



DAIMABAD

1976-79



Dr S A SALLI

GOVERNMENT OF INDIA

ARCHEOLOGICAL SURVEY OF INDIA

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BY
DR. S.A. SALI

WITH CONTRIBUTIONS BY
DR. S.N. RAJAGURU, DR. VISHNU MITTRE, ARUNA SHARMA,
CHANCHALA, DR. R. V. JOSHI, DR. B.C. DEOTARE, DR. ANUPAMA
KSHIRSAGAR, DR. S.R. WALIMBE AND DR. V. D. GOGTE



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PREFACE

A number of archaeological sites has been excavated by the officers of the Archaeological Survey of India in the past three decades and more. Unfortunately, the reports of many of these excavations have remained unpublished. Thanks to our Prime Minister, Archaeological Survey can no more feel the dearth of funds for its various activities. With the increased budget allocation we have launched a programme of publishing all the pending reports. In this endeavour many of the officers/excavators have been extending their co-operation. Dr. S.A.Sali is one such officer, who undertook the task of completing the writing of the report on the excavations at Daimabad, for which he was responsible between 1976 and 1979. Dr. Sali deserves our special gratitude, because even after retirement in May 1984, he worked incessantly in a small room at Bibi-ka-Maghara in Aurangabad and submitted his report in two volumes, by October 1984. Not only that, he came to Delhi at two stages and has seen his manuscript through the Press, the result of which is the present work.

Daimabad is one of the most important sites for the study of proto-historic cultures of India. Discovered in 1958, it was subjected to limited excavations in 1959, which yielded three clear periods of occupation viz., Neolithic, Malwa and Jorwe periods of proto-historic Deccan (*Indian Archaeology 1959-60 - A Review*, pp.15-18). However, with the discovery of a cache of solid bronze figurines, albeit in an unstratified context, the site at once assumed significance, in the context of extension of the Harappan civilisation further south. Hence, Dr. Sali was entrusted with the task of excavating the site horizontally.

The excavations at Daimabad between 1976 and 1979, have made significant contribution to our knowledge. According to the excavator, five periods of Chalcolithic culture have been distinguished, viz. the Savalda, the late Harappan, Daimabad, the Malwa and the Jorwe, based primarily on the pottery tradition of the proto-historic folk. The excavator pushes the date of occupation of the site to the beginning of the second millennium B.C. (with correction to C.14 dates as per MASCA calibrations). Be that as it may, the dig has brought out an extremely interesting array of evidence, which helps in reconstructing the life of proto-historic folk in the Deccan till about 1000 B.C., when the site appears to have been abandoned. We do hope that this report will help scholars and researchers in interpreting the early history of our people.

In regard to the present publication, I must record my appreciation of the staff of Archaeological Survey of India's publications wing. Shri K.N.Dikshit, Director, assisted by Shri K.P.Padhy, has been doing his best to clear the pending reports of excavations. Dr. Sali himself has spared no pains, and has come to Delhi for lengthy period of stay, even after retirement, and seen the work through the press, for sheer love of the subject. To all of them, I extend sincere thanks. M/s. Vap Enterprises, New Delhi have spared no pains to produce this attractive volume. I offer them my thanks.



(M.S. Nagaraja Rao)

Director General
Archaeological Survey of India

New Delhi
24.7.1986

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By Dr. S.R. Walimbe, Deccan College, Pune

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By Dr. Vidhwas D. Gogte and Dr. Bhaskar C. Desai, Deccan
College, Pune.

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ANNEXURE I :

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DEDICATED TO MY GURU
SHRI M.N. DESHPANDE
FORMER DIRECTOR GENERAL,
ARCHAEOLOGICAL SURVEY OF INDIA
WHO SHAPED MY CAREER



1. INTRODUCTORY

A. The Problem And The Objectives Of The Work

A perusal of archaeological publication would bring out a fact that the fifties of this century heralded a new era in the field of archaeological research in India. It was in this decade that most important discoveries throwing open new vistas for research in different spheres of the discipline were made. Among these, in the present context, mention should be made of the discovery of the first Chalcolithic site of Maharashtra made by this author in the year 1950 at Jorwe, a village on the left bank of the river Pravara, a tributary of the Godavari, about 8 km east of Sangamner, the headquarters of a taluka of the same name, in Ahmednagar district¹. The Chalcolithic nature of the remains found on this site was confirmed in the following year in the excavation of the ancient mound at Nasik on the Godavari, when painted pottery and microliths similar to those collected at Jorwe were found in the lowest black soil layer below the levels of the Mauryan period.² This prompted excavation of the site at Jorwe itself immediately after the excavation at Nasik was over.³ The discovery of the Chalcolithic Culture, which subsequently came to be known as the Jorwe Culture after the type-site Jorwe, pushed back the history of an advanced cultural life in the region of Maharashtra by one millennium. Because, the cultural history of the region was considered to begin with the Mauryan period prior to which the region was believed to be thickly forested and hence unsuitable for human habitation. Besides, as pointed out by Sankalia, "the immediate importance of the discovery was that the archaeologists got definite clues with which to search for remains of protohistoric cultures in the Deccan".⁴ It was, therefore, quite natural that the centre of archaeological research in the region should have shifted from the Early Historical period to the Chalcolithic. The result was that within a decade excavations were conducted in Maharashtra at Bahal⁵ and Tekwada⁶ on the river Girna, a tributary of the Tapi, district Jalgaon, first in 1951-52 and then in 1956-57, Prakash⁷ in 1954-55 and Bahuripa⁸ and Savalada⁹ in 1959-60 all on the river Tapi in district Dhule (former Dhulia or West Khandesh), Nevasa¹⁰ and Daimabad¹¹ both on the river Pravara, in district Ahmednagar during the years 1954 to 1956 and 1958-59

1. H.D. Sankalia and S.B. Deo, *Report on the Excavation at Nasik and Jorwe, 1950-51*, Deccan College Monograph Series, No. 13, Poona, 1975, p. 51.
2. *Op. cit.*
3. *Op. cit.*
4. *Op. cit.*, p. 154.
5. *Indian Archaeology 1956-57 - A Review*, pp. 17-18.
6. *Op. cit.*, pp. 18-19.
7. R.K. Tripathi, Prakash: 1955: "A Chalcolithic site in the Tapi Valley", *Ancient India*, Nos. 20 and 21, 1964 and 1965, New Delhi, 1967, pp. 5-167.
8. *Indian Archaeology 1959-60 - A Review*, pp. 34-37.
9. *Ibid.*
10. H.D. Sankalia, S.B. Deo, Z.D. Ansari and Sophie Ehrhardt, *From History to Prehistory at Nevasa (1954-56)*, Poona, 1960.
11. *Indian Archaeology 1958-59 - A Review*, pp. 15-18.

respectively.

The excavations at Bahal, Prakash and Nevasa confirmed a cultural gap between the Jorwe Culture and the Early Historic period, as noticed first at Nasik. The evidence from Tekwada, a burial site opposite of Bahal, and Nevasa brought to light different customs of burying the dead during the Chalcolithic period, at the former there being a separate burial site away from the habitation area on the opposite bank of the river whereas at the latter the dead were found buried within the habitation area itself. At Prakash, besides obtaining a painted ware named by the excavator as "Variant of the Malwa Ware", was also recorded the presence of elements of the Ahir or Banas Culture¹² of Rajasthan and the Lustrous Red Ware culture¹³ of Gujarat. A further landmark in the history of chalcolithic research in the region was the discovery at Daimabad, in a stratified context below the levels of the Jorwe culture, of the Malwa culture, so designated after the region of Malwa in Madhya Pradesh in which it was first identified, the best known site being Navdatoli¹⁴ in district Khargone (former East Nimar).

In the same decade explorations carried out by this author, under the village-to-village survey scheme, in the Central Tapi basin in district Dahanu, from the year 1957 onwards, brought to light a number of settlements of two other Chalcolithic cultures, viz., the Savalda and the Late Harappa. The discovery of the latter suggested penetration of the Harappans in the Deccan and thus made available this vast region for the study of the degenerate phase of Harappa culture, the extent of which was earlier traced upto Bhagatrao on the Kim estuary between the Narmada and the Tapi in southern Gujarat. Sites yielding the Savalda Ware, named after the site Savalda, on the left bank of the Tapi, almost opposite of Prakash, where its distinguishing features were first recognized and which characterised the Savalda culture, were subsequently traced as far south as the Upper Krishna Valley in Karnataka which fact made it clear that this was not a localized culture.

12. *Indian Archaeology 1934-55 - A Review*, pp. 2 and 14-15; also H.D. Sankalia, S.B. Deo and Z.D. Ansari, *Excavations at Ahir*, Poona, 1969.
13. S.R. Rao, "Excavations at Rangpur and other Explorations in Gujarat", *Ancient India*, Nos. 18 and 19, (1962 and 1963), pp. 4-207.
14. H.D. Sankalia, B. Subbarao and S.B. Deo, *Excavations at Maheshwar and Navdatoli 1952-53*, Poona-Baroda, 1958; also H.D. Sankalia, S.B. Deo and Z.D. Ansari, *Chalcolithic Navdatoli*, Poona, 1971.
15. S.A. Sali, "A New Ceramic of the Chalcolithic from Dahanu District, Maharashtra State", *Journal of the Asiatic Society of Bombay*, Vol. 38, 1968, pp. 207-210.
16. S.A. Sali, "The Harappa Culture as Revealed Through Surface Exploration in the Central Tapi Basin", *Journal of the Oriental Institute, University of Baroda*, Vol. 20, No. 2, 1970, pp. 93-101.
17. A. Sankar, "Chalcolithic Phase of the Upper Krishna Valley", (in eds.) Shrinivas Ravi and B.R. Gupta, *Studies in the Indian History and Culture*, Part. P.B., Dasa Felicitation Volume, Dhawan, 1971, pp. 13-30.

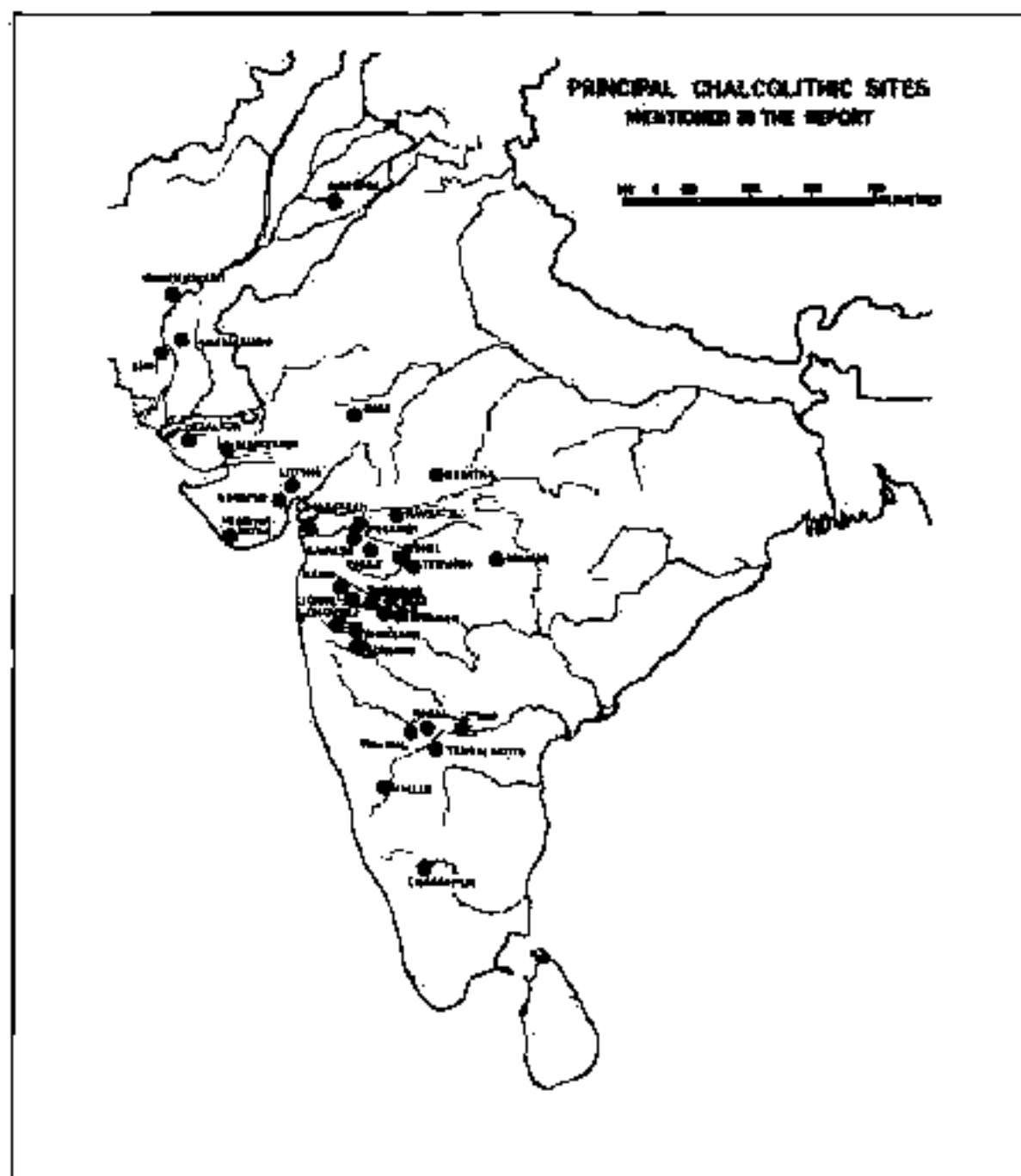


Fig. 1 India map showing principal Chalcolithic sites.

In the following decade the sites at Chandoli¹⁸ Songaon¹⁹ Inamgaon²⁰, Their²¹ and Saste-vadi²² in the Bhima basin in Pune district and at Paunar²³ in the Dham valley in Wardha district were subjected to excavation. While the first three sites yielded evidence of the Malwa and the Jorwe Cultures, the importance of Inamgaon has been that it has for the first time brought to light a late phase of the Jorwe culture which evidence helped bridge the cultural gap between the Chalcolithic period and the Iron Age to a considerable degree. The excavation at Paunar exposed remains of a distinct Chalcolithic culture with the painted pottery indicating "features associated, if at all, with degenerate Malwa Ware"²⁴ (see, however, pp. 248 and 257-258).

Thus, till the end of the sixties of this century in the region of Maharashtra the occurrence of painted pottery characteristic of as many as five Chalcolithic cultures, viz., the Jorwe, the Malwa, the Late Harappa, the Savalda and that termed as the variant or degenerate of Malwa as at Prakash and Paunar respectively, was recorded. But the major lacuna in this was that on none of the excavated sites stratigraphic position of the last three cultures in relation to that of the known Jorwe and Malwa Cultures was revealed. Surface observations in the Tapi basin indicated that the occupational deposit containing Savalda Ware underlay that yielding Late Harappan red ware.²⁵ Confirmatory evidence through excavation, however, was lacking. When viewed in the light of the above described situation it may be said that the excavations at Daimabad not only provided for the first time the evidence that was wanting but also produced much that is new and of interest.

B. Previous Work

In the course of village-to-village survey of archeological remains the ancient mound at Daimabad was discovered by B.P. Bopardikar in the year 1958²⁶ and was first excavated by M.N. Deshpande in the 1958-59 season.²⁷

In all four trenches, named as DMD-1, DMD-2, DMD-3, and DMD-4 were excavated (fig. 3). All these trenches were located in the south-western part of the mound which in the

18. S.B. Deo and Z.D. Ansari, *Chalcolithic Chandoli*, Poona, 1965.

19. S.B. Deo, *Songaon Excavation 1965*, Poona, 1968.

20. H.D. Sankalia, *Prehistory and Protohistory of India and Pakistan*, Poona, 1974.

21. *Indian Archaeology 1969-70 - A Review*, pp. 27-29.

22. *Indian Archaeology 1971-72 - A Review*, p. 35.

23. S.B. Deo and M.K. Dhavalikar, *Paunar Excavation*, Nagpur, 1967.

24. Deo and Dhavalikar, *op. cit.* (1968), p. 7.

25. Comments by S.A. Sali on H.D. Sankalia "The Chalcolithic Cultures of India", in (ed) S.B. Deo, *Archaeological Congress and Seminar Papers*, (Nagpur, 1970), p. 180. Also S.A. Sali in (eds.) D.P. Agrawal and A. Ghosh, *Radiocarbon and Indian Archaeology*, Tata Institute of Fundamental Research, (Bombay, 1973), pp. 499-500.

26. *Indian Archaeology 1958-59 - A Review*, p. 15.

27. *op. cit.*, pp. 15-18. The account of 1958-59 season's work has been prepared on the basis of that published in the above cited publication as also the draft of the unpublished report prepared by Shri M.N. Deshpande, I had also the privilege to participate in this excavation.

subsequent division of the site into four sectors (see p. 7) lay in Sector L. The area for the trench DMD-1 was selected on a higher ground about 40 meters away from the river bank. It was divided into squares of which squares B2 and C1 were excavated upto the natural soil. The square A1 was abandoned halfway as it was found to be very much disturbed. The other squares were also found considerably disturbed below the levels of the Malwa Culture.

Trench DMD-2, measuring 6.3 x 5 meters, was sunk about 90 meters north of DMD-1 with a view to find out whether the burials encountered near the periphery of the mound were also present in the middle of the habitation.

The trench DMD-3 was excavated near the south-western periphery of the mound in order to locate the traces of the *chunam* embankment observed on the periphery of the mound towards the river side and to find out the phase in which it was constructed.

With the same intention as that in the case of trench DMD-3 the trench DMD-4 was cut on the southern periphery of the mound, on the river side, some 100 meters south-east of DMD-1.

On the basis of the ceramic and other evidence derived out of the excavation, Deshpande divided the occupation at Daimabad into three phases, I, II and III.²⁸ The Phase I was characterized by the use of thick and coarse grey ware, similar to that of Brahmagiri I and consisting of the large globular urn with a flared rim, basin with a slightly out-turned rim, subspherical bowl and stemmed lid with a pointed or round tip, with a marked tendency to the treatment of the rim and tip of the lid with red ochre. The handmade pottery, mainly accounted for by the large trough, platter with a vertically flattened rim and huge storage jar, was mostly decorated with incised or applied decorations, including linear, cross-cross and finger-tip decorations. Painted pottery was scarce. A large fragment of a thick buff ware found on the surface of the black soil, not from the regular excavation, and ascribed to this phase was profusely painted with a jungle scene in two horizontal compartments.²⁹ The upper compartment had a muscular human figure with two deer approaching it as if enchanted and peacocks in between. The lower had three tigers springing away in the opposite direction. The bodies of the animals were hatched in broken lines.

Microliths, mostly of chalcedony, consisted essentially of parallel-sided and pen-knife blades. A few beads of terracotta and semi-precious stones completed the collection of small finds.

In Phase II, there was a predominance of pottery with paintings in black on a red surface. It was of medium fabric and was treated with a thin brown, deep red, light-orange or pink slip. The principal types were the subspherical bowl, sometimes with a tubular spout, shallow cup, short-necked *handi* and high necked jar. A painted channel-spout, probably of a cup and typical of the Narmada-Godavari chalcolithic culture was also found. The paintings included geometric patterns such as triangles, squares, lozenges, etc. hatched, filled or otherwise, and oblique, vertical or horizontal lines, non-geometric pattern such as hooks, loops, festoons, etc.,

28. *Indian Archaeology 1958-59 - A Review*, pp. 15-18 and fig. 7.

29. *op. cit.*, fig. 8.

and animals such as the goat, etc. drawn in conventional manner. Grey and red wares, sometimes handmade, continued side by side.

Microoliths were found in large numbers, while copper was represented by a fragmentary celt, a pin-head and a fragmentary knife. The terracotta figurines included the head of a dog and a humped bull. Beads of semi-precious stones, shell and faience were found.

The ceramic industry of Phase III was dominated by the painted Jorwe Ware. The types comprised the concave-sided carinated bowl, rarely with a tubular spout, spouted vessel with a funnel-shaped rim and high-necked globular jar with a beaded rim. The painted patterns were mostly linear and geometric, though animal and human motifs were also present. Grey and red wares, including hand-made specimens, persisted.

Microoliths were found in even larger numbers than in Phase II. Stone maceheads, pottery spindle-whorls, beads of semi-precious stones, a gold coil, possibly an ear-ornament, two terracotta human figures and a terracotta dog showed the cultural equipment of the Phase.

The houses were either circular or rectangular on plan, as shown by post-holes. The floors were of rammed clay mixed with husk and were plastered with lime.

An embankment of lime was constructed during this Phase along the western, southern and eastern periphery of the habitation. This was cut through in the trenches DMD-3 and DMD-4. In the former cutting it was observed that the embankment sloped eastwards — towards habitation. In the topmost deposit of the Malwa Culture a little cutting was made and the surface was rammed with hard clay. Over this surface layers of *chunam* and *chunam* mixed with clay were rammed to form the embankment. Along the southern periphery the embankment rested over a river deposit of hard kankary reddish yellow silt locally known as *man*. The extant portion of the embankment measured 10 m wide and a little over 2 m high.

Evidence for the disposal of the dead was available in all the phases. The only grave in Phase I was within the habitation area. It was represented by an extended adult skeleton, partly cut by later pit, with its skull towards the north. Phase II had another grave — a specially dug pit with a complete skeleton, oriented north-south and unaccompanied by any furniture. Of the two skeletons belonging to Phase III, one was completely despoiled, the second, also oriented north-south, rested on a rammed clay floor in the habitation area without any grave-goods. This skeleton did not lie in a pit; on the other hand, a series of post-holes all around suggested the existence of a canopy. It was, therefore, a case of lying in state before the burial.

Another funerary method was the urn-burial restricted to children. One such burial consisted of two grey ware urns with flared rims, containing skull, ribs and lower extremities of the body and placed flat mouth-to-mouth with a north-south orientation in a pit just sufficient to accommodate them. Sometimes painted carinated bowl and spouted vessel, probably containing food and water, were placed beside the urns. An infant burial in a single urn, lying with its mouth towards the south, was met with. In another burial, probably of an older child, whose remains could not be accommodated in two urns, three urns were used, the third placed in continuation of the other two, which were disposed mouth-to-mouth. Skeletal rema-

ins were distributed in all the three, which also contained bone beads. A carinated bowl, a spouted vessel and small *lota*-shaped vases formed the subsidiary pots.

After a lapse of one-and-a-half decades, in the year 1974, Daimabad figured again prominently in the world of archaeology, when a clandestine digger found on the site a cache of four unique solid bronzes including a chariot yoked to a pair of bull and driven by man, an elephant, a buffalo and a rhino (pls. CXXIV – CXXVII). Being of an exquisite workmanship displaying highly advanced technique it was felt necessary to resume excavation of the site with a view to understand cultural horizon to which they belonged. With this view in mind as well as to re-examine the cultural sequence indicated by the 1958-59 season's excavation, to ascertain the purpose of construction of circular structures suspected to be furnaces, noticed at a number of places near the habitation site and to determine whether there were cultural contacts with Harappan or Late Harappan settlements, S.R. Rao resumed excavations at the site in the season of 1974-75. During this season the site was divided into four sectors, I, II, III, and IV, and was gridded into squares of 6m x 6m, the intersection of the dividing lines of the sectors falling at the peg M28.

Rao's work spread over three Sectors, I, II, III. In the beginning in Sector I a portion between DZ52–CZ52 and DZ61 – CZ61 located between DMD–1 and DMD–2 was selected for area excavation in order to study in detail the Jorwe Culture. In Sector III two trenches, A1 and A2, lying about 50 meters north of the find-spot of the bronzes, were taken up for excavation with a view to properly understand the sequence of cultures in this part of the site in which the bronzes were found. These works, however, were suspended and concentration was made on two cuttings, one, FZ65, in Sector I and second, Z7–EZ7 and AZ6–BZ6, in Sector II (fig. 3). Rao divided the sequence into three periods, I, II and III and interpreted the evidence obtained as under.

His period I, represented by the neolithic culture comparable to the neolithic culture of south India, was further divisible into two sub-periods, IA and IB. Sub-Period IA was distinguished by the occurrence of burnished grey ware. The period IB, on the other hand, was marked by the introduction of till then unknown painting tradition, namely the red-on-grey and red-on-red wares. The design repertoire consisted of simple horizontal bands, vertical wavy lines drawn in groups, vertical and oblique dented lines, cross-hatched bands and ladders, antelope and arrowheads, the arrow motif recalling that occurring on the black-on-red painted ware of Savalda. Three different ceramic industries were identified in this Sub-period; a grey slipped ware with crackled surface; a dark grey burnished ware; and dull red ware. The vases of the last mentioned ware were sometimes treated with a slip. In addition to these, a dull grey ware, either with or without burnished surface was also found to be in use. Most of the wares were either handmade or turned on a slow wheel. The use of the fast wheel was limited to a very few vessels. It was observed that this period was not represented in the Sectors I and II.

Period II was characterized by the typical Malwa Ware, including the cream-slipped,

30. *Indian Archaeology 1974-75 – A Review*, pp. 29–31; also S.R. Rao, "Late Harappan Daimabad", *Illustrated London News*, March and April, 1978.

coarse grey, and coarse red wares. Some of the sherds in the coarse red ware were also painted in black with vertical and horizontal bands. A few vessels in this ware were found to be treated with a grey slip. Particular mention may be made of a large sherd of well-levigated clay, treated with a chocolate slip showing a generic affinity with the Savalda ware. The vessel has an externally thickened rim.

The cream-slipped ware, occurring in fairly large quantities, is generally thick and coarse in fabric, the colour scheme being black or chocolate on a cream base. The design consists of combs in panel separated by horizontal bands, hatched diamonds, dented vertical lines in panels, criss-cross lines and thick vertical strokes between horizontal bands. Remains of allos were also found in the early levels of this period. An interesting discovery of this period was a pit cut into the natural soil, which yielded a large quantity of animal bones.

Period III was distinguished by the use of the (i) Jorwe Ware along with the (ii) Malwa and Lustrous Red and grey wares. The major types in the Jorwe Ware were carinated bowl-on-stand, concavo-convex-sided bowls with or without flaring rim, globular pots with constricted neck, miniature pots and storage jar with beautiful applique designs. The painted designs included slanting strokes and hatched diamonds enclosed by horizontal band and zigzag lines drawn between horizontal bands, etc. Some of the vessels were painted on the interior with simple horizontal or vertical lines and dots with or without radiating lines.

The red ware, produced from a fine levigated clay was well-fired and treated with a dark slip both externally and internally. The main type in this ware was bowl with a carinated body and beaded rim. The exterior especially above the shoulder was painted in black oblique slashes enclosed by horizontal bands. This ware compared favourably in fabric and treatment with the Late Harappan Ware, discounting the painted designs which were typically in the Jorwe style.

A number of urn-burials and double-urn burials were also found in the late levels of this period.

Another noteworthy feature of the early levels of this period, according to Rao, was the occurrence on Jorwe pottery of unmistakable Indus signs similar to the graffiti occurring on Late Harappan pottery. The basic signs of the Indus writing were used here both singly and in conjunction with other basic signs.

The most important evidence, however, was provided by the excavation in Sector III in the trench A1 near where the bronzes were found. Here were recovered a fairly thick and sturdy black-painted red ware represented by such types as vases with heavily beaded or collared rim closely resembling those occurring in the Late Harappan assemblages from the Central Tapi basin in District Dhule.

The significant contribution of the excavation, according to Rao, however, was the identification of the furnaces. In Sector I, a large furnace with flues was laid bare in the Malwa level. An interesting feature of the furnace was that while one opening was used as a stoke hole, the other connected with a large pot ensured easy flow of metal. Thick potsherds were used for building the walls of the furnace which were finely plastered on both sides with mud. The earthen tubes through which the molten metal flowed were also recovered. The furnaces were

built close to the river to ensure enough water supply for cooling the molten metal. The furnace was assignable to the overlap phase of Jorwe and Malwa cultures. The occurrence of large quantities of lime and charcoal near the furnaces as also the presence of slag indicated that the furnaces were used for smelting metal which, in all probability, was copper.

Vestiges of another furnace were encountered in the south-western extremity of the mound (French FZ65), in the Jorwe level. It had two concentric circular enclosure walls of clay of 1 cm thickness. The outer wall which was slightly ovalish on plan had a flat bottom.

Noteworthy antiquities found from the various levels included; beads, biconical, long and short barrel-shaped, standard spherical and thin disc made of agate, jasper, shell, crystal and steatite; terracotta figurines, mostly animal, such as bull, elephant and horse (?), and a female figurine, probably of Mother Goddess; copper objects, such as a fish-hook, ring, bangle and piece of wire; stone tools like ring stones, stone balls and microliths represented by parallel-sided blades, limates, backed blades, pen-knife blades and points of chalcedony, jasper and quartz. The most important find of the season was a small bone dagger with its hilt in the form of an anthropomorphic figure (fig. 119, 8; pl. CLV, 21), simulating ceremonial daggers of the West Asian Bronze Age sites. Two holes meant for revetting a gold or silver plate below the hilt are also visible. The significance of the find was enhanced by the findspot which was just 2 m away from the location of the bronzes.

In a nutshell, the excavations at Daimabad during the 1958-59 and 1974-75 seasons revealed that the Malwa Culture preceded the Jorwe Culture and apart from the remains of those two cultures the site also contained pottery closely resembling the Late Harappan red ware of the Central Tapi basin and that showing some features akin to those of the Savalila Ware. The presence of a cream-slipped ware was also recorded in association with the Malwa Ware. The data presented made it quite clear that here was an appropriate chalcolithic site which offered the archaeological requisites to understand the stratigraphic position of different groups of painted wares in relation to each other and called for a careful and systematic excavation to unravel details of the cultures represented by them. The present work undertaken for four seasons from 1975-76 to 1978-79, besides fulfilling the objective opened up new vistas to undertake research connected with various aspects of the life of authors of these cultures.

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2. THE SITE AND ITS ENVIRONS

Daimabad (19° 51' N. Lat. and 74° 42' E. Long) is at present a deserted village¹ situated on the left bank of the river Pravara, a tributary of the Godavari (fig. 2). It lies about 16 km south-east of Shrirampur,² a taluka head-quarters of the same name,³ and 6 km south-east of Padhegaon,⁴ both railway stations on the Daurud-Mannad section of the Central Railway in Ahmednagar district of Maharashtra. Shrirampur is also approachable by State Transport bus from Bombay, Pune, Ahmednagar, Mannad and Aurangabad. From Shrirampur to Padhegaon is a tar road and beyond a fair weather road.

There is no authentic information on the origin of the name of the village. Traditionally, however, the site is also called *Dalimbabad* or *Dalimb Bag* because it is said, pomegranate (that is *Dalimba* in Marathi) orchards were planted on the site by a Muslim Nabab during the Nizamshahi rule in the 17th-18th cent. A.D., when a small portion of the site was occupied as is indicated by the presence of the ruins of a mud citadel, a tomb or *samadh* of a saint named *Gairuba* or *Gairinath* and a temple of *Hanuman* over the occupational deposit of the Chalcolithic period.

Daima is also a surname in the Marwadi community of Rajasthan. Whether this has anything to do with the village name is not certain.

The Chalcolithic site at Daimabad (pl. I; fig. 3) measured about 1000 m in length and 300m in breadth⁵. The thickness of the deposit varies from place to place and a maximum of five meter-thick deposit was exposed in Sector I of the site near the river bank. On the south

1. This village was amalgamated on 6-6-1945 with the village Ladpur which is situated one kilometer to the east.

2. The name of the railway station at Shrirampur is Belapur although the village Belapur after which the station has been named lies about 6 km south of Shrirampur.

3. Shrirampur taluka was formed on the 1st. 1945. It had, in 1971, an area of 508.5 sq. km, 74 inhabited villages with a population of 247521 and 307 as the density of population per sq. km. which is the highest in the district due to a large number of sugar factories.

4. This railway station was formerly named as Lakh.

5. Erosional activities reduced the original dimensions of the mound considerably both horizontally and vertically. Examination of the peripheral area revealed that there existed a separate Chalcolithic burial site of the Jorwe period on either side of the canal between the railway line and the western periphery of the habitation mound. Due to ploughing and national agencies it has been eroded leaving only a few clusters of pottery and human skeletal remains here and there. Of the habitation mound, only 20,842 hectares of area has been protected under the Ancient Monuments and Archaeological Sites and Remains Act, 1958 and fenced by the Archaeological Survey of India. The remaining part is privately owned and under cultivation.

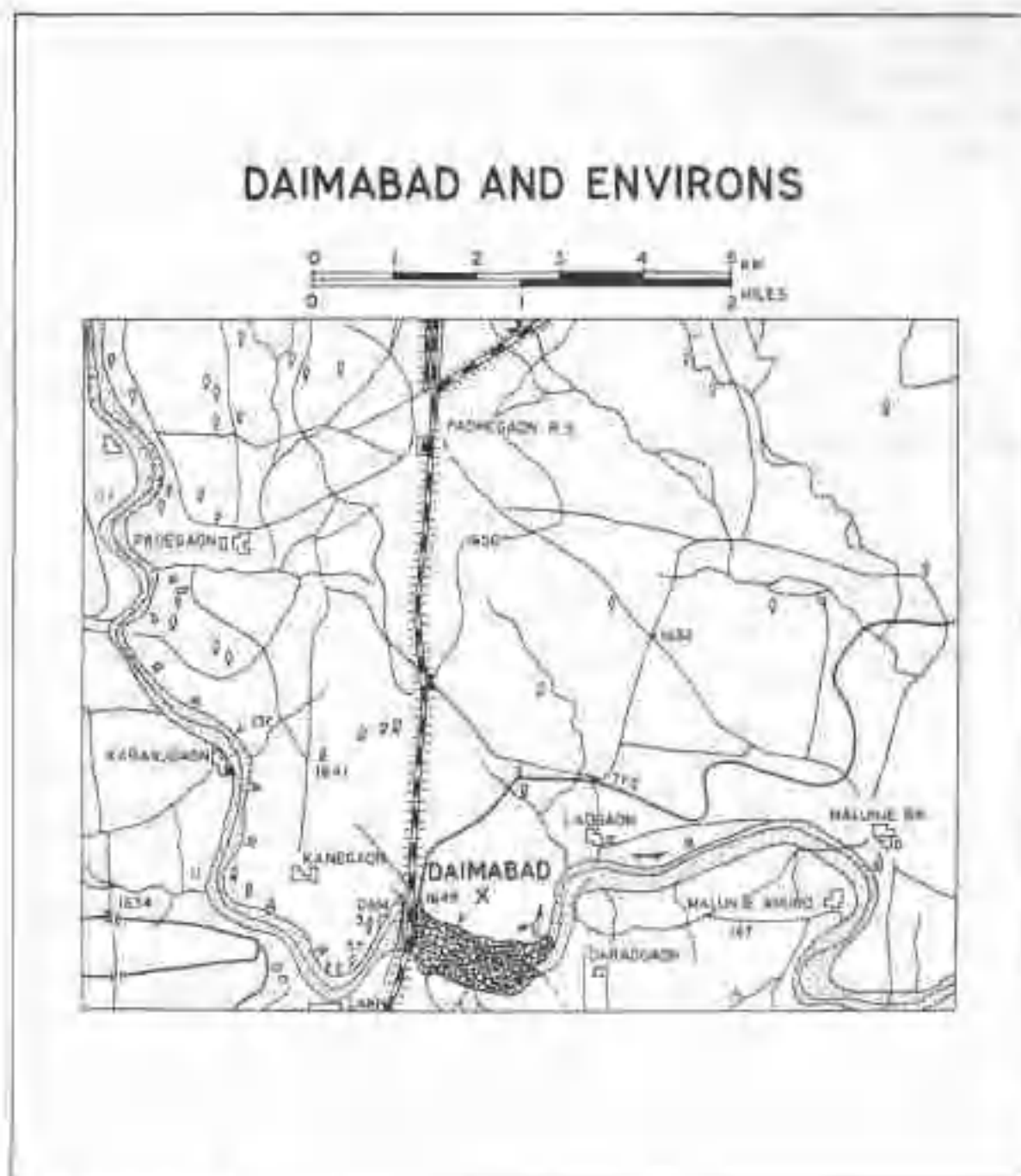


Fig. 2. Daimabad and environs.

of the site is the bed of the river Pravara, on the west a left bank canal of the river Pravara and beyond it the railway line, on the north are cultivated fields and on the east the site extends right upto the left bank of the river where it takes a north-easterly course. On this side, beyond the fenced limits of the protected area, the site is under cultivation and near the river bank the occupational deposit has been disturbed by river floods, at places it being mixed up with alluvial deposit. The occupational deposit which lies at a height of about 10 meters above the river bed rests upon black soil wherever the latter has not been eroded. The black soil has been formed on the yellow silt which is the topmost deposit of an alluvial flat developed during the Late Pleistocene times in a concave loop of the river Pravara. In the north-eastern part of Sector III and beyond the fencing on the east wherever exposures were available for examination, the habitation deposit was found resting upon yellow kankary silt, the black soil having been eroded away. In Sector III this cultural deposit of phase II was seen lying over both mature and immature black soil (see also pp. 59-61).

The river Pravara rises in the eastern slope of the Sahyadri near Ratangad, a hill fort. After a winding course through the hilly terrain and leaping down a 60-meter-deep fall near the village Randha in the western part of Akola taluka it enters a wide plain near the town of Rajur. Further downstream it enters the plain of Sangamner in which it is joined by the rivers Adhala and Mahalingi. Upto Daimabad the Pravara flows eastwards wherefrom it takes a north-easterly course to join the Godavari at Pravara-Sangam or Toka. Before meeting the Godavari the Pravara receives on its south the river Mula near the village Pachegaon, 12 km downstream from Daimabad. The total course of the river is about 200 km.

Archaeologically the Pravara valley has not been systematically explored so far. The Chalcolithic sites known from the basin of this river are, from the upstream to down-stream, Kalas, Bhojapur, Sangamner, Kharadi, Pimpri, Ambhore, Jorwe, Fatiyabad, Padhegaon, Lakh, Kanhegaon, Daimabad, Malunje, Navasa and Pravara-Sangam.

The source of this river being in the hilly region of the Sahyadri, the heavy rains in the source-region cause heavy floods during monsoon. The floods have been occasionally devastating, forcing many a settlement to shift away from the river banks. The floods of 1947 and 1956 had inundated the ancient mound to a considerable height leaving only a small highest portion.

The course of the Pravara in the present form seems to have come into being towards the end of the Late Pleistocene or during the early Holocene when most of the streams in Maharashtra got rejuvenated due to changed relationship between discharge and sediment load (see also Appendix I). During the rejuvenation Phase the Pravara developed an acute meander and abrupt north easterly course near the site and thus formed a classical example of rejuvenation. Owing to a broad and braided course little down-stream of the site there developed a bar-and-pool-configuration in the channel near the site (pl. II). It is these channel pools, a source of perennial water supply, and the clay-rich moisture retaining black soil of the area that attracted the early farming communities to settle down at Daimabad. The presence of low rocky ridge in the river bed serving as an easy river-crossing spot in the non-monsoon days also probably was an added attraction.



PLATE 1 General view of the mound with extant water pool of the river Pravara in the foreground.

