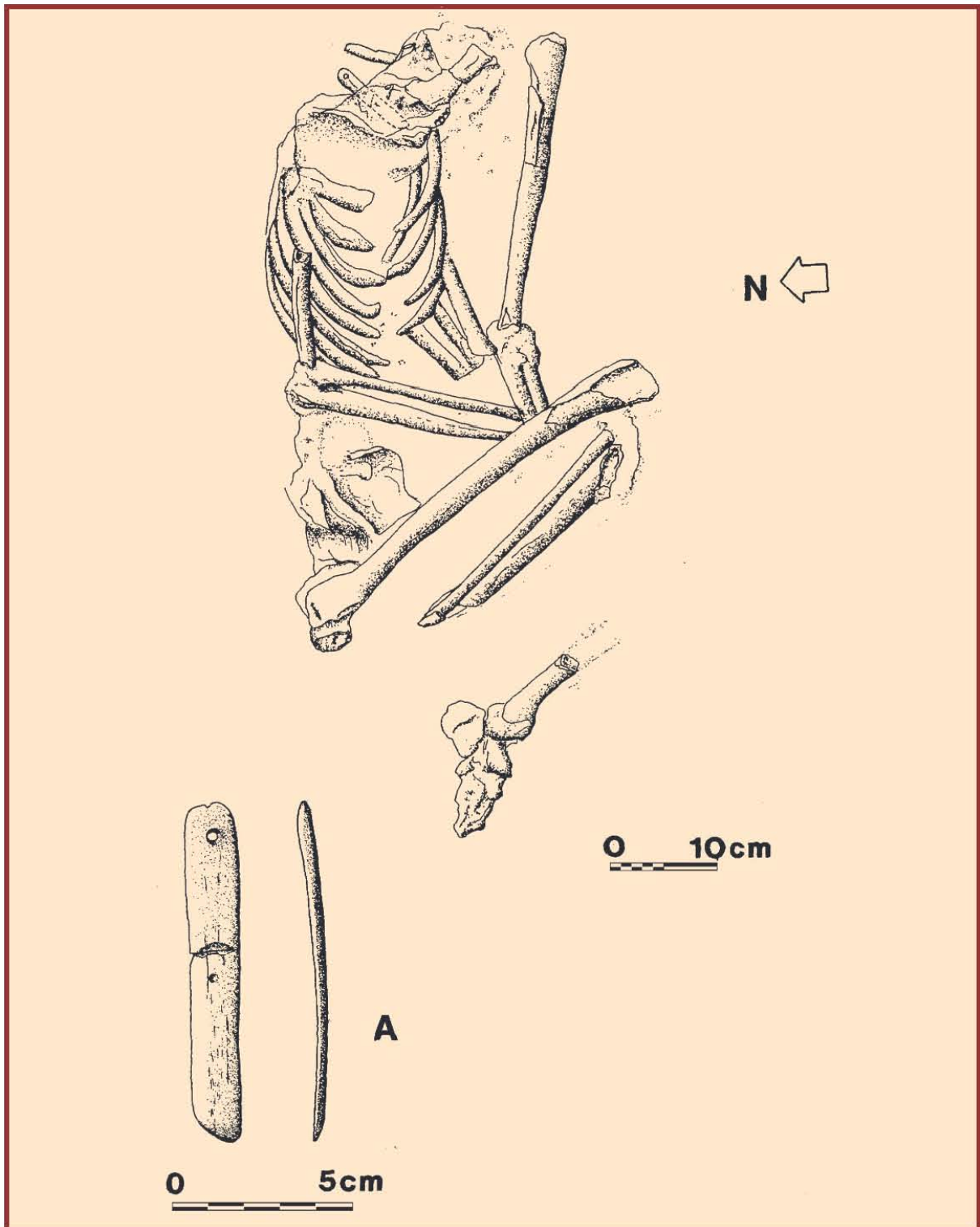


Figure 124: Mehrgarh 1999. Burial 280, Graveyard 1 and Grave good A- MR 99 03 280 01, Period I.

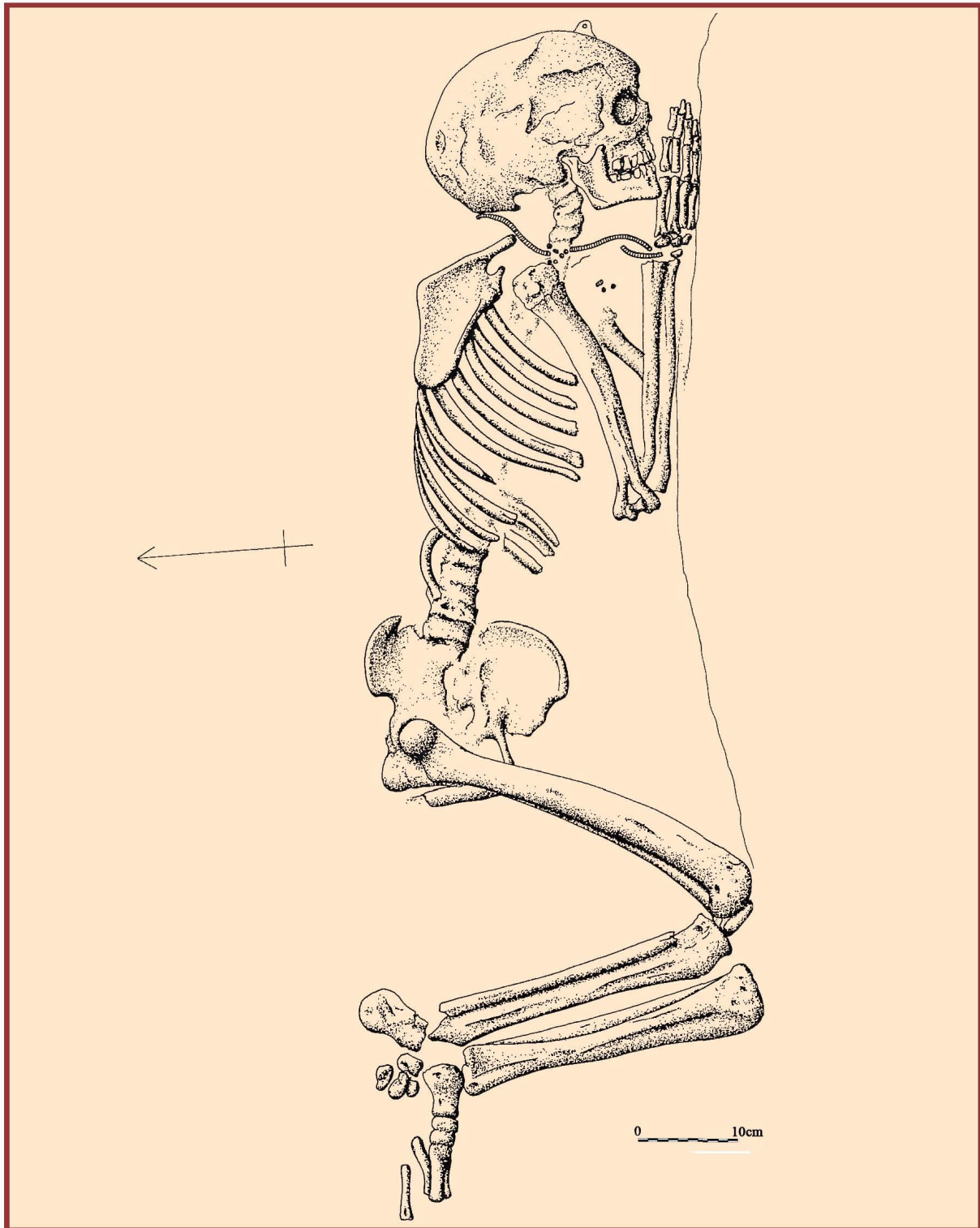


Figure 125: Mehrgarh 2000 , Burial 264 Graveyard 8. Period I.

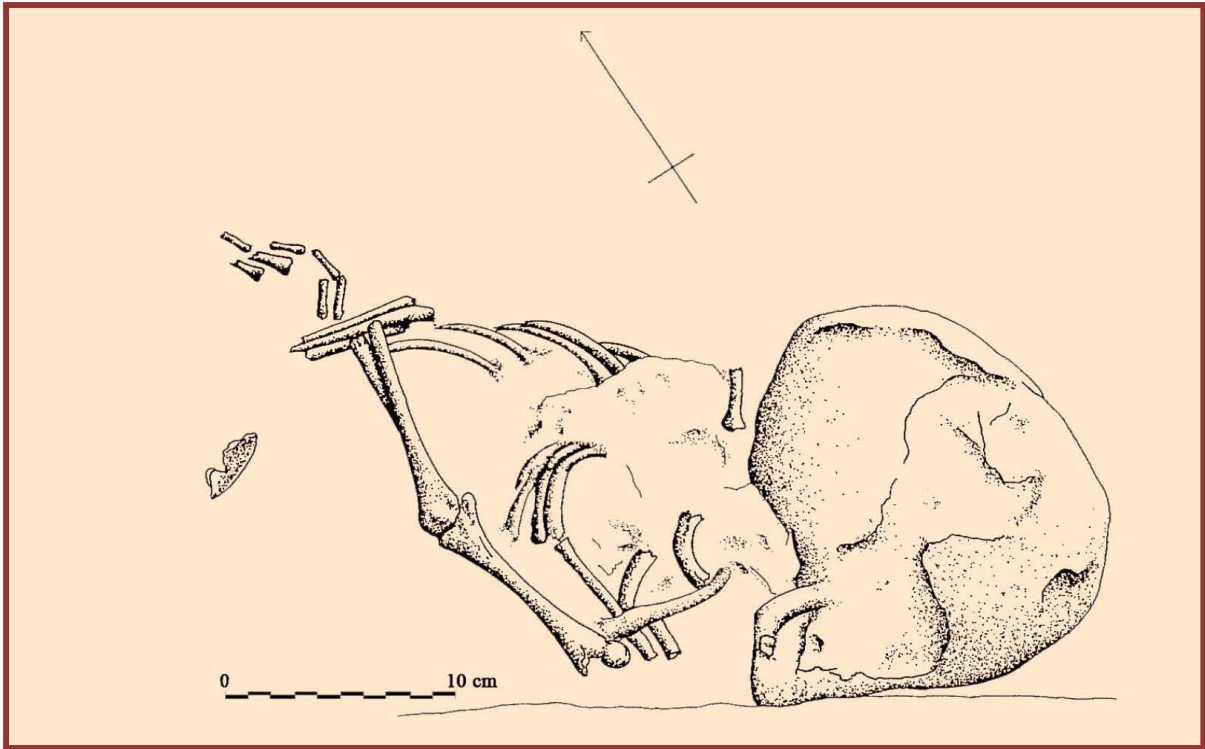


Figure 126: Mehrgarh 2000. Burial 284, Graveyard 9. Period I.

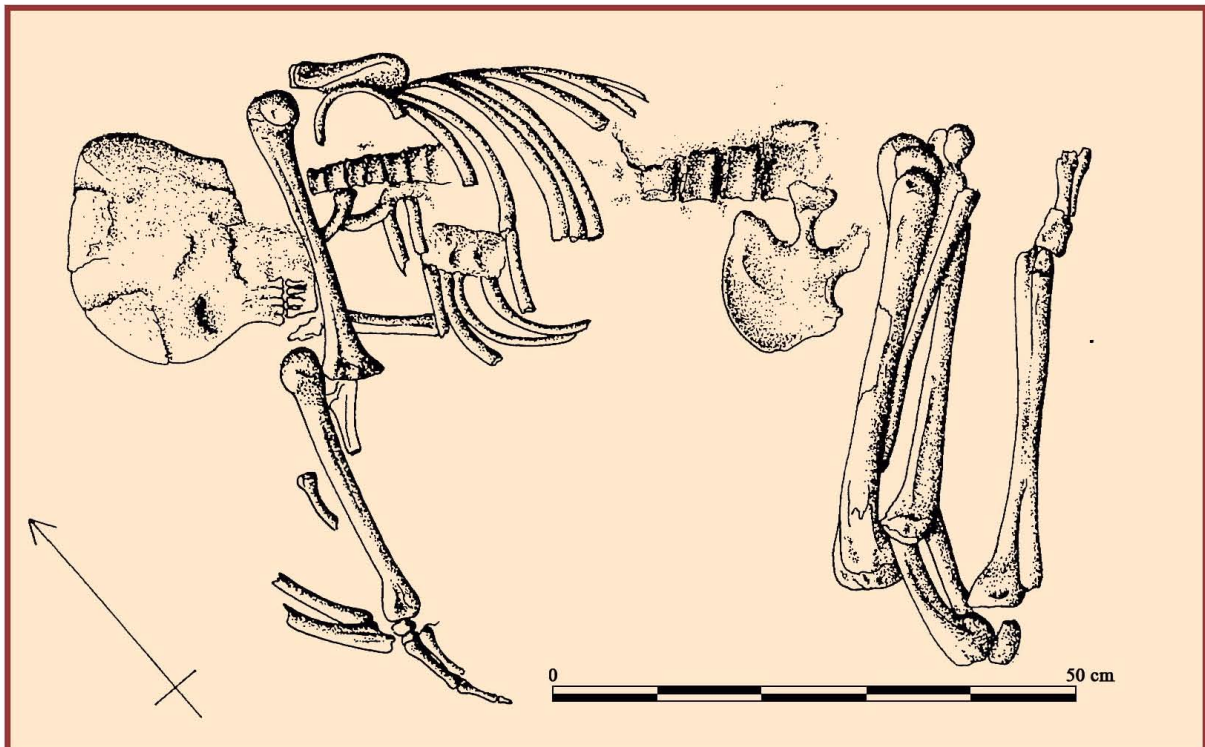
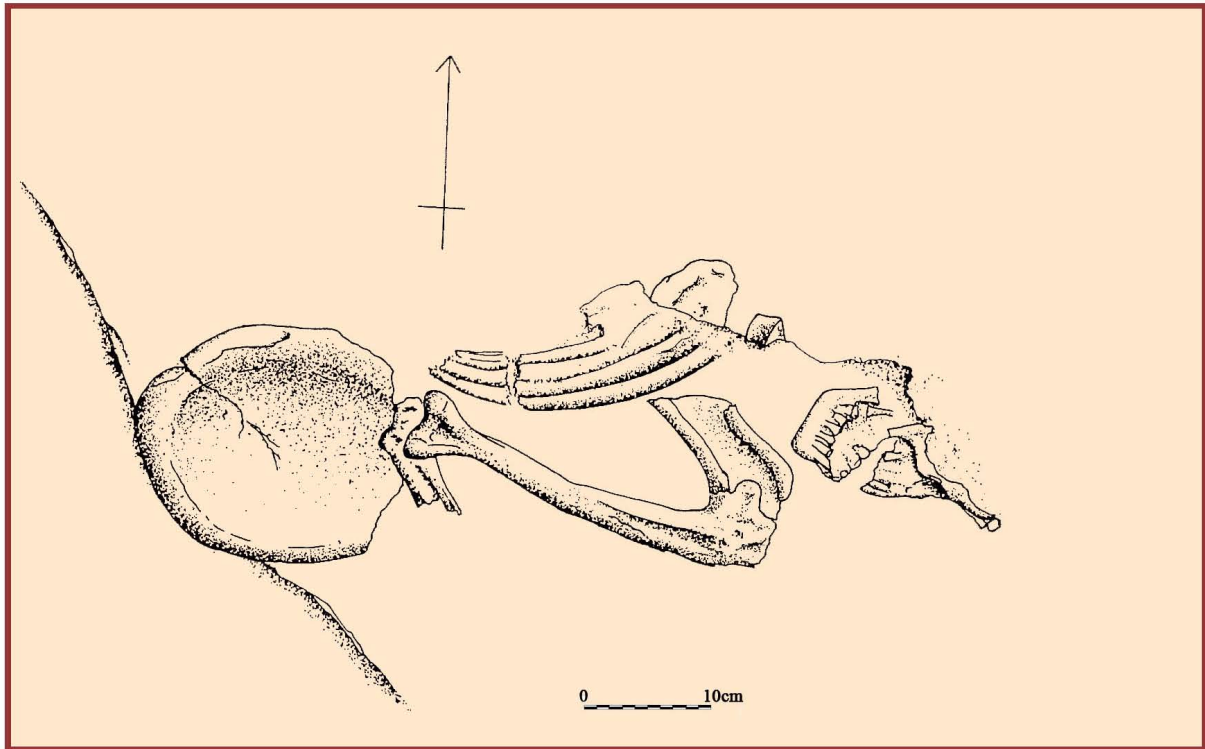
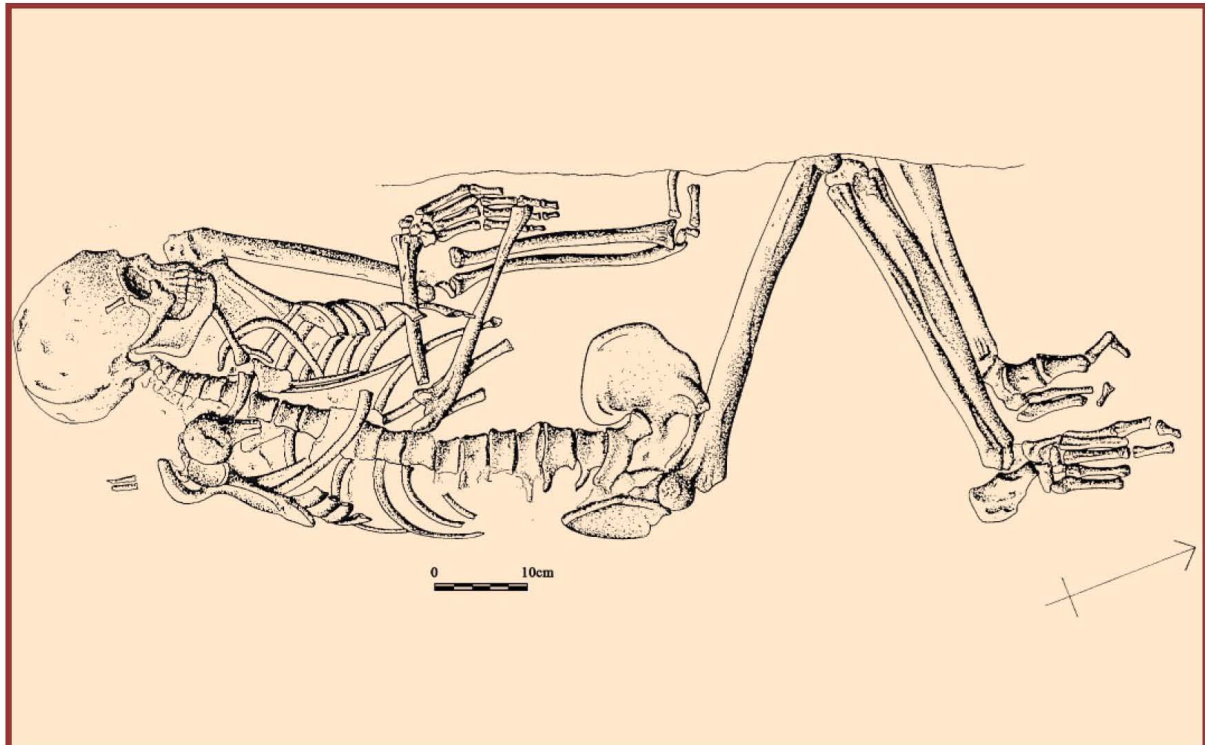


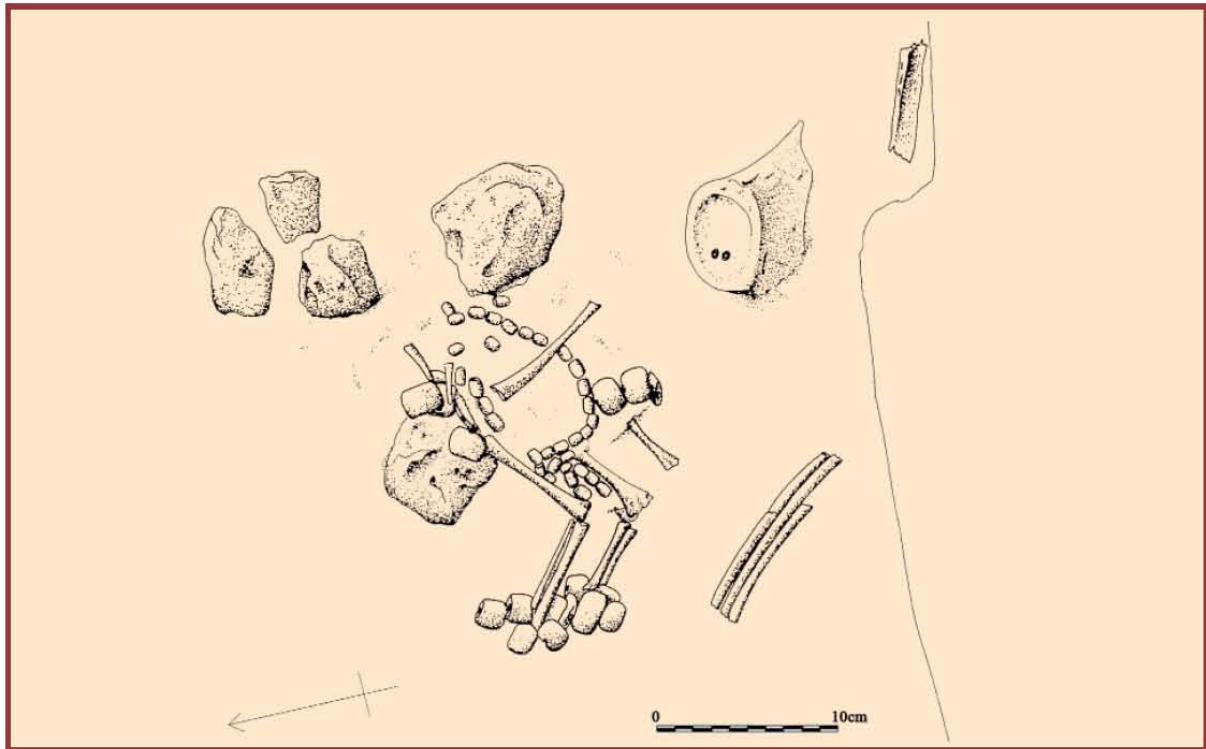
Figure 127: Mehrgarh 2000. Burial 285, Graveyard 9. Period I.



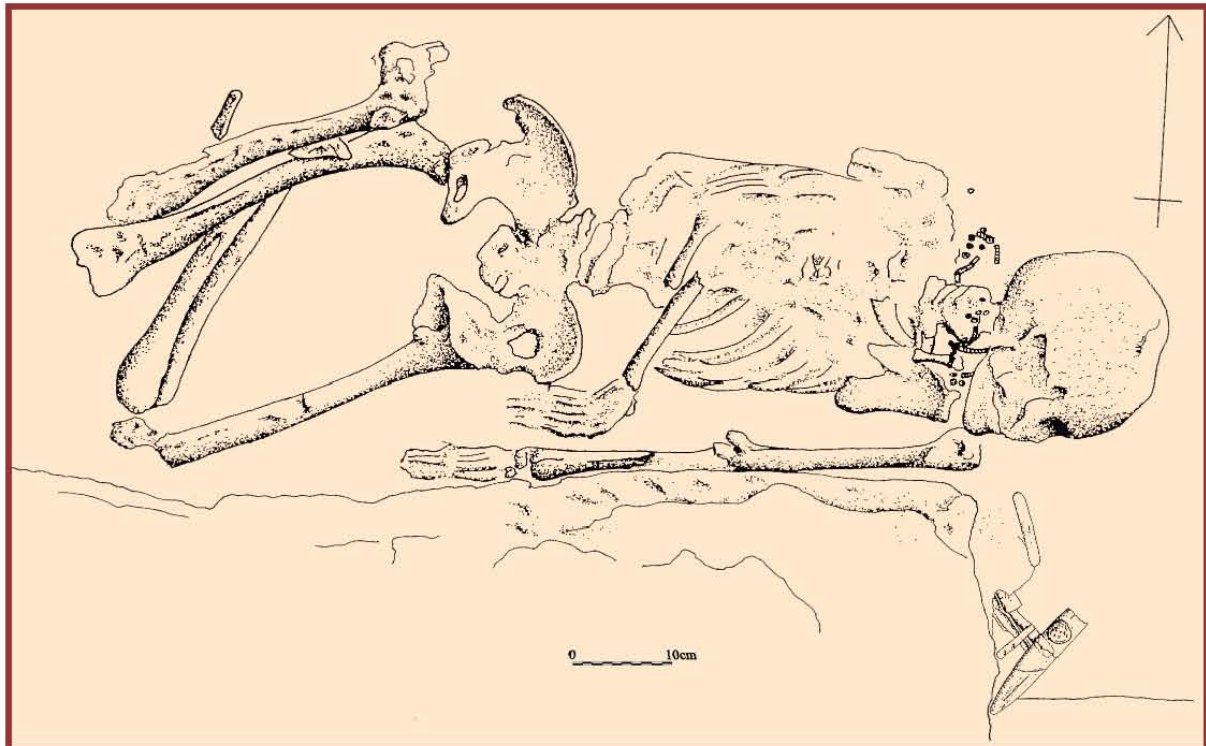
**Figure 128:** Mehrgarh 2000. Burial 286, Graveyard 9. Period I.



**Figure 129:** Mehrgarh 2000. Burial 288, Graveyard 8. Period I.



**Figure 130:** Mehrgarh 2000. Burial 289, Graveyard 8. Period I.



**Figure 131:** Mehrgarh 2000. Burial 290, Graveyard 9. Period I.

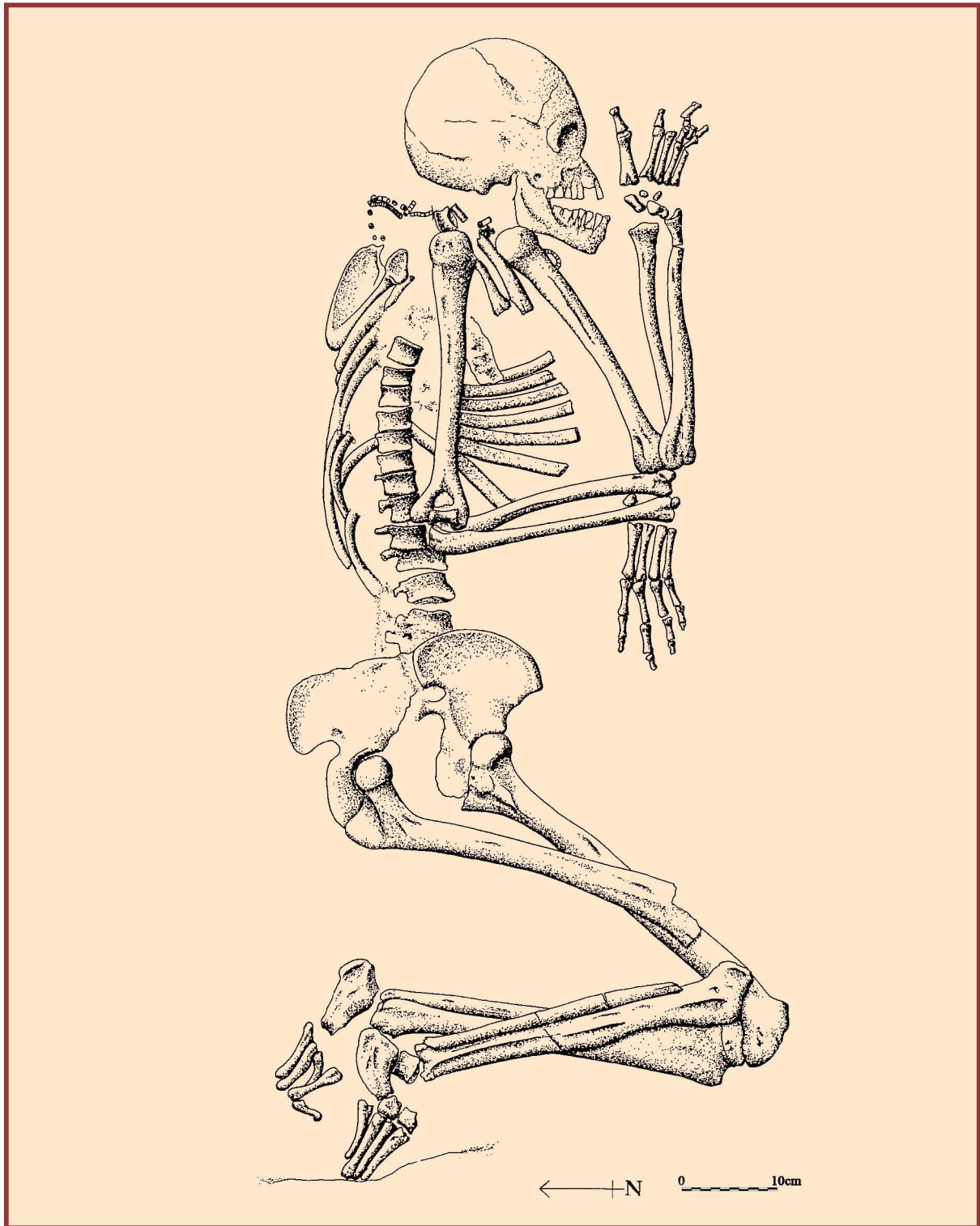


Figure 132: Mehrgarh 2000, Burial 291, Graveyard 7, Period I.

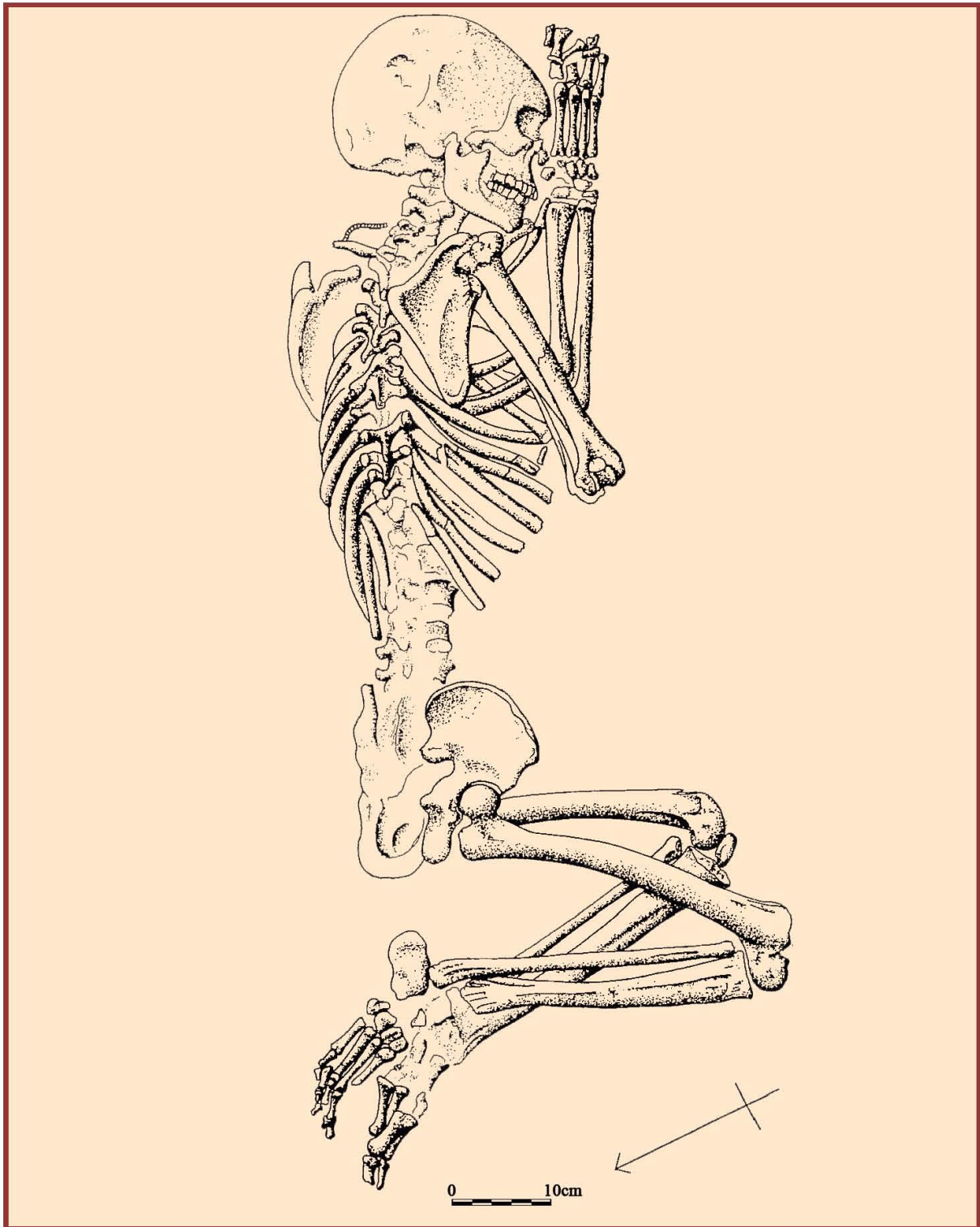


Figure 133: Mehrgarh 2000 Burial 292, Graveyard 7, Period I.

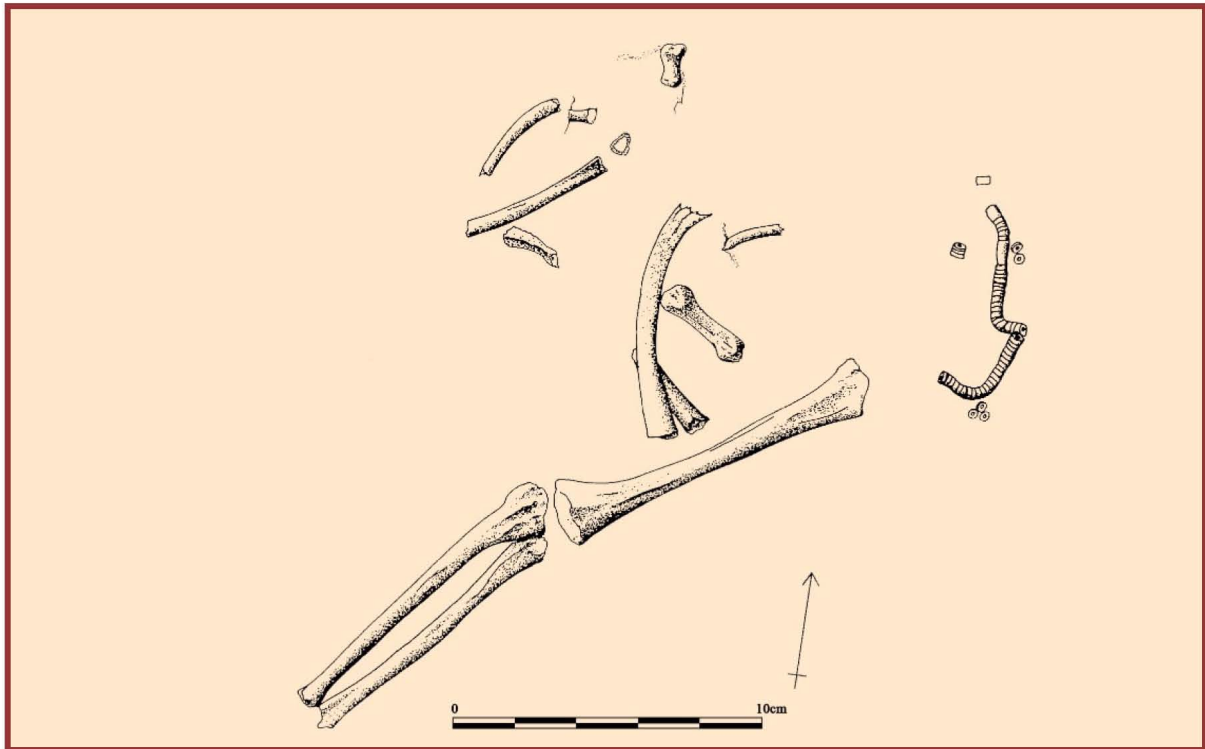


Figure 134: Mehrgarh 2000. Burial 293, Graveyard 8. Period I

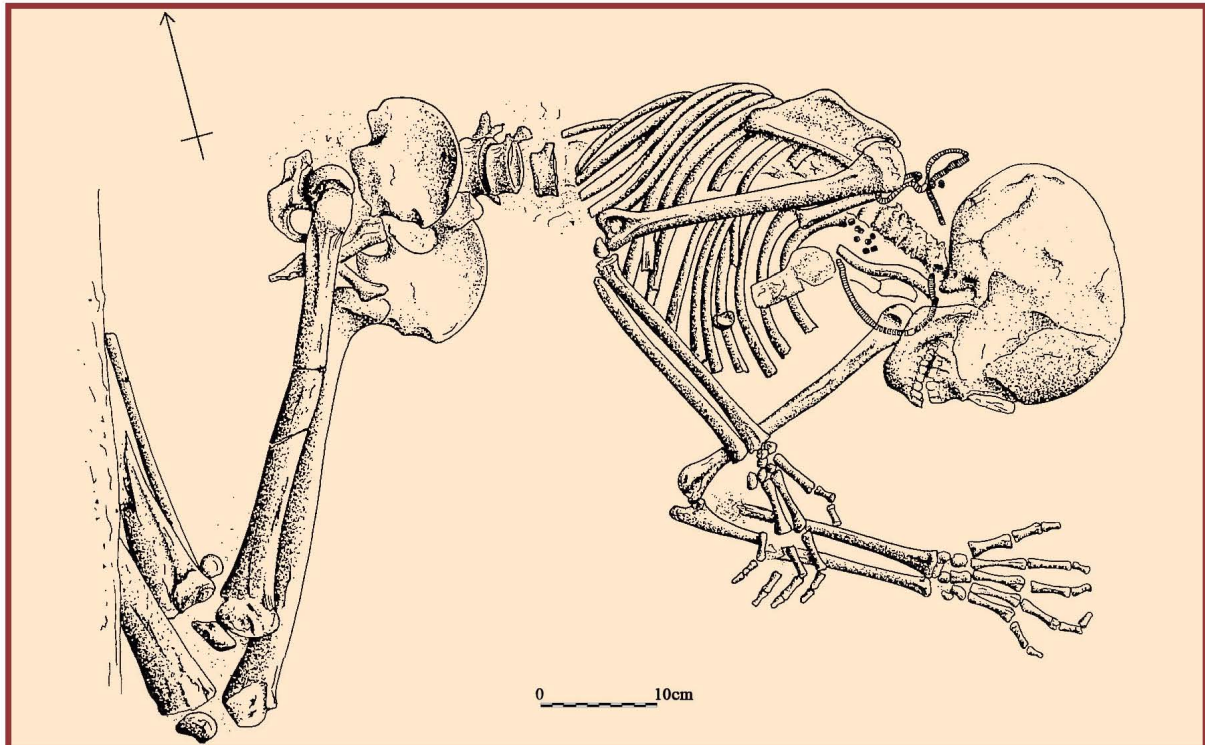


Figure 135: Mehrgarh 2000. Burial 294, Graveyard 8. Period I.

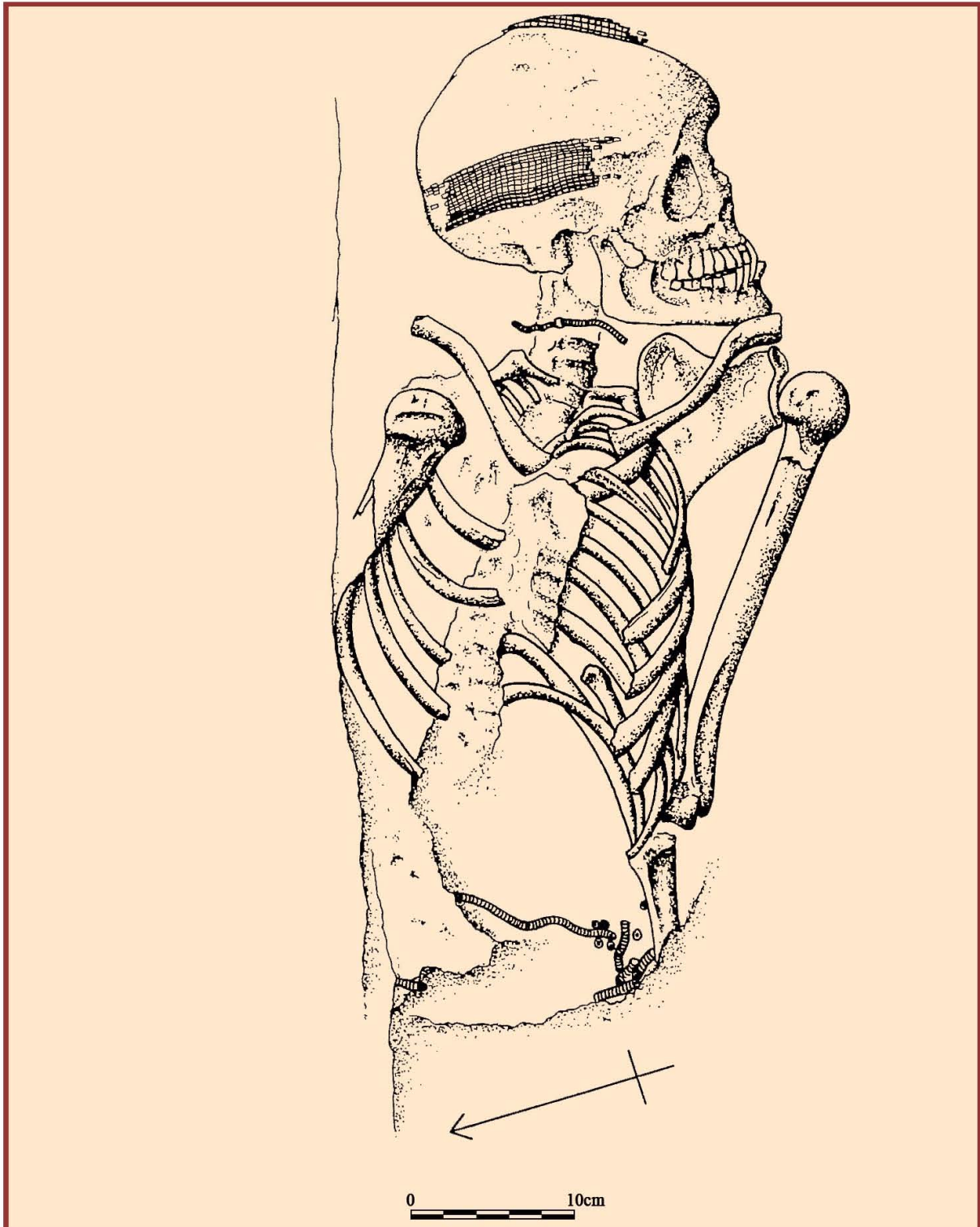


Figure 136: Mehrgarh 2000 Burial 295, Graveyard 8, Period I.

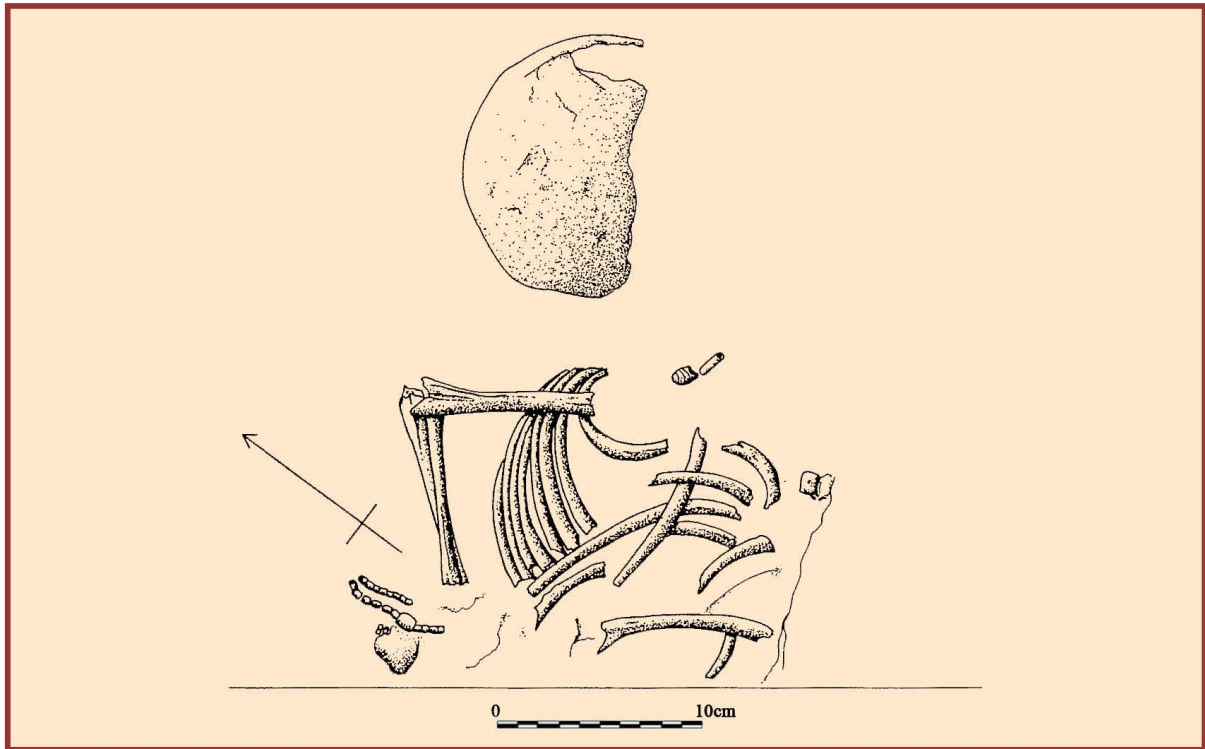


Figure 137: Mehrgarh 2000. Burial 500, Graveyard 4. Period I.

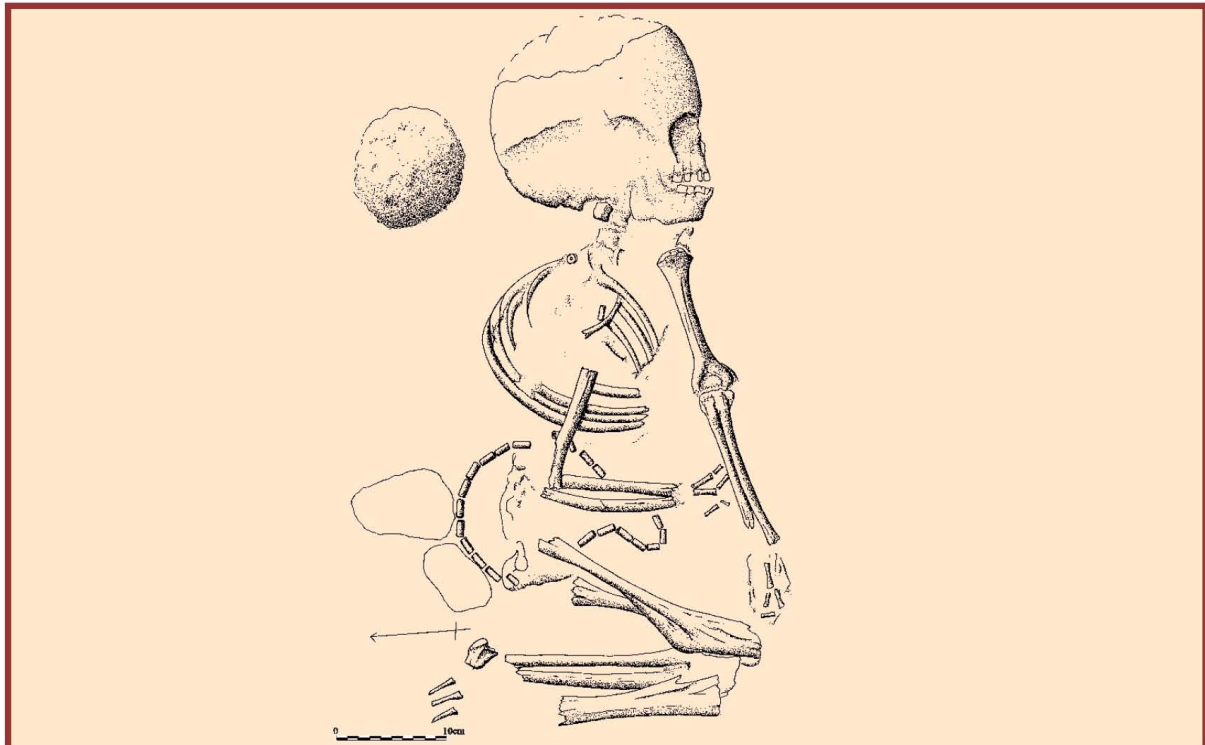


Figure 138: Mehrgarh 2000. Burial 501, Graveyard 4. Period I.

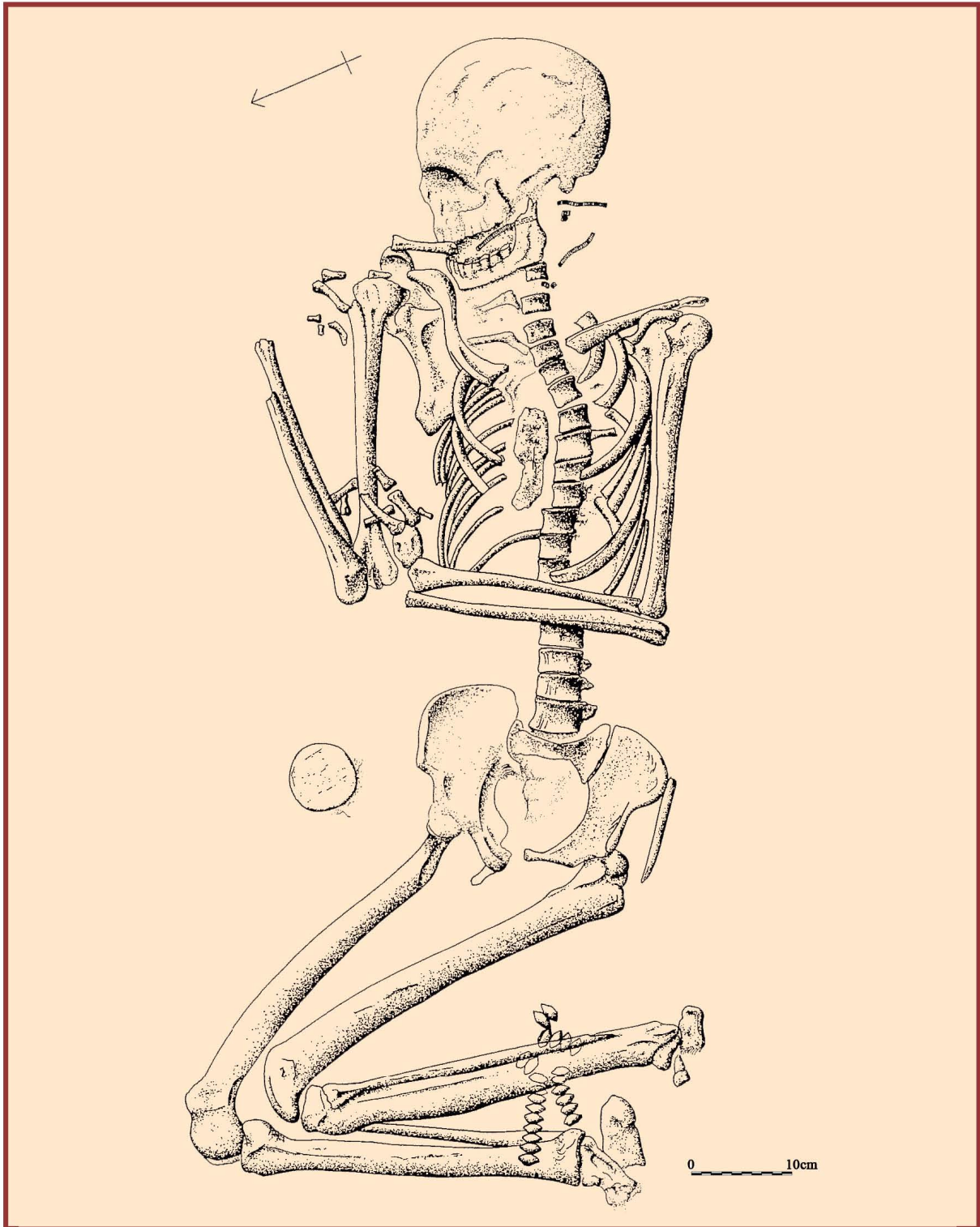


Figure 139: Mehrgarh 2000. Burial 502, Graveyard 3. Period I.

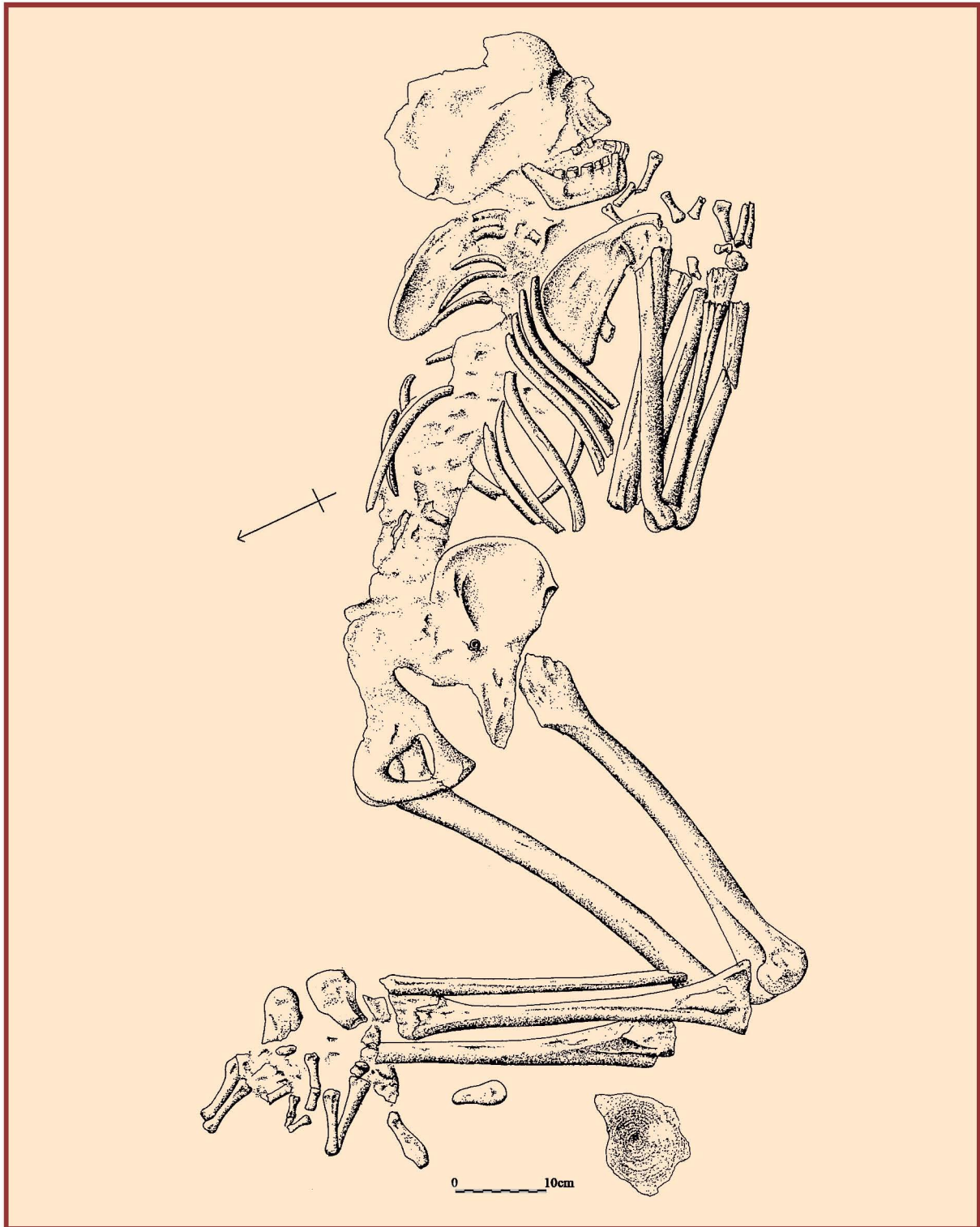


Figure 140: Mehrgarh 2000. Burial 503, Graveyard 4, Period I.