The surrounding terrain of the site consists of a Late Pleistocene alluvial flat, 1 to 2 km wide that imperceptibly merges with the valley pediments developed on basaltic rocks of the Cretaceous-Eocene age which are the chief rock-formations of the region. In these basalt or Trap rock occur veins or lenticular patches of secondary silicious minerals like jasper, agate, chalcedony and crystal which were used by the chalcolithic people for manufacturing beads, microliths and other objects. About two kilometers north of the site is a nearly 3-meter-high elevation formed due to north-east-south-west running dyke and except this one does not come across rock-elevations worth the name within the vast area of the surrounding fertile plain, known as Kopergaon plain, which covers the area of Godavari and the Pravara basins in Yeola taluka of Nasik district, Kopergaon, Sangamner, Shrirampur, Rahuri, Nevasa and Shevgaon talukas of Ahmednagar district and Paithan taluka of Aurangabad district. There are wide tracts of deep and rich clayey black soil in this plain. Within this plain itself the area of "Kopergaon, Shrirampur and Rahuri taluka form a separate zone. This area receives low rainfall but has better soils".

Climatically the chalcolithic settlement at Daimabad lies in a semi-arid zone. The climatic details pertaining to Ahmednagar district are also applicable to this site. The cold weather starts by about the middle of November and continues till the end of February. December is the coldest month of the year with daily maximum temperature at 28.5° C and the mean daily minimum at 11.7° C. The area is sometimes affected by cold waves in association with the passage of disturbances across North India, causing drop of minimum temperature to 2° to 3° C. From March to the break of south-west monsoon the day temperatures increase progressively, the night remaining comparatively cool. Thunder storms occur during the months from March to June and in September and October. One such a storm on the 3rd March, 1979 caused heavy damage to the exposed religious complex of the Mahwa Culture and other exposed remains. May is the hottest month of the year with the mean maximum temperature at 38.9° C and the mean daily minimum at 22.4° C. Occasionally the temperature goes up to 43° or 44° C. With the onset of south-west monsoon there is an appreciable drop in temperature and weather becomes pleasant.

Daimabad lies in a tract of exceptionally small capricious rainfall. The average rainfall is 60 cm. per annum.⁶ Because of the scanty and untimely rains failure of crops has been a common feature and the district of Ahmednagar has come to be known as a "famine district".

However, the fertile soil and the canal irrigation has, in recent years, completely changed the crop pattern of the area around Daimabad. The sugarcane cultivation has occupied an important place so much so that Shrirampur taluka ranks first, Kopergaon taluka second with Rahuri taluka following a close third in the average under sugarcane crop.⁷ Prior to the introduc-

6. *Maharashtra State Gazetteers, Ahmednagar District*, (Revised Edition), Bombay, 1976, p. 304. In recent years the canal irrigation has changed the economy of this area, particularly because of the sugarcane cultivation.

7. *Op. cit.*, p. 28.

8. *Bombay Gazetteers, Ahmednagar*, Vol. XV/II, (Bombay, 1984), p. 256.

9. *Maharashtra State Gazetteers*, *op. cit.*, p. 354.

ction of the present irrigation system, that is till the last quarter of the last century, double-cropping, summer (*Kharif*) and winter (*Rabi*), were being practised in the region.¹⁰ The deep heavy soils were ploughed not oftener than once in four, six or some time ten years.¹¹ The crop pattern in 1881-82 was as under¹²:

Kharif or early season: *Bajri*, *Tur*, *Ambadi*, *Til*, *Rala*, *Mug*, *Udid*, *Moth*, *Shalu* were all seen growing in the same field.

Rabi or late or cold season: Safflower and Linseed were always mixed with the staple crop whether it be *Shalu* or cold-weather millet (*Jawar*), Wheat or Gram. Barley was sown in black soil in November.

In Akola taluka, which occupies the hilly tract of the Sahyadri, Rice, *Negali*, *Vari* and *Sava* were grown after the rains had fallen.

Five varieties of wheat were grown, *Bakshi*, *Khapale* or *Jod*, *Pivale*, *Kate* and *Pote*.¹³ Of these, the first two varieties were watered and the last three dry-crop. The average acre yield was worked out as 227 kg. (500 pounds) in dry land.¹⁴ The Indian millet (*Sorghum vulgare*) covered largest acreage. This was largely exported.¹⁵ Five varieties of it were recorded. The esteemed variety among these was *Shalu*. This and the other variety named *Dudhmogra* which was sown with *Shalu* were grown in winter in black soils and were seldom watered or manured. The stalk of the former was inferior to *Shalu*, being straight and hard and because of this quality it was used as a hand-rod by weavers.¹⁶ The other three varieties which were grown in summer (*Kharif*) were *Tambdi* or red *Juari* which ripened rapidly, *Khondya* or *Hundya* which was cut for fodder before the head appeared and *Kulbondi* so called from its dark husk. It gave the husbandman food in bad years before the regular crop ripened.¹⁷

The agricultural products of that year were as under:¹⁸

Grain Crop : Spiked millet, *Bajri* (*Pennisetia spicata*), Indian millet, *Juari* (*Sorghum vulgare*), Wheat, *Gahu* (*Triticum aestivum*), Ragi or *Nechani* (*Echinochloa crusgalli*), Rice, *Bhat* (*Oryza sativa*), Chenna, *Sava* (*Panicum miliaceum*), Maize, *Maka* (*Zea mays*), Indian millet *Rala* or *Kang* (*Pennisetia glauca*), *Kodra* or *Haridra* (*Paspalum scrobiculatum*), Barley, *Jaw* (*Hordeum hexastichon*). There were also other grains of which details were not available.

Pulses : Gram, *Harbura* (*Cicer orientinum*), Horse gram, *Kulith* or *Kulthi*, (*Dolichos biflorus*), *Cajan* pea, *Tur* (*Cajanus indicus*), Green gram, *Moog* (*Phaseolus Mungo*), Black gram, *Udid* (*Phaseolus radiatus*), Peas, *Vatana* (*Pisum sativum*), Lentils, *Masur* (*Ervum lens*), Chick-

10. *Bombay Gazetteer*, Ahmednagar, op. cit., p. 243.

11. *Op. cit.*, p. 248.

12. *Op. cit.*, p. 261. Since the present day crop pattern is completely changed it may not be useful for a comparative study and hence that of 1881-82 is selected for the purpose.

13. *Op. cit.*, p. 265.

14. *Op. cit.*, p. 267.

15. *Op. cit.*, p. 262.

16. *Ibid.*

17. *Ibid.*

18. *Op. cit.*, p. 45.

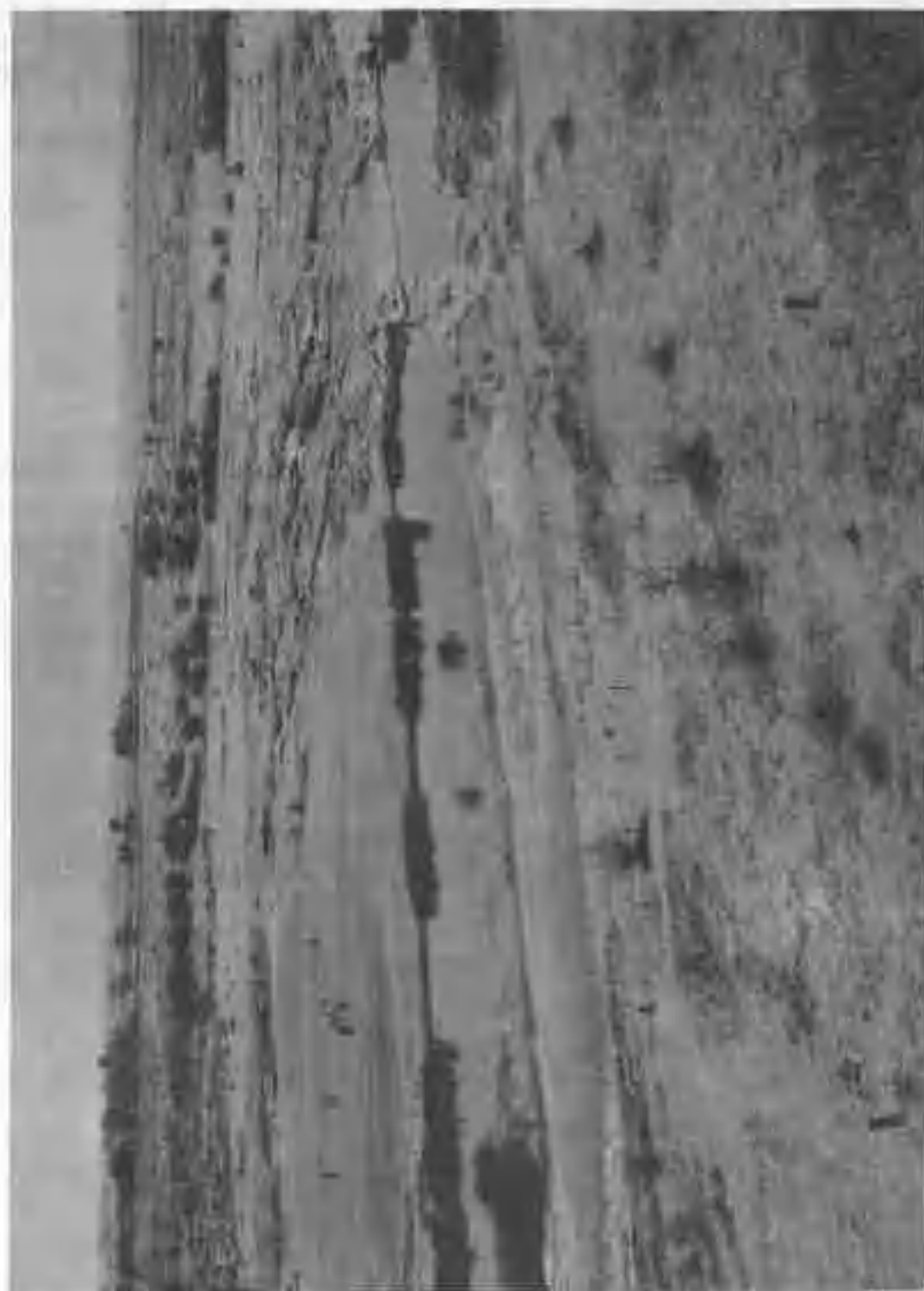


PLATE II General view showing the bed of the river.

ling Vetch and other pulses.

Oil seeds : Sesame, *Toel* (*Sesamum indicum*), Linseed, *Alshi* (*Linum usitatissimum*), Mustard, *Rai* (*Sinapis racemosa*), Safflower, *Karadi* (*Carthamus tinctorius*), Castor seed, *Erandi* (*Ricinus communis*).

Fibres : Cotton, *Kapus* (*Gossypium herbaceum*), Bombay hemp, *San* or *Tag* (*Crotalaria juncea*), Brown hemp, *Ambadi* (*Hibiscus cannabinus*).

Miscellaneous crops : Tobacco (*Nicotiana tabacum*), Chillies (*Capasicum frutescens*), Sugarcane (*Saccharum officinarum*) and Hemp, *Ganja* (*Cannabis Sativa*).

Apart from the scanty and capricious rainfall, the invasion of swarms of locusts from Rajasthan and Sind have also caused a great loss to the crops in the region in the past. "In October 1879 when millet was in ear, a swarm of locusts came from the north, swept over the country about fifteen miles wide, and passed Locusts did not appear till June 1882. The flight was in depth about an eighth of a mile and in breadth about sixty miles from Paithan in the east and Rahuri in the west. They devoured every green thing."¹⁹

The vegetation around Daimabad is of dry deciduous type. The trees, bushes and creepers which yield eatable fruits are: *Amba* (*Mangifera* Linn), *Awla* (*Phyllanthus emblica* Linn), *Chinch* (*Tamarindus indica* Linn), *Bor* (*Zizyphus jujuba* Lamh), *Kuth* (*Feronia elephantum Correa*), *Jambhul* (*Syzygium jambolanum*), *Sitaphul* (*Annona squamosa*), *Bhokar* (*Cardia mixta Roxb*), *Kangunya* (*Physalia minima* Linn), *Umbar* (*Ficus religiosa* Linn), *Belpal* (*Aegle marmelos* Corr.) *Belwange/Bhedare Tarbooj/Kharbooj* and *Koral* (*Capparis aphylla*). The other trees are *Limb* (*Azadirachta indica*), *Babhl* (*Acacia arabica*), *Karani* (*Pongamia glabra*), *Hingambet* (*Balanite roxburghii* Planch), *Vad* (*Ficus indica*), *Pimpal* (*Ficus religiosa*), *Tivas* (*Dalbergia latifolia*), *Hivar* (*Albizia leucophloea*), *Khair* (*Acacia Catechu*), *Dhanda* (*Conocarpus latifolia*).

The following naturally occurring vegetables and edible green leaves are found around the site. *Pathar* (*Lactuca runcinata* DC.), *Shetari* (*Sesbania sesban* Mew.), *Shetuga* (*Moringa oleifera* Lam), *Ambadi* (*Hibiscus Cannabinus* Linn.), *Tandulka* (*Amarnathus polygamus* L.), and *Tarwad*.

There is no forest worth the name around Daimabad now a days and yet the *Jackal* (*Canis aureus*), *Fox* (*Vulpes bengalensis*), *Wild Hog* (*Sus indicus*), *Antelope* or *Black Buck* (*Antelope bexoartica*), *Gazelle* (*Gazelle bennettii*), *Hare* (*Lepus ruficaucatus*) are seen occasionally in the surrounding area. Among the game birds are found the quails in the fields and cranes on the river banks. The pools in the bed of the river Pravara abound in fish.

The domestic animals include cow, buffalo, oxen, sheep and goats, ass, horse and dog.

19. Op, cit. p. 281.

THE SEQUENCE OF CULTURES AND CHIEF CHARACTERISTICS OF EACH CULTURE.

A. Introductory

The purpose of the excavation during the 1975-76 season was two-fold: (i) to ascertain the sequence of the chalcolithic cultures; and (ii) to expose horizontally the structural remains of the Jorwe Culture. The operations were chiefly confined to the cutting CZ52-DZ52 to CZ61-DZ61 in which the work was abandoned by Rao during the previous season. In this cutting the trench CZ-61 was selected as a guide-trench and was deepened upto the natural soil in order to achieve the first objective and in the rest of the area work was carried out with a view to fulfill the second objective. Meticulous work in the guide-trench revealed, within a maximum of 4.3 m thick occupational deposit, resting upon the virgin black soil, a sequence of five chalcolithic cultures, each characterized by a distinct class of painted ceramic and representing a distinct phase within the Chalcolithic period of the site, as follows, beginning with the earliest (fig. 4; pl. III):

Phase I, named Savalda Culture, represented by 20 to 30 cm thick deposit of blackish brown colour resting upon the black soil and with a sharp contact with the overlying deposit of the succeeding phase.

Phase II, designated as Late Harappa Culture, with greyish brown deposit extending to a maximum height of 50 cm, had a sharp contact with the deposit of the overlying phase.

Phase III, first designated as Buff and Cream Ware Culture and subsequently Daimabad Culture¹, further extended upto a height of 80 cm, in the uppermost 30 cm of which there was an overlap with the following phase. The colour of the deposit was reddish.

Phase IV, the Malwa Culture, covered 80 cm thick deposit of pinkish brown colour, the uppermost 20 cm belonging to the overlap with the succeeding phase.

Phase V, the Jorwe Culture, extending to the surface, was represented by a maximum of 2.00 m thick deposit, whitish grey in colour, except the upper 30 cm formed by layer 2 which showed brownish ting.

Encouraged by these results of far reaching importance work was continued during the next three seasons, each season with specific objectives, and in accordance with them operations were extended in other sectors. Thus, in the season of 1976-77, apart from continuing the work in the previous season's cutting, cuttings were made in all the four sectors with a view (i) to confirming the cultural sequence established during the previous season; (ii)

1. S.A. Sali, "The Discovery of Daimabad Culture", *Journal of the Asiatic Society of Bombay*, Vols. 54-55 1979-80, (combined), (Bombay, 1983), (New Series), pp. 128-132.

to ascertaining the chrono-cultural context of the cache of the bronzes found in the year 1974 and (iii) to finding out the spread of the settlement of each of the Phases. The cutting FZ64-GZ64 (fig. 5; pl. V) in Sector I fulfilled the first objective and besides revealed an outline of the house plans of Phase I. In Sector II excavation of DY26 (fig. 6; pl. VI) and X'4 - Y'4 showed that the site was abandoned for a short period which intervened the desertion of the site by the Harappans and its occupation by the authors of the succeeding Daimabad Culture. A part of a mud-wall and parts of houses of Phase II were also exposed in the latter cutting. In Sector III centimeter-by-centimeter removal of occupational deposit in the trenches B8, B9, C8, C9 and D8 (pp. 105-108; fig. 8; pl. IX) revealed that the levels at which the bronzes were found, yield Late Harappan pottery suggesting thereby the probable cultural horizon to which they belonged. In the cutting L48 the occupational deposit of the Daimabad Culture was found lying directly over the black soil (fig. 7; pl. VIII), thus indicating that the area around the cutting was not occupied for habitation purposes during the preceding two phases. In the succeeding 1977-78 season concentration was made on laying bare the houses of Phases I and II in the cuttings FZ63 - GZ63 to JZ63 - JZ64 and X'3 - Z'3 to X'5 - Z'5 respectively and one of the two potter's kilns, Kiln 1, (pp. 125-127) of the Jorwe Culture in X'2 - X'1 to Y'2 - Y'1. The cutting Y1 was taken up in this season to trace the extent of a north-south running mud-wall of Phase II (see p. 70). In the 1978-79 season were exposed the 'religious and residential complex' of the Malwa Culture in AZ'3-CZ'3 to AZ'5-CZ'5, various categories of structures of the Jorwe Culture in Z'1 - Z'2 to KZ'1 - KZ'2 and DZ'1 - DZ'3 to EZ'1 - EZ'3 in Sector II and the remains of a mud fortification wall in Z63-Z69 in Sector I. Besides, more evidence about the Harappans was also obtained from Z60-Z62 in Sector IV.

All the cultures represented at Daimabad are Chalcolithic in nature, being characterized by the use of painted pottery, blade tools and copper and as such belong to the Chalcolithic Period. Therefore, each of them was considered as a Phase within this period. The main characteristics of each Phase are detailed below.

B. Phase I: The Savalda Culture

The authors of the Savalda Culture were the first inhabitants of Daimabad during the Chalcolithic period, who established their settlement on the flat top of black cotton soil, in a narrow strip of land approximately 300 meters east-west and 100 meters north-south, along the left bank of the river Pravara. Their culture was characterized by the use of a painted ceramic named SAVALDA WARE (below, pp. 213-227), besides a blade industry and copper represented by two very much corroded bangles (pl. CXLIII, 1), which justify the appellation 'Chalcolithic'. The Savalda Ware and the exposed structural remains were the two main features of this culture which differentiated it from succeeding ones.

The prominent feature of the Savalda Ware which distinguished it from the other painted wares of the Chalcolithic of the Deccan, and for that matter of the Indian sub-continent is the paintings of weapon and tool motifs that have been executed on the surface of mostly thick

and crackled slip of the pots. On this ware, at Daimabad, these motifs (fig. 25) chiefly included notched arrowheads in chains, arrow, harpoon, barbed tool resembling a saw and a sword-blade-like design painted in red ochre colour. The other paintings (fig. 26) in red and occasionally in black pigments were the bird and animal motifs such as horned deer and fish, stylized human figures, plant motifs, geometric designs including horizontal bands and trellis pattern and a group of miscellaneous designs consisting of a broom-like motif, vertically placed groups of short strokes, crinkled, vertical and horizontal lines and vertically placed groups of short crescentic strokes and some non-descript designs. The types were restricted to a few and slightly varying shapes (fig. 26).

In the painted variety of pottery there also occurred four potsherds of MISCELLENEOUS PAINTED WARES (below, p. 227) which differed from Savalda Ware in fabric and surface treatment.

Two other wares were in use during this Phase.

(i) *Burnished Grey Ware* (below, p. 227) — This was an underfired ware with burnished surface and occasional examples with red ochre band on the rim of the vases. The common types met with included a vase with globular body and outcurved or splayed out rim, a bowl and a lid (fig. 28). The varieties represented the decorated, the corrugated and the grooved wares (below, p. 227) (fig. 28).

(ii) *Thick Coarse Ware* (below, p. 231). This thick gritty ware, sometimes decorated with applique and incised designs was represented by large storage vase, bowl and platter (fig. 28, pl. LXXV, 1-4).

The exposed remains of eleven houses, numbered 11 - 15 and 22 - 27 and ascribable to two structural phases, A and B, (fig. 9; pl. XIII; pp. 81 - 88) showed no planning in layout. The houses were built adjoining each other or there was a narrow lane between two houses. Houses 11 and 12, the former of three and the latter of two rooms, each room having a circular hearth with a flat stone inside, both identified as nobleman's houses, and the house 15, the Village Priest's house had spacious courtyards. The unique feature of the houses was that, except one (15) which was rectangular in shape and 7 X 5 m in size, they were trilateral with walls on three sides, the fourth side being open. The smallest (25) among the fully exposed houses measured 3.4 x 1.6 m. The houses 11 and 12 were trapezoidal in shape. The end of the mud-walls was rounded. The floors were made of alternate layers of black soil and yellow silt, plastered with mud and occasionally decorated with fresh water shells. None of the houses showed any arrangement for a door and it seemed the wide front was closed with a wattle frame when needed. There were no postholes but the squat stumps of hard white clay in Room A of house 12 suggested that wooden posts were placed over them for the roof to rest.

That the authors of the Savalda Culture were agriculturists has been very well attested to by the recovery of charred grains of wheat (*Triticum* sp. cf. *aestivum*), Barely (*Hordeum vulgare* Linn.), Lentil (*Lens esculenta* Moench), Common Pea (*Pisum arvense* Linn.) and Black gram/Green gram (*Phaseolus mungo* Linn./*Phaseolus aureus* Roxb. Syn. *Vigna*

2. Kindly identified by Dr. M.D. Kajale of the Deccan College, Pune for which I am grateful to him. A detailed report on his findings on the botanical remains of all the five phases is awaited.

mungo/Vigna aurens. They also consumed *Ber*. They had known double cropping, summer (*Kharif*) and winter (*Rabi*), and in the absence of any evidence of irrigation it may be presumed that they practised dry-farming.

No evidence of burial was found in this phase.

Although represented by a comparatively small number, the blade industry, chiefly made on chalcedony was typically chalcolithic and marked by a variety of tools (fig. 89; pl. CVI; Table 4) including blades of simple, penknife, retouched, serrated, tanged and crested-ridged types, notched arrowheads and a micro burin. A noteworthy feature characteristic of the blade industry of this phase was that, besides the parallel-sided blades, there was also a variety of blade in which the bulber end was a thick and narrow platform and the sides were unparallel (fig. 89, 1; pl. CVI, 1). Corresponding cores also occurred (fig. 89, 19; pl. CVI, 19).

Copper was represented by two heavily corroded bangles one of which was survived in the form of thin wire (fig. 110, 1; pl. CXLIII, 1).

Only four beads (fig. 111; pl. CXLV), one each of conch shell, carnelian, steatite and terracotta were found. The finds of a conch shell bead and a sawn piece of the same material indicated that beads were made locally.

The stone objects consisted of a fragment of a ring stone, saddle querns, millers and balls.

Interesting among the other finds were an *ithyphallus* of agate obtained from a fire-pit in house 15 (fig. 99, pls. CXXIIA-B) and five bone objects including a fragment of a harpoon, a tanged and a notched arrowhead, a point and a blank purported to have been used for fashioning a tanged arrow-head. A few pottery objects and basalt flakes were also found.

That Daimabad was thickly populated during the Savalda Phase has been indicated by the highest phosphorous values arrived at in the chemical analysis of the deposit (Appendix III).

C Phase II : The Late Harappa Culture

Phase II, which followed, belonged to an altogether different chalcolithic culture the authors of which were very much advanced than their predecessors both technologically and culturally. This culture has been designated as Late Harappa, implicit in which term is the assumption that it represented a culture of the descendants or the succeeding generations of the Harappans of the mature Phase. As pointed out before (p. 8), the thick and sturdy red ware showing close similarities with the Late Harappan red ware of the Central Tapi basin was recovered at Daimabad in the 1974-75 season. In the succeeding season it was this very type of pottery that was found characterizing the levels of Phase II. This evidence prompted the author to attribute the nomenclature Late Harappa to this phase in the first instance. That this designation was quite befitting was proved by the subsequent discovery of terracotta stamp seal (fig. 107, pl. CXXXIV, 37), terracotta seals and potsherds bearing Indus script or signs (pls. CXXXIXA-F) and other cultural evidence.

3. S.A. Sali, "The Harappans of Daimabad", in (ed.) Gregory L. Possehl, *The Harappan Civilization*, 1982, pp. 175-184.

The arrival of the Late Harappans at Daimabad, apparently through the Central Tapi basin, was an important event; for, they not only ousted the Savaldans but also replaced their village by a small town covering over 20 hectares of area and thus sown the seeds of urbanization or urbanism for the first time in the Upper Godavari basin. Their extant occupational deposit overlying that of the Savalda Culture in Sector I and elsewhere over the virgin black soil, varied in colours from greyish brown to weathered brown and in thickness from a few centimeters in the cutting B8-B9-C8-C9 in Sector III to 60 cm in FZ63-FZ64 to JZ63-JZ64 in Sector I. It was found to have been eroded and undergone weathering *in situ* (Appendix I) suggesting that the site remained uninhabited for a short period after it was abandoned by the Harappans and before it was occupied by the people of the succeeding Daimabad Culture.

The cultural equipment of the (late) Harappans at Daimabad consisted of pottery, structural remains, a coffin or a grave, microliths, beads, objects of copper, shell, terracotta, unbaked clay, stone, bone and pottery, and seals and potsherds bearing Indus script or signs, engraved and painted. It should be mentioned that inherent in the cultural equipment recovered was the Harappan tradition.

The ceramic industries of this Phase included (i) LATE HARAPPAN RED WARE (below, pp. 231-246); (ii) RIBBED BICHROME WARE (below, p. 246); (iii) DEEP RED WARE (below, p. 246); (iv) BURNISHED GREY WARE (below, pp. 246-247) and (v) THICK COARSE WARE (below, pp. 247-248).

(i) *Late Harappan Red Ware* :- This sturdy, fast-wheel-made, pottery of fine fabric and baked under controlled uniform heat under oxidizing conditions characterized Phase II. The ware was painted in black with horizontal bands, cross-hatched triangles and diamonds, trellis pattern between horizontal bands, concentric circles, interlaced loops, groups of wavy lines, a bucranian or doublehorn motif, and plant-like and snake-like motifs (fig. 29; pl. LXXVI). The types represented in this ware were dish-on-stand, bowl-on-stand, dish with beaded rim, vase with oval-collared rim, vase with clubbed rim and vase with beaked rim (fig. 30-32). A small number of sherds with graffiti marks including the motifs resembling those of a goat, a lizard and a plant also deserve mention (fig. 33).

(ii) *Ribbed Bichrome Ware* :- This was represented by only a few sherds (fig. 33; pl. LXXVIII).

(iii) *Deep Red Ware* :- About half-a-dozen sherds of extremely fine fabric comparable with that of the Ribbed Bichrome Ware formed this group (pl. LXXVIII).

(iv) *Burnished Grey Ware* :- This was of coarse fabric and with burnished surface. It was represented by large globular vase with flared out or out-turned rim, bowl with an almost vertical or incurved profile, a carinated vase and a lid (fig. 34). Occasionally top of lids and rim-edge of vases were painted in ochre red colour. The decorated variety of this ware was decorated with applique and incised designs.

(v) *Thick Coarse Ware* :- This coarse handmade ware was usually decorated with incised and applique designs (pl. LXXV, 5-8). It was represented by storage jar with out-curved rim and deep platter or bowl with almost vertical sides.

The Harappans of Daimabad built houses of mud-bricks as well as mud-walls, those of the former being attested to by a mass of a fallen mud-brick wall, two among which were bonded together with a mortar of black clay.

Although severely damaged by later occupants and complete plan of not a single house could be made out, eight structures of mud-walls, the walls being chiefly of black earth and only occasionally of greyish or whitish grey earth, numbered 16, 16A, 17, 17A and 18-21 and a portion of what appeared to be a street between houses 19 and 20 could be recognized by studying the extant patches of floors and mud-walls and traces of wall foundations. In contrast to the triliteral and trapezoidal houses of the Savaldans those of the Harappans were in rectilinear pattern and lay on either side of a wall of black clay, 30 to 50 cm thick, which was traced to a length of 33 meters towards south. Two of the houses (16 and 17) yielded one terracotta seal each (pls. CXXXIX A-B). It appeared, the entire complex of the exposed houses belonged to merchants or traders. The smallest of the houses (17) was 3.6 x 3 m and the largest, (19), 6.3 x 6 m.

The mud-bricks used for lining a grave of this Phase occurred in two sizes: (1) 32 x 16 x 8 cm and (2) 28 x 14 x 7 cm, both the sizes thus being in the ratio of 1:2:4. The bottom of the grave was rammed in two successive stages and mudplastered. On this surface lay the extended human skeleton covered with reeds of fibrous plant. The peculiarity of the grave was that it occurred within the habitation area near the river bank in contrast to the Harappan tradition of burying the dead in a separate burial site away from the habitation.

The most important among the other finds which set to rest the Harappan character of Phase II at Daimabad were two terracotta button-shaped seals and four potsherds, all bearing Indus signs or script, those on three potsherds being engraved and on one painted (pls. CXXXIX A-F).

The chalcolithic blade industry (fig. 90; pl. CVI) of this phase was a class by itself. Although chalcedony remained the chief raw material, chert stood second and made of this latter material was the longest and broadest specimen of blade (fig. 90, 8; pl. CVI 27), reminding the Harappan tradition of knapping ribbon blades. The presence of a large percentage of serrated and penknife varieties of blade was another important feature of this industry. Noteworthy were also the lunates made on thin blades, the thickness not exceeding 1 mm.

Copper was represented by only three specimens, one each a fragment of a celt (fig. 110, 8; pl. CXLIV, 10), a tiny copper lump and a lump of a slag, the last-named indicating local copper working activities.

A taste for fine quality ornaments of the Harappans was indicated by the beads (fig. 112; pl. CXLV, 5-18) and shell bangles (fig. 118, 2-4; pl. CLIII, 2-4). Among the former the boat-shaped pendant of ivory, the carnelian head with remnants of copper accretion of a stud, the chalcedony bead with shallow pittings along its circumference apparently meant for inlay work and the beads of gold display superb skill of the Harappan lapidaries. Interesting was also one of the two fragments of shell bangles with a medial ridge bearing patches of a substance probably used as an adhesive to fix an ornamental covering, perhaps of gold.

Noteworthy among the other objects were a fragment of a terracotta measuring scale (fig. 121,8; pl. CLIX,8), a highly weathered terracotta cake (fig.105,31; pl.CXXXVI,2), a carrot-type clay cone (fig.109, 4; pl. CXLII,3), pottery objects (pl.CLVIII), a complete shell bangle (fig.118,4; pl.CLIII,4) and bone points (fig.119,11; pl.CLV,12). Unique was the cult object made of a purposely shaped semi-circular potsherd of red ware bearing on one side a scene of a tiger attacking a buffalo from behind and on the other a horizontal row of six lozenges with oblique lines inside the upper half of each shape and below in an open space between the two lozenges (fig.30,15; pl. CXXXVIII).

Among the stone objects were included a rectangular saddle quern from house 17 (pl.CXV,2), a ground hammer stone, mollers and balls.

The study of charred grains obtained from the levels of this Phase indicated that the Harappans of Daimabad cultivated Wheat, Barley, Lentil, Common peas and Horse gram.⁴

D. Phase III : The Daimabad Culture

It is not as yet clear as to why the Harappans suddenly left Daimabad, but it is clear that after an interval of about half-a-century or so the settlement was occupied by the people of a culture named here Daimabad Culture⁵.

The authors of the Daimabad Culture occupied almost the same area of the site, viz. 20 hectares, that was covered by the settlement of their predecessors. The occupational deposit of this phase was reddish or pinkish brown in colour. It varied in thickness from 20 cm in the cutting ZD60-ZD62 in Sector IV to about 1 meter in Y1 in Sector II. In its upper levels this Phase overlapped with the succeeding Malwa Phase.

The black-painted *DAIMABAD WARE* (below, pp. 248-276) (formerly called the Buff and Cream Ware) characterised this Phase. The most common feature of its core was the presence of an ashy grey or ivory back streak in its middle suggesting that the pottery was underfired. The paintings in black (figs. 35-38; pl.LXXXIX) on the buff and occasionally cream or whitish surface generally showed careless execution. The designs presented a considerable variety and included single and multiple horizontal bands; groups of straight and wavy vertical lines; latticed diamonds and triangles; chevrons; comb design with or without handle; chequer pattern; besides animal motifs with elongated stippled body, a feature which is characteristic of the Daimabad Ware. The shapes represented were (figs. 39-42) a high concave-sided carinated bowl, vase with internally incurved or "hooded" rim, vase with flat base and vase with narrow mouth. The graffiti marks on this ware were sun, animal and tree motifs; *tristula* patterns and vertical and hooked lines (fig. 47; pp. 281 and 287-288).

Associated with the Daimabad Ware were (i) BLACK-PAINTED RED WARE, (ii) BLACK, BLACK-AND-GREY, GREY and CORRUGATED WARES WITH OR WITHOUT PAINTINGS, (iii) ALL BLACK WARE, (iv) BURNISHED GREY WARE AND (v) THICK COARSE WARE.

4. Kindly identified by Dr. M.D. Kapde of the Deccan College, Pune.

5. Sali, *op. cit.*

(i) *Black-Painted Red Ware* (below, p. 276). This was distinguished by its red-slipped surface, thin well-baked sections and was represented by such types as vase with oval collared rim and vase with beaded rim (fig. 43).

(ii) *Black, Black-And-Grey, Grey and Corrugated Wares with Or Without Paintings* (below pp.277-279). — The paintings, chiefly in white and occasionally in black, included (fig. 44) groups of vertical wavy lines on the outside and vertical short strokes on the inside of the rim, comb design and converging groups of lines. The types represented were vase with a vertical high neck out-turned lip and ledged shoulder, bowl with convex sides and out-turned rim and vase with out-curved rim (fig.44).

(iii) *All Black Ware*. This was represented by only one small *lota* with splayed mouth.

(iv) *Burnished Grey Ware*. (below, pp. 279-281). The ware was relatively low-fired and showed burnished surface in various shades of grey, brown, pink, chocolate colours. The rim edge of some pots and the lid-top was painted in red ochre colour. Important types in this ware were *lota-on-stand* (fig.45,13; pl.LXXXI,9), spheroid bowl (fig.45,6), deep and shallow bowls (fig.39 and 45), and lid with either flat or conical knob (figs.50 and 51). The graffiti on this ware included star and sun motifs, drooping strokes, hooked lines and vertical lines (fig.47).

(v) *Thick Coarse Ware* (below, p. 281). It was with or without slip and decorated with incised and applied designs (pl. LXXVII,13). Storage vessels usually occurred in this ware.

Three burials, 33, 34 and 59, each belonging to a distinct type, A, B and C respectively, and representing a pit burial, a symbolic burial and a post-cremation pot-burial were exposed. A clay matrix around the burial urn of burial 59, a pair of hardly sticking circular marks in applique, perhaps representing breasts, on two of the pots in burial 33 and the location of the vase of Daimabad Ware with globular body at a level higher than that of the other pots in burials 33 and 34 were the most important aspects of the burials of this phase (pp. 226-229).

In the blade industry use of quartz was recorded for the first time, chalcidony remaining chief raw material (93.6%) followed by chert (2.4%). It was characterized by pen-knife, backed, serrated, notched, retouched and simple types of blades, a lunate, a backed point, a scraper on flake, a notched arrowhead (fig. 91,12; pl.CVI,44) and lumps and pieces.

The beads were distinguishable from those of Phase II by being of simple type, the dominance of carnelian as raw material (86.6%), the shell acquiring a second position (6%), and the materials coral, opal, agate and hydrothermally altered fine-grained red basalt making their appearance as raw material for the first time. The new types that occurred in this phase were truncated cone disc square in opal (fig.113,14; pl.CXLVI,13), barrel disc in coral (fig.113,10; pl.CXLVI,8) and cone disc with concave sides (fig.113,12; pl.CXLVI,10), cylinder disc (fig.113,11; pl.CXLVI,4), standard oval (fig.113,6; pl.CXLVI,5) and barrel disc (fig.113,8; pl.CXLVI,7) all in shell. The standard barrel was the dominant type in carnelian.

The study of botanical remains recovered showed that the people of Daimabad Culture

cultivated Wheat, Barley, Lentil, Grass Pea, Horse Gram, Hyacinth Bean and Mung/Ved (Green Gram/Black Gram).⁵ Ber (Indian Jujube) were also consumed by these people.

A find of a piece of slag from a small exposed portion of a furnace suggested that copper smelting was also one of the occupations of the Daimabadians.

Among the other finds were included two fragments of graduated terracotta rings, tools of bone and a worked piece of elephant tusk, a fragmentary male figure in applique on the inside wall of a vase as in a votive tank (fig.106,3; pl.CXXXVII,1), a fragment of a terracotta animal figure, shells and a shell bangle piece and saddle querns, mullers, hammers and balls of stone.

E. Phase IV : The Malwa Culture.

Around 1600 B.C. Daimabad witnessed the arrival of the authors of a distinct culture whose characteristic painted pottery is known among the archaeologists as the Malwa Ware (p.288ff.) and the culture represented by it is the Malwa Culture. The evidence of overlap with the earlier culture in the upper levels of Phase III suggested that their predecessors lived with them for sometime and were finally ousted by the Malwans. The blade industry of the Overlap Phase showed no special features worth the name. The other finds included one each a copper wire, a bead of carnelian, standard truncated bicone circular (both unillustrated) and a fragment of a shell bangle with a blunt mid-ridge (fig.118,6 pl.CLI,6).

The settlement of the Malwa Culture covered 20 hectares of area. The habitation deposit of this culture was pinkish brown or pinkish grey in contrast to reddish grey of the preceding culture and whitish grey of the succeeding Jorwe culture. It varied in thickness from 30 cm to 1.2 m, the maximum thick deposit being exposed in the cutting Y1 in Sector II. In the same Sector in the cutting X'S - X'S to Z'S - Z'S the deposit varied from 90 cm to 1.1 m. In Sector I it ranged in the cuttings CZ61, FZ63-FZ64 and DY26 between 30 and 60 cm whereas in Sector IV in L-48 it varied from 30 to 40 cm and in ZD60-ZD62 from 40 to 60 cm.

The material equipment of the Malwa Culture comprised pottery, structural remains, burials, microliths, copper objects, terracottas, beads, stone objects, charred grains, shell bangles, animal bones, objects of unbaked clay and a stone sculpture. An important aspect of the evidence was that several elements of this culture continued to occur in the succeeding Jorwe Phase.

The pottery of this phase included (i) MALWA WARE, (ii) IMITATION DAIMABAD WARE, (iii) BLACK-AND-RED WARE, (iv) BURNISHED GREY WARE AND (v) THICK COARSE WARE.