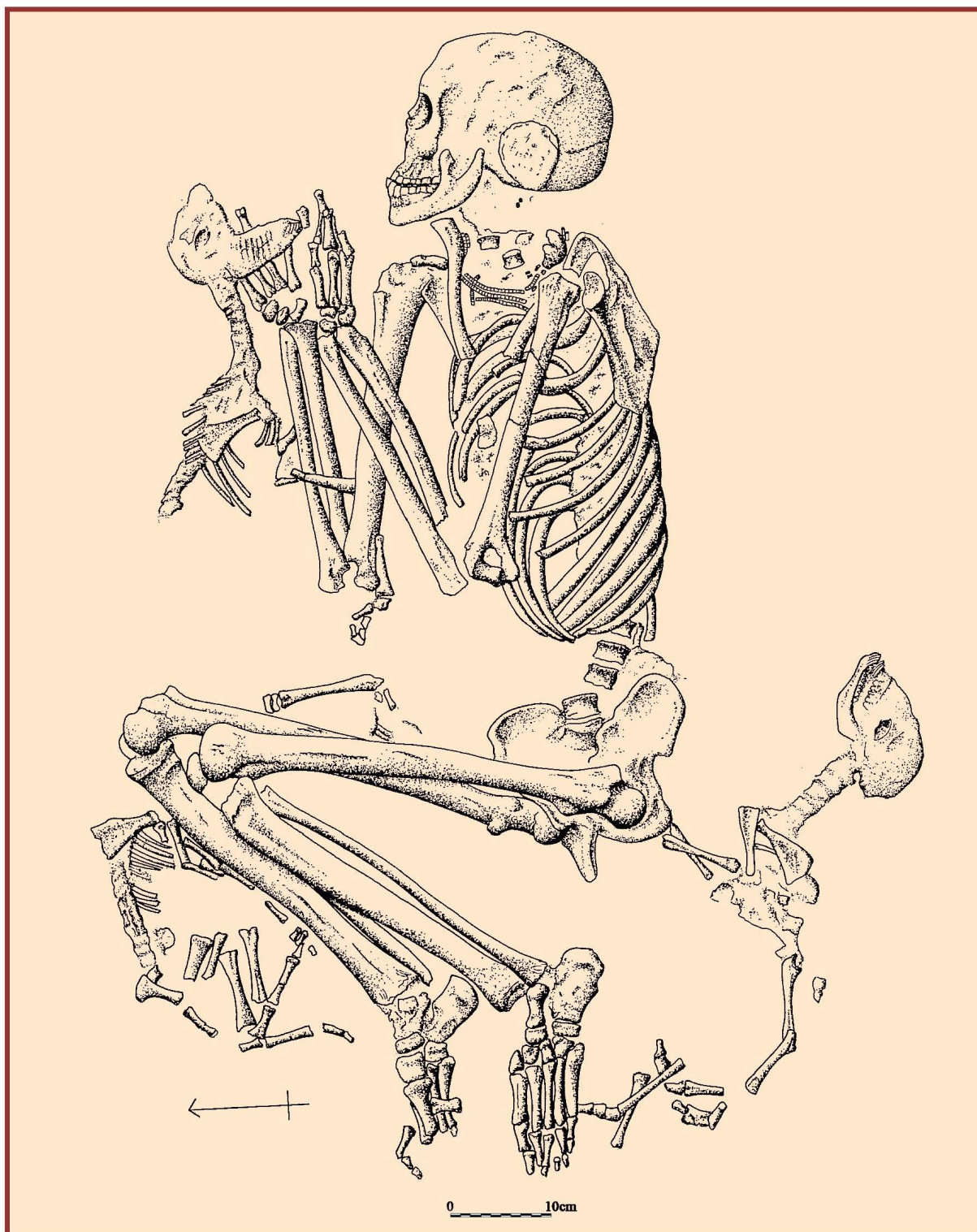


Figure 141: Mehrgarh 2000. Burial 504, Graveyard 3, Period I.

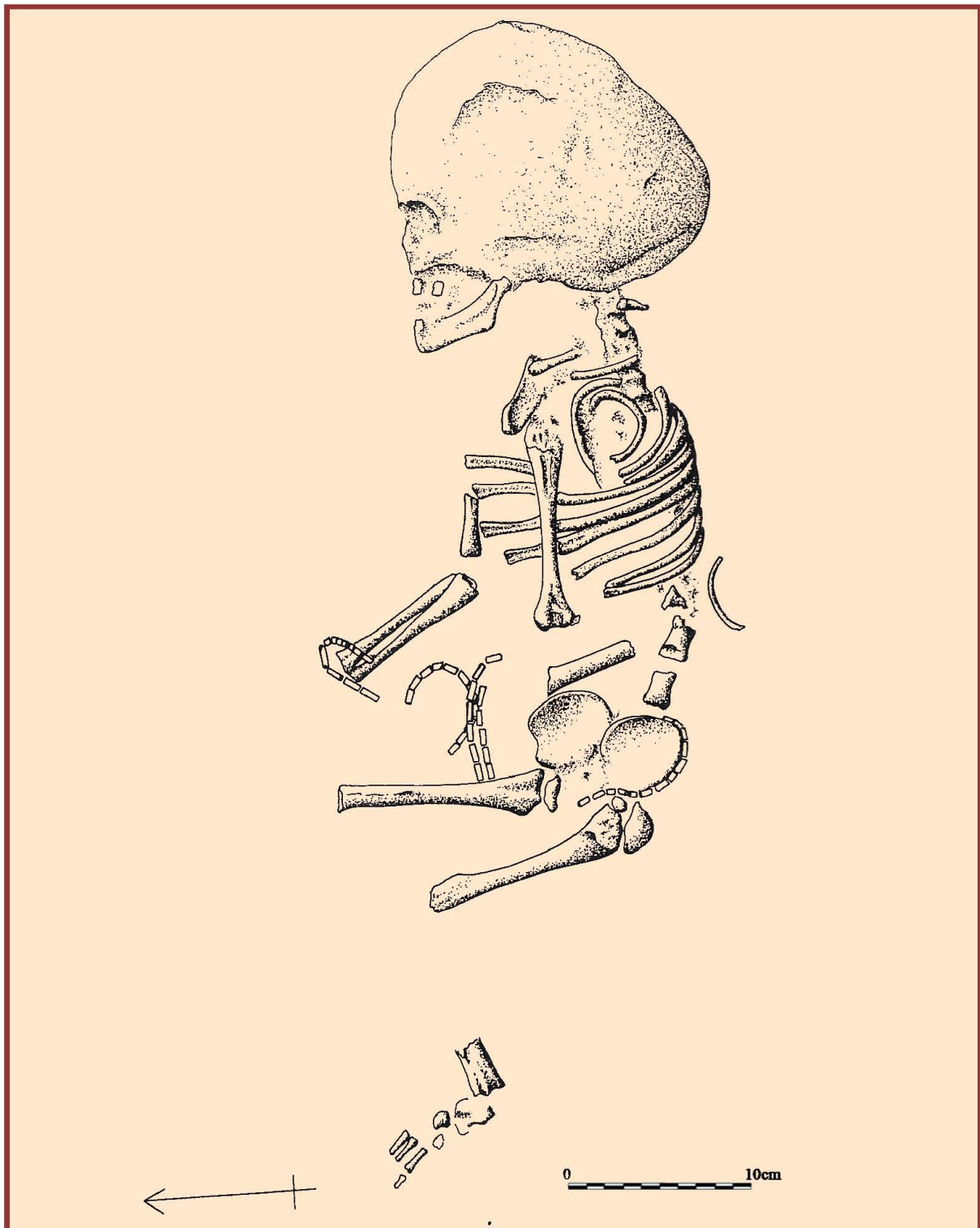


Figure 142: Mehrgarh 2000. Burial 505, Graveyard 3, Period I.

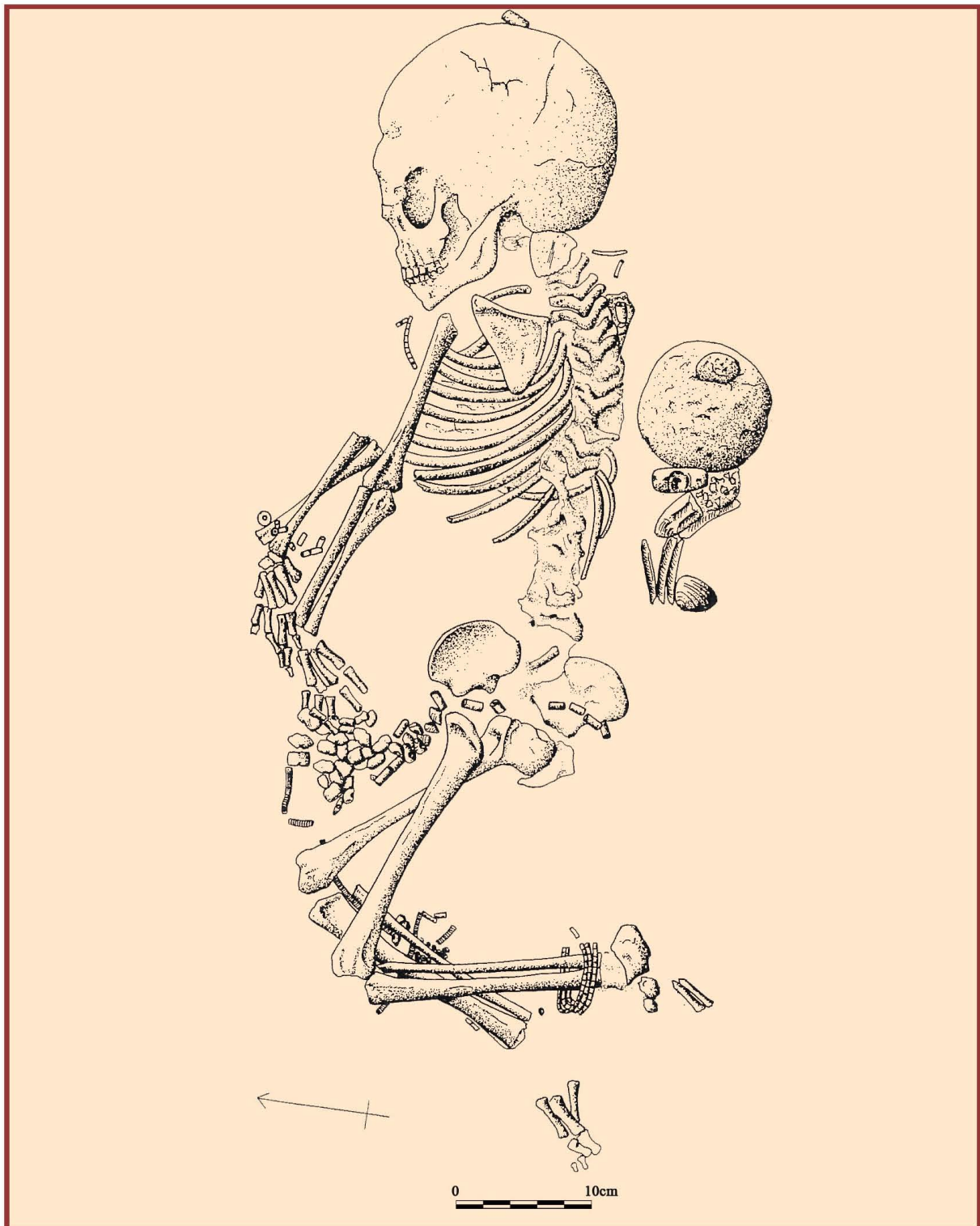


Figure 143 Mehrgarh 2000. Burial 508, Graveyard 3, Period I.

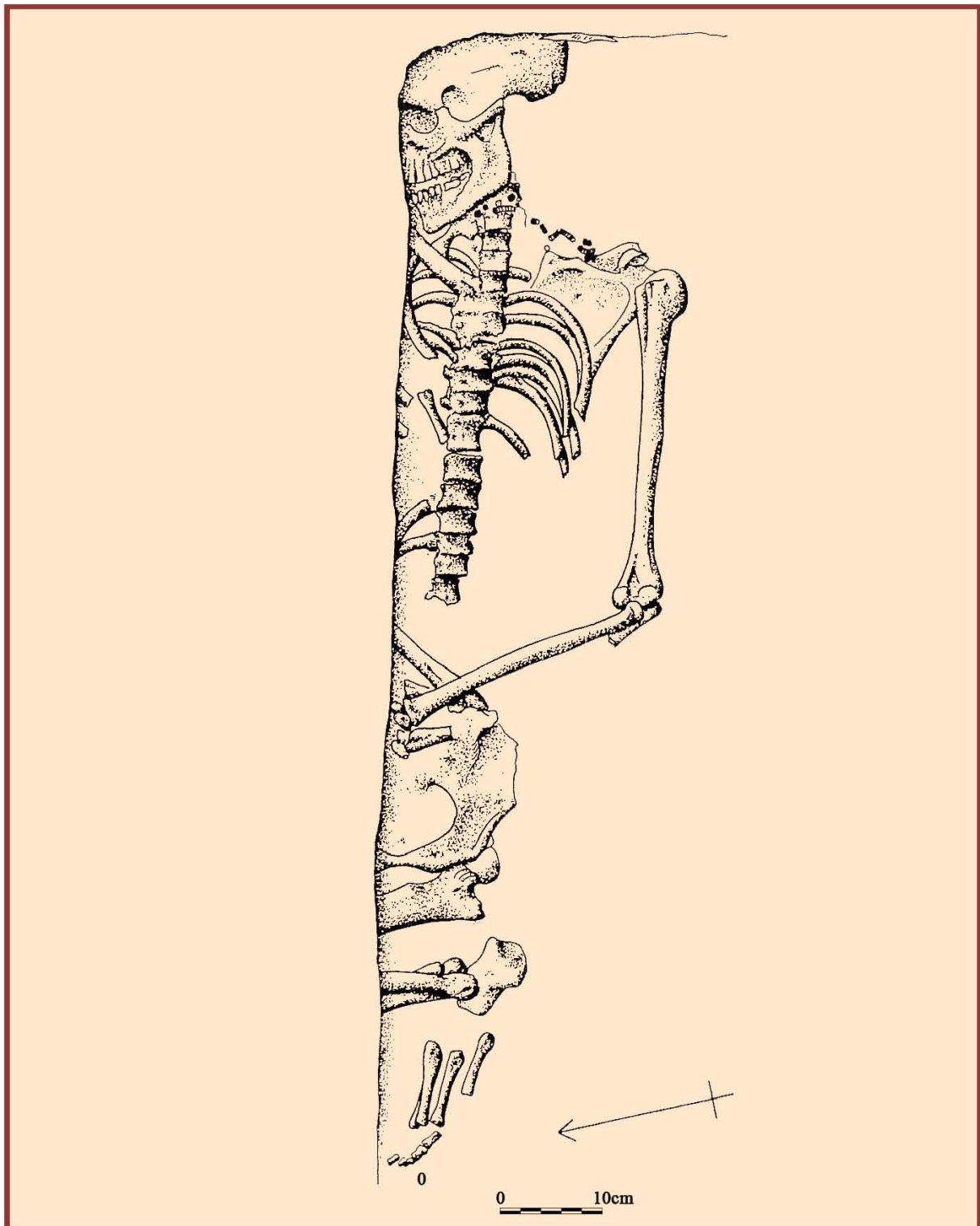


Figure 144: Mehrgarh 2000. Burial 509, Graveyard 3, Period I.

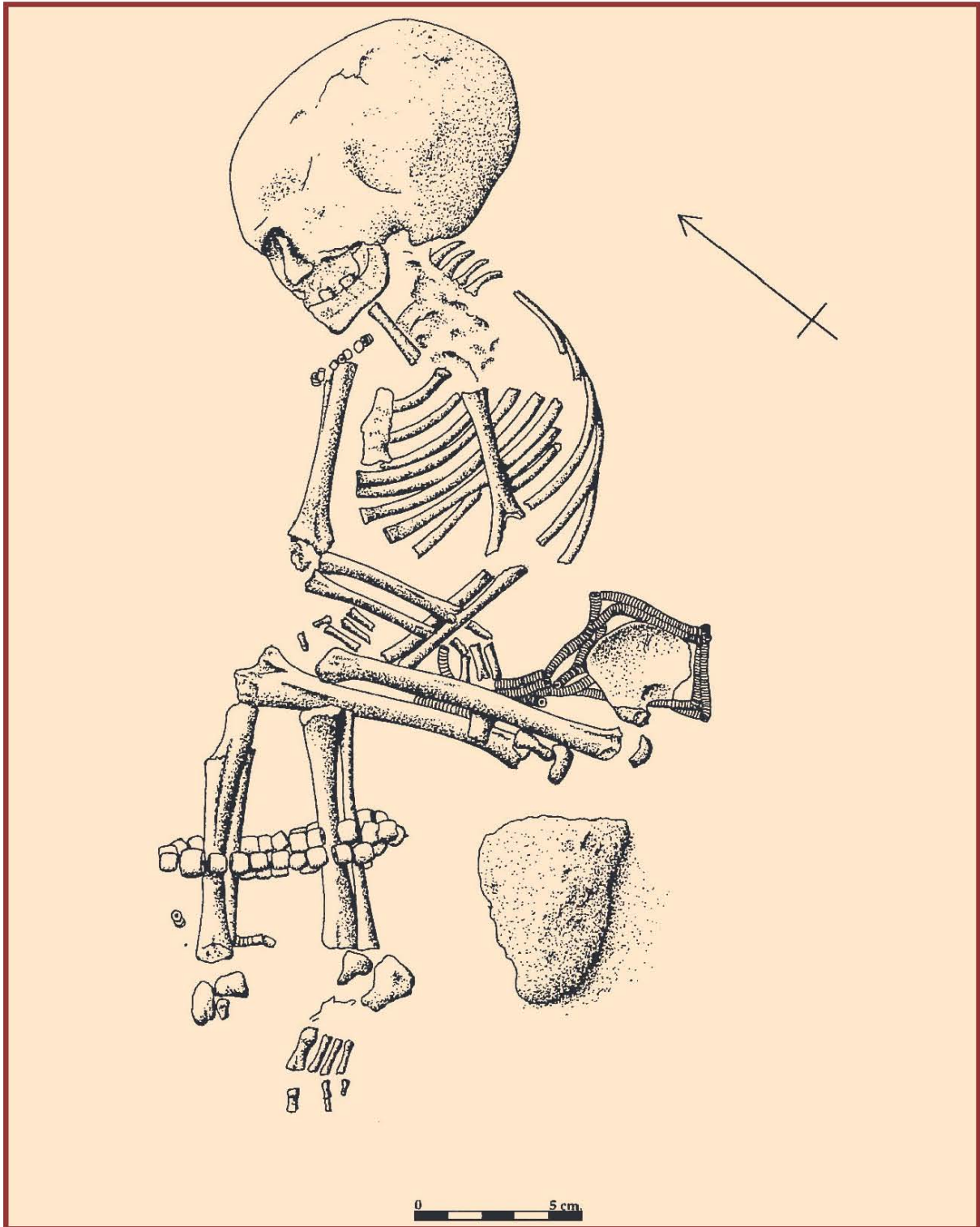


Figure 145: Mehrgarh 2000. Burial 550, Graveyard 7, Period I.

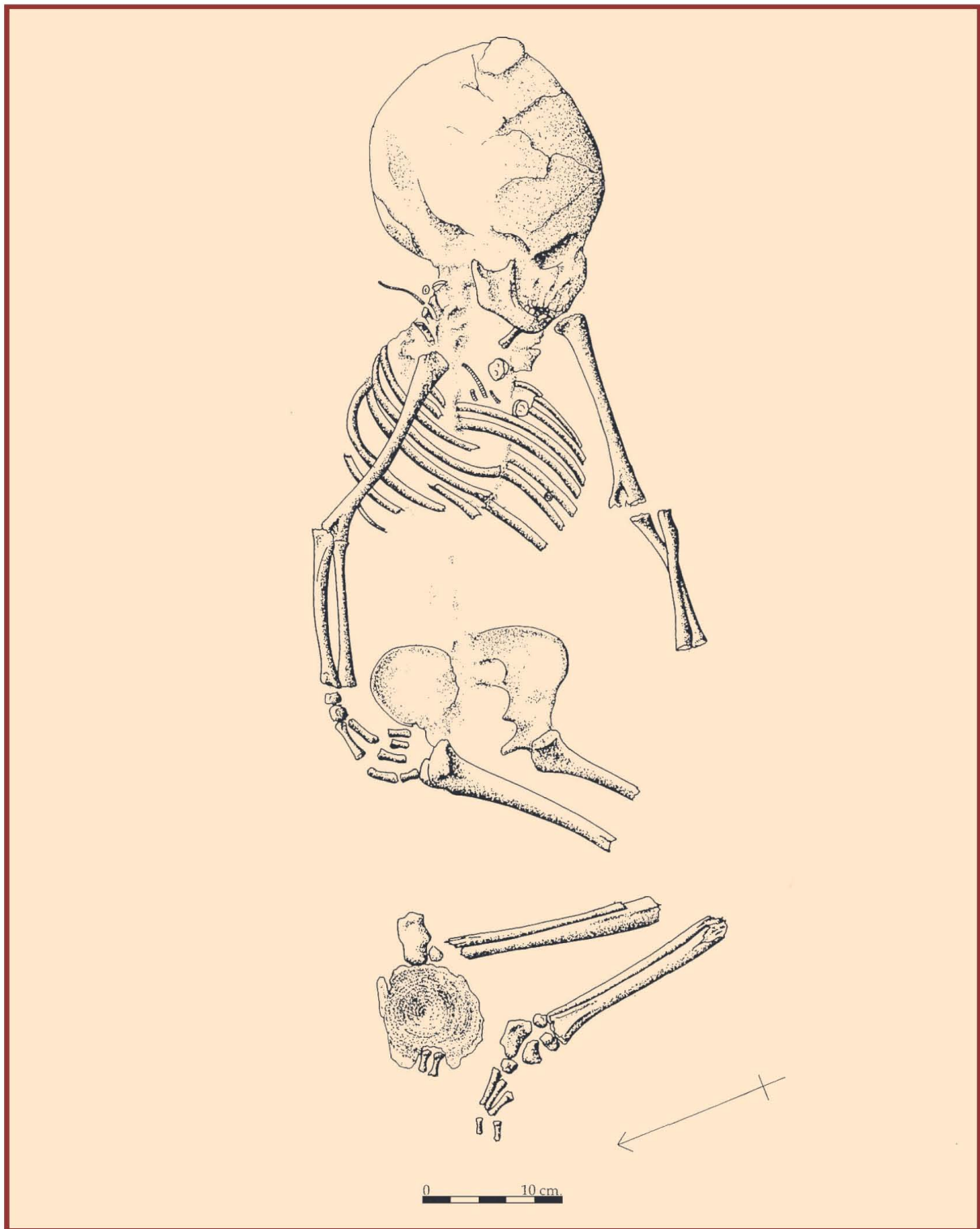


Figure 146: Mehrgarh 2000. Burial 551, Graveyard 5, Period I.

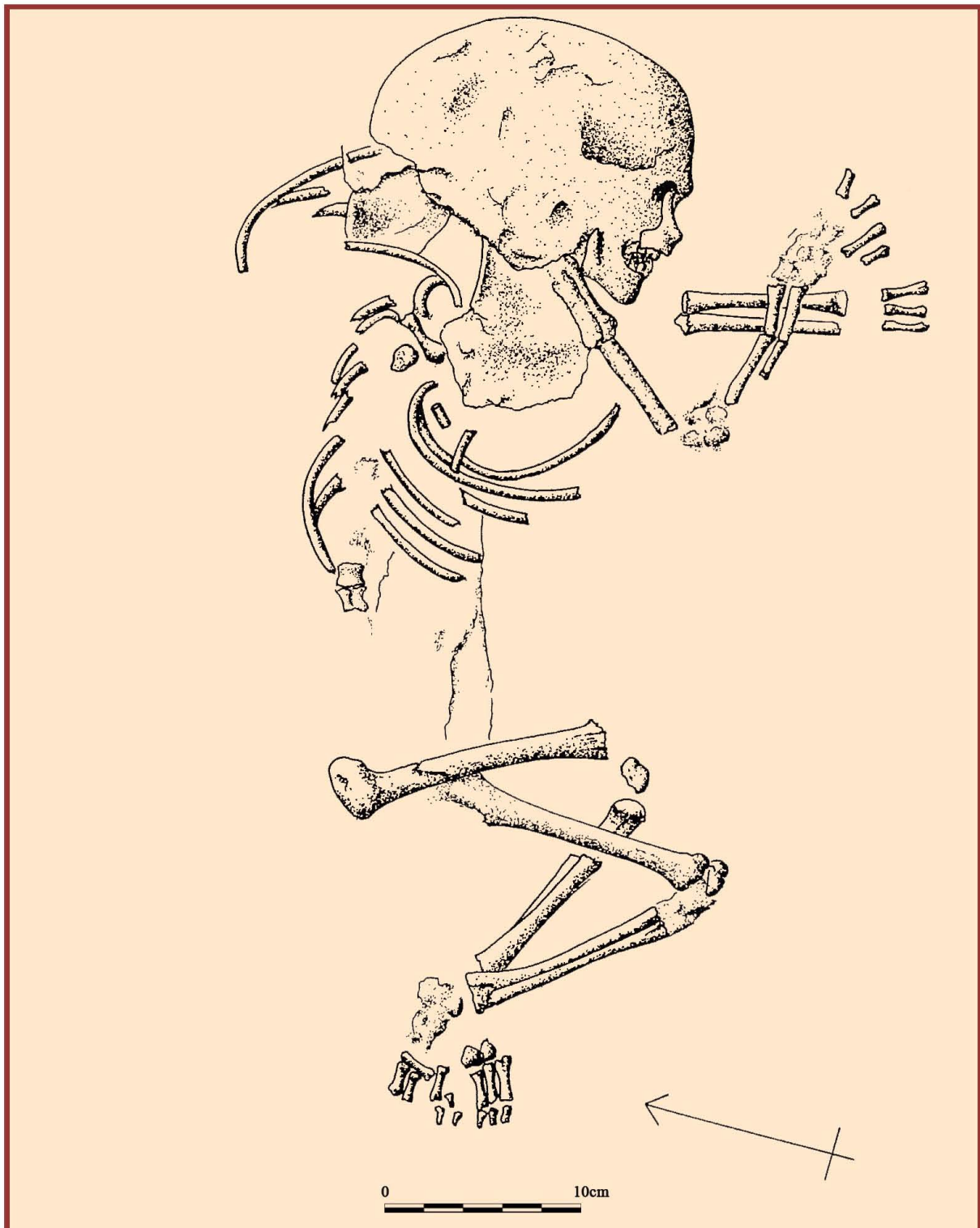


Figure 147: Mehrgarh 2000. Burial 552, Graveyard 5, Period I.

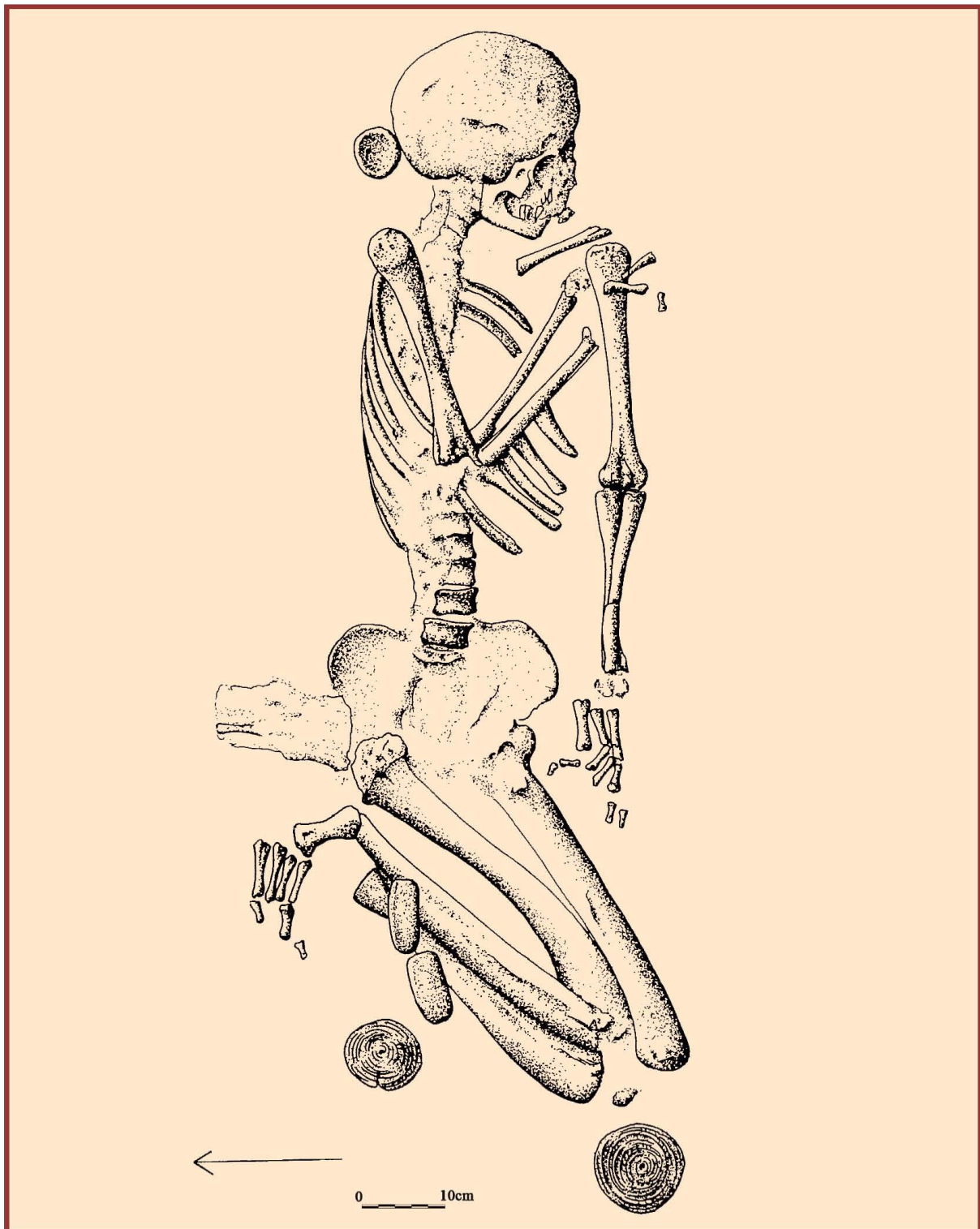


Figure 148: Mehrgarh 2000. Burial 555, Graveyard 8, Period I.

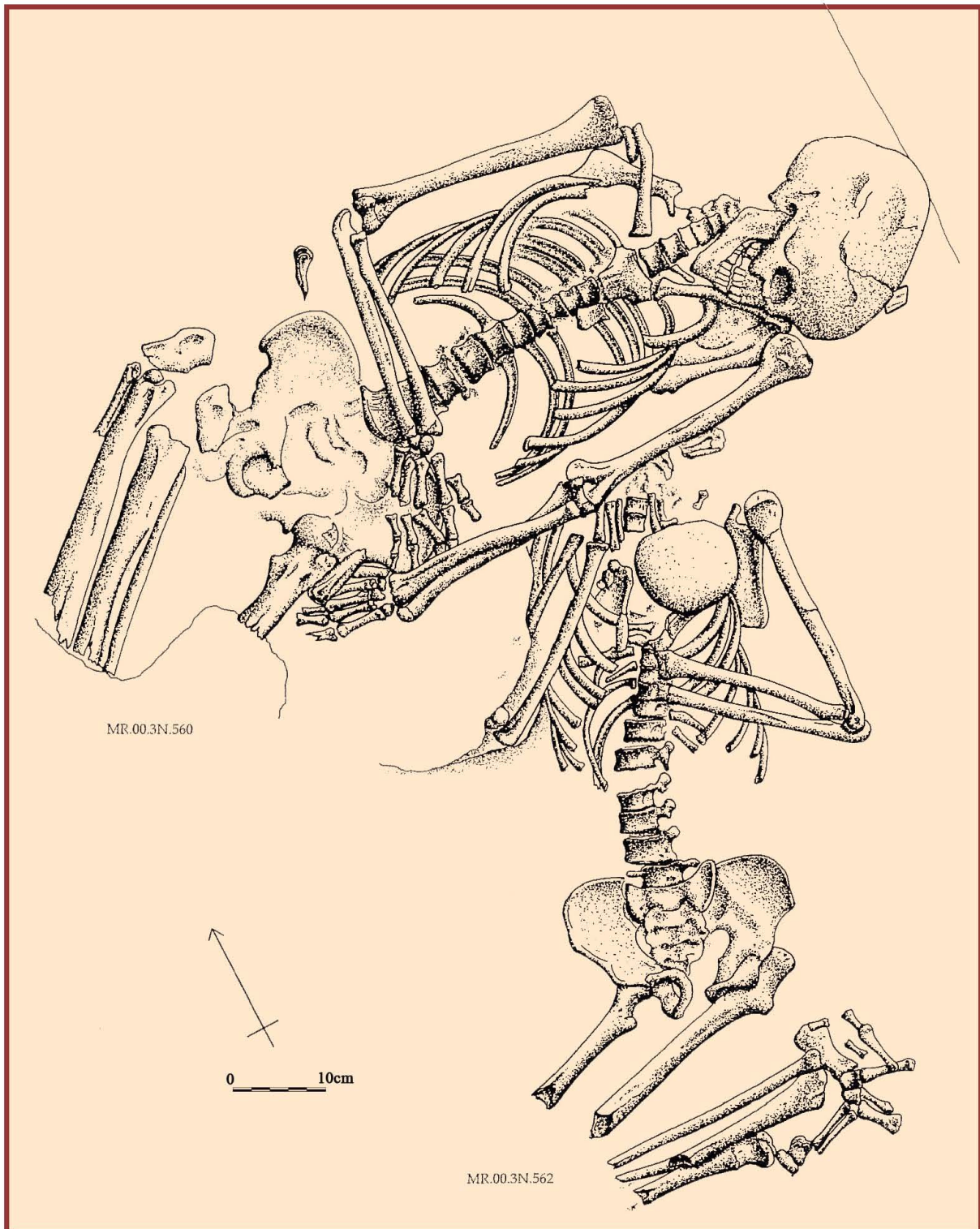


Figure 149: Mehrgarh 2000. Burials 560 and 562. Graveyard 7, Period I.

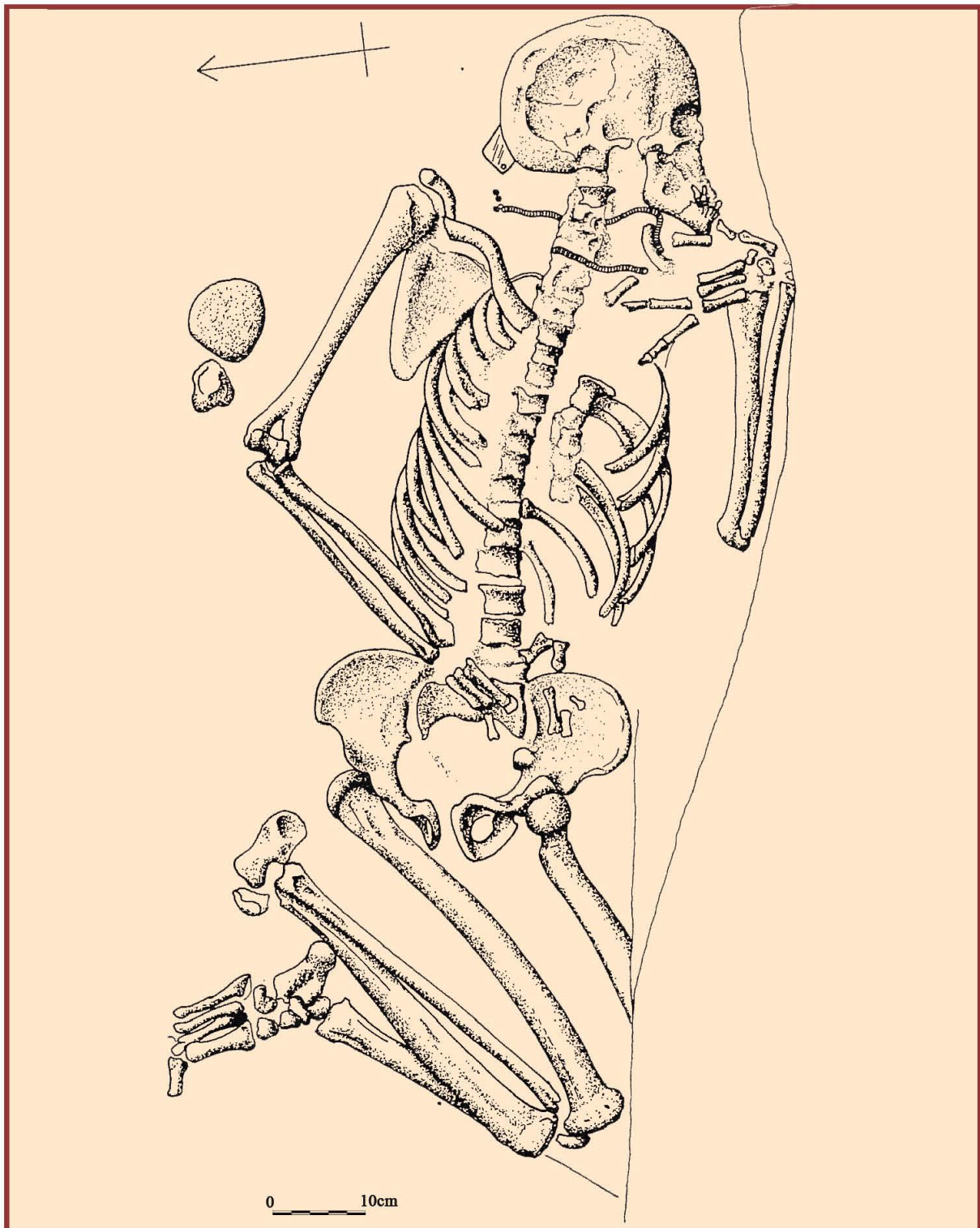


Figure 150: Mehrgarh 2000. Burial 571, Graveyard 8, Period I.

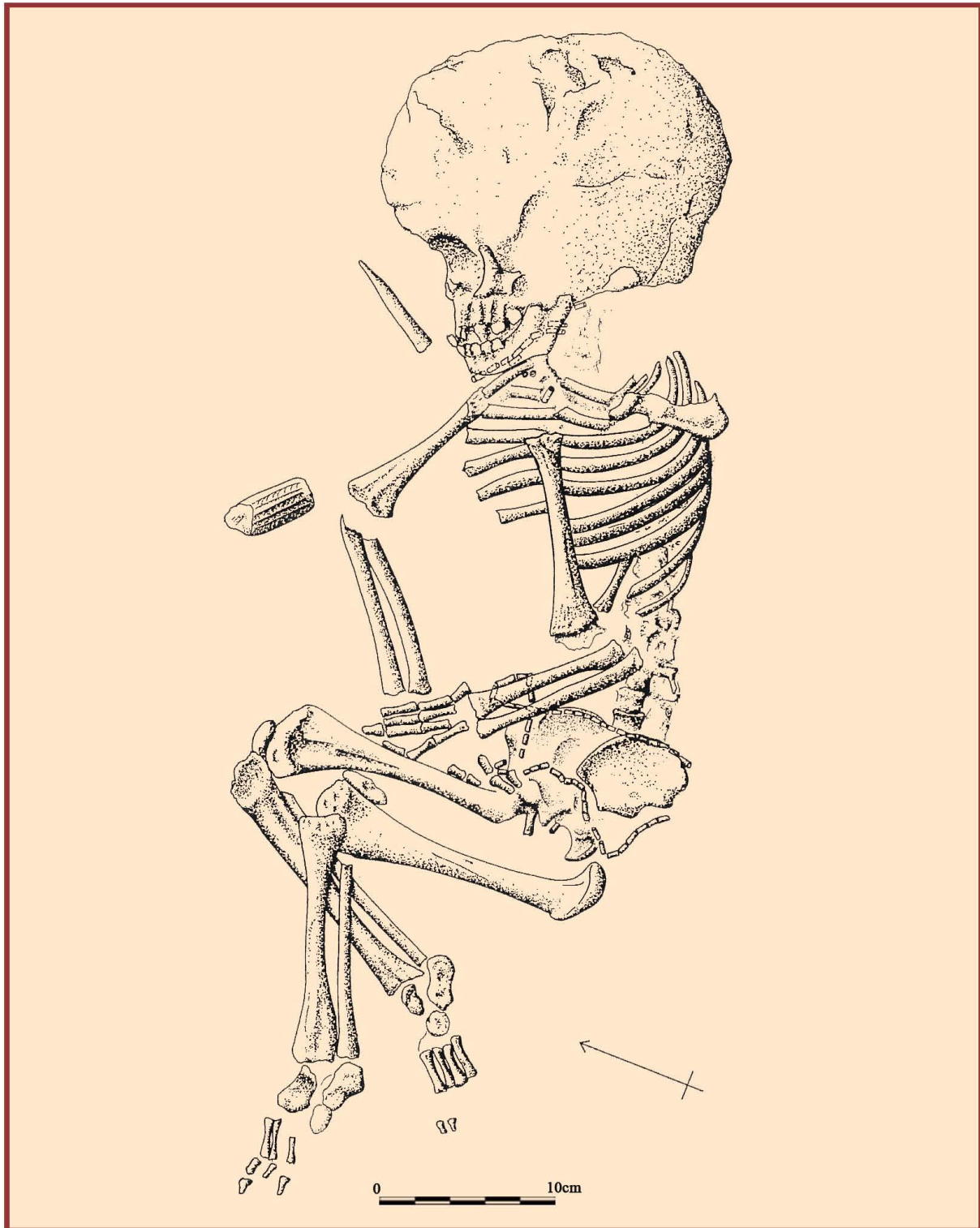


Figure 151: Mehrgarh 2000. Burial 572, Graveyard 3, Period I.

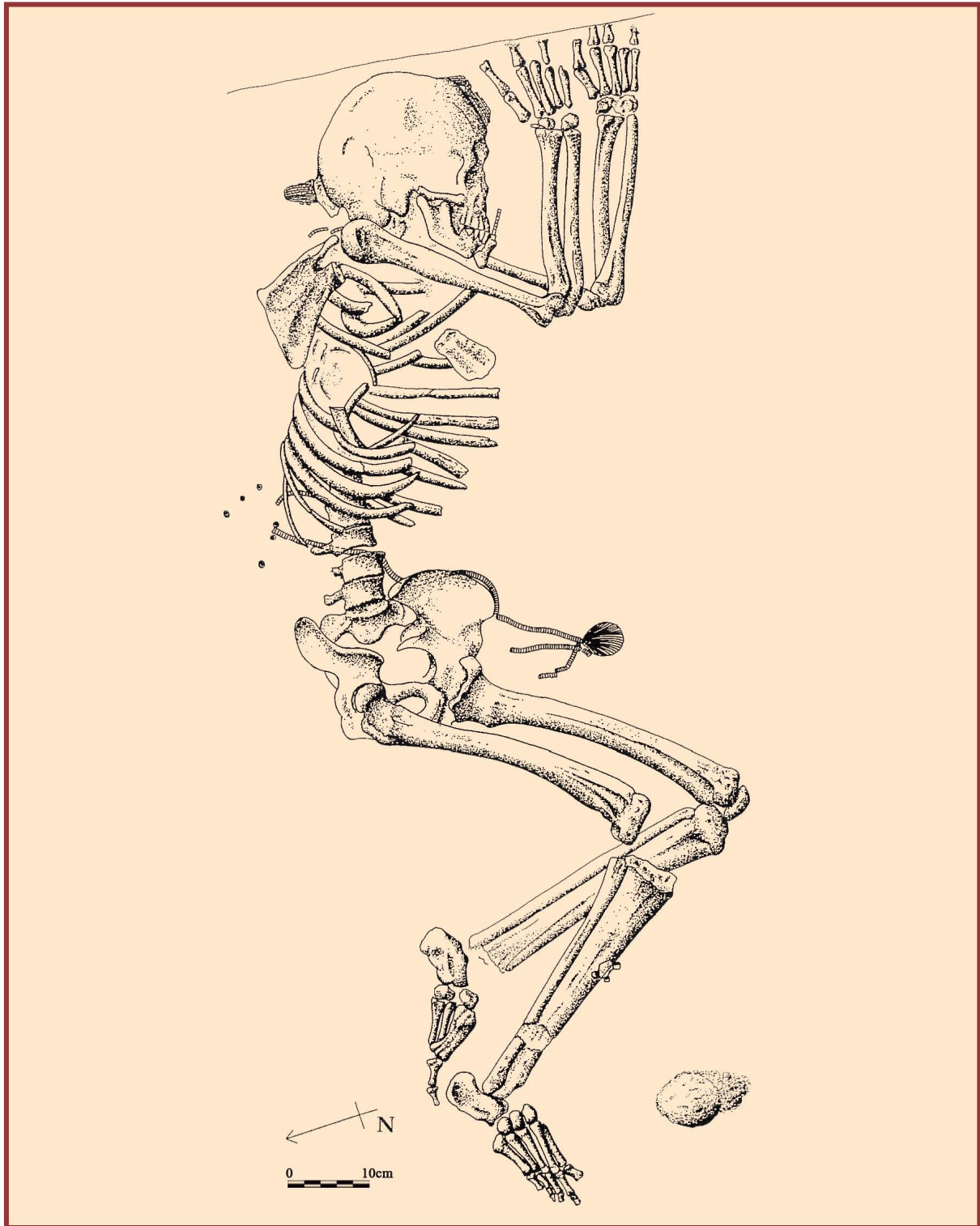


Figure 152: Mehrgarh 2000. Burial 573, Graveyard 7, Period I.

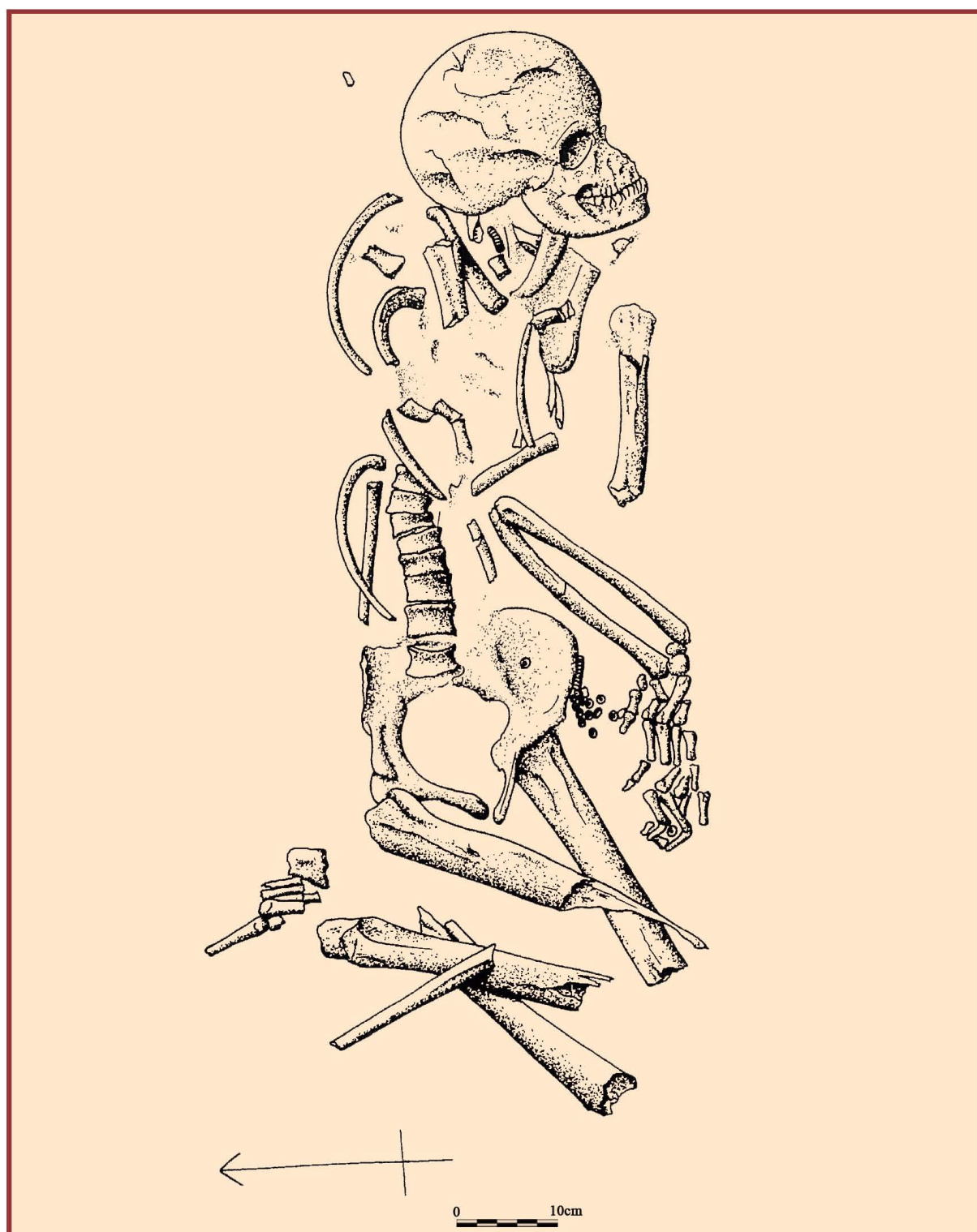


Figure 153: Mehrgarh 2000. Burial 575, Graveyard 5, Period I.

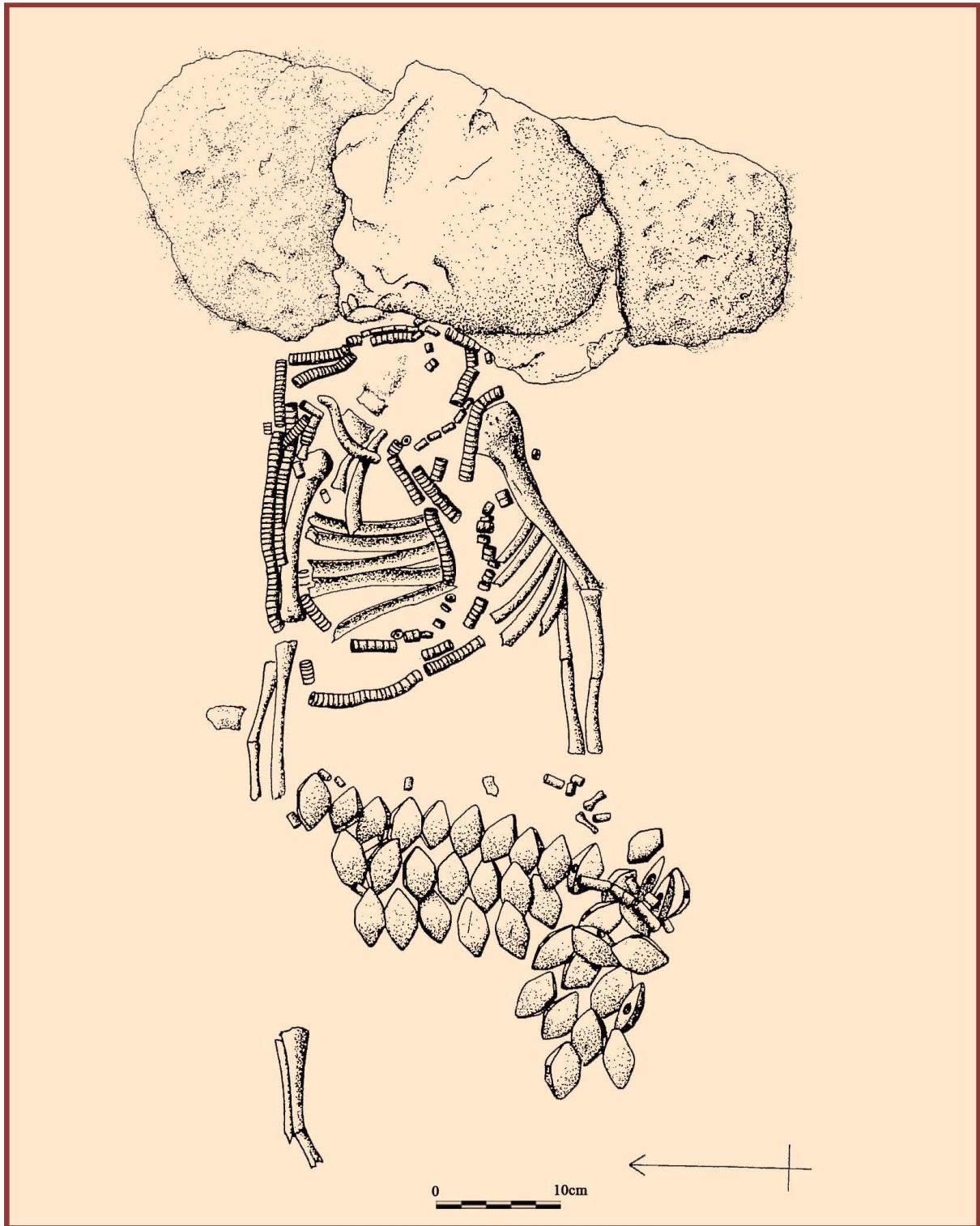


Figure 154: Mehrgarh 2000. Burial 578, Graveyard 3, Period I.