(i) MALWA WARE (below, pp.288-319):— This black-painted pottery, showed surface-dressing of pleasing shades of yellow, orange, red and pink. Although wheel-made, use of pacing technique and beating up in green hard state were resorted to. The pottery was well-fired in oxidizing conditions. The painted designs, executed in black pigment, were varied and divisible into as many as five major groups: (i) geometric; (ii) animal and other motifs; (iii)

5. Kindly identified by Dr. M.D. Kajale of the Deccan College, Pune.

naturalistic scenes; (iv) schematic and (v) the so called potter's marks. In contrast to the carelessly drawn geometric designs on the Daimabad Ware of the preceding Phase those on the Malwa Ware were carefully drawn and those characteristic of the latter included single or doubled crinkled horizontal bands; a pair of crinkled vertical line when close-spaced forming a chain pattern; groups of obliquely hatched triangles; groups of opposed oblique lines and cross hatched squares. Dog was the frequently depicted animal (fig. 53; pl. LXXXIII). Interesting was the scene depicting a man standing in a pool of water with fish and aquatic plant around (fig. 53, 27; pl. LXXXIII, 17). Unique was the figural schematisation of a female with her thighs stretched apart and the male penis inside the vagina (fig. 58, 4, 5; pls. LXXXV, 1 and CV, 2). What are being called 'Potter's marks' were recognized on the Malwa Ware for the first time at Daimabad. They included solid dots; a group of three lines; a cross and a *trisola* (fig. 54; pl. LXXXIV). Besides paintings, the ware also possessed graffiti marks which were varied and comprised single or opposed hooked vertical lines; crinkled lines; ladder pattern; plant motif; chequer pattern and schematisation of buttocks and man's reproductive organ (fig. 66, 29; pl. XC, 22). The commonest shapes were a carinated *handi* with tubular spout and funnel-shaped mouth (fig. 58; pl. LXXXV); concave-sided carinated as well as incurved bowl (fig. 55; pl. LXXXV); channel-spouted vase (fig. 52) and a bowl with squat globular body and ledged vertical rim (fig. 57).

(ii) *Imitation Daimabad Ware* (below, pp. 319-320):—A small number of pots/birds showed the technique of production of Malwa Ware but the treatment including paintings, (fig. 62; pl. LXXXVI) was in the style of Daimabad Ware.

(iii) *Black-And-Red Ware* (below, p. 320). This was represented by only a couple of sherds.

(iv) *Burnished Grey Ware* (below, pp. 320-327):—The ware was insufficiently fired and showed burnished surface in the shades of mottled grey, brown, tan, pink and black colour. Vase with round body and flared out rim was typical of the double-urn burials (figs. 60, 65, 81). A vase with flat base, oval-shaped body and flared out mouth also deserved mention (fig. 63). The decorated variety with incised and applique decoration was represented by *kalinda*-type vase with splayed sides, platter with slightly raised edge and vase with almost vertical profile. The small-sized vessels were comparatively neatly made and included all-black and black-and-grey varieties as well and presented a number of types, interesting among them being concave-sided carinated bowl-on-stand and convex-sided bowl-on-stand. Common shapes met with were bowl with round base and convex profile; a carinated *lotā* with splayed out rim; lid and lamp (fig. 63). The ware was characterised by different graffiti marks; but, graffiti on the flat top of lid-knobs was a unique feature which included three lines shooting upwards from a single point; "W"; two parallel straight lines cut by one or two straight lines; plant-like mark; cross; a trident and a boat-shaped mark. Occasionally rim-edge of bigger vessels was painted with a band in ochre red colour. Of unusual interest were human figures in early lines and a dog painted in black (fig. 63, 13).

(v) *Thick Coarse Ware* (below, p. 327):—This hand made thick ware of coarse gritty fabric was represented by chiefly large storage vessels most of which were decorated in

incised and applied designs. The latter consisted of single or multiple bands along the neck and over the body either pecked or with finger-tip marks and the former oblique, cross-hatched and angular lines. A sherd with basket impression was also present. Large shallow plates with vertical walls; *kunda*-type vase with channel spout; a crucible; jar with outcurved rim; vase with splayed-out rim and miniature bowls of various types comprised the types in this ware (fig. 63, 17-24).

A large and deep platter of unbaked clay exposed in the workshop of a stone cutter (below, p. 98) suggested that vessels of unbaked clay were also in use during this Phase.

The structural remains, divisible into two phases, A and B, the former earlier than the latter, and grouped into five broad categories, viz. (i) Workshop (ii) Craftsman's house, (iii) Priest's house, (iv) Religious and (v) Unclassified, were exposed. To the Phase A belonged a coppermith's workshop (9) represented by two hearths one of which yielded a heart-shaped razor of copper (fig. 110, 11; pl. CXLIV, 13), and a mud-plat-form in front of each hearth, being a seat of coppermith, and the front courtyard (10) probably coppermith's residential quarters, facing the workshop and separated from each other by a north-south running channel of 50 cm width (fig. 11; pl. XVIII). Besides these, partly exposed four floors, called houses 50-53, also belonged to this structural phase (below, p. 98).

Most interesting structures, however, belonged to structural phase B. One of these was a partly exposed workshop of a stone cutter (below, p. 98). What has been called as 'residential and religious complex' comprised houses 30-33, 36, 37, 54-56 and 66 (fig. 12; pl. XX-XXII). Of these, 36, 37, 56 and 66 were sacrificial altars. The residential structures included houses 30-33, 54 and 55. They were of mudwalls of varying breadth from 8 cm to 30 cm, spacious, mostly rectangular, having single or double-flap door, a low rectangular or semi-circular mud-step at the entrance, the latter recalling *chandrashila*, meticulously made and finely mud-plastered floors sometimes decorated with circular designs made of potsherds, and circular hearths as well as U-shaped *chullahs*, besides some with sacrificial fire altars. In the joints of mudwalls were postholes which assumed the shape of circular bastions. Postholes were also in walls. Apart from postholes there were circular stumps of white hard clay to rest the wooden posts above the floor level. The diameter of wooden posts used in walls varied from 20 to 30 cm. The wooden posts were perhaps trimmed. The presence of a square post-hole near the sacrificial Ring Altar suggested that wooden posts were dressed into desired shapes. The exposed houses showed a set pattern of floor-making. A thick layer (1.5 cm) of fine sand and silt was first rammed over the old floor. This was covered by a centimeter thick layer of silt and clay and rammed. The rammed surface was plastered with a thin coat of whitish mud-paste. The floors were seasonally mud-plastered. In the section of the floor of house 30 six such coats were identified. The mudwalls of houses were made of brownish hard clay and occasionally mud-plastered.

The exposed residential structures were intimately connected with the religious structures and it appeared all belonged to a single complex. The houses 32, 33 and 54, the first two oriented east-west and the last north-south, represented separate rooms within a *Wada*. This, along with the adjoining house 31, having a common wall with the former and the fact that all were of almost identical dimensions ranging from 3.7 to 3.9 m in length and 2.4

to 2.5 m in breadth, suggested that they belonged to a single owner who, in view of the presence of three types of fire-altars, Heart-shaped, Ovaloid Sunken and Oval (below, pp. 159-161), in the premises of the *Wada* and because these houses were located within the religious complex, was perhaps a head-priest. The partly exposed houses 30 and 55, severely damaged by later pits and their extant exposed portions represented by two rooms each, also probably belonged to the priests. In one of the rooms of house 30, between the circular hearth and U-shaped *chullah* with a cusp at the apse on the inside, a small circular portion of floor was decorated with vertically arranged post-herds.

Unique were the religious structures comprising the large Mud Platform and different kinds of sacrificial altars (fig.12; pl.XX-XXX). The Mud Platform, to accommodate the congregation, was exposed to a length of 18 meters. Over it and within a dwarf apsidal mudwall was a channel to spill the ablution water into the sunk-pits filled with gravel and lined with rings of hard white clay. To the east of the soakpits was a solitary short wall with three post-holes perhaps for fixing wooden posts to tie the animals to be sacrificed, and to the west an Apsidal Sacrificial Altar resting over a horseshoe-shaped mud platform. Of unusual interest was the Apsidal Sacrificial Temple (house 37) with a stone stump at the apse covered with mud, burnt red due to fire in the adjoining fire-pit which contained, besides ash and charcoal, third phalange of *Bo*? To the east, over the eastern arm of the wall, were embedded in clay three pebbles. To the south of the stone stump was a circular depression containing black clay and in the rest of the area were nine pot-rests-circular depressions caused due to pressure of the pots containing offerings. Seventeen such pot-rests were met with within the triangular area formed by the western wall of the Apsidal Sacrificial Temple, margin of the Mud Platform and the Ring Altar (house 36), the last-named consisting of a series of mud rings and located to the west of house 33 within a trilateral enclosure, from south, west and north, with an entrance on the northeast. To the northwest of this was the Rectangular Fire Altar (house 56) very much damaged due to later pits in its western portion. Well-levigated whitish hard clay or mud bereft of coarse material like sand and silt was used in the construction of the public Mud Platform; the dwarf mudwalls over the platform and those of Apsidal Sacrificial Temple; the clay rings of the Ring Altar; the clay stump, the surrounding rings, the base and the covering layer of the Heart-shaped Fire Altar; the Ovaloid Fire Altar; the clay rings of the soak-pits; the mud steps at the entrance of houses and sacrificial altars and the clay stumps to rest the wooden posts. This clay was as fine as that of anthills and this reminds one the frequent use of anthill earth in the construction of sacrificial altars during the *Vedic* Period.⁷

Of exceptional interest was the evidence of sixteen burials, divisible into two main groups: I. urn-burial and II. pit-burial, and represented by as many as four main types, A, B, C and D, the first two belonging to Group I and the last two to Group II, and further divisible into twelve sub-types. In Group I the Type A was the horizontally placed double-urn burial

7. Kindly identified by Dr. G.S. Balam of the Deccan College Postgraduate and Research Institute, Pune for which the author is thankful.

8. A.B. Keith, *The Religion and Philosophy of the Veda and Upanishads*, Oxford University Press, 1925, p. 397.

which had two sub-types A_i, A_{ii}, the latter having two variants, A_{ii}a and A_{ii}b. In sub-type A_i two urns of burnished grey ware were placed mouth-to-mouth. Sub-type A_{ii} differed from the above in having placed the mouth of one urn in the mouth of another and in the variant A_{ii}a both the urns were of the burnished grey ware whereas in the variant A_{ii}b one of the urns was of Malwa Ware and the other of burnished grey ware both enclosed within a clay packing. The smaller urn, placed in the mouth of the bigger one, was on the north. The Type B was a single-urn burial with four sub-types. In sub-type B_i the urn was of Malwa Ware, placed vertically, its mouth covered by the bowl of burnished grey ware placed in inverted position (fig. 61, 8, 9). While sub-type B_{ii} was represented by a small vase of burnished grey ware covered with a lid of the same ware, in sub-type B_{iii}, in the mouth of the horizontally placed urn of burnished grey ware a deep bowl was placed in the same position, both lying in the north-south direction. Sub-type B_{iv} was symbolic, the urn containing no remains.

The type C in Group II was the pit-burial containing bowls. In sub-type C_i, of the three bowls of the Malwa Ware, two were placed mouth-to-mouth in the north-south orientation and the third by their side vertically. Sub-type C_{ii} contained all the three bowls of the Malwa Ware placed horizontally in a row in the north-south orientation, the mouth of each being towards south. The bowls in sub-type C_{iii} were of all black ware. The Type D was a symbolic burial, without any remains.

An interesting aspect of sub-types C_{ii}, C_{iii} and Type D burials was that twigs of fibrous plant were spread on the bottom of the pit, in the first-named even the bowls being also covered. This recalls mention of spreading *darbha* in the burial pits in the *Grihyasutra* texts⁹.

The charred remains of grains (Appendix II) collected from the houses and the fire-pits of sacrificial altars suggested that the Malwians exploited the black soil of the surrounding plain both for the winter (*Kharif*) and summer (*Rabi*) crops. Those from the houses included Wheat, Barley, Ragi, Lentil, Horse Gram, Beans, Hyacinth Bean, Black gram, Green Gram and Cheno/Ams, whereas from the sacrificial altars, apparently the offerings, were recovered Wheat, Barley, Horse Gram, Beans, Lentil, Grass Pea, Ragi, as well as Cheno/Ams, Taria and Sugandha Bela. Seeds of *Iler* were collected both from the houses and the sacrificial altars and *Cordata* seed from the latter.

The blade industry of this Phase was made on lumps of chalcedony, jasper, agate, carnelian, chert, red basalt and quartz collected both from the river bed and the basalt beds. Besides various types of blades, the industry also included a drill (fig. 92, 21; pl. CV II, 22), notched arrowheads (fig. 92, 19, 20; pl. CV II, 19-20), lunates and points. Among the polished stone tools the celt of diorite (fig. 97, 1; pl. CX II, 2) deserves attention as it represented a clear evidence of contact with southern Deccan.

In the six copper objects were two rings (fig. 110, 2; pl. CXL III, 2), and one each a tanged spearhead (fig. 110, 10; pl. CXLIV, 14), a heart-shaped razor (fig. 110, 11; pl. CXLIV, 13), a chisel (fig. 110, 9; pl. CXLIV, II) and a trapezoidal flat sheet.

9. Sridhar S. Dange, 'The chaitya Yajna', *Journal of the Asiatic Society of Bombay*, Vols. 49-51, 1974-76, (Bombay, 1979), pp. 72-74.

Richest, three hundred seventy seven, was the collection of beads, majority of which came from burials, burial 75 yielding two hundred eightythree, burial 20 seventytwo and burial 24 one. Paste and faience occurred for the first time as raw material in the manufacture of beads, the use of steatite, carnelian, shell, terracotta and carnelian continuing as before, and in these steatite ranking first (88.3%) followed by carnelian (8.5%). The new types were spherical in carnelian (fig. 114, 5; pl. CXLVIII, 6); tubular in paste (fig. 114, 14; pl. CXLVIII, 15) and spherical (fig. 114, 17; pl. CXLIX, 22), biconvex circular (fig. 114, 18; pl. CXLIX, 21), short truncated bicone (fig. 114, 16; pl. CXLVIII, 8) and oval pendant (fig. 114, 15; pl. CXLVIII, 7) in terracotta. Absence of 'wafer' or 'wheel-type' in the steatite was a noteworthy feature. One of the shell beads was marked by pittings along the circumference for inlay work.

The collection of terracottas comprised a skin scrubber (fig. 104, 20; pl. CXXXV, 2), two small cakes (fig. 105, 26-27; pl. CXXXVI, 3, 6), a ball (fig. 103, 18; pl. CXXXIV, 4) and a horn or a leg of animal (fig. 102, 11; pl. CXXXIII, 6).

The bone objects consisted of points (fig. 119, 5, 12, 13, 20; pl. CLV, 15, 16, 18, 20), awls (fig. 119, 16; pl. CLV, 10), a spatula (fig. 120, 27; pl. CLIV, 1), an engraver (fig. 119, 21; pl. CLV, 9) and a bodkin (fig. 119, 18; pl. CLIV, 7).

Two other objects deserve special mention. One of them was a fragment of a storage jar of Thick Coarse Ware recovered from a potrest by the side of the Ring Altar with a figure in applique of *Siva* and an attendant figure (fig. 106, 1; pl. CXXXVII, 2) and the other a stone sculpture of *Siva* (fig. 100; pl. CXXIII).

The saddle querns, various types of mullers, hammers, grinders and balls, all of stone and toy-cart-wheels, spindle whorls and some other objects of pottery were also recovered.

F. Phase V: The Jorwe Culture

The change over from Phase IV to Phase V was a unique event in the history of Chalcolithic Daimabad, for, the newcomers did introduce a number of elements of their own, but, they also followed several cultural traits of their predecessors and modified them in their own way. This was very well demonstrated by the transition from the Malwa Ware to the Jorwe Ware, the latter characteristic of the Jorwe Culture (below, pp. 337-338), so much so that it appeared for some time that the latter was the result of development from the former since such types as concave-sided carinated bowl; *handi*-type vase with tubular spout and funnel-shaped mouth and high-necked jar with globular or squat body, the "fossil" types of the Jorwe Ware, had their parallels in the Malwa Ware at Daimabad. But the most important hitch in this assumption was the introduction of a fast-wheel which coincided with the arrival of the newcomers.

As in pottery, in the burial practices as well a continuation and also some changes were discernible. The seven burials encountered in the Overlap Phase (below, p. 191) were of two major types, A and B, the former double-urn and the latter single-urn. In Type A there were two sub-types A1, mouth-to-mouth, and A11, mouth-in-mouth. The burial urns in both

the sub-types oriented north-south and in sub-type Aii the northern urn being smaller was placed in the mouth of the southern, a marked change in the custom from that observed in the preceding Malwa Phase in which the southern urn was smaller and placed in the mouth of the bigger urn on the north. The change in this mode, first observed in the Overlap Phase, continued in the full-fledged Jorwe Phase. Type B had two sub-types, Bi and Bii, in the former the urn of Malwa Ware, placed vertically, was covered with a lid and in the latter it was without any covering.

Although typologically the blade industry of this Overlap Phase showed no difference from that of the preceding Phase a marked difference between the two was that the raw material for knapping the former was procured directly from the rock beds and not from the river bed. Copper was represented by three rings. Interesting among the beads were two of shell of cylinder circular type with pittings in two rows (fig. 114, 21, 22; pl. CXLVIII, 18, 19).

As pointed out before, the *JORWE WARE* (below, pp. 337-369) characterized Phase V. It was made on a fast wheel and fired under controlled heat in oxidizing conditions of the scientifically constructed potter's kiln (below, pp. 125-127). The painted designs in black pigment were chiefly geometric and occasionally animal; bird; insects like cockroach besides human motifs (fig. 69; pl. XCI-XCII). Of the animal representations, that of a camel and in those of human that of a dancer (fig. 69, 38; pl. XCII, 1) deserve special attention. The painting of dog in the Malwa style was conspicuous by its absence. Apart from the 'fossil types' mentioned before (p. 63), vase with pear-shaped body (pl. XCV B), carinated bowl-on-stand (fig. 70, 12, 26; pl. XCV, 13); *chambu* with bottle-neck (fig. 72, 11), a *loti*; a beaker; a cup with ear-handle and incurved bowl were some other types in this ware. The potter's marks (figs. 74-77) were in large number and included, besides those which occurred on the Malwa Ware, single or double 'B' design, pipal-leaf motif, man holding plough in both hands; 'H' design; pair of vertical lines at each end of a horizontal line; intersecting groups of three lines; a cross intersected by a horizontal line; a vertical line and a loop at its lower end; a circle joined at one end of horizontal line; a solid dot at each end of a straight line and a star. A variety of graffiti also occurred on this ware. In addition to those noticed on the Malwa Ware there were a human motif, a circle, a circle with five lines inside cut by a cross and a ladder pattern and a motif of a broom tied to a stick represented by a pair of cross-hatched line.

There were also four minor but interesting wares, each represented by a few sherds: (i) *DEEP RED WARE WITH WAXY TOUCH* (below, p. 369); (ii) *REDDISH PAINTED WARE* (below, p. 369); (iii) *KNORRED WARE* (Below, p. 370), and (iv) *PERFORATED WARE* (below, p. 370).

The following were the other important wares of this Phase.

(i) *Burnished Grey Ware* (below, pp. 378-391):- This occurred in various shades of colour, blotchy grey, brown, black, pink and chocolate and was slightly better made than that in the preceding Phase, although in technique of manufacture it showed no difference. The body of the burial urns was well-rounded and the flaring rim was more pronounced

than that in the Malwa Phase. The new types in this ware was a small *loti* with vertical neck and pedestal base (fig. 79, 12). The other interesting types were bell-shaped bowls; vase with stand; bowl with flat base, splayed sides and flat rim with or without incised decorations; vase with channel spout; lid; lamp; incense burner and mud-handle (figs. 79-84; pls. LXXXVIII-XCIX). A miniature *loti* with globular body and shallow platter represented in the all-black variety of this ware. The graffiti on a small number of sherds included ladder pattern, curved lines and plant motif.

(ii) *Thick Coarse Ware* (below, pp. 391-397):— In the technique of manufacture, as well as shapes and applied and incised designs this ware showed similarities with that of the Malwa Phase. Of great interest was the huge vase that was kept by the side of Kiln 1 (below, pp. 125-127) and profusely decorated with figures in applique of human, bull, flying figure, dog, lizard, scorpion, etc. (pls. CIII). One of the incised examples was with a tubular spout. A few miniature bowls and an oval-shaped large plate in this ware also deserve mention.

(iii) *Handmade Red Ware* (below, p. 397):— This distinct class of pottery made of thin layers of coarse clay and fired under oxidizing conditions of the kiln was associated with religious rites.

(iv) *Unbaked Ware* (below, p. 397):— Pots of unbaked clay were represented by over a dozen examples. The most important feature of all of them was that they had high pedestal base which was embedded in the floor.

The exposed structures of this Phase belonged to five structural phases, A to E, and to nine categories (Table 1; below, p. 126). They were of mud-walls as well as of wattle and daub, of the latter being the three-room house (4), (64), (65), the 'butcher's hut' (6) and the circular huts, (2), (39) to (42A) and (43) to (49). The mud-walls were made of two kinds of material, one of whitish hard clay and the other of brownish mud. The former was used in the construction of potter's kilns, mudlining of pits 207 and 208 and the nearby crescentic structure, Apsidal Temple and its associated structure (35) and the lenticular structures in the 'mud-wall complex'. The clay used was obtained from ant-hills and was well levigated before using. Even the mud-plaster of the flooring of the Apsidal Temple and the adjoining house 35 was of whitish hard clay. Walls made of whitish clay varied in thickness from 10 cm to as much as 75 cm, the maximum thickness being in the lenticular structures. The brownish mud used in other structures was quite hard and the walls made of it varied from 15 cm to 85 cm, the outer face of which was occasionally lime-plastered. Calculations based on the debris of walls of house 3 suggested that the walls of the house were about 2.3 m high (below, pp. 133-135). The outer mud-wall of the exposed potter's kiln, 1.4 m high, was made of whitish clay and was occasionally plastered with similar kind of mud-plaster. The material used in the construction of fortification wall and its bastions was hard clay of whitish, yellowish and light pinkish or red colour. The floor of the houses was neatly made of whitish clayey material and plastered with mud of similar colour.

The wooden posts supporting the structures varied in dimensions from 15 cm to 30 cm. Not all posts were fixed in the postholes. Some were placed over circular stumps of hard whit-

ish clay. In majority of the cases the postholes were lined with a lining of hard whitish clay while in some gravel was used, perhaps for avoiding white ants, for example, house 64.

The entrance of the houses varied in breadth from 60 cm to 90 cm and at some a squarish step of hard clay was provided. The doors were of either single or double flap.

The structures of structural phases A, B and C lay in the north-west-south-east orientation. The circular hut (2) of structural phase D in Sector I was in the north-west-south-east direction, while huts of the same phase in Sector II oriented east-west. This direction was maintained in the structures of Phase E. The north-south orientation of the extant mud fortification wall of this phase was significant in this regard.

The biggest was the merchant's house which, when originally constructed, measured 9 m long and 5 m broad. The smallest fully exposed rectangular structure, the 'butcher's hut' was 2.8 m long and 1.9 m broad. Among the circular huts the smallest (48) measured 1.25 m diameter and the biggest (41) 4.45 m.

Sanitary arrangement in the settlement was represented by a channel ascribable to structural phase C.

The structures were exposed almost along the periphery of the site and hence to look at them with a view to interpret the social stratification in relation to the location of houses of different communities would be unreliable. Still the structures exposed in the excavated area do provide a glimpse of their interesting locations. The structures of the structural phase A belonged chiefly to the crafts persons and their workshops and although religious structures also occurred in the same area no residential quarters of a priest or of a priestly class could be identified. The situation of a lime-maker's house (3) nearer the river bank on the peripheral area of the settlement was in keeping with the modern situation in that even now a day's the houses of a lime-maker's community, the *Lonaris*, are located nearer to the river or stream bank on the peripheral area of a settlement-a village or a town. The western half of this house, besides being used as a kitchen, was also utilized for storing prepared lime in the large vases of unbaked clay with high pedestalled base. The small damaged structure (5) close to this house was perhaps its additional store room. The location of the butcher's hut in this area was likewise interesting. The circular *chullah* to the south of the 'butcher's hut' probably belonged to it. The limemaker's house was abandoned after it was collapsed and the sealing of its postholes and part of the debris along the northern side by the floor of house 4 of the succeeding structural phase suggested that no attempt was made by the limemaker to reoccupy it by re-erecting as also to retrieve the belongings from underneath the debris. Subsequently the area of this house was used to dump refuse material. In the northern part of the settlement (Sector II of the site), some 100 meters in the interior from the northern periphery, the situation was different; for, here were located the two potter's houses and kilns, besides the religious structures such as the *yonipentha-shaped* Pit 207 and its ancillary Pit 208, the crescentic structure and the *Apsidal Temple* (34) and its adjoining rectangular structure (35) (below, pp. 138-146). The vast quantity of potsherds in the religious pits indicated that the offerings were placed on potsherds as in *purôdasha*. The location of these religious pits near the potter's kilns was thus advantageous as the potsherds required for the purpose were easily available in

and around the kilns. It seemed also likely that the terracotta objects including the mother goddesses were obtained from the potter's residing nearby. As explained, the mother goddesses and terracotta cakes were offered in the fire-pit before becoming leather hard and it was quite possible that they were prepared by the potters from those desirous of offering them into the pits.

The use of river gravel inside the pottery kiln for artificially raising the temperature and of the central ash-and-earth packing as an insulator have given us ample idea about the advanced scientific knowledge the potter of the Jorwe Phase possessed in the pottery firing technique.

Houses 4 and 38, both of structural phase B, the former in Sector I and identified as a nobleman's house and the latter in Sector II and recognized as a merchant's house, were large, the former with three rooms measured 7.9 m X 4.6 m and the latter 9 m x 5 m. Both however, differed in the mode of construction. House 4 came up after the collapse of house 3, and as pointed out before, was constructed of wattle and daub whereas house 38 was of mudwalls. An interesting aspect of house 4 was that the kitchen was located in the last of the three rooms, the back room, as in modern times, the middle room perhaps served as a *majghar* for the ladies in the house and the easternmost as a drawing room. The house had both front and the back courtyards as well. The large size, the three rooms, each meant to be used for specific purpose, and the front and the back courtyards suggested that its owner maintained a sizeable family and the ladies of the house probably were confined themselves to the central and the back side rooms and the back courtyard and the male members to the front room and the front courtyard. The merchant's quarter was much more specious, as it should be, although the first floor of it was not exposed with a view to getting a clear picture of its plan.

From the times of structural phase C the settlement appeared to have started experiencing natural calamities such as floods which devastated structures close to river bank and the result was the construction of the lime embankment as a flood-prevention measure on the river side. The change in the orientation of the house particularly in the northern part of the settlement from the northwest-southeast to east-west was also significant. Barring the postflood circular hut (2) of structural phase D in Sector I which lay in the northwest-southeast orientation, the circular huts in Sector II and even the street acquired east-west orientation. It, therefore, appeared that the floods brought about deterioration in the civic discipline at Daimabad. The most remarkable change that was visible during the structural phase E on the southern side of the settlement was the occurrence of religious lenticular structures with parallel strips of approach paths related to children welfare rituals and the defences. The house 1, represented by the mud-platform, was perhaps intimately connected with the lenticular religious structures. Of great significance was the evidence that close to the river bank, particularly in Sector I, there were no residential structures worth the name during the structural phase E. A complete change was thus evident in the pattern of the settlement during the structural phase E, the construction of mud-fortification wall being a further corroboration.

No fewer than fortyeight burials were exposed in the levels of Phase V (below, pp.

192-205). They were divisible into three major groups: (I) extended burial in a pit; (II) extended burial in urns and (III) urn-burial. Of the three examples of Group I, one, (5), was disturbed due to floods (pl. LXVI) and in the remaining two the feet of one, (8), (pl. LXVII) were chopped off, whereas in the other, (53), in the courtyard of a merchant's house, (38), feet were intact. Only one burial, (7), belonged to Group II. The feet of the skeleton in this example were chopped off. The most outstanding feature of the latter was the occurrence at its head of flowers of a wild flowering plant *Flaveria* sp. (family Compositae).¹⁰

The burials of Group III were of three main types, A, B and C, double-urn, single-urn and jar-burial respectively. In the Type A, there were as many as six sub-types, Ai-Avi. In sub-type Ai the urns were placed mouth-to-mouth and in sub-type Aii mouth-in-mouth. The urns in sub-type Aiii were placed in a clay matrix. The burials of sub-type Aiv were associated with a stone muller and a chopper. The burial urns in sub-type Av were of Jorwe Ware. The sub-type Avi was represented by group burials. Important difference between the urn burials of the Malwa and the Jorwe Phases was that in the former the subsidiary pots were placed inside the urns and in the latter inside as well as outside. The sub-types Ai-Aiii were first encountered in the preceding phase but notable was the change in the position of the urns. In the Malwa Phase the southern urn was smaller and placed in the mouth of the northern, as against this, in the Jorwe Phase the northern urn was smaller and placed in the mouth of the bigger southern urn. It may be recalled that the method of embedding the burial urns in a clay matrix was first noted in the Daimabad Phase (pp. 179-183). Examples of sub-type Aiv were typical of the Jorwe Phase. Significant was the fact that burials of this sub-type and those of sub-type Av occurred in the uppermost levels of the Phase. The burials of sub-type Avi under the floor of house 62 indicated death of three children simultaneously.

The three examples of single-urn burials of Type B of Jorwe Phase differed from those of the Malwa Phase in certain respects in that the burial urn in the former was the globular vase of burnished grey ware with flaring mouth and it was placed horizontally with its mouth towards south. Only the base portion of jars in Type C burials were survived. Their survival has, however, helped understand the intensity of erosional activities and the approximate thickness of the occupational deposit that covered them and lay over the present surface of the site (below, p. 43).

The study of charred grains recovered from the levels of the Jorwe Culture at Daimabad showed that this period witnessed the best development of the farming activities so that maximum cultigens were brought into cultivation by practising double-cropping and the rotation crops. The following plant remains were identified.

Wheat, Barley, Rice, Ragi (Finger millet), Kodon millet, Sorghum, (*Jawar*), Common pea, Grass pea, Horse gram, Hyacinth bean, Chick pea (Gram), Lentil, Black gram/Green gram (Urd/Moong), Linseed, Safflower, Ber, Foxtail millet, Dak Taranghedva, Tarta and Cheno/Ami. The most important finding was that of Sorghum (*Sorghum* sp.) which represented the earliest record of its charred grains in India.¹¹

10. Kindly identified by Dr. M.D. Kajale of the Deccan College, Pune (per. com.)

11. M.D. Kajale, "On the botanical findings from excavations at Daimabad, Chalcolithic site in Western Maharashtra, India", *Current Science*, Vol. 46, No. 23, December 5, 1977, pp. 818-19. See also Appendix II.

The blade industry consisting of over two thousand five hundred artifacts, showed culmination of technology in its paper-thin blades, minute retouch and a variety of blade (figs. 94-95; pl. CLX-CX). Noteworthy among the other types were lunates, burins, points of different types, arrow-heads and drills, the last-mentioned occurring in two types (i) cylindrical and (ii) conical (fig. 95; pl. CX). Unique was a piece of blade hafted in a fragment of a rib-bone representing the first direct evidence of hafted blade in bone in the Indian sub-continent.¹² The find of a blade below a bone-haft in one of the clusters in the elliptical religious structures also deserve special mention.

Of special interest among the copper objects were two mother goddesses (fig. 110; pl. CXIV) made of sheet with fan-shaped head, one of them coming from a doubleurn burial (72) in house 62. The other finds of copper comprised eight rings including five fragments and one each a flat piece, a wire and a tiny lump.

The collection of more than two hundred beads from this Phase was marked by the first appearance as raw material of onyx, jasper, black basalt and unbaked clay, the other material recorded in the preceding Phases occurring side by side. The new types were elliptical (fig. 115, 9; pl. CL, 3), oblate disc (fig. 115, 1; pl. CL, 1), long polygonal (unfinished) (fig. 115, 11; pl. CL, 11) and conical pendant (fig. 115, 7; pl. CL, 9-10) in carnelian; spherical in coral (fig. 116, 39; pl. CL, 20); long barrel and standard truncated bicone (fig. 116, 33, 44; pl. CL, 18, 17) in jasper; ellipsoid (fig. 115, 12; pl. CL, 49), long barrel (fig. 115, 17; pl. CL, 11) and oblate (fig. 115, 10, 13; pl. CL, 37, 41) in shell; short truncated bicone (fig. 116, 41, pl. CL, 22) and oblate in chalcedony; short cylindrical (fig. 116, 26; pl. CL, 32), standard cylindrical (fig. 115, 18; pl. CL, 43) and long barrel (fig. 116, 34; pl. CL, 48) and areca-ut (fig. 117, 48; pl. CLII, 1) in terracotta.

Maximum number of terracotta objects have come from the levels of Phase V. Exquisite among them was a cult object of a deified sage and his three consorts unified with him represented by their heads on platform and recovered from the house of a merchant (38) (fig. 101, 5, 6; pl. CXXXIA-C). Images of mothergoddesses, of bull and rhinoceros, gamesmen, a skin scrubber, cakes, a dabber, toy wheels, a painted ball (marble), a reel, a pulley and a cylindrical fragment constituted the other finds of terracotta (figs. 101-105; pls. CXXXII-CXXXVI). Of great interest was the cylinder seal obtained from the merchant's house (38) (fig. 108; pl. CXLI).

The other finds were shell bangle pieces; bone objects including points, awls, chisels, engravers and tool-hafts (figs. 119-120; pls. CLIV-CLVI); a variety of stone objects consisting of saddle querns, mullers of various types, hammers, grinders, balls and ringstone (pls. CXIV - CXXI); ground stone tools (figs. 97, 98; pls. CXII - CXIII) and pottery objects including toywheels, a few of them engraved with spokes, and combs (pl. CLVII).

The charcoal recovered for C-14 dating from the levels of different Phases was studied with a view to identifying the plant species (Appendix II). Their Phase-wise identification

12. S. A. Sali, 'The first evidence of a hafted blade found at Daimabad, District Ahmednagar, Maharashtra', *Current Science*, Vol. 46, No. 23, December, 1977, p. 818.

was as follows.

Phase I	Babul (<i>Acacia</i> Sp.)
Phase II	Salai (<i>Bouwelia serrata</i>)
Phase III (a)	Babul (<i>Acacia</i> sp.)
(b)	Dhavada (<i>Anogeissus latifolia</i>)
Phase IV (a)	Babul (<i>Acacia</i> sp.)
(b)	Dhavada (<i>Anogeissus latifolia</i> Wall)
(c)	Bhahawa (<i>Cassia fistula</i>)
(d)	Sisu (<i>Dalbergia latifolia</i>)
Phase V (a)	Babul (<i>Acacia</i> sp.)
(b)	Bijasal (<i>Pterocarpus marsupium</i>)
(c)	Ramabada (<i>Trema orientalis</i>)

1. THE CUTTINGS

A. Introductory

As already pointed out (pp. 20–21), in each season cuttings were made in different sectors of the site keeping in mind specific objectives. In the season of 1974–75, as said before (p. 7), the site was divided into four sectors, I, II, III and IV, and grided into squares of 6 m x 6 m. In that season the first cutting of the trenches A1 and A2 was named DMD 5 in continuation of DMD 1–4 of the 1958–59 season. But in the succeeding seasons successive numbering was not followed and instead the nomenclature DMD 5 continued to be used in general. Therefore, in the following pages each cutting is described according to the trenches covered by each one. (fig. 3).

B. Cutting CZ52–FZ52 to CZ61–FZ61 (fig. 4, pls. III and IV)

Let it be repeated that during the 1975–76 season work was resumed with two-fold objectives: (1) to ascertain the sequence of the chalcolithic cultures and (2) to expose horizontally the structural remains of the Jorwe Culture. Earlier, in the 1958–59 season, the area of Sector I, particularly its south-western portion, was noticed to contain over four-meter-thick occupational deposit and hence in the 1974–75 season this author had selected an area lying close by the previous cuttings, DMD 1, DMD 2 and DMD 5, and covering the gridded area of the trenches CZ52–FZ52 on the north and CZ61–FZ61 on the south, for sinking a guide-trench and for horizontal excavation (pl. IV). The author had made considerable progress in this cutting and obtained interesting information about the upper levels of the Jorwe Culture. This information being related to that obtained in the succeeding seasons is detailed below as a background to what follows.

The layer 1 was a hard mass of surface wash about 5 to 10 cm thick, greyish white in colour, contained fragmentary potsherds, rounded gravel, sub-rounded or sub-angular small stones and rootlets of vegetation. Throughout this cutting the layer 2, brown in colour and composed of loose earth, showed features of a weathered fluvial deposit. This layer was characterized by the occurrence of numerous potsherds in a vertical position, at random spread of fragments of wall-plaster and that of a number of human bones of extremities, apparently derived from the skeletons, and several patches of sand and gravel. It appeared that the layer was formed as a result of encroachment of river flood and in course of time it got weathered imparting it the soil characters (Appendix I). Placed within the layer 2, were found five urn burials, 1–5, 1 and 2 in trench CZ61, 3 in CZ60 and 4 and 5 in DZ55. The sixth burial

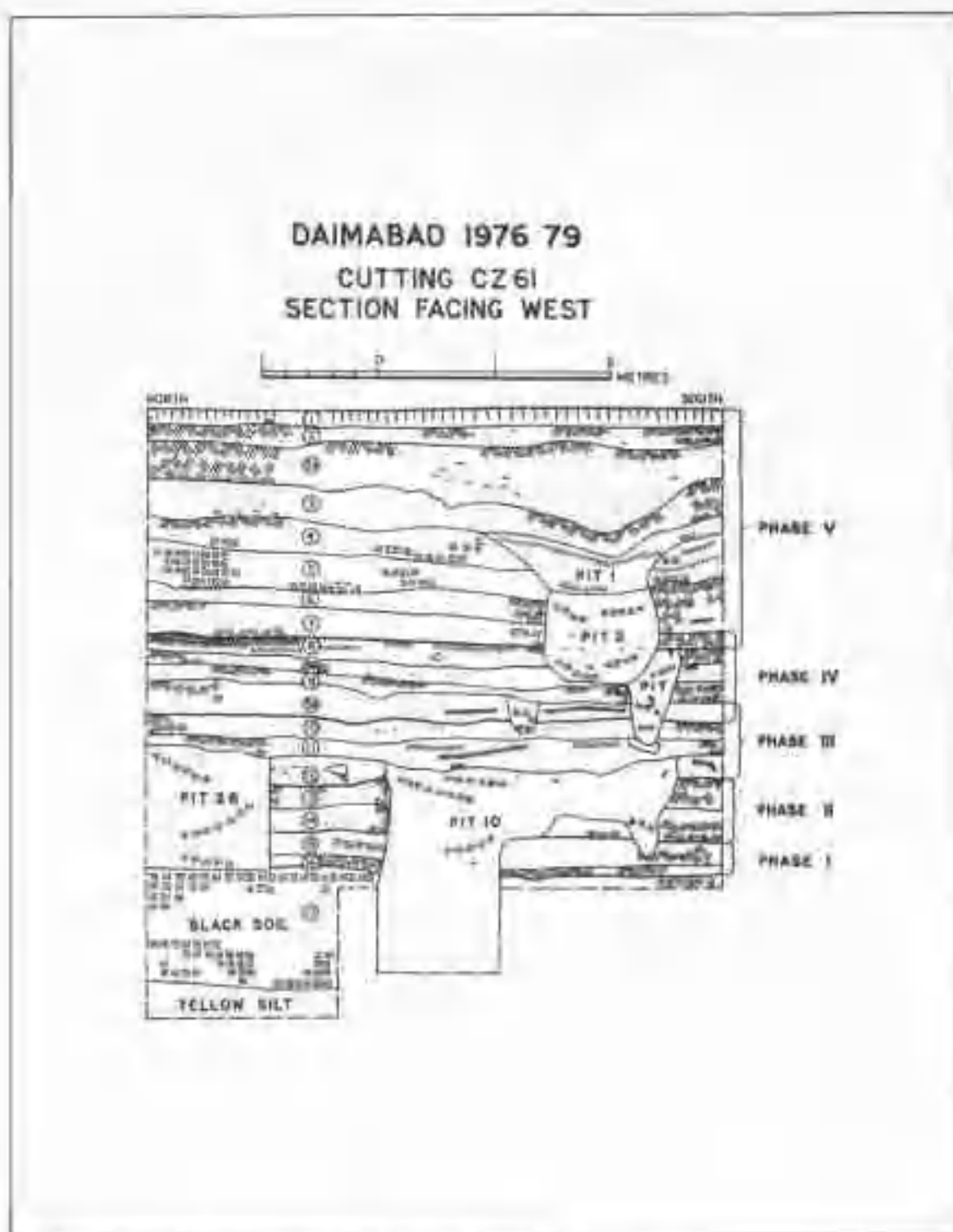


Fig. 4. Cutting CZ 61, section facing west.

was represented by disturbed skeletal remains on the top of layer 3 and sealed by 2 in DZ60. The disturbed skeletal remains in the last-named burial also further fortified the surmise that layer 2 represented a flood deposit.

The occurrence of burials 1-5 just below the thin surface wash and their pits cut into layer 2 clearly suggested that they belonged to post-layer-2-formation times. Burial urns of thick coarse handmade red ware used in the case of burials 4 and 5 of which only the base was survived in layer (2), were of the type of those encountered on the burial site at Takwada, on the river Girna, opposite Bahad.¹ Such type of urns were not less than 75 cm high and as such it can safely be surmised that at Daimabad in Sector I there was not less than one meter thick cover of the occupational deposit of the Jorwe Culture over that existing at present. That this should have been so was also indicated by the occurrence of a few groups consisting of four flat stones on the top of layer 2 arranged in a square pattern to serve as rests of four-legged storage bins.

After the removal of layer 2 in EZ54 and DZ54, one channel, running northwest-south-east and varying in thickness from 30 to 60 cm was exposed to a length of 11 meters. It was cut into the hard clayey deposit of 2A not more than 5 cm deep. On either side of this channel were observed several impressions of cattle hoofs.

Three trenches CZ60, DZ60 and CZ61 were deepened upto the top of layer 5. In the first two trenches a huge ash-pit cut into 4 and sealed by 3 was met with. When the material of this pit was removed in the corner of the control pit of DZ60, below was exposed a finely made mud-floor and a part of broken edge of a storage jar of thick coarse ware with applique decorations.

In the 1975-76 season work was resumed in the above described cutting. The trench CZ61 was earmarked for ascertaining the culture-sequence and the rest of the area for horizontal excavation. In the 1958-59 season it was experienced that in this area the levels below those of the Malwa Culture were very much disturbed by huge pits. (This was also proved in the excavation of the guide-trench). Hence, great care was taken while excavating the reference-trench. Concentration was made in the first instance in the control pit in which use of large pick-axe was totally avoided. Only after ascertaining the position of stratigraphy in the control pit that the excavation was extended in the remaining part of this trench, taking utmost care to see that the material from the pits was not mixed up with that from the undisturbed deposit. The work was, therefore, very slow but extremely rewarding; for, it was only because of great precautions taken that the succession of the Savalda Culture, the (Late) Harappa Culture and the Daimabad Culture could be clearly recognized in the occupational deposit that lay below that of the Malwa Culture.

In the guide-trench, CZ61, after the top of black soil, the virgin soil, was exposed in the north-east corner, a small portion was deepened further upto 30 cm into the yellow kankary silt over which was found developed the former. The black soil exposed here was 1 m thick, deep black in colour, clayey, containing cubes of calcite and it developed fissures when dried.

1. *JAR* 1956-57, *op. cit.*, pl. XXIIa.



PLATE III
Trench C2-61 (guide trench). Sections facing west and north.

No cultural remains were found in either the black soil or the excavated portion of the underlying yellow silt.

The occupational deposit of the Chalcolithic period rested directly upon the black soil. It yielded remains of five distinct chalcolithic phases, I to V, each phase representing a well-defined chalcolithic culture designated by a specific name after its characteristic painted pottery (fig. 4; pl. III).

PHASE I, the SAVALDA CULTURE, was represented by layers 16 and 15; the former, lying over the black soil, was composed of loose greyish earth mixed with ash, charcoal bits and tiny clods of black soil. The layer 15 was relatively compact and blackish brown in colour with a yellowish tinge. The whole deposit contained burnt clods of clay, varied in thickness from 20 to 30 cm and showed blackish brown colour although this colour was not the result of its weathering *in situ*. The finds from the levels of this Phase were microliths, including a backed blade of chert (fig. 89, 4; pl. CVI, 4), and retouched (fig. 89, 3; pl. CVI, 3) and penknife (fig. 89, 8; pl. CVI, 7) blade and a lunate (fig. 89, 11; pl. CVI, 11) of chalcedony, an unfinished spindle whorl of pottery, fresh water shells and animal bones. A charcoal sample from layer 16 has given an inconsistent Carbon-14 date, PRL-429, (3490 ± 220) 1540 B.C. (below, p. 209).

PHASE II, the LATE HARAPPA CULTURE, which immediately followed, was indicated by layers 14 and 13, both compact and thicker than the underlying layers of Phase I and together varied in thickness from 40 to 50 cm. Of these, layer 14 was more brownish than 13 and its compactness resembled that of a clay. The layer 13 was light brown in colour and mixed with charcoal bits. This layer was robbed off from a considerable area of the trench by a huge pit sealed by layer 11. The finds recovered from these layers comprised microliths including simple (fig. 90, 1; pl. CVI, 25) and serrated (fig. 90, 7; pl. CVI, 26) blades, a pendant of conch shell (fig. 112, 11; pl. CXLV, 16), a spindle whorl of pottery (pl. CLVII) and fresh water shells.

Belonging to this phase was an extended human burial, Burial 18 (below, p. 225), the mud-brick-lined coffin (pls. LIII, LIV). The undisturbed portion of this burial was first exposed towards the head-side. It was marked by a tumulus with a stone above and composed of earth mixed with small pieces of mud-bricks. But beyond the head-side, towards south, two large pits were met with. These pits had robbed the mud-bricks on this side, but fortunately left the skeleton almost undisturbed, thereby permitting the study of the floors of the grave-pit. Below the tumulus complete mud-bricks and their large pieces were uncovered around the head, the complete examples measuring in two sizes (i) $32 \times 16 \times 8$ cm and (ii) $28 \times 14 \times 7$ cm, both falling in the ratio 4:2:1.

One of the two charcoal samples, PRL 426, collected from Pit 25 of this trench, cut into into 15, 16 and 17 and sealed by 14, provided the C-14 date (3710 ± 210) 1760 B.C. being not far removed from that estimated for this Phase (below, p. 207).

PHASE III, the DAIMABAD CULTURE, was represented by layers 12, 11 and 10, the deposit of which together varied in thickness from 50 to 60 cm and was clearly distinguishable from that of the preceding phase by being reddish in colour due to the admixture of burnt



PLATE IV Cutting CZ 52-FZ 52 to CZ 61-FZ 61 showing structural phases A to E, looking north.

material. A small part of a furnace (almost an edge) was met with in the control pit in layer 12 from which was recovered one piece of copper slag. The layer 11 was slightly loose and contained ash streaks. Much more loose was, however, layer 10 which was mixed with charcoal and burnt earth lumps and contained a number of ash patches. The finds from this phase included a fluted core with a double striking platform (fig. 15; pl. CVI, 47), a bone point (fig. 119, 10; pl. CLV, 17), a conch shell and fresh water shells. A few loose teeth of a child from layer 11 also deserve mention. (Appendix IV).

The layer 9A, varying in thickness from 20 to 30 cm and ashy grey in colour, represented an overlap between the Daimabad and the Malwa Cultures. The ashy grey earth of this layer was mixed with charcoal bit. A few fresh-water shells and microliths were the finds recovered from this layer.

One of the two charcoal samples, PRL 428, from Pit 10 sealed by 11, has given an inconsistent C-14 date of (3500 ± 140) 1550 B.C. (below, p. 206).

PHASE IV, the MALWA CULTURE, was represented by layers 9, 8A and 8, the deposit of which was pinkish brown in colour and varied in thickness from 40 to 60 cm. All the layers contained charcoal bits and burnt earth lumps as well as ash streaks. The layer 9 was slightly compact but 8A and 8 were loose, the top of the latter being composed of burnt material. The finds from the levels of this phase were microliths which included a backed variety of point (fig. 92, 15; pl. CVII, 11), two beads, one each of carnelian and shell (fig. 114, 9; pl. CXLVIII, 9) and animal bones.

An overlap phase between the Malwa and the Jorwe Phases was indentified in layer 7. It was composed of compact brownish earth with streaks of black burnt material, charcoal bits and whitish ash patches. The top of this layer was marked by a thin blackish ash deposit and a number of floors as well as a few hearths. This layer yielded microliths, shells and fragments of animal bones.

PHASE V, the JORWE CULTURE, was represented by the layers 6, 5, 4, 3, 2A, 2, 1A and 1, composed of mainly whitish grey deposit varying in thickness from 1.6 to 2 m. While the overall colour of the deposit practically remained unchanged some variations were also observed in different layers. The floors in the northern part of the trench in layer 6 were yellowish in colour whereas the deposit of this layer in the southern part was clayey, whitish and compact. This latter type of deposit also occurred in layer 5 but with a difference that it was marked by occasional patches of sand and fine gravel and ash streaks.

From the top of layer 5 upwards five structural phases, A-E, were recognised in the remaining part of the cutting that was selected for horizontal excavation. Besides, eleven burials, 7-17, were also exposed in these levels (pp. 170-175). The earliest of the structural phases, A, were represented by the houses 3 and 5-8. They were situated on the top of layer 5 in the trenches CZ57 - CZ60 and DZ57 - DZ61. As already pointed out (p.43), in the 1974-75 season a huge ash pit cut into layer 4 and sealed by layer 3 was encountered in the trenches CZ60 and DZ60. This pit extended in CZ59 and DZ59. A large number of animal bones, charred and semi-charred, and potsherds were recovered from this pit. The material of this pit covered almost the entire area of house 3 and it was only after its removal that an outline

of the plan of this house was visible. It was also observed that the inside of the house was filled up with the debris of its collapsed walls. This gave a hope that a careful removal of the debris would uncover material remains left in the house *in situ*. This hope was duly fulfilled in the next season's work and the contents exposed suggested that the house belonged to a lime-maker (below, pp. 133-137). Further on the basis of the thickness of debris of mud-walls accumulated inside the house probable height of the mudwalls of this house was calculated to be 2.3 m (below, p. 137).

House 5 was a small structure partly damaged by a huge circular pit immediately to the south-west of house 5 and to its west was exposed a part of house 8. The composition of layer 5, in the trenches CZ57, CZ58, DZ57 and DZ58 was different from that in the trenches CZ59-CZ61 and DZ59-DZ61 in that it contained a large proportion of white lime material in the form of large lumps. On its surface in trench CZ57, were exposed a small portion of house 7 and southwards a rectangular hut, house 6, identified as a 'butcher's hut' (fig. 13; pl. XXXI) since on the floor of it was exposed enormous quantity of animal bones, a large number of them showing cut-marks. Notable among the finds from layer 5 were one each an axe (fig. 98, 10; pl. CXIII, 12), and an adze (fig. 98, 7; pl. CXIII, 10) of delerite, an end-scraper of chalcedony on blade (fig. 95, 40; pl. CX, 14) and beads of chalcedony (fig. 116, 41; pl. CL, 22), steatite (fig. 115, 20; pl. CL, 47) onyx (fig. 115, 21; pl. CL, 7) and gold (fig. 116, 38; pl. CL, 24). One bead of carnelian, long barrel circular was picked up from house 6. The house 4 belonged to structural phase B. It occurred in the lowest levels of layer 4. The floor of house 4 sealed northern wall and a small portion of wall-debris along that side of house 3. The important finds from House 4 were two beads, one of carnelian and the other of unbaked clay, the former long barrel circular and the latter spherical. A little away from this house were picked up two terracottas, a bull and a rhino.

The upper portion of layer 4 in the trenches CZ57, CZ58, DZ57 and DZ58 was composed of sticky clay and lime lumps. It was whitish in colour and developed fissures when dried. In the trench CZ58 it occurred in laminations. Large later pits sealed by 2A were cut through it. On the whole this deposit showed close resemblance in its composition with the lime deposit of the embankment.

The composition of layer 4 in the trenches CZ56 and DZ56 was quite different from that described above in that it was composed of slightly loose greyish deposit with ash patches. It was, however, found very much disturbed in particularly uppermost levels. In DZ56 a couple of patches of floors of a house were noticed on the top of this layer. From one of the floor patches seven beads of steatite, all standard cylindrical circular, and one hundred spherical beads of coral were collected. On the top of layer 4 in CZ58 was one circular hearth consisting of two circular mud walls burnt red, due to fire, the inner, 5 cm thick and 45 cm in diameter and the outer 10 cm broad and 1.7 m in diameter. In the centre of the inner was a flat stone apparently for the pots to rest. The outer had an opening facing northwest, 70 cm wide. Notable finds from this layer were shell bangle pieces, truncated and penknife blades and points, a drill, three copper rings (unillustrated) and a terracotta wheel and a cake.

In contrast to the white colour of layer 4 that of the overlying layer 3 was pinkish brown with greyish ting. It was composed of clayey earth and on its top was spread a thin layer

of gravel throughout the area of the cutting, at places the gravel also being present in lenticular patches, suggesting encroachment of the Pravara floods. In the trenches CZ57 and DZ57, it was slightly loose and contained a considerable proportion of ash of black and white colours. On the top of this layer in the trenches CZ58 and DZ58 occurred several impressions of hoofs and a few of human feed. In the middle levels of this deposit, in these trenches and in CZ59 and DZ59, three large patches of floors, ascribable to structural phase C, were observed. On the top of one such were found lying three angular stones one of which was with a groove. From the floor patches and the debris of layer 3 were also recovered drills made of chalcedony as well as a few pieces of couch shell, beads of unbaked clay, fine-grained green basalt, and carnelian, a fragment of a terracotta mothergoddess, an axe of dolerite and a shell bangle piece (fig. 118, 11 pl. CLIII, II). Although some postholes were located no house-plan could be reconstructed as the levels were very much disturbed owing to the floods. In trench DZ57, in its north-west corner, remains of a circular hut, House 2, belonging to structural Phase D, were exposed on the top of layer 3. Burials 10-13, all of double-urn type, were sealed by this layer.

The layer 2A was composed of whitish ashy loose earth. In this layer occurred patches of floors as also postholes but none provided a complete plan of a house. On the top of this layer, however, occurred the mud-platform (house 1) and oval or elliptical structures with approach paths (below, pp. 163-165; pl. LI) in the trenches CZ56, DZ55, DZ56 and EZ56. Of great significance from the clusters associated with the latter structures were two razor-shaped hafts of rib-bone of *Bos* (fig. 120, 25, 26; pl. CLVI) and a long blade of chalcedony found from underneath one of them (fig. 94, 3; pl. CIX, 2). These structures have been ascribed to structural phase E. The urn burials 9 and 16 belong to this layer. One ground stone celt was picked up from this layer from EZ57 (fig. 97, 4; pl. CXII, 4). The house 1 yielded one bead of banded agate (fig. 116, 30; pl. cl, 14).

The layer 2, as pointed before, was a weathered flood deposit, brown in colour and containing lenticular patches of river sand and gravel. Towards north this layer progressively thinned down and in the trenches CZ52-DZ52 it was not present. Sealed by this layer were five burials 7, 8, 14, 15, 17, No. 8 of these being of extended inhumation type, and the rest of the double-urn type which, surprisingly enough, were not much damaged due to the flood action. In the trenches CZ55 and EZ55 this layer also yielded beads of unbaked clay, standard-truncated bicorne and sperial in shapes. The most remarkable find was a blade hafted in a rib-bone from the trench CZ58 (fig. 96; pl. CXI).

The layer 1 was a whitish hard surface wash mixed with rolled potsherds, sand, gravel, sub-angular small stones and humus.

C. Cuttings FZ63-FZ64 to JZ63-JZ64 (fig. 5, pl. V)

This cutting was made quite near to the aforescribed one, on the southwestern periphery of the site. From a vast area on this side of the site vandals had taken away truck-loads of deposit. Examination of the cuttings of the rain-gullies in this area indicated presence of occupational deposit of the Late Harappa and the underlying Savalda phases, that of the latter



PLATE V Cutting FZ. 63-FZ.64 : view showing section facing west of FZ. 63 and FZ. 64 and midwalls of structures of Phase I at the base.

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resting directly upon the black soil. Further, in this part of the site, in the season 1974-75, Rao had exposed in the trench HZ64, what he called a copper smelting furnace.² The topmost unexcavated deposit of this trench yielded Daimabad Ware. Therefore, in order to confirm the sequence of cultures established during the 1975-76 season, an east-west oriented cutting, consisting of four trenches, FZ64, GZ64 and HZ64 and JZ64, was made in the 1976-77 season. Besides confirming the cultural sequence, the cutting revealed a part-plan of houses of mud-walls in the upper levels of the Phase I. With a view to fully exposing these houses the adjoining trenches, FZ63, GZ63, HZ63 and JZ63 were deepened upto the working level in the next 1977-78 season. The deposit in FZ63 and FZ64 was undisturbed; that of HZ64 was, as said above, already excavated upto the levels of the Daimabad Phase and the western half portion of GZ63 and GZ64 as well as the entire area of HZ63, JZ63 and JZ64 were robbed off its deposit upto the uppermost levels of the Late Harappan Phase. A maximum of 4.5 m thick deposit was exposed in the trench FZ64 at the peg FZ65.

PHASE I, the SAVALDA CULTURE, was represented in this cutting by the layers 16 and 15, the thickness of which varied from 50 to 70 cm. The corresponding layers in the trenches HZ63, HZ64, JZ63 and JZ64 were 3 and 4 respectively. Both the layers were marked by a number of floors and the layer 16 among them, resting upon the black soil, was slightly more brownish in colour and loose than layer 15. Remains of eleven trilateral houses, 11 to 15 and 22 to 27, divisible into two structural phases, A and B, the former earlier than the latter, were encountered in the exposed parts of the two layers. Of these, 23 and 25-27 belonged to phase A and 11 to 13, 22 and 24 to phase B (below, pp. 141-147; fig. 9; pl. XII). From Room C of house 11 were recovered two beads, one each of shell and steatite (fig. 111, 1, 2; pl. CXLV, 1, 2) while a fragment of a bone-harpoon (fig. 119, 1; pl. CLV, 25) was recovered from Room B. The other finds from this house included fresh-water shells and microliths. One copper bangle (fig. 110, 1; pl. CXLIII, 1) was recovered from Room A of House 12. The House 15, the largest among the Savalda houses, yielded a saddle-quern and a muller, both broken, an ithypallus of agate from the fire-pit (fig. 99; pl. CXX, II A-B), a tanged arrowhead of rib-bone and a fragment of animal ribbone, being a blank to make a tanged arrowhead of the type mentioned above (fig. 119, 7; pl. CLVIV, 5). In the courtyard of houses 11 and 12 were collected one each a copper ring (unillustrated), a terracotta bead (fig. 111, 3; pl. CXLV, 4), a finely sawn piece of a conch shell with a hole (fig. 118, 1; pl. CLIII, 1) and a notched arrowhead of bone (fig. 19, 5; pl. CLIV, 4). A charcoal sample, BS 176, collected from Room A of house 12 yielded the C-14 date 3590 ± 90 (3695 \pm 95) 1745 B.C.

PHASE II, the LATE HARAPPA CULTURE was indicated by layers 14 and 13, the thickness of both varying from 40 to 60 cm. In the trenches HZ63, HZ64, JZ63, JZ64 the corresponding layers were 3 and 2, the layer 1 forming a surface wash. The material of these layers was fairly compact and was brownish grey in colour, that of layer 13 being more brownish than that of layer 14. The most important finds from the Harappan levels from this

2. Rao, op. cit.

cutting were potsherds bearing Indus script, one in painting and two in graffiti (pls. CXXXIX C,D,F). One with a painted sign was recovered from layer 14 of the trench FZ63 and one each graffiti-bearing from layer 14 of FZ64 and layer 2 (corresponding to layer 13) of JZ63. Interesting among the other finds were conical fluted cores from layer 14 of GZ63 (fig. 90, 12; pl. CVI, 31), a pendant of fresh water shell and terracotta (fig. 112, 5; pl. CNLV, II), and carnelian (fig. 112, 6; pl. CNLV, 6) beads.

From a hearth in layer 3, (corresponding to 14), in HZ64, a charcoal sample was collected for C-14 dating. This sample, PRL 420, was covered with a patch of current-bedded sand and silt deposited by river floods and hence contaminated. It has given the date (1410) 340 A.D. (below, p. 207).

PHASE III, the DAIMABAD CULTURE, was represented by layers 12 and 11 reddish grey in colour and together varying in thickness from 40 to 50 cm. The layer 12 was compact but more compact than it was layer 11 which contained clay lumps. A lower portion of a large vase of Daimabad Ware was found in a pit cut into 12 and 13 and sealed by 11. One plano-convex miller stone was found placed in it. Sealed by layer 12 and cut into 15-16 was found a pit-burial, 33, in the trench FZ63 and partly in the haulk of FZ63 (pl. LV; p. 179).

One carnelian bead was recovered from this burial. Most interesting were, however, those beads which were found in two small bowls of grey ware in layer 12 of the trench HZ64, about 30 centimeters away from the edge of what Rao has described as a furnace for smelting copper.² One of the bowls contained 117 beads and the other 11. The layer 12 of GZ64 also yielded one bead of agate (fig. 113, 1; pl. CNLV1, 6). The top of layer 11 in the trenches FZ63 and GZ63 was a rammed surface covered with a thin sheet of river gravel which seemed to have been purposely spread. A few holes, like the postholes, were observed cut into the hard surface but they did not give any idea about their purpose. Noteworthy types among the blades recovered from layer 11 of this cutting were the retouched (fig. 91, 2; pl. CVI, 40), backed (fig. 91, 3; pl. CVI, 33) and penknife (fig. 91, 4; pl. CVI, 34).

An overlap between the Daimabad and the Malwa cultures was represented by layer 10 which varied in thickness from 30 to 40 cm and was composed of greyish compact earth with occasional patches of whitish ash and hard clay.

PHASE IV, the MALWA CULTURE, was marked by the layers 9 and 8 varying in thickness from 50 to 60 cm. On the whole the deposit of both the layers was pinkish brown in colour and both were marked by ash patches and floorings but layer 9 contained more clayey hard earth. In trench FZ64 a row of six postholes was exposed on the top of layer 9, spread over a distance of 4 m, along its eastern section. The remaining part of the house appeared to be in the adjoining unexcavated trench. On the top of layer 8 were found half-a-dozen oval-shaped hearths. The charcoal collected from them was sent for C-14 dating. The sample, PRL 412, gave the date 3250 ± 110 (3340 ± 120) 1390 B.C. (below, p. 206). Beads of carnelian (fig. 114, 7; pl. CNLVIII, 1), a copper (fig. 110, 1; pl. CNLIII, 1), notched blade (fig. 92, 11; pl. CVII, 3) and a fluted core (fig. 92, 25; pl. CVII, 21) among the microliths, a terracotta

2. Rao, op. cit.

DAIMABAD 1976-79
SECTION FACING WEST
CUTTING DY26

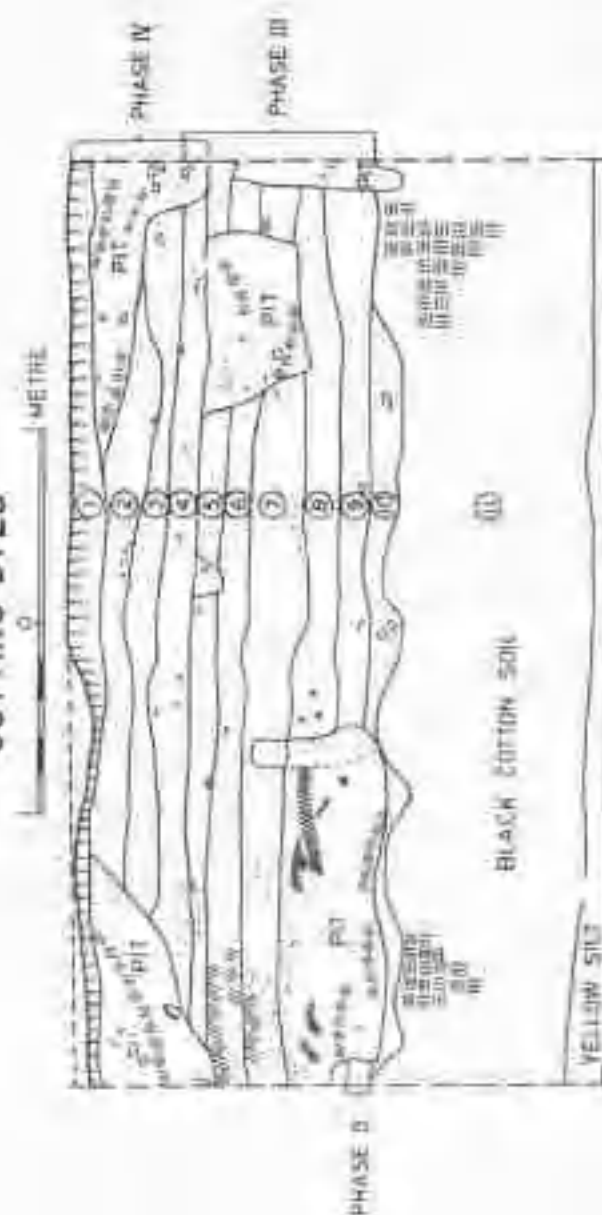


Fig. 6. Section facing west, Cutting DY 26.

skin scrubber (fig. 104, 20; pl. CXXXV, 2) and a shell bangle piece (fig. 118, 7; pl. CLIII, 3) were the other noteworthy finds from the levels of this phase.

Layer 7 was the deposit of overlap between the Malwa and the Jorwe Cultures. It varied in thickness from 20 to 30 cm and was composed of brownish earth containing patches of black and grey ash as well as brick-red earth. Notable among the objects recovered from this layer was a terracotta bull (fig. 102, 9; pl. CXXXIII, 3).

The charcoal sample collected from layer 7 of FZ64, PRL 411, yielded the C-14 date (3520 ± 100) 1370 B.C.

PHASE V, the JORWE CULTURE, was represented by layers 6 to 1, the deposit of which was whitish grey in colour and varied in thickness from 1.4 to 1.65 m. The layer 6 was composed of compact earth with patches of grey ash. Comparatively layer 5 was much loose and contained brick-red and whitish burnt material. Layer 4 consisted of clayey material and thin patches of grey ash, besides a few of yellow kankary silt. Layer 3 was loose and composed of light brownish and greyish earth. The composition of layer 2 was similar to that of layer 2 in the cuttings CZ52-CZ61 to DZ52-DZ61. In the cutting under description this layer was brownish in colour, loose and contained a number of gravel patches. Similarly, as in the other trenches mentioned above, a large number of potsherds in this layer also occurred in vertical position. Layer 1 was a hard surface wash whitish in colour and contained commuted potsherds, gravel, small stones and humus. While removing the baulk between FZ64 and FZ65 three double-urn burials, 30-32, were exposed. They were sealed by layer 3. Noteworthy finds recovered from this phase were a fragment of a copper ring, a cube of purple basalt, being a weight (fig. 121, 7; pl. CLIX, 5), beads of red jasper (fig. 116, 33; pl. CL, 18), onyx (fig. 116, 22; pl. CL, 19), banded agate (fig. 116, 25; pl. CL, 16), carnelian (fig. 115, 2; pl. CL, 2), terracotta (fig. 117, 46; pl. CLI, 30) and black basalt (fig. 116, 42; pl. CLI, 29) and a pebble (pl. CXIV, 6) of stone.

D. Cutting DY26 (fig. 6; pl. VI)

In the season 1958-59 a portion of a large vase of buff ware painted in black with a jungle scene was recovered from the eroded surface of black soil on the western periphery of the site.⁴ The sequence of cultures as revealed in the aforesaid two cuttings had made it amply clear the presence of the Daimabad Culture with its characteristic Daimabad Ware of buff and cream colour and this evidence also indicated that the vase found in 1958-59 season belonged to this culture.⁵ This spot lay very close to the trench DY26 in Sector II and hence, when it was decided in the season 1976-77 to understand the extent of each culture this trench was sunk in order to find out if deposit of Phase III was preserved in this part of the site. A total of 1.7 m thick occupational deposit resting over the black soil was exposed in this cutting.

4. *Indian Archaeology 1958-59 - A Review*, pp. 15-18, fig 8.

5. *Sali*, op. cit.

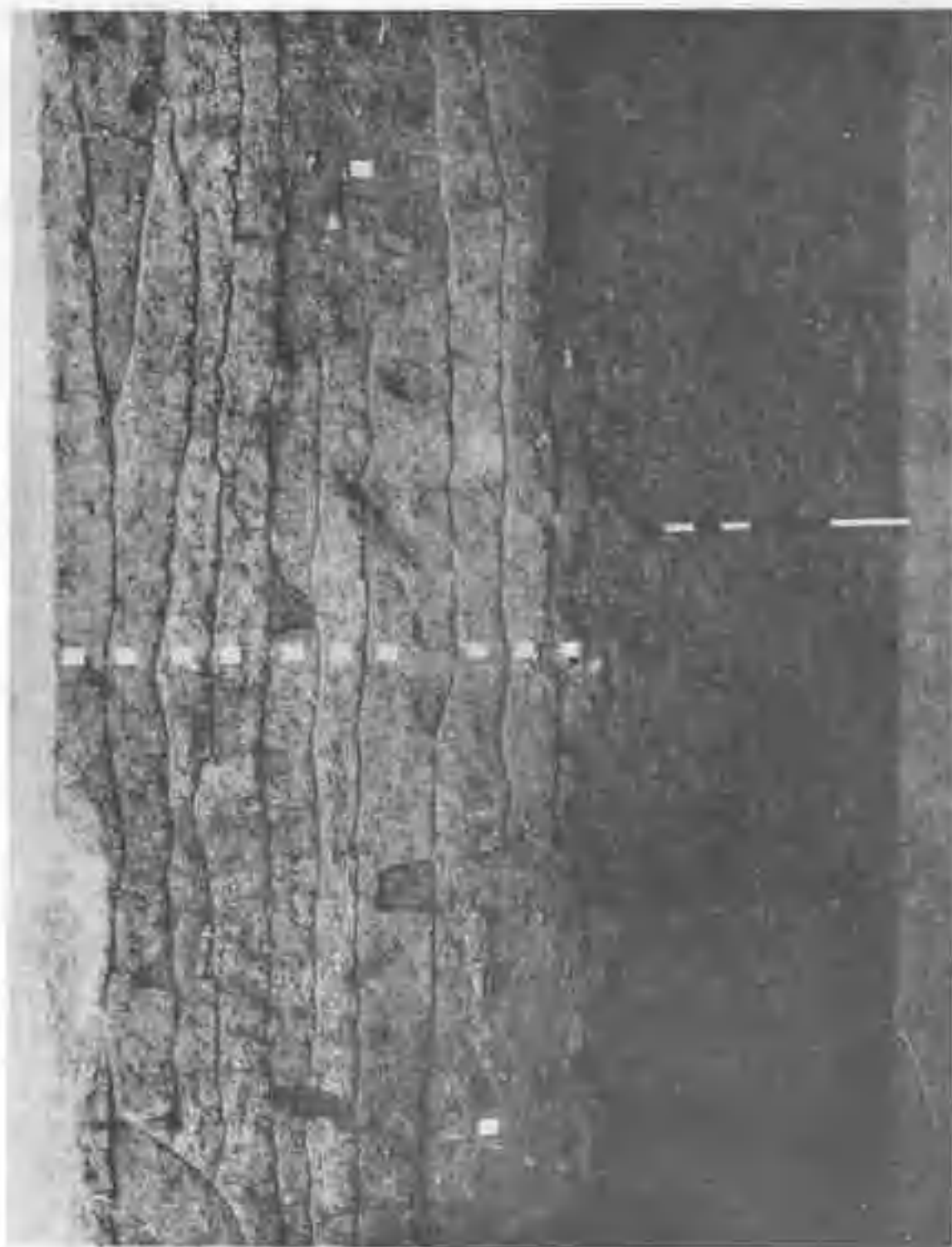


PLATE VI Cutting LV 24 / section facing west showing extant occupational deposit preserved in patches on the top of black soil (the scale is resting against the black soil)

PHASE I, the SAVALDA CULTURE, was not represented in this cutting.

PHASE II, the LATE HARAPPA CULTURE, was indicated by an extant patch of brown weathered deposit, representing layer 10; about 10 cm thick, lying on the top of black soil. The patchy nature of this layer, its uneven surface and brown colour as also the occurrence of a few rolled potsherds of the Late Harappan red ware in the overlying layer 9 indicated that the deposit was partly eroded and weathered, thus suggesting an occupational gap between the Phases II and III (see also Appendix I).

PHASE III, the DAIMABAD CULTURE, was represented by 90 cm thick occupational deposit, of light reddish grey colour and consisted of layers 9 to 3. Wherever the layer 10 was missing owing to erosion the layer 9 was found resting directly over the black soil.⁶ This layer was composed of compact earth mixed with burnt clay clods and charcoal bits. It was slightly loose than the overlying layer 7 which contained a number of ash patches of white, black and grey colours. The composition of layer 6 was not dissimilar to that of layer 7, but it was more compact. Layer 5 was composed of pinkish brown hard compact earth mixed with charcoal bits. The finds from these levels included a fragment of a terracotta animal figure (fig. 102, 8; pl. CXXXIII, 2).

The layer 4 represented an overlap phase between Phases III and IV. It was composed of whitish rammed clayey earth, about 15 cm thick.

PHASE IV, the MALWA CULTURE, was represented by the topmost three layers, 3, 2 and 1, which together varied in thickness from 30 to 40 cm and were, on the whole, pinkish in colour. The layer 3 was composed of pinkish grey earth and was mixed with burnt clay lumps, charcoal bits and ash. Layer 2 was loose, brick-red in colour and contained streaks of ash and charcoal bits. The layer 1 was compact and whitish in colour due to the presence of ash.

E. Cutting L48 (fig. 7)

As in the case of the cutting DY26, this cutting in Sector IV, was also made in the season 1976-77 with a view to tracing out the area occupied by different cultures. The total thickness of the deposit exposed in this cutting was 2.5 m.

PHASE I, the SAVALDA CULTURE and *PHASE II, the LATE HARAPPA CULTURE* were not represented in this cutting.

PHASE III, the DAIMABAD CULTURE, extended to a height ranging from 60 to 70 cm above the black soil and was represented by layers 12, 11, 10 and 9. The deposit showed light red, white, grey and brown shades of colour. Large pits sealed by 12 and cut into the black soil were met with (pl. VII). These pits contained material of Phase III. Layer 12 was composed of compact clayey earth, light brown in colour, with occasional streaks of ash and mixed with charcoal bits. The overlying layer 11 was grey in colour, slightly loose and contained more ash patches and charcoal bits. The layer 10 was compact with clayey earth, ash and charcoal bits and showed a tinge of light red colour. The layer 9 was composed of

6. This explained as to why the vase with jungle scene was found on the top of black soil in 1955-59 season.

white lime-like deposit of clayey nature. The finds obtained from the levels of this phase were microliths and shells.

The layer representing an overlap between Phases III and II was not found in this cutting.

PHASE IV, the MALWA CULTURE, was shown by layers 8 and 7, both together varying in thickness from 30 to 40 cm and pink in colour. The layer 8 was made up of compact earth whereas layer 7 was comparatively loose and contained more ash patches. Noteworthy among the finds was a terracotta leg or horn or animal figurine (fig. 102, 11; pl. CXXX-III, 6).

An overlap between Phases IV and V was indicated by layer 6. It was pinkish grey in colour and composed of compact earth.

PHASE V, the JORWE CULTURE, was represented by layers 5 to 1 which together varied in thickness from 80 cm to 1 m. Layer 5 was composed of compact clayey earth, grey in colour and layer 4, although almost similar in composition, was comparatively loose and contained occasional patches of ash and showed brownish shade. Layer 3 was brownish grey in colour and more loose than the underlying layer 4 but comparatively compact than the overlying layer 2 which was light brown in colour and showed all the features of a flood deposit that have been observed in the cuttings in Sector I described before. Sealed by this layer was one double-urn burial, 19. The layer 1 was whitish in colour and composed of surface wash.

F. Cutting B8-C8-D8-B9-C9 (fig. 8; pls. VIII, IX and X)

One of the objectives of the 1976-77 season was to understand the probable cultural context of the bronzes found in 1974 in Sector III in the light of the cultural sequence obtained previous season. While camping at Daimabad the author collected all possible details about the circumstances in which the cache was found. The information obtained from those who actually found it and reported the matter to the police revealed that the bronzes were found at the base of a shrub in the levels lying below that of the deposit of grey colour, 'Bhuri mati' as the informers called it, but in the blackish soil, *Kalzar mati* as they described it. When the shrub existed, there was a low tumulus of grey earth of about 50 cm or so, *kh hat* as per the measuring scale of the finder, and the blackish soil in which the bronzes were found lay below this deposit of grey earth. Rao had cut a small trench on this spot in 1974 after the finds were reported. The trenches B8, C8, B9 and C9 lay around this cutting. They were, therefore, selected for the purpose stated above. The 1974-cutting of Rao showed that the cultural deposit here was very shallow. Therefore, excavation in particularly two trenches B8 and C8 which lay to the east and west of the find-spot of the bronzes respectively was carried out most carefully, removing the deposit centimeter-by-centimeter with excavation knife only. The results of this excavation are described below from the top to the bottom (fig. pls. VIII-X).

In these two trenches, the topmost deposit, about 30 cm in thickness, grey in colour,



PLATE VII Cutting L. 98 : sections facing west and north. Remnants of Burial 19 are preserved in the section facing west.

consisted of pit material yielding pottery both of the Daimahad and the Malwa Wares. This pit deposit occurred even in the virgin soil where the pits were cut deeper into it. But where the pits were shallow and had not touched the black soil, there occurred in both these trenches one patch each, about 3 to 5 cm thick, of an undisturbed occupational deposit, pale brown in colour and with occasional patches of whitish ashy streaks. These patches yielded worn out potsherds of the Late Harappan Red Ware along with a few sherds of burnished grey ware. The surface over which lay the pale brown occupational deposit yielding the Late Harappan red ware was smooth like that of a flooring and this surface was made right over the light brown soil, the virgin soil formed over the yellow kankary fluvial deposit. Since this flooring-like smooth surface occurred close to the find-spot of the bronzes on its eastern and western sides, it was logical to believe that the surface over which the bronzes lay should not have been dissimilar. The location of the extant patches of Late Harappan habitation deposit and the underlying flooring-like patches facing each other also indicated that originally they formed part of a continuous flooring and in the course of clandestine digging and subsequent sinking of a small trench by Rao in 1974, the portion in between was lost. The evidence thus suggested that the bronzes originally lay at a level at which occurred the smooth flooring-like surface and the overlying patches of occupational deposit of the Late Harappan phase.