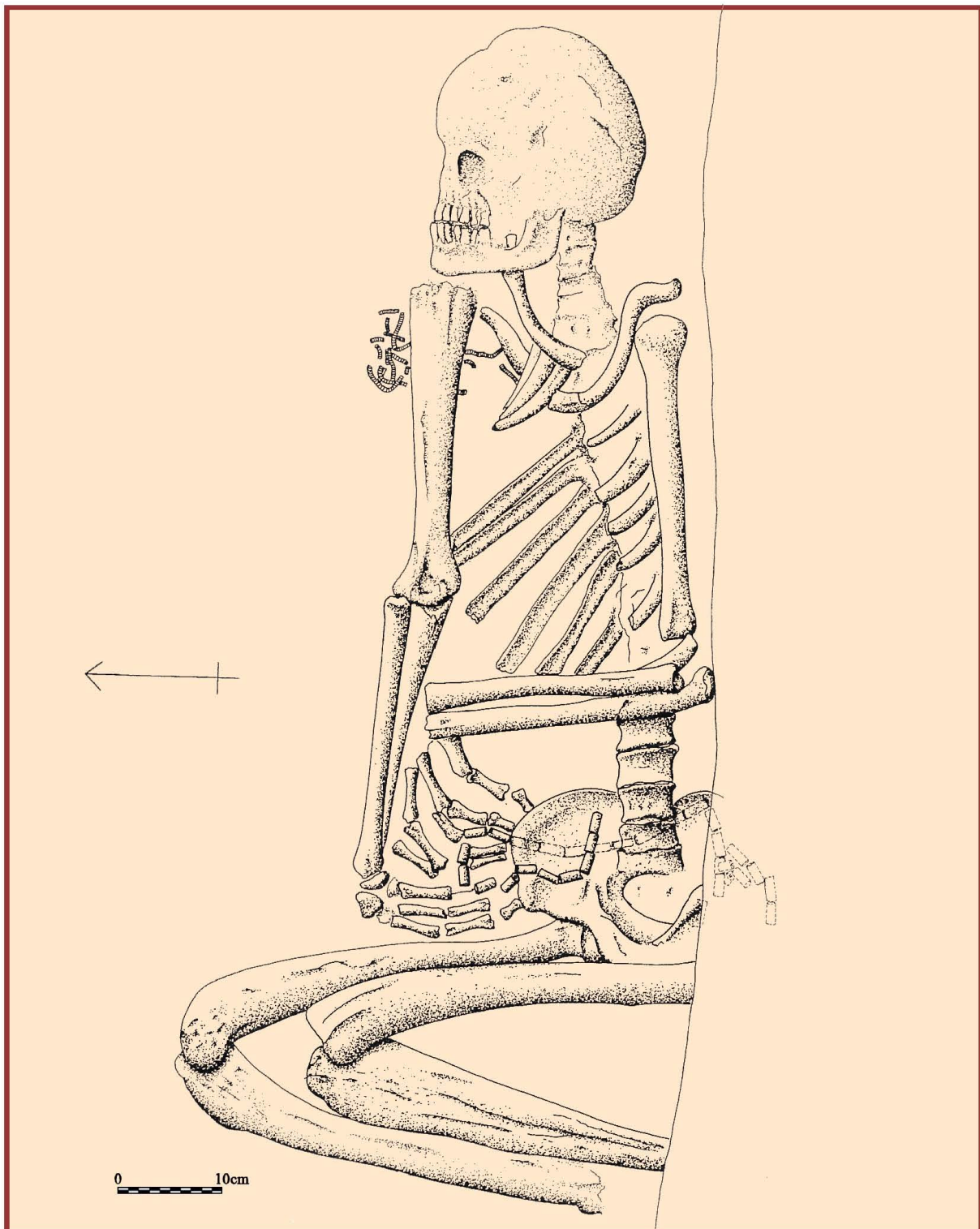


Figure 155: Mehrgarh 2000. Burial 579, Graveyard 3, Period I.

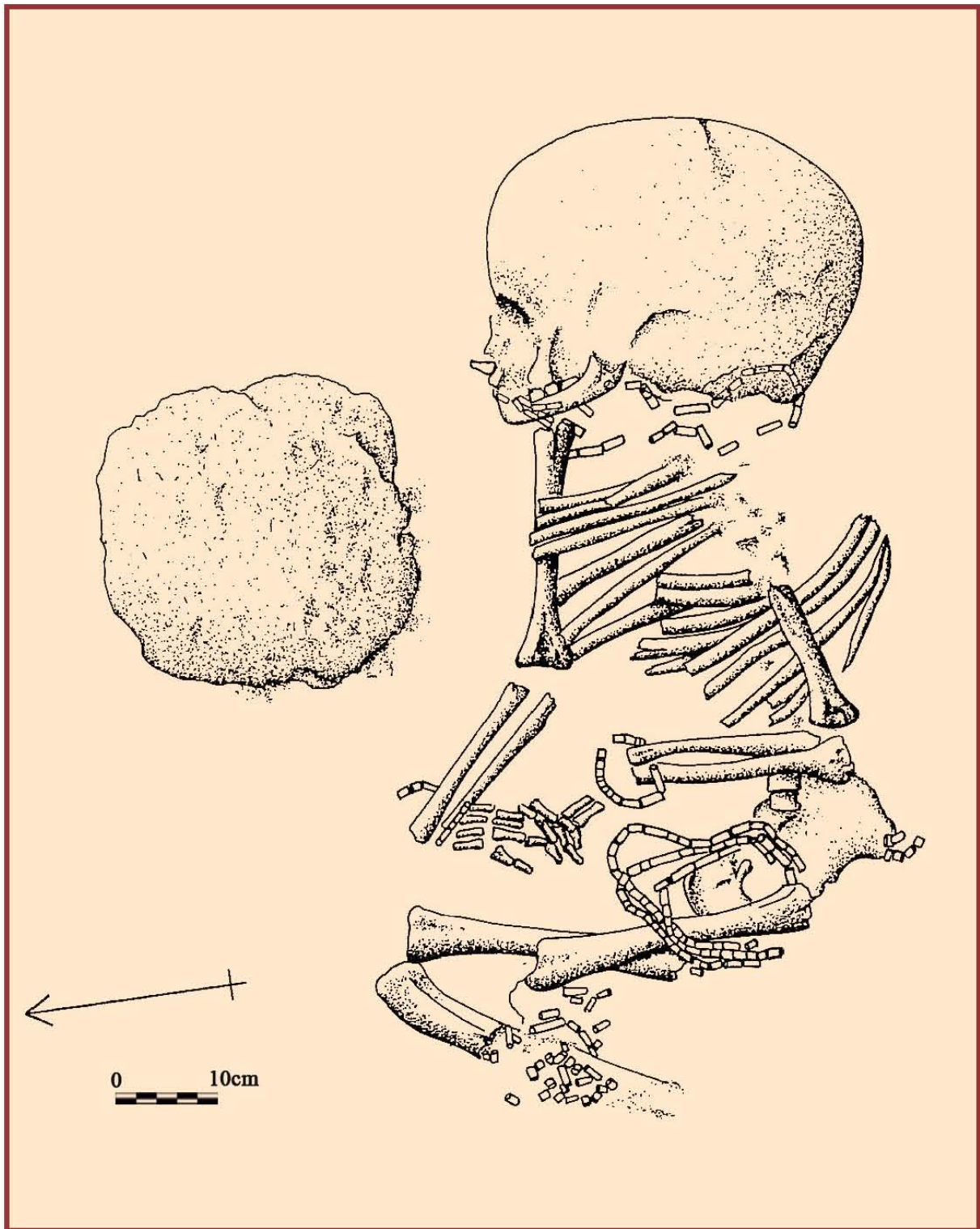
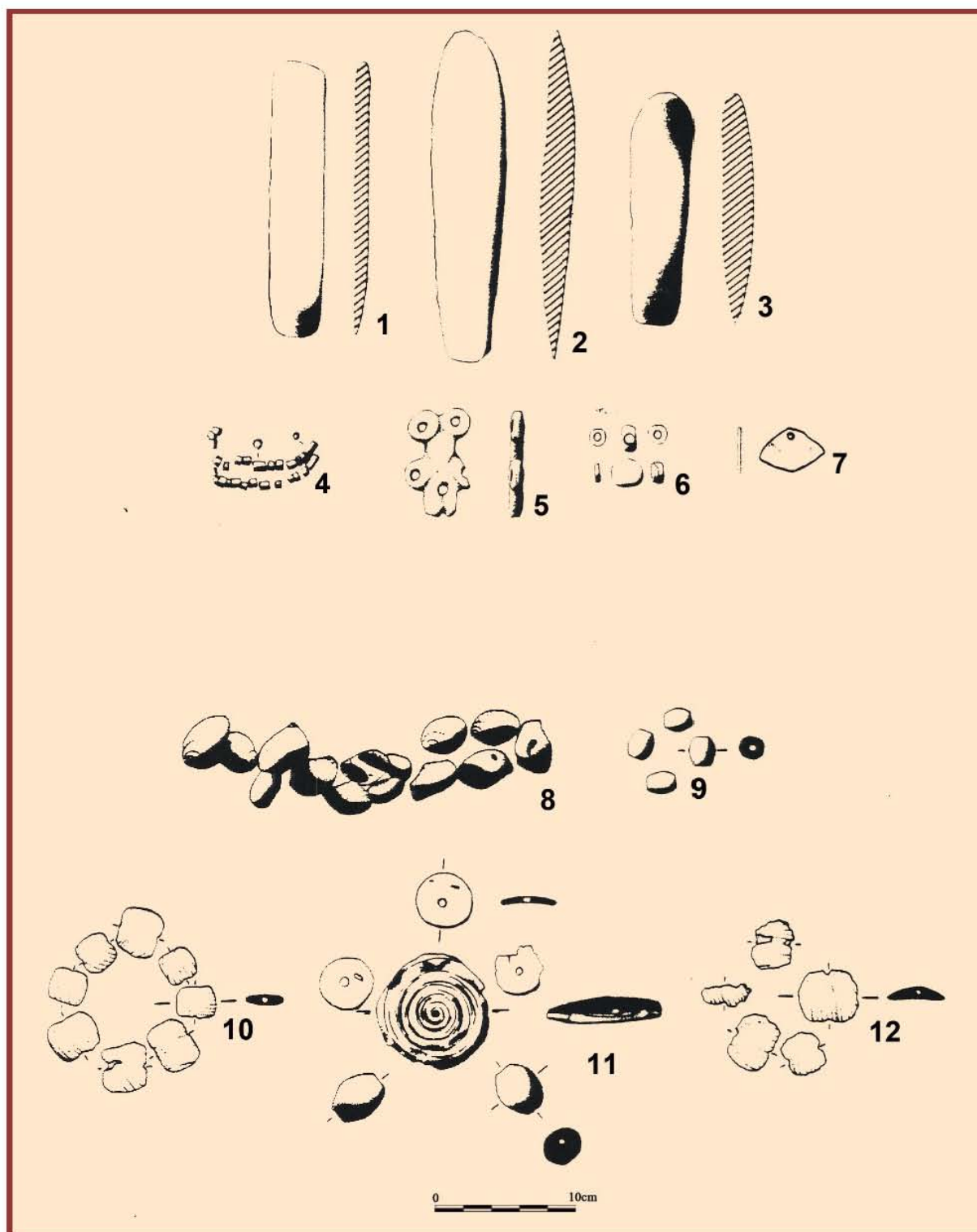
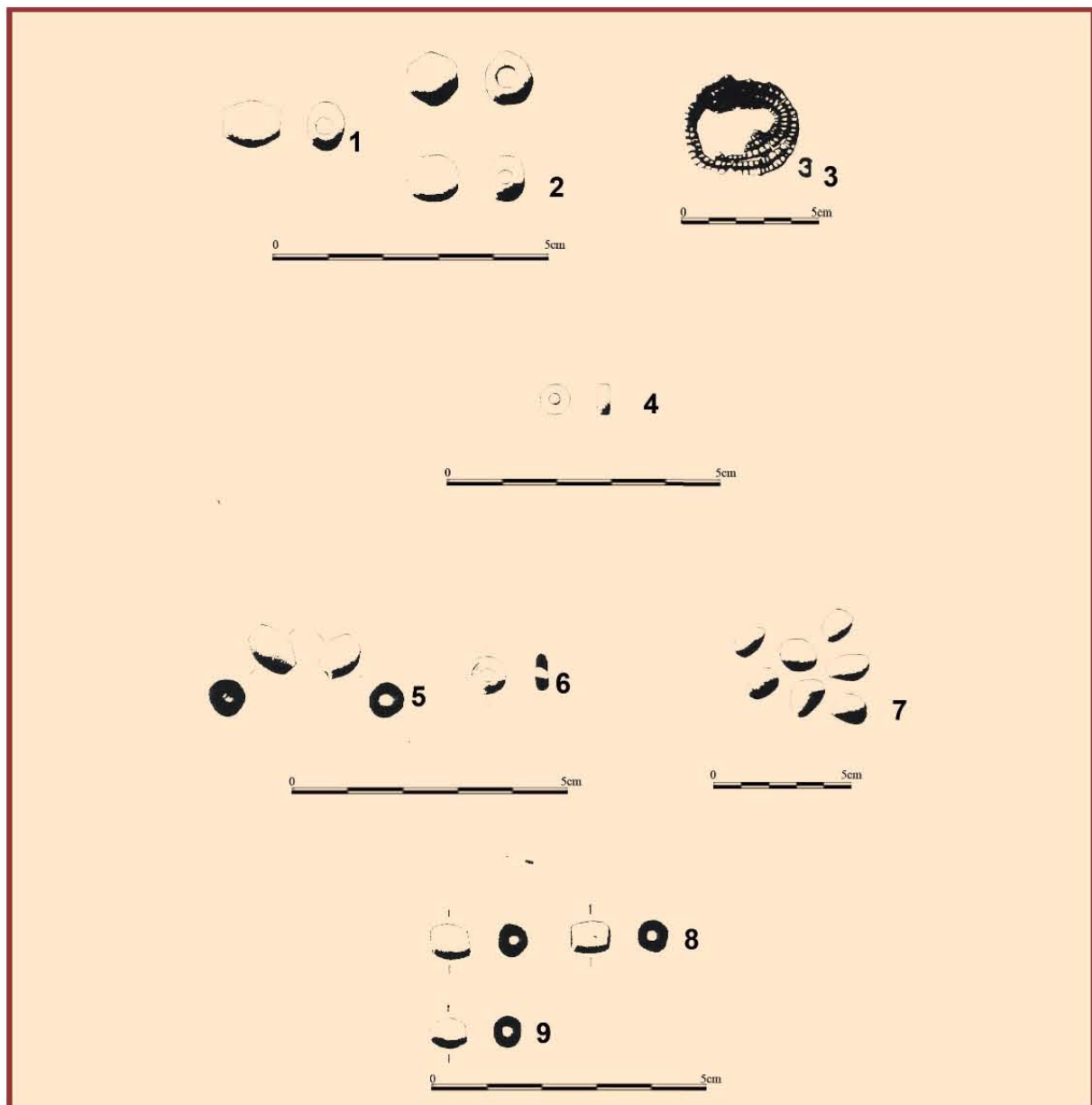


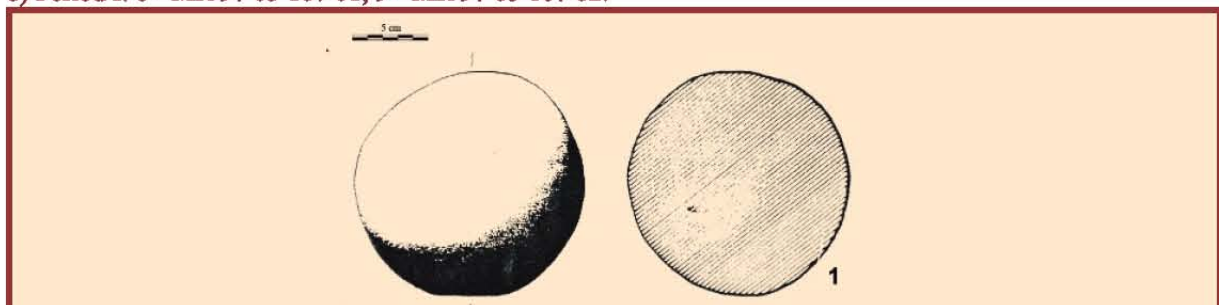
Figure 156: Mehrgarh 2000. Burial 582, Graveyard 4, Period I.



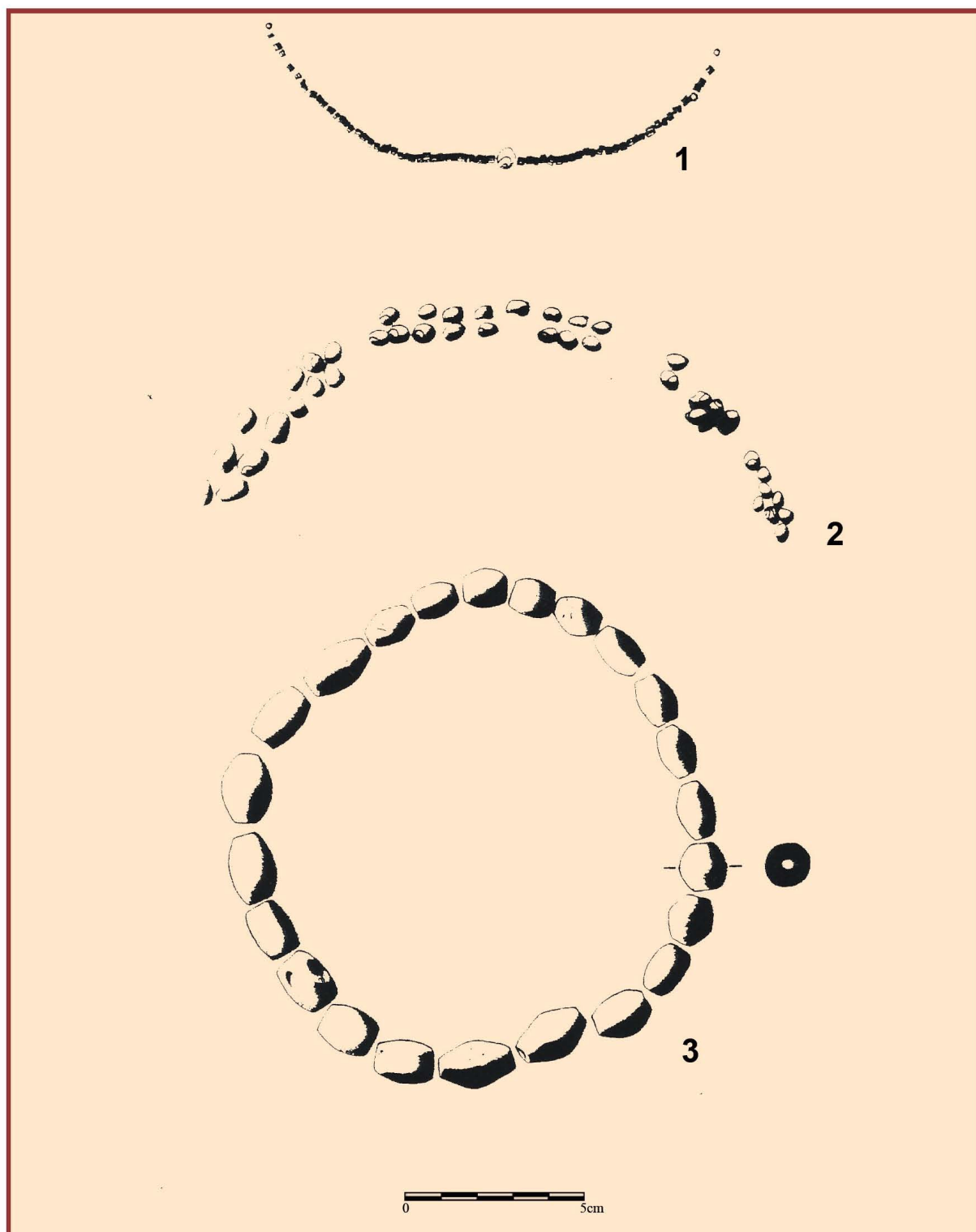
**Figure 157:** Mehrgarh 1997. Grave goods from burial 101 (Graveyard 9). Period I. 1- MR 97 03 101 03; 2 - MR 97 03 101 02; 3- MR 97 03 101 04; 4 - MR 97 03 101 06; 5- MR 97 03 101 01; 6- MR 97 03 101 08; 7- MR 97 03 101 07 and from burial 102 (Graveyard 9) Period I. 8- MR 97 03 102 01; 9- MR 97 03 102 02; 10- MR 97 03 102 03; 11- MR 97 03 102 05; 12- MR 97 03 102 04.



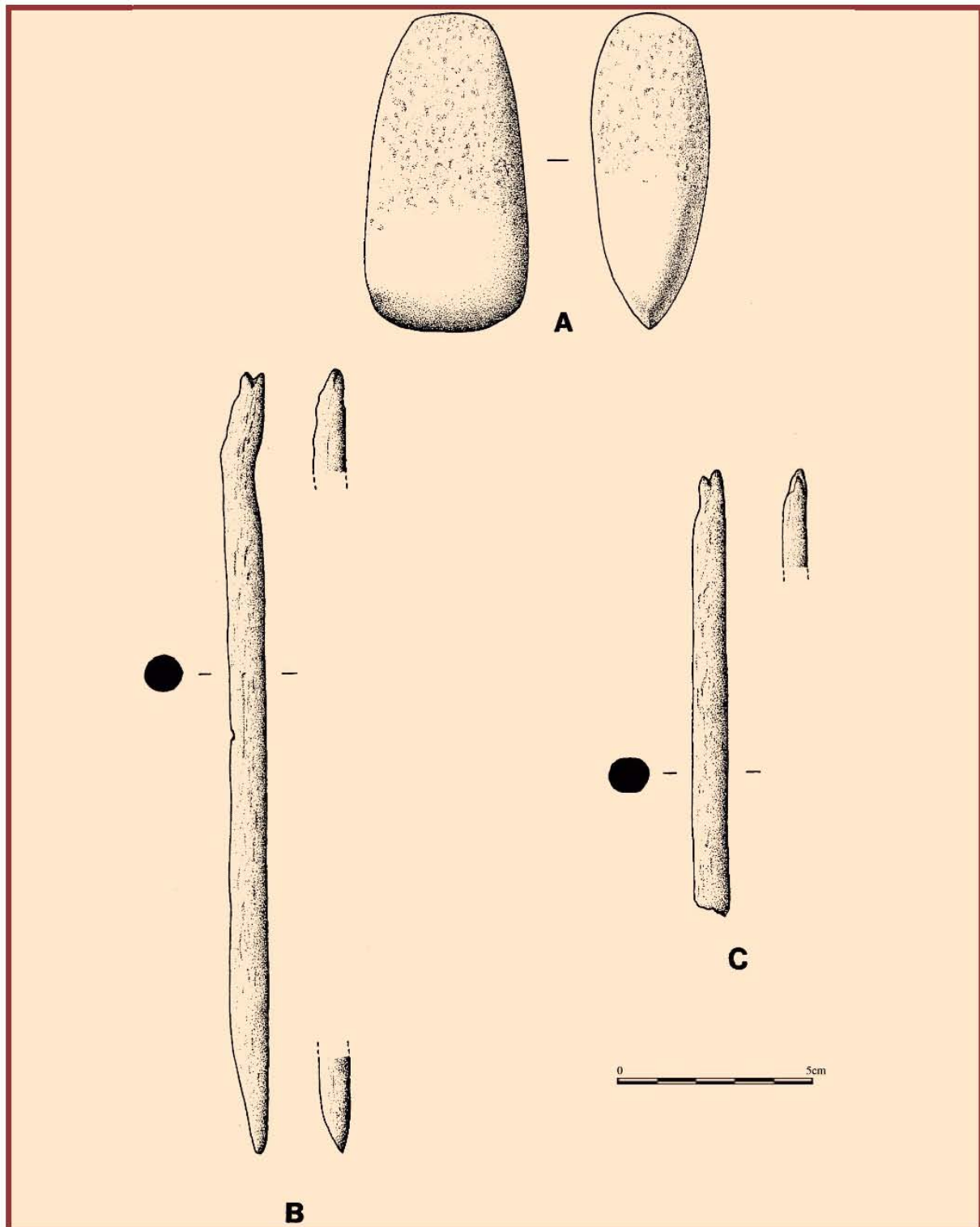
**Figure 158:** Mehrgarh 1997. Grave goods from burial 103 (Graveyard 9). Period I. 1- MR 97 03 103 02; 2 - MR 97 03 103 01; 3- MR 97 03 103 03. From burial 105 (Graveyard 9) Period I. 4 - MR 97 03 105 01. From burial 106 (Graveyard 9): 5- MR 97 03 106 01; 6- MR 97 03 106 02; 7- MR 97 03 106 03. From burial 107 (Graveyard 8) Period I. 8- MR 97 03 107 01; 9- MR 97 03 107 02.



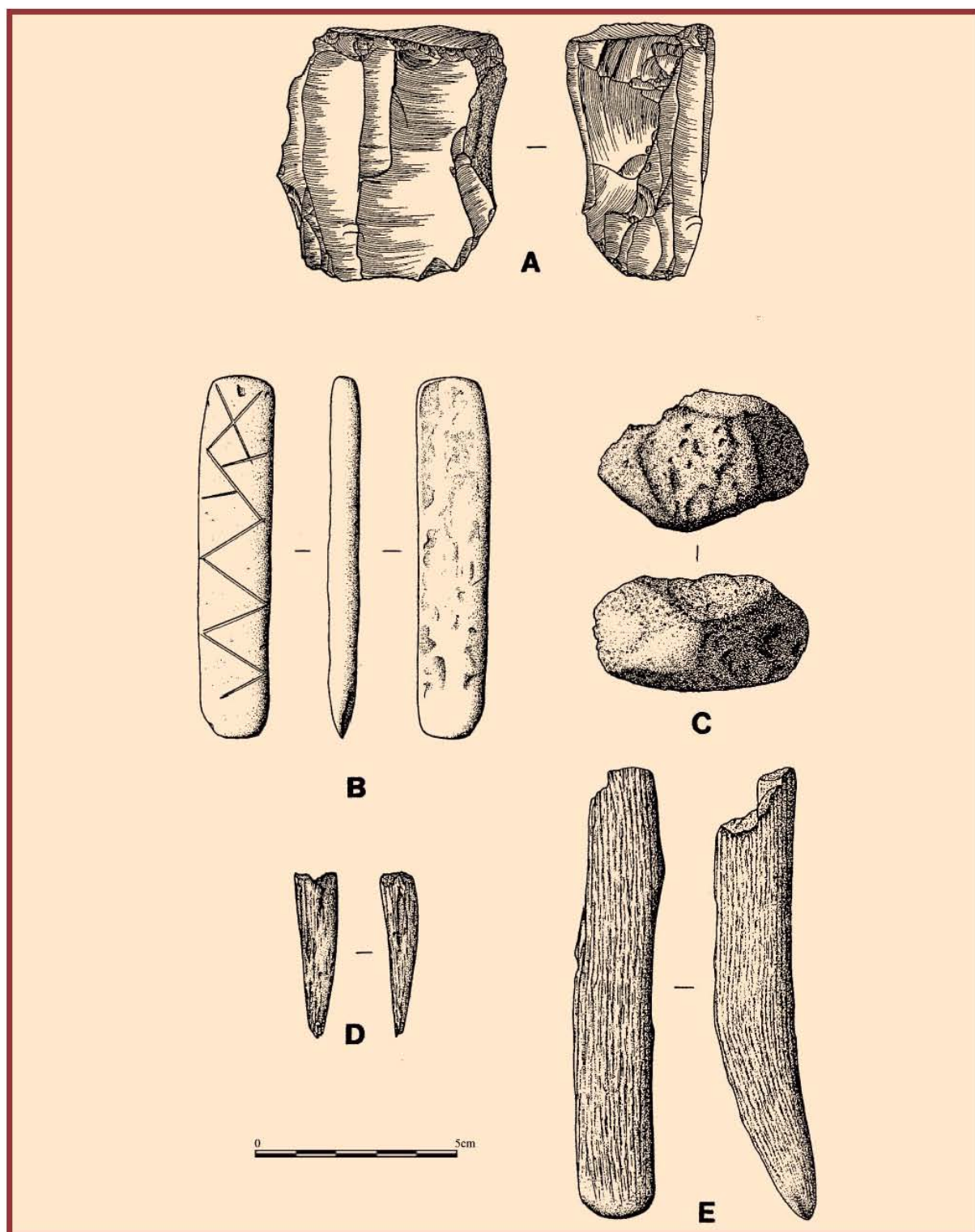
**Figure 159:** Mehrgarh 1997. Grave good from burial 109 (Graveyard 8) Period I. 1.- MR 97 03 109 01.



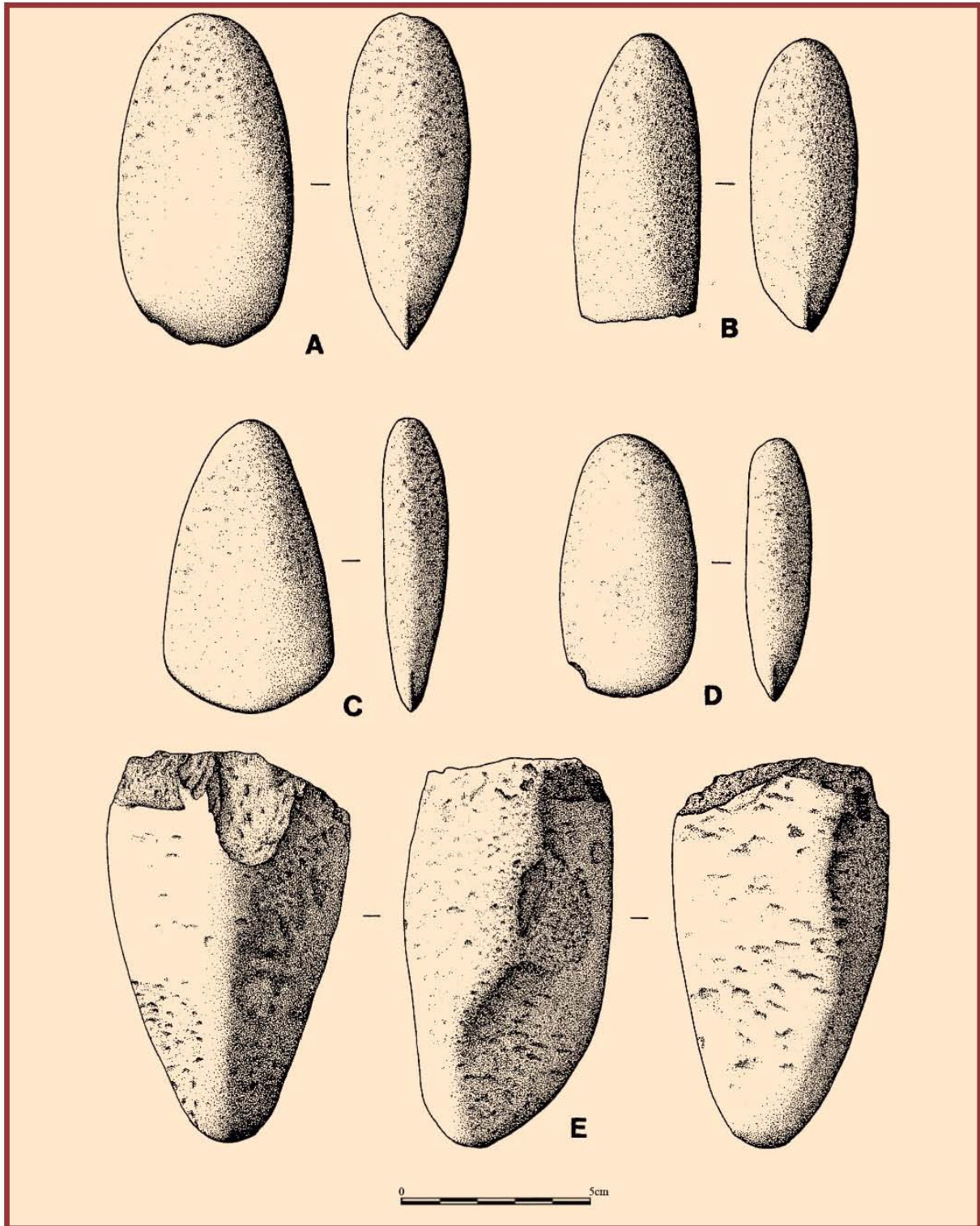
**Figure 160:** Mehrgarh 1997. Grave goods from burial 110 (Graveyard 9) Period I. 1- MR 97 03 110 02; 2- MR 97 03 110 01; 3- MR 97 03 110 03.



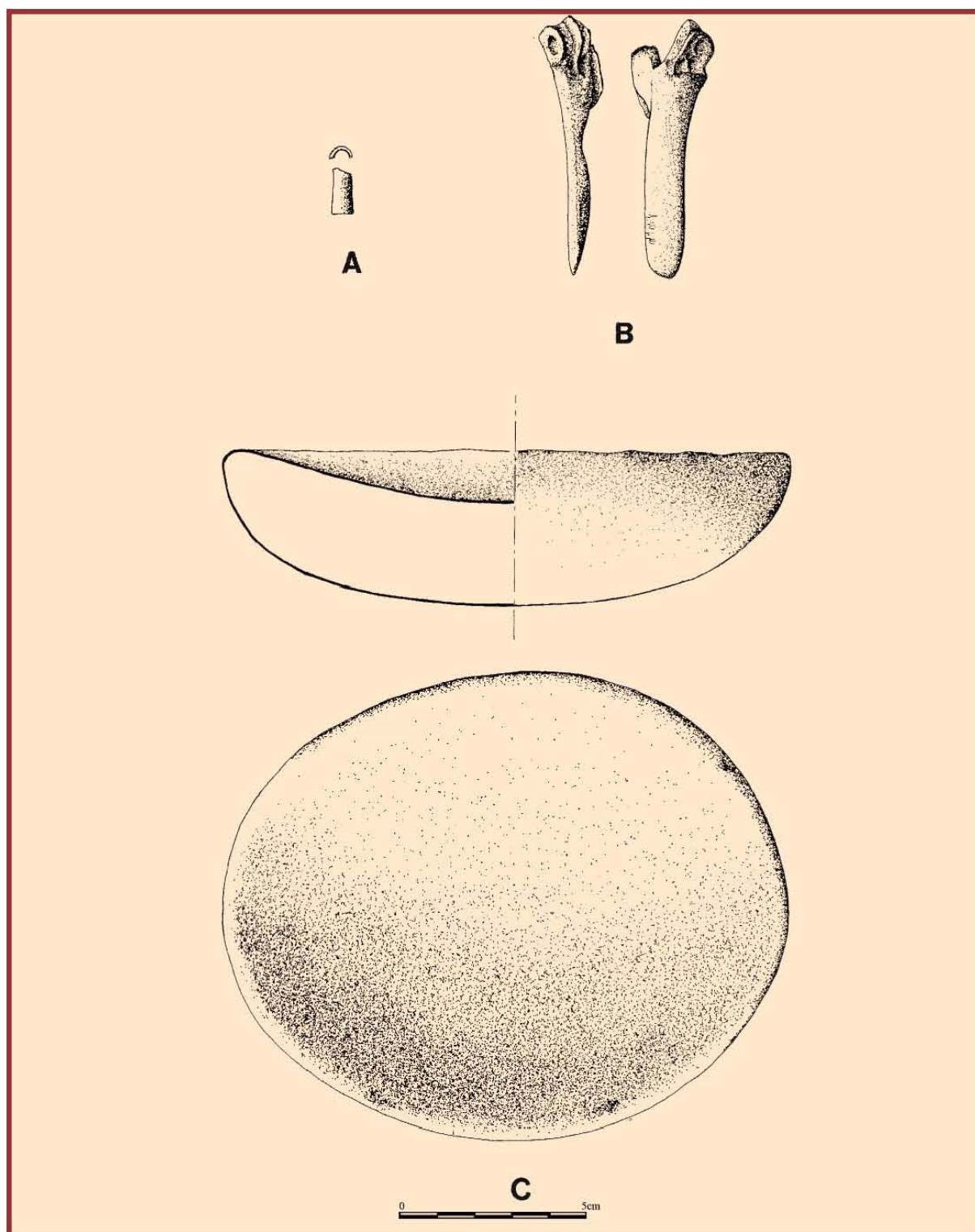
**Figure 161:** Mehrgarh 1998. Grave goods from burial 233 (Graveyard 9) and burial 226 (Graveyard 8) Period I. A- MR 98 03 233 01; B- MR 98 03 226 01; C- MR 98 03 226 02.



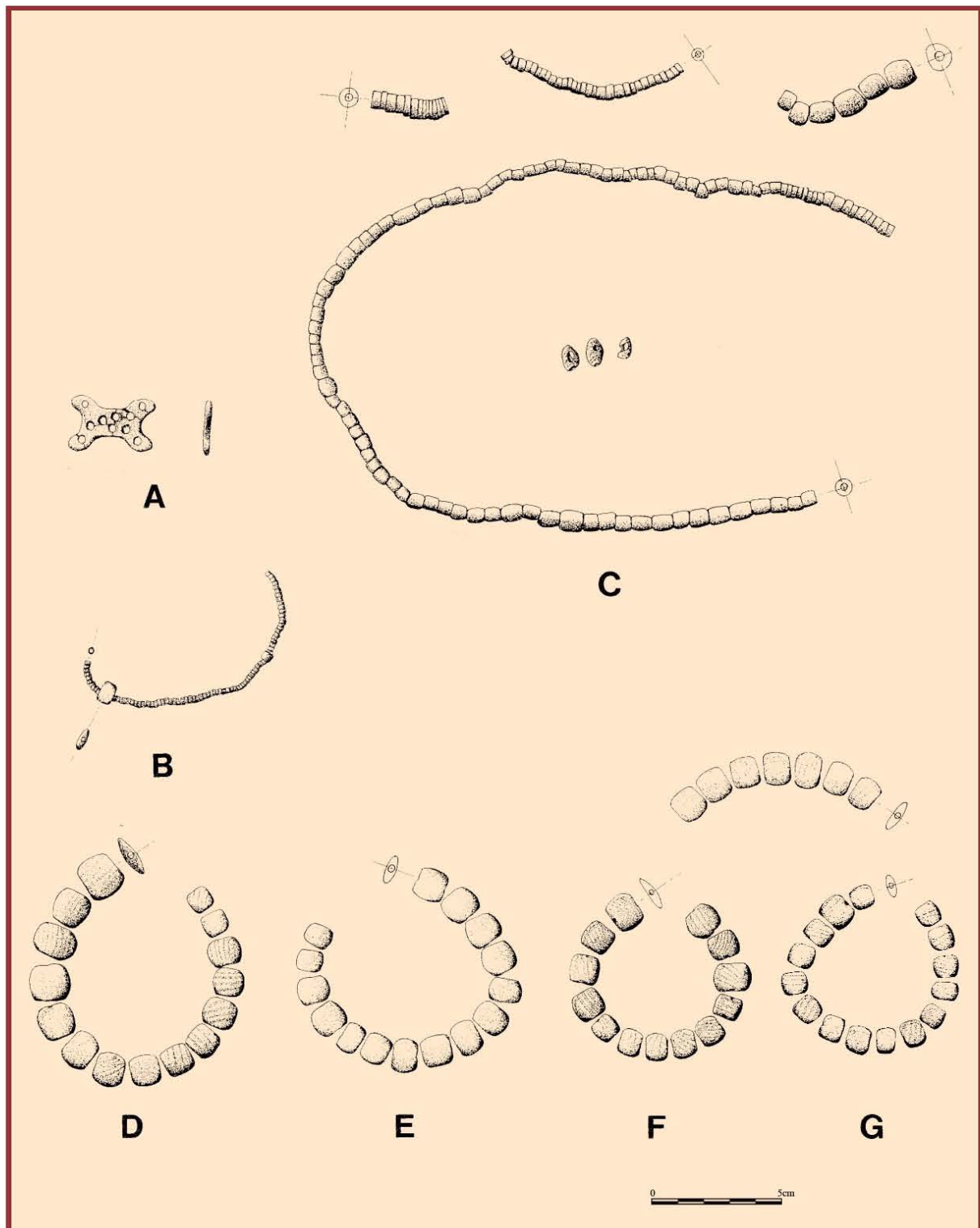
**Figure 162:** Mehrgarh 1998. Grave goods from burial 234 (Graveyard 9). Period I. A- MR 98 03 234 06; B- MR 98 03 234 07; C- MR 98 03 234 08; D- MR 98 03 234 09; E- MR 98 03 234 10.



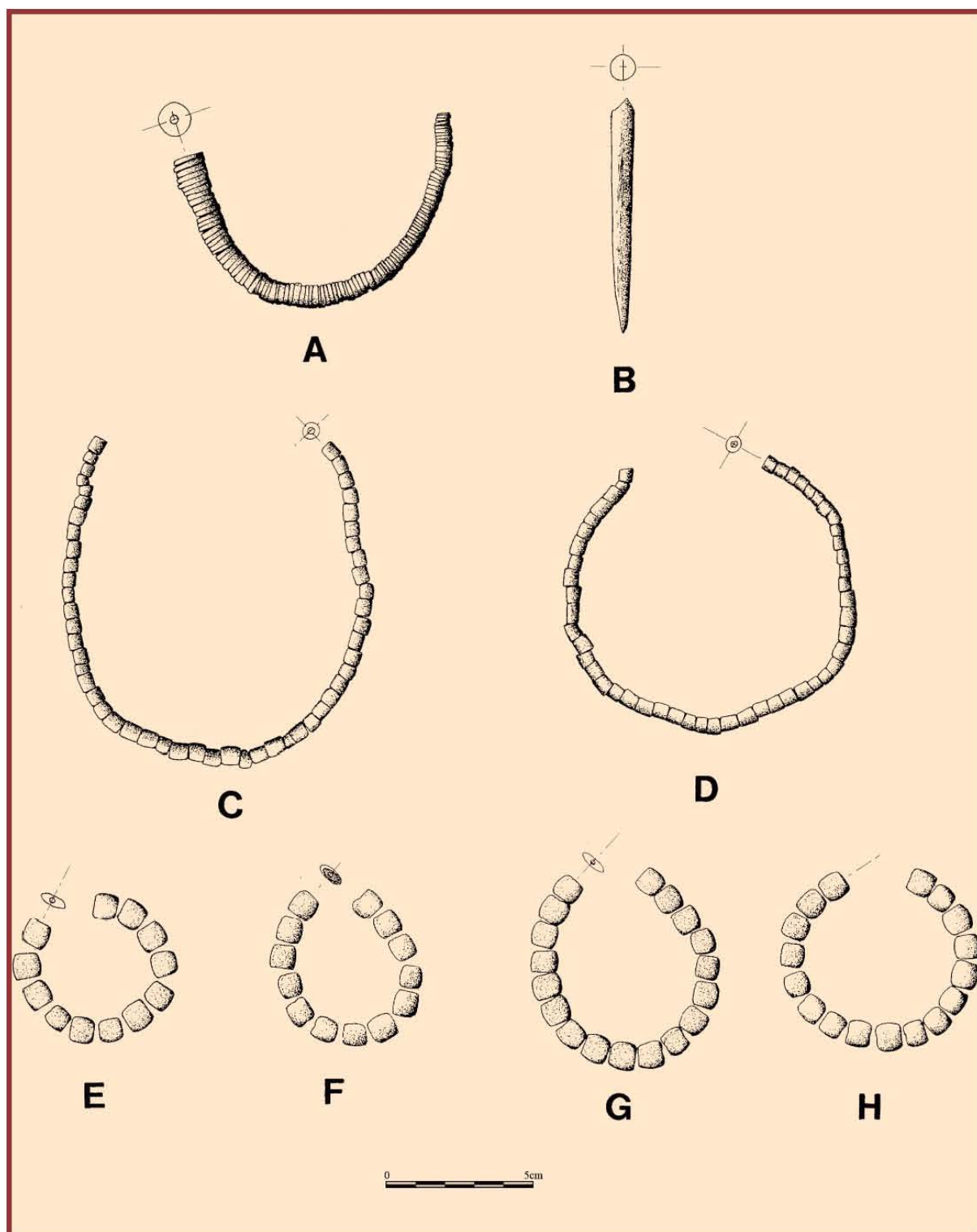
**Figure 163:** Mehrgarh 1998. Grave goods from burial 234 (Graveyard 9). Period I. A- MR 98 03 234 01; B- MR 98 03 234 02; C- MR 98 03 234 03; D- MR 98 03 234 04; E- MR 98 03 234 05.



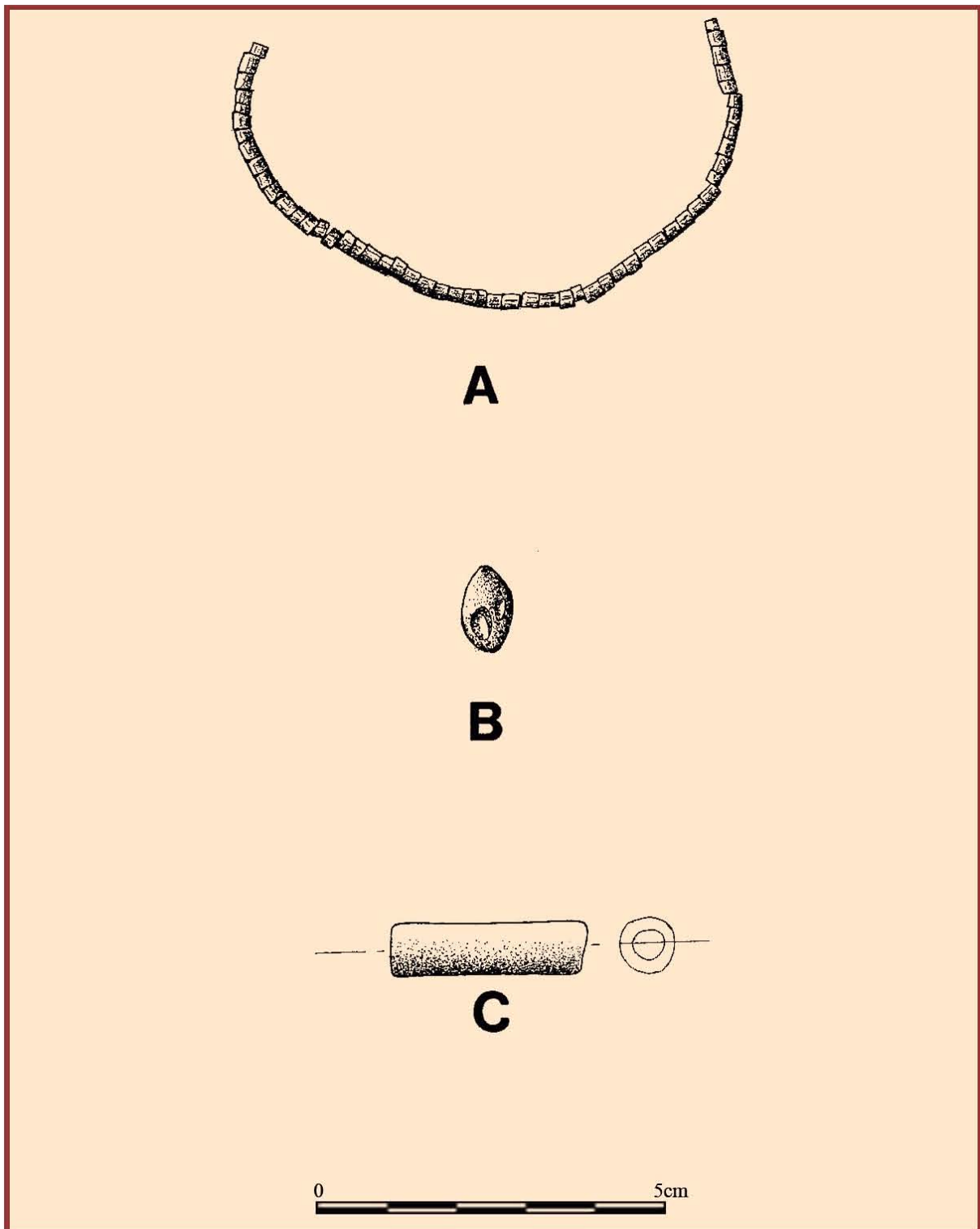
**Figure 164:** Mehrgarh 1999. Grave goods from burial 229 (Graveyard 9). Period I. A- MR 99 03 229 09; B- MR 99 03 229 01; C- MR 99 03 229 10.



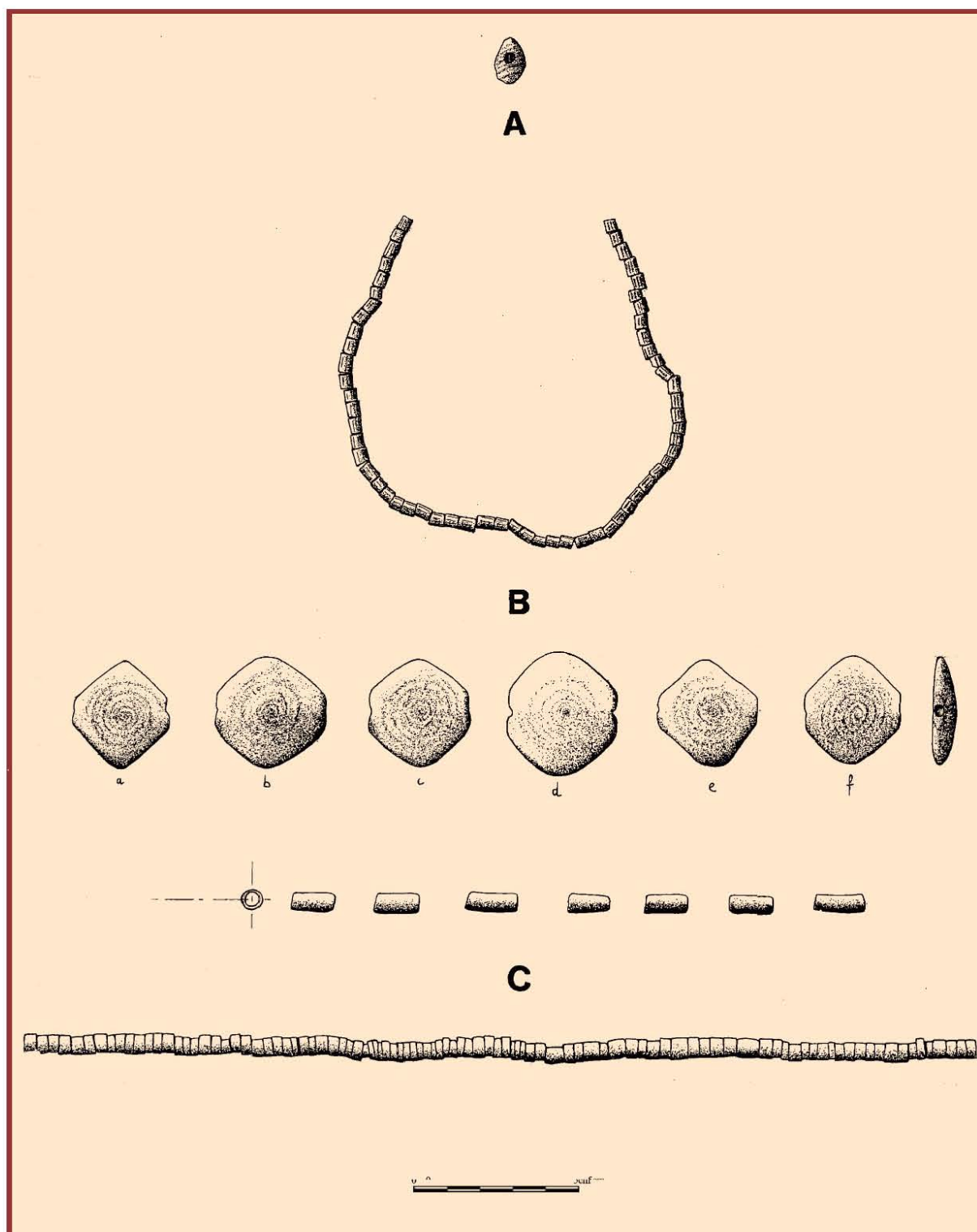
**Figure 165:** Mehrgarh 1999. Grave goods from burial 239 (Graveyard 9). Period I. A- MR 99 03 239 07; B- MR 99 03 239 06; C- MR 99 03 239 05; D- MR 99 03 239 02; E- MR 99 03 239 01; F- MR 99 03 239 03; G- MR 99 03 239 04.



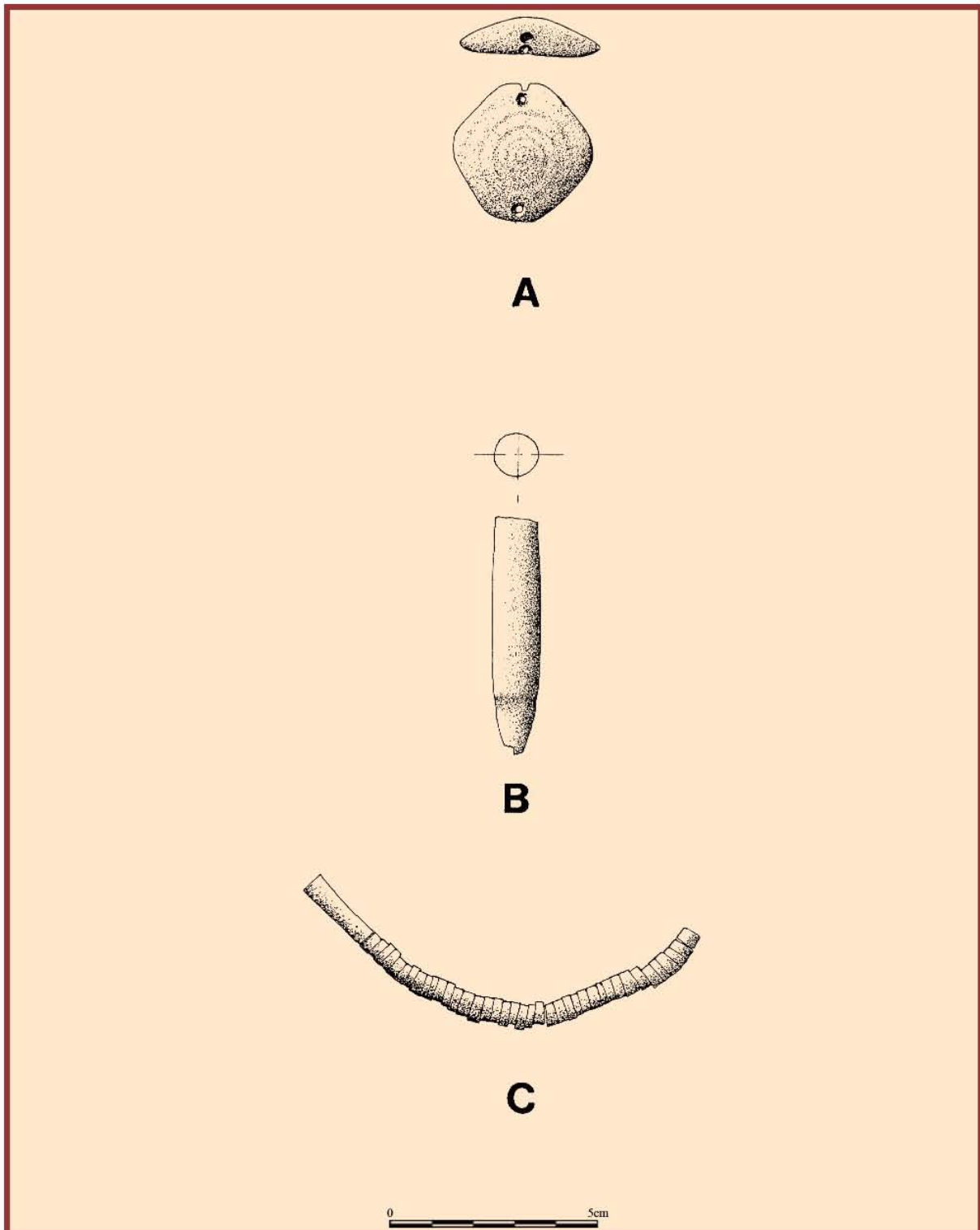
**Figure 166:** Mehrgarh 1999. Grave goods from burial 241 (Graveyard 9). Period I. A- MR 99 03 241 06; B- MR 99 03 241 08; C- MR 99 03 241 03; D- MR 99 03 241 07 E- MR 99 03 241 04; F- MR 99 03 241 05; G- MR 99 03 241 01; H- MR 99 03 241 02.