In the trench D8, located to the west of C8, the picture was more clear. Here, resting over the light brown soil occurred an undisturbed occupational deposit, about 5 cm thick, similar in composition to that in the trenches B8 and C8, which yielded weathered and worn out Late Harappan red ware sherds. Immediately above this deposit was undisturbed habitation deposit of Phase III. In the trenches B9 and C9 very large pits were met with and hence work in them was abandoned. While clearing the area around the find-spot of the bronzes in the 1974-75 season a small bone dagger with its hilt in the form of an anthropomorphic figure (fig. 119, 8; pl. CIV, 21), was found in the debris of earth only about 2 m away from the actual find spot of the bronzes. In the trench C8 one each a lunate (broken) and a backed blade (fig. 90, 4; pl. CVI, 22), both of chert, were recovered from the deposit of Phase II.

G. Cutting A1-A2. (pl. VIII)

In 1974-75 season two trenches, A1 and A2, being not very far from the find-spot of the bronzes, were selected for excavation. A control pit in the southwest corner of the A1 was deepened to a depth of about 1.5 meters and in the rest the topmost few-centimeter-thick cover of surface wash or layer 1 was removed. In A2 nothing more than mere removal of surface wash was done. Careful excavation in the control pit of the trench A1 had yielded Late Harappan red ware on the top and in the topmost levels of the black soil.⁷ Over the black soil was about 15 cm thick occupational deposit light reddish in colour which yielded a few sherds of Daimahad Ware, the significance of which could not be known then. The topmost deposit was a surface wash. In 1976-77 season an opportunity was taken to excavate these

7. *Indian Archaeology 1974-75 - A Review*, pp. 29-31.



PLATE VIII Dalmabad : view showing two small cuttings made at the find-spot of the bronzes in 1974 (in the background) and the cutting A1/A2 in the foreground.



PLATE IX

Cutting BR/CS (foreground) showing intact patches of undisturbed occupational deposit of Phase II exposed in the 1976-77 season bearing the remains of the basins of the 1978-cuttings undisturbed. The top of the smaller basins dividing the eastern side (left side) cutting into two parts marks the level of the basins at which they were said to have been found. This level coincided with that of the exposed eastern patches of the occupational deposits of Phase II.



PLATE X: Cutting BB-CB : view showing probable location of the find spot (indicated by the sitting figure) of the bronzes in relation to the extent patches of the habitational deposit of Phase II exposed in 1976-77 season.

two trenches primarily to obtain more Late Harappan material. In the half portion of A1 the yellow kankary silt lying below the black soil was reached and in the remaining half as also in the A2 trench the black soil was dug upto 30 cm depth, upto which levels worn out potsherds of the Late Harappan red ware were found. The occurrence of the Late Harappan potsherds to so much of depth in the black soil was due to their percolation through the fissures. Besides getting these potsherds inside the black soil, they were also found sticking hard to the top of and partly embedded in it. In association with the potsherds were found one fragment of a celt of copper/bronze (fig. 110, 8; pl. CXLIV, 10) and two beads of gold, one each a standard barrel circular and short truncated bicone (fig. 112, 12, 13; pl. CXLV, 12, 13). One bone point and blades of chert were also found in these levels. Above this lay an occupational deposit, varying in thickness from 15 to 40 cm and reddish grey in colour, of the Daimabad Culture. The topmost layer, being a surface wash and whitish in colour, contained humus and an admixture of small stones, gravel, commuted potsherds and bone pieces.

H. Cutting X'3-X'5 to Z'3-Z'5 (pl. XI)

The cutting in Sector III failed to expose occupational deposit worth the name of the Late Harappan phase and the material remains recovered yielded very little information. With a view to know more about this culture a trench Y'4 in Sector II, about 140 meters west of A1 described above, was deepened in the season 1976-77. The layers 12 and 11, light brown in colour, the former lying over the black soil, represented Phase II, there being absence of the evidence of Phase I in this cutting. One wall, running north-south, 35 cm broad and made of black soil belonging to Phase II was exposed along its eastern section. In the south-western corner was exposed one saddle-quern and lower half portion of a vase of handmade coarse red ware which in subsequent expansion of the cutting were found to lie in house 17 (below, p. 92; fig. 10). The remains exposed aroused hopes of getting house plans and hence operations were extended into the adjoining X'4 trench. In this cutting a fragment of another wall running east-west at right angle to the one mentioned above was exposed. Within these two walls were exposed a well-made floor with mud-plaster and a hearth with ash, animal bones and potsherds. These remains belonged to house 16, later on identified as a merchant's house (below, p. 92; fig. 10). The area beyond the fragment of the wall was found very much disturbed owing to large pits. The layers 10A, 10 and 9 represented phase III and layer 8 an overlap between this and the phase IV. The deposit of this latter was represented by layers 7, 6, 5, 4, 3A and 3 and was 1.1 m thick. The most important evidence from this phase from trench X'4 was that of a child burial, 20, the first burial of the Malwa Culture to be found at Daimabad (below, p. 189; pl. LXIII). It was cut into 8, 9, 10 and 10A and sealed by 7. This evidence and that of the structures of the phase II prompted this author to extend excavation in a wider area in the next 1977-78 season in which the trenches Z'4 and Z'5 were deepened to the working level. Before actual excavation was commenced in the 1977-78 season a portion of the northern section of trench Y'4 was found collapsed and in this section, close to the north-south running mud-wall of Phase II was seen jutting out one



FLATE XI Cutting N^o 1, N^o 2 to Z, 3, 2' 5' : showing parts of sections facing east and south and remnants of mudwalls of Phase II.

mud-brick, 30 cm long and 8 cm thick. This brick was later on found to be the one among those lying as a debris of a fallen mud-wall (pl. XVI; p. 88).

PHASE I, the SAVALDA CULTURE, was not represented in this cutting.

PHASE II, the LATE HARAPPA CULTURE, was represented in this cutting by layers 12 and 11, both together ranging in thickness from 25 to 35 cm and on the whole, showing greyish brown colour, the brown colour being imparted due to the weathering *in situ* of the deposit (Appendix I). The layer 12 which lay directly over the black soil was loose and composed of light brownish earth. The cultural deposit was found very much disturbed owing to later large pits which had also eaten away the mud-walls of the houses of this phase. The result was no complete plan of any of the houses was found. On the basis of extant patches of floorings and mud-walls and traces of their foundation plans of eight houses, 16, 15A, 17, 17A and 18-21, as also a street between houses 19 and 20 could be reconstructed (below, pp. 88-92; fig. 10; pl. XVII). The most puzzling among the walls was the one, running north-south, varying in thickness from 30 to 50 cm and traced in the trenches Y'2 and Y1 upto the length of 85 meters towards south. The important finds from this phase were two terracotta button-shaped seals with Indus script, one each from house 16 and house 17 (pls. CXXXIX A-B); one terracotta scale (fig. 121, 8; pl. CLIX, 8), one "carrot"-shaped cone of unbaked clay (fig. 109, 4; pl. CXLII, 3), and one complete shell bangle from house 17 (fig. 118, 4; pl. CLIII, 4).

PHASE III, the DAIMABAD CULTURE, was represented by layers 10A, 10 and 9. In colour the deposit of these layers, on the whole, was pinkish grey. It varied in thickness from 35 to 60 cm and was composed of mostly compact earth containing streaks of whitish and grey colours. Layer 10 among these was very hard, composed of clayey clods which developed cracks on drying. It appeared to represent a rammed floor. Burial 34, a symbolic burial (fig. 10; pl. LVI), sealed by layer 9, was exposed in the levels of this phase in trench Z'4. The objects recovered from the levels of this phase were, two terracotta ring-fragments bearing engraved graduations both on the lower and upper sides of the exterior (fig. 123, 5, 6; pl. CLIX, 1, 2), a fragment of a male figure in applique on the inside of a vertical wall of a potsherd as in a votive tank (fig. 106, 3; pl. CXXXVII, 1), a small thin sheet of copper, a pendant of estuarine shell of *Oliva* sp. (unillustrated), microliths including a notched arrowhead (fig. 91, 12; pl. CVI, 44) and mullers, querns, hammer stones and balls of stone (pls. CXIV-CXVII). The layer 8, varying in thickness from 20 to 35 cm, whitish grey in colour and composed of hard clayey earth with ash streaks of grey and white colours, represented the overlap phase between the Phase III and the Phase IV. A bead of carnelian (unillustrated), a copper wire (unillustrated) and a shell bangle piece (fig. 118, 5; pl. CLIII, 5), were the noteworthy objects recovered from this layer.

The charcoal sample, PRL 655, from layer 10A of Z'4 produced the C-14 date (3600 ± 110) 1650 B.C. and sample, PRL 419, collected from layer 10 of Y'4 (3070) 1120 B.C. The Charcoal sample, BS 177, from Pit No. 145 sealed by 10A in trench Z'3 has given the C-14 date 3460 ± 105 (3560 \pm 105) 1610 B.C. and that, BS 182, from layer 10 of the same trench 3130 ± 90 (3130 \pm 100) 1280 B.C.

Phase IV, the MALWA CULTURE, was represented by the layers 7, 6, 5, 4, 3A and 3. The deposit of these layers together varied in thickness from 90 cm to 1.1 m and was yellowish pink in colour. The layers 3-6 in the trenches Z'3 and Z'4 were marked by floors and patches of blackish earth. One vase belonging to the burnished grey ware group with a pink slip, slightly flaring rim, oval body and flat base was found sealed by layer 7. In the trench Z'3 a workshop of coppersmith (house 9) and a front courtyard (house 10) perhaps of a copper-smith's house were exposed (below, pp. 93-98; fig. 11; pl. XVIII). From one of the hearths in the workshop was recovered one heart-shaped razor of copper and from the courtyard one crucible. Besides, a part of a workshop of a stone-cutter was also exposed in the trench Y'3 (p. 98). The most important evidence from the levels of this phase in this cutting was that of nine burials, 21-29, exposed in the season 1977-78, which belonged to sub-types Bii, Biii, Cii, Ciii and Type D (below, pp. 183-189). The finds recovered from the levels of this phase were one spear-head with a square tang (fig. 110, 10; pl. CXLIV, 1-4); a terracotta cake (fig. 105, 26; pl. CXXXVI, 3), beads of carnelian, shell and terracotta (fig. 114, 6, 15, 18, pls. CXLVIII, 2, 10, CXLIX, 21); bone points (fig. 119, 5, 15; pl. CLV, 18, 20); microliths (fig. 92, 1, 3-5, 7-10, 14, 16-18, 20, 23, 24; pl. CVII, 4, 7, 2, 9, 17, 18, 5, 8, 15, 12-14, 19, 25, 24); and a polished stone of jasper (pl. CXXI, 1). Of exceptional interest was the find of a stone sculpture-head of *Siva* from X'3 (fig. 100; pl. CXXIII).

The C-14 date obtained for the charcoal sample, BS 181, collected from layer 7 of Y'3 was 2930±100 (3080±110) 1130 B.C.

The layers 2, 1A and 1, represented an overlap between the Malwa and the Jorwe Cultures. The total thickness of the deposit of these layers varied from 25 to 50 cm and in colour it was brownish grey. The layer 2 in the trench X'3 was yellowish pink in colour like that of layer 1A. It contained a large number of small pebbles and sub-angular small stones. Notable among the finds recovered from this phase were two beads of shell with pittings (fig. 114, 21, 22; pl. CXLVIII, 19, 18) and a copper ring (fig. 110, 3; pl. CXI.III, 3).

The area of this cutting was at a low level in this part of Sector II and hence the Phase V was not represented as the deposit of it seemed to have been eroded away.

I. Cutting X'2-X'1 to Y'2-Y'1

The north-south oriented wall of Phase II, first exposed in the trench Y'4 (p. 66), was found to have extended towards south in the trench Y'3. Whether it further extended towards south was to be known and hence the trench Y'2 was taken up for excavation. Immediately after the removal of the topmost layer in this trench, a patch of burnt-red gravel was encountered. It appeared to be a very unusual feature and hence excavation was extended in the adjoining trench X'2. In this trench, after the removal of the thin and hard deposit of surface wash, a large area was seen marked by loose whitish, greyish, and blackish ash. The picture as revealed by the burnt red gravel and the ash indicated some burning activity of a very intense type and in order to understand its significance operations were extended in the adjoining trenches X'1 and Y'1. A small area, about 50 cm wide, along the northern baulk of the

trench Y'2, was deepened upto the black soil with a view to tracing if the mudwall extended further south. A total of 2.35 m thick deposit was encountered in this small cutting. The stratigraphy in it was similar to that described in the cutting X'3-X'5 to Z'3-Z'5 and over the black soil at the bottom was exposed extension of the mudwall of Phase II. However, the area of excavation upto the level of the mudwall could not be extended beyond the breadth of 50 cm; because, the burnt red gravel and the ash were found to belong to two potter's kilns, 1 and 2, of Phase V. Of these two, Kiln 1 was exposed fully in the 1976-77 season. Kiln 2 was to be exposed the next season but because of the unprecedented torrential rains accompanied by hail-storm, the plan had to be shelved. The exposed kiln has provided for the first time valuable information about the technique of firing the pottery adopted by the potters of Jorwe Phase (below, pp. 125-127). The maximum excavated deposit in this cutting was 1.5 m. The uppermost two layers yielded remains of Phase V, lower down the layers 3-7 belonged to Phase IV. The deposit of Phase V above Kiln 1 was found to have been eroded, that near the Kiln 2 being preserved partly. Both the kilns were constructed by excavating into the deposit of Phase IV.

The charcoal sample, BS 178, obtained from Kiln 1 has given the C-14 date 2950 ± 100 (3040 ± 100) 1090 B.C. (below, p. 206).

J. Cutting Y1

When it was observed that the mudwall of Phase II extended in the trench Y'2 but because of the occurrence of the potter's kilns of Phase V excavation in the entire area of that and that of the Y'1 upto the working level was not possible, the trench Y1 was selected with a view to tracing if the wall extended further south. A total of 2.8 m thick deposit along the eastern section was exposed in this trench.

PHASE I, the SAVALDA CULTURE, was not represented in this cutting.

PHASE II, the LATE HARAPPA CULTURE, was represented by layer 13 composed of brownish deposit, the colour being imparted due to weathering. It was 30 cm thick and lay over the black soil. The mud-wall first encountered in Y'4 (p. 66) was found running across the whole trench in the north-south orientation, the total length of it traced being upto 33 meters. An important find from this phase was one lump of slag. Besides, one bead each of carnelian (fig. 112, 1; pl. CXLV, 15) and shell (fig. 112, 13; pl. CXLV, 18), fragments of shell bangles (fig. 116, 2, 3; pl. CLIII, 2, 3), fresh water shells and microliths were also recovered.

PHASE III, the DAIMABAD CULTURE, was represented by layers 12, 11, 10, 9, and 8. The deposit, on the whole, was compact containing clayey earth, light reddish grey in colour and about 95 cm thick. Notable among the finds from these levels was an unfinished bead of hydrothermally altered amygdaloidal red basalt, truncated bicone circular, from layer 8 (fig. 113, 13; pl. CXLVII).

PHASE IV, the MALWA CULTURE, was represented by layers 7, 6A, 6, 5, 4 and 3. The thickness of the deposit of these layers varied from 1 m to 1.2 m, being maximum in this

cutting. It was pinkish grey in colour. The layer 7 was fairly compact and contained clayey earth. As against this, layers 6A and 6 were loose, the former being absent in the western section. The layer 5 was marked by streaks of ash and patches of red burnt material. A few postholes were noticed on the top of layer 5 along the northern section. One of them which was exposed in the northern section of the trench, cut into layers 5-8, contained decayed remnants of a wooden post 8 cm across and about 50 cm high. The layers 4 and 3 were composed of pinkish earth, the former being compacter than the latter.

PHASE V, the JORWE CULTURE, was represented by layers 2, 1A and 1, the deposit of which, about 40 cm thick, was grey in colour. The layer 2 was composed of compact earth with occasional streaks of ash. Layer 1A was missing in the southern section. It was composed of loose earth with several patches of ash. Layer 1 was a surface wash.

K. Cutting Z'1-Z'2 to BZ'1-BZ'2

The second of the two potter's kilns was to be exposed. Moreover, being at a higher level than that of the cutting X'2-X'1 to Y'2-Y'1 described before, other structures contemporaneous with the two kilns were expected to be lying in the trenches to the west of this cutting. With a view to know the nature of the structures, therefore, the cutting under description in the east-west orientation, in continuation of the one mentioned above, was made in the season 1978-79, (fig. 17). This cutting had a fairly steep slope towards east so much so that the layers 1A, 1B, 2 and 2A occurring in the trenches BZ'2, BZ'1, AZ'2 and AZ'1 diminished gradually and left no trace in the trench Z'2 in which the top of layer 3 was exposed below the layer 1 representing surface wash. The layers 1A and 2A were absent in the trench Z'1.

In this cutting the top of Kiln 2 corresponded the top of layer 3. At this level remains of other structures, residential and religious, were also exposed. Among the residential structures were partly exposed two houses, 28 and 29, both belonging to a potter or potters. (p. 137). The religious structures included an Apsidal Temple, house 34 and an adjoining rectangular structure called house 35, closely connected with the former, two large pits, 207 and 208, both connected with child welfare rituals and a partly exposed semicircular structure (below, pp. 138-146). Pit 207 yielded charred grains of Wheat, Barley, Foxtail Millet, Kodon, Ragi, Lentil, Dak Taranghvida, Horse Gram, Beans, Tarla, Peas and seeds of Bex (Appendix II) as also terracotta mother goddess figures (fig. 101, 1, 3; pl. CXXXII, 1, 2), a gamesman (fig. 103, 15; pl. CXXXIV, 1) and a cake, (fig. 105, 25; pl. CXXXVI, 1), stone balls, microliths and fresh-water shells. A number of later pits, 189, 199, 201-203 and 213, caused considerable damage to the structures. Mention should be made of the pits 198 and 199 which damaged to a great extent the Apsidal Temple, house 34, whereas Pit 211 sealed by layer 1, a huge pit in the trench AZ'2, disturbed almost the entire area of this trench, leaving behind stray fragments of mud-walls. Layer 2A was composed of ashy grey compact earth whereas layer 2, although as compact as the former, was marked by a number of ash patches. Burials 46 and 48 were sealed by this layer in trench BZ'1. On the top of 1B was exposed an incomplete plan of a very large house, 65, 9 m long and 6 m broad, of which the postholes, lined

with hard clay packing, were exposed chiefly in BZ'1 and AZ'1, only a small portion lying in the AZ'2 (fig. 21). From this house were collected two drills of chalcedony (fig. 95, 45, 50; pl. CX, 20, 25), suggesting that the house belonged to a carpenter. Interestingly enough this house belonged to the same structural phase as that of house 58 and was located very close to it (p. 149). The layer 1A was confined to the trenches BZ'2, BZ'1 and AZ'1 and even in these trenches it did not run continuously. It was a thin hard deposit, light brown in colour and appeared to represent a floor. Layer 1 was a surface wash. Burials 35 and 36 which were located in house 28 were sealed by this layer. In the trench BZ'2, besides a small portion of a human skull in its southern section, burials 38 and 43 were sealed by layer 1.

L. Cutting AZ'3-CZ'3 to AZ'5-CZ'5

One of the objectives of the 1978-79 season was to expose houses of the Malwa Culture. In the previous season parts of structural remains of this phase were exposed in the Z'5 and X'3 trenches (p. 66) and hence three trenches in the north-south orientation, AZ'3-AZ'5, were deepened upto the top of layer 5. The area of these trenches was a steep slope towards north and in the northern section of the trench AZ'5 the top of layer 5 was covered directly by layer 1, the layers in between having been washed away. Over the top of layer 5, in the trench AZ'3, a platform of hard mud, plastered with mud and with postholes along its margin was exposed. Besides, in other trenches faint traces of mud-walls of structures became also visible indicating that the level of the structures was reached. It was, therefore, decided to extend the operations in a more wide area and hence the trenches BZ'3-BZ'5 and CZ'3-CZ'5 were also deepened upto the working level. Later, a small portion of the trenches AZ'2, BZ'2 and CZ'2 was also excavated upto this level with a view to exposing more area of the mud platform. A small part of the trench CZ'3 was left unexcavated upto this level as the two important burials, 52 and 53 (below, pp. 192, 200), occurred in the courtyard of house 38. The maximum deposit, excavated in this cutting was 1.2 m thick and the lowest levels in all the trenches, at which digging was stopped, belonged to phase IV.

PHASE IV, the MALWA CULTURE, was represented by layer 5. Within this layer and partly on the top of it occurred the remains of residential and religious structures including the houses, a mud platform and different types of sacrificial altars which have given for the first time a clear idea about the religious practices of the authors of this culture (below, pp. 109-114; fig. 12; pls. XX-XXX). From the debris occurring in the uppermost levels of this layer which covered the ruins of the religious complex, in the trench BZ'3, one each a chisel and a flat sheet of copper (fig. 110, 9, 14; pl. CNLIV, 14, 12) were recovered. Noteworthy among the finds recovered from the structures were a cylindrical cake of unburnt clay from the Apsidal Sacrificial Temple (fig. 109, 3; pl. CXLII, 2), beads of shell with pittings, (fig. 114, 11; pl. CXLVIII, 19), carnelian (fig. 114, 2; pl. CXLVIII, 5), faience (fig. 114, 11; pl. CXLVIII, 16) and coral (unillustrated), a terracotta pendant (fig. 114, 15; pl. CXLVIII, 7), bone points (fig. 119, 17, 20; pl. CXLV, 14, 15), a pottery weight (fig. 121, 1; pl. CLIX, 3), a ball (fig. 103, 18; pl. CXXXIV, 4) and a dabber of terracotta (fig. 104, 22; pl. CXXXV, 4).

Of extraordinary interest was a fragment of a vase of thick coarse ware bearing on the outside in applique what has been identified as the image of *Sawa* and an attendant figure by its side (fig. 106, 1; pl. CXXXVII, 2).

The layer 4 which was composed of brownish grey deposit with patches of ash, represented an overlap between Phase IV and Phase V. It was 30 to 35 cm thick in the trenches AZ'3-CZ'3. Sealed by this layer and cut into 5 and partly 6 were exposed seven burials, 44, 45, 47, 50, 51, 57 and 58. Of these, 57 and 58 belonged to the sub-type B_i and B_{ii} respectively and the rest to Type A (pp. 235-237). Outstanding among the finds recovered from the levels of this phase were two copper rings (fig. 110, 4, 5; pl. CXLIII, 4, 5).

PHASE V, the JORWE CULTURE, was represented by the layers 3, 2 and 1. Of these, layers 3 and 2 were not present in all the trenches, particularly being absent in the steeply sloping northern half of the cutting. In the trenches BZ'3, AZ'4, AZ'3 and AZ'4 on the top of layer 3 and belonging to the same structural level as that of houses 28 and 29, lying in the adjoining cutting described before, was exposed the plan of house 64, the house of a beadmaker identified so on the basis of the find of an unfinished bead of carnelian, long bared polygonal (below, p. 180; fig. 115, 11; pl. C, 11). Sealed by layer 3 was burial 41 in the baulk of AZ'3 and AZ'4. The layer 2 was composed of clayey earth greyish in colour. A part of house 38 lay on top of this layer in the trench CZ'3. The burial 53 exposed in the open space east of this house was sealed by this layer and cut into 3. The Burial 52, belonging to sub-type A_{ii}, although lay by the side of burial 53, was sealed by layer 1B. Burials 37, 39, 40 and 42 were sealed by layer 1.

M. Cutting DZ'1 DZ'3 to EZ'1-EZ'3

The exposed portion of house 38 in CZ'3 suggested that it was a big house oriented southeast-northwest. Besides, the section showed presence of number of floors above the exposed walls of this house. Hence with a view to exposing it further the trenches DZ'3 and DZ'2 were taken up for excavation. When layer 1 was removed, below it were exposed remains of circular huts and part of a street. The operations, therefore, were extended in the adjoining trenches for getting a fairly clear picture of these structures. Small portions of the trenches CZ'2, CZ'1, DZ'4 and EZ'4 were also excavated upto the working level. Eleven circular huts, 39-42A and 43-49, one of them, 42 and 42A, being an example of a twin hut, a street, 1.4 m broad, and a lane were exposed. Inside hut 48 were found two double-arm burials, 66 and 67, besides four flat-topped stones arranged in a square form to rest a four-footed storage bin. In the open space of huts 44-46 and 48 was another double-arm burial, 68. The hut-complex found resting upon layer 1A. Immediately below this was exposed, on the top layer 1B, a group of houses of mudwalls of the Jorwe Phase assignable to the structural phase C. It was observed that the house 38, resting upon layer 2, was having four more floor levels above the lowest one. The topmost of these, the fifth one, which was covered with the debris of collapsed walls was coeval with the other seven houses, viz. 57-63, of structural phase C, exposed on the top of layer 1B (fig. 19; pl. XLIV; pp. 188-193).

From the fifth floor was collected a unique terracotta figure of a deified sage and his three consorts unified with him (fig. 101, 5, 6; pl. CXXXIA-C) and from the fourth floor a terracotta cylinder seal (fig. 108; pl. CXLJ). In the eastern courtyard of this house occurred two burials, 52 and 53, the former a double-urn type and the latter an extended inhumation type (below, pp. 192, 200). Of these, burial 52 belonged to the fifth floor level times corresponding to structural phase C and burial 53 to the first floor level coeval with structural phase B. The house 58 yielded drills and a saw blade of chalcidony (figs. 94, 14, 95, 46, 49, 53 pl. CIX, 15, CX, 19, 22, 29, p. 149), suggesting that it belonged to a carpenter. One unfinished bead was recovered from house 57 (fig. 115, 17; pl. CL, 11; p. 148). Cut into the flooring of house 62 and sealed by 1, in the trenches DZ'4 and EZ'4, were found seven burials of double-urn type, three of which, 68-70, were located in a single burial pit. Burial 72 yielded one copper mothergoddess (below, p. 197; fig. 110, 12; pl. CXLIV, 9). This cutting was not further excavated.

The charcoal sample, BS 179, from house 38 produced the C-14 date 2970 ± 100 B.P. (3050 ± 100) 1100 B.C. The charcoal was of *Acacia* sp.

N. Cutting Z63 - Z69

The charred grains recovered by means of floatation technique belonged to various levels exposed in different parts of the site. In the 1978-79 season Dr. M.D. Kajale suggested that these be obtained from a single trench located at such a spot where cultural deposit of all the five phases would be available. It was also decided to cut a section on the river side on the southern periphery of the site with a view to getting an idea about the embankment of which remains were exposed in the cutting DMD 4 in the 1958-59 season (pl. XLVII; below, p. 150). The Z69 in Sector I, situated close to the southern edge of the site and at a high level was, therefore, selected for the dual purpose. The work was commenced in the eastern half of the trench in which the uppermost four layers were excavated. When the operations were shifted to the western part of this trench, immediately after the removal of the topmost layer 1, remains of a massive semi-circular bastion of reddish mud of fortification wall were exposed. In order to expose remains of this fortification wall excavation was extended in the trenches AZ67, AZ68 and Z67 to Z63. In Z67 to Z63, after the removal of topmost layer 1, remnants of the north-south oriented fortification wall were exposed and hence further digging was stopped. In AZ67 a circular bastion was exposed on the western side of the fortification wall. It consisted of concentric layers of hard whitish mud (fig. 22). In order to find out the traces of the fortification wall further north beyond the huge rampfully the topmost layer of the trenches Z53-Z55 and Y53-Y55 was removed. No traces of the wall were found in these trenches apparently because they lay at a much lower level than those mentioned above. From the half portion of trenches Y63 and Y64 layer 1 was removed in order to know if there were remains of any other structure coeval with the fortification wall.

The fortification wall with one semi-circular and two circular bastions, was traced upto

the length of 35 meters (fig. 22; pl. III; p. 165).

Q. Cutting Z69-Z70 to AZ69-AZ70

Because of the occurrence of the remains of the fortification wall, further deepening of the trench Z69 was not considered feasible. Therefore, the trenches Z69 and Z70 and about half part of AZ69 and AZ70 which lay right on the southern edge of the site were taken up for scraping step-by-step by removing the talus material. The steps left in this course were to be deepened by scientific excavation. But the torrential rains of the 3rd March, 1979 spoiled the cutting very badly and hence this attempt was given up. The occupational deposit exposed in this cutting was 5.1 m thick and all the five phases were represented in it as under:

PHASE I, the SAVALDA CULTURE, was represented by layers 20 and 19, the lowest resting upon the black soil developed on the yellow kankary silt. Both the layers were fairly compact, composed of clayey earth and brownish in colour. Layer 19 contained ash patches and was slightly loose than layer 20. Remains of mud-walls, sealed by layer 19, were also exposed in this phase.

PHASE II, the LATE HARAPPA CULTURE, was represented by layer 18. It was light brown in colour, quite compact and mixed with greyish and whitish ash. A mudwall of whitish hard mud was sealed by this layer. It yielded one terracotta stamp seal (fig. 107; pl. CXXXIV, 3).

PHASE III, the DIAMABAD CULTURE, was indicated by only layer 17 which was composed of loose light reddish earth with patches of whitish and ivory black ash.

PHASE IV, the MALWA CULTURE, was represented by layers 16 to 12. On the whole, the deposit of this phase was greyish in colour but showed a distinct pinkish ting. In the levels of this phase three burials, 62-64, were exposed. Burials 62 and 64 were of sub-type A1 and 63 of sub-type Biv (below, p. 183).

PHASE V, the JORWE CULTURE, was represented by layers 11 to 1, 2 meters thick and whitish grey in colour. The layers 11 to 9 contained a large number of patches of ash and were comparatively loose than the underlying layer 12 of the Malwa Phase. The layers 8 to 6 were composed of whitish clayey earth with large patches of whitish ash. Layers 5 to 1 were brownish grey in colour and loose. Burials 60 and 61, both of double-urn type and sealed by layer 5 and layer 6 respectively occurred in the section. The section of the mud-fortification wall was exposed in layers 3 and 2, the layer 1 being graded in this portion.

P. Cutting ZD60-ZD62 (pl. XII)

The unexpected torrential rains accompanied by hailstorm compelled to suspend the excavation for more than a fortnight in the 1978-79 season. An opportunity was taken during this period to explore the site with a view to tracing out traces of the fortification wall and the line embankment elsewhere. In this course, in the rainfalls, in the area of the trenches ZD60-ZD62, quite a number of unweathered potsherds of Late Harappan red ware were



PLATE XII Cutting ZD 60-ZD 62 : section facing west. Near the section is Burial 39 and in the foreground Burial 75.

found. Since no complete house plans of Phase II could be obtained in other cuttings it was decided to try in these trenches which lay close to the fence, in the south-eastern part of the site, on the edge of the left bank of the river, in Sector IV. Half portion of the trench ZD60 was excavated to a depth of only 1.3 m and the remaining half and the other two trenches were deepened upto the top of black soil. All efforts to trace out mud walls of Phase II, the deposit of which lay directly over the black soil, failed.

PHASE I, the SAVALDA CULTURE, was not represented in this cutting.

PHASE II, the LATE HARAPPA CULTURE, was represented by layers 11, 10 and 9 which together varied in thickness from 25 to 40 cm. The layer 11 was thin and composed of brownish earth mixed with small clods of the underlying black soil. The layer 10 was brownish grey and composed of clayey earth with occasional streaks of ash. Layer 10 was compact and contained blackish and whitish ash patches. One potsherd, semi-circular in shape, with rounded sides, engraved on one side with a scene of a tiger attacking a buffalo from behind and on the other a horizontal row of six lozenges with hatched upper half of each shape and the open space between the two (fig. 30, 15; pl. CXXXVIII), a circular potsherd with deep cross, an Indus sign, engraved on both sides (pl. CXXXIX), an oval-shaped terracotta cake (fig. 105, 31; pl. CXXXVI, 2), a terracotta horn of a bull (fig. 102, 13; pl. CXXXIII, 5); triangular, subtriangular, oval, squarish and circular pottery objects (pl. CLVIII, pp.); beads of ivory and chalcedony (fig. 112, 8, 9; pl. CXLV, 8, 14) shells and microliths (fig. 90, 8, 10; pl. CVI, 23, 27) were the notable finds recovered from the levels of this Phase.

Ten samples of potsherds were collected from layer 10 of ZD60 for Thermoluminescence dating. The evaluated values for this Phase were between 2000 and 3000 B.C. (below, p. 210). The C-14 date for the charcoal sample, BS 189, from the hearth sealed by 11 in trench ZD60 was 3390 ± 110 1530 B.C. and for part of the same sample, PRL637, was (3220 ± 110) 1250 B.C. (below, pp. 207-210).

PHASE III, the RAIMABAD CULTURE, was represented by layers 8 and 7 ranging in thickness from 25 to 35 cm, greyish in colour and with light red ting. The deposit was compact and composed of clayey earth. Sealed by layer 7 was the post-cremation burial, No. 59 (pl. LVII; pp. 179-183).

PHASE IV, the MALWA CULTURE, was represented by layers 6, 5 and 4. The thickness of the deposit of these layers varied from 50 to 60 cm and it was pinkish grey in colour. The layer 6 was marked by a number of white ash patches and yet it was compact. Burial 75 was sealed by this layer (pl. LXI; p. 186). In the southern part of the cutting layer 5 contained whitish ash patches. It was composed of hard clayey earth and was fairly compact. Sealed by this layer was burial 56 (pl. LX; p. 183). The layer 4 was, however, comparatively loose although in composition it did not differ from the underlying layer. Burial 55 was sealed by this layer (fig. 61, 8, 9; p. 180).

The layer 3 represented an overlap between Phase IV and V. It varied in thickness from 15 to 30 cm, was grey in colour, composed of compact earth and marked by a number of ash streaks.

PHASE V, the JORWE CULTURE, was represented by layers 2, 1A and 1. The deposit varied in thickness from 30 to 40 cms. It was whitish grey in colour. Sealed by layer 1 was burial 54. Noteworthy find from layer 2 of ZD60 was a copper mothergoddess (fig. 110, 13; pl. CXLIV,1).

Q. Pits

There hundred twentyfour pits were encountered in the cuttings. Of these, two, 207 and 208, were connected with religious rites, one, (209), was used by the potter for storing pots in green hard state, two hundred ninetyfour were refuse pits and twentyseven belonged to a distinct class of circular pits. The last-named were confined to Phase V. They varied in diameter from 1m to as much as 3.5 m. The depth of none was examined. But in a group of ten such pits, 166, 167 and 179 to 186, intersecting each other apparently because they were excavated at different times, exposed in the trench Y'2 near Kilo 1, the bottom of the deepest had reached 2m below surface. The wall of each pit in this was lined with a coat of lime. The pits 198 and 199 were lined with a wall of hard whitish clay varying in thickness from 15 to 25 cm. The filling in the pits consisted of greyish earth mixed with charcoal bits and occasional potsherds, gravel and lumps of clay. Earth to a depth of 5 to 10 cm was examined from pits 166, 196-199, 222 and 225 by means of 'floatation technique'. Of these, only Pits 199 yielded charred remains of Wheat, Horse Gram, Lentil, Peas, Chenopods, Taro and Ber (Appendix II). It is not unlikely that these circular pits were meant for storing food grains. But none of them was found located inside any of the houses of this culture.

What have been called as hearths were not included in the above mentioned categories of pits. They were small and in shape usually oval and circular and only occasionally trapezoidal, as in house 4, and horse-shoe-shaped, as in coppersmith's workshop (house 9), pits, containing ash, charcoal bits and charred or semi-charred animal bones and some with a flat stone. They were found in all the phases usually inside the houses and occasionally in the courtyards. The hearths inside the house were meant to be used as *chullahs* whereas those occurring in the courtyards perhaps represented fire-place in winter such as those situated in the courtyard of house 15 of the Savalga Culture. The former were shallow and the latter comparatively much deeper, the examples in Sector II in the cutting X'3-N'5 to Z'3-Z'5 exceeding 2 meters in depth. Such hearths appeared to have remained in use for generations together or even from one Phase to the other.

5. THE STRUCTURES

1. INTRODUCTORY

Barring Phase III, structural remains were exposed in the levels of all the phases. Not all the exposed structures were given numbers; for example, the elliptical religious structures, the fortification wall, and the embankment of the Jorwe Culture and the stone-cutter's house of the Malwa Culture were not given numbers. On the other hand, in order to avoid confusion, the sacrificial altars were given house numbers and these numbers were retained even after these so-called houses were identified as sacrificial altars. The sacrificial altars and other religious structures were given different names with a view to keep their distinct identity. While doing so the shape and the nature of construction of each were taken into account. The apsidal shape reminded one the shape of *chaityagriha* of early historical times and hence and also because the fire-pit in each contained a third phalange of *bo's*, house 37 of Malwa Culture and house 34 of Jorwe Culture were designated Apsidal Sacrificial Temple and Apsidal Temple respectively. The Heart-shaped Fire Altar, the Ovaloid Sunken Fire Altar, the Rectangular Fire Altar (house 56), the Apsidal Fire Altar (house 66), the Ring Altar (house 36) and Oval Sacrificial Altar were the names given to other exposed sacrificial altars.

The exposed structures were classified into different categories on the basis of their function and the occupation of their occupants such as workshop, craftsman's house, priest's house, merchant's house, nobleman's house, stone-cutter's house, circular house, religious, defences, embankment and unclassified. The workshop was recognized separately as an actual place of production or manufacture in order to differentiate it from the craftsman's house since this latter, although a place of work and production, unlike the former, also served as a residence of the craftsman. Thus in the category of workshop were included coppersmith's workshop, (9), stone-cutter's workshop, the potter's kilns and the 'butcher's hut'.

The craftsman's house was identified on the basis of the finds typical of the craft recovered from the house. Thus, the lime contained in the unbaked pots in house 3 was an indication of the house being of a limemaker. Similarly, the occurrence of unfinished beads in houses 57 and 64 was considered to recognize them as those of bead-makers and the finds of drills from the houses 58 and 65 made one believe them to be of carpenters. The houses 28 and 29 lay close to the kilns. In the former was found a pit (209) which contained fragments of unbaked vases and ash and as such it was recognized as a pit used by the potter to store the leather-hard pots until they were placed in the kilns. The close proximity to the kilns and the above said pit enabled to identify the two houses as belonging to a potter or potters.

It seemed that the exposed house complex of Phase II in Sector II belonged to a

merchant community. This was indicated by one find each of a button-shaped terracotta seal with Indus script from house 16 and house 17 (pls. CXXXIXA-B) and a fragment of a terracotta scale (fig. 121, 8; pl. CLIX, 8). The lump of slag of copper from the nearby cutting Y1 suggested presence of the house of a copper smelter in this part of the site. The house 38 of Jorwe Phase was recognized as that of a merchant on the basis of the find of a terracotta cylinder seal, an insignia (fig. 108; pl. CXLII).

In the category of the residential structures were included those remains of houses about which there was no evidence to suggest the occupation of the owner or occupier and which, in all probability, could have been used as residence, if not also for production.

The large houses, 11 and 12, of the Savalda Culture with three and two rooms respectively and with a spacious front courtyard, and house 4 of the Jorwe Culture with three rooms and the front and the back courtyards appeared to be the possessions of well-to-do and important persons of the settlement and as such have been included in the category of nobleman's house. The find of an ithyphallus of agate, a cult object, from the fire-pit of a large house, 15, of the Savalda Culture, with a spacious front courtyard, was the main consideration to regard the house as that of a village priest. The houses 32, 33 and 54 of the Malwa Culture seemed to form a single residential complex like that of a modern *Wada* of Maharashtra and perhaps was the possession of the head priest of the religious complex. The houses 30, 31 and 55, being located so close to the religious complex, in all likelihood, belonged to the priests.

The sacrificial altars were characterized by their unusual shape, intricate construction and a fire-pit containing semi-charred and charred bones, or charred grains as in the Rectangular Fire Altar, the features which distinguished them from the other structures. The altars located inside the *Wada* were perhaps for performing sacrifices by individuals or by the priests in the house whereas those situated outside were probably for the public to perform grand sacrifices, particularly for the nobles and the rich as was indicated by the number of potrests suggestive of the number of pots containing offerings that the *yajamana* or the sacrificer had to offer which certainly could not have been within the means of a common man. The spacious mud-platform with postholes to hold the roof above was for the public to assemble and the provision of channel over the platform as also in the courtyard of house 31 was for ablution before going to the sacrificial altars. The *chullahs* in house 32 near the Heart-shaped Sacrificial Altar were probably for cooking food meant for offering oblation. The hearths on the platform perhaps served the same purpose. The three postholes in a solitary wall near the ablution channel were perhaps for fixing posts to tie the animals to be sacrificed. The entire complex thus presented the picture of a well-developed sacrificial cult and indicated that the sacrifice dominated everything.

It took little time to identify sacrificial altars in the Malwa levels. But once they were recognized, identification of religious structures of the Jorwe Phase in Sector II was not difficult. The apsidal plan, the fire-pit with small stones and a third phalange of *Bos* in the inside, and the bowl containing black clay were the base to regard house 34 (called Apsidal Temple) as a religious structure whereas house 35 appeared to be closely connected with the former as was evident from a continuous spread of mudplaster coats in both. The *yonipratha* shape,

the female symbol of generation) of Pit 207 and its contents, particularly the terracotta mother goddesses, were enough to identify it as a religious structure. The lenticular shape, the parallel approach paths plastered with cowdung, and clusters of pots, including miniature forms, helped recognize the mudwall complex as of religious nature and for performing rituals connected with the welfare of children. The types of religious structures exposed were thus meant for performing different kinds of religious rites.

All the exposed circular houses seemed to belong to a single structural phase. They were classified into a separate category not only because they were different in their form but also because it was difficult to make out as to whether they represented store houses or residences. There seemed, however, every possibility that they were meant to be used as stores. This appeared more plausible from the fact that in House 48 were found four flat-topped stones to rest the storage bin, besides the two double-urn burials (fig. 21; pl. I), and in the circular hut (house 2) in Sector I remains of large storage jars as well as a mud-platform were exposed. Low mud-platforms were also exposed in almost all the circular huts. It appeared that they were made for keeping storage vases. What was, however, perplexing was the fact that, except houses 41 and 48, none of the circular huts showed presence of a hearth although a few of them did contain ash patches. The large open space with well-prepared flooring and post-holes along its edge parallel to the edge of the street, was perhaps the place of daily activities and the huts were meant to be used chiefly for storage.

Those structures which could not be classified reasonably were grouped under 'unclassified'.

The exposed structures are phase-wise described in the following pages.

2. PHASE I: THE SAVALDA CULTURE.

A. Introductory

The eleven houses (fig. 9; pl. XIII), all exposed in the cutting FZ63-FZ64 to JZ 63-JZ65, in Sector I, were divisible into two structural phases, A and B, the former being earlier than the latter. To the phase A belonged four houses, 23 and 25-27, and to phase B seven, 11-15, 22 and 24, those of the latter being divided into three categories, viz. (1) Nobleman's house (2) Priest's house and (3) Unclassified. To the first category belonged houses 11 and 12, to the second house 15 and to the third the rest. In the structures of phase A the evidence was too meagre to attempt such a categorisation and as such they have been grouped under the category of unclassified.

The structures of both the phases are described below.

B. Structural Phase A.

(i) Unclassified

(a) *House 23*: This was the only fully exposed house of phase A. It was a trilateral house facing east, with mud walls, 20 cm thick, one each on the south, west and north, the eastern

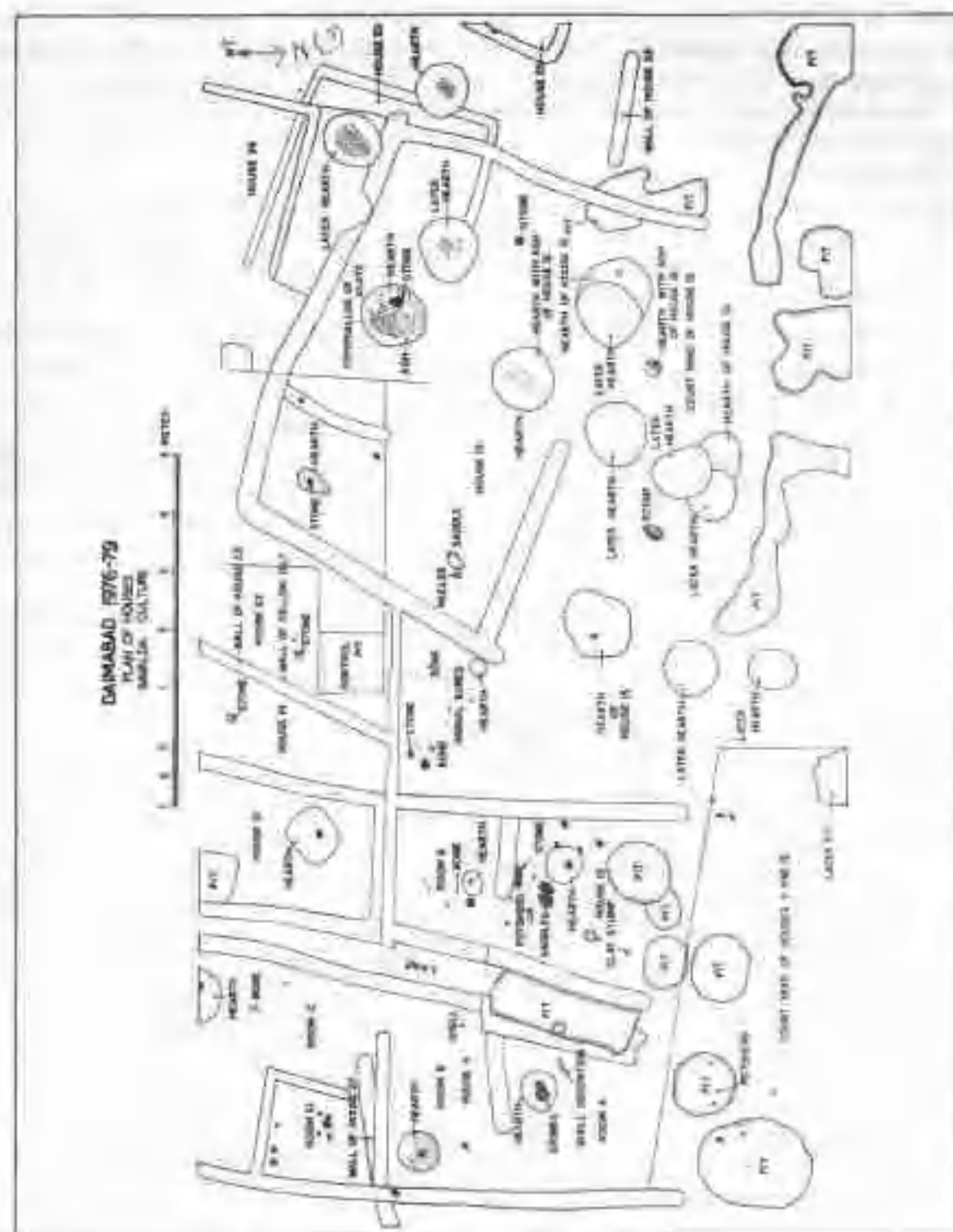


Fig. 10. Plan of houses - Samalika Culture.

side being open. The house was 3.5 m long and 3.1 m broad at the backside. The northern wall was survived only to a length of 1.9 m, being partly cut by one of the later hearths. A small portion of the western wall was also eaten away by a later hearth.

(b) *House 25*: was similar in shape to house 23 but only a small portion of its eastern and northern walls was exposed.

(c) *House 26*: was represented by only an extant fragment of mud-wall, 2 m long and 25 cm thick, lying east-west to the north of house 25. The area here was very much disturbed.

(d) *House 27* was represented by a part of a wall of whitish mud, 25 cm thick. The three-meter-long exposed portion of this wall passed from below the partition wall of Room C of house 11. In the small dog-out portion on either side of this wall close to the eastern section of the cutting a part of this wall was exposed to a height of 50 cm. The occurrence of part of this wall in the section of the cutting suggested that more structures of this phase were present to the east of the cutting.

C. Structural Phase B

(i) *Nobleman's House (pl. XIV)*

(a) *House 11* was of three-rooms, A, B, and C, each room separated from the other by a partition wall. It faced north and was exposed to a length of 8.9 m, part of the third room, Room C, lying in the adjoining trench. The eastern wall of the house was 8.3 m long but the western was 7.6 m. Both these walls were 30 cm thick but the western of these suffered damage by a burial pit of Phase III. The breadth of this house was not uniform, at the southern exposed end it was 3.6 m and at the entrance on the north 2.2 m. The exposed part of Room C measured 3.6 m north-south and 3.6 m east-west. Inside this room were found two beads, one each of shell and steatite (fig. 111, 1, 2; pl. CXLV, 1, 2.). In its northeast corner was a compartment, made by a 20-cm-broad L-shaped wall, measuring 2.1 m north-south and 1.65 m east-west. The floor in this compartment had a soling of small sub-rounded stones. The hearth in this room was only partly exposed on the south. The room B measured 1.8 m north-south and 3.3 m east-west. It was separated from Room C by a mud wall, 2.65 m long and 25 cm broad. It had a circular hearth 70 cm in diameter. From this room was recovered one fragment of harpoon of bone (fig. 119, 1; pl. CLV, 25). The room A was 2.2 m long and 2.2 m broad (east-west) at the entrance. It contained an ovaloid hearth, 70 m. x 60 cm, with two flat stones in the centre for the pots to rest. In about 25-cm-square area of the floor fresh-water shells were found embedded near the hearth as a decoration (pl. XV). This house was separated from the houses 12 and 13 by a narrow lane varying in width from 30 cm to 55 cm.

In front of the houses 11 and 12 was a spacious courtyard which was only partly exposed. In the exposed courtyard were collected one bead each of carnelian and terracotta (fig. 111, 4, 3; pl. CXLV, 3, 4), one sawn piece of conch shell with an ovaloid hole (fig. 118, 1; pl. CLIII, 1), one highly corroded copper ring (unillustrated), a bone point (fig. 119, 4; pl. CLV), and a notched arrowhead of bone (fig. 3; pl. CLIV, 4).



PLATE XIII Cutting FZ 63/EZ64 to JZ 63/JZ64: final eye view of structures of structural phases A and B, Phase I.



PLATE XIV Cutting FZ63-FZ64 to JZ 63-JZ64 - general view of houses 11, 12 and 13 and a line of structural Phase B, Phase 1, looking south. The wall of house 27 of structural phase A is also seen exposed in the narrow cutting along the section on the left.



PLATE XV Cutting FZ63-FZ64 to JZ63-JZ64: close view of fresh water shells embedded in the floor of Room A of house 41, Phase I

(b) *House 12*, facing north, consisted of two rooms and was 5 m long. Towards north the side walls of this house were widened giving a trapezoidal shape in plan to this house. At its southern end the breadth of the house was 1.9 m whereas that at the front, on the north, 2.9 m. A partition wall, 1.4 m long and 30 cm broad, divided this house into two rooms, A and B. Room A was 5 m long north-south with a circular hearth 60 cm in diameter. Adjacent to the partition wall was lying one flat stone and near the hearth were two fragments of saddle querns and animal bones. There were also four roughly circular hard clay stumps varying in diameter from 6 to 20 cm, apparently to rest the wooden poles to carry the roof in this room. Room B was 1.7 m north-south. It had an almost circular hearth 40 cm in diameter with a flat stone inside. Nearby this hearth were also found lying animal bones. The charred sample, BS 176, recovered from Room A has given the C 14 date 3590 ± 90 (3695 ± 95) 1745 B.C.

(ii) *Priests House*

House 15 was one of the largest among the Savulda houses, measuring 7 x 4.5 m. It lay in the southeast-northwest orientation with a 4-meter-wide entrance facing northeast. This house differed in some respects from the other houses of this phase in that it was almost rectangular in shape and had a short fourth wall on the entrance side. In the south-western part of the house was a small room or compartment, 2 m long and 1.75 m broad, made by a partition wall 30 cm broad. Inside this room was an oval-shaped hearth, 60 cm long and 40 cm broad, and with a flat stone in the centre. In this room was found one tanged arrowhead of bone and also a rib-bone of *Bos*, the raw material for making such a type of arrowhead (fig. 119, 7; p. CLIV, 5). In the northeast corner of the house were found one each a saddle quern with a depression and a fragment of muller stone, plano-convex in section. In the south-west portion of the house were two circular hearths from one of which was recovered the lithophallus of agate (fig. 99; pl. CXXIIA-B). Near the entrance were also two circular hearths. This house had a very large front courtyard and besides, there was an open space between this house and house 12. There were three circular hearths in the courtyard of this house. This was perhaps a house of the village priest or religious chief of the settlement.

(iii) *Unclassified*

(a) *House 13* was located to the south of house 12, the northern wall of it being adjacent to the southern of the latter. The house faced south and only a small portion of it, 2.9 m north-south and 2.2 m east-west, was exposed. In this exposed portion occurred a roughly rectangular hearth, 1 m x 90 cm. The walls exposed on three sides were 30 cm broad.

(b) *House 14*, facing south, had a common wall on the east with the western wall of house 13. The wall on the north, starting from the northern wall of house 13 and touching the eastern wall of house 15, was also shared by house 22. The eastern wall of this house was 3.2 m long and 20 cm thick, while the western lay obliquely, giving a trapezoidal shape to this

trilateral house. The breadth of this house at its northern end measured 90 cm and southern end 1.7 m.

(c) *House 22*, facing south, lay between house 14 on the east and house 15 on the west. It was formed by the western wall of the former and the eastern wall of the latter, the wall on the north touching the eastern wall of house 15 and partly shared on the east by house 19. The exposed area of it measured 2.2 m broad at its entrance towards south. In the centre of this house was found a circular flat stone, 10 cm in diameter.

(d) *House 24*, facing east, of trilateral type like house 23 of phase A, was located to the south of house 15. Only two of its walls, 18 cm thick, were exposed.

3. PHASE II: THE LATE HARAPPA CULTURE

The structures of this phase were exposed in the cuttings CZ61 and X'3-X'5 to Z'3-Z'5. They belonged to two main types: (1) mud-brick and (2) mud-wall.

A. Mud-Brick Structures

The remains of the first type were represented by an extant coffin (pls. LIII-LIV; pp. 175-176) and a mass of mud-brick wall in CZ61 and Y'4 respectively. Nine full-size mud-bricks were recovered from the coffin from the head-side of the skeleton, burial 18, the rest being in fragments. Of these, four measured 32 cm x 16 cm x 8 cm and five 28 cm x 14 cm x 7 cm, both the sizes being in the 4:2:1 ratio. In the trench Y'4 the face of the mud-brick which was noticed jutting out of the fallen section before the actual commencement of the 1977-78 season's work (p. 68), measured 30 cm in length and 8 cm in thickness. The breadth could not be measured because the specimen crumbled while it was being taken out. The debris of mud-bricks (pl. XVI) found lying by the side of the brick *in situ* mentioned above, did not contain complete specimens. Two of these were, however, found bonded together by mortar of black clay in between.

B. Mudwall Structures

None of the mudwall houses showed a complete plan (fig. 10; pl. XVII). This was because of disturbance caused by huge later pits which had eaten away the mudwalls and also the floorings. But using surviving walls and traces of their foundation as also the patches of floorings, plan of eight structures, 16, 16A, 17, 17A and 18-21, could be reconstructed. The mud-plaster of the floor, of which five coats were counted in house 16, was very thin and the mud used for plastering was light reddish brown in colour. The mud-walls were mostly of black earth and only occasionally of greyish or whitish grey earth, with their foundation in the black soil. The shortest extant exposed wall measured 45 x 45 cm and the longest with its thickness varying from 30 cm to 50 cm, and lying in the north-south orientation, to a length of 33 m. It was of black earth. The structures are described below.

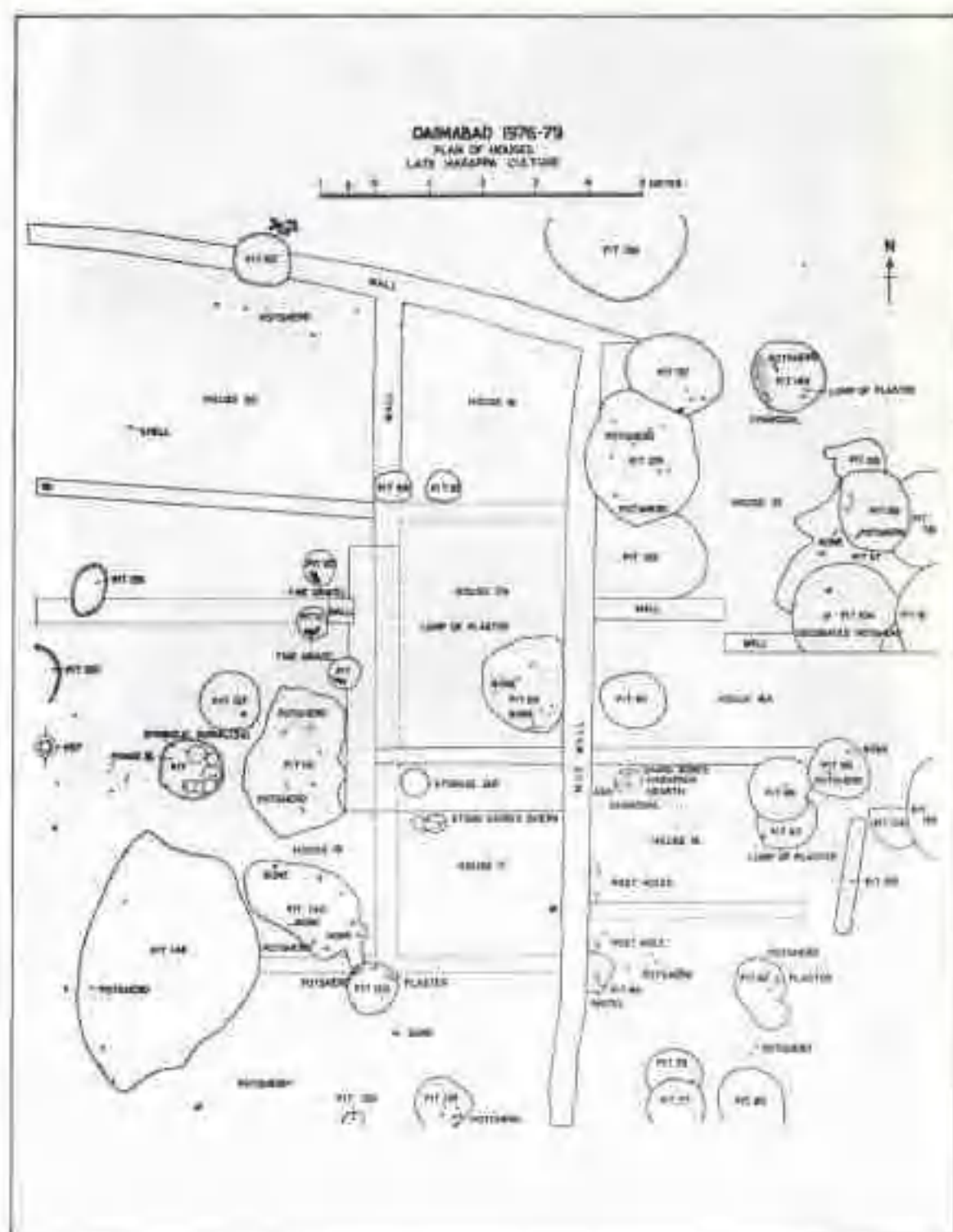


Fig. 10. Plan of houses : Late Harappa Culture.



PLATE XVI Cutting V4 : mud-brick debris of a fallen mud-brick wall, from southwest. Mudbricks bounded together with black and mortar are seen in the entire foreground. Phase II.



PLATE XVII Cutting X₁X₂ to Z₁Z₂ : general view of the exposed eastern mudbricks, looking west.
Phase II

(a) *House 16* measured 4 m long and 2.6 m broad. In this house was exposed one circular hearth of 50 cm diameter. Its southern and northern walls were 50 cm broad. In its south-west corner were two postholes. To the south of this house was an open space. It was in this house that the first terracotta button-shaped seal bearing Indus sign (pl. CXXXIXA) was found.

(b) *House 16A* was represented by a space on the south of which was house 16, on the west house 17A and on the north house 21. Traces of wall on the east could not be traced out. This open space could have also been an approach path or a street 1.8 m wide.

(c) *House 17* was another important house of Phase II which lay to the west of house 16, the north-south lying long mud-wall being the major visible partition between the two. It was 3.6 m north-south and 3 m east-west. Embedded in the floor of this house were found one saddle-quern and lower portion of a large storage jar of coarse red ware with flat base (fig. 10). Important finds from this house were a terracotta button-shaped seal bearing Indus script (pl. CXXXIXB) and a complete shell bangle (fig. 118, 4; pl. CLIII, 4).

(d) *House 17A* was formed by the walls of house 18 on the north, of house 17 on the south, of houses 16A and 21 on the east and of 19 on the west. The space of the house lying within these boundaries measured 4.3 m north-south and 3.1 m east-west.

(e) *House 18* measured 3.7 m north-south and 3.35 m east-west. Its northern wall lay obliquely in the northwest-southeast direction and on the east it was joined by the north-south lying long wall.

(f) *House 19* was the largest among the houses of the Late Harappan Phase, being 6.3 north-south and 6 m east-west. Its western wall perhaps lay in the unexposed western part of the cutting, whereas the traces of foundation of the eastern wall were only visible. The southern wall was cut up by the huge spoil pit, No. 145, its fragment, 45 x 45 cm, being only survived.

(g) *Blind Lane* (?) between houses 19 and 20 was an open space varying in width from 1.6 m to 2 m, in the east-west orientation. It might either be a courtyard or an end-part of a blind alley.

(h) *House 20* was also a large house measuring 6.5 m east-west and 4.3 north-south. It had common walls on the east and north with house 18. The wall on the south was on the "street" side whereas that on the west perhaps lay in the unexcavated area.

(i) *House 21* was having two fragments of separate walls on its south. On its west was the wall of house 18. No traces of wall could be located on its east whereas on its north was a fragment of a wall in continuation of the northern wall of house 18. In the area of this house were found ten large pits, Nos. 57, 61, 102, 104, 129, 137, 143, 155, 156 and 159.

4. PHASE III: THE DAIMABAD CULTURE

No structure as such which could be assigned to this phase was exposed. In the trench GZ61, as pointed out before, a small portion of a furnace was encountered. It yielded one piece of slag. The structure on the southern edge of the mound described by

Rao as copper smelting furnace containing "a row of pot-furnaces for refining furnace metal" and ascribed to the Malwa level¹ actually belonged to the Daimabad Culture. No slag or lime and charcoal were observed nearby this furnace when the area was cleaned in the 1976-77 season. Two small bowls containing beads were, however, found closeby (p. 53).

5. PHASE IV : THE MALWA CULTURE

A. Introductory

Except for a row of six postholes spread over an area of 4 meters in trench FZ64 no structures were exposed in Sector I. All those described below were exposed in Sector II. They have been grouped into five broad categories, viz. (1) Workshop, (2) Craftsman's house (3) Priest's house, (4) Religious and (5) Unclassified. They belonged to two structural phases, A and B, the former earlier than the latter. To the structural phase A belonged houses 9, 10 and 50-53 and to B 30-33, 36, 37, 54-56, 66, the stone cutter's workshop and an unexposed circular structure. They are described below (figs. 11, 12; pls. XVIII-XXX).

B. Structural Phase A

The structures of categories (1), (2) and (5) belonged to this phase.

(i) Workshop

A. Coppersmith's Workshop (fig. 11; pl. XVIII)

House 9 represented the coppersmith's workshop with a well-made floor plastered with mud. It contained remains of two furnaces, four pots, a rectangular fragment of stone and mud-platforms which were partly exposed. Of the four pots, one was represented by the base of a thick jar which lay between the two furnaces. The second was a *kunda*-type vase found lying in a slanting position against the third pot which was the base of a bulbous pot embedded in ground and the fourth was a globular pot with high featureless vertical rim partly embedded to the south of the *kunda*. The rectangular stone was found lying close to the pots. Both the furnaces contained ash, but the one on the north yielded one heart-shaped razor of copper (fig. 110, 11; pl. CXLIV, 13). That this workshop was provided with a roof, perhaps a slanting one, supported on the wooden posts, was apparent from the presence of postholes in its mud-plastered floor. Both the furnaces were U-shaped and their walls, made of mud, were burnt red. The mouths of both of them faced the mud-platform meant for taking a seat by the coppersmith.

(ii) Craftsman's House (fig. 11; pl. XVIII)

Just opposite the Coppersmith's workshop, but separated from it by a north-south

1. Rao, *op. cit.*



PLATE XVIII Coppermith's workshop (house 8) and Craftsman's house (house 10) (in the foreground)
 Situational Phase A, Phase IV.



PLATE XIX. Bone-carver's workshop with different types of millers and the deep platter of unfired clay.

running channel, 75 cm wide, was house 10. It consisted of a mud-plastered floor and post-holes of what may be the front courtyard of the copper-smith's house. An interesting find from the floor of this house was a crucible.

(iii) *Unclassified*

The houses 50-53 were represented only by the floors. These floors were exposed below the floors and walls of houses 32 and 33, the Apsidal Fire Altar and the surface east of it which had to be removed after the torrential rains of the 3rd March 1979 had badly damaged them. The floors were only partly exposed. It was not possible to understand the nature of the structures represented by these floors.

C. Structural Phase B

Structures of this phase belonged to three categories, viz. (1) Workshop (2) Priest's house and (3) Religious, besides an unexposed circular structure.

(i) *Workshop*

A. Stone Cutter's Workshop

To this category belonged only one partly exposed structure, the workshop of a stone-cutter (pl. XIX). On the partly exposed floor of this workshop were found lying fourteen stone mullers and five broken stones, apparently the raw material for preparing mullers, by the side of a large and deep platter of unbaked clay with vertical sides and flat base embedded in the floor. The mullers were of varied types including rectangular, sub-triangular, tapering, oval and barrel, the last-named variety being closely parallel with the modern type used in the region. Their occurrence in large number and in a variety of shapes in association with raw material close to the platter, perhaps used for storing water to be used while grinding the surface of the mullers to make them smooth, suggested that they were the possessions of a stone-cutter dealing with supply of stone mullers to the inhabitants.

(ii) *Priest's House*

A. Introductory

The houses 32, 33 and 54 appeared to belong to a single house-complex. This complex is comparable with a *Wada* which in Maharashtra consisted of a group of houses or rooms occupied by different families or various members of one patrilineage within a large single enclosure. In the present example the *Wada* had a wall on the west and one each on the north and south running parallel to each other. The wall on the west was 1.0 m thick and it had a post-hole at each end. Towards east was a lane on either side of house 54 to serve as an approach to houses 32 and 33 and to the Ovaloid Sunkin Fire Altar as well as Heart-shaped Fire Altar.



PLATE XX View of Wade in the Religious and Residential Complex showing houses 32, 33 and 54 (foreground) with Heart-shaped Fire Altar, Ovaloid Sunken Fire Altar, Oval Fire Altar and the Chaudetashda step by the side of the eastern entrance of house 54, looking west, Phase IV. (This photograph shows the remains survived after the rains of 2nd March, 1979).



PLATE XXI Partial view of the Heligina and Residential Complex showing Mud-platform; Ablution Channel; Wada (centre background); Apollal Sacrificial Temple and Ring Altar, looking east. In the left background, corner is seen unexcavated circular structure, Phase IV. (This photograph shows the remains involved after the rains of 3rd March, 1979).



PLATE XXII

Partial view of the Heligmos and Residential Complex showing Multiplatform Ablution Chunzei, Wada (right foreground) with Chunzei, Heart-shaped Fire Altar, Ovaloid Sunkun Fire Altar, Oval Fire Altar and Chunzei steps by its side; Apollon Sacrificial Temple; Ring Altar and Rectangular Fire Altar (Right side background), looking west, Palace IV. (This photograph shows the remains survived after the ruins of 3rd March 1979).



PLATE 2XIII Extant pottery decoration in the floor of house 30, Religious and Residential Complex.
Photo IV



PLATE XXIV *Chuluk* in house 30, Religious and Residential Complex, Phase I

The houses had separate as also interconnecting entrances. Almost identical dimensions was the striking feature of the houses or rooms in this *Wada* and the adjoining house 31 having a common wall with the latter. The dimensions ranged from 3.70 m to 3.90 m length and 2.40 m to 2.50 m breadth. This fact also suggested that they belonged to a single owner. In house 32 and in the space between it and house 54 was located one sacrificial altar each, the Heart-shaped Fire Altar and the Ovaloid Sunken Fire Altar respectively. They were perhaps meant for performing sacrifices by individuals or by priests in the houses. The southern door of House 33 opened towards the Apsidal Fire Altar, Apsidal Sacrificial Temple and the Mud Platform. This facilitated easy access to and from the *Wada* both for the members of the public and the priests. This *Wada* and house 31, therefore, seemed to be closely connected with the performance of sacrificial rites and belonged to a head-priest or one patrilineage.

The close proximity of the houses 30 and 55 to the religious complex also suggested that they too belonged to the priests. Between them was an open space, 1.4 m broad, with a finely made floor which served as an approach path from the north leading to the Ring Altar, Rectangular Altar (called House 56) as also the common courtyard of houses 31 and 32. In this courtyard, in front of house 31, was an ablution channel, 85 cm long and 28 cm broad, spilling to a soak-pit filled with gravel and lined with clay packing. This was perhaps meant to be used by those going to the Ring Altar, Rectangular Altar and houses 31 and 32.

Of all the residential and religious structures exposed at Dumehad those in the residential and religious complex of the Malwa Culture were the most elaborately made and pleasing to look at. Unfortunately, however, the torrential rains of 3rd March, 1979 caused tremendous damage to them. The general view of the complex in pls. XX-XXII was taken after removal of the damaged parts. Fig. 12 shows the plan of the structures before damage.

B. Description of Houses

(a) *House 55* suffered severe damage due to later pits. It was partly exposed. Its east-west dimensions measured 5.1 m. In the exposed extant portion were two rooms, A and B, formed by an east-west running wall through which there was an entrance into Room B. The Room A, southern room, was 2.65 m broad. The house had one entrance each from the south and the east, 90 cm in breadth and with one posthole each for a single-flap door.

(b) *House 30* was eaten away on its north by a large pit. Its extant portion measured 4.6 m east-west and 3.6 m north-south. The house was divided into two rooms, A and B, by a north-south running wall, 15 cm broad, leaving a 50 cm wide gap to serve as an entrance. Room A measured 2.6 m and Room B 1.8 m east-west. The postholes occurred at the joints of the walls and in the walls. In the eastern room, (Room A), towards north was a circular hearth. Near this hearth, a 30 cm circular portion of the floor was decorated with vertically placed potsherds of Malwa Ware (pl. XXIII). To the south of the decorated floor was a U-shaped *chullah* with a cusp on the inside at the apse (pl. XXIV). Its arms were 15 cm broad and 10 cm high. The base of the *chullah* burnt red owing to fire, had a thick mud plaster. Charred grains of Wheat, Barley, Lentil and Ber were collected from this house (Appendix II).

(c) To the south of house 30, but separated from it by a 20 cm wide lane, was house 31. This rectangular house, with a 90-cm-broad entrance, facing west, having a 3-cm-high mud-step and one posthole, measured 3.9 m east-west and 2.4 m north-south. In its north-west corner was a circular pit, 25 cm in diameter, filled with fine gravel, meant perhaps for keeping a water-pot. In the centre of the house was a circular hearth, 90 cm in diameter, with a flat stone in its centre. In the north-eastern corner of the room was 55-cm-square compartment provided by an L-shaped wall. Fragments of a jar of thick coarse ware—a storage jar—were found by the side of this compartment.

(d) House 32 was a rectangular room measuring 3.9 m east-west and 2.4 m north-south. It had two entrances, one on the north and the other on the east, 1.00 m and 90 cm wide respectively. The entrance on the north with one posthole had a low mud-step, 2 cm high, close to that of house 31. Inside this house to the left of the northern entrance were about half-a-dozen U-shaped *chullahs* superimposing one another, burnt red due to fire, a few with a cusp in the inside at the apse and with ash in the inside (pl. XXV). The top and sides of the *chullahs* were plastered with mud-paste. Their mouth was about 15 cm wide and they faced different directions, that of the topmost facing south. To the east of the *chullahs* was Heart-shaped Fire Altar (fig. 12; pl. XXVI) covered, leaving the circular area of the central fire pit with ash, entirely with mud-plaster. On its broad side on the east it was 10 cm high above the surrounding floor level. Its top was flat and sloping towards west while its periphery was steeply sloping. It measured 1.8 m long and 1.5 m (maximum) broad. With a view to understanding details of its construction it was cut across along north-south. It was found that in the centre of the fire pit was embedded a rectangular stump of yellowish white hard clay measuring 22 cm x 20 cm, the corners facing east-west and north-south. Around the fire pit was a ring of clay similar in colour and composition to that of the rectangular stump, 70 cm in diameter, and varying in width from 12 cm to 15 cm. The floor surrounding the fire-pit but lying inside the clay ring was made of the clay of which the ring and the stump were made of whereas that outside the clay ring but lying in the inside of the periphery, was made as meticulously as the surrounding floor of the house. The fire-pit yielded fragments of charred and semi-charred bones. The eastern wall of this house with an entrance with a mudstep and posthole on either side, opening towards the Ovaloid Sunken Fire Altar, was 8 cm thick. Charred grains of Barley, Ragi, Lentil, Horse Gram and Cheno/Ans were collected from this house (Appendix II).

(e) The Ovaloid Sunken Fire Altar, measured 1.4 m in length (east-west), 85 cm in breadth and 5 cm in depth. Its sides and floor were well-plastered. In the fire altar were ash, charcoal bits, semi-charred bone pieces and a few potsherds.

(f) To the south of house 32, and separated from it by the east-west lying 10 cm thick mudwall, was house 33. It measured 3.7 m long and 2.5 m broad and had a 70 cm wide front courtyard. It had three entrances, one each from the north from inside house 32 with a mud-step, 3 cm high, from the south and from the east. The northern entrance was 70 cm wide, the southern 60 cm and the eastern 1 m with a 6 cm high and 1 meter square mudstep or platform and a posthole each on either side. By the side of this eastern entrance was a mud-



PLATE XXV *Gaullate* near the Heart-shaped Sacrificial Altar in house 82, Religious and Residential Complex, Phase IV.



PLATE XXVI Heart-shaped Fire Altar and Ovaloid Sunken Fire Altar (background), Religious and Residential Complex, Phase IV.



PLATE XXVII - Oval Sacrificial Altar, view from top. Religious and Residential Complex, Phase IV.

latform, 1.1 m long, 95 cm broad and 5 cm high. Over it were clear impressions of a 15-cm-broad wall of wattle and daub connected with the southern wall of the *Wada*. Close to the western wall of this house was one circular pedestal of hard whitish clay, 20 cm in diameter, and nearby a decoration of horizontally embedded potsherds on the floor in a circle, 15 cm in diameter. A patch of floor near this decoration had a gravelly surface. The house yielded charred grains of Wheat, Barley, Lentil, Horse Gram, Ragi, Bean and Ber (Appendix II).

(g) To the east of houses 32 and 33 within the east-west running parallel mudwalls of the *Wada* and flanked by a lane, 40 cm wide, was *house 54* in the north-south orientation. It was 3.8 m long and 2.4 m broad and had two entrances, one from the west and the other on the east. The former was 1.8 m broad with a posthole on either side and about 15 cm high mud-step. The eastern entrance, located in the south-east corner of the house, was 95 cm broad, with a posthole on either side and a semi-circular mud-step of hard clay, 50 cm long and 40 cm broad, representing a prototype of *chandrashila*. Immediately to the north of this step was an Oval Sacrificial Altar (pl. XXVII), 95 cm long, 75 cm broad, with 20 cm high rounded sides and a circular fire pit, 35 cm in diameter, in the centre filled with ash, a few potsherds and bits of bones. Inside the house a short wall, 70 cm long and 16 cm broad, formed a compartment in the north-east corner. The floor of the house was sunken and damaged by a later pit, (312), near the western entrance.

(iii) Religious Structure

(a) This is a unique structural complex consisting of a spacious mud-platform and sacrificial altars of different types, lying close to the residential complex described above and very much connected with it. The mud-platform oriented northwest southeast but all the other structures lay along the cardinal points. The mud-platform was exposed to a length of 18 meters. The exposed portion varied in breadth from 2.9 m on the southeast and 6.15 m on the northwest. Its margin was lined with a series of postholes varying in diameter from 14 cm to 36 cm.

(b) Over the platform, towards east, was an apsidal dwarf wall, 32 cm wide, 4 cm high and with square ends. From the apse of this wall originated a channel, 5 cm deep and varying in width from 55 cm at apse to 40 cm at the end where it spilled into a soak-pit, 52 cm long and 45 cm broad, lined with hard whitish clay coil, 8 cm thick, and filled with gravel. At a lower level there was another similar type of soak-pit, but smaller in size, measuring 25 cm long and 20 cm broad, filled with gravel and lined with hard clay coil, 3 cm broad. At the end of the right side arm of the apsidal wall was a posthole, 18 cm in diameter. There was also a corresponding posthole on the other side of the channel. Besides, one posthole each was also present on either side of the channel, at the edge of the platform.

(c) To the east of the soak-pits was a solitary mudwall, running parallel to the mud-platform. It was 2.1 m long and 26 cm broad. Three postholes, one each at either end and the third almost in the middle, 24 cm in diameter, two of them lined with hard clay coils, were cut through it. The purpose of this solitary wall is difficult to understand. But the



PLATE XXVIII Close view of the Apsidal Sacrificial Temple, Reliquary and Residential Complex, Phase IV.

postholes within suggested that they were perhaps meant for fixing the wooden posts to tie the animals to be sacrificed.

(d) About 80 cm west of the soak-pits and 60 cm north of the mud-platform was the Apisidal Fire Altar. This consisted of an apsidal clay wall, burnt red due to contact with fire, resting over a horse-shoe shaped platform of hard clay, 1.3 m long and lying almost parallel to the mudplatform. The northern arm of the clay wall was 18 cm broad and the southern 25 cm, the ends of both being rounded. The length of the space inside the apsidal structure was 1.05 m. The entire structure was covered with a thick layer of ash and as such it was thought that it represented a hearth and it was designated *Hearth* in layer 6. After removal of the ash, however, the structure as described above was exposed. It yielded a vast quantity of charred and semi-charred animal bones, potsherds and charred grains of Wheat, Barley, Ragi, Lentil, Horse gram, Grass Pea, Sagandha Bela, Tarla, Cheno/Ams and Ber (Appendix II).