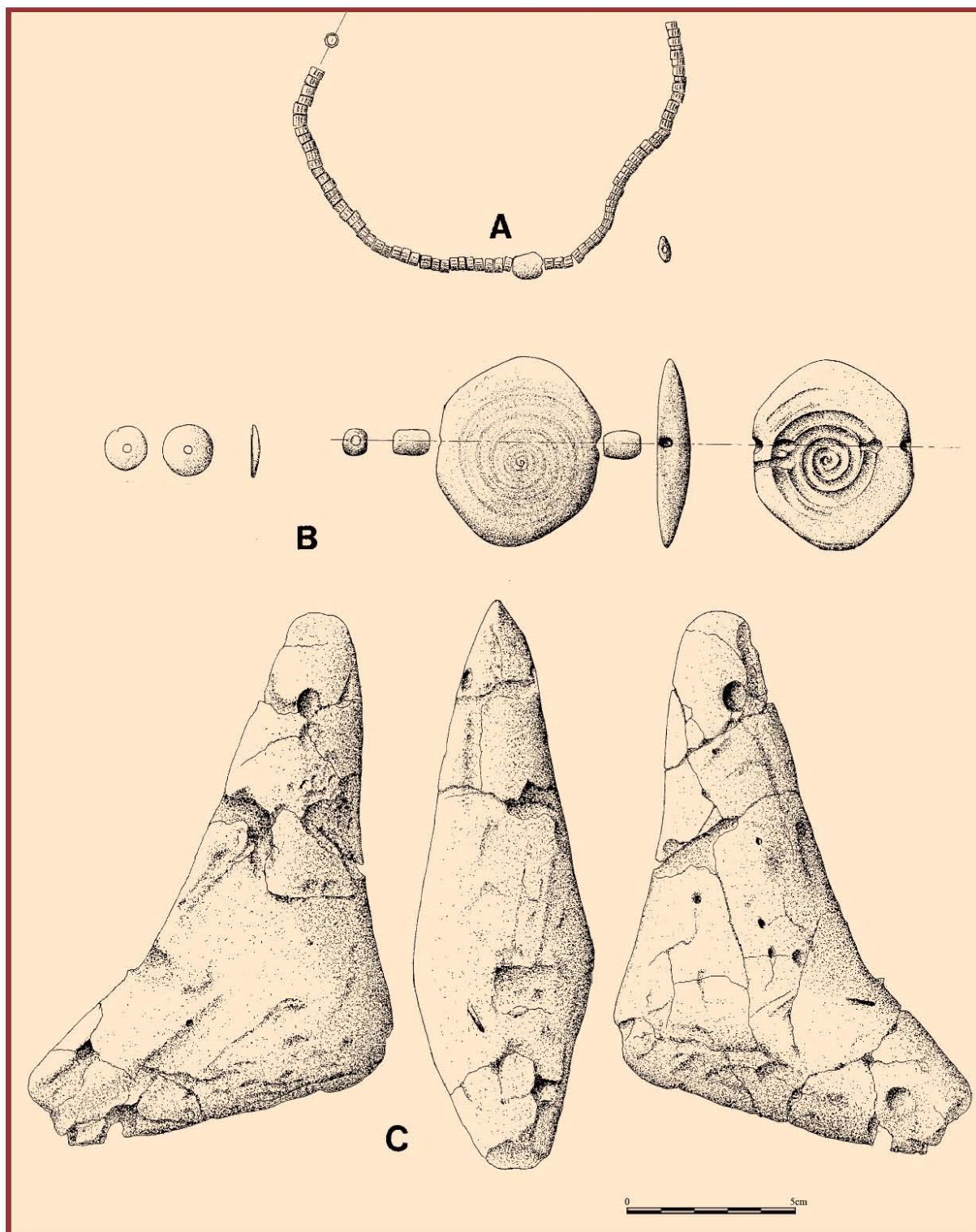
**Figure 167:** Mehrgarh 1999. Grave goods from burial 247 (Graveyard 4). Period I. A- MR 99 03 247 02; B- MR 99 03 247 01; C- MR 99 03 247 03.



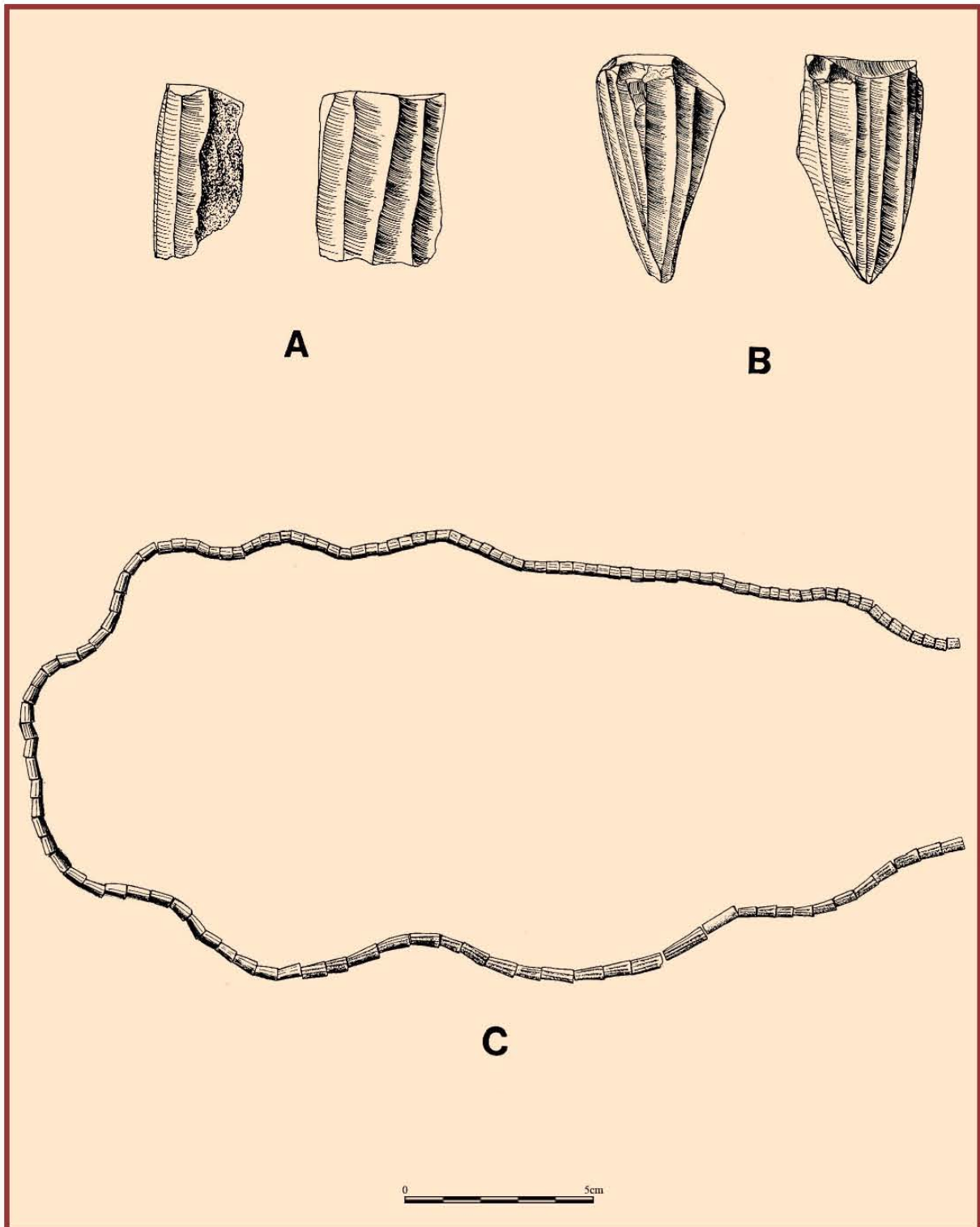
**Figure 168:** Mehrgarh 1999. Grave goods from burial 250 (Graveyard 5). Period I. A- MR 99 03 250 03; B- MR 99 03 250 02; C- MR 99 03 250 01.



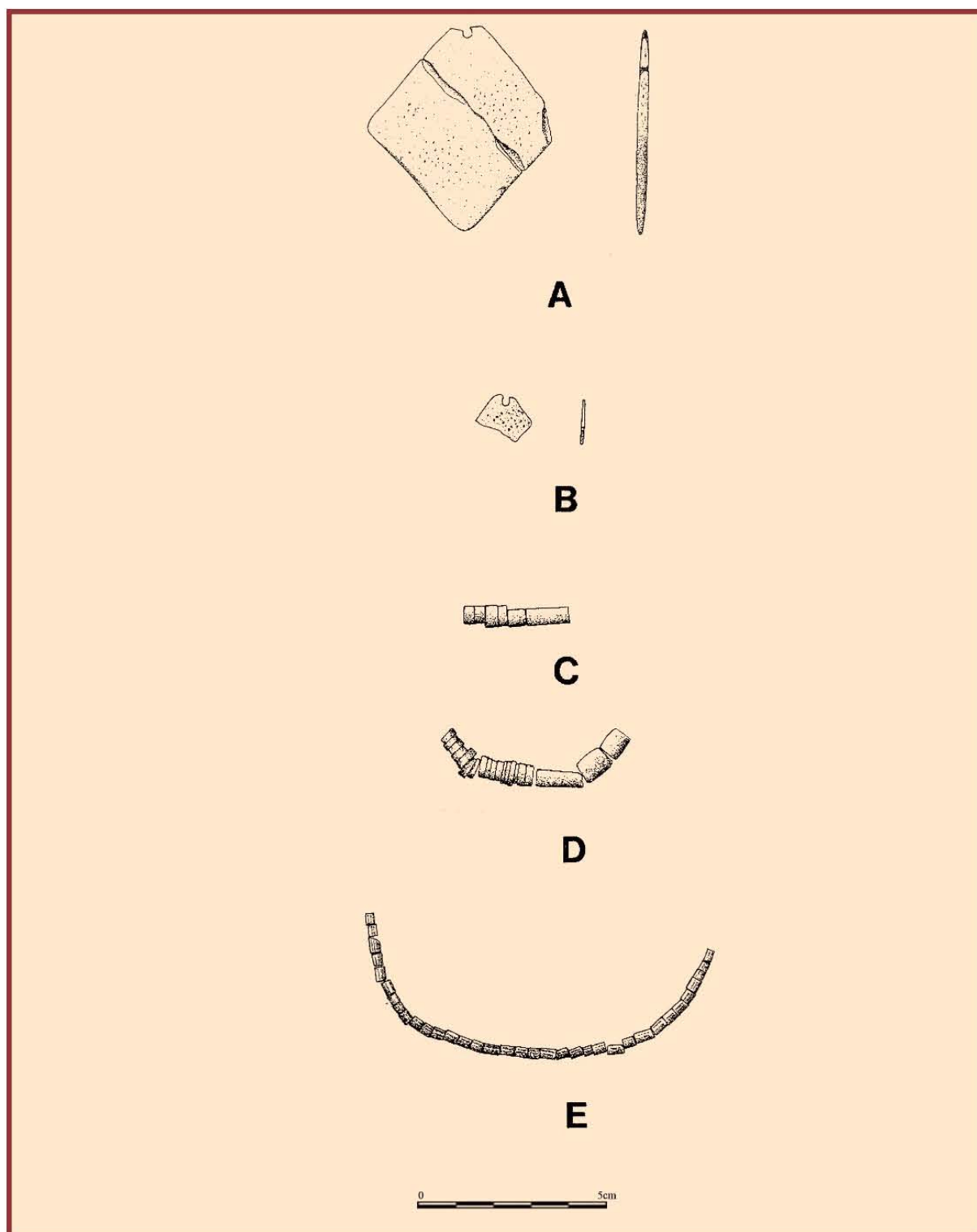
**Figure 169:** Mehrgarh 1999. Grave goods from burial 254 (Graveyard 8). Period I. A- MR 99 03 254 01; B- MR 99 03 254 03; C- MR 99 03 254 02.



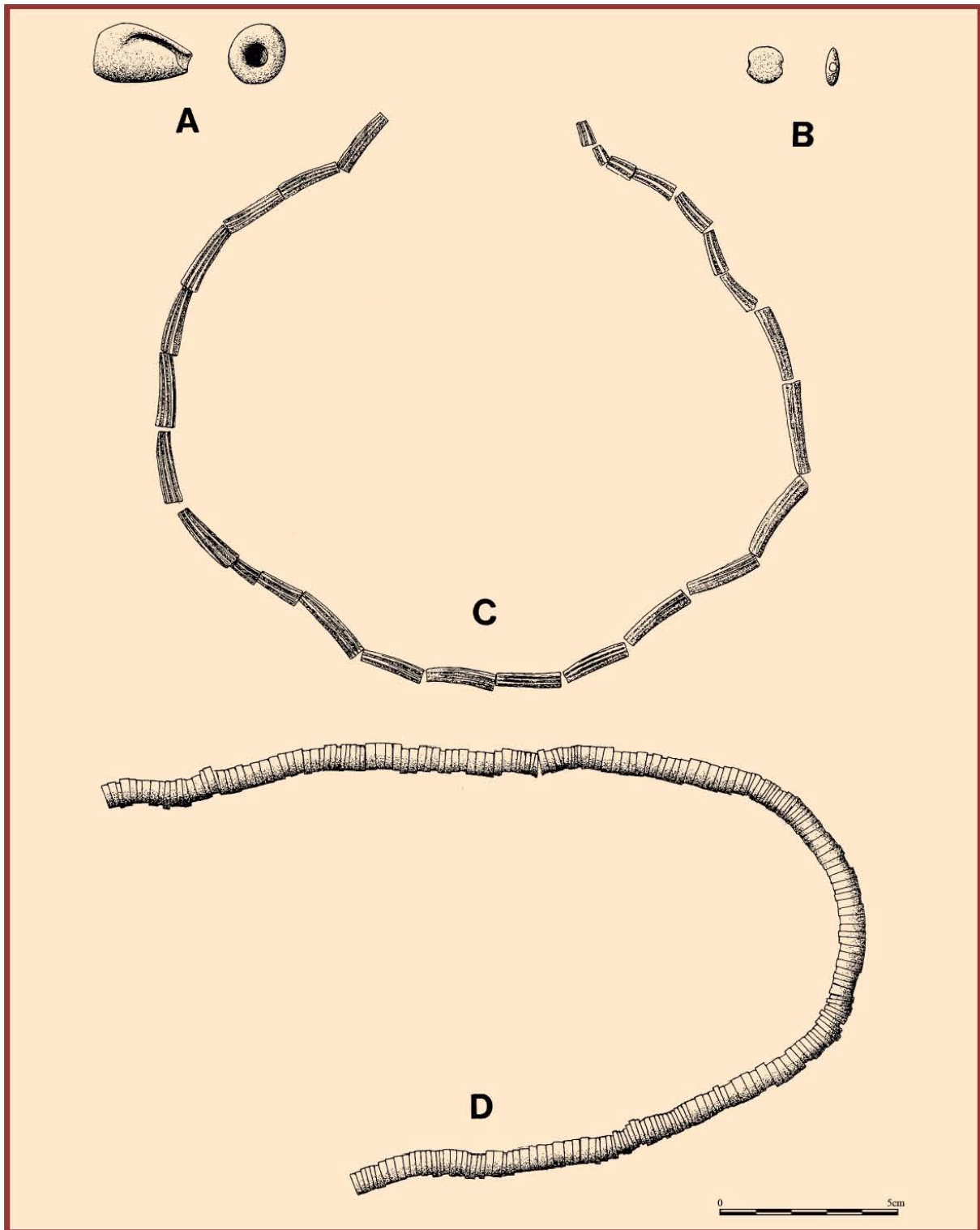
**Figure 170:** Mehrgarh 1999. Grave goods from burial 258 (Graveyard 9). Period I. A- MR 99 03 258 01; B- MR 99 03 258 02; C- MR 99 03 258 03.



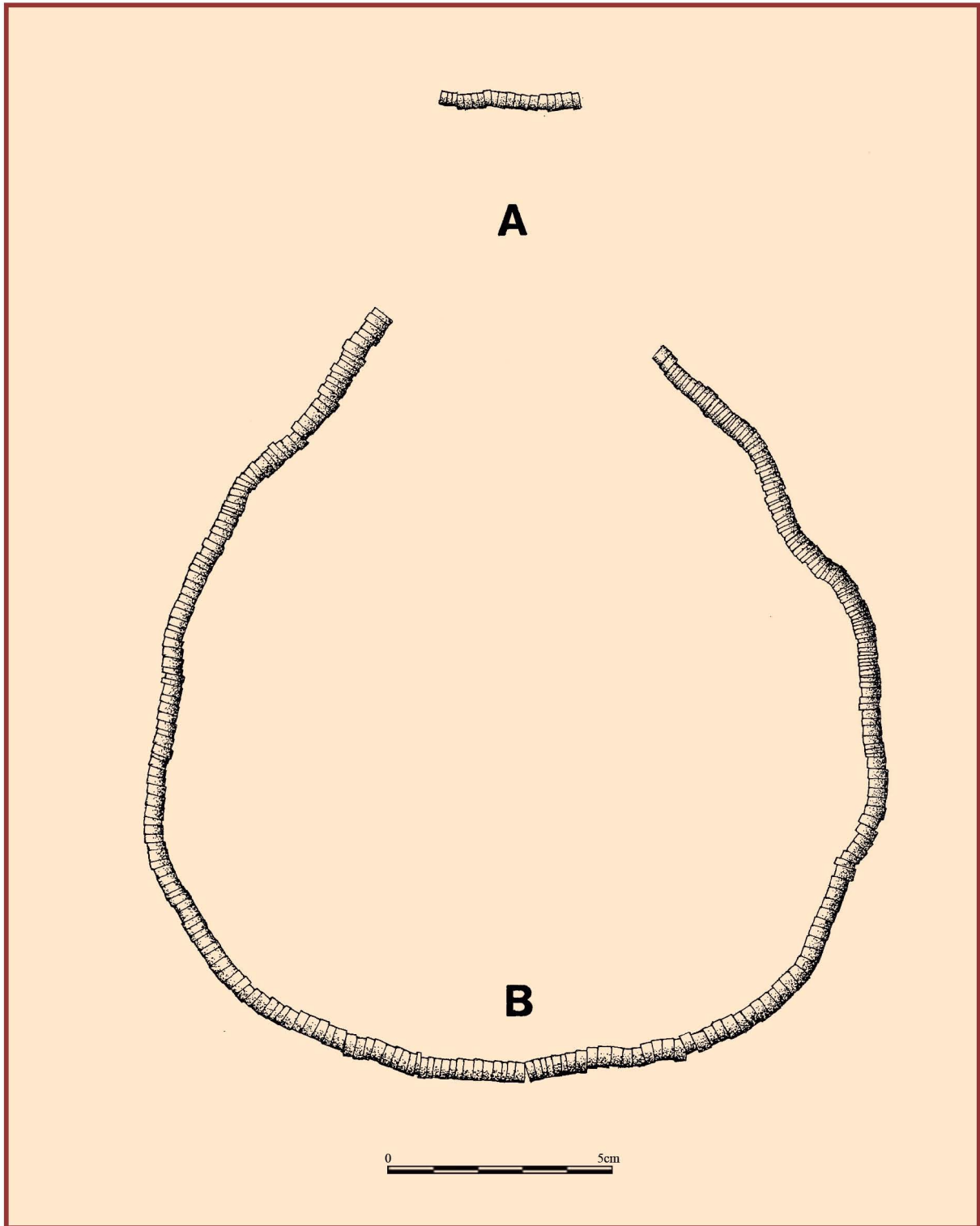
**Figure 171:** Mehrgarh 1999. Grave goods from burial 262 (Graveyard 8). Period I. A- MR 99 03 262 03; B- MR 99 03 262 02; C- MR 99 03 262 01.



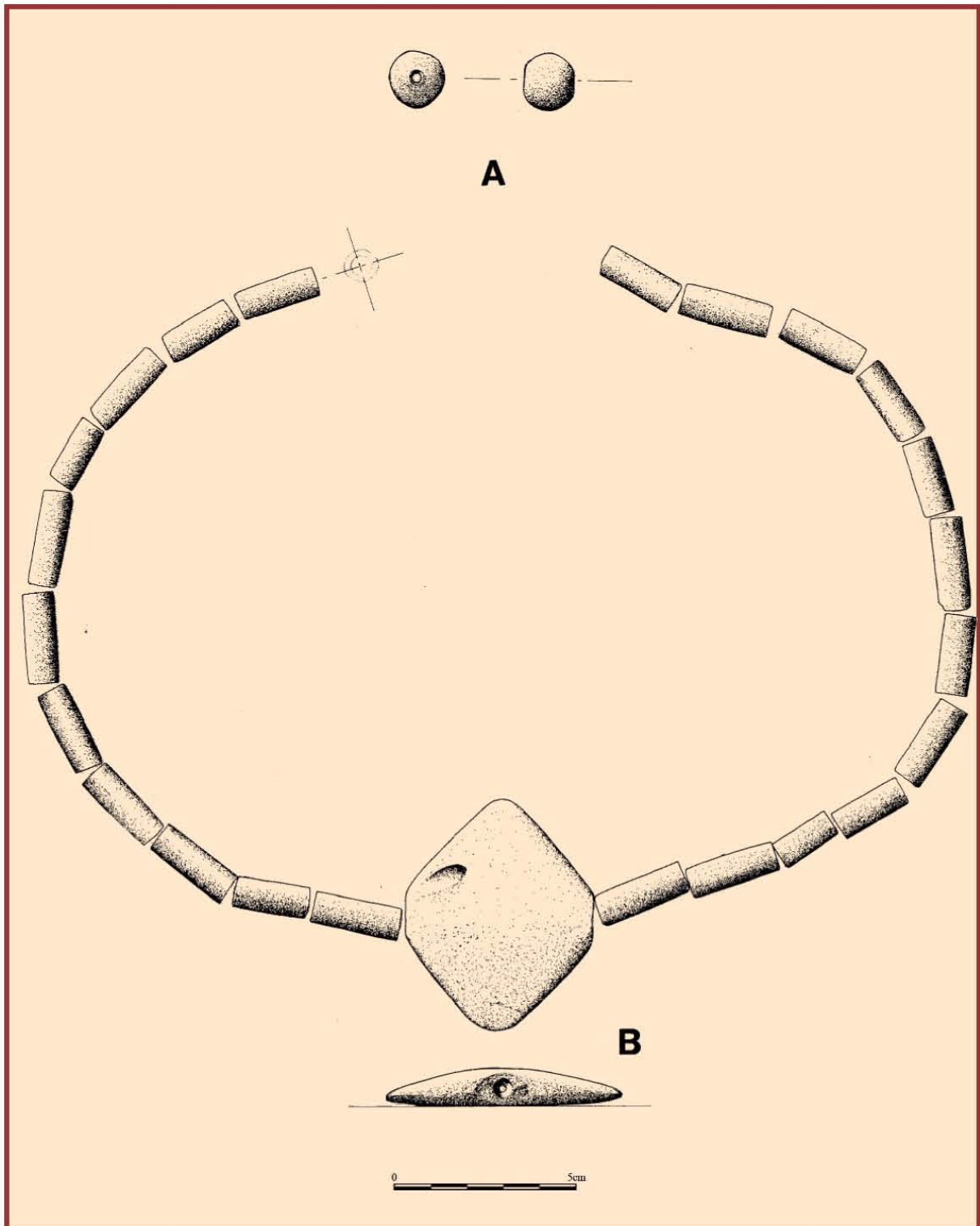
**Figure 172:** Mehrgarh 1999. Grave goods from burial 268 (Graveyard 8). Period I. A- MR 99 03 268 02 B- MR 99 03 268 03 C- MR 99 03 268 05 D- MR 99 03 268 01; E- MR 99 03 268 04.



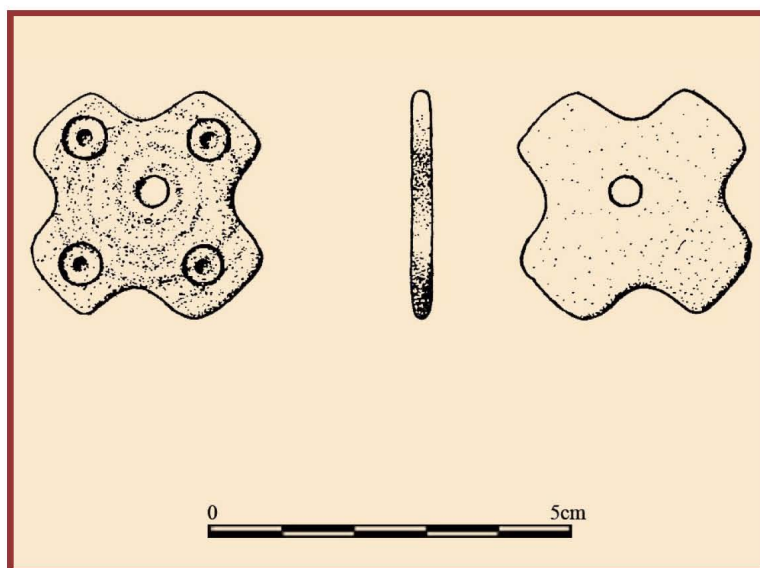
**Figure 173:** Mehrgarh 1999. Grave goods from burial 269 (Graveyard 8). Period I. A- MR 99 03 269 04; B- MR 99 03 269 03; C- MR 99 03 269 02; D- MR 99 03 269 01.



**Figure 174:** Mehrgarh 1999. Grave goods from burial 274 (Graveyard 5). Period I. A- MR 99 03 274 02 B- MR 99 03 274 03.

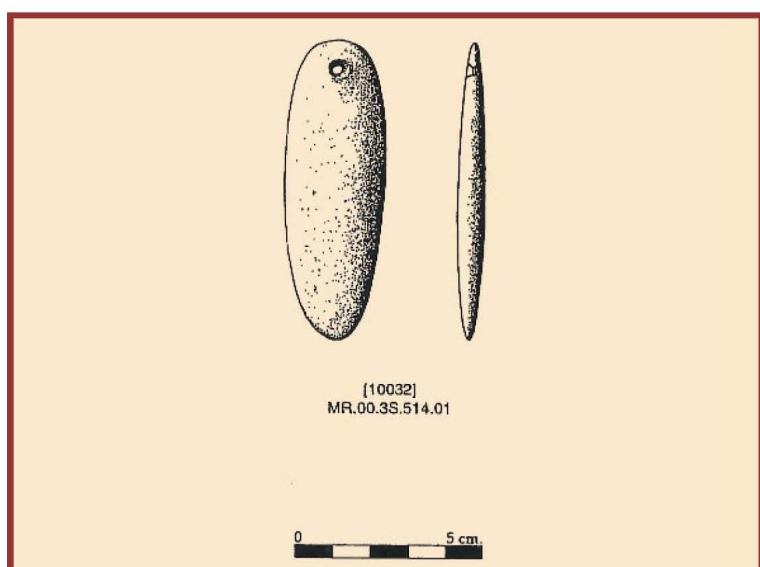


**Figure 175:** Mehrgarh 1999. Grave goods from burial 279 (Graveyard 5). Period I. A- MR 99 03 279 02; B- MR 99 03 279 01.

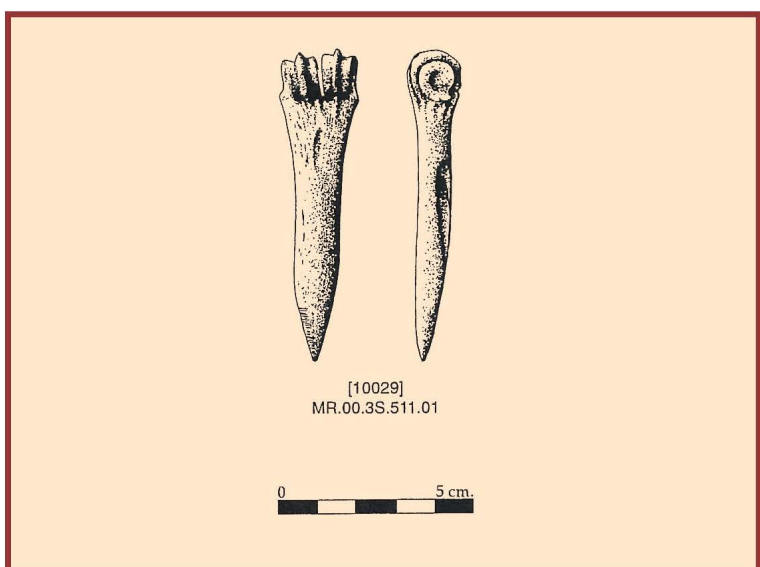


**Figure 176:** Mehrgarh 1999. Grave good from burial 282 (Graveyard 6), Period I.

MR 99 03 282 01.



**Figure 177:** Mehrgarh 2000. Grave good from burial 514 (Graveyard 1), Period I.



**Figure 178:** Mehrgarh 2000. Grave good from burial 511 (Graveyard 3), Period I.

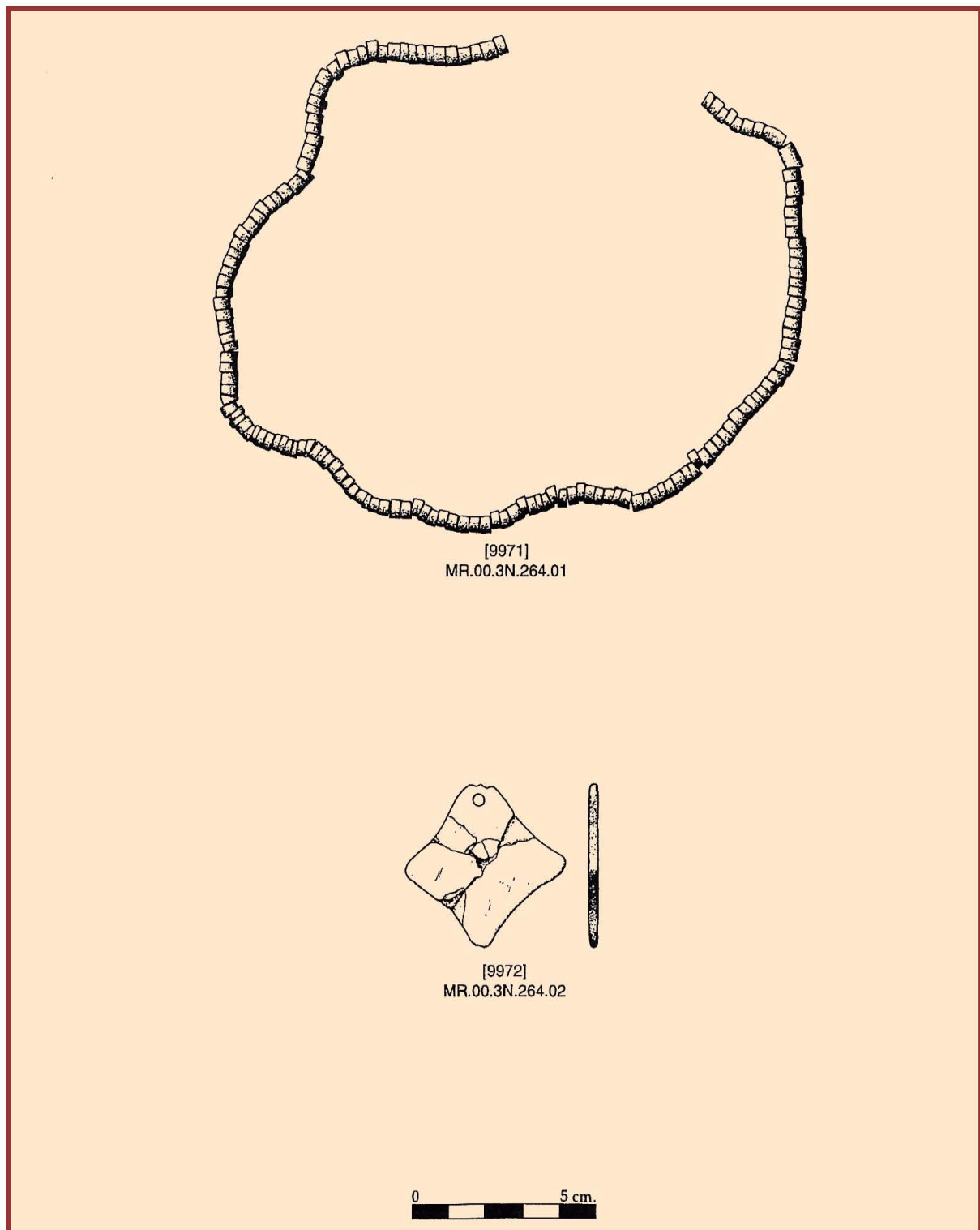


Figure 179: Mehrgarh 2000. Grave goods from burial 264 (Graveyard 8), Period I.

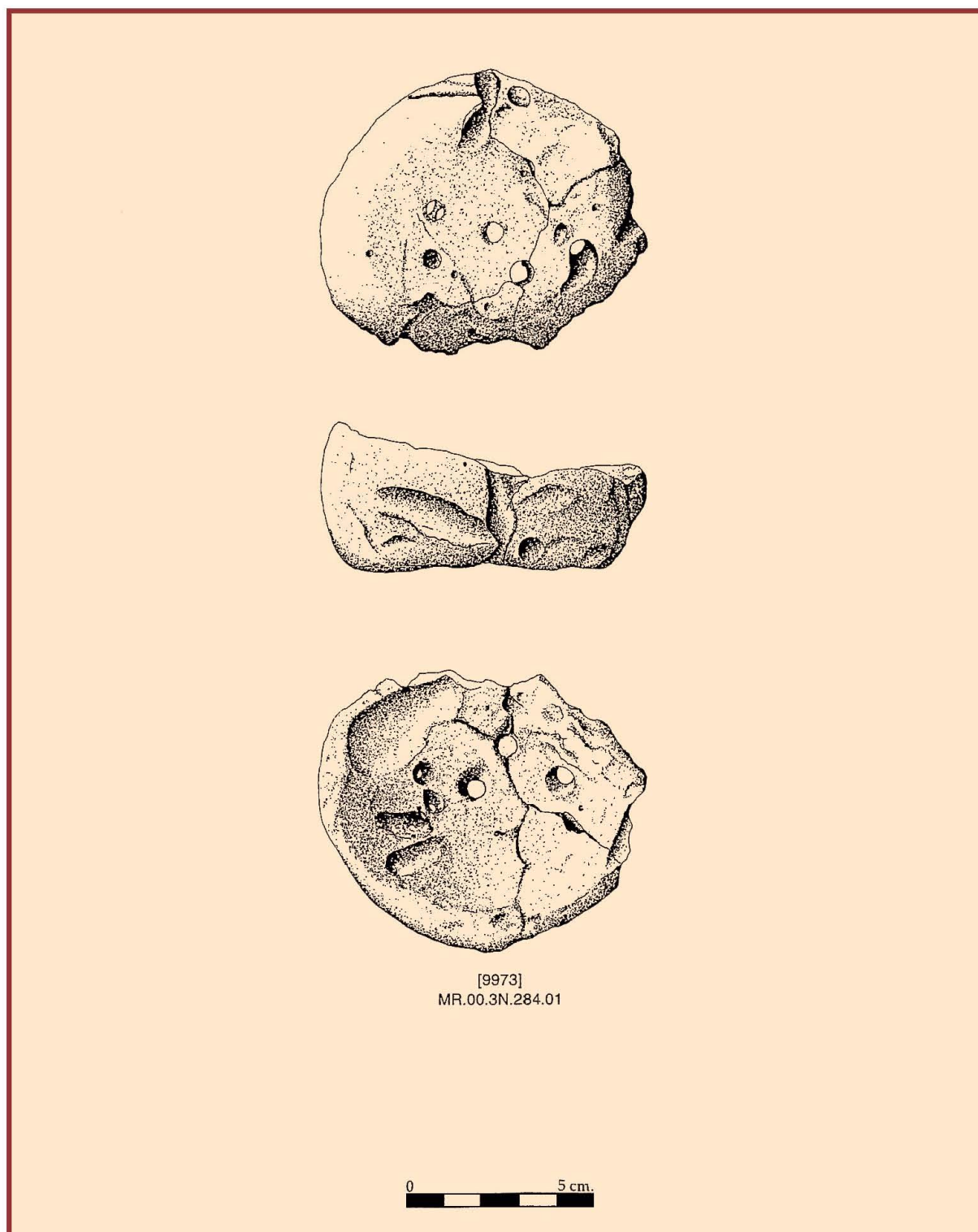


Figure 180: Mehrgarh 2000. Grave goods from burial 284 (Graveyard 9), Period I.

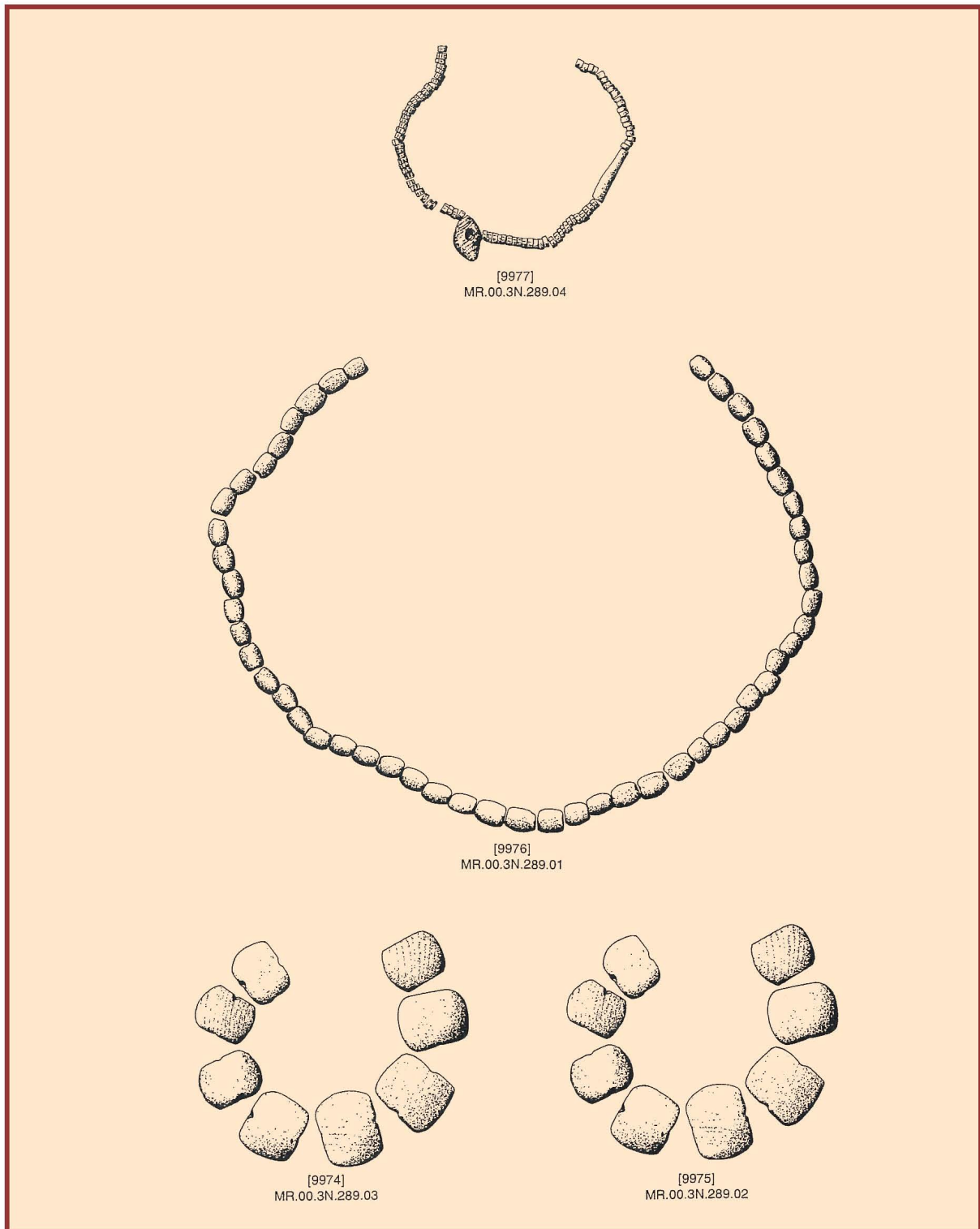


Figure 181: Mehrgarh 2000. Grave goods from burial 289 (Graveyard 8), Period I.

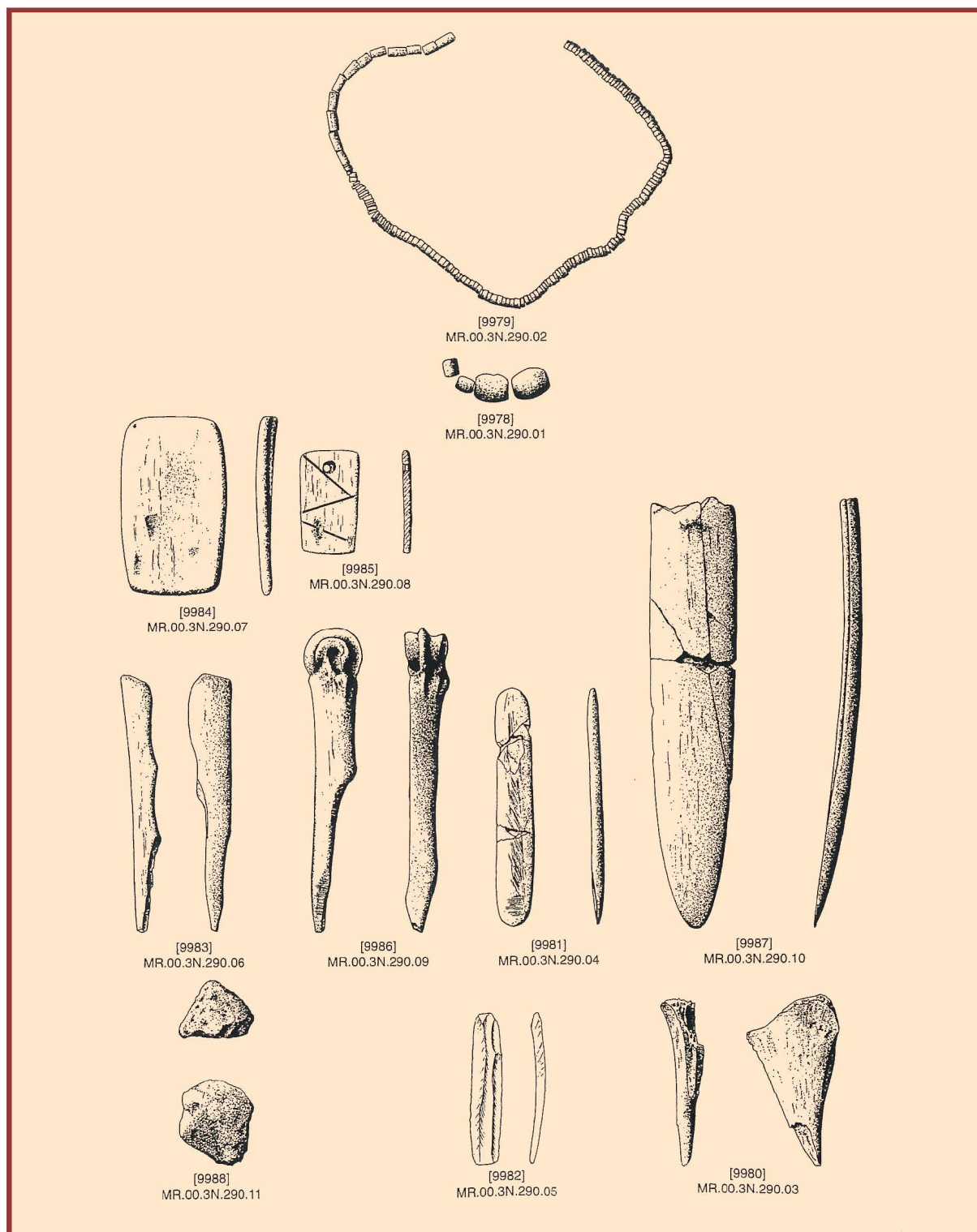
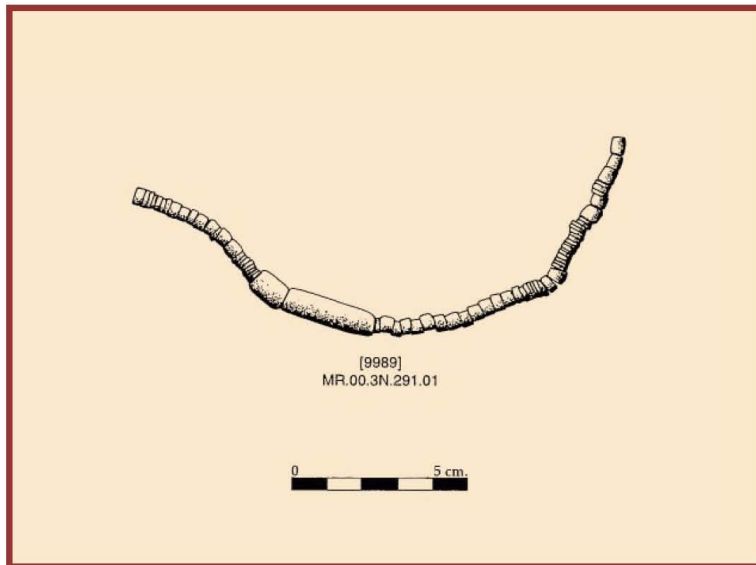
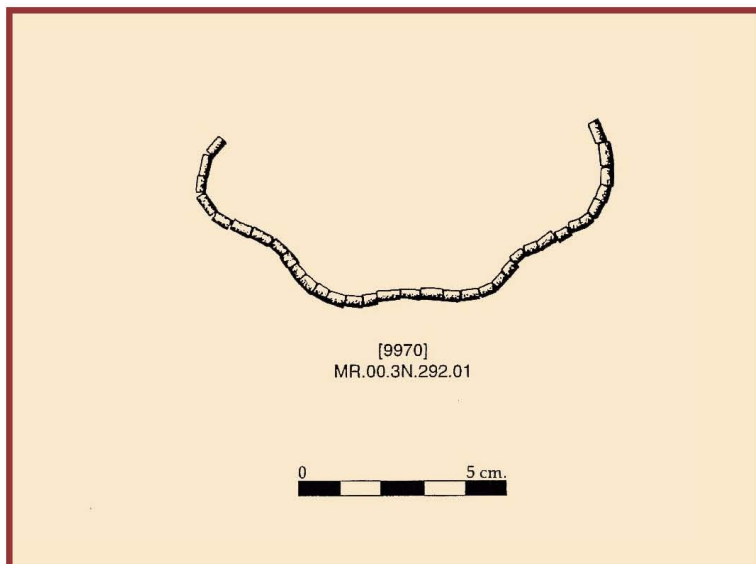


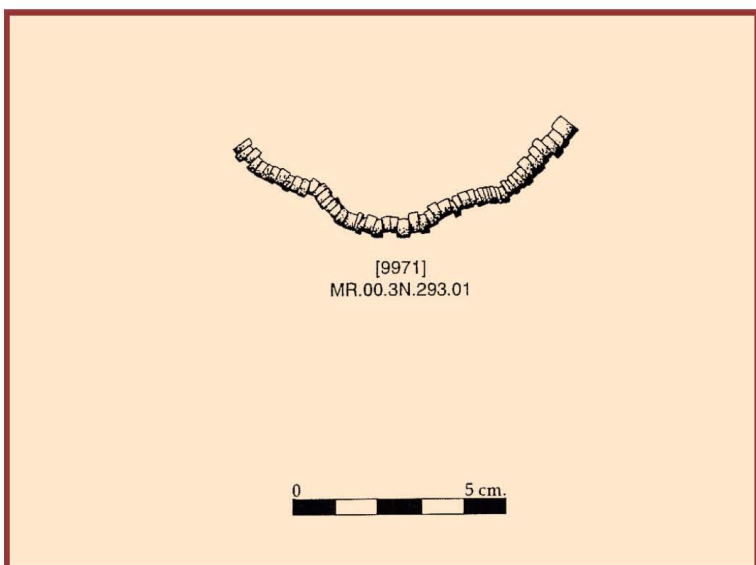
Figure 182: Mehrgarh 2000. Grave goods from burial 290 (Graveyard 9), Period I.



**Figure 183:** Mehrgarh 2000. Grave good from burial 291 (Graveyard 7), Period 1.



**Figure 184:** Mehrgarh 2000. Grave good from burial 292 (Graveyard 7), Period 1.



**Figure 185:** Mehrgarh 2000. Grave good from burial 293 (Graveyard 8), Period 1.

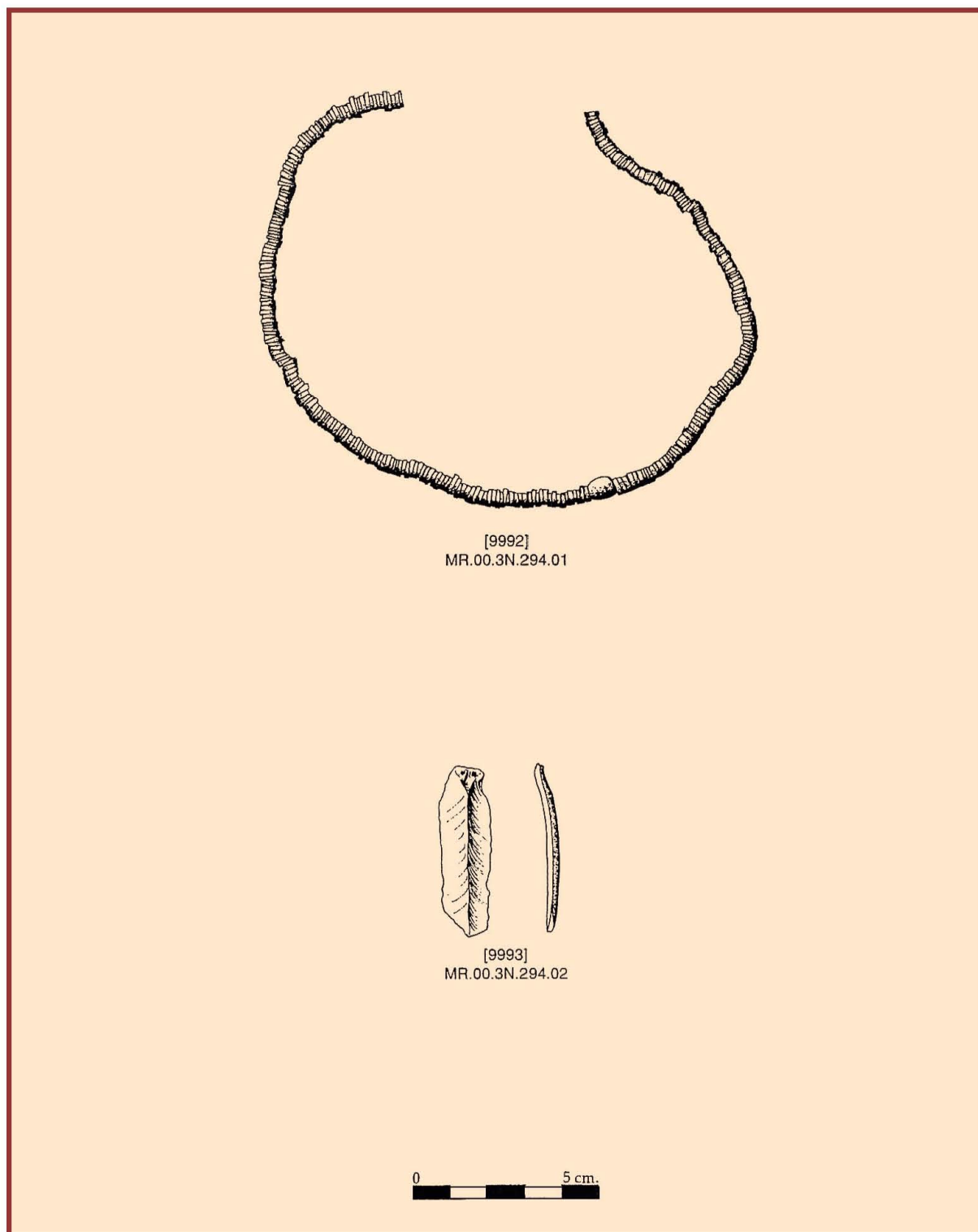


Figure 186: Mehrgarh 2000. Grave goods from burial 294 (Graveyard 8), Period I.