(e) Beyond the Apisidal Fire Altar, towards west, was the unique religious structure, called Apisidal Sacrificial Temple (pl. XXVIII) (house 37), facing south, with a low mud-step, 2 cm high, 70 cm long and 24 cm broad, placed a little obliquely at the entrance and a posthole 20 cm in diameter on the east. The apsidal mud-wall of this temple with its plastered top was 5 to 10 cm high and 20 cm broad. It was little cut on the outside by later two pits on the north. The inside measured 2.6 m long and 1 m broad. At the apse was a circular mass of dark brown clay with raised sides abutting the inner face of the mud-wall, inside of which was a fire-pit, 55 cm in diameter. At the edge of the fire-pit was embedded a stone stump roughly rectangular in cross-section and coated with a thick coat of clay which was burnt red due to contact with fire in the fire-pit and the stone stump, towards south of which was found placed a small cylindrical unbaked clay object (fig. 109, 3; pl. CXLII, 2). Towards east, over the wall, was another circular clay mass, 45 cm in diameter, in which were embedded three sub-rounded stones in triangular fashion, one kept above two. Towards east, partly over the wall and partly inside, was another circular mass of dark brown or black clay, 45 cm in diameter, apparently meant to be used for coating the stone stump. To the west of it was a circular depression, a pot-rest, 30 cm in diameter, as was indicated by the fragments of a base of pot of Malwa ware inside. Besides this, there were nine pot-rests, varying in diameter from 25 cm to 35 cm, inside the apsidal structure, some with base fragments of pots. From inside this temple were recovered charred remains of Wheat, Barley, Lentil, Ragi, Beans and Cheno/Ams (Appendix II).

(f) From the west of the entrance of the Apisidal Sacrificial Temple, over the mud-platform and parallel to its margin lay a dwarf mudwall, 4.1 m long, 40 cm broad and 3 cm high and with a posthole at each end, the one at the eastern end, lying close to the entrance of the Apisidal Sacrificial Temple being 26 cm in diameter and the other at its northern end 40 cm. This wall took a northerly turn and at a distance of 20 cm it abruptly ended at the latter posthole. Beyond this posthole there were traces of a wattle and daub wall, about 35 cm wide, running to a distance of 7.6 m along the western and northern peripheral area of the Ring Altar and ending at the mud-step of its entrance on the northeast near the western wall of

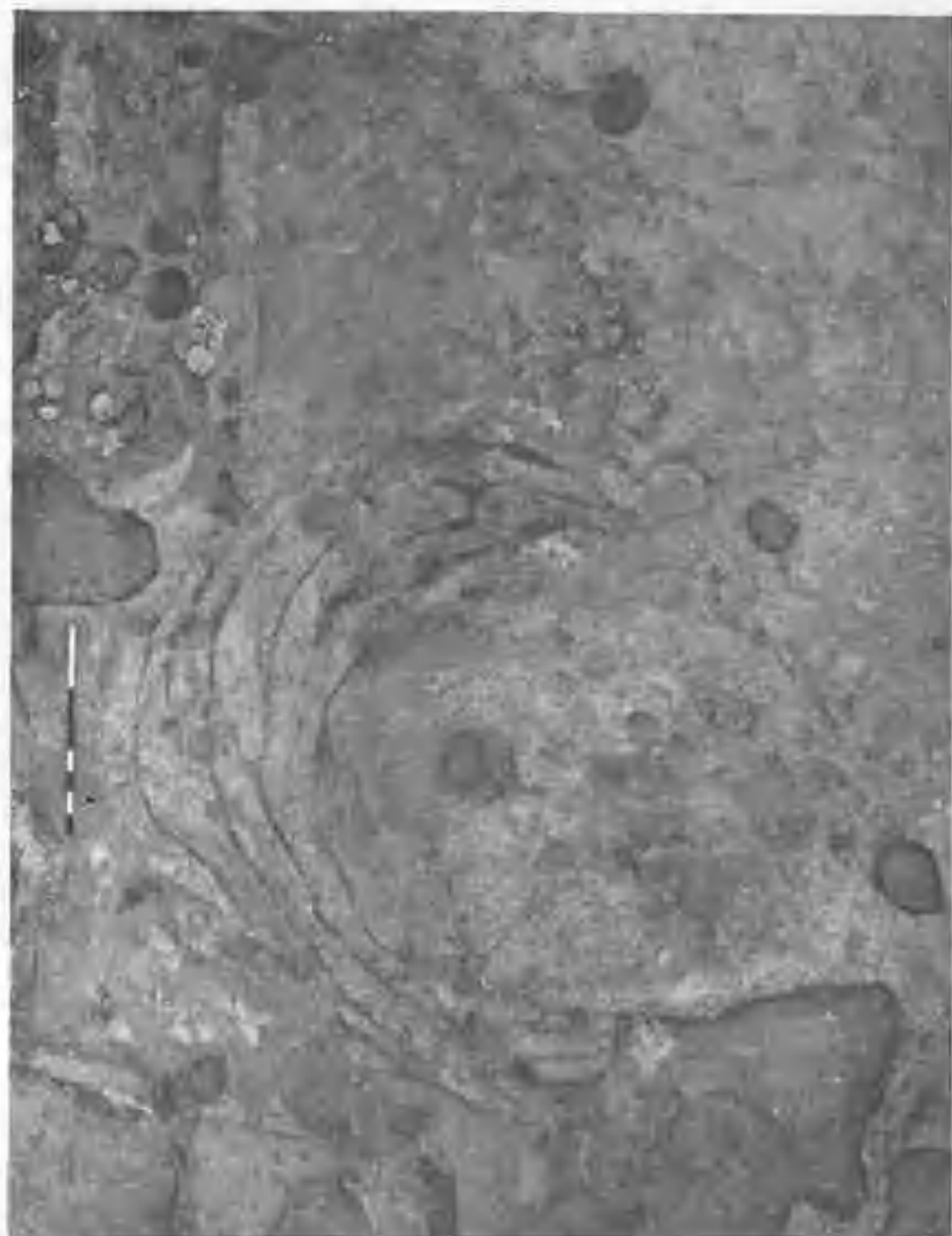


PLATE XXIX Bird's eye view of the Ring Altar and the Apaidal Sacrificial Temple, Religious and Residential Complex. The potteries are also seen on the right of the Ring Altar, Phase IV.



PLATE XXX. View from top of part of Rectangular Fire Altar, Religious and Residential Complex, Phase IV.

house 52. The mudwall and the traces of the wattle and daub wall together suggested that the Ring Altar (pl. XXIX) (called house 56), lying to the west of house 55 and northwest of Apsidal Sacrificial Altar, had a trilateral enclosure, from south, west and north. It had an entrance marked by a mud-step, 3 cm high and 95 cm broad, with a posthole on either side. This altar consisted of a series of rings of clay varying in width from 5 to 25 cm and in thickness from 3 to 5 cm. In the centre of the mud-plastered circular area inside the rings was one main firepit, 35 cm in diameter, besides smaller ones, varying in diameter from 10 cm to 18 cm. The central fire-pit yielded semi-charred animal bones and a terracotta cake (fig. 105, 27; pl. CXXXVI, 6) and this as well as the other smaller fire-pits yielded charred remains of Wheat of three kinds, Barley, Horse Gram, Beans, Grass Pea, Ber, Tarla, Lentil, Cordata seed and Cheno/Ams (Appendix II).

(g) In the space to the south of the Ring Altar, between it and the mud-platform, were found seventeen pot-rests varying in diameter from 22 cm to 45 cm (pl. XXIX). Within and outside them were found lying base-fragments of pots. One lid of burnished grey ware was also found over the platform between its margin and the inner side of the dwarf mud wall. Of great interest from one of the pot-rests was the fragment of a jar of thick coarse ware with an image of *Siva* in applique and traces of an attendant figure by its side (fig. 106, 1; pl. CXXXVIII, 2).

(h) To the south of the dwarf mud-wall were three hearths. The largest among these, which was horseshoe-shaped, was 95 cm long and 90 cm broad. A flat stone was kept inside it. The second was circular, with 38 cm diameter and a flat stone in the centre. The third was located 50 cm south of the mudwall. It was circular in shape, 55 cm in diameter and contained a flat stone in the centre. Besides the hearths, there were large later pits dug into the mud-platform.

(i) To the northwest of the Ring Altar and southwest of house 55 was the Rectangular Fire Altar (pl. XXX) (house 56). It was found very much damaged in its western portion by later pits. On this side it was exposed to a length of only 2.8 cm. Its breadth measured 2.6 m. In its southeastern corner was a rectangular fire-pit, 65 cm X 55 cm, containing ash and charred grains but no bones. Near this fire pit was found, covered with ash and baked soot, one fragment of a stone, flat on one side and uneven on the other, the latter bearing three blind holes of 1 cm diameter (pl. CXIV, 5). Close to it was recovered one scapula of bone (fig. 120, 27; pl. CLIV, 1). By the north-eastern corner was embedded a base of an ill-baked and handmade very fragile jar, 80 cm in diameter. There were three postholes in the exposed portion of the altar. They varied in diameter from 20 cm to 28 cm. The charred grains recovered from the fire-pit represented Lentil, Ragi, Horse Gram, various species of beans and Cheno/Ams.

(ii) Unexposed Circular Structure

To the north of house 54 was seen in plan a circular structure, 3.6 m in diameter with 20 cm thick mud wall and an iron burial and a pot inside. It was not exposed fully.

DAIMABAD 1976-79
BURIAL 21, DOUBLE-URN BURIAL, SUB-TYPE A1
MALWA CULTURE

-25 0 25
 METRE

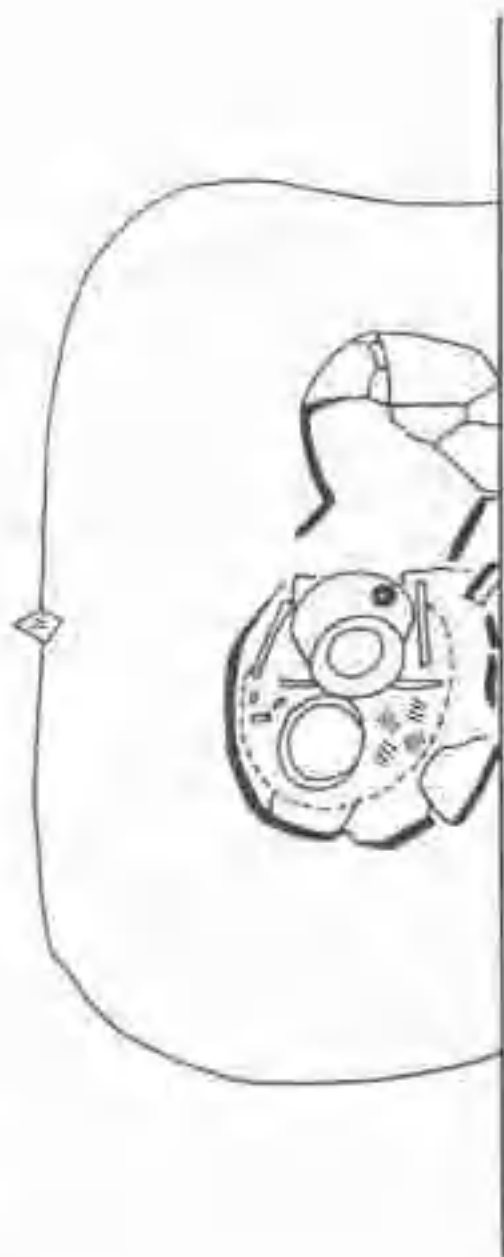


Fig. 13. Burial 21, double-urn burial, Sub-Type A1, Malwa Culture.

DAIMABAD 1976-79

BURIAL 23, PIT BURIAL, SUB-TYPE C III

BURIAL 22, PIT BURIAL, SUB-TYPE C II

MALWA CULTURE

0 50 50 METRE

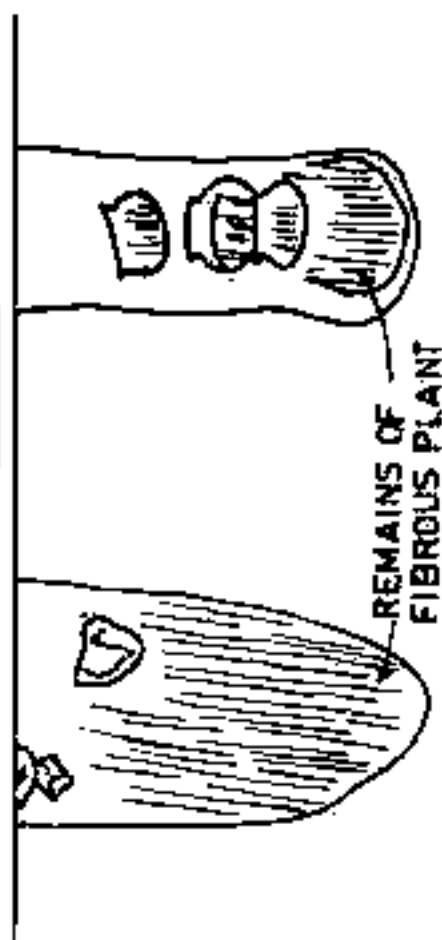


Fig. 14. Burial 23, Pit Burial, Sub-Type C III, Burial 22, Pit Burial, Sub-Type C II, Malwa Culture.

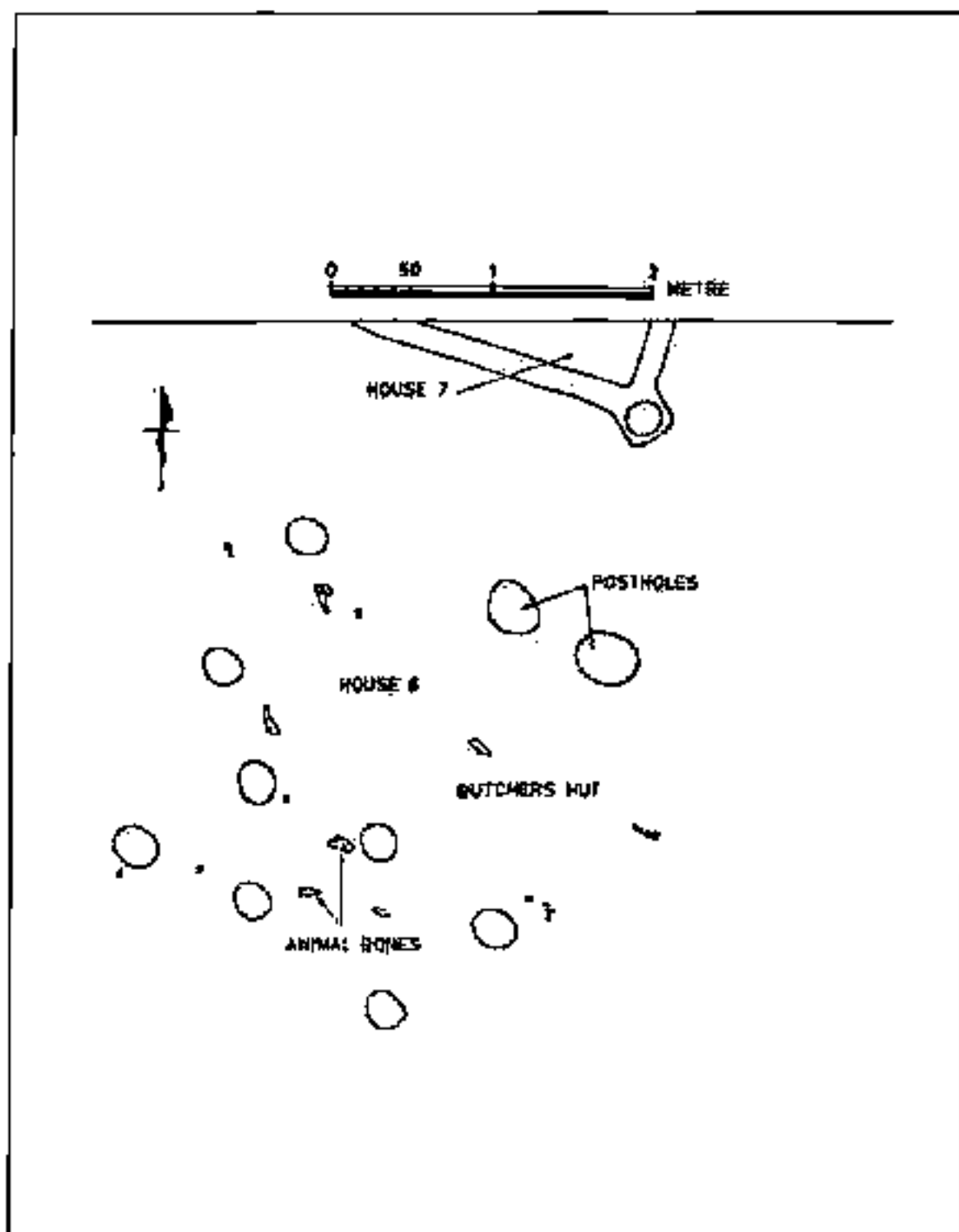


Fig. 15. Plan of houses 6 (Butcher's hut) and 7, structural phase A, Jorwe Culture.



PLATE XXXI Butcher's pit (house 6) structural phase A, looking west, Phase V.



PLATE XXXB. Cutting N71 : section of jordan's kiln 1 showing gravel filling, posts in-situ on the floor of the kiln, the inner burnt clay wall, the central ash packing and the outer mud wall, looking northeast.



PLATE XXXIII General view of potter's Kān 1 showing location of the decorated jar, looking south-east, Phase V.



PLATE XXXIV. View of potter's kiln 1 showing details of construction, looking east. Phase V.

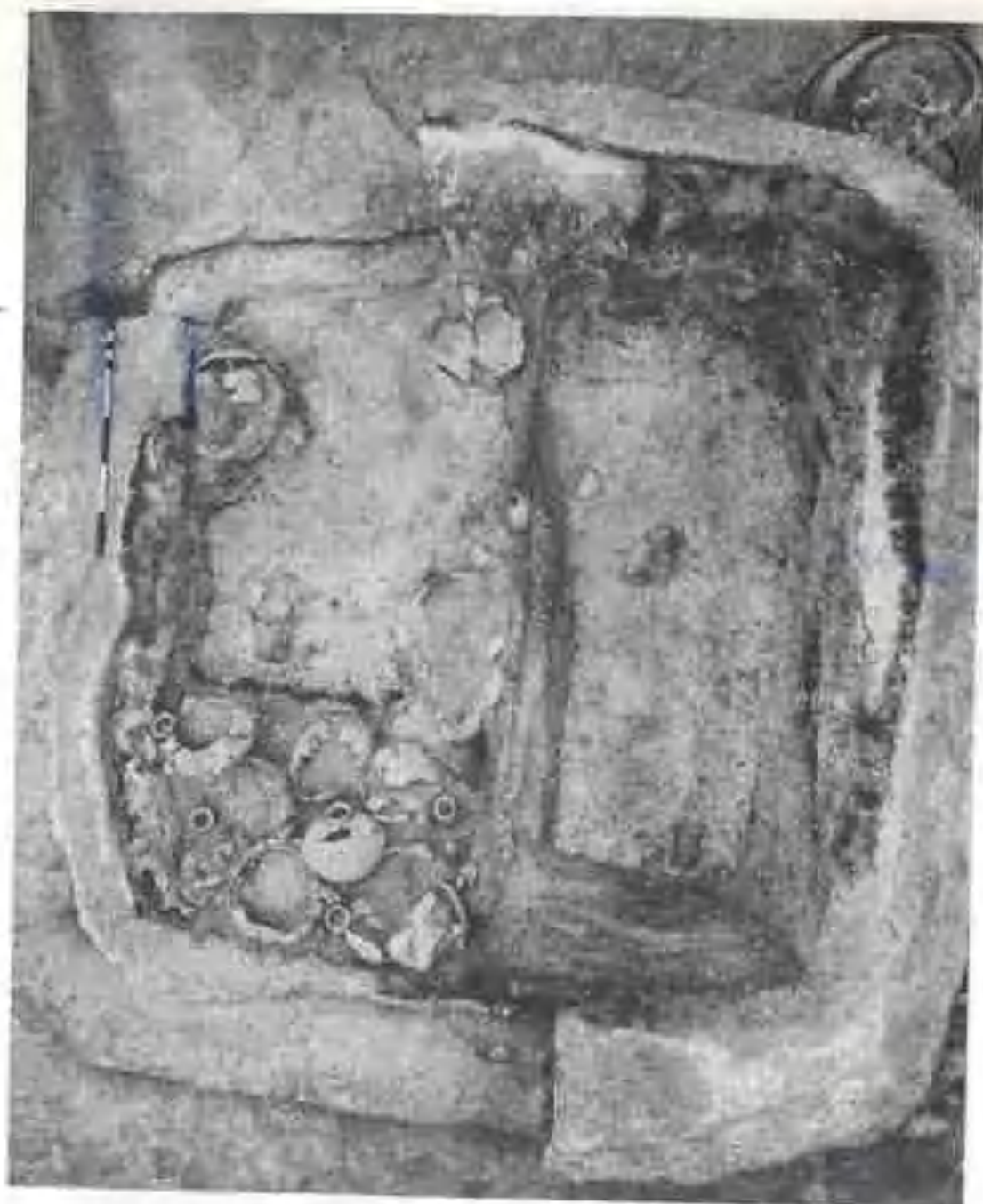


PLATE XXXV Bird's eye view of potter's kiln I, Phase V.



PLATE XXXVI Cutting X'2 X'1 to V'2 V'1 : relative position of potter's kilns 1 and 2, looking west.
Structural phase A, Phase V.





PLATE XXXVII Close view of the charred top of vessel, angled filling above, angular gravel spread at the base and the blind sinkhole in potter's kiln 2, looking west.

6. PHASE V: THE JORWE CULTURE

A. Introductory

The structural remains of the Jorwe Culture were exposed in Sectors I and II, those in the latter lying about 360 meters away from those in the former and thus were not directly connected with each other. The layer of overlap between the Midwa and the Jorwe cultures in these two sectors was considered the basis for correlation. Thus for layer 7 in Sector I the corresponding layer in Sector II was 4 in the cutting AZ'3-CZ'3 to AZ'5-CZ'5. The structures of the structural phase A in Sector I occurred on the top of layer 5. The roughly corresponding structures to these in Sector II were, therefore, regarded those lying on the top of layer 5. It should be mentioned that in this attempt of correlation it was merely by coincidence that the group of circular houses or huts in Sector II and the solitary circular hut in Sector I happened to belong to one and the same structural phase, B.

The structures of Phase V have been ascribed to five structural phases, A to E, and grouped into as many as nine categories as shown in Table 1. They are described below.

B. Structural Phase A

(i) Workshop

A. Butcher's Hut

House 5 (fig. 15; pl. XXXI) was a rectangular hut marked by postholes and oriented northeast-southwest. It measured 2.8 m long and 1.9 m broad. It had an opening on the east. Over the flooring of this hut were found lying a large number of animal bones including those with distinct cut-marks and hence this structure was identified as butcher's hut. On the southern side there were three postholes in a row in the same alignment as that of the hut. These were probably for the posts of a side wing or a shed, 1.9 m long and 85 cm broad, perhaps meant to be used for keeping the animals to be butchered.

B. POTTERY KILNS

(a) *Kiln 1* (pls. XXXII-XXXV) was exposed in the trenches X'1, X'2, Y'1 and Y'2 in Sector II.² It measured 5 X 5 m and oriented northeast-southwest. The top of this kiln was covered by about 10-cm-thick layer of ash and its surrounding area was marked by loose earth mixed with ash and numerous potsherds. For constructing the kiln a huge pit was excavated and a mud-platform, 5-meters-square and 25 cm high, was prepared. Above this platform was an enclosure consisting of three parts, the outer mud wall, the central ash-

2. A. A. Sali, "A Potter's Kiln of Jorwe Culture from Dhanubad", *Madhya: Recent Remarques in Indian Archaeology and Art History*, Shri. M. N. Deshpande Festschrift, (ed), M. S. Nagaraja Rao, Agam Kala Prakashan, Delhi, 1981, pp. 59-62.

Table 1

*Structural - Phasewise Distribution of Different Categories of Structures**Phase V*

<i>Struc- tural Phase</i>	<i>Work- shop</i>	<i>Crafts- man's House</i>	<i>Mer- chant's House</i>	<i>Noble- man's House</i>	<i>Circu- lar House</i>	<i>Religious Structure</i>	<i>Defen- ces</i>	<i>Em- bank- ment</i>	<i>Unclassified</i>
A	Kilns 1 and 2 and house 6 (Butcher's hut)	Houses 3, 28, 29 and 64	—	—	—	Houses 34 and 35, pits 207 and 208 and the crescentic structure.	—	—	5, 7, 8
B	—	—	38	4	—	—	—	—	—
C	—	Houses 57, 58 and 65	—	—	—	—	—	Long Em-bankment.	Houses 59-63, and floors, floor-decoration and a channel.
D	—	—	—	—	Houses 2, 39 to 42A and 43 to 49.	—	—	—	—
E	—	—	—	—	—	Elliptical structural complex with approach patha, and house 1.	Mud for tification wall.	—	—

packing and the inner burnt wall. The kiln had two stoke-holes on the north, both oval-shaped with a very small recessed opening of the same shape in the centre above the level of the platform, the portion lower down being blind. A large flat stone was inserted in the south-east corner of the wall apparently to serve as a step for getting inside the kiln from the top of the wall. The extant outer mud wall and the ash packing were 1.4 meters high from the base of the kiln whereas the inner burnt wall, which lay slightly obliquely against the central ash-packing, measured 1.1 m high above the surface of the platform. The outer mud wall was made of lumps of mud and plastered with mud from the outside. It was 50 cm broad at the base, tapering upwards to 15 cm at the top. The ash packing, composed of white and black ash mixed with earth, varied in thickness from 15 cm to 50 cm. This packing which was fairly compact, served as an insulator of the kiln. The inner varying burnt wall, resting against the ash packing, consisted of a series of laminar burnt clay layers in thickness from 5 to 10 cm. A similar kind of wall, varying in thickness from 3 to 5 cm and running north-south across the kiln, divided the kiln into two compartments, called here eastern and western. The inside of the kiln measured 3.5 m long and almost equally broad. The floor of the kiln was plastered from time to time and had a gentle slope towards south. In the inside of the kiln were reddish fine gravel, charcoal lumps, charred logs of fuel wood, two oval-shaped naturally rolled pebbles of purple basalt, potsherds and fifteen crushed complete and incomplete pots. A large number of charred stumps of wood occurred on the floor of the kiln and in various levels of the gravel-filling in various positions as also inside the holes of burnt laminar clay wall along the inner periphery of the kiln, all being the remnants of the fuel wood used in the kiln. The use of gravel was apparently for raising the temperature of the kiln artificially.

Outside the kiln, adjoining the north-east corner, was found embedded in the ground a large oval-shaped jar (pls. XXXIII, C-CH) of handmade thick coarse ware profusely decorated in applique with human, bull and reptile motifs and concentric arches (p. 471). In this jar were found placed a large number of small angular and sub-rounded stones bearing stains of soot and burning.

The sample of charcoal, identified as of Bijasal (*Pterocarpus marsupium*) and Ranambada (*Trema orientalis*) (Appendix II), from this kiln has given the C-14 date, BS 178, 2950 ± 100 (5040 ± 100), 1090 B.C. (below, pp. 206-208).

The kiln was thus square in shape, the walls being rounded at the corners. The pots were placed inside the kiln in layers and the cavities between the pots were filled with fine gravel as also fuel. Against the inner burnt wall and also in its holes along the periphery thin logs of wood were placed vertically as fuel. The oval-shaped stoke holes served as air vents but they seemed to be too small to be used for putting fire. The gravel inside the kiln raised the temperature artificially and the packing of ash and earth served as an insulator and thus helped to maintain high temperature for a long time.

(b) *Kiln 2* (fig. 17; pls. XXXVI-XXXVII) was located in the trenches Y'2, Y'1, Z'2, and Z'1. It was not fully exposed but the part of its exposed in the section and its plan suggested that its construction was almost on the lines of that of Kiln 1. This was a little bigger in size than Kiln 1. It measured 3.8 m north-south and almost equal in east-west. As in the case of



PLATE XXXV/II Cutting G2.39-42.60 and D2.59-42.60 : View showing exposed outline of L. Juchas's house (house 3) and the debris of the debris of house 3, Phase V.



PLATE XXXIX Close view of details of unexcavated face of mounds all and two apotheked pots exposed while clearing the debris in Laboratory's house (house 3), Phase V.



PLATE XL View showing Lullfemskær's house (house 2) which fully exposed, looking northeast. Note the left foreground corner to house 3, Phase V.



PLATE 33.1. Bird's eye view of Linnemaker's house (House 3), Phase V.

Kiln 1, this was constructed after cutting a pit into earlier deposit, but the base of the fire-chamber was at a higher level than that of the former, although the base of the U-shaped stoke-holes of the latter lay almost at the level of the base of the platform of Kiln 1. The fire-chamber was divided into two compartments, 2.5 m wide, northern and southern, by a 10-cm-thick partition wall which was burnt red. The enclosure exposed on the south of the section was preserved better than that in the northern section which was damaged by later disturbances. The outer mud wall was 20 cm broad at the base tapering to 5 cm at its top and 1.45 m high. The ash packing was 20 cm thick at the base in the southern section and 10 cm in the northern. The floor of the kiln was covered with a thin layer of small angular stones and fine sandy gravel. Over this layer, in the northern compartment, was found lying one log of charred wood, 1.1 m long and 20 cm thick. The inside of this kiln was filled with sandy fine gravel. The top of this kiln was cut up by a few later pits and hearths.

(a) Craftsman's House

A. Lime Maker's House

House 3 (fig. 16; pls. XXXVIII-XLI) was exposed in the trenches CZ59, CZ60, DZ59 and DZ60. It lay on the top of layer 5 in northwest-southeast orientation. It was a rectangular house of mud walls, 7-25 m long and 3.6 m broad, the mud walls varying in thickness from 18 cm to 25 cm. The walls of the house were erected after sinking a foundation varying in breadth from 20 to 70 cm and depth from 5 to 15 cm outside the walls. No attempt was made to locate the foundation in the inner side of the walls, being covered with floor. On the four outer corners of the house, at the joints of the walls, were postholes of average 20 cm diameter lined with hard mud. This lining has given these corners the shape of bastions. The house had two entrances, one each from the south and the north. The one on the north had on its either side a posthole each of 30 cm diameter. The entrance was recessed inside the house by about 20 cm. It was 75 cm wide with its sill (threshold) about 15 cm thick. To the west of this entrance was a circular clay-stump to rest the wooden post. Immediately inside of the entrance of the house was a rectangular thick patch of mud plaster with a coat of lime. At the entrance on the south was a rectangular mud step, 50 x 40 x 5 cm, flanked by a cylindrical stump of hard clay of 15 cm diameter. The mud walls of the house were 20 cm thick on an average and were coated with mud plaster from outside. The plastered surface was treated with a coat of lime. On the outside of the southern wall near the entrance it was possible to count six alternate coats of mud plaster and lime. The walls seemed to have been repaired from inside, particularly near both the entrances. The material used for the walls consisted of hard clay and silt yellowish in colour. In the clay were included grass and other vegetable material.

It appeared that the house had front courtyard on the south, the position on the north being not known as that side was covered with the floor of house 4. The floor of the courtyard was as meticulously made as that inside the house and in the floor of the courtyard was

embedded one large vase of thick coarse ware with applique designs perhaps for storing water.

In the inside of the house was a small compartment 1.5 m in length and 1 m in breadth. Apart from this, traces of a curtain wall were also visible in the north-south direction thereby dividing the house into two major parts or rooms, eastern and western. Both the entrances, southern and the northern, lay in the eastern part of the house. Near the southern entrance was one oval-shaped muller stone of basalt and by its side a posthole about 20 cm in diameter. In the southeast corner was an oval-shaped clay stump for resting a wooden post to support the roof. To the northwest of the flat oval stone and the posthole mentioned above, was a badly crushed pot of Jorwe Ware with oval body, short narrow neck and beaded rim. About a meter northeast of this pot, by the side of a few potsherds, was flat ovaloid stone of basalt around which were found lying one fluted core of chalcedony, few parallel sided blades, a nicely made pen-knife blade and about half-a-dozen waste flakes, which indicated that microoliths were manufactured in the house.

Between the above mentioned pot and the curtain wall were scattered potsherds of Jorwe Ware. To the west and by the side of the curtain wall was a circular hearth, 50 cm in diameter, containing ash, charcoal, charred and semi-charred animal bones and one piece of half-burnt wood. Around the hearth were found scattered a number of animal bones, small angular stones, potsherds as also a few microoliths, including one obliquely backed penknife blade. Besides, the area around the hearth was also marked by ash patches and charcoal bits. Interestingly enough a broken part of an unbaked vase, partly baked due to the fire in the hearth, was also noticed lying by the side of the hearth. To the north of this hearth was a circular shallow fire-pit, about 20 cm in diameter and lined with a thin and dwarf clay wall. It contained ash and charcoal. To the south of the fire-pit were potsherds, one muller stone and a few other stones. To the west of the hearth were half-a-dozen unbaked *kunda*-type pots with a high pedestal base embedded in the floor. Two of these pots contained white lime. On either side of these two pots was a big-sized concave-sided carinated bowl of Jorwe Ware. One clay stump was found to the west of these two unbaked pots. About a meter to the north of this clay stump was found lying one oval-shaped hammer stone and some 20 cm further north of it were located twenty four disc beads of steatite. The chamber lying to the south of the two unbaked pots mentioned above contained one fragment of a bun-shaped lid, charcoal bits and closely charred animal bones. To the north of these groups were two small flintish stones and near the entrance of the chamber were animal bones, including teeth. To the west of the chamber, between it and the western wall of the house, were scattered animal bones and microoliths. To the east of this group were found lying potsherds of burnished grey ware and further east, near the screen wall was found lying one fresh water shell. Very near these, under the floor of the house was one urn burial but it was not exposed.

On the basis of the thickness of the mass of debris lying inside this house, the probable height of the walls of this house was worked out, assuming that when the structure collapsed the entire debris of walls had fallen inside this house. On an average the thickness of the debris of the fallen walls was 80 cm. The average thickness of the walls was 20 cm. The figure arrived at was 2.5 m high approximately as under,

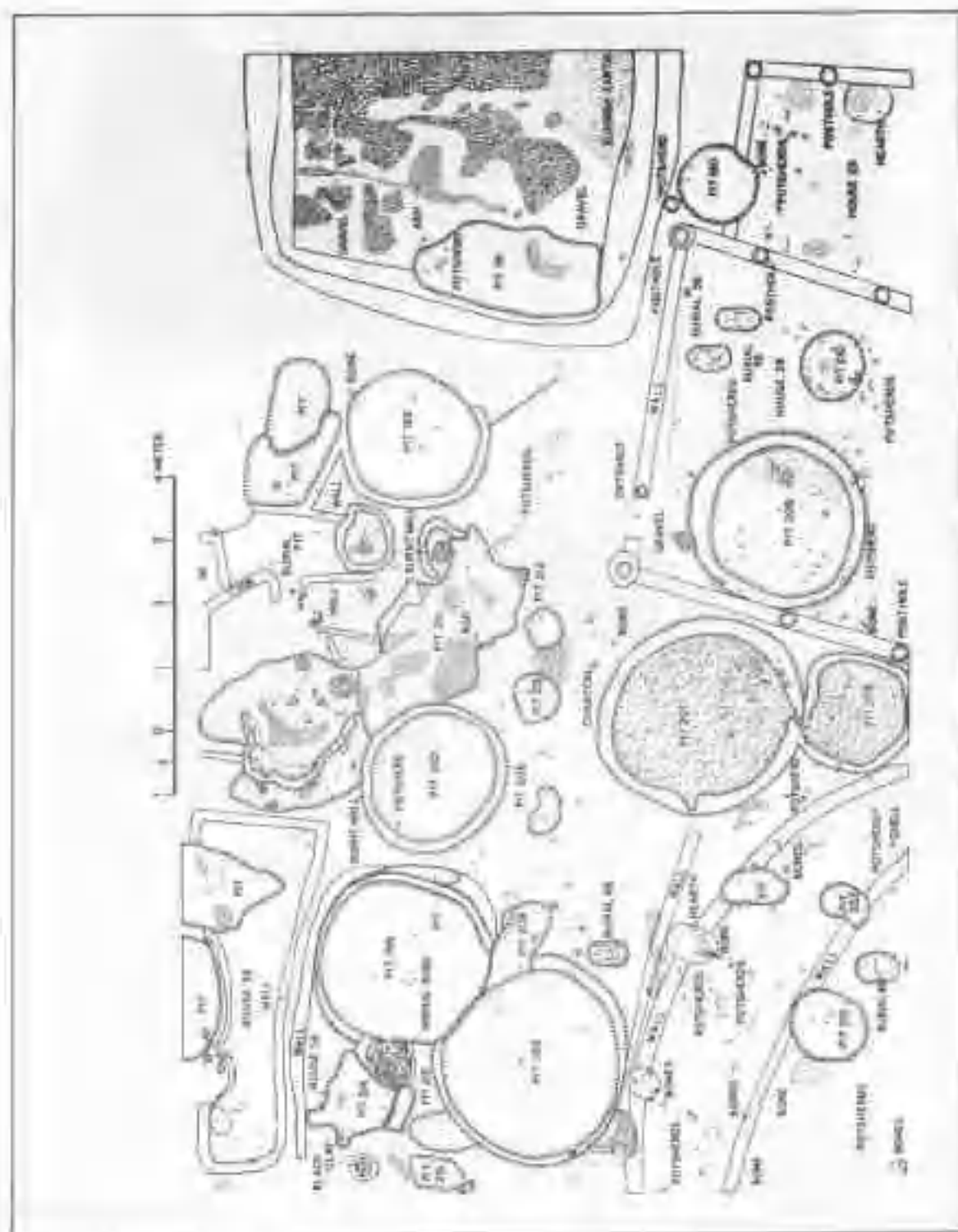


Fig. 17. Plans of structures of structural phases A and B at 35, 36, 48 and 69. Forsee Culture.



PLATE XLII: Plan view of excavated remains of Sacrificial Temple (House 34), structural phase A, looking east. The southern wall of House 23 is also seen. Phase V.

Length of all walls = $7.25 + 7.25 + 3.6 + 3.6 = 21.7 \times 0.2 \text{ m} = 4.34 \text{ m}^2$

Total quantity of debris = $6.85 \times 3.6 \times 0.35 \text{ m}^3 = 8.65 \text{ m}^3$.

Approximate height of walls = $8.65 \div 4.34 = 2 \text{ m. approx.}$

+ extant height + add for the gap of the two entrances, say: 10 cm = 2.10 m + extant height = 2.5 m approx.

B. Potter's House

(a) House 28 (fig. 17) was located close to the potter's kilns and was only partly exposed in the trench Z'1 in Sector II. It was a large mudwall house oriented northeast-southwest and its exposed portion measured 5.1 m east-west and 4.4 m north-south. The exposed walls were 25 cm thick. Within the walls and at their joints were postholes in the eastern and western corners with a lining of hard clay, about 16 cm thick. The house had an entrance from the north, 60 cm broad. Interesting in this house was a circular pit, pit 209, 2.4 m in diameter, and lined with hard clay band varying in thickness from 13 cm to 35 cm. This pit contained a large number of potsherds of unbaked pots and ash inside the house which suggested that it was meant for storing pots in green hard state duly covered with ash until they were placed in the kiln to avoid pots developing cracks due to drying. It needs to be mentioned here in this context that even now-a-days similar pits occur in potter's house for storing unbaked pots before they are placed in the kiln for firing. The pots kept in such pits are covered with ash.