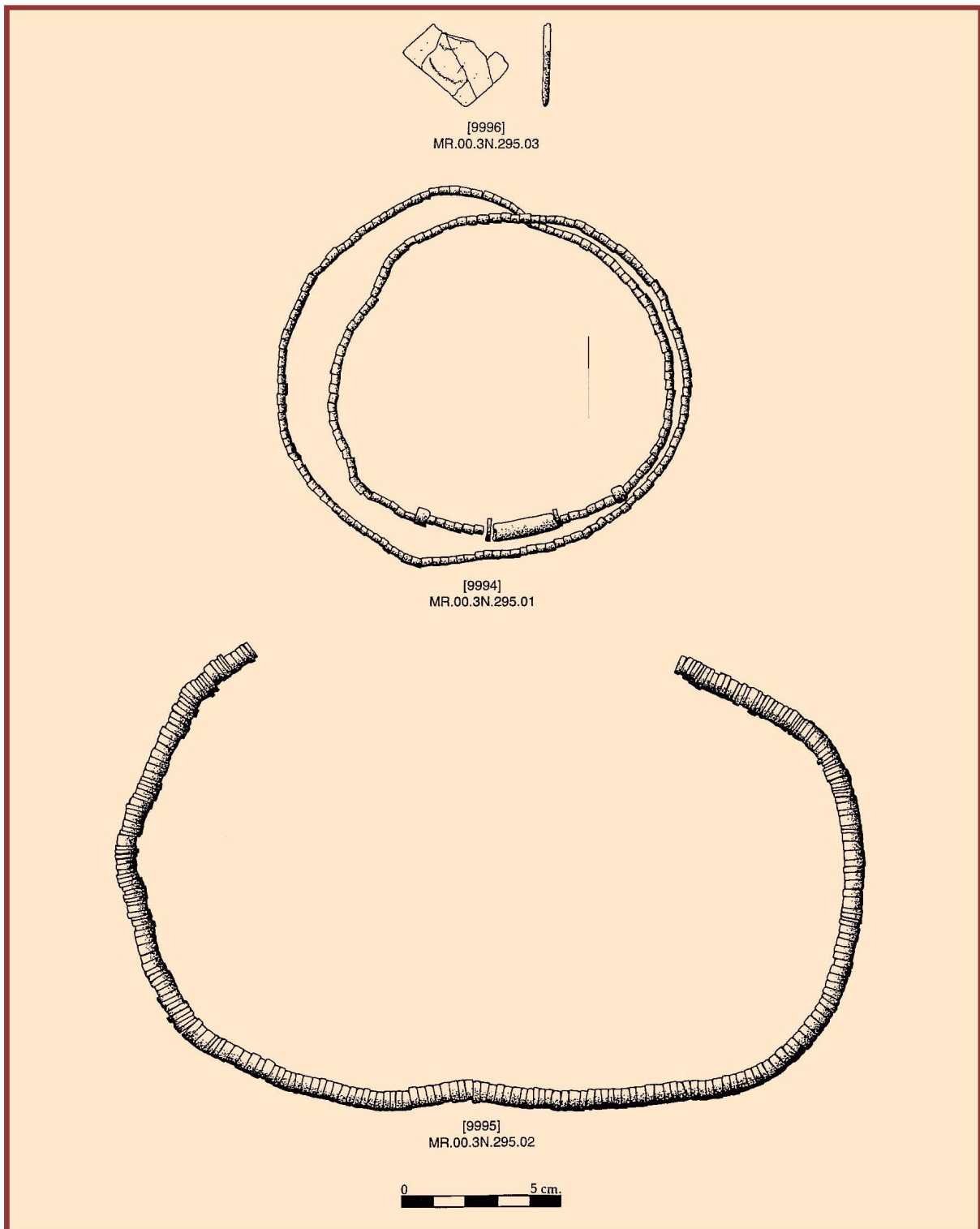


Figure 187: Mehrgarh 2000. Grave goods from burial 295 (Graveyard 8), Period I.

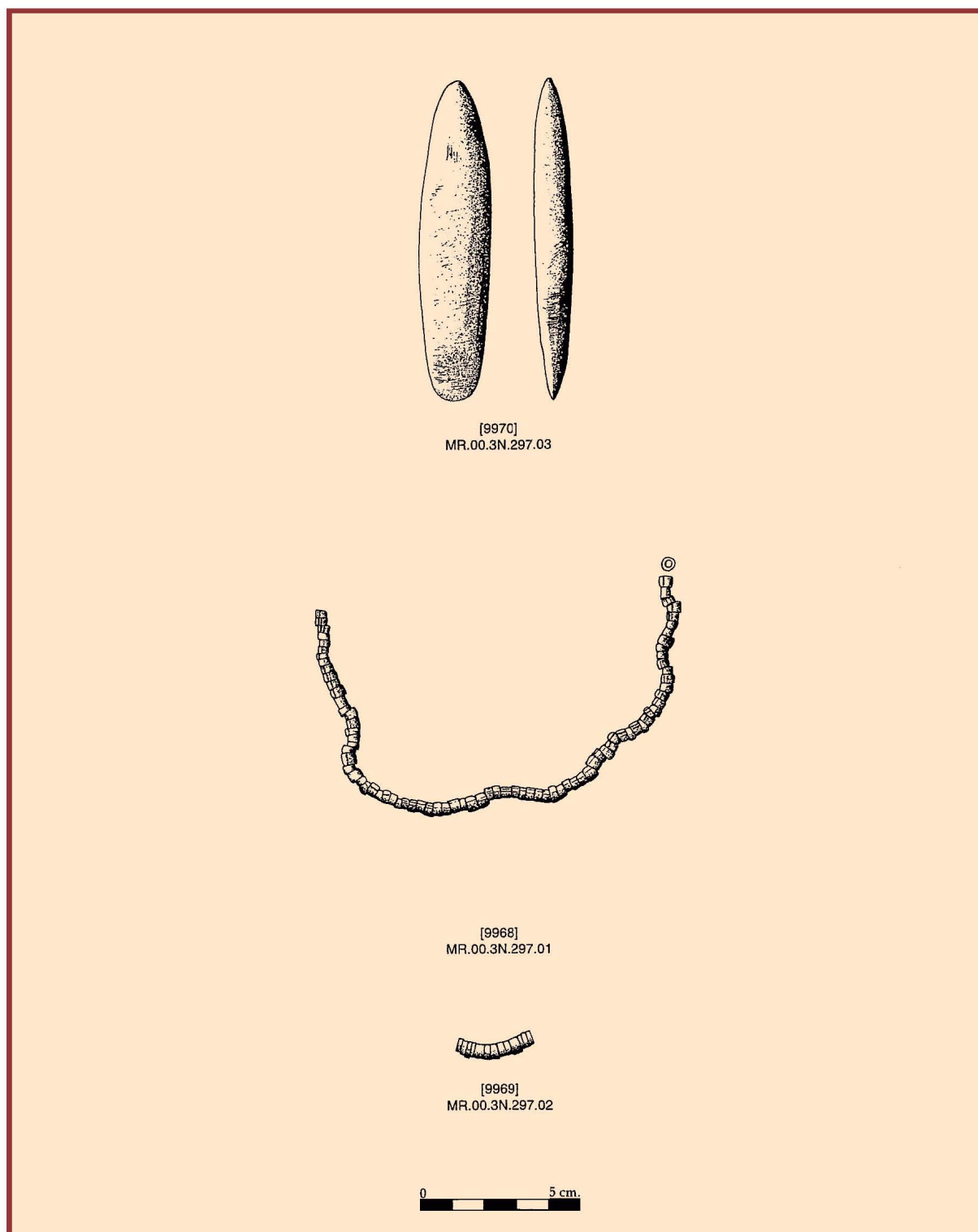
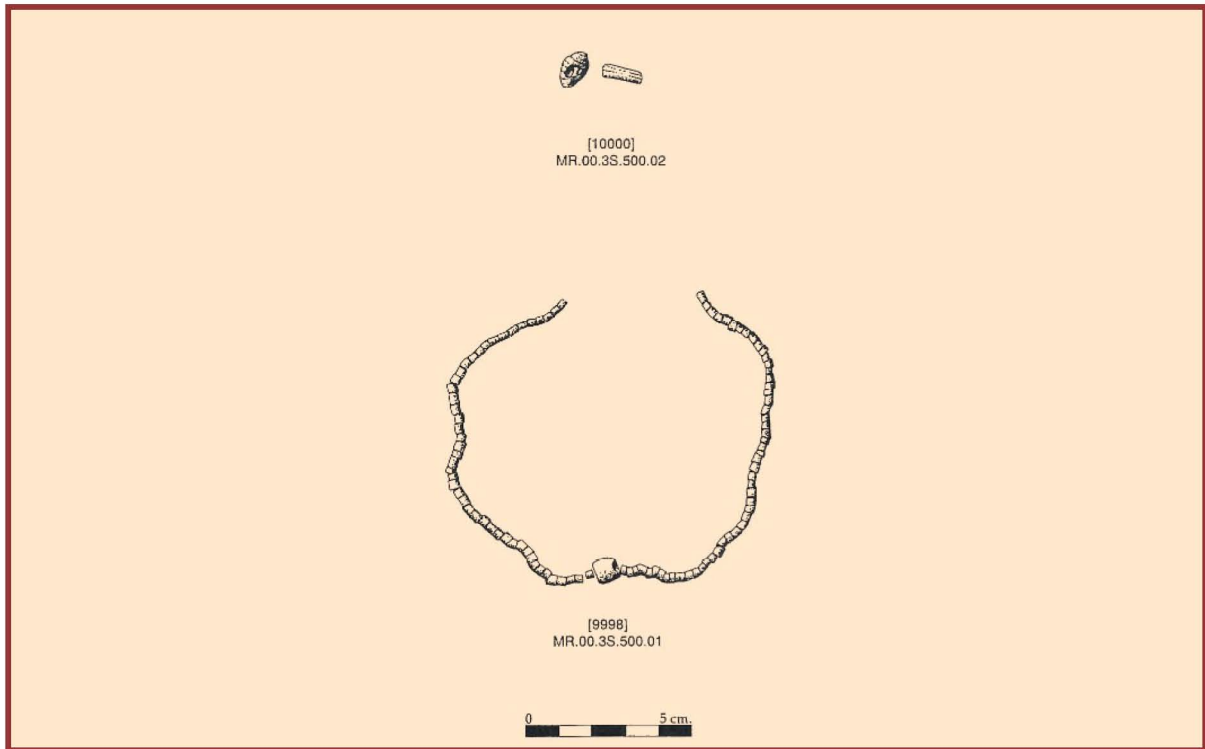


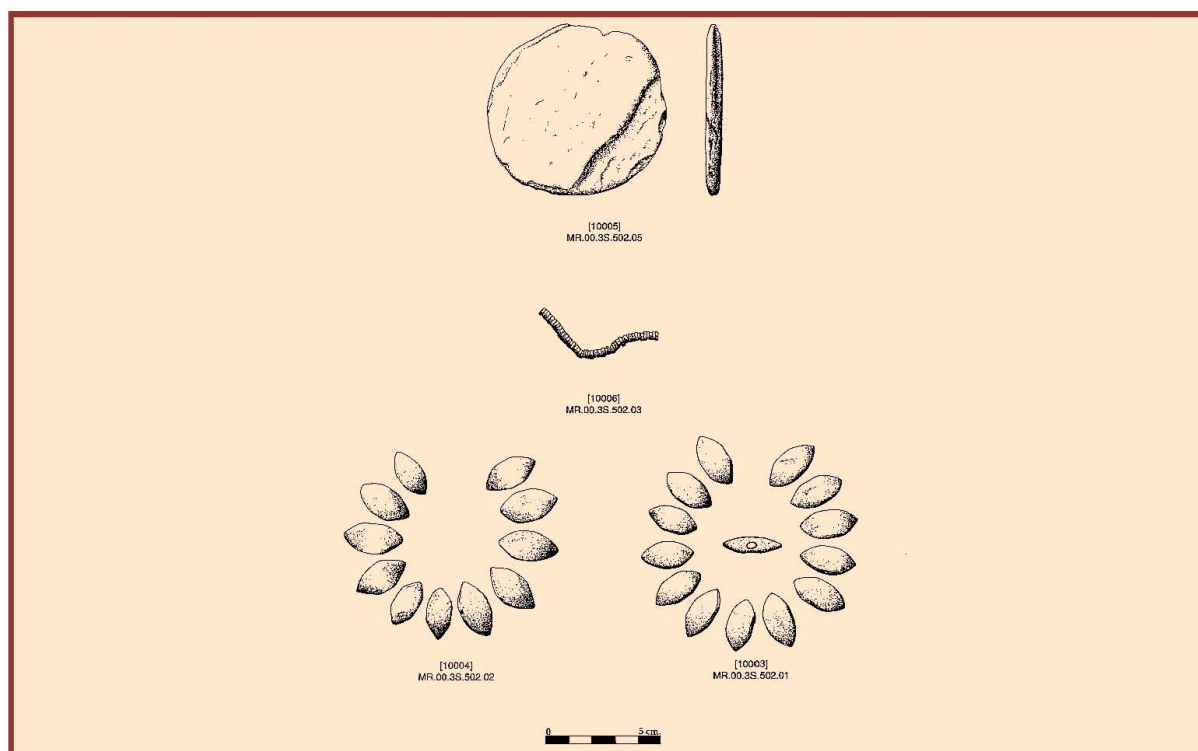
Figure 188: Mehrgarh 2000. Grave goods from burial 297 (Graveyard 9), Period I.



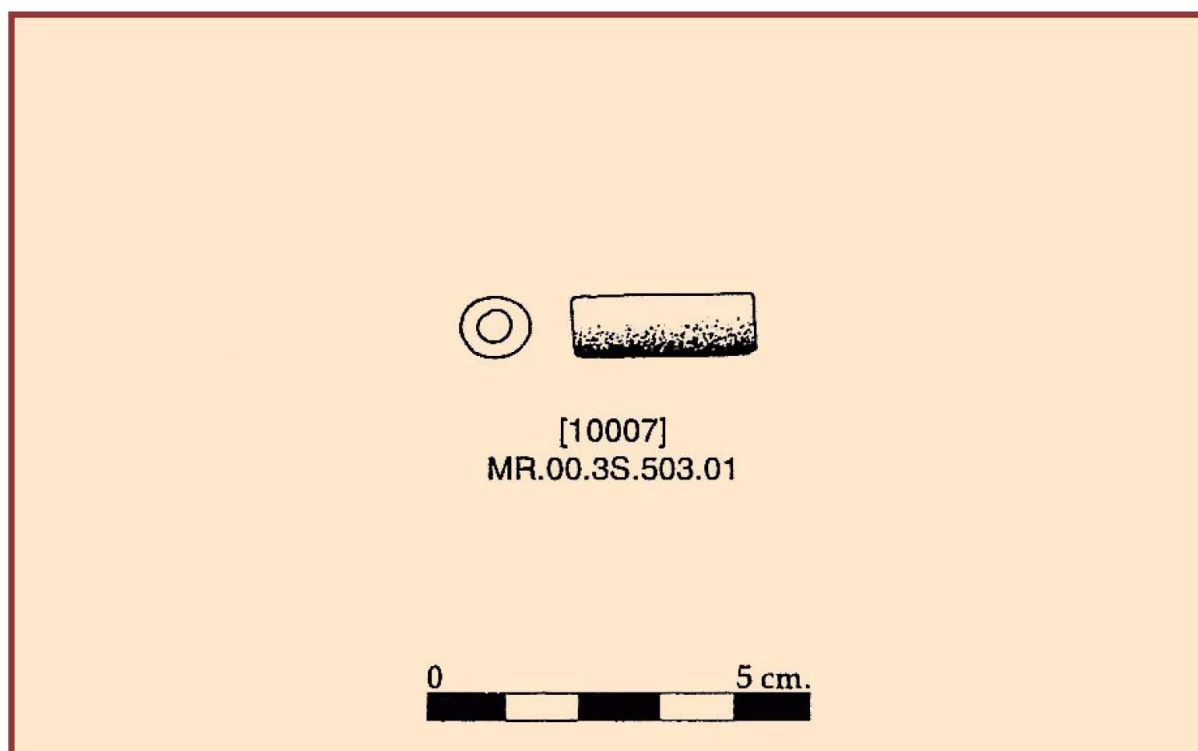
**Figure 189:** Mehrgarh 2000. Grave goods from burial 500 (Graveyard 4), Period 1.



**Figure 190:** Mehrgarh 2000. Grave goods from burial 501 (Graveyard 4), Period 1.



**Figure 191:** Mehrgarh 2000. Grave goods from burial 502 (Graveyard 3), Period I.



**Figure 192:** Mehrgarh 2000. Grave good from burial 503 (Graveyard 4), Period I.

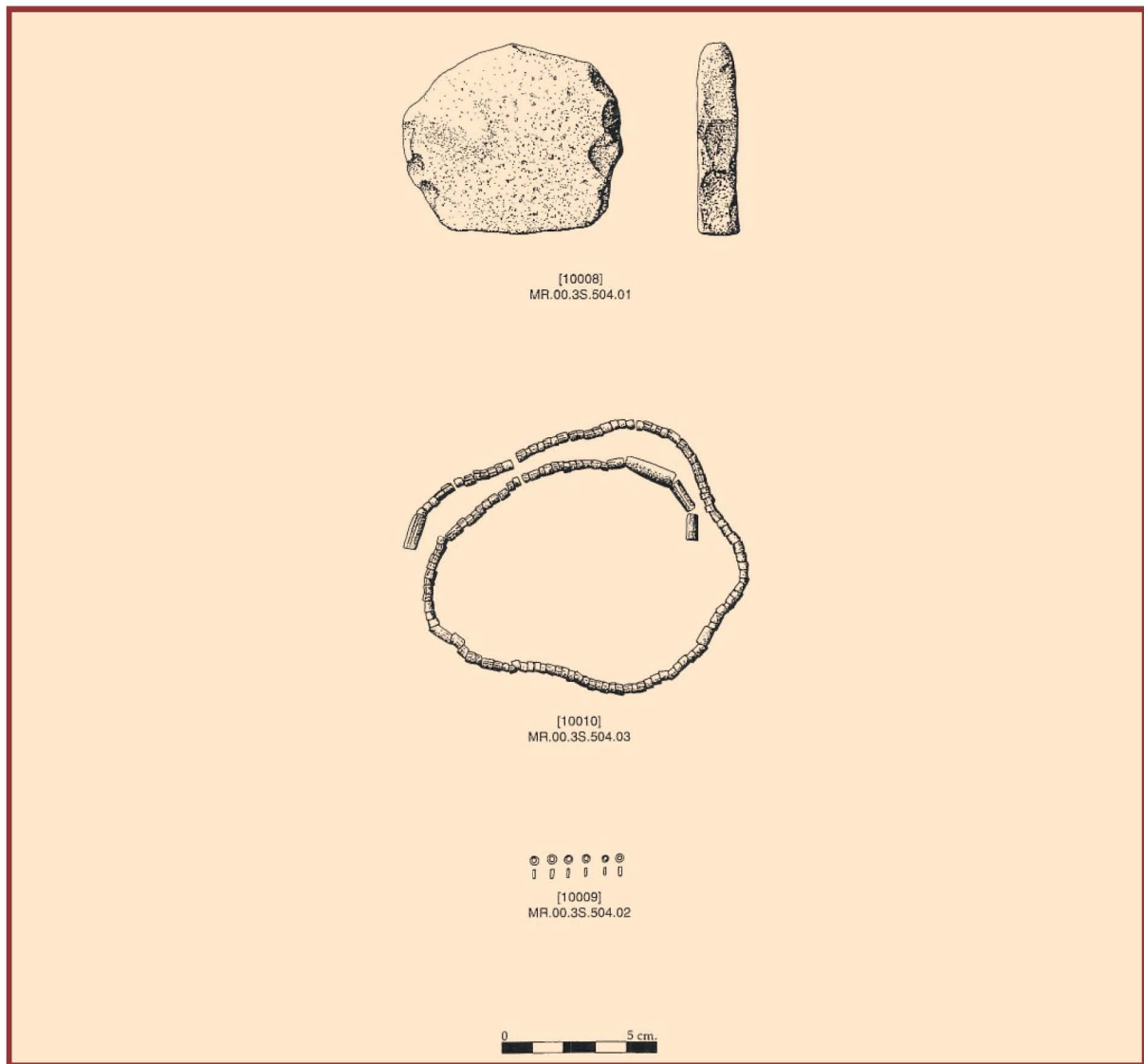


Figure 193: Mehrgarh 2000. Grave goods from burial 504, (Graveyard 3). Period I.

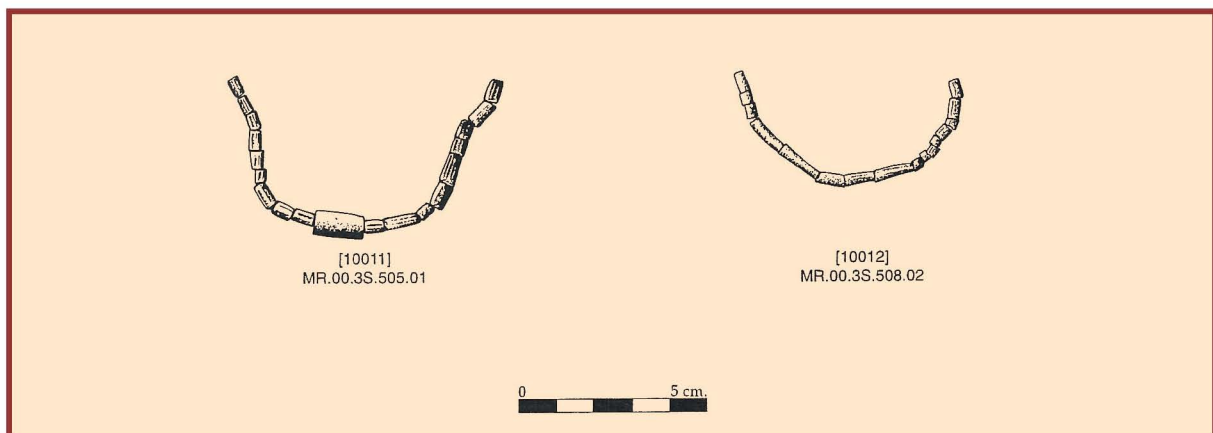


Figure 194: Mehrgarh 2000. Grave goods from burial 505, (Graveyard 3), Period I.

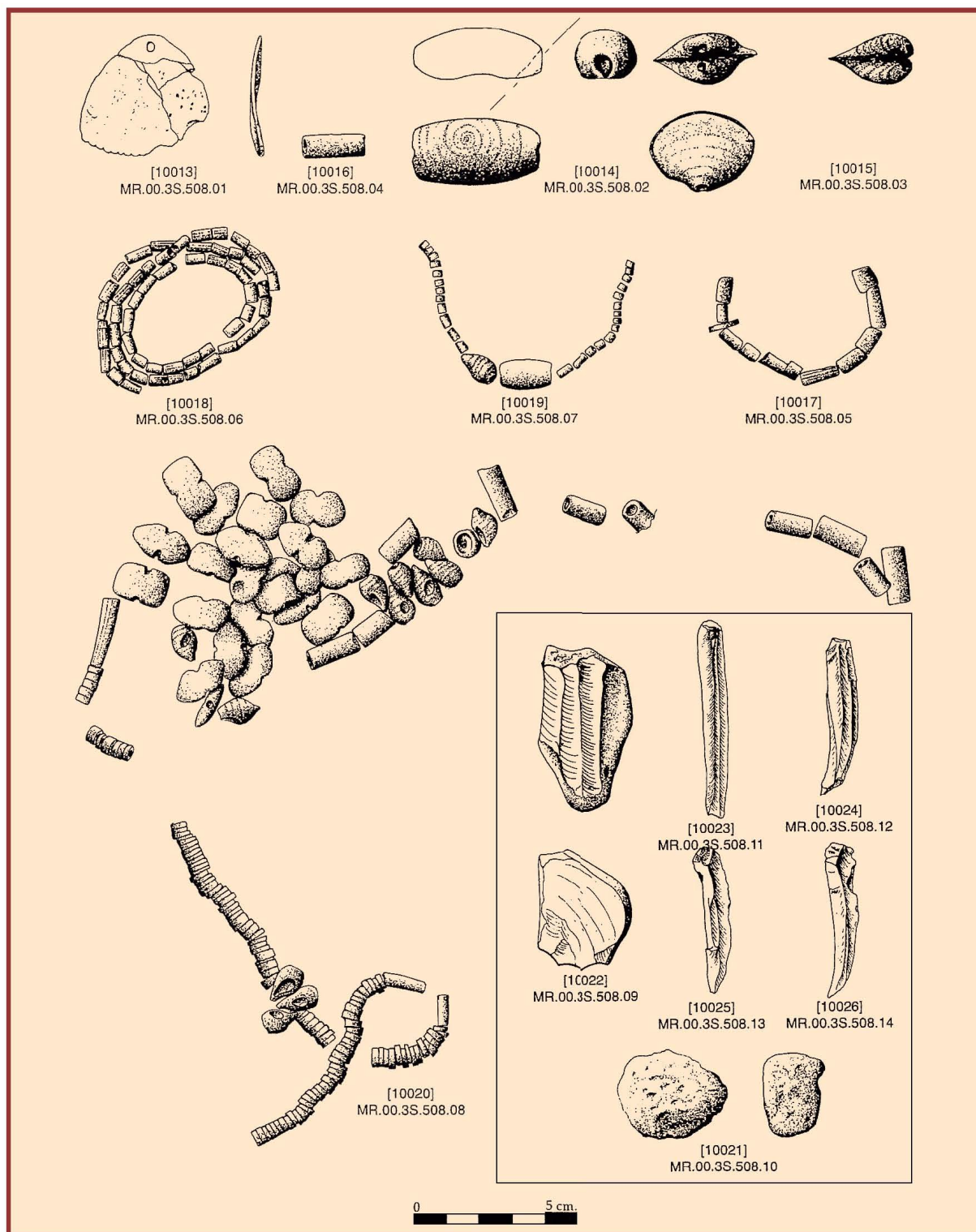
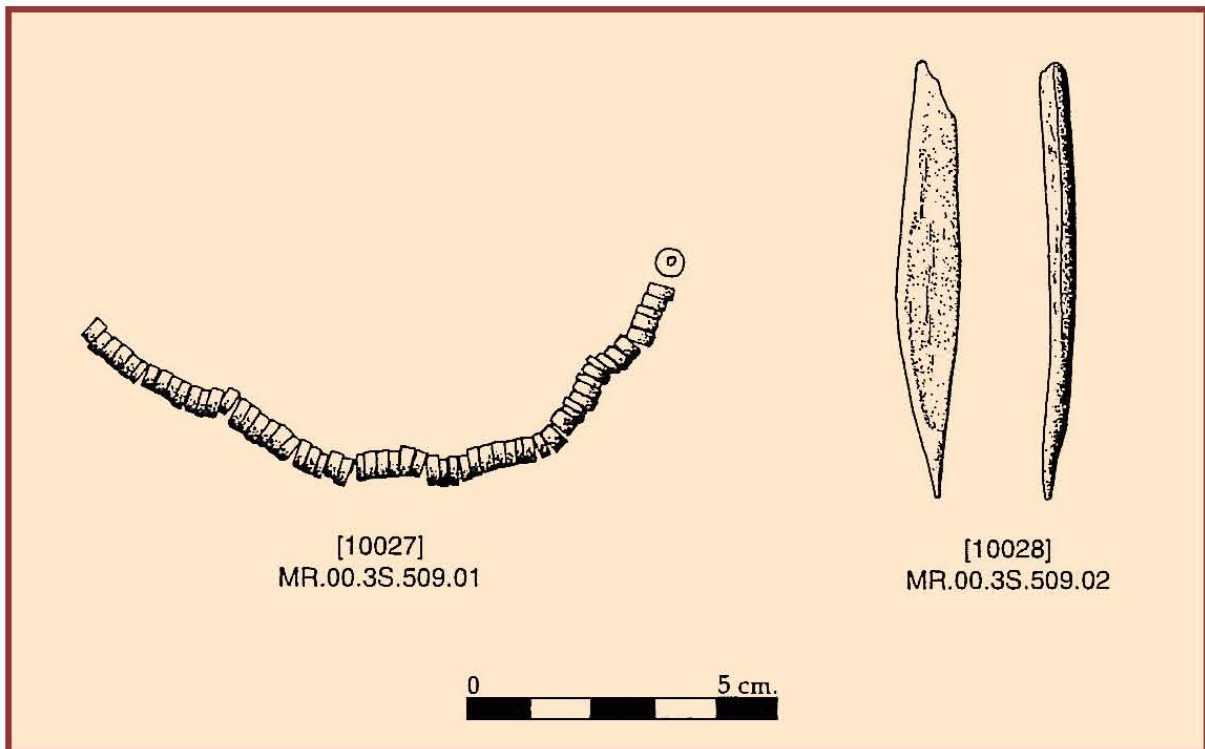
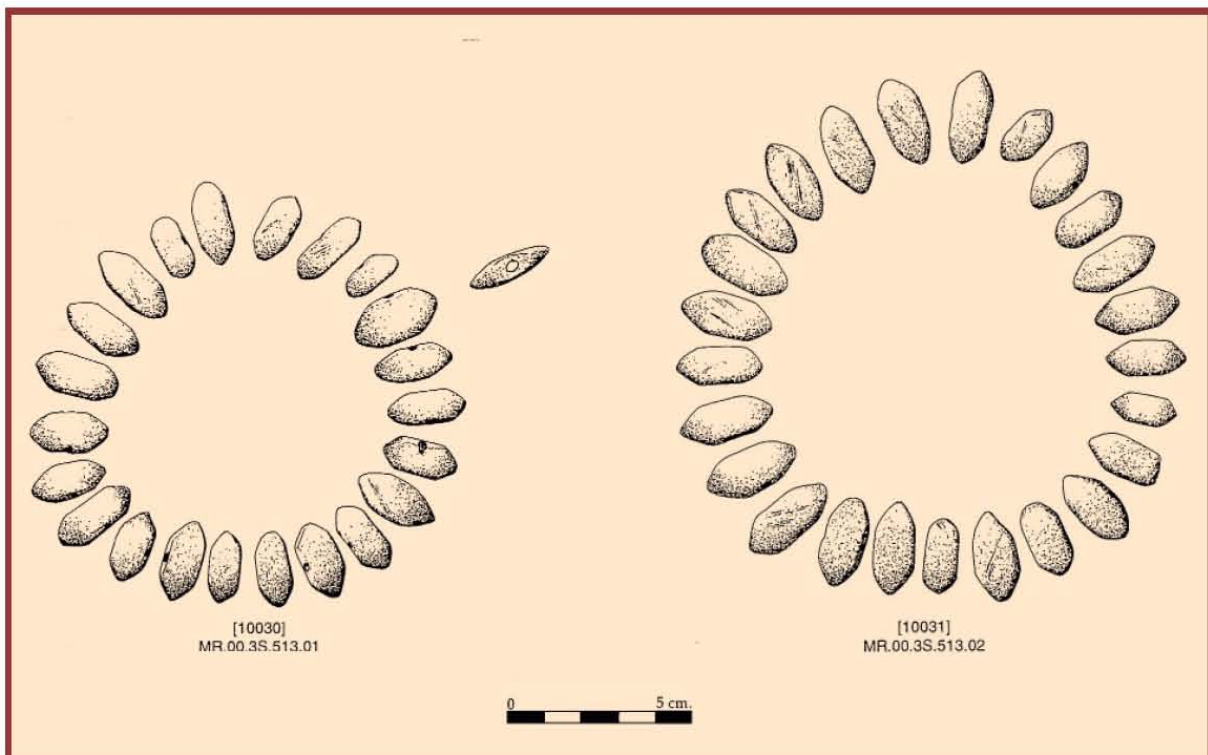


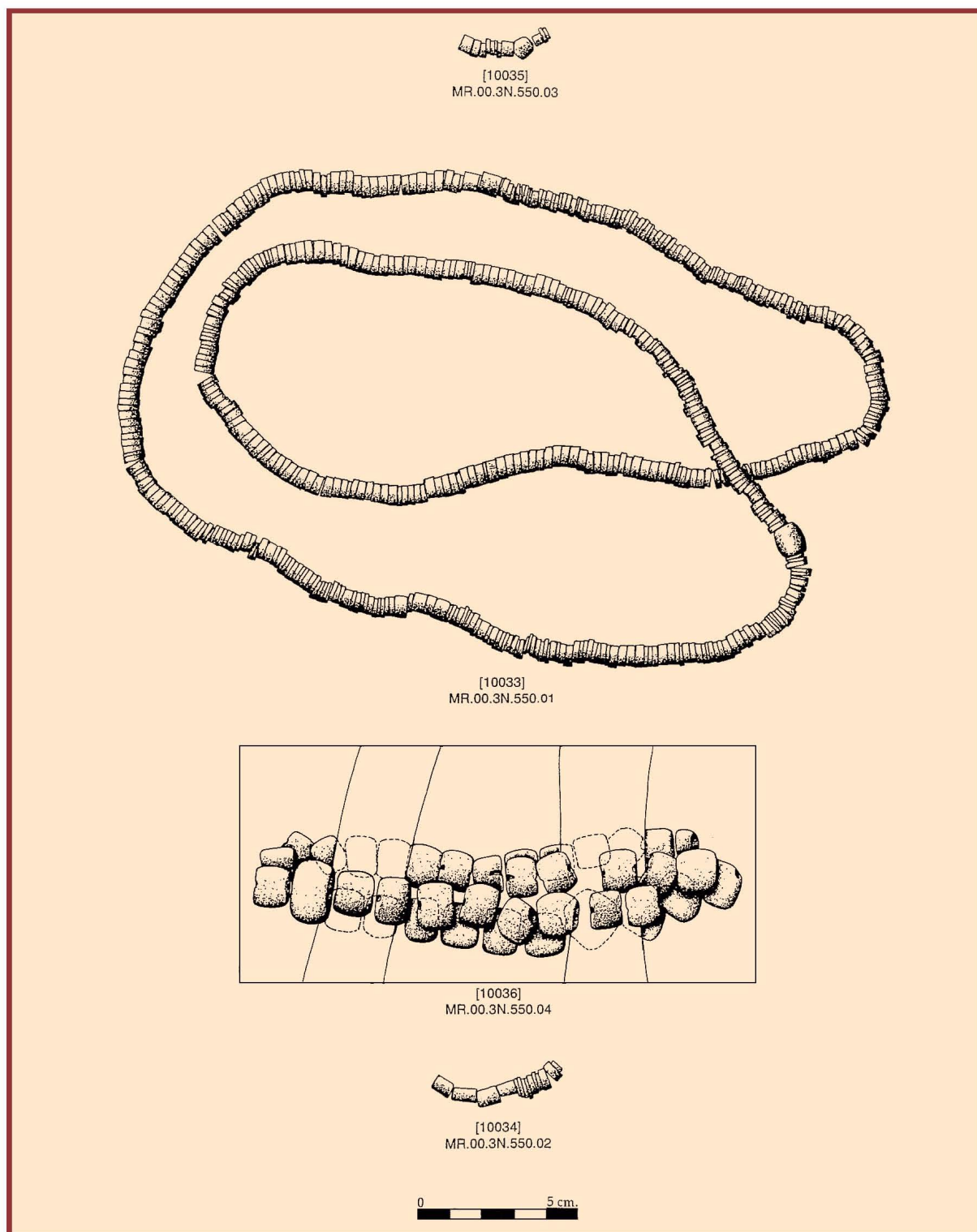
Figure 195: Mehrgarh 2000. Grave goods from burial 508 (Graveyard 3), Period I.



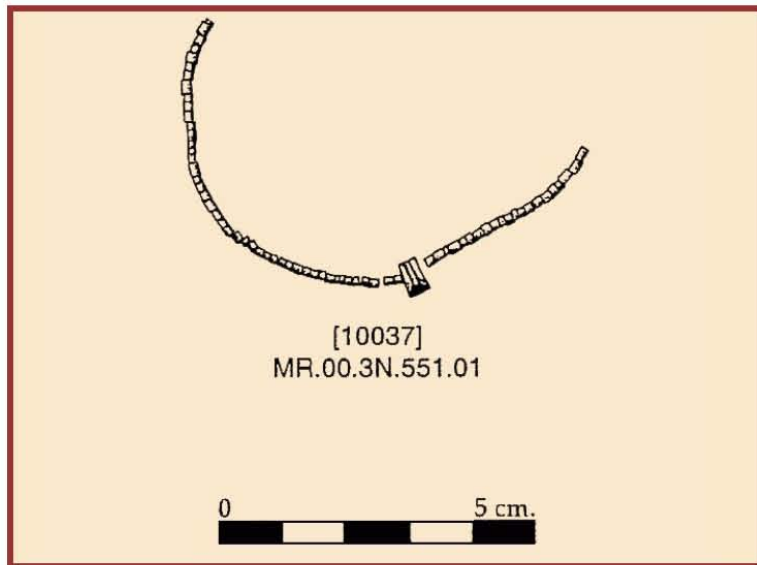
**Figure 196:** Mehrgarh 2000. Grave goods from burial 509 (Graveyard 3), Period I.



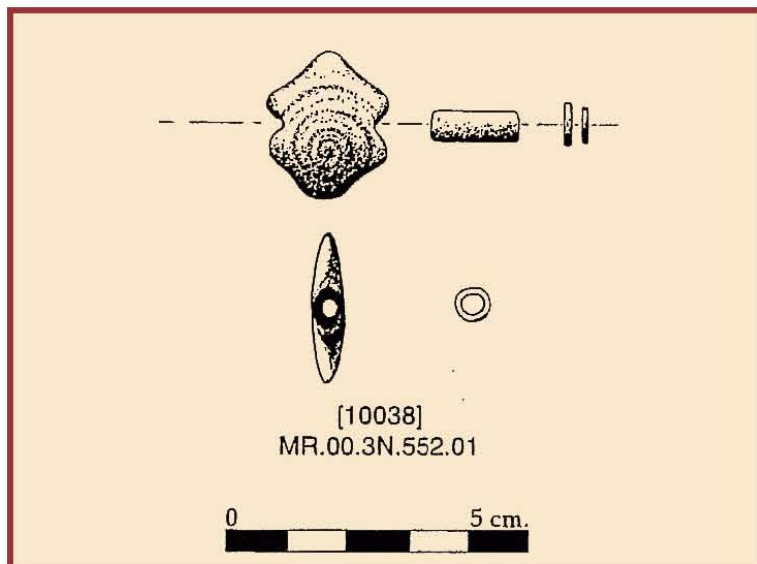
**Figure 197:** Mehrgarh 2000. Grave goods from burial 513 (Graveyard 2), Period I.



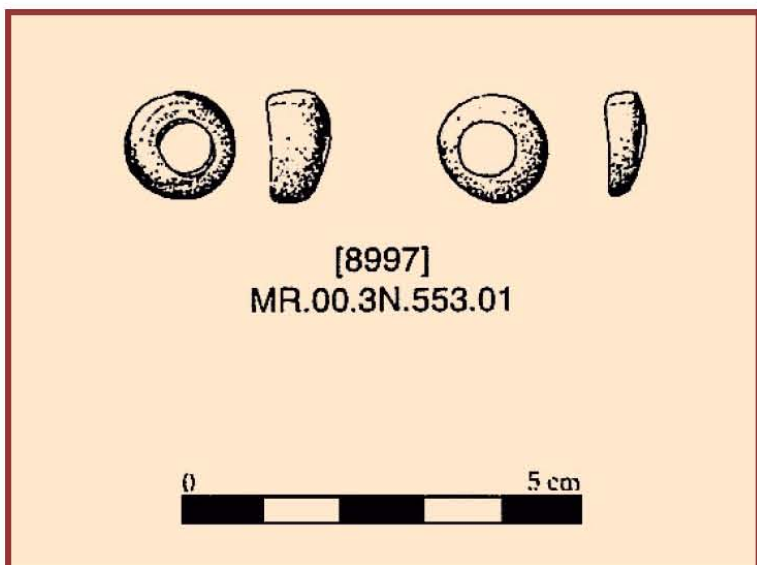
**Figure 198:** Mehrgarh 2000. Grave goods from burial 550 (Graveyard 7), Period I.



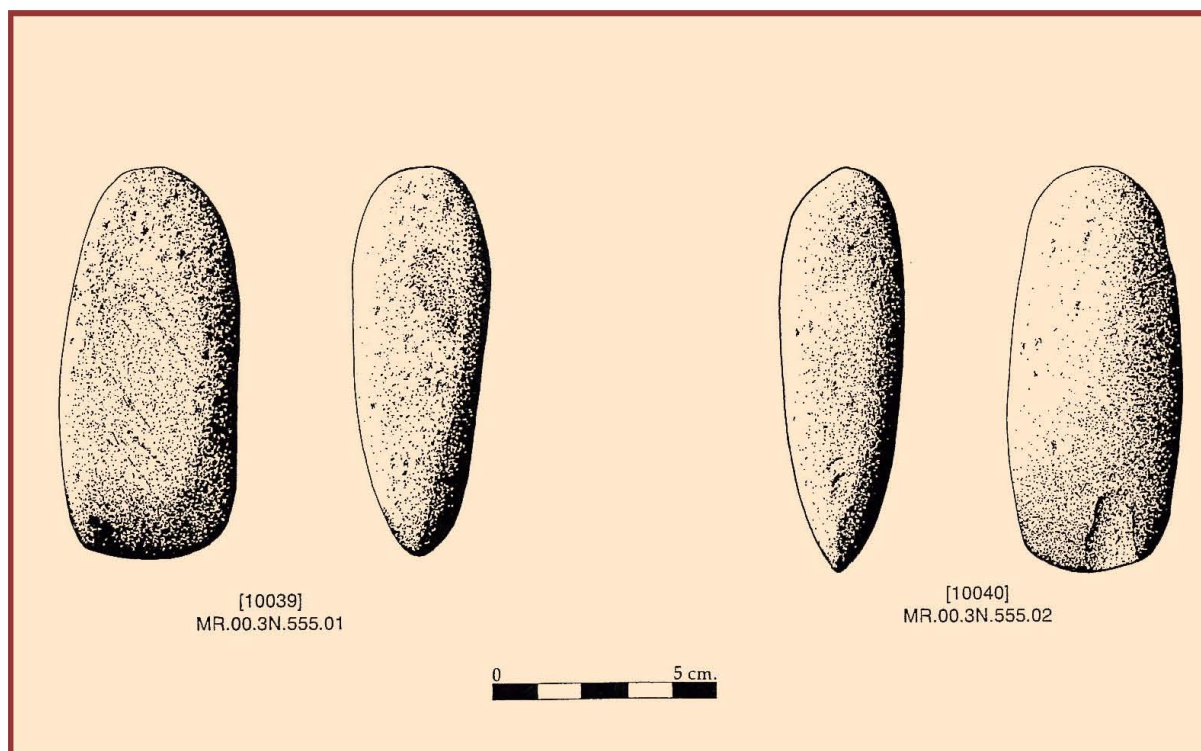
**Figure 199:** Mehrgarh 2000. Grave good from burial 551 (Graveyard 5), Period I.



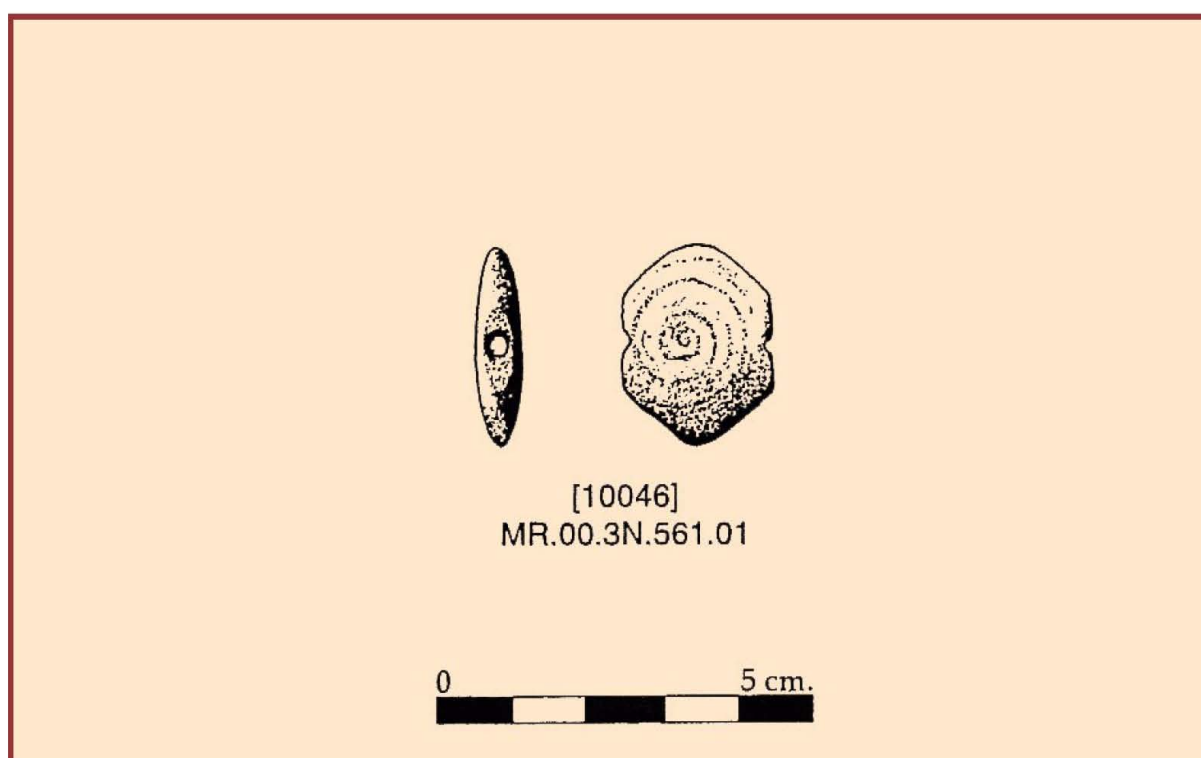
**Figure 200:** Mehrgarh 2000. Grave goods from burial 552 (Graveyard 5), Period I.



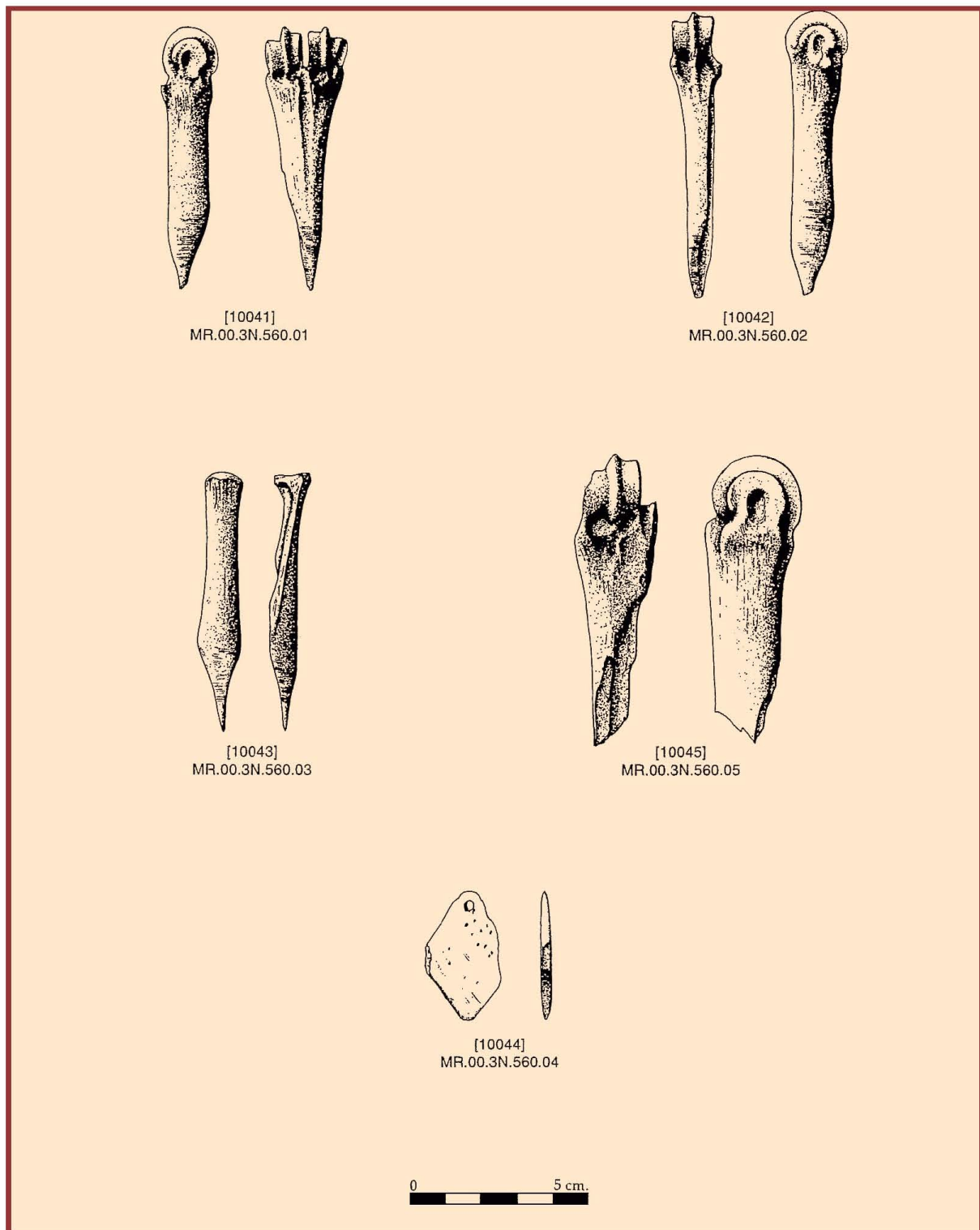
**Figure 201:** Mehrgarh 2000. Grave goods from burial 553 (Graveyard 8), Period I.



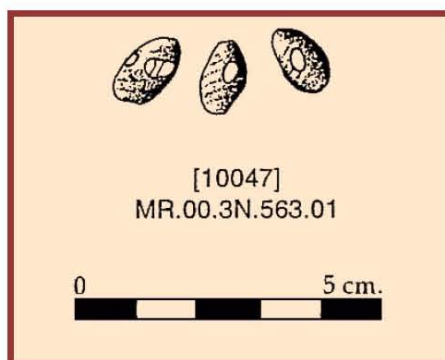
**Figure 202:** Mehrgarh 2000. Grave goods from burial 555 (Graveyard 8), Period I.



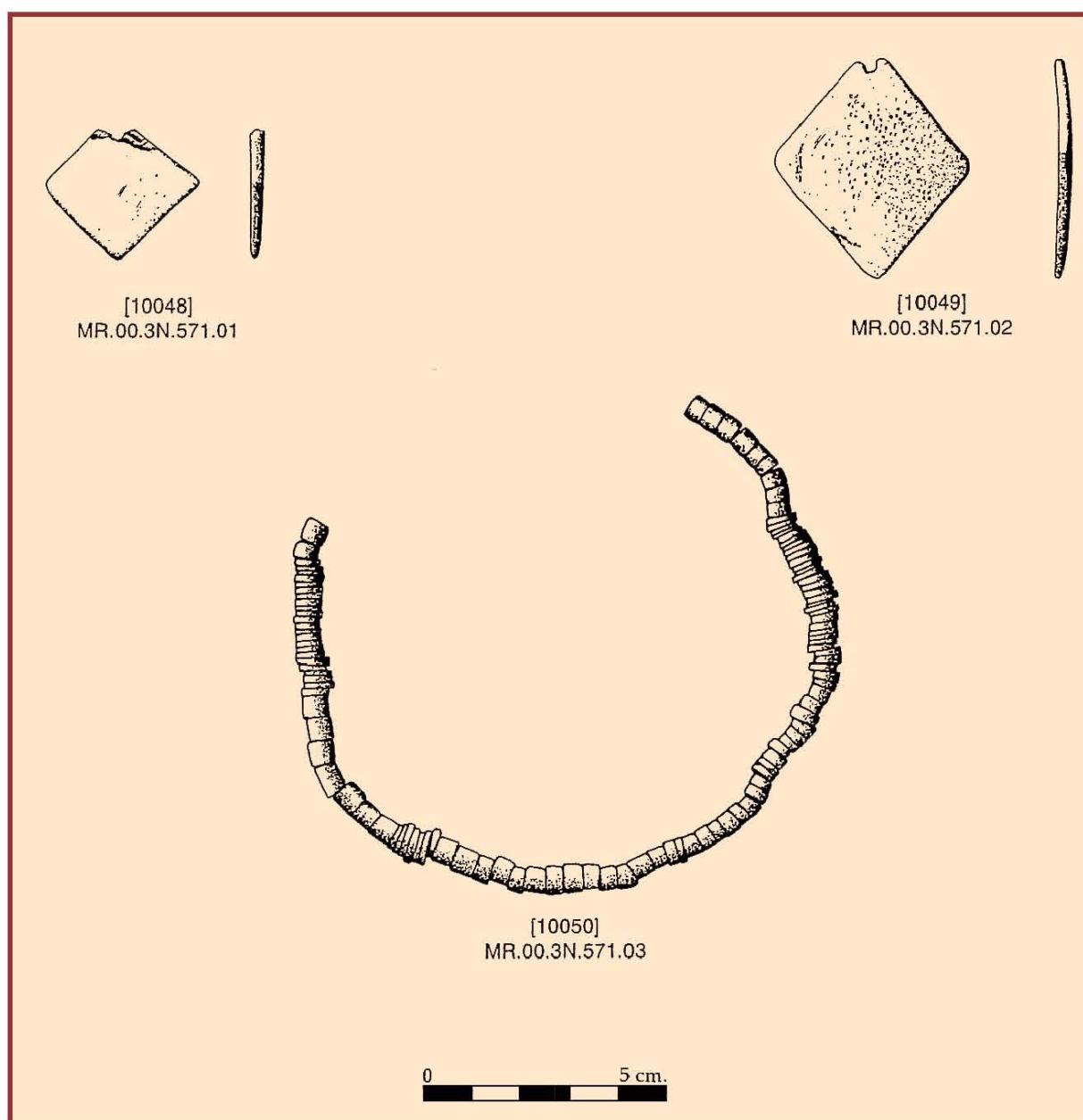
**Figure 203:** Mehrgarh 2000. Grave good from burial 561 (Graveyard 5), Period I.



**Figure 204:** Mehrgarh 2000. Grave goods from burial 560 and from burial 562 (Graveyard 7), Period I.



**Figure 205:** Mehrgarh 2000. Grave goods from burial 563 (Graveyard 7), Period I.



**Figure 206:** Mehrgarh 2000. Grave goods from burial 571 (Graveyard 8), Period I.

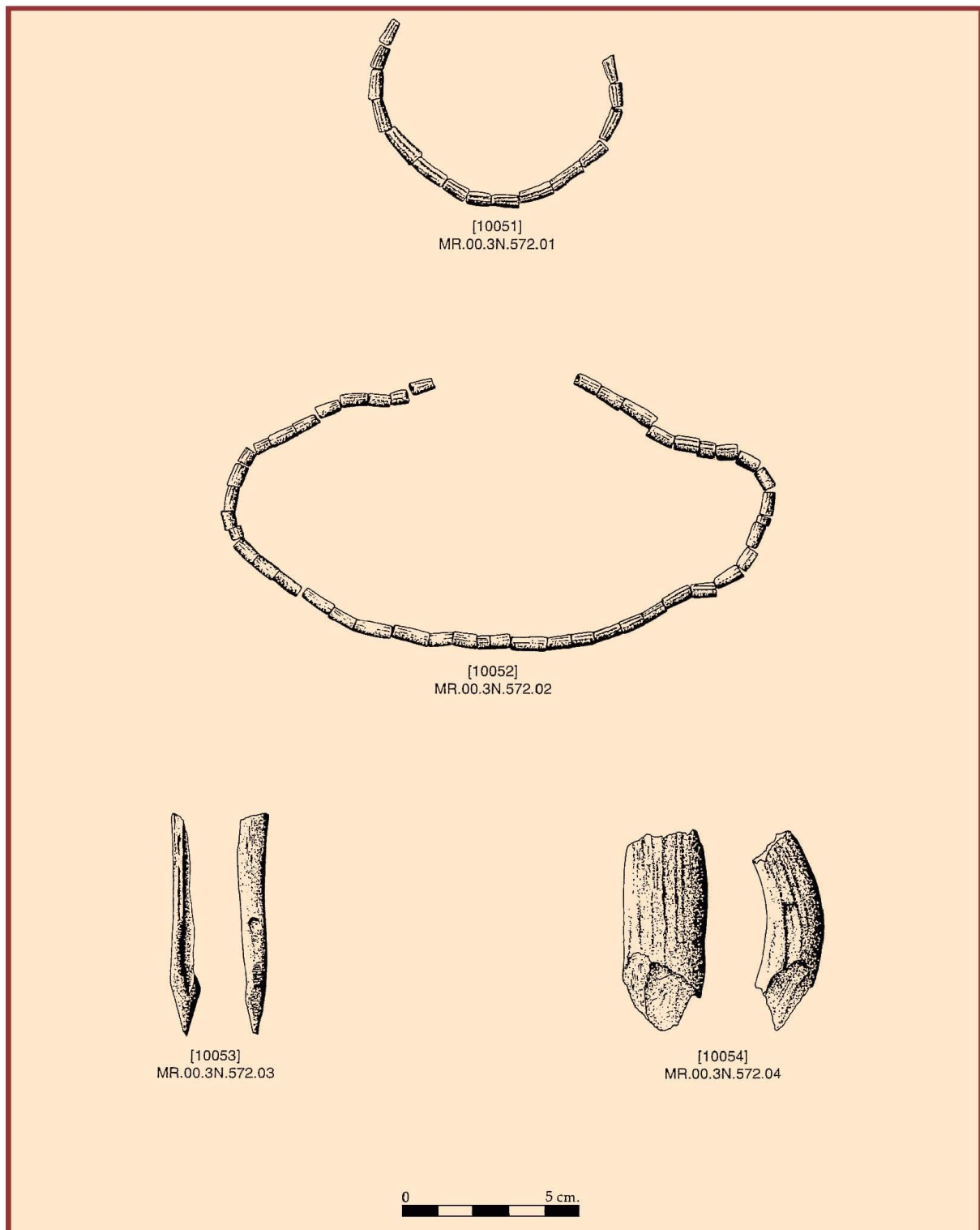
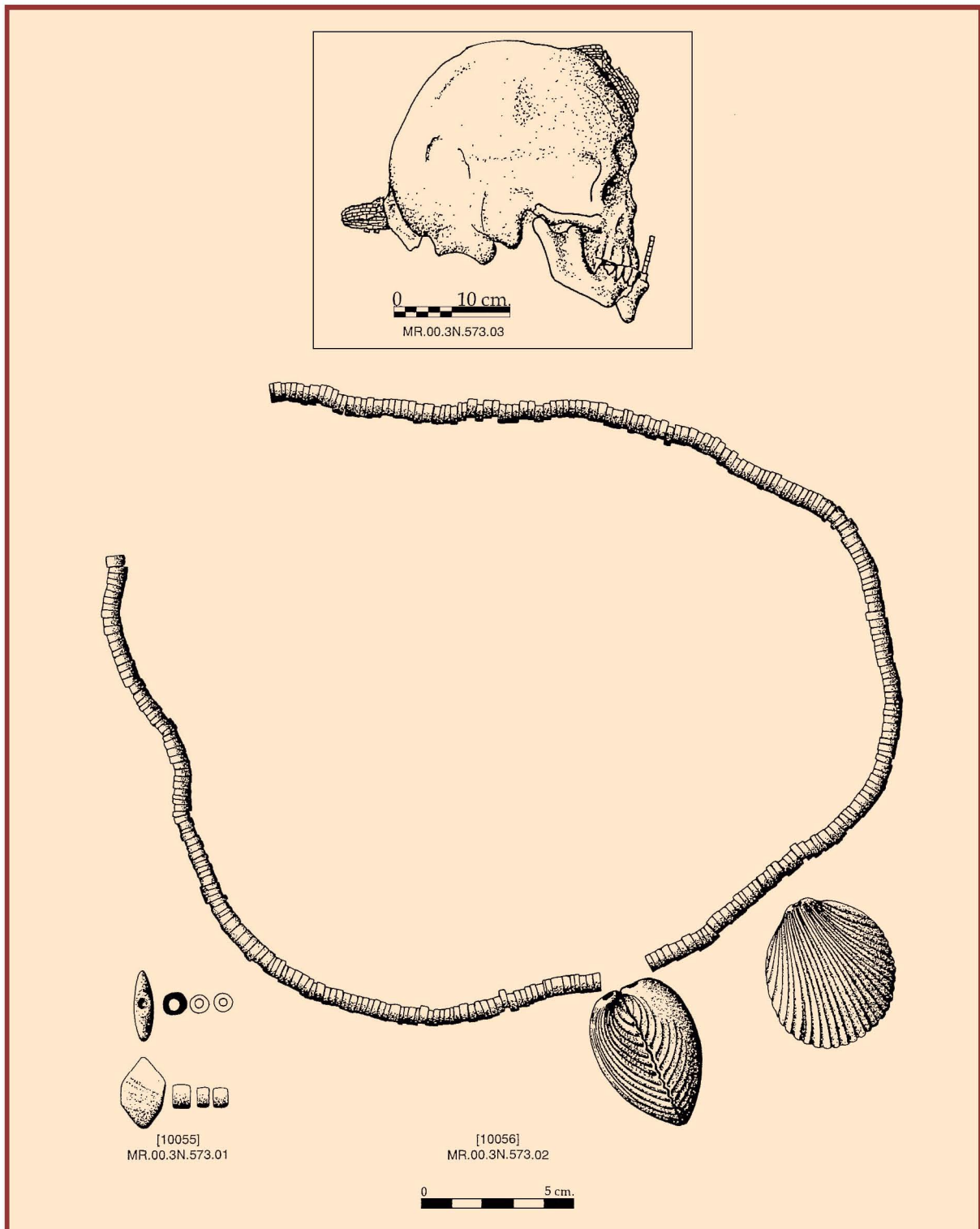
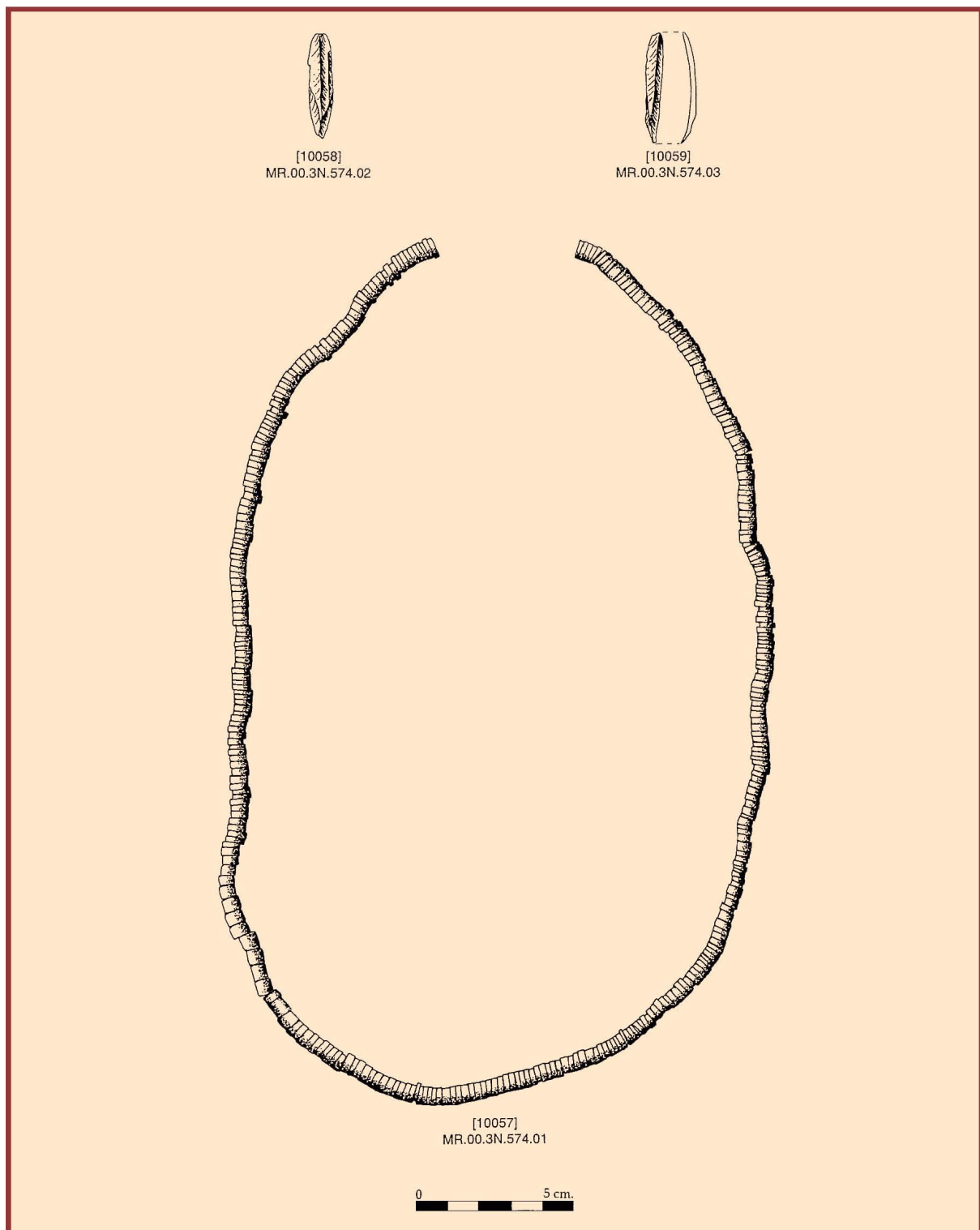


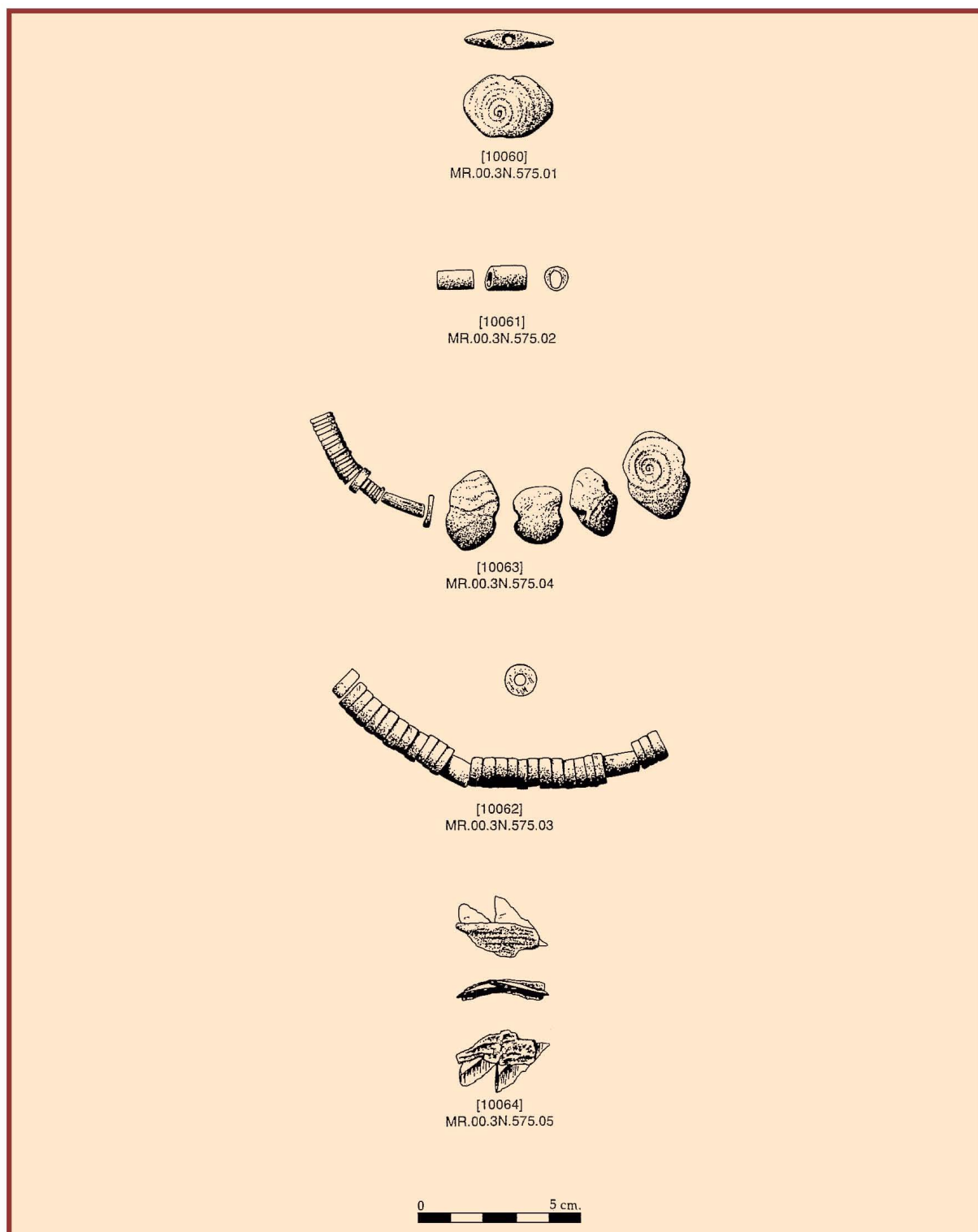
Figure 207: Mehrgarh 2000. Grave goods from burial 572 (Graveyard 3), Period I.



**Figure 208:** Mehrgarh 2000. Grave goods from burial 573 (Graveyard 7), Period I.



**Figure 209:** Mehrgarh 2000. Grave goods from burial 574 (Graveyard 7), Period I.



**Figure 210:** Mehrgarh 2000. Grave goods from burial 575 (Graveyard 5), Period I.

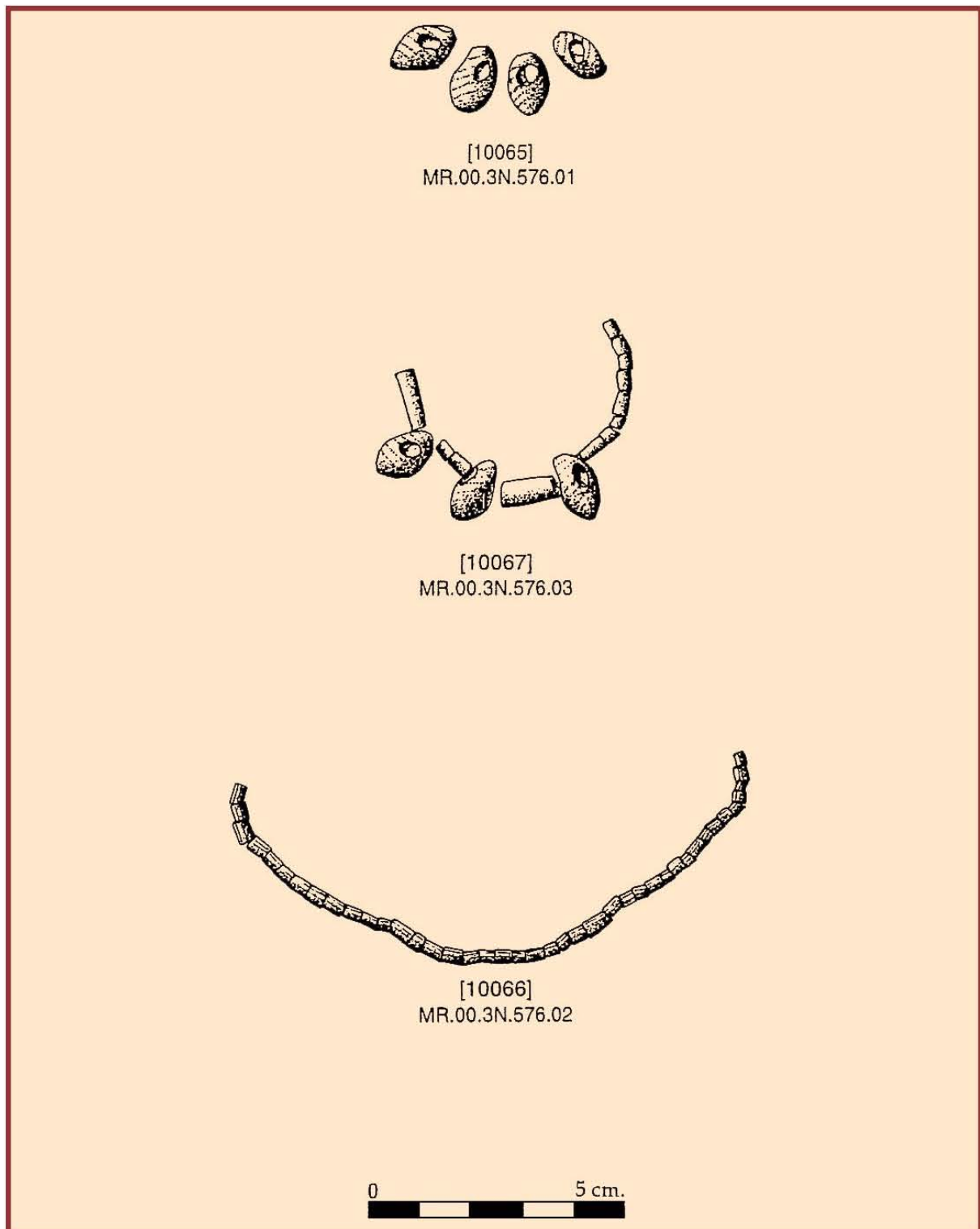


Figure 211: Mehrgarh 2000. Grave goods from burial 576 (Graveyard 6), Period I.

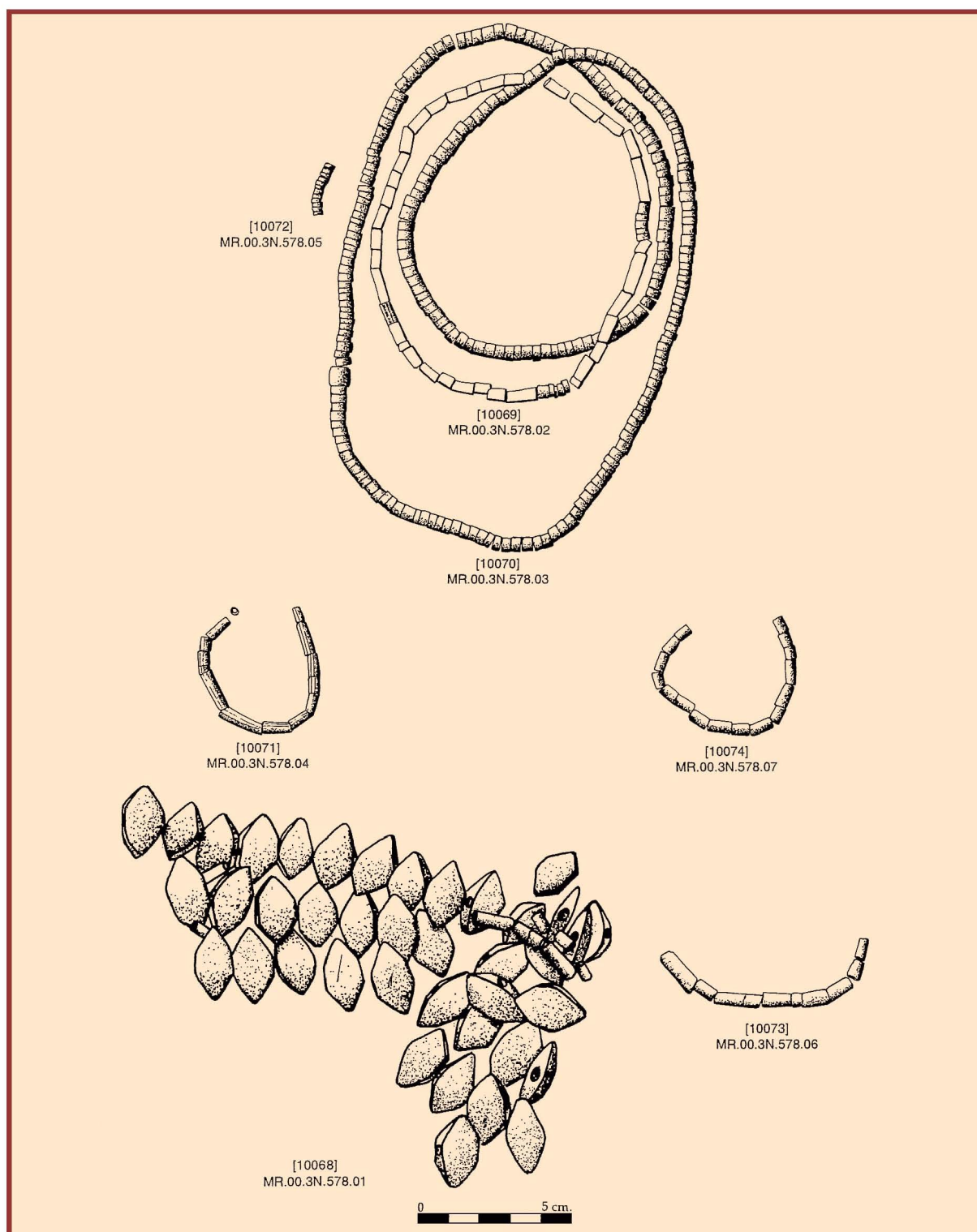


Figure 212: Mehrgarh 2000. Grave goods from burial 578 (Graveyard 3), Period I.

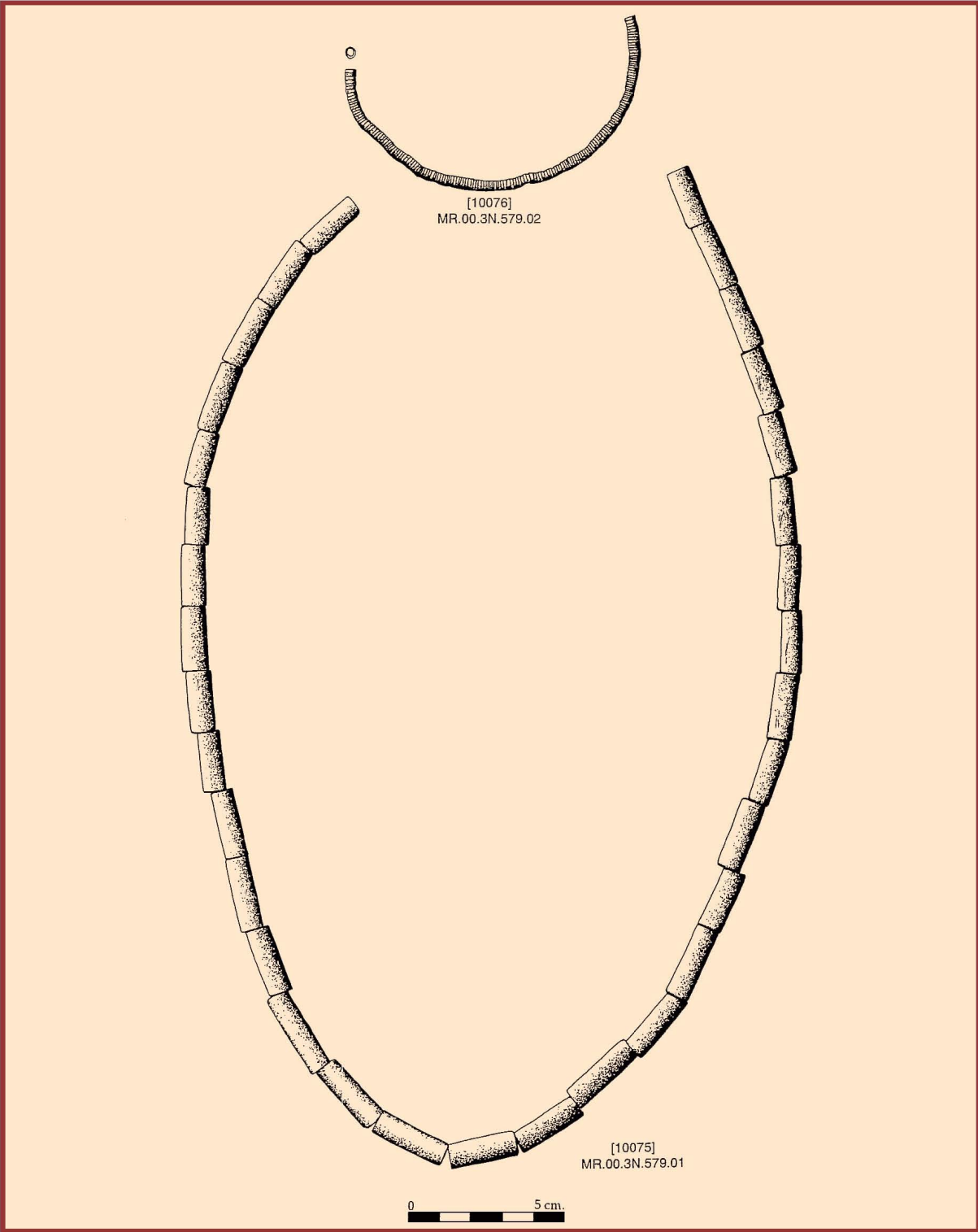


Figure 213: Mehrgarh 2000. Grave goods from burial 579 (Graveyard 3), Period I.

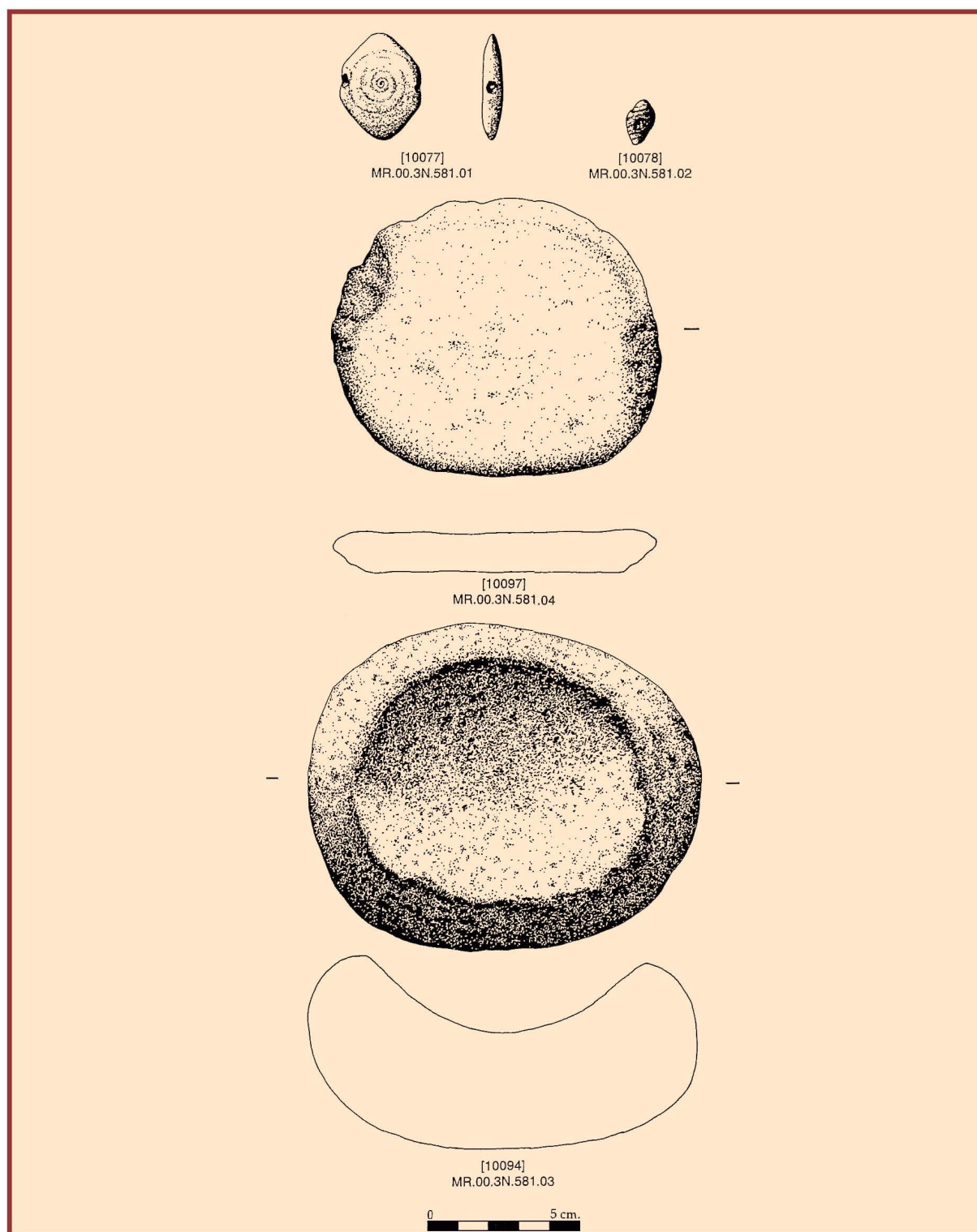


Figure 214: Mehrgarh 2000. Grave goods from burial 581 (Graveyard 5), Period I.

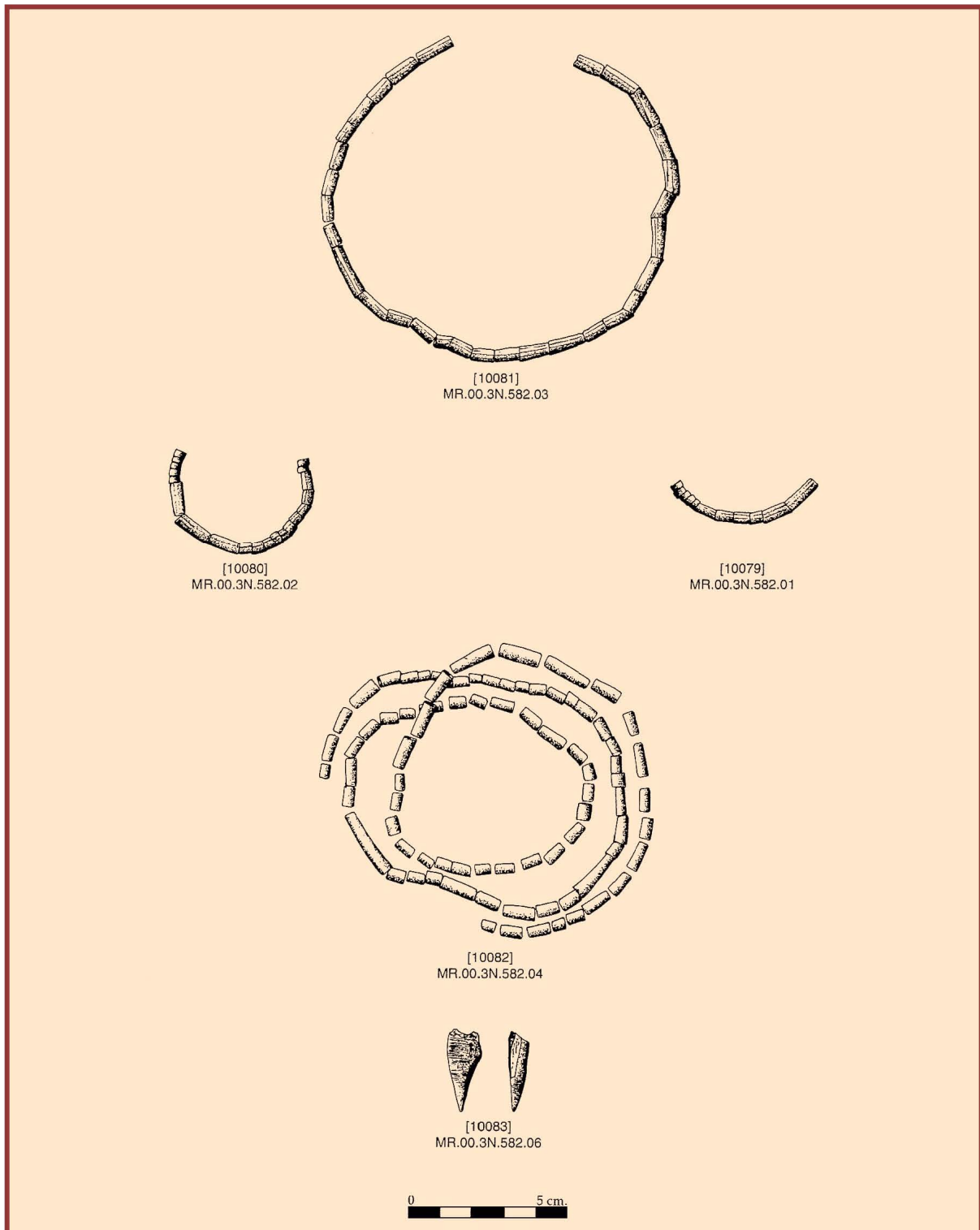


Figure 215: Mehrgarh 2000. Grave goods from burial 582 (Graveyard 4), Period I.

**ARCHITECTURAL REMAINS  
ARTEFACTS  
BURIALS  
AND  
GRAVE GOODS  
1997 - 2000**





**Fig. 216:** Mehrgarh 1997. View of the 96/97 excavation seen from South.



**Fig. 217:** Mehrgarh 1997. View of the 96/97 excavation seen from West.



**Fig. 218:** Mehrgarh 1997. House1: Locus 4 with remains of fauna, lithics and bone tools.



**Fig. 219:** Mehrgarh 1997. House 5: Nine large flint cores in Room 61.



**Fig. 220:** Mehrgarh 1998. The collapsed cliff of the Bolan river seen from the excavation.



**Fig. 221:** Mehrgarh 1998. Eroded structures from Period IIA.



**Fig. 222:** Mehrgarh 1998. Buildings of Area MR.03 South, Period I. View from the South.



**Fig. 223:** Mehrgarh 1998. Buildings of Area MR.03 South, Period I. View from the West.



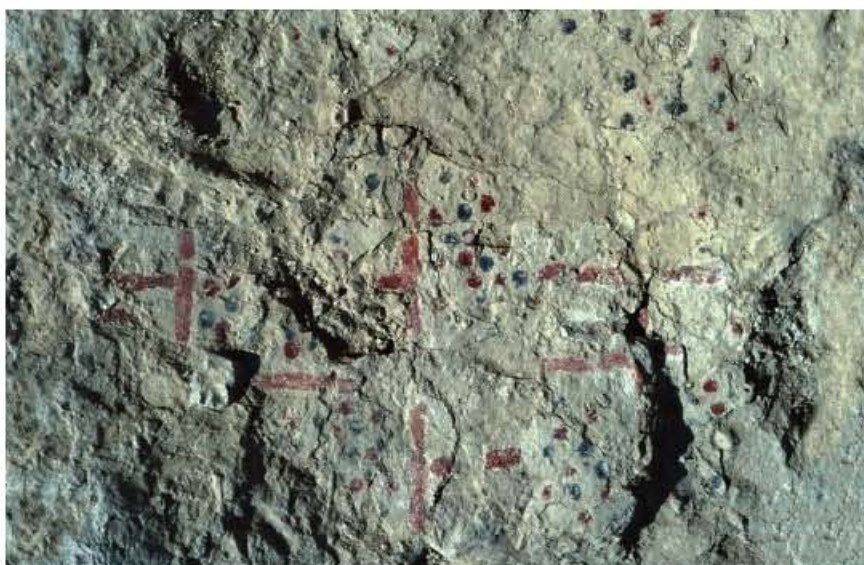
**Fig. 224:** Mehrgarh 1998. Area MR.03 North. View from the North-West with House 7 in the foreground.



**Fig. 225:** Mehrgarh 1998. Area MR.03 North. View from the West with House 18 in the foreground.



**Fig. 226:** Mehrgarh 1998. Area MR.03 North. Houses 13 and 11 seen from the North-West.



**Fig. 227:** Mehrgarh 1998. Area MR.03 North. Fragments of painted mud plaster found on the ground between Houses 15 and 19.



**Fig. 228:** Mehrgarh 1999.  
Area MR.03 South. Levels  
1, 3, 4, 7, 8.



**Fig. 229:** Mehrgarh 1999.  
Area MR.03 South. Levels  
3, 4, 7, 8.



**Fig. 230:** Mehrgarh 1999.  
Eastern part of area MR.03  
North.



**Fig. 231:** Mehrgarh 1999.  
Eastern part of area MR.03  
North.



**Fig. 232:** Mehrgarh 1999.  
Western part of area MR.03  
North.



**Fig. 233:** Mehrgarh 1999.  
Western part of area MR.03  
North.



**Fig. 234:** Mehrgarh 1999.  
Area MR.03 North. Fire  
place in Locus 78.



**Fig. 235:** Mehrgarh 2000.  
Area MR.03 South. Levels  
1 and 8 seen from South.



**Fig. 236:** Mehrgarh 2000. Area MR.03 South. Levels 1 and 8 seen from East.



**Fig. 237:** Mehrgarh 2000. Area MR.03 North. View from North-East showing superimposed levels of structures.



**Fig. 238:** Mehrgarh 2000. Area MR.03 North. View from South-West showing superimposed levels of structures.



**Fig. 239:** Mehrgarh 2000.  
Area MR.03 North, seen  
from East.



**Fig. 240:** Mehrgarh 2000.  
Area MR.03 North, seen  
from East.



**Fig. 241:** Mehrgarh 2000.  
Area MR.03 North, seen  
from West.



**Fig. 242: Mehrgarh 2000.  
Area MR.03 North.  
Superimposed Houses.**

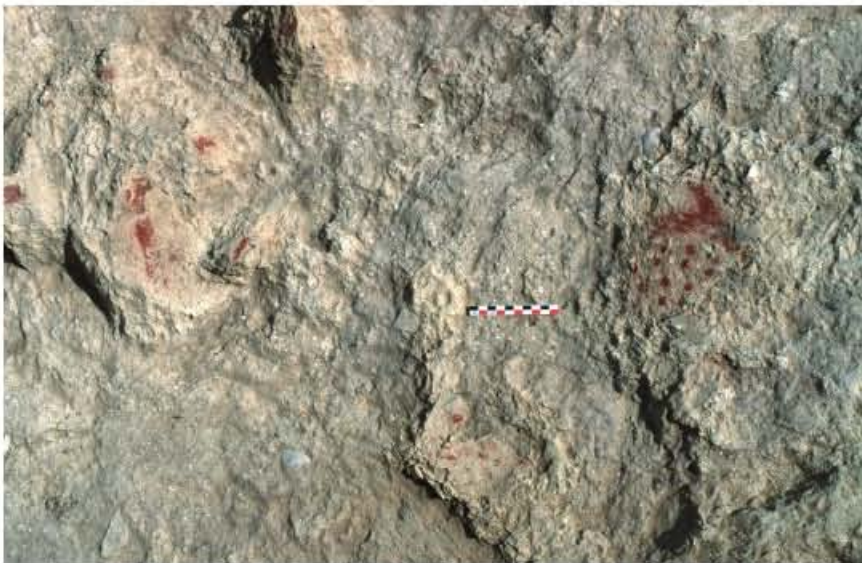
House 26, level 3.  
House 25, level 4.  
House 25a, level 6.  
House 25b, level 7.  
House 25c, level 8.



**Fig. 243: Mehrgarh 2000.  
Area MR.03 North. Fire  
place.**



**Fig. 244:** Mehrgarh 2000.  
Locus 49, Level 6.



**Fig. 245:** Mehrgarh 2000.  
Locus 49, Level 6 with  
the collapsed fragments of  
painted plaster.



Mehrgarh 2000. Grave goods from Burial 508, Graveyard 3 (see fig. 338).



**Fig. 246:** Mehrgarh 1997.  
House 1. 24 flint drills from  
Locus 6.



**Fig. 247:** Mehrgarh 1997.  
House 6, an engraved stone  
object from Room 45.

MR 97 03 45 11



**Fig. 248:** Mehrgarh 1997.  
House 10, deposit on the  
floor of Locus 57.

MR 97 03 57 78

MR 97 03 57 79

MR 97 03 57 80



**Fig. 249:** Mehrgarh 1997.  
Heavy lithics including  
three stone axes.

MR 97 03 57 81  
MR 97 03 57 82  
MR 97 03 57 83  
MR 97 03 57 84  
MR 97 03 57 57  
MR 97 03 57 58  
MR 97 03 57 59



**Fig. 250:** Mehrgarh 1997.  
Shell bead with triple per-  
foration from Locus 56.

MR 97 03 56 125



**Fig. 251:** Mehrgarh 1997.  
House 7. Clay pendant  
from Locus 33.



**Fig. 252:** Mehrgarh 1997.  
A clay figurine with an applied representation of a snake and a stone figurine with painted coils.

MR 97 03 49 50  
MR 97 03 33 31



**Fig. 253:** Mehrgarh 1997.  
Four polished stone foot-shaped figurines.

MR 97 03 3 35  
MR 97 03 45 10  
MR 97 03 49 47



**Fig. 254:** Mehrgarh 1998.  
House 15, tool made of antler.

MR 97 03 72 56



**Fig. 255:** Mehrgarh 1998. Stone artefacts of Period I. Mortars coated with red-ochre.

House 9, locus 66  
House 36, locus 335  
House 7 locus 53

MR 98 03 66 45  
MR 98 03 335 1  
MR 98 03 53 264



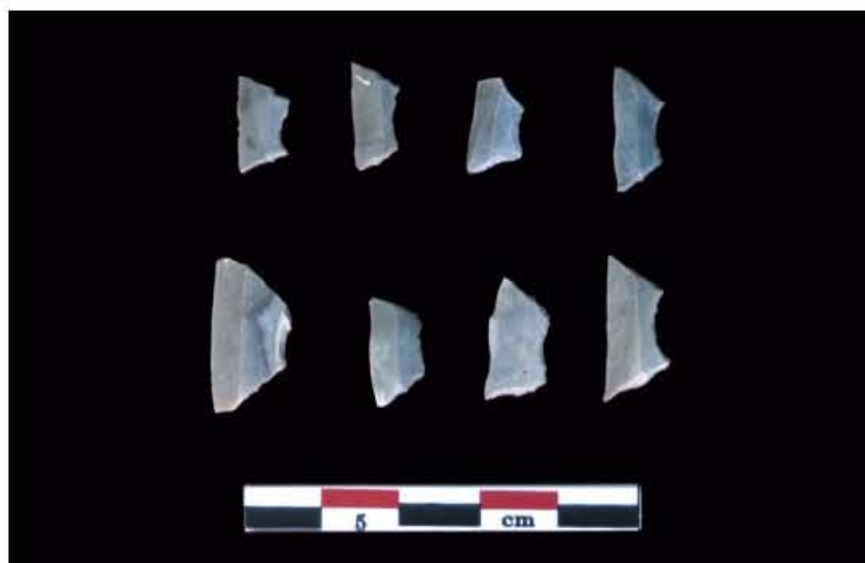
**Fig. 256:** Mehrgarh 1998. Stone artefacts of period I. Two polishers from House 8.

MR 98 03 114 7  
MR 98 03 112 16



**Fig. 257:** Mehrgarh 1998. Flint artefacts of period I. Two sickle elements shafted in bitumen from House 15 (top) and house 8 (bottom).

MR 98 03 71 193  
MR 98 03 97 55



**Fig. 258:** Mehrgarh 1998.  
Flint artefacts of Period I. 8  
microliths.

MR 98 03 102 11  
MR 98 03 88 72  
MR 98 03 100 110  
MR 98 03 108 5  
MR 98 03 320 12  
MR 98 03 104 76  
MR 98 03 106 110



**Fig. 259:** Mehrgarh 1998.  
Clay human figurine from  
House 15, with represented  
hair and ornaments.

MR 98 03 72 01



**Fig. 260:** Mehrgarh 1997.  
Burnt clay figurine thoro-  
ughly pierced, showing evi-  
dence of magic practices.

MR 98 03 40 05



**Fig. 261:** Mehrgarh 1997 - 1998. Triangular shaped clay figurines; most of them showing evidence of piercing.

MR 97 03 60 42  
 MR 98 03 30 88  
 MR 98 03 71 92  
 MR 98 03 71 91  
 MR 98 03 31 37  
 MR 97 03 35 70



**Fig. 262:** Mehrgarh 1999. Clay human figurine from area MR.03 South, Period I.

MR 99 03 372 01



**Fig. 263:** Mehrgarh 1999. Clay human figurine from area MR.03 South, Period I.

MR 99 03 372 04



Fig. 264: Mehrgarh 1999.  
Clay human figurine from  
area MR.03 South, Period I.

MR 99 03 361 86



Fig. 265: Mehrgarh 1999.  
Clay human figurine from  
area MR.03 South, Period I.

MR 99 03 344 28



Fig. 266: Mehrgarh 1999.  
Clay human figurine from  
area MR.03 South, Period I.

MR 99 03 356 01



Fig. 267: Mehrgarh 1999.  
Clay human figurine from  
area MR.03 North, Period I.

MR 99 03 77 40



Fig. 268: Mehrgarh 1999.  
Clay human figurine from  
area MR03 North, period I.

MR 99 03 105 14



Fig. 269: Mehrgarh 1999.  
Clay human figurine from  
area MR.03 North, Period I.

MR 99 03 123 19



**Fig. 270:** Mehrgarh 1999.  
Bull figurine from area  
MR.03 North, Period I.

MR 99 03 126 162



**Fig. 271:** Mehrgarh 1999.  
Beadmaking debitage.  
Steatite flakes, roughouts,  
blanks and beads from area  
MR.03 South, Period I,  
house 37.



**Fig. 272:** Mehrgarh 1999.  
Grooved stone from area  
MR.03 South, Period I.

MR 99 03 373 01



**Fig. 273:** Mehrgarh 1999.  
Grooved stone from area  
MR.03 North, Period I.

MR 99 03 73 01



**Fig. 274:** Mehrgarh 1999.  
Stone axes from area  
MR.03 South, Period I.

MR 99 03 344 24

MR 99 03 344 118

MR 99 03 353 21



**Fig. 275:** Mehrgarh 1999.  
Stone axes from area  
MR.03 North, Period I.

MR 99 03 86 38

MR 98 03 117 01



**Fig. 276:** Mehrgarh 1999. Stone chisel from area MR.03 South, Period I.

MR 99 03 368 01



**Fig. 277:** Mehrgarh 1999. Stone chisel from area MR.03 North, Period I.

MR 99 03 123 18



**Fig. 278:** Mehrgarh 2000. Human figurine made of mother-of-pearl from area MR.03 South, Period I.

MR 00 03 393 168



**Fig. 279:** Mehrgarh 2000.  
Clay human figurine from  
area MR.03 North, Period I.

MR 00 03 176 1



**Fig. 280:** Mehrgarh 2000.  
Clay human figurine from  
area MR.03 North, Period I.

MR 00 03 154 48



**Fig. 281:** Mehrgarh 2000.  
Clay human figurine from  
area MR.03 North, Period I.

MR 00 03 76 24



**Fig. 282:** Mehrgarh 2000. Painted clay human figurine from Area MR.03 North, Period I.

MR 00 03 174 1



**Fig. 283:** Mehrgarh 2000. Clay human figurine from Area MR.03 North, Period I.

MR 00 03 109 676



**Fig. 284:** Mehrgarh 1997. Child burial 107 from Graveyard 8 with an offering of a small caprine at the feet.



**Fig. 285:** Mehrgarh 1997. Child burial 110, Graveyard 9 with its belt, necklace and headband.



**Fig. 286:** Mehrgarh 1997. Funerary deposit from burial 101, Graveyard 9.

MR 97 03 101 1  
 MR 97 03 101 2  
 MR 97 03 101 3  
 MR 97 03 101 4  
 MR 97 03 101 5  
 MR 97 03 101 6  
 MR 97 03 101 7  
 MR 97 03 101 8



**Fig. 287:** Mehrgarh 1997. Belt of 23 ellipsoidal shell beads from burial 110, Graveyard 9.

MR 97 03 110 3



**Fig. 288:** Mehrgarh 1998. Burial 222 from Graveyard 8 with its pit and funerary chamber.



**Fig. 289:** Mehrgarh 1998. Burial 228 from Graveyard 9 with remains of a faunal offering.



**Fig. 290:** Mehrgarh 1998. Burial 226 from Graveyard 8 with its grave goods.



**Fig. 291:** Mehrgarh 1998.  
Burial 234 from Graveyard  
9 with its grave goods.



**Fig. 292:** Mehrgarh 1998.  
Grave goods from burial  
234, Graveyard 9.

MR 98 03 234 1  
MR 98 03 234 2  
MR 98 03 234 3  
MR 98 03 234 4  
MR 98 03 234 5  
MR 98 03 234 6  
MR 98 03 234 7  
MR 98 03 234 8  
MR 98 03 234 9  
MR 98 03 234 10



**Fig. 293:** Mehrgarh 1998.  
Shell necklace and frag-  
ment of belt from Burial  
236, Graveyard 8

MR 98 03 236 1  
MR 98 03 236 2



**Fig. 294:** Mehrgarh 1999. Burial 239 from Graveyard 9 with its grave goods: two lumps of red ochre and ornaments.



**Fig. 295:** Mehrgarh 1999. Grave goods from burial 239, Graveyard 9.

MR 99 03 239 1  
 MR 99 03 239 2  
 MR 99 03 239 3  
 MR 99 03 239 4  
 MR 99 03 239 5  
 MR 99 03 239 6  
 MR 99 03 239 7  
 MR 99 03 239 11



**Fig. 296:** Mehrgarh 1999. Burial 241, Graveyard 9.



**Fig. 297:** Mehrgarh 1999.  
Grave goods from Burial  
241, Graveyard 9.

MR 99 03 241 1  
MR 99 03 241 2  
MR 99 03 241 3  
MR 99 03 241 4  
MR 99 03 241 5  
MR 99 03 241 6  
MR 99 03 241 7



**Fig. 298:** Mehrgarh 1999.  
Burial 250, Graveyard 5.



**Fig. 299:** Mehrgarh 1999.  
Grave goods from Burial  
250, Graveyard 5.

MR 99 03 250 1  
MR 99 03 250 2  
MR 99 03 250 3



**Fig. 300:** Mehrgarh 1999.  
Burial 258, Graveyard 9.



**Fig. 301:** Mehrgarh 1999.  
Grave goods from Burial  
258, Graveyard 9.

MR 99 03 258 1  
MR 99 03 258 2  
MR 99 03 258 3



**Fig. 302:** Mehrgarh 1999.  
Burial 259, Graveyard 3.



**Fig. 303:** Mehrgarh 1999.  
Burial 276, Graveyard 2.



**Fig. 304:** Mehrgarh 1999.  
Burial 262, Graveyard 8.



**Fig. 305:** Mehrgarh 1999.  
Grave goods from Burial  
262, Graveyard 8.

- MR 99 03 262 1
- MR 99 03 262 2
- MR 99 03 262 3



**Fig. 306:** Mehrgarh 1999.  
Burial 265, Graveyard 8.



**Fig. 307:** Mehrgarh 1999.  
Bone spindle from Burial  
265, Graveyard 8.

MR 99 03 265 1



**Fig. 308:** Mehrgarh 1999.  
Burial 274, Graveyard 5.



**Fig. 309:** Mehrgarh 1999.  
Burial 274, Graveyard 5.  
Detail of head ornament.



**Fig. 310:** Mehrgarh 1999.  
Burial 279, Graveyard 5.



**Fig. 311:** Mehrgarh 1999.  
Grave goods from Burial  
279, Graveyard 5.

MR 99 03 279 1  
MR 99 03 279 2



**Fig. 312:** Mehrgarh 1999.  
Burial 280, Graveyard 1.



**Fig. 313:** Mehrgarh 1999.  
Bone spatula from Burial  
280, Graveyard 1.

MR 99 03 280 1



**Fig. 314:** Mehrgarh 1999.  
Burial 281, Graveyard 4.



**Fig. 315:** Mehrgarh 1999.  
Burial 281, Graveyard 4.  
Detail of head ornament.



**Fig. 316:** Mehrgarh 1999.  
Burial 282, Graveyard 6.



**Fig. 317:** Mehrgarh 1999.  
Belt incised ornament in shell from Burial 282, Graveyard 6.

MR 99 03 282 1



**Fig. 318:** Mehrgarh 2000.  
Burial 514, Graveyard 1.



**Fig. 319:** Mehrgarh 2000.  
Burial 513, Graveyard 2.



**Fig. 320:** Mehrgarh 2000.  
Burial 508, Graveyard 3.



**Fig. 321:** Mehrgarh 2000.  
Burial 510, Graveyard 3.



**Fig. 322:** Mehrgarh 2000.  
Burial 511, Graveyard 3.



**Fig. 323:** Mehrgarh 2000.  
Burial 512, Graveyard 3.



**Fig. 324:** Mehrgarh 2000.  
Burial 561, Graveyard 5.



**Fig. 325:** Mehrgarh 2000.  
Burial 581, Graveyard 5.



**Fig. 326:** Mehrgarh 2000.  
Burial 292, Graveyard 7.



**Fig. 327:** Mehrgarh 2000.  
Burial 559, Graveyard 7.



**Fig. 328:** Mehrgarh 2000.  
Burial 569, Graveyard 7.



**Fig. 329:** Mehrgarh 2000.  
Burial 264, Graveyard 8.



**Fig. 330:** Mehrgarh 2000.  
Burial 232, Graveyard 8.



**Fig. 331:** Mehrgarh 2000.  
Burial 288, Graveyard 8.



**Fig. 332:** Mehrgarh 2000.  
Burial 554, Graveyard 8.



**Fig. 333:** Mehrgarh 2000.  
Burial 577, Graveyard 8.



**Fig. 334:** Mehrgarh 2000.  
Burial 283, Graveyard 9.



**Fig. 335:** Mehrgarh 2000.  
Burial 290, Graveyard 9.



**Fig. 336:** Mehrgarh 2000.  
Grave goods from Burial  
513, Graveyard 2.

MR 00 03 513 1  
MR 00 03 513 2



**Fig. 337:** Mehrgarh 2000.  
Grave goods from Burial  
502, Graveyard 3.

MR 00 03 502 1  
MR 00 03 502 2  
MR 00 03 502 3  
MR 00 03 502 5



**Fig. 338:** Mehrgarh 2000.  
Grave goods from Burial  
508, Graveyard 3.

MR 00 03 508 1  
MR 00 03 508 2  
MR 00 03 508 3  
MR 00 03 508 4  
MR 00 03 508 5  
MR 00 03 508 6  
MR 00 03 508 7  
MR 00 03 508 8  
MR 00 03 508 9  
MR 00 03 508 10  
MR 00 03 508 11  
MR 00 03 508 12  
MR 00 03 508 13  
MR 00 03 508 14  
MR 00 03 508 15



**Fig. 339:** Mehrgarh 2000.  
Grave goods from Burial  
501, Graveyard 4.

MR 00 03 501 1  
MR 00 03 501 3



**Fig. 340:** Mehrgarh 2000.  
Grave goods from Burial  
575, Graveyard 5.

MR 00 03 575 1  
MR 00 03 575 2  
MR 00 03 575 3  
MR 00 03 575 4  
MR 00 03 575 5



**Fig. 341:** Mehrgarh 2000.  
Grave goods from Burial  
550, Graveyard 7.

MR 00 03 550 1  
MR 00 03 550 2  
MR 00 03 550 3  
MR 00 03 550 4



**Fig. 342:** Mehrgarh 2000.  
Left: stone pendant from  
burial 514, Graveyard 1.

MR 00 03 514 1

Right: Stone pendant from  
Period I.

MR 00 03 393 169



**Fig. 343:** Mehrgarh 2000.  
2 fragments of bitumen  
with imprints of the baskets  
which once were partly  
covered with this material  
(Burial 555, Graveyard 8).

MR 00 03 555 3

MR 00 03 555 4



**Fig. 344:** Mehrgarh 2000.  
Mortars from Period I.

MR 00 03 581 3

MR 00 03 75 69

MR 00 03 109 414

MR 00 03 164 64

MR 00 03 164 70

MR 00 03 172 278

MR 00 03 183 105

MR 00 03 194 46

MR 00 03 198 36



**Fig. 345:** Mehrgarh 2000.  
Grooved stones from Pe-  
riod I.

MR 00 03 160 72  
MR 00 03 180 15  
MR 00 03 188 189



**Fig. 346:** Mehrgarh 2000.  
Flint artefact shafted in  
clay. Period I.

MR 00 03 188 192



**Fig. 347:** Mehrgarh 2000.  
Left: Sickle element from  
Period I.

MR 00 03 183 47

Right: Sickle element from  
Burial 575, Graveyard 5.

MR 00 03 575 5



**Fig. 348:** Mehrgarh 2000.  
Ivory object from Period I.

MR 00 03 188 191



**Fig. 349:** Mehrgarh 2000.  
Bone object from Period I.

MR 00 03 172 25



**Fig. 350:** Mehrgarh 2000.  
Bone object from Period I.

MR 00 03 199 88



**Fig. 351:** Mehrgarh 2000.  
2 tools made of antler from  
Period I.

MR 00 03 170 37  
MR 00 03 194 35



**Fig. 352:** Mehrgarh 2000.  
Bone pendant from Burial  
290, Graveyard 9.

MR 00 03 290 8





View of the Kirthar Range, West of the Neolithic site

# APPENDIX



# ÉTUDE DE L'ENVIRONNEMENT SÉDIMENTOLOGIQUE ET GÉOLOGIQUE DU NORD DE LA PLAINE DE KACHI

Par Luc Wengler

## 1. INTRODUCTION

Les travaux que nous avons effectués au cours de la mission 1985 (période du 12 janvier au 11 février 1986) sur le site de Mehrgarh avaient pour but, outre une première prise de contact avec la région, d'aborder l'étude de l'environnement sédimentologique et géologique de cette vaste et complexe zone archéologique, qui s'étend sur plus de 200 hectares au Nord de la plaine de Kachi, au Balochistan.

Ces recherches, menées dans une optique quaternariste, doivent permettre de mieux saisir l'imbrication et la succession des séquences stratigraphiques contenant des restes d'occupation humaine dans la zone MR.03. Celle-ci constitue, en effet, la seule séquence préhistorique connue dans cette région du monde, qui se raccorde aux civilisations protohistoriques également présentes à Mehrgarh. Elle a surtout l'avantage de montrer, dans un site de plein air, la superposition de couches sédimentaires d'origine alluviale et de couches archéologiques avec des structures d'habitat bien conservées, qui permettent d'avoir des repères chronologiques sur une longue période comparativement à la durée de l'Holocène.

Grâce à cet ensemble de conditions extrêmement favorables, associé à des études pluridisciplinaires axées sur la reconstitution des paléoenvironnements, on devrait pouvoir, à plus ou moins long terme, dégager l'essentiel des événements sédimentologiques et paléoclimatiques survenus au cours des dix derniers millénaires dans cette partie du Pakistan.

Ce type d'étude mené sur la période holocène apparaît de plus en plus important à l'heure actuelle, non seulement pour comprendre les faits humains au travers de l'archéologie, mais aussi pour aborder les phénomènes climatiques et géologiques sur une échelle plus vaste, comme celle des zones arides et semi-arides du domaine méditerranéen, dont la zone étudiée marque une limite extrême. Elle peut aboutir à une modélisation des événements géologiques qui permettrait de mieux comprendre les périodes antérieures.

Il faut souligner que ce genre de recherche était jusqu'à présent cantonné à l'étude de l'environnement humain des sites archéologiques. A Mehrgarh, la présence de Néolithique et de Néolithique précéramique liés à des structures géologiques holocènes ouvre de nouvelles perspectives qui paraissent exceptionnelles par rapport aux autres sites archéologiques connus dans cette région du monde.

D'autre part, la pérennité de l'habitat durant au moins les neufs derniers millénaires dans la plaine de la Bolan incite à se demander s'il n'existe pas de vestiges archéologiques plus anciens, notamment paléolithiques. Cette interrogation constituera notre troisième thème de recherche, qui n'est en fait que l'élargissement du premier, c'est-à-dire: réaliser une étude de géologie du Quaternaire au niveau régional.

Rechercher des sites paléolithiques au hasard constitue un investissement peu rentable, alors que la reconnaissance des formations quaternaires susceptibles d'en contenir s'avère payante. En effet, elle permet d'avoir des renseignements sur les périodes antérieures tant au point de vue de la chronologie que des processus de mise en place de ces terrains, et donc des paléoenvironnements. De plus, en

limitant la part du hasard, elle facilite la prospection des sites préhistoriques qui, réciproquement, contribuent à situer dans le temps ces formations.

Enfin, la découverte d'une sélection de graminées et leur collecte, ainsi que la présence de bâtiments vraisemblablement destinés à leur stockage, indiquent une économie de production qui se révèle déjà importante dans la première moitié de l'Holocène. Ces faits posent le problème d'une agriculture et des sols qui lui sont associés. La mise en évidence de ces paléosols, s'ils sont conservés, constitue une autre orientation de nos travaux. Dans un milieu aride ou semi- aride, où actuellement la céréaliculture est étroitement dépendante d'un système d'irrigation par inondation, cette étude passe inévitablement par une recherche d'éventuelles traces d'irrigation.

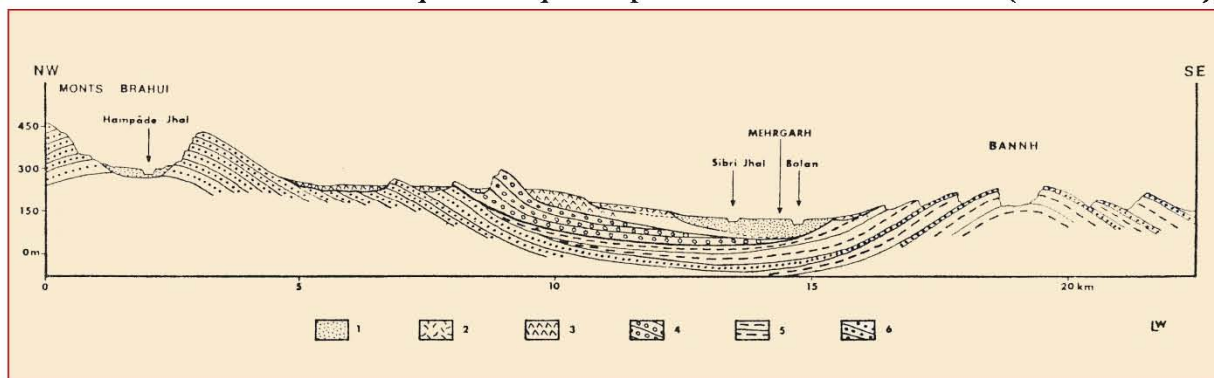
## 2. CADRE GÉOLOGIQUE.

Le site de Mehrgarh se situe sur la bordure orientale de l'arc balouche dont les terrains, essentiellement calcaires, font partie de la "calcareous zone", principalement tectonisée durant l'orogénèse himalayenne.

### 2.1. Stratégie et milieux sédimentaires

Le bord Ouest de cette région, formant la plaine de Kachi, qui se rattache géographiquement à la vaste plaine de l'Indus, est constitué par une série détritique: la formation de Sibi (fig.1). Celle-ci repose en concordance sur des formations sédimentaires essentiellement carbonatées, séparées en plusieurs unités. La plus récente, dont nous aurons à reparler, est composée par les "*Spitangi limestones*", d'âge éocène inférieur et moyen, qui comportent des calcaires marins riches en foraminifères, facilement reconnaissables grâce à la présence de *Nummulites planulatus*.

La formation de Sibi est représentée par un puissant ensemble de couches (2000 à 8000 m),



**Fig. 1 : Coupe géologique de la plaine de la Bolan.**

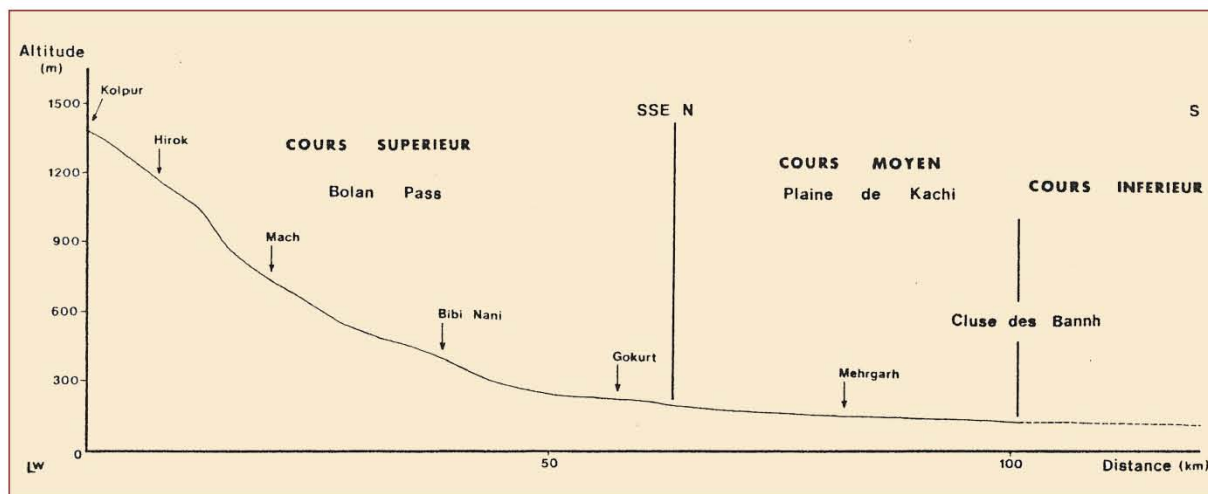
**1 : alluvions holocènes. 2 : glacis G1. 3 : glacis G2. 4 : Poudingue de Dada. 5, 6 : respectivement, argiles litées et grès calcaire de la formation de Sibi**

formé par des argiles litées ("shale" des auteurs anglo-saxons), alternant avec des strates gréseuses. Cette série débiterait à l'Oligocène, vers - 37 millions d'années, par des grès et des calcaires riches en fossiles marins, et se terminerai à la fin du Pliocène.

La plaine de la Bolan, au niveau du site de Mehrgarh, est coincée entre deux zones de reliefs: à l'Ouest, les premiers chaînons de la Central Brahui Range, et à l'Est, la petite chaîne des Bannh, qui la sépare de la plaine de la Nari (fig.2). Cette rivière, coulant du Nord vers le Sud, a un tracé subparallèle à celui de la Bolan, avec laquelle elle partage la particularité de se perdre au Sud des Bannh.

C'est au niveau de ces zones montagneuses largement entamées par l'érosion que nous avons observé la partie terminale de la formation de Sibi, sur une épaisseur d'environ 500 m.

Celle-ci présente une sédimentation rythmique. Les séquences, épaisses de plus de 100 m (photo 1), sont constituées essentiellement par des argiles litées rouges, riches en sel et en gypse, présentant parfois une structure massive.



**Fig. 2 : Profil longitudinal de la Bolan de sa naissance à la plaine de Kachi.**

Elles sont quelquefois intercalées de petits niveaux gréseux décimétriques, et se terminent toujours par un banc de grès tendre rougeâtre à ciment calcaire, puissant de plusieurs mètres, dont les éléments détritiques sont des sables quartzeux plus ou moins grossiers. Celui-ci montre toujours des stratifications obliques constituant des structures entrecroisées de longueur supérieure au mètre.



**Photo 1 : Argiles litées couronnées de bancs gréseux de la formation de Sibi. Partie interne de l'anticlinal évidé des Bannh.**

L'ensemble de ces observations indique un milieu de sédimentation proche du continent, où les apports terrigènes sont très importants. La présence de quantités assez considérables de sel et de gypse fait penser à une mer peu profonde dont le confinement de plus en plus grand offrirait les conditions d'une zone lagunaire. D'autre part, les apports détritiques plus grossiers qui apparaissent périodiquement dans la série, avec leur structure de chenaux, évoquent une zone deltaïque.

A la fin de cette période, toujours dans la même ambiance, la région reçoit d'importants apports fluviaux qui charrient d'énormes quantités de galets. Ces derniers proviennent de l'érosion des unités calcaires antérieures qui ont été tectonisées lors des premières phases de l'orogénèse himalayenne, et notamment des calcaires à nummulites des "*Spitangi limestones*". Ils sont cimentés par du carbonate de calcium mélangé à des sédiments fins quartzeux, et intercalés, à leur base, de grès calcaire rouge. Quoique azoïque dans la région étudiée, ce poudingue (Dada conglomerate) a été attribué au début du Pléistocène par les auteurs anglo-saxons, car il a été plissé par les derniers contrecoups de la tectonique himalayenne, et marque une rupture dans la sédimentation mio-pliocène.

## 2.2. Structure et relief régional

Le relief actuel résulte avant tout de la dernière phase tectonique pléistocène, qui a eu pour conséquence de plisser la couverture sédimentaire. Les plis sont généralement droits ou déjetés, et parfois faillés, notamment dans les séries calcaires, où les roches sont plus compétentes. Ce style est bien représenté dans la Central Brahui Range, dont seul le flanc Est nous intéresse.



**Photo 2 : Vallée du torrent d'Hampâde, au cœur de l'anticlinal bordant la plaine de Mehrgarh. Partie Est des Monts Brahui. (Remarquer l'ampleur de la terrasse holocène, haute de 9m, bordant le lit du torrent).**

Les observations ont été conduites suivant une coupe ONO-ESE, allant de la vallée du torrent Hampâde, affluent de la Sibri, au rebord Est des Bannh (fig. 1). On y rencontre un anticlinal à cœur de grès rouge grossier, à ciment calcaire, creusé d'une combe anticlinale qu'a empruntée un affluent de la Bolan (photo 2). Le flanc Est de cet anticlinal a été disséqué par l'érosion; il n'en subsiste plus que des

crêts émergeant d'un glaciaire quaternaire dont la surface est un reg sur lequel nous reviendrons ultérieurement.

La fin de cette série est représentée par le poudingue de Dada. Ses couches à fort pendage (60° E) plongent dans la plaine de la Bolan en formant un synclinal entièrement occupé par les sédiments alluviaux du Quaternaire récent. L'analyse de ceux-ci sera abordée postérieurement puisqu'ils constituent les formations contemporaines des occupations humaines de Mehrgarh.

Les mêmes couches de conglomérat devraient se retrouver sur le bord Ouest des Bannh ; en fait, elles ont été en grande partie démantelées par l'érosion, si bien que l'on ne trouve que des épandages de galets contenant des fragments de calcaire à foraminifères.

Les Bannh correspondent à un autre anticlinal, aux proportions beaucoup plus modestes. Il n'est en fait qu'une ride périphérique marquant l'amorce des phénomènes tectoniques de plus grande ampleur observables dans les Monts Brahui. Il se rattache d'ailleurs à cette chaîne vers le Sud, alors qu'au Nord, la terminaison périanticlinale s'abaisse progressivement et s'ennoye dans les sédiments quaternaires à l'Est de Dadhar.

Là encore, on retrouve un relief de type jurassien conforme à la structure, mais qui a déjà dépassé le stade de la maturité. Le centre de l'anticlinal est largement évidé, et sur les flancs ne subsiste plus qu'un relief de cuestas élevées où les grès, plus résistants à l'érosion, occupent le sommet (photo 3). Le réseau hydrographique conséquent qui alimente soit la Bolan à l'Ouest, soit la Nari à l'Est, a largement entaillé ces reliefs par un système de cluses, isolant même des buttes témoins. C'est par l'une de ces cluses que la Bolan traverse de part en part les Bannh dans leur partie méridionale pour rejoindre le bassin de la Nari.



**Photo 3 : Emprise de l'érosion sur la formation de Sibi, flanc Est des Bannh.**  
(Le pendage des grès sur les reliefs marque l'amorce du synclinal de Mehrgarh).

Les zones argileuses rouges donnent des paysages de "*bad lands*". L'érosion par griffes, dans une région où les précipitations sont rares (150 à 200 mm par an), mais violentes, a entraîné la formation de profondes ravines. Celles-ci entament également les plaines alluviales, ainsi que les glacis qui les raccordent aux zones de relief.

### 3. LES FORMATIONS ALLUVIALES DE LA BOLAN

Nous avons étudié la portion du cours de la Bolan comprise entre son débouché de la Bolan Pass et la cluse qui lui permet de traverser l'anticlinal des Bannh. Sur cette section, longue de 36 km, où elle aborde la plaine de Kachi et que l'on peut considérer comme son cours moyen (fig.2), la rivière est pérenne. Son profil peu incliné est celui d'une rivière de plaine. Elle longe le piémont Est des Monts Brahui, et reçoit tout au long de son trajet, orienté grossièrement Nord-Sud, des cours d'eau temporaires (appelés localement des "*Jhal*") à régime d'oued, issus de cette même chaîne montagneuse. Le plus important d'entre eux est la Sibri.

En amont, dans la Bolan Pass, son cours supérieur correspond à un profil plus incliné de rivière de montagne. Au-delà des Bannh commence son cours inférieur, caractérisé par un régime temporaire et sa perte progressive dans la plaine de Kachi.

Peu après sa sortie des gorges, la Bolan occupe un lit large à fond de galets limité par des berges. Celles-ci sont formées de sédiments alluviaux recoupés par le cours actuel. Plus en aval, on peut suivre l'évolution sédimentologique de cette terrasse alluviale au fur et à mesure que l'on s'éloigne de la zone de piémont, et observer une seconde formation de même type, mais plus récente, occupant une partie du lit majeur.

Pour des raisons de nomenclature, on désignera ces formations par la lettre F, affectée d'une minuscule à partir de z en remontant l'alphabet, de la terrasse la plus récente à la plus ancienne. Deux terrasses ont été mises en évidence, et une troisième plus ancienne est probable.

#### 3.1 Les alluvions Fz.

Les sédiments qui les constituent sont localisés dans le lit actuel encaissé de la Bolan. On peut suivre cette basse terrasse sur toute la portion du cours étudiée, sauf sur les six premiers kilomètres qui font suite à la sortie de la Bolan Pas.

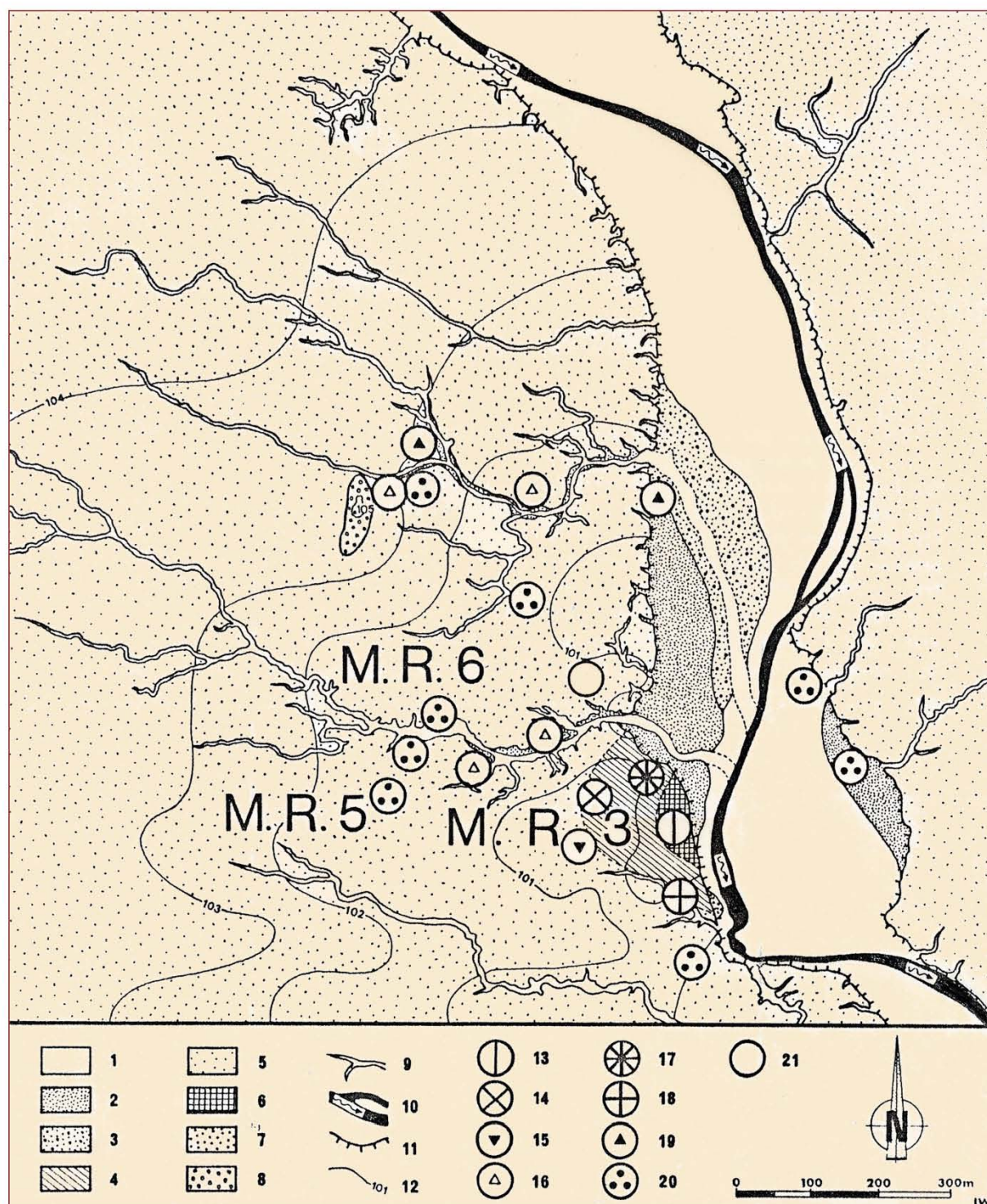
Cette formation est emboîtée dans la terrasse Fy, et succède à une phase d'incision linéaire de cette dernière. Une étude détaillée des ravines dans la zone archéologique de Mehrgarh (fig.3) montre que les plus importantes ont leur partie aval occupée par les bords de cette terrasse ; celle-ci est donc postérieure à l'établissement du réseau de ravines qui dissèque Fy.

Actuellement, la formation Fz est entaillée à la fois dans les ravines et dans le lit majeur par une reprise de l'érosion. Ceci permet d'y observer des coupes de deux à trois mètres d'épaisseur. Dans le lit de la Bolan, elle est le plus souvent colonisée par une végétation arborescente où le *Tamari articulata* Vahl domine (photo 4).

##### 3.1.1. Analyse des séquences sédimentaires.

Au point de vue sédimentologique, on distinguera deux séquences. A la partie inférieure des coupes, on trouve une nappe de galets calcaires bien arrondis, en majorité décimétriques (fig.4), qui proviennent de l'érosion des couches de la Central Brahui Range. Ils sont emballés dans un sable grossier plus ou moins limoneux suivant les endroits.

La base de la nappe n'est pas visible, et vers son sommet viennent s'intercaler des lentilles de sable grossier granoclassé.



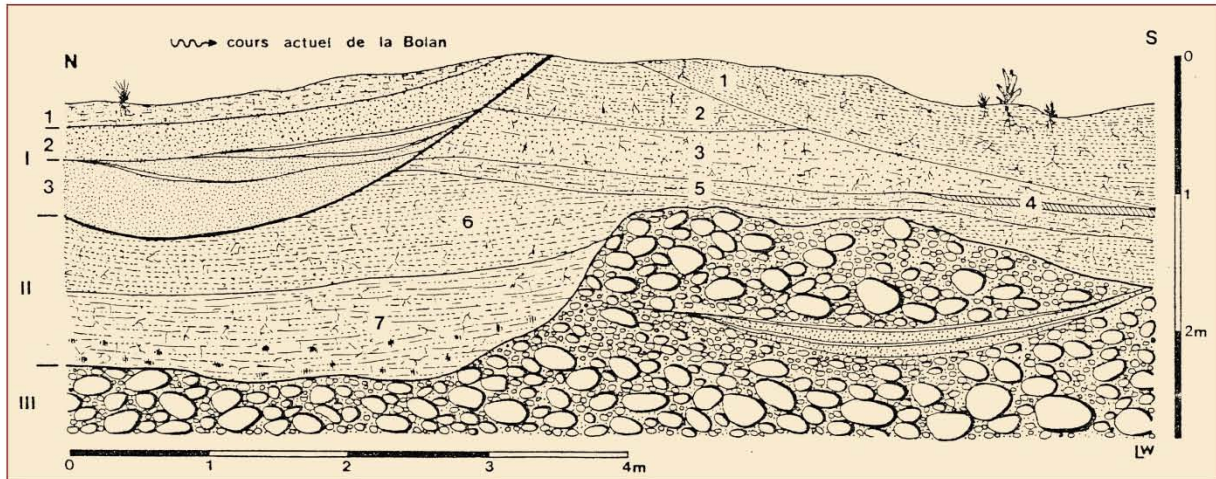
**Fig 3 : Carte géomorphologique des terrasses alluviales de la Bolan dans la zone archéologique de Mehrgarh : MR.03, MR.05, MR.06 : appellation des différentes zones archéologiques.**

1 : nappe de fond de vallée. 2 : sables et limons de la partie supérieure de la terrasse Fz. 3 : nappe de galets inférieure de la terrasse Fz. 4 : Tépé archéologique de la terrasse Fy. 5 : sables et limons de la terrasse Fy. 6 : Tépé archéologique couronnant la terrasse Fx. 7 : lentille de galets à la base de la terrasse Fx. 8 : Poudingue de Dada. 9 : ravine. 10 : lit mineur actuel de la Bolan. 11 : falaise du lit majeur. 12 : courbe de niveau avec altitude en mètres. 13 : fouilles période I. 14 : fouilles période IIA. 15 : sondage période IIB. 16 : sondage ou travail ponctuel période IIA. 17 : fouilles Période I. 18 : fouilles période IIB. 19 : sondage période IIA. 20 : zone à occupation archéologique reconnue non encore étudiées période III. 21 : travail ponctuel période IIB.



**Photo 4 : Lit de la Bolan en aval du site archéologique de Mehrgarh.:**

Le lit actuel de la rivière, au centre de la photo, incise la terrasse Fz colonisée par la ripisylve à *Tamarix Articulata* Vahl. A droite, on voit la falaise de la terrasse Fy dans laquelle s'emboîte Fz)



**Fig. 4 : Coupe stratigraphique de la basse terrasse Fz de la Bolan en aval du gué de Dadhar**

**I.** 1 : limon sableux. 2 : sable limoneux. 3 : sable fin intercalé de pellicules limoneuses. Il s'agit d'un chenal secondaire recoupé par le lit actuel.

**II.** 1 : sable fin limoneux très finement lité. 2 : limon sableux. 3 : sable plus grossier, peu limoneux, lité. 4 : foyer superficiel non construit. 5 : limon sableux finement lité. 6 : limon mélangé à du sable grossier, lité. 7 : limon sableux fin, taches de réduction grisâtres à la base. Toutes les couches contiennent de nombreuses traces de racelles. Celles de la couche 7 sont remplies de limon ocre.

**III.** Nappe de galets hétérométriques « en vrac », mêlée de sable grossier très limoneux contenant des lentilles de sable grossier granoclassé se terminant par un niveau de sable fin limoneux.

Cette séquence est facilement observable dans sa partie supérieure au niveau du site de MR 03, où la Bolan a décapé les sédiments sus-jacents (fig.3). D'ailleurs, plusieurs indices laissent supposer qu'une partie des galets du lit actuel de la rivière proviennent du démantèlement de cette nappe et d'autres situées plus en amont.

Au-dessus se trouve une série sablonneuse dont le contact avec la nappe de galets est net, de type érosif. Les couches sableuses présentent par endroits (fig.5) des structures entrecroisées inférieures à un mètre de longueur, dont les stratifications obliques présentent un granoclassement. Vers le sommet, elles diminuent de taille, et passent à de simples couches ondulées dont la texture est celle d'un sable fin, intercalées de nombreuses pellicules limoneuses et de niveaux faiblement graveleux contenant des cristallisations de gypse et de sel. Près des berges, des éléments éboulés provenant de la terrasse Fy se retrouvent pris dans les sédiments sans avoir été démantelés (fig.5).

Ailleurs, la série a une composante plus limoneuse, ayant gardé les traces d'une colonisation par la végétation, ainsi que des taches d'hydromorphie (fig.4). Ces couches peuvent alterner avec des niveaux plus sableux à stratifications horizontales intercalées de pellicules limoneuses, et être recoupées par des chenaux comblés de sable fin plus ou moins chargé en limon.

### *3.1.2. Interprétation des observations*

L'analyse de cette formation montre que l'organisme fluvial avait au départ une compétence suffisante pour transporter des galets sur toute la largeur de son lit encaissé, laquelle oscille entre 150 et plus de 400 m près du gué de Dadhar. Ceci suppose des crues importantes où les sédiments fins sont systématiquement déblayés par la crue suivante.

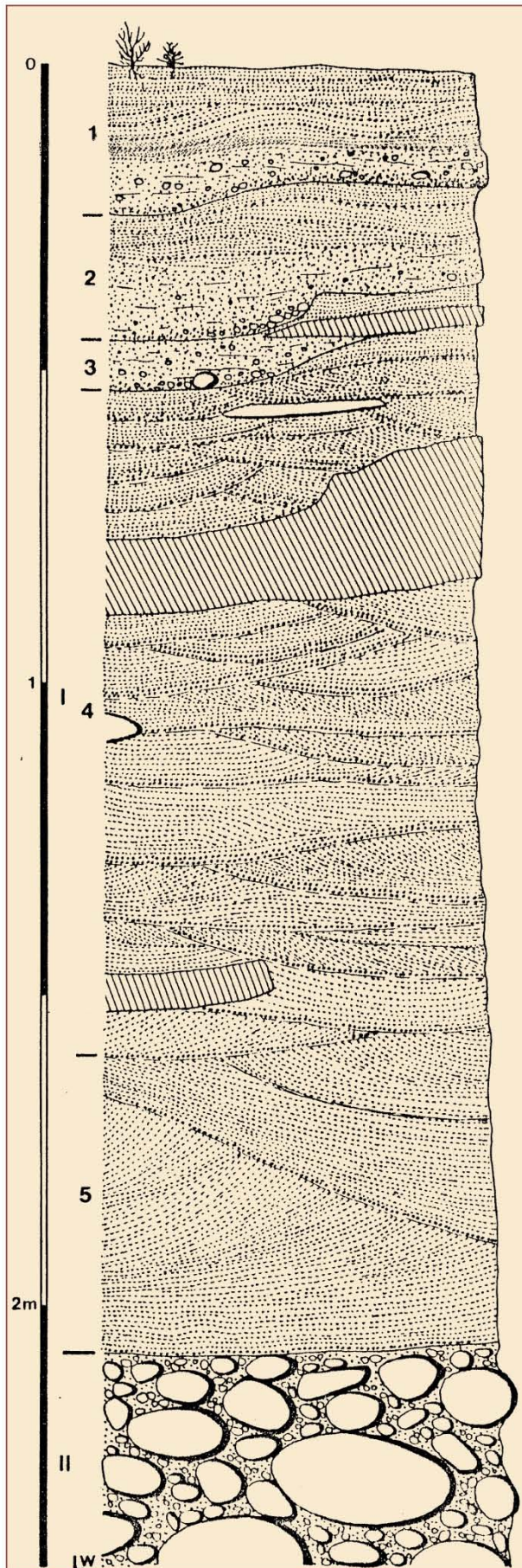
Ce régime change rapidement, et permet le dépôt de sable dans des chenaux creusés d'abord aux dépens de la nappe de galets et où s'élaborent les structures entrecroisées, et, en dehors de ceux-ci, la sédimentation de particules plus fines dans les endroits où le courant est moins fort. L'exondation, du moins temporaire, de ces parties, se traduit par la formation d'un couvert végétal suffisant pour laisser son empreinte dans les sédiments, et les variations de la nappe phréatique lors de cette phase sédimentaire sont à l'origine des faibles traces d'hydromorphie observées.

La divagation des différents bras de la rivière, dans les limites autorisées par les falaises de Fy, explique les fréquentes variations sédimentologiques visibles, ainsi que les nombreuses structures en chenaux. Peu à peu, la rivière voit sa compétence diminuer. La plus grande fréquence des apports sédimentaires limoneux de fin de crue suggère un régime plus régulier et certainement moins contrasté qu'au début de l'élaboration de cette terrasse. La stagnation d'eau séléniteuse (sur l'origine de laquelle nous reviendrons ultérieurement) en fin de série a favorisé très localement la cristallisation de gypse et de sel.

Les restes d'une activité humaine y sont rares, seul un foyer non construit, qui correspond à une utilisation occasionnelle, a été mis en évidence. D'autres éléments, comme des tessons de poterie isolés, situés près des bords, proviennent des niveaux archéologiques de Fy et n'apportent pas de renseignement complémentaire quant à l'âge de cet ensemble.

## **3.2. Les alluvions Fy.**

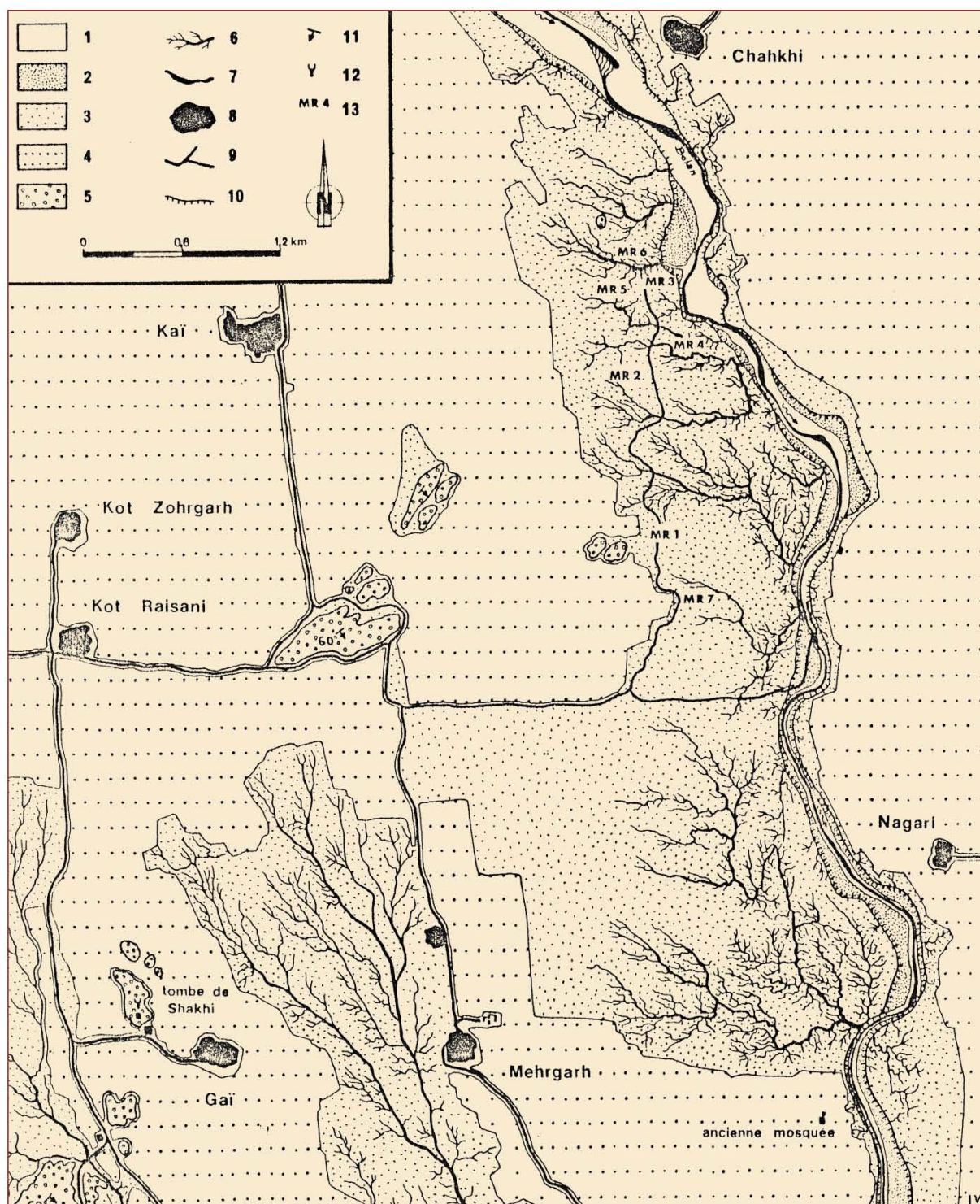
Cette formation est présente dans toute la plaine de la Bolan (fig.6), à partir de la fin des gorges. Elle occupe une place considérable et constitue l'essentiel des terres cultivées par irrigation. Elle est largement entaillée par des réseaux de profondes ravines se développant aux dépens des griffes d'érosion qui marquent de leur empreinte les zones en légère dépression. Leur organisation en réseau anastomosé leur permet de drainer les eaux de précipitations vers la Bolan, qui a creusé un lit profond d'une douzaine de mètres dans Fy.



**Fig. 5 : Colonne stratigraphique de la séquence supérieure de Fz au niveau des sites de Mehrgarh.**

**I.** 1, 2 et 3 : couches formées à la base de sable grossier graveleux à cristallisations gypsosalifères, passant à des sables fins à stratifications ondulées, puis horizontales, intercalées de pellicules limoneuses. 4 : sable fin peu limoneux à stratifications obliques avec structures entrecroisées. Les éléments hachurés correspondent à des blocs de sédiments limono-sableux éboulés et remaniés provenant de la terrasse Fy.

**II.** Nappe de galets hétérométriques « en vrac », avec du sable grossier limoneux dans les interstices.



**Fig. 6 : - Carte géomorphologique de la région de Mehrgarh.**

**1** : nappe alluviale de fond de vallée. **2** : terrasse alluviale Fz. **3** : terrasse alluviale Fy. **4** : partie cultivée par irrigation de la terrasse Fy. **5** : poudingue de Dada. **6** : ravine. **7** : lit actuel de la Bolan. **8** : village. **9** : piste. **10** : falaise bordant le lit majeur de la Bolan. **11** : pendage des couches. **12** : monument musulman. **13** : zone archéologique.

C'est en suivant les falaises qui bordent le cours actuel de la Bolan que l'on a pu observer les variations latérales de faciès et le mode d'élaboration de cette terrasse.

### 3.2.1. Analyse des séquences sédimentaires.

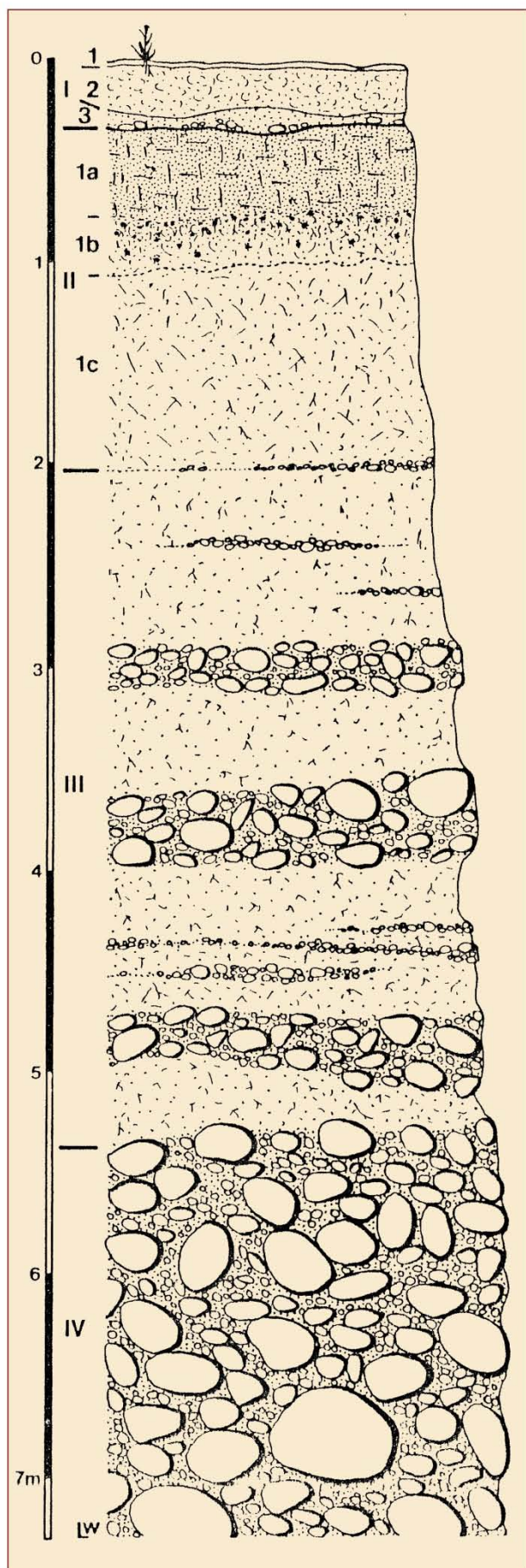
En aval du gué de la piste de Mehrgarh à Dadhar, les falaises de la rive gauche (fig.7) montrent une nappe de galets très hétérométriques passant progressivement dans sa partie supérieure à des sédiments sablo-limoneux intercalés de lentilles de gravier et de galets (photo 5). Peu à peu, les sédiments deviennent plus fins et portent des traces d'hydromorphie et d'une légère carbonation secondaire développée à partir du système racinaire, ainsi que des taches de carbonate de calcium pulvérulent. A ce niveau, les formations à galets, dont la base n'est pas visible, et les sédiments fins sont d'égale importance, alors qu'au fur et à mesure que l'on avance vers l'aval, c'est à dire à une dizaine de kilomètres de la sortie des gorges, les seconds augmentent au détriment des premières.



**Photo 5 : Terrasse alluviale Fy en aval du gué de Dadhar.**

On distingue la nappe de galets intérieure et la séquence sédimentaire fine qui la surmonte. Le personnage est placé au niveau de la zone de transition - Ensemble III de la figure 7.

Dans les coupes plus en aval, seuls les sédiments fins sont observables (fig.8) (photos 6 et 7). Ils sont caractérisés par une texture sableuse à sablo-limoneuse où les limites de couches sont diffuses. Les bioturbations sont très importantes, de même qu'une porosité liée aux radicelles. On y remarque aussi, suivant les couches, le développement de structures grumeleuses ou polyédriques, ainsi que des traits carbonatés. Les phénomènes d'oxydo-réduction liés à l'hydromorphie sont omniprésents, mais plus ou moins accentués selon les couches. Vers la base des coupes, certains niveaux sont humides et exsudent des efflorescences salines. La présence d'une nappe phréatique suspendue de faible importance rend compte de ce phénomène: les eaux qui l'alimentent, en lessivant les couches chargées de sel et de gypse de la formation de Sibi, provoquent une salure secondaire des sédiments de Fy.



**Fig. 1 : Coupe stratigraphique de la terrasse Fy de la Bolan, 500 m en aval du gué de Dadhar.**

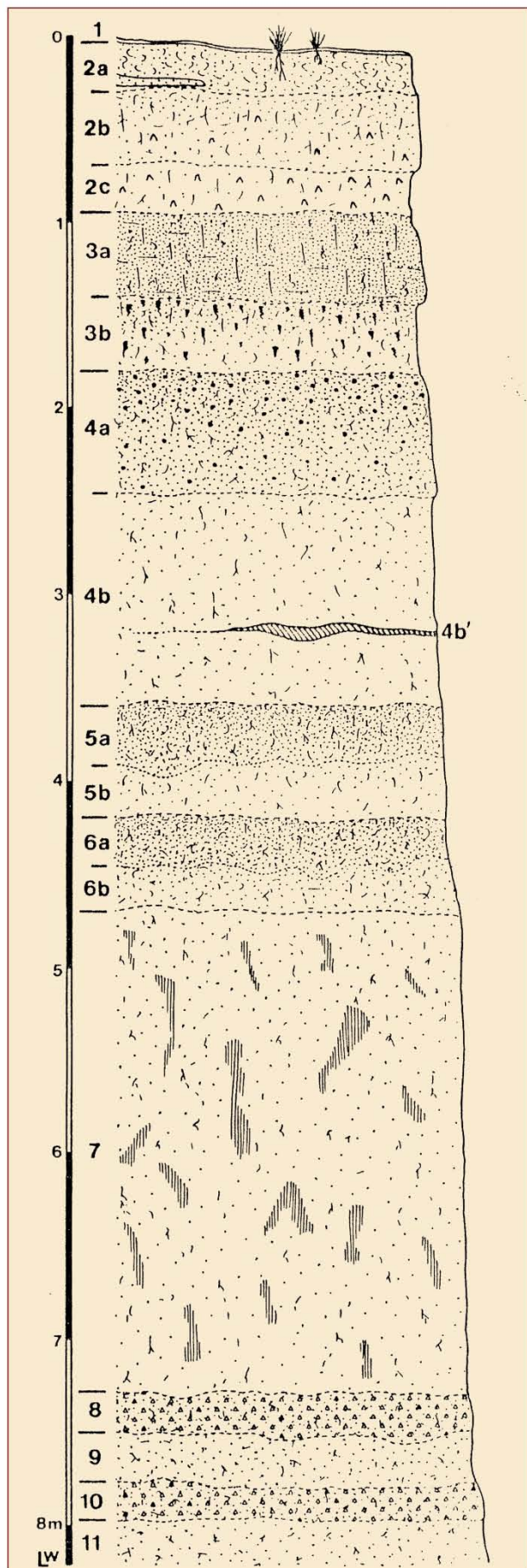
**I.** 1 : pellicule limoneuse de glaçage. 2 : limon sableux compact à structure granuleuse grossière, beige (10YR 7/3), nombreuses bioturbations. 3 : petits galets et graviers emballés dans du sable grossier. Contact érosif avec la couche sous-jacente.

**II.** 1a : limon gris pâle (10YR 7/1), compact, structure polyédrique grossière peu développée à tendance prismatique. 1b : limon beige (10YR 7/3), compact, à structure polyédrique moyenne à grossière, limite diffuse.

Ces différents niveaux présentent une porosité développée aux dépens des racelles.

**III.** Zone de transition où alternent des lentilles de graviers et de galets mélangés à du sable limoneux beige (10 YR 7/3) et des niveaux de limon sableux compact de même couleur, à réseau de fentes polyédrique et porosité racinaire.

**IV.** Nappe de galets hétérométriques « en vrac » à sable grossier limoneux interstitiel.



**Fig. 2 : Coupe stratigraphique de la terrasse Fy de la Bolan, 2 km en aval du gué de Dadhar.**

**1** : pellicule limoneuse de glaçage.

**2a** : limon compact gris-beige (10YR 7/2,5), structure grumuleuse grossière, très nombreuses bioturbations animales et végétales, lentilles de sable fin par endroits, limite inférieure diffuse.

**2b** : limon aux mêmes caractéristiques que le précédent, structure à tendance prismatique, apparition de cristaux millimétriques de gypse, faible hydromorphie et diminution vers le bas des bioturbations, limite inférieure diffuse.

**2c** : mêmes caractéristiques que l'horizon précédent, avec accentuation des caractères et couleur plus claire (10YR 7/3, beige).

**3a** : limon compact gris-brun pâle (10YR 6/3), structure grumuleuse moyenne à tendance prismatique, porosité radicellaire comblée par des cristaux de gypse, tendance marquée à l'hydromorphie au niveau de la porosité, limite inférieure diffuse.

**3b** : limon plus clair que le niveau sus-jacent, structure grumuleuse moyenne, développement de l'hydromorphie par les pores et apparition de trainées de carbonate de calcium pulvérulent à contour diffus disparaissant à la base de l'horizon, nombreuses bioturbations, limite inférieure diffuse.

**4a** : limon compact brun pâle (10YR 6/3), structure grumuleuse grossière, réseau de fentes per développé, ponctuations ferro-manganiques sur les facettes des agrégats, faible hydromorphie développée à partir de la porosité radicellaire, bioturbations importantes, 1 à 2 % de taches de carbonate de calcium pulvérulent, limite inférieure diffuse.

**4b** : niveau de texture identique au précédent, plus clair (10YR 7/3, beige), sans taches carbonatées. **4b'** : paléosurface marquée par un foyer superficiel non construit.

**5a** : horizon identique, mais sans taches carbonatées.

**5b** : horizon identique à 4b.

**6a** : idem 5a.    **6b** : idem 4b.

**7** : limon sableux compact, beige (10YR 7/3), nombreux pores radicellaires et racinaires, environ 10 % de taches grises (10YR 7/2) et ocres 510YR 8/6, brun jaune clair) d'oxydo-réduction graduelle.

**8 et 10** : niveaux identiques au susjacent avec formation d'efflorescences salines.

**9 et 11** : niveaux identiques à 7, mais légèrement plus sableux.



**Photos 6 et 7 : Terrasse alluviale Fy à deux kilomètres en aval du gué de Dadhar.**  
Seule la séquence sédimentaire fine subsiste. Sur la photo 7, on peut constater l'homogénéité de l'ensemble, ainsi qu'une structuration de certains niveaux indiqués par des flèches).

Au niveau des sites archéologiques de Mehrgarh, les limites de couches sont plus distinctes, et les phénomènes sédimentaires initiaux moins altérés. Les coupes dégagées par le recul de la falaise ne laissent pas voir la base de la série, mais parmi les événements sédimentaires majeurs, on note la présence de bas en haut :

- d'une séquence sablonneuse à fines stratifications montrant des niveaux plus limoneux de fin de crue ;
- d'un ensemble sédimentaire limono-argileux entrecoupé d'épisodes plus sablonneux;
- d'une deuxième séquence à dominante sableuse avec des structures sédimentaires de chenaux fluviaux ;
- de couches limono-sableuses alternant avec des niveaux sableux à stratifications ondulées ou horizontales.

La majorité de ces couches présentent des phénomènes de bioturbation provoqués par l'appareil racinaire des végétaux et par de nombreux organismes fouisseurs, notamment ceux appartenant au groupe des Annélides. Les traits carbonatés sont rares (photo 8), et l'hydromorphie apparaît uniquement dans les couches inférieures, à partir de la deuxième séquence sableuse.

La colonne stratigraphique levée dans le sondage profond du tepe associé à la terrasse Fy dans la zone MR.03 (fig.9) ne livre qu'une vision incomplète des phénomènes sédimentaires, étant donné l'importance de l'impact humain sur ce milieu; néanmoins, les données que l'on peut en tirer sont très instructives et se corrélatent avec les observations rapportées ci-dessus.

Au Sud du village de Nagari, la base des coupes est systématiquement masquée par la terrasse Fz ou par les éboulements des rives dont les bases sont sapées. Par contre, les parties hautes sont plus facilement accessibles, et montrent une remarquable homogénéité sur le plan sédimentologique avec les résultats précédents.

### *3.2.2. Interprétation des observations.*

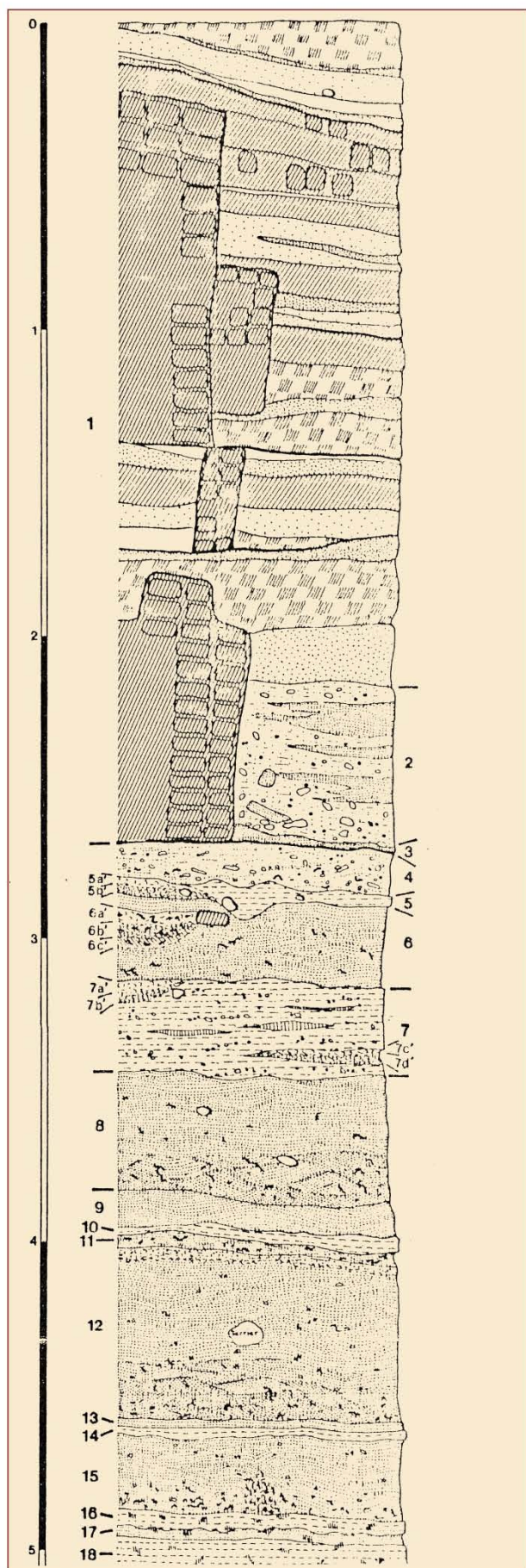
Les renseignements que nous possédons sur cette formation sont loin d'être complets, étant donné la surface qu'elle occupe et la diversité des phénomènes qu'elle a enregistrés ; toutefois, il est possible d'envisager au moins les grandes lignes de sa mise en place, les événements postérieurs ayant affecté ces sédiments ne pouvant être qu'effleurés pour l'instant.

#### L'environnement sédimentologique

Au débouché de la Bolan Pass, à l'occasion des fortes crues de printemps et d'été, les sédiments, constitués par des galets hétérométriques, ont formé un cône alluvial qui s'est largement étendu dans la plaine. Peu à peu, en s'éloignant de cette zone où le débit solide est très important, la rivière va perdre sa compétence en s'étalant et donc charrier de moins en moins de gros éléments. Cet amortissement du flux est difficile à apprécier, car la base des séries n'est jamais visible ; cependant il apparaît notable au bout des dix premiers kilomètres de cours dans la plaine. Il est très fortement probable que des éléments de cette nappe de galets se retrouvent beaucoup plus en aval, enfouis sous les alluvions plus récentes.

On retrouve ici le même type de processus que celui décrit pour la terrasse Fz, mais caractérisé par deux différences fondamentales :

- d'une part, l'ampleur des phénomènes mis en jeu est sans commune mesure avec le précédent, le cône alluvial n'occupe plus quelques centaines de mètres, mais plusieurs kilomètres ;
- d'autre part, le mécanisme de mise en place des sédiments fins ne procède plus d'un système en chenaux divagants limité par les berges du lit majeur, mais d'un système d'écoulement en nappe (sheet flood) qui se produit lors des crues, étalant les sédiments fins (sables fins, limons, argiles) sur une surface proche de l'horizontale.



**Fig. 9 : Coupe stratigraphique du sondage profond de MR.03 (périodes I et IIA).**

- 1** : ensemble de niveaux d'habitats archéologiques.
- 2** : sable fin limoneux beige (10YR 7/3), nombreux fragments remaniés de zone limoneuse, fines stratifications ondulées conservées par endroits.
- 3** : petite lentille de sable fin limoneux à stratifications ondulées, marquant un ruissellement localisé au pied d'un mur.
- 4** : sable fin limoneux beige, litage très peu marqué, nombreux fragments limoneux remaniés, quelques traces de vers
- 5** : argile limono-sableuse compacte, gris pâle (2, 5YR 7,5/2), vestiges anthropiques (pierres chauffées).
- 5a'** : cendres rubéfiées (5YR 6/4, ocre brun).
- 5b'** : cendres grises (5YR 7/1,5, gris rosé).
- 6** : sable fin limoneux beige, fines stratifications ondulées et horizontales, fragments remaniés de limon, traces de vers.
- 6a'** : sable rubéfié ocre brun (5YR 6/4) comblant un foyer construit rectangulaire limité par des briques crues.
- 6b'** : sable cendreux gris pâle (5YR 7/1).
- 6c'** : sédiment en place rubéfié (5YR 7/1, 5, gris rosé). Cette structure anthropique contient de nombreuses traces de vers.
- 7** : limon argileux beige, anthropique (lentilles limono-argileuses, petits ravinements comblés, fragments limoneux remaniés...).
- 7a'** : partie supérieure rubéfiée (5YR 6/4) d'un foyer non construit.
- 7b'** : zone cendreuse inférieure, grise (5YR 6/1).
- 7c'** : idem 7a'.                      **7d'** : idem 7b'.
- 8** : limon sableux gris pâle (10YR 7/2) à stratifications ondulées et éléments limoneux remaniés, passant progressivement à un sable fin limoneux à stratifications ondulées, puis obliques à structures entrecroisées, quelques traces de vers.
- 9** : limon sableux gris pâle à stratifications ondulées
- 10** : argile limoneuse gris pâle (10YR 7, 5/2) à taches de réduction blanchâtres (7,5YR 9/0), quelques taches ocres (2,5YR 7,5/4), jaune pâle), microdendrites de pyrolusite sur les facettes, faible porosité racinaire.
- 11** : sable fin limoneux beige (10YR 7/3, 5), stratifications ondulées, fine pellicule limoneuse au sommet, traces de vers

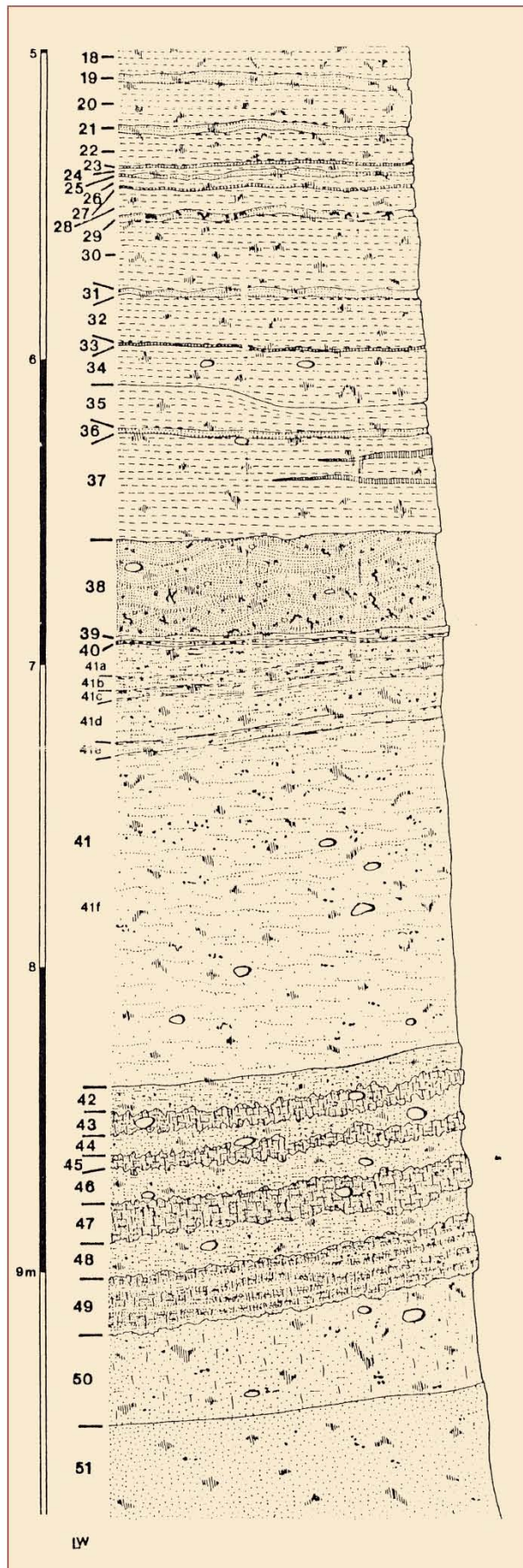


Fig. 9 : suite

**12** : au sommet, limon à sable fin beige (10YR 7/3, 5) alternant avec de fines pellicules limoneuses ondulées, passant au-dessous à un sable fin limoneux remaniés à stratifications ondulées puis obliques à structures entrecroisées ; nombreux éléments limoneux remaniés. Les traces de vers augmentent vers la base.

**13** : limon sableux beige (10YR 7/3), fines stratifications ondulées, rares traces de vers.

**14** : argile limoneuse compacte, beige, rares traces de radicelles vers la base, réseau de fentes ondulées à tendance horizontale dont la surface est de couleur ocre (7, 5YR 6/6).

**15** : limon fin beige clair (10YR 7, 5/2, 5) légèrement sableux, fines stratifications horizontales, puis ondulées vers la base, nombreuses bioturbations provoquées par les vers.

**16 à 37** : alternance de couches de limon argileux beige, compact, à nombreuses traces de radicelles et de limon sableux beige à fines stratifications horizontales ou ondulées.

**38** : sable fin gris pâle (10YR 7/2? 5) à stratifications ondulées, fragments remaniés de limon, nombreuses traces de vers.

**39** : limon beige, traces de radicelles.

**40** : idem 16.

**41** : limon sableux beige comportant plusieurs cycles (a, b...) peu différenciés, sans stratification bien marquée, débutant à la base par un limon sableux qui alterne avec des pellicules limoneuses millimétriques de plus en plus nombreuses vers le sommet.

**42 à 49** : alternance de sable limoneux ocre (2, 5Y 8/3, jaune pâle), à nombreuses traces de radicelles et de limon terreux brun clair (10YR 5/3) présentant des phénomènes d'injection dans les couches sableuses ; cailloux thermoclastés.

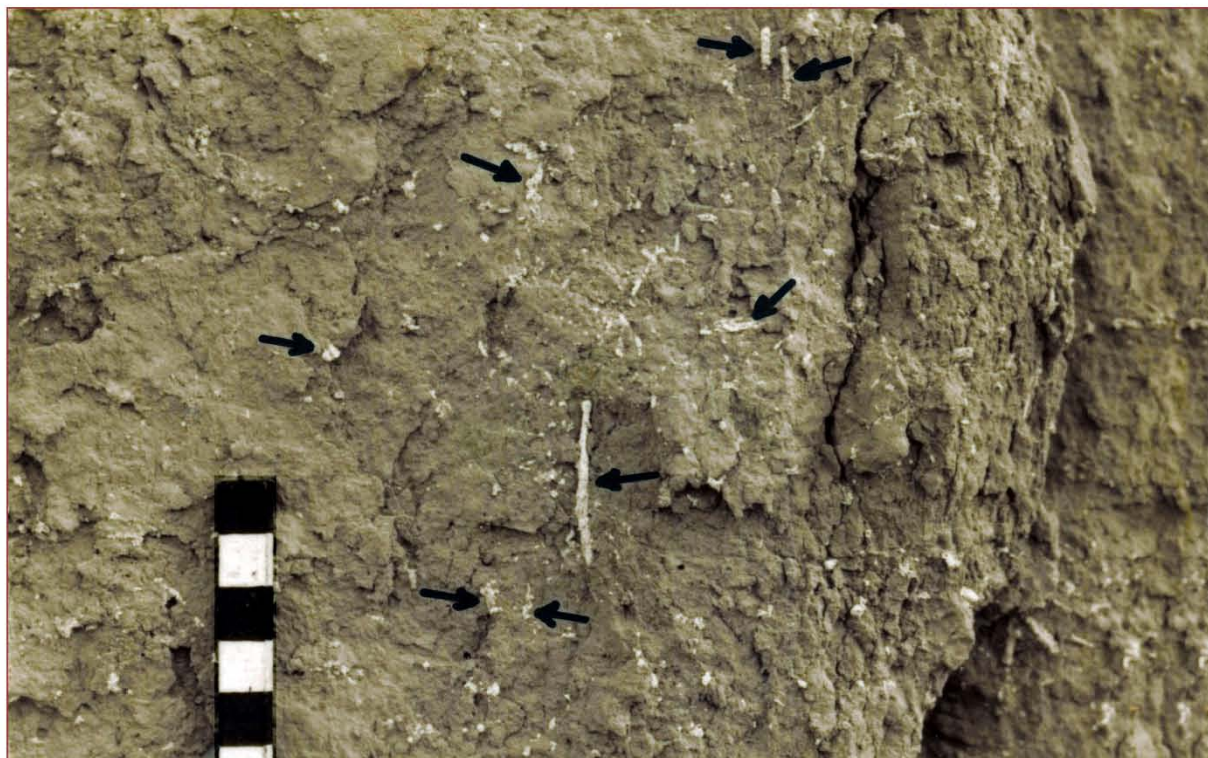
**50** : identique à 41, avec présence de limon terreux mélangé.

**51** : sable fin limoneux brun clair (10YR 5/3, 5) à taches d'oxydation ocres.

A partir de la couche 16 jusqu'en bas de la coupe : 3 à 10 % de taches d'oxydation, jaune pâle à rouge (2, 5Y 7,5/4 à 2, 5YR 5/8) et de réduction, blanchâtres (5Y 8/1). Les couches 32, 34, 35, 37, 39 à 51 contiennent des charbons de bois. Des efflorescences salines se forment sur la tranche des couches 42 à 49, et en moindre quantité à partir des couches inférieures? Le sondage est arrêté au sommet de la nappe phréatique.

Ce mode de sédimentation est fréquent dans les zones arides et semi-arides. Il n'exclut pas la présence de zones d'écoulement préférentiel où un courant suffisamment important (toute proportion gardée avec les épisodes précédents) favorise l'établissement de fines structures entrecroisées dans les sables avec un granoclassement. La force du courant diminuant, on n'obtient plus que des stratifications ondulées, puis horizontales, avec une augmentation des particules les plus fines.

Des variations mineures du régime des cours d'eau, portant sur des périodes alternativement longues et brèves, ont favorisé une sédimentation à dominante soit sableuse, soit limoneuse. Ces cycles se sont répétés apparemment plusieurs fois au cours de la formation de la partie supérieure de la terrasse, et ont contribué à l'envoyage de la plaine.



**Photo 8 : Couche limono-sableuse de la partie médiane de Fy au niveau de Mehrgarh.** Elle montre un envahissement des pores racinaires par le carbonate de calcium. Les principales concrétions carbonatées sont indiquées par des flèches. Echelle : 5 cm

### 3.3. Existence d'une terrasse ancienne Fx

Dans la zone archéologique MR.03, plusieurs problèmes se sont posés lors des fouilles. En effet, celles-ci ont révélé l'existence de plusieurs niveaux chalcolithiques, néolithiques et antérieurs au Néolithique pratiquement juxtaposés ou partiellement superposés. Cette zone étant recoupée actuellement par la Bolan, qui en sape peu à peu les assises à chaque crue, il existe de grandes coupes naturelles que l'on peut suivre sur plusieurs centaines de mètres. Malheureusement, elles sont toujours recouvertes de coulées limoneuses qui altèrent leur lisibilité.

Des travaux de ravivage de certaines portions, effectués entre 1980 et 1984, ont mis en évidence l'existence d'un "ravinement" séparant les couches néolithiques des couches antérieures, dont les études d'archéozoologie, de paléobotanique et de préhistoire ont démontré qu'elles contenaient, dans la partie supérieure de la séquence un Néolithique précéramique. Ces observations stratigraphiques ont permis

une meilleure compréhension des problèmes archéologiques et de l'organisation spatiale du site, mais cette série sédimentaire "précéramique" n'a pas fait l'objet d'une interprétation globale.

L'examen de cette série montre qu'elle est constituée de couches sédimentaires alluviales de texture sableuse à sablo-limoneuse, affectées par des phénomènes d'oxydo-réduction et de carbonatation dépendant de conditions hydromorphes postérieures au dépôt.

La base de cette formation est souvent masquée par des éboulements ; néanmoins, nous avons pu y mettre en évidence au moins une lentille de galets longue de plusieurs mètres, décapée partiellement par la Bolan (fig.4). Elle rappelle sans contexte les phases intermédiaires de la figure 8, à la limite entre la nappe de galets et la série sédimentaire fine.

La partie supérieure comporte un établissement humain en place du type tepe, dont certaines phases d'occupation anciennes paraissent s'intercaler avec des couches sédimentaires. Etant donné l'état de conservation relativement bon de certaines coupes, il serait important de les reprendre en s'attachant aux aspects sédimentologiques et paléopédologiques afin d'obtenir des compléments d'information.

L'ensemble de cette formation est recoupé de façon oblique (fig.1), et les couches inférieures de Fy viennent mourir sur cette zone inclinée en formant un biseau. Cette coupure sédimentologique nous paraît être un événement majeur dans l'histoire géologique récente de la région.

La série sédimentaire située sous le tepe précéramique offre toutes les caractéristiques d'une terrasse fluviale à part entière, avec une nappe de galets basale en grande partie cachée par les alluvions récentes de la Bolan et une séquence de texture plus fine dont la partie supérieure a fait l'objet d'une occupation humaine. Dans ce cas, le plan incliné n'apparaît plus comme un simple ravinement mineur à l'intérieur d'une séquence (auquel cas ses dimensions seraient plus restreintes), mais comme une phase d'érosion majeure qui a tranché la terrasse antérieure Fx, précédant par là-même l'établissement de Fy.

Bien que plusieurs éléments militent en faveur de cette hypothèse :

- importance du plan oblique (plusieurs dizaines de mètres de longueur) ;
- absence de son symétrique correspondant à l'autre bord du V d'entaille du ravineau, et présence au contraire d'un plan symétrique qui représente l'autre pente d'une butte () ;
- troncature apparente des couches sédimentaires sous le tepe précéramique ;
- identité des principaux événements sédimentologiques de part et d'autre du plan, et non pas complémentarité;

et comme de nombreuses parties de coupes ne sont plus directement lisibles et n'ont pas été relevées en détail dans cette optique, il conviendrait de vérifier précisément :

- les rapports entre le plan incliné et les couches de la formation précéramique (IIA) ; les conditions de mise en place de II A ;
- les rapports entre IIA et la base de la séquence de FY, notamment dans la zone des biseaux ;
- et de lever des logs stratigraphiques dans les deux formations aux endroits qui paraissent les plus appropriés, en tenant compte des réalités du terrain.

Ce n'est qu'à l'issue de ce travail que l'on pourra concevoir un modèle retraçant dans le détail la formation des différentes zones d'occupation de MR.03 en fonction des événements géologiques.

### 3.4. Chronologie et signification des terrasses de la Bolan

L'existence d'un système de terrasses emboîtées, présentes sur toute une région, avec une répétition quasi cyclique des phénomènes sédimentologiques dans un laps de temps relativement court, ne peut être mise en relation qu'avec des événements climatiques, bien que nous soyons dans une zone orogénique tectoniquement active. En effet, en parcourant le cours de la Bolan, nous n'avons observé aucun phénomène néotectonique.

Chronologiquement, toutes les terrasses mises en évidence recèlent des éléments archéologiques attribuables à des civilisations néolithiques ou postérieures à celles-ci, et se placent dans la période holocène, qui correspond approximativement aux dix derniers millénaires. En l'état actuel de nos connaissances, il est très difficile de préciser l'âge de la terrasse Fz. On sait seulement qu'elle est postérieure à l'entaille de Fy, et donc qu'elle date probablement de la période historique, ou de la fin des temps protohistoriques.

Les problèmes ne sont pas du même ordre pour la terrasse Fy. Bien que sa base ne soit pas visible, elle semble postérieure aux éléments contenus dans Ib, qui sont datés archéologiquement du début du Néolithique à céramique. A son sommet, elle contient une occupation chalcolithique, et la fin de sa formation est contemporaine soit à la fin du Chalcolithique, soit du début de l'âge du Bronze.

Plusieurs datations des niveaux archéologiques par le carbone 14 ont été effectuées par différents laboratoires ; malheureusement, il ressort de l'ensemble une divergence de point de vue entre les datations absolues obtenues et les âges proposés à partir des considérations archéologiques. Pour l'instant, en l'absence d'autres informations, nous retiendrons l'existence d'une terrasse contemporaine du Néolithique, ce qui concorde avec ce que l'on connaît dans d'autres régions du monde, notamment en Afrique du Nord.

L'existence d'une terrasse plus ancienne Fx, dont le sommet est contemporain du Néolithique précéramique, pose les mêmes problèmes de confrontation avec les âges fournis par le radiocarbone. Cependant, là encore, il faut noter que des formations datées d'environ 8000 BP sont connues ailleurs dans le monde, et en particulier en plusieurs endroits du sous-continent indien, ce qui constitue un élément de plus en faveur de l'existence de cette terrasse.

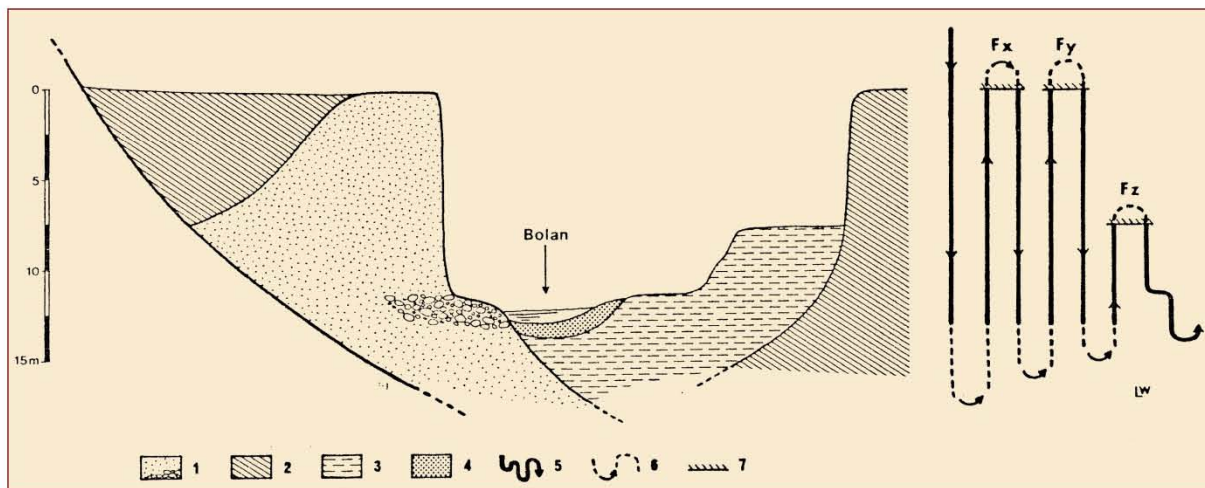
Comme nous l'avons vu précédemment, la formation d'une terrasse suit toujours une phase d'incision qui nécessite une forte compétence des cours d'eau, au moins durant les périodes de crue. Ceci implique des modifications climatiques qui vont dans le sens d'une aridification et caractérisent une phase générale de rhéxistasie. A la fin de celle-ci, le lit majeur de la rivière se trouve encombré de galets.

Les conditions climatiques s'améliorant, avec en particulier une augmentation de l'humidité, les crues deviennent moins brutales et le régime plus régulier. Dans ce cas, la capacité de transport d'un cours d'eau baisse rapidement, et il charrie principalement des alluvions fines. Elles sédimentent dès que la vitesse de l'eau diminue, comme lors de son étalement dans une plaine au-delà d'un défilé, où la faible largeur du lit entretient un fort courant. Cette "humidité" plus grande favorise le développement de la végétation et la formation de sols, ce qui ralentit d'autant l'érosion, et assure les conditions générales d'une période de biostasie, au cours de laquelle s'élabore la séquence fine des terrasses alluviales.

Au cours de l'Holocène, en comptant Fx, quatre périodes rhéxistasiques alternent avec trois phases de biostasie. Cette succession érosion-sédimentation est résumée dans la figure 10, qui tient compte des niveaux atteints par la Bolan et de l'érosion des interfluves. Le lit de la Bolan est présentement couvert de galets, mais il est quasiment impossible de dire si la rivière creuse ou remblaie ; par contre, nous pouvons affirmer que nous sommes dans une période rhéxistasique.

L'évaluation de la partie de sédiment enlevée par l'érosion sur la terrasse Fy résulte de la découverte à fleur de terre de matériel archéologique provenant de cénotaphes, et qui était initialement enfoui à environ 1,5 m de profondeur. On entrevoit, dès lors, l'importance que revêt en soi l'existence ou non d'une terrasse alluviale ancienne dans l'Holocène pour l'interprétation paléoclimatique de cette période au Balochistan, et l'intérêt de la dater précisément.

Au cas où les datations absolues ne concorderaient pas avec un faisceau de données provenant des différentes disciplines impliquées dans l'étude du site Mehrgarh, l'étude détaillée de cette formation apporterait des éléments d'information non négligeables.



**Fig. 10 : Coupe schématique des terrasses emboîtées de la Bolan et variations altimétriques de la rivière au cours de l'Holocène.**

**1** : terrasse ancienne Fx. **2** : terrasse Fy. **3** : terrasse récente Fz. **4** : nappe alluviale de fond de vallée. **5** : variations altimétriques du lit de la Bolan. **6** : variations altimétriques supposées. **7** : niveau atteint actuellement par l'érosion.

#### 4. LES FORMATIONS DE PIÉMONTS

Nous avons recherché également d'autres terrasses plus anciennes sur les bords de la plaine alluviale de la Bolan, en aval de Dhadar. Ces travaux, s'ils se sont révélés intéressants pour comprendre le système de mise en place de la plaine, n'ont pas amené la découverte de formations escomptées. Deux hypothèses peuvent être émises : soit ces formations existent et ont été entièrement recouvertes durant les périodes d'ennoyage qui ont prévalu à l'Holocène; soit elles ont été démantelées par une des importantes phases d'érosion qui ont précédé la mise en place de la première terrasse holocène.

Les parcours que nous avons faits dans les zones de piémont ont permis la découverte d'un système de glacis étagés, mieux conservé dans la zone des Monts Brahui que dans celle des Bann. Cette région montre une vaste surface peu inclinée se raccordant à la terrasse Fy, qui représente actuellement le plus haut niveau d'ennoyage de la plaine. Elle est essentiellement constituée par les argiles litées sous-jacentes (fig.1), et forme un glacis d'ablation holocène (photo 9). Par endroits, des galets épars témoignent du démantèlement d'un glacis antérieur dont les éléments proviennent principalement du poudingue de Dada.

Ce glacis plus ancien se retrouve sous forme de lambeaux appuyés aux premiers crêts qui jalonnent la bordure de l'anticlinal. Il est constitué par une assise d'argile litée en place, recouverte d'une couche de galets hétérométriques mélangés à des graviers et des particules plus fines sablo-limoneuses. Son épaisseur varie de 50 cm à plusieurs mètres et sa partie supérieure est très légèrement encroûtée par du carbonate de calcium qui la consolide partiellement. L'ensemble de ces formations est largement raviné.



**Photo 9 : Glacis d'ablation formé aux dépens des argiles litées sur le piémont Ouest des Bannh**

#### **4.1. Le piémont Est des Monts Brahui.**

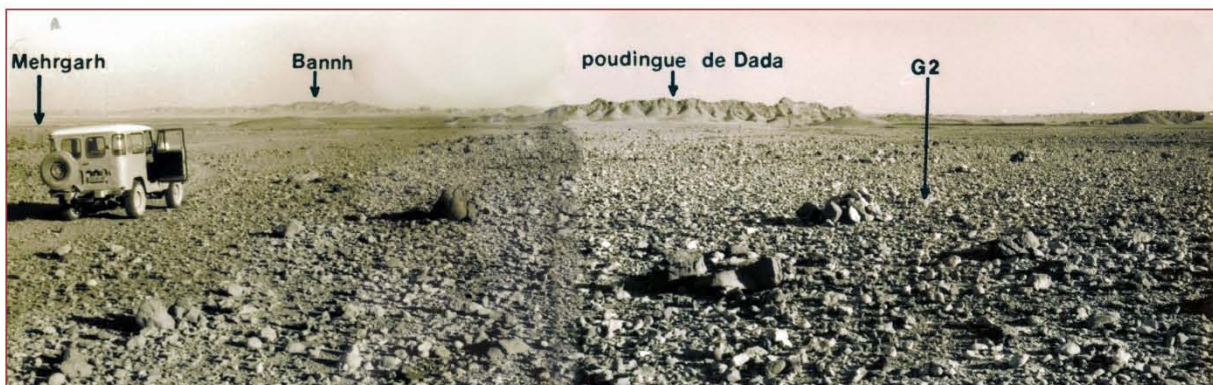
La surface occupée par les glacis de piémont y est beaucoup plus développée, puisqu'ils s'étendent des bords de la plaine alluviale jusqu'aux premiers crêts de grès rouge bordant la rivière de Garmab, soit une largeur de 8 à 10 km, incluant les crêts conglomératiques de la formation de Dada (photo 10), qui leur a fourni la quasi-totalité de leur matériel grossier (fig.1). Le glacis le plus bas (G1), à pente faible, domine la plaine de quelques mètres à son point le plus haut. Sa surface est occupée par un reg dont les éléments caillouteux sont arrondis et assez peu marqués par les caractères désertiques. Sa partie basse vient mourir sur le glacis d'ennoyage que constitue la plaine de la Bolan, tout en recouvrant les bords d'un épandage caillouteux hétérométrique emballé dans un sédiment sablo-limoneux. Ce reg, témoin d'une intense déflation, est parcouru par un réseau fluvial anastomosé qui commence à le disséquer. Il constitue la partie supérieure d'un glacis d'épandage d'âge probablement holocène qui continue à fonctionner à l'heure actuelle.

Cette formation est située en contrebas d'un glacis d'accumulation (G2) qui le domine de 6 à 8 m (photo 11). Le passage de l'une à l'autre se fait par une brusque rupture de pente. Le point le plus haut de ce glacis, d'aspect bombé, correspond au contact grès-poudingue très érodé du flanc Est de l'anticlinal de Garmab. Il est profondément entaillé par d'importants cours d'eau du type oued sur les berges desquels on peut observer des coupes hautes d'une dizaine de mètres (photo.12). Les sédiments

grossiers (blocs roulés de 40 à 70 cm, associés à des galets décimétriques et à des graviers) sont disposés "en vrac", et les interstices sont comblés par des sables grossiers faiblement limoneux. De la base vers le sommet, on constate une certaine diminution de la taille des gros éléments. La partie supérieure est faiblement consolidée par un sédiment fin carbonaté témoignant d'une mobilisation de carbonates dans ce milieu totalement désertique, qui contraste énormément avec la plaine toute proche de la Bolan, occupée au moins par une steppe arborée très clairsemée à *Prosopis Spicigera*.

La partie superficielle de la formation est un reg où le climat a fortement laissé son empreinte (photo 13). Les cailloux éclatés par le gel, fissurés ou vermiculés sont fréquents. Suivant la nature des roches, le vernis noir désertique ("*black varnish*" des auteurs anglo-saxons), de nature ferromanganique, est plus ou moins accentué, marquant surtout les roches de nature siliceuse comme les calcédoines grossières formées dans les calcaires à Nummulites. L'âge de cette surface est difficile à préciser ; cependant, nous y avons trouvé une industrie préhistorique qui sera analysée plus loin, et que l'on peut rapporter au paléolithique moyen. Les artefacts étant extrêmement disséminés à la surface du reg, il s'agit probablement de sites de plein air démantelés par l'érosion, dont les éléments ont été éparpillés par le ruissellement. Cette formation peut donc être soit contemporaine du paléolithique moyen, soit postérieure. si l'on utilise les références de la chronologie glaciaire européenne, elle est à rattacher au würm, mais en l'état actuel, nous ne pouvons préciser s'il s'agit du Würm ancien ou récent.

Cette découverte d'industrie paléolithique laisse présager la possibilité de trouver d'autres sites, et donc d'attribuer un âge à des formations quaternaires anciennes qui n'avaient jamais été signalées jusqu'à présent au Balochistan. D'autres glacis existent au Nord de Dadhar, ainsi que dans la Bolan pass, au Sud de Mach et de part et d'autre de la cluse de Bibi-Nani dans le cours supérieur de la Bolan ; une étude de ces formations, aperçues lors de trajets routiers, paraît être prometteuse.



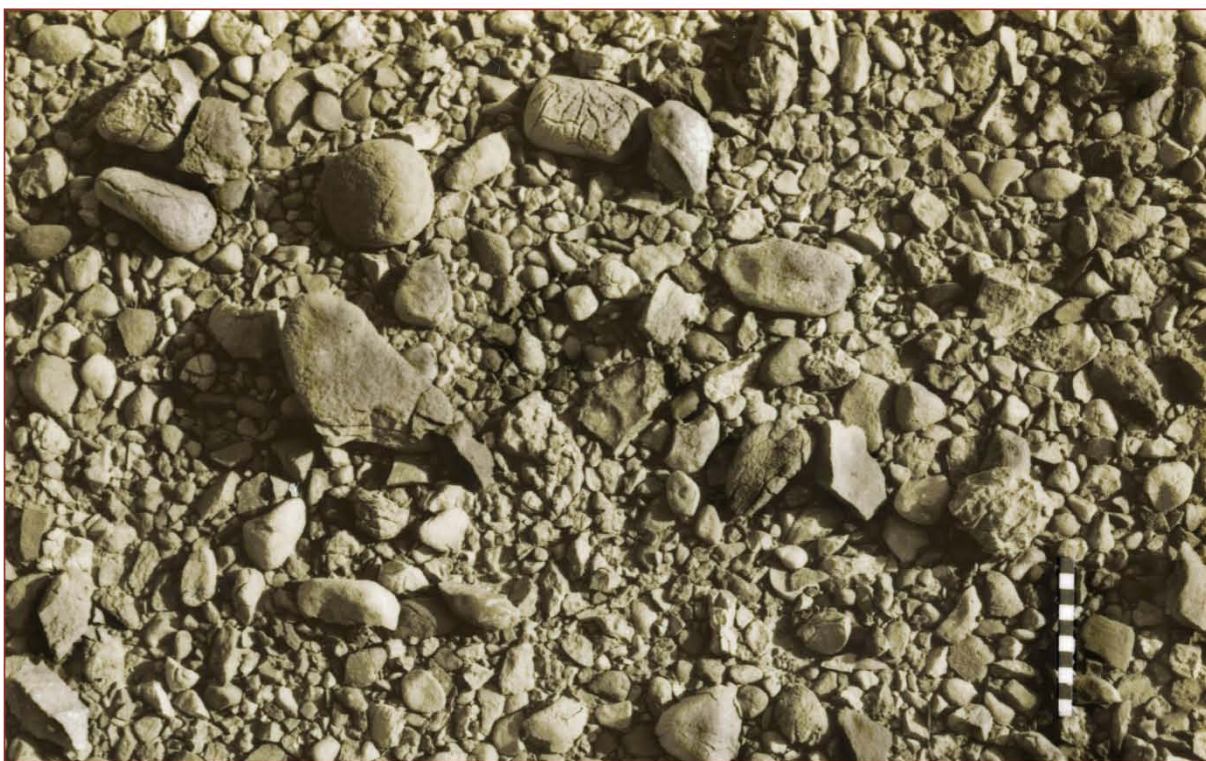
**Photo 10 : Vue panoramique du glacis d'accumulation G2, prise vers l'Est.**



**Photo 11 : Emboîtement du glacis G1 dans le glacis G2 sur le piémont Est des Monts Brahui**



**Photo 12 : Coupe du glacis d'accumulation G2 entaillé par un Jhal sur 9m de hauteur.**  
(À l'arrière, les couches redressées du poudingue de Dada)



**Photo 13 : Aspect du reg sur le glacier G2.**  
(Nombreux cailloux fissurés et gélivés. L'échelle mesure 10 cm)

## 5. L'INDUSTRIE PALÉOLITHIQUE DU GLACIS G2

Les artefacts sont redécouverts de façon homogène par la patine noire désertique. Ils ont tous été fabriqués à partir d'une seule matière première une calcédoine blanchâtre, grossière, assez hétérogène, provenant des calcaires à foraminifères des "*Spitangi limestones*" (photo 14).

Nous n'avons pu mettre en évidence aucune zone de concentration de l'industrie ; la répartition des objets à la surface du reg semble totalement aléatoire et dépendante de facteurs naturels.

Parmi les nombreuses pièces observées, un examen sévère a abouti à la sélection de 60 d'entre elles, qui portent des traces indéniables de taille. A partir de cette série très limitée, nous avons calculé quelques indices et pourcentages qui ne sont fournis qu'à titre indicatif et ne peuvent en aucun cas donner une vision définitive de cette industrie.



**Photo 14 : Nodules de calcédoine identiques à la matière première utilisée par les hommes du Paléolithique. (Galet de calcaire à foraminifères, 22 cm de longueur, photographié sur le glacis G2)**

### 5.1. Étude technologique.

D'un point de vue technique, mis à part sept nucléus, les autres pièces sont des états et des lames dont certains gardent la trace d'un débitage Levallois (fig.11), sans toutefois que cette industrie soit de faciès Levallois. L'indice Levallois, calculé à partir de 53 artefacts, dont certains sont brisés, donne 18,9, ce qui est déjà relativement important.

Parmi les autres éclats, ce sont ceux qui gardent des restes de cortex qui sont les plus fréquents (41,5), puis viennent, par ordre décroissant, les éclats ordinaires (24,5) et les éclats d'entame (7,5).

L'importance des éclats corticaux provient sans doute de la petite taille des rognons calcédonieux ; comme nous le verrons plus loin, les observations faites à partir des nucléus vont dans le même sens. Les lames sont peu nombreuses, l'indice laminaire (ILam : 7,5) est faible. Elles sont de facture assez grossière et souvent relativement larges, et rentreraient très bien dans la catégorie plus restrictive des éclats laminaires.

L'examen des talons indique une nette prédominance des talons lisses (72,2). Les talons corticaux (16,7) sont bien représentés par rapport aux talons dièdres (2,8) et aux talons facettés convexes (8,3). Cette constatation reste valable pour les éclats Levallois. Cette série n'appartient donc pas à la catégorie des industries à talon facetté.

Les nucléus sont de petite taille et peu variés. La grande majorité d'entre eux (6 sur 7) ne possèdent qu'un plan de frappe obtenu par l'enlèvement d'un éclat d'entame ; sur un exemplaire, ce plan est cortical. Très souvent, on ne retrouve sur ces pièces que les négatifs de l'enlèvement de quelques éclats principalement disposés sur une face. Enfin, un nucléus présente un débitage à tendance discoïdale.

## 5.2. Étude typologique.

Les outils sont peu nombreux (fig.11) et de dimension tout à fait comparable à celle des éclats. Les éclats Levallois ont servi de support dans trois cas, ce qui est relativement important compte tenu de leur nombre par rapport à celui des éclats dans le débitage.

La liste suivante dresse l'inventaire des différents outils ainsi que de leur support :

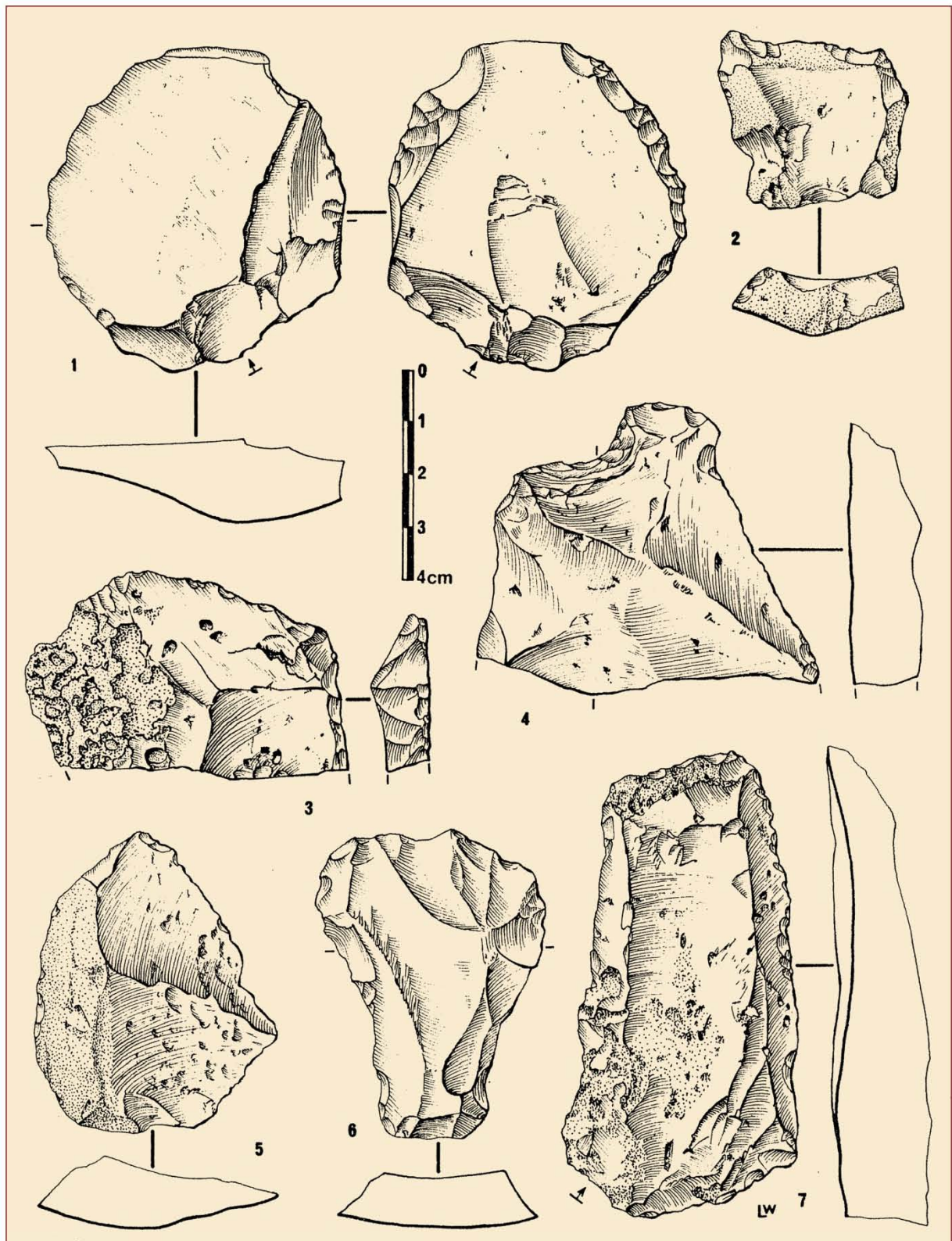
- racloir double biconvexe sur face plane / éclat Levallois
- fragment de racloir à retouche abrupte / éclat Levallois
- racloir latéral droit sur face plane / éclat cortical
- encoche retouchée en bout / éclat Levallois
- coche clactonienne / éclat cortical
- denticulé / éclat - denticulé épais à encoches clactoniennes / éclat
- denticulé à encoches clactoniennes / éclat
- couteau à dos naturel/lame corticale.

Les retouches utilisées pour la réalisation des racloirs sont plano-convexes, semi-abruptes à abruptes. De nombreux autres éclats (13, soit 24,5) portent des retouches abruptes à semi-abruptes, alternes ou alternantes, discontinues et épaisses, qui correspondent aux vicissitudes (transport, concassage ...) qu'ont subies ces pièces sous l'action des conditions naturelles.

L'examen de cet inventaire, ainsi que la taille des pièces, leur facture et leur mode de débitage, nous conduisent à classer cette industrie dans le Paléolithique moyen, car elle présente des affinités moustéroïdes évidentes ; mais étant donné que l'on ne possède pas d'informations sur ces cultures et encore moins sur leur évolution, il est bien difficile de leur attribuer une position chronologique précise.

Les seules industries qui comportent des éléments Levallois au Pakistan sont celles de la quatrième terrasse de la Soan au penjab, à quelque 500 km de là. On voit donc l'intérêt que prend la découverte de cette série au Pakistan, et plus encore au Balochistan, où aucune industrie paléolithique n'a jamais été trouvée malgré les recherches.

La connaissance de son mode de gisement devrait permettre de découvrir d'autres pièces et peut-être d'inventer des sites plus favorables à une étude typologique nécessaire pour mieux appréhender cette civilisation, qui peut se situer entre 20.000 et 100.000 ans.

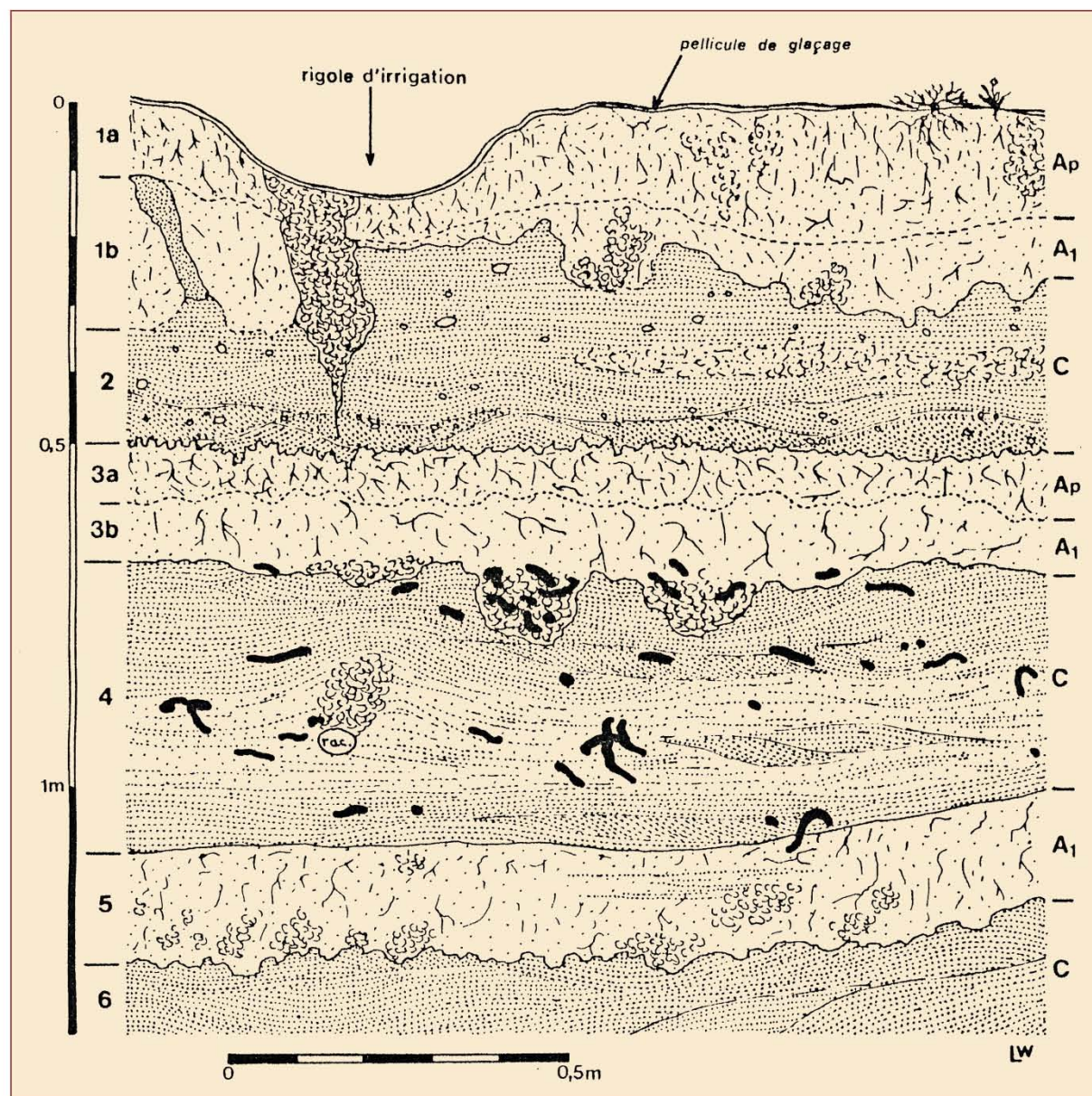


**Fig. 11 : Industrie paléolithique du glaciaire G2.**

**1** : Racloir double biconvexe sur face plane. **2** : Éclat cortical à retouches abruptes alternantes épaisses. **3** : Fragment de racloir à retouches abruptes directes. **4** : Encoche retouchée en bout d'éclat Levallois. **5** : Éclat cortical. **6** : Éclat Levallois à retouches abruptes alternantes discontinues épaisses. **7** : Éclat laminaire à retouches alternantes abruptes discontinues.

## 6. ÉTUDE PÉDOLOGIQUE PRÉLIMINAIRE.

Afin de préparer les études de paléopédologie et d'aborder les problèmes d'irrigation, deux sondages ont été réalisés dans la propriété du M. Sardar Raisani pour y lever des profils pédologiques.



**Fig. 12 : Coupe stratigraphique du sommet de Fy dans un champ irrigué laissé en jachère depuis 5 ans.**

**1a :** Limon sablonneux gris pâle (10YR 7/2), structure grumeleuse moyenne, nombreuses bioturbations animales et végétales, limite inférieure distincte.

**1b :** Identique à 1a, mais structure grumeleuse fine et moins de bioturbations, limite inférieure distincte.

**2 :** Sable fin limoneux beige (10YR 7/3) à stratifications ondulées et fragments de pellicule limoneuse remaniés, intercalé avec des niveaux plus limoneux bioturbés, limite inférieure nette et irrégulière.

**3a :** Idem 1a, limite inférieure nette.

**3b :** Idem 1b, limite inférieure nette.

**4a :** Idem 2, nombreuses traces de vers.

**4b :** Idem 4a, mais plus limoneux et stratifications peu marquées.

**5 :** Paléosol identique à 3a-b, mais plus bioturbé et où les deux horizons ne peuvent être différenciés.

**6 :** Idem 2.

Ils ont été implantés dans des terres actuellement cultivées en utilisant la méthode d'irrigation par inondation couplée avec un système de jachère qui laisse les champs incultes pendant cinq années après une mise en culture. Un premier profil a été réalisé dans un champ en jachère depuis cinq ans (fig.12), et un autre dans un canal d'irrigation fonctionnel depuis une trentaine d'années.

Le premier sondage nous a permis d'observer un sol de culture irriguée. Il s'agit d'un sol brut d'apport sur alluvions sablo-limoneuses de la terrasse Fy.

Il présente un horizon Ap de 12 à 18 cm de profondeur, à structure grumeleuse moyenne à fine, gris pâle (10YR 7/2) (1), où l'activité biologique est très développée (nombreuses traces de lombricidés et de radicelles). La mise en jachère se traduit par un tassement près de la surface et par la formation d'une pellicule de glaçage limoneuse de quelques millimètres. Séparé par une limite distincte, l'horizon A1, plus compact, de couleur identique, présente une structure plus fine et des bioturbations moins fréquentes. Il est épais d'une dizaine de centimètres, et sa limite inférieure, très irrégulière et distincte, le sépare d'une couche alluviale de sable fin limoneux à stratifications horizontales, puis ondulées, contenant des fragments remaniés de pellicule limoneuse.

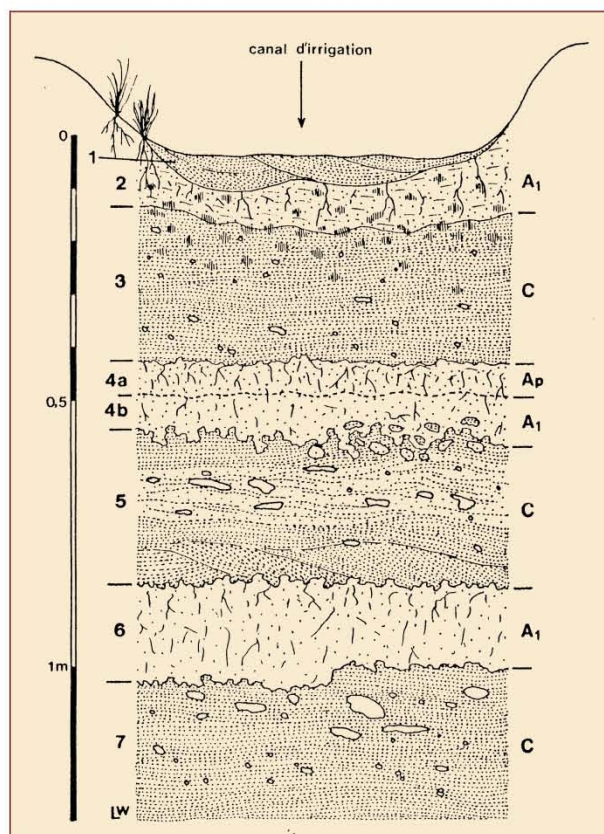
Au niveau d'une rigole d'irrigation, on retrouve simplement l'horizon Ap, mais plus compact, l'absence de A1 traduisant la faible colonisation végétale ; par contre, les bioturbations animales semblent plus développées.

La couche alluviale a légèrement tronqué un paléosol récent enfoui à 50 cm de profondeur, et présentant exactement les mêmes caractéristiques que le sol décrit précédemment (photo 15). Le même cycle se répète au-dessous, avec un troisième paléosol plus bioturbé et moins bien conservé.



**Photo 15 : Paléosol de la couche 3 enfoui à 50 cm. Sondage du champ irrigué de Mehrgarh.  
Echelle : 20 cm.**

Le deuxième sondage, creusé à une centaine de mètres du premier (fig.13), a livré, outre les deux paléosols précédents arrivant en fin d'épisode alluvial, une séquence hydromorphe au sommet, ainsi que les structures sédimentaires classiques d'un chenal, qu'il soit d'irrigation, comme c'est le cas ici, ou non. Elles sont constituées par de fins lits sablonneux alternant avec des pellicules limoneuses millimétriques, le tout formant des structures entrecroisées décimétriques.



Dessous, un ancien sol irrigué est enrichi en argile ; sa structure grumeleuse fine a tendance à devenir massive, et il présente de nombreuses radicules, et des taches d'oxydo- réduction (10, soit plus grises que la teinte d'ensemble: 10YR 6,5/2, gris brun pâle, soit plus ocres : 2,5Y 7,5/4, jaune pâle). Au contact avec les sables fins limoneux sous-jacents, celles-ci sont plus nombreuses (15 à 20), puis elles disparaissent progressivement vers 20 cm de profondeur.

En l'espace d'une trentaine d'années de fonctionnement, un canal d'irrigation a laissé suffisamment de traces dans les sédiments pour qu'il soit possible d'en envisager la recherche dans des sédiments plus anciens. Ces canaux sont caractérisés par des phénomènes d'hydromorphie très localisés, liés à des structures sédimentaires particulières.

Du fait de l'encaissement du lit de la Bolan, cette région ne subit plus d'inondation comme durant son ennoyage; dès lors, il est probable que les paléosols mis en évidence soient relativement anciens. Malheureusement, nous n'y avons trouvé aucun élément de datation permettant de vérifier cette hypothèse.

La découverte de paléosols dont les caractéristiques ressemblent fort, à première vue, à celle des sols irrigués, et parfaitement conservés, est un résultat très intéressant et encourageant pour entreprendre la recherche de tels paléosols dans des zones se raccordant stratigraphiquement à des couches archéologiques ou contenant des vestiges archéologiques, afin que l'on puisse les situer précisément dans l'échelle chronologique, et contribuer à mieux connaître l'activité et l'environnement de ces hommes du passé.

(1) sur sédiment sec d'après la *Munsell Soil Color Charts*.

## COLLECTIONS

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# MEHRGARH

NEOLITHIC PERIOD - SEASONS 1997-2000



The north-western regions of the Indo-Pakistani subcontinent have been the cradle of one of the most famous civilizations of the Ancient world. But until the last quarter of the 20th century, the antecedents of the Indus civilisation with its major cities such as Mohenjo-daro or Harappa were poorly known. It was commonly thought that small farming communities coming from the Iranian Plateau began to settle down in Balochistan in the first half of the 4th millennium BC. Other groups with cultural links with southern Central Asia would also have reached the border of the Indus valley around 4000BC. The discovery in 1977 of an aceramic Neolithic settlement in the northern area of the site of Mehrgarh has opened a new chapter in the archaeological studies in this part of the world. It became then obvious that the archaeological sequence of the Greater Indus regions, since the 8th millennium BC till the emergence of the Indus civilization, c. 2500 BC, was far more impressive than it was thought before.

Alongside the excavations conducted in the Chalcolithic/Bronze Age occupation deposits of Mehrgarh, from 1976 until 1985, the Neolithic settlements provided a first set of information about periods so far unknown in these regions. Some of the information from the 1977-1985 excavations were regularly published in the field reports (C. Jarrige *et al.* 1995). In 1996, it was decided to resume work in the Neolithic area of Mehrgarh within a program of four seasons of fieldwork. Since all the efforts of the archaeological team were only concentrated on the aceramic Neolithic settlement, these four seasons of fieldwork allowed a much larger exposure of the successive occupation levels and graveyards from the natural soil up to the surface. This work gave the opportunity to fix in a much precise way than before the whole archaeological sequence of the aceramic Neolithic settlement.

The first ever published overview of the Neolithic period at the western border of the Indus valley has been added to the four reports.

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