The floor of this house was made of whitish compact earth and plastered with mud of similar colour. The floor as well as the mudwalls of this house suffered considerable damage due to later disturbances. The two double-urn burials, 35 and 36, exposed in the north-east corner of the house did not belong to this house (below, p. 196). Noteworthy finds from the house were two beads, one each of fine-grained green basalt, long barrel circular, (fig. 116, 35; pl. CL, 25) and of carnelian, standard barrel circular (unillustrated).

(b) House 29 (fig. 17) was partly exposed immediately to the east of the above described house 28. It was in the same orientation as that of the latter. The exposed portion measured 3 m east-west and 2.5 m north-south. The walls of this house, 12 cm broad, were made of whitish hard earth. One posthole, 15 cm diameter, was observed in the joint of the walls in the north-west corner. One oval-shaped hearth, 70 x 60 cm, was located in the house. Part of the northern wall was eaten away by Pit 190. Over the floor of this house were found lying a large number of potsherds. Being located adjoining the potter's house described above and near the two kilns this house too appeared to belong to a potter.

C. Beadmaker's House

House 64 (fig. 20) was represented by a plan of postholes filled with gravel in the trenches AZ'3, AZ'4, BZ'3, BZ'4 on the top of layer 3. It measured 4.4 m square and was oriented northeast-southwest. The diameter of the postholes varied from 20 to 40 cm. From the floor

of this house was collected one unfinished bead of carnelian, long barrel polygonal (below, fig. 115, 11; pl. CL, 11). This find suggested that the house belonged to a beadmaker although no debitage or raw material was found in its association.

(iii) Religious Structure

(a) House 34 (fig. 17; pl. XLII) was in fact an apsidal structure exposed in the trench, BZ¹2 in Sector II. When exposed it was not possible to identify its religious nature and hence with a view to avoid confusion it was named house 36. The entrance of this apsidal structure now called "Apsidal Temple", was on the west. Its southern arm and a large area at its apse were damaged by later pits, 198, 199 and 214-216. The extant mud-wall, covered with a mud-plaster all over, 5 cm high and 7.95 m long, was made of whitish hard clay. Almost in the centre of the extant inner side of this temple was a partly damaged fire-pit containing ash, 30 sub-angular stones with signs of burning and amidst them one bone of third phalanx of *Bos* sp.⁵ Embedded near the entrance was one ill-baked deep bowl of handmade red ware with 45 cm wide mouth and containing black clay. Charred remains of Wheat, Lentil, Pulses, Ragi, Horse Gram, Cheno/Ams and Ber (Appendix II), besides a terracotta bead, standard truncated bicone (fig. 117, 47; pl. CL, 36), were recovered from the undisturbed floor of this Temple.

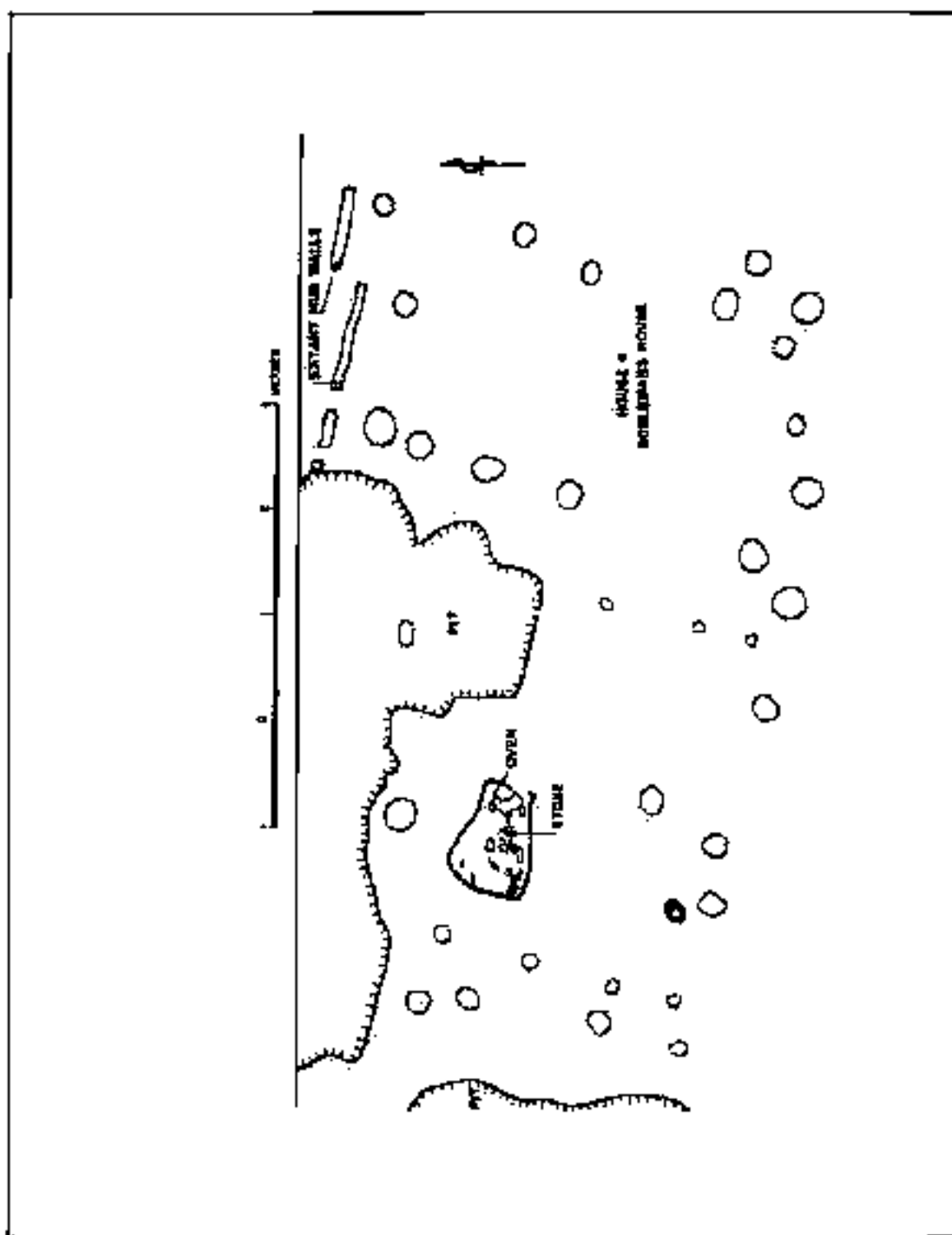
(b) House 35 (fig. 17) was a roughly rectangular structure lying close to the above described "Apsidal Temple" with a gap of hardly a few centimeters in between and appeared to be intimately connected with the latter in view of the fact that the mud-plaster over the northern arm of the apsidal temple also covered the southern wall of this structure and further covered its floor. It oriented roughly northeast-southwest. It was 5.5 m long, 1 m broad on the west and 1.8 m broad on the east. The mudwalls, about 20 cm broad and 5 cm high, were composed of hard whitish clay and were plastered with fine whitish mud. They were laid out in a very haphazard manner so that the western wall was rounded in the south-western corner and the southern was curved. The eastern and the extant northern which was partly eaten away by pits, were, however, straight. One piece of shell bangle (fig. 9) of a girl was found inside this house.

(c) Pit 207 (fig. 17) was a unique pit with its mouth on the top of layer 5 in trench AZ¹. It was 2.8 m in diameter, 50 cm deep, with vertical sides and of the shape of *Yonipce-itha*. It was lined with a wall of hard mud, varying in thickness from 12 cm to 30 cm and was full of ash, charcoal and potsherds and yielded interesting antiquities such as mother goddess figures (fig. 101, 1, 3; pl. CXXXII, 1, 2) and gamesman of terracotta (fig. 103, 15; pl. CXXXIV, 1), animal bones, fresh water shells, burnt clay lumps, terracotta cakes (fig. 105, 25; pl. CXXXVI, 1), sub-angular small stones, stone balls and microliths, besides charred grains of Wheat, Barley, Foxtail Millet, Kodon, Ragi, Lentil, Dak Tarungbeyda, Horse Gram, Beans, Tarla, Ber and Peas (Appendix II). A fragment of a ear of corn was also recovered

5. Kindly identified by Dr. G.L. Batam of the Datta College Postgraduate and Research Institute, Pune (per. com.).



PLATE XLIII. Mableman's house (below d_1 , structural plan B), looking east, Phase V.



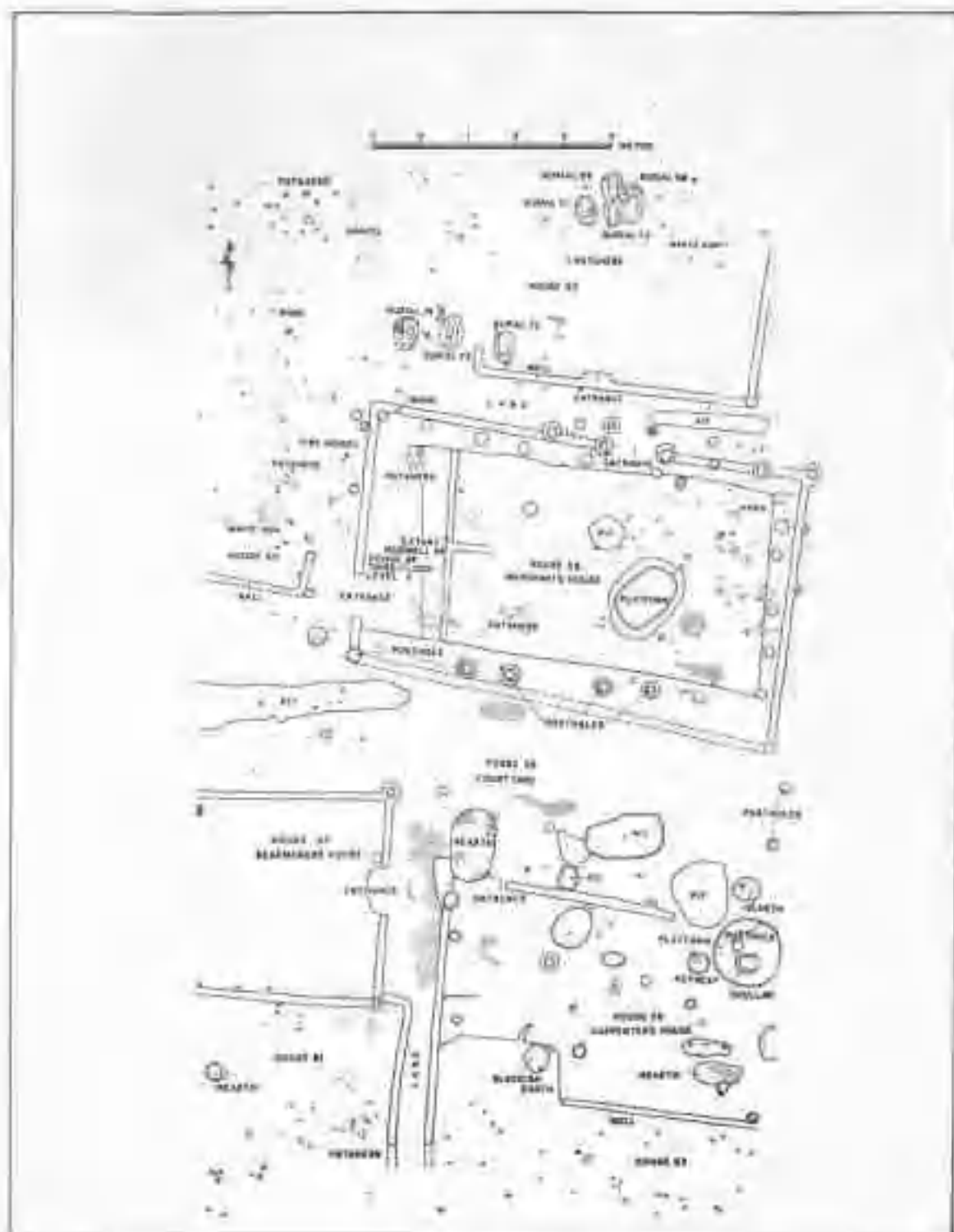


Fig. 19. Plan of houses, structural phase C and burials 68-74. Jerwe Culture.

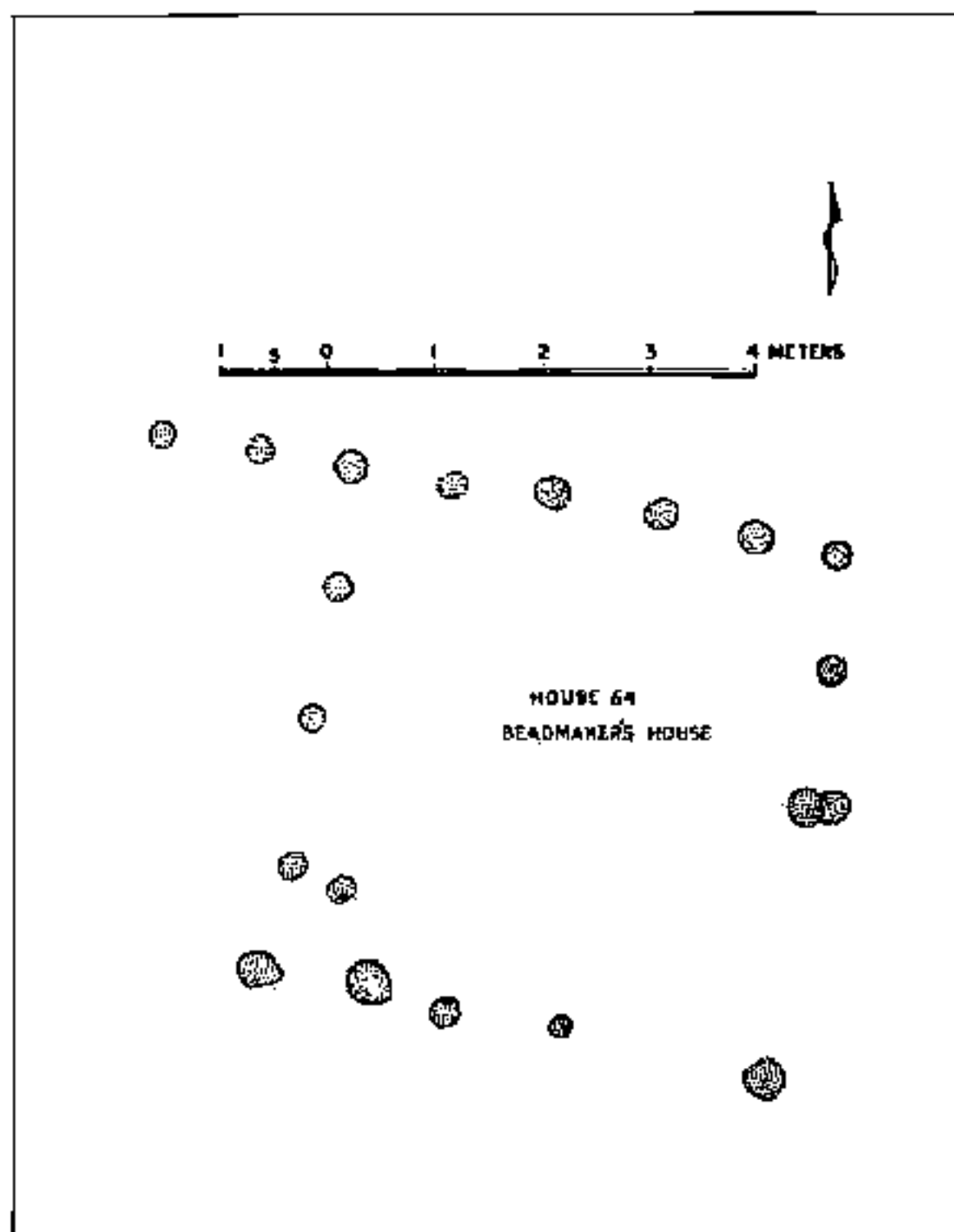


Fig. 20. Plan of Beadmaker's house (House 64), structural phase A. Jomon Culture.



PLATE XI, IV Structures of structural phase C, looking south, Phase V. In the middle ground is house 48.

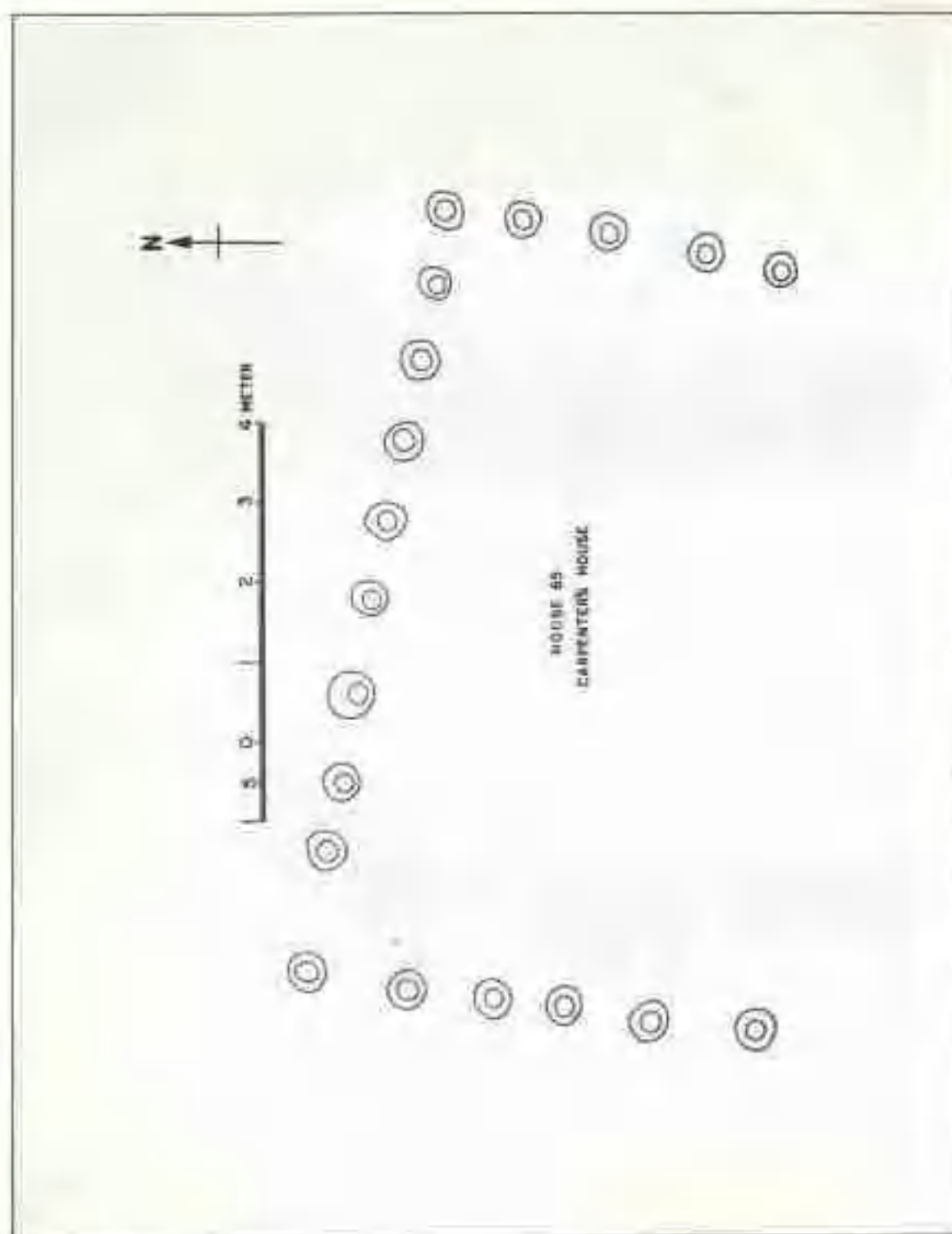


Fig. 24. Plan of Carpenter's house (House 65), structural phase C, Jirwa Culture.



PLATE XLV Channel of structural phase C, looking west, Phase V.

from this pit but the grains in it could not be identified (Appendix II). This pit was connected with the rituals of women welfare.

(d) Pit 208 (fig. 17), 1.6 m in diameter, and as deep as Pit 207, lay immediately to the south of the latter and was connected with it as was indicated by a narrow oblique gap between the mudwall lining. The mudwall from inside this pit varied in thickness from 10 cm to 16 cm. The pit contained ash and potsherds.

(e) The *Crescentic or Semicircular Structure* (fig. 17) was spread diagonally in the trench BZ'1 in its south-western part. It consisted of three parts: (i) a central platform of rammed hard whitish earth, measuring 3 cm in height and varying in width from 1.2 to 2 m, (ii) a 25-cm-wide mudwall of light brown earth along its southern periphery (iii) and 30-cm-wide mudwall of light brown earth running along the northern periphery of the platform. Both the ends of this structure were not completely exposed. One circular pit, 50 cm in diameter, and another oval-shaped, 80 x 50 cm, both containing charred animal bones were exposed on the northern margin of the structure.

(iv) *Unclassified*

(a) House 5 (pl. XI) was a severely damaged small room, lying close to the south-west of house 3, perhaps a storage room. It lay in the northeast-southwest orientation and was survived by a wall on the north, 2.25 m long, another wall on the east, 1.5 m long, and a small fragment of the western wall, the northern wall extending further west by 20 cm. There was one posthole in the northern wall, 25 cm in diameter. The floor of this structure was plastered with fine mud.

(b) House 7 (fig. 18) appeared to be similar in plan and orientation to house 5, but only a small portion of it was exposed in the trench CZ57, the unexposed portion being in the adjoining trenches. The exposed southern wall measured 1.7 m in length, 15 cm in thickness and the eastern 55 cm and 12 cm respectively. At the junction of these two walls was a posthole 20 cm in diameter, lined with clay, about 3 cm thick. The height of the exposed wall was 5 cm.

(c) House 8 was partly exposed in DZ60, its unexposed part lying in the adjoining trench EZ60. The exposed portion indicated southeast-northwest orientation of the house. The eastern wall measured 2.1 m. The exposed northern wall was 1.15 m and that on the south 70 cm. It was partly damaged. In the northern wall there was one posthole of 20 cm diameter. The walls were 15 cm broad. Inside the exposed portion of the house a part of a hearth was exposed.

C. Structural Phase B

(i) *Merchant's House*

House 38 (fig. 19; pl. XLIV) was exposed in the trenches CZ'8, DZ'8 and EZ'8 on the top of layer 2. A section cut through its floor in the eastern part of the house exposed

five floor levels. The original size of the house appeared 9 m long and 5 m broad. The extant northern mud-walls of this original structure, exposed in the section, measured 30 cm in height and 20 cm in breadth. The house had successively shrink in size so much so that during the fifth floor level it measured 5 m long and 3 m broad. The house during the fifth floor level times was corral with the other houses of phase C exposed by its side (pl. XLIV) and changed its orientation to east-west from the original northeast-southwest. The first floor of this house was made of three layers, 2-cm-thick brown clay covered by equally thick layer of yellow silt with kankar pellets, the surface of this latter being plastered with thick mud-plaster. This pattern was changed in the second floor level times when the floor was made of about 5 cm thick light brown hard mud. The third floor, very much disturbed, was similarly made, but the fourth was made of 3.5 cm thick light brown hard clay and covered by about 2 cm thick white clay which in turn was coated with brownish white mud-plaster. During the third floor level one additional room 2 m x 1.9 m, of mud wall was made in the northwest corner of the house. An important change that was noted during the second floor level was that the mudwalls were replaced by the wattle and daub walls. The house at this time was 7.45 m long and 4.4 m broad. But from the times of the third floor level the structure was again made of mud walls in spite of the fact that its size reduced to 6.5 m x 4 m. During the times of the fourth floor the house was 6 m long and 3 m broad. The floor of the second level was sunken, being about 30 cm below the edges. During the first floor level the entrance was from the north and the west, that from the former appeared to have used during the succeeding times. On the 2nd floor was one mud-platform 1.35 m long surrounded by a shallow depression about 24 cm broad and 2 cm deep. It was in the southwest-northeast direction. Close to it were patches of ash, one of them being oval-shaped and 60 cm x 30 cm in size. On the eastern part of this floor were found one horn of *Bos*, several animal bone pieces, potsherds and small stones. The fourth and the fifth floors were covered with debris of the collapsed mud walls and were fairly well-preserved. In the eastern courtyard of this house were exposed two burials; 52 and 53 (below, pp. 192-200), the former urn-burial and the latter extended inhumation, which was of a boy with intact feet. The occurrence of a lamp at the head, on its left, the finds of a sub-rounded small stone and a fresh water shell and sealing of the burial pit by a thick coat of clay were the other features of the extended burial. On the surface of the fifth floor was collected one terracotta figure of a deified sage with his three comports covered with a coat of ochre red colour (fig. 101, 5, 6; pl. CXXXIA-C) and on that of the fourth a terracotta cylinder seal (fig. 108; pl. CXLI). From the second floor were collected thirteen pottery spindle whorls out of which four were finished, two with half-bored holes, five discs without holes and two broken, one conical pendant (fig. 115, 8; pl. CI, 10) and two beads, one each standard truncated bicone circular and long barrel circular, all of chalcedony.

(ii) *Nobleman's House* (fig. 16; pl. XLIII)

House 4 came up by the side and in the same orientation as that of house 3,

after the latter had collapsed. It was a rectangular house of wattle and daub measuring 7.9 m in length and 4.6 m in breadth and consisted of three rooms, a kitchen, a central room or *maighar* and the front room, the first two having been partly eaten away by a later pit on their north. The double row of postholes, with a 50 cm distance between the two, on the west of the kitchen, suggested that on this side the house had a back courtyard. The kitchen was 3.6 m broad (east-west) and contained a trapezoidal hearth, 1 m long and maximum 80 cm broad, with a flat stone in its centre for the pot to rest. The central room was 2.1 m broad and the front room 2.7 m. Near the entrance of the central room through the front room, was a curtain wall as was suggested by three small posthole parallel to the entrance. This arrangement appeared to have been made probably to maintain privacy for the ladies of the house for whom the central room was meant to be used like the *maighar* of modern times in villages. The postholes varied in diameter from 8 cm to 34 cm and an interesting aspect of them was that they were lined with hard clay lining above the floor like a *kumbhi*. The floor of the house was made of clayey earth mixed with gravel and sand and was plastered with mud. Two fragments of mud wall in northeast-southwest alignment were exposed to the north of the front room of this house. One of them measured 1.5 m long and 10 cm broad and the other 80 cm long and 10 cm broad. Noteworthy finds from this house included a spherical bead of terracotta and a long barrel circular bead of carnelian.

D. Structural Phase C:

(i) Introductory

The structural level of this phase in Sector I, as pointed out before (p. 50), was very much disturbed and as such no house plans could be made out. Belonging to this phase was, however, one channel, oriented northeast-southwest varying in width from 30 cm to 60 cm, exposed to a length of 11 m in the trenches DZ 64 and EZ64 (pl. XLV). This channel indicated that in Sector I the houses of this phase were provided with sanitary arrangements. Whether the house of this phase in this sector were in the same orientation as that of the channel or not could not be known, although in Sector II, except houses 57 and the merchant's house of the fifth floor level which lay in the east-west direction, the houses of the corresponding structural phase retained this orientation.

(ii) Craftsman's House

A. Beadmaker's House

House 57 (fig. 19; pl. XLIV) was partly exposed in the trenches EZ'1 and EZ'2. This was one of the two houses in this complex which was oriented east-west. The house was 4 m broad and was exposed to a length of 3.9 m, the remaining portion lying in the unexcavated area on the west. It was oriented east-west and had an entrance from east, 45 cm wide,

marked by a very low mudstep, 2 cm high. The walls of the house varied in thickness from 15 to 18 cm. At the junction of the midwalls, in the north-eastern and southern corners, there was one posthole each in the shape of a circular bastion. The floor of the house was uneven and made of about 2 cm thick brownish rammed earth plastered with whitish mud-plaster. Near the northern wall of the house was found lying one oval-shaped flat miller stone. An interesting find from this house was an unfinished bead of conch shell long barrel circular (fig. 115, 17; pl. CL, 31) which suggested that the house belonged to a beadmaker.

B. Carpenter's House

(a) House 58 (fig. 19; pl. XLIV) was located east of house 57, on the other side of the 1.1-m-broad lane, in the trenches DZ'2 and DZ'1. The exposed portion of this house measured 5.7 m east-west and 3.96 m north-south. Its area on the east was partly exposed. The entrance in the north-west corner of the house was partly damaged by a later hearth. The badly preserved midwalls varied in thickness from 18 to 20 cms. The floor of the house was uneven. In the exposed eastern part of the house was a *chullah* (pl. XLV) over a circular platform, 1.4 m in diameter. The *chullah* with a cusp on the inside had a 25 cm wide mouth and dwarf walls, only 3 cm high, but there was a fairly deep depression in its inner part apparently to accommodate the fuelwood. To the west of the *chullah* was a potrest, 40 cm in diameter. The drills (fig. 95, 46, 49, 53; pl. CIX, 19, 22, 29;) recovered from this house indicated that it belonged to a carpenter.

(b) House 65 (fig. 21) was situated to the east of house 58 in the trenches AZ'2, AZ'1, BZ'2 and BZ'1 and was only partly exposed. Oriented towards northeast-southwest its exposed portion measured 9.9 m east-west and 6 m north-south and it thus appeared that this was the biggest of the houses of the Jorwe Culture. But it was not fully exposed. It was represented by postholes lined with clay packing. Two drills of chalcedony were recovered from this house (fig. 95, 45, 50; pl. CX, 20, 25). These finds and its location close to house 58, a carpenter's house, indicated that this house, perhaps of wattle and daub, also belonged to a carpenter.

(iii) Lime Embankment

As pointed out before, a lime embankment was cut through in the cutting DMD-3 in the 1958-59 season (p. 5). The northern section in this cutting was scrapped in the season 1978-79 with a view to knowing more about it. In pl. XLVII the thick whitish layer of lime mixed with clay represented the extant embankment. The layer lying immediately above it therefore looked different from the compact mass of the lime-clay deposit below, whereas that lying immediately below the lime represented the rammed hard clay. The scraping of the part of the section towards the east of this cutting, facing west, however, provided fresh information about the encroachment of the river flood and subsequent raising the height of the embankment. In this scraping it was noticed that a thin layer of lime-clay deposit of embankment, 30 cm thick, was covered with about 10 cm thick layer of current-bedded sandy silty deposit deposited by river (pl. CLXI). It appeared that the floods entered through the embankment and



PLATE XIV | *Chalcolithic* in house-58, looking west. Phase V.



FIGURE 10.10.3 (1958.29) - general view of the section facing south and part of section facing west (right) at which the table is kept; acquired in 1978-79 to explore its section; the long arrow marks the archaeological periphery of the site.

PLATE XLV/1



PLATE XLVIII : Extant from decoration, Phase V.



PLATE XLIX View from top of house 2, circular kiln, structural phase D, Phase V.

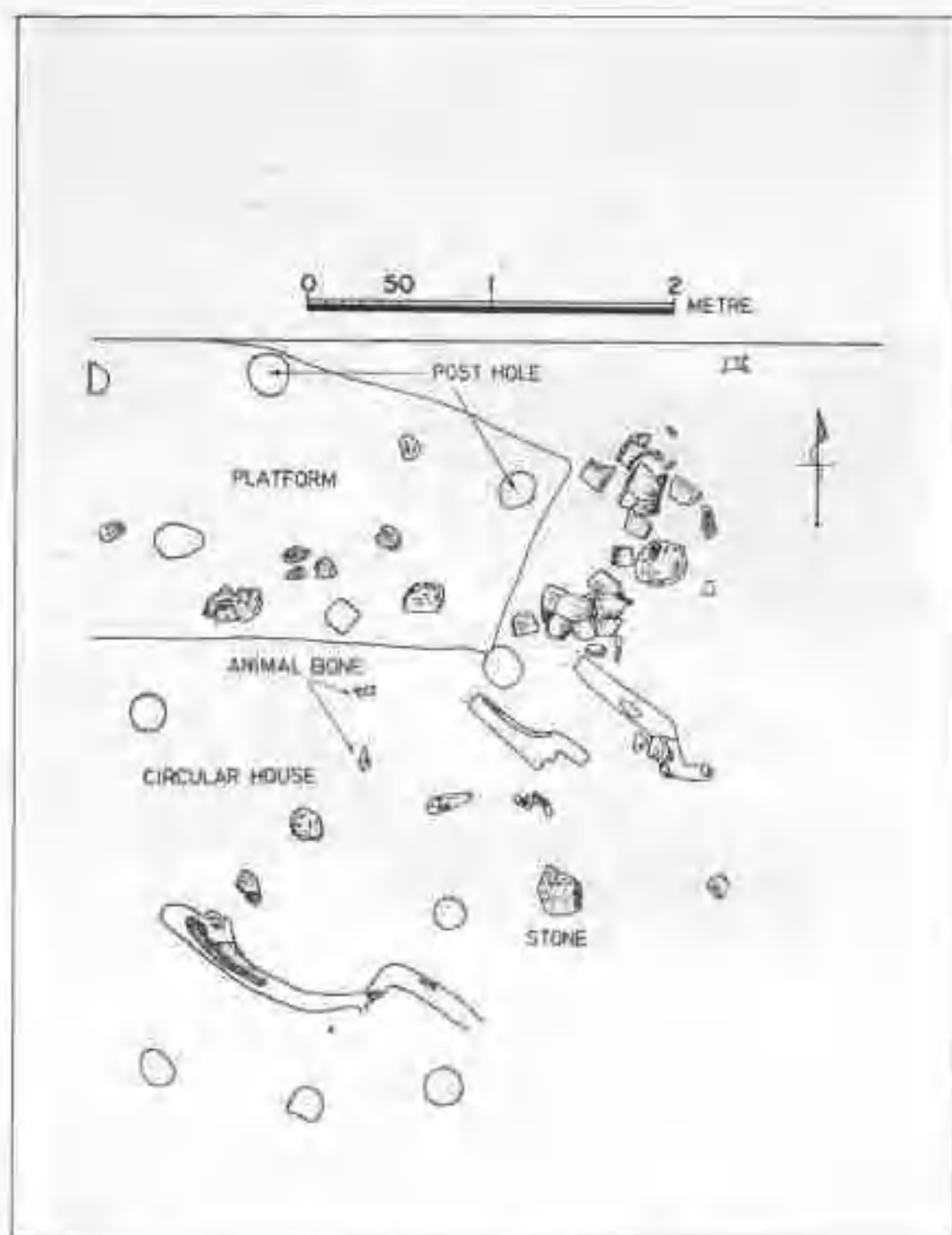


Fig. 22. Plan of circular house (House 2), structural phase D, Jyote Culture.

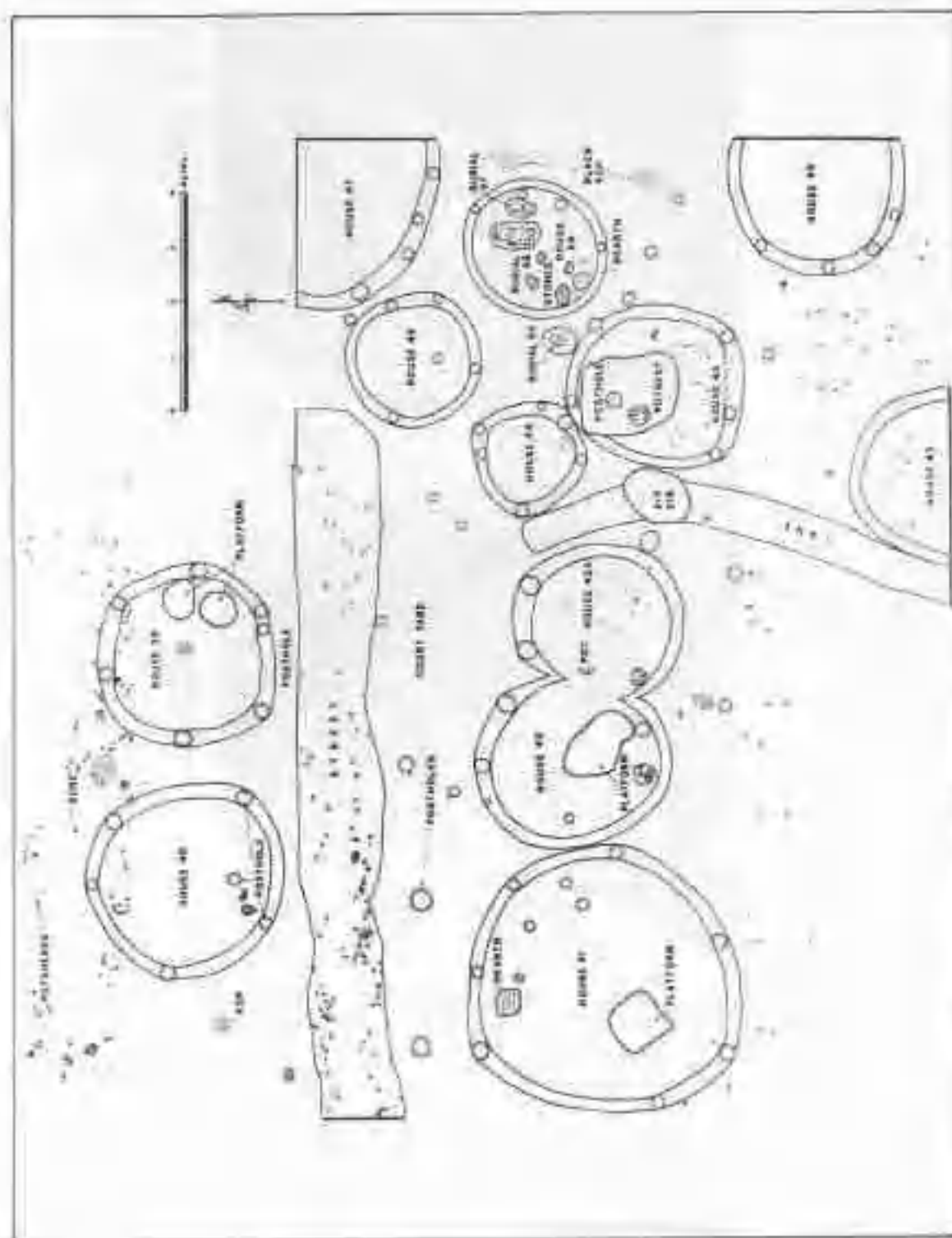


Fig. 23. Plan of circular houses, structural phase D and Pottery 65-67, Jorwe Culture.



PLATE 4. General view of circular huts and street, structural phase D, looking east, Phase V.

deposited the flood deposit over a low wall of the embankment on this side. The layers lying over the flood deposit consisted of lime-clay deposit similar to that of the embankment but were very much weathered and consequently became loose. The evidence, however, clearly suggested that the height of the embankment was raised after the flood, marked by the alluvial deposit above layer 3, was recorded.

(vi) *Unclassified*

(a) House 59 (fig. 19) represented an open space, 3.6 m broad, to the north of house 38 with a mud-plastered floor, damaged here and there by later disturbances. It seemed more likely that this formed a courtyard of house 58, because the carpenter needed a spacious place for working.

(b) House 60 (fig. 19) was located in the trench EZ'3, to the west of house 38. Of this house, only 1.4 m long southern wall and 90 cm long eastern wall were found survived in the exposed portion. Its floor was very much disturbed by later disturbances.

(c) House 61 (fig. 19) was situated immediately to the south of house 57, an L-shaped arm of its eastern wall touching the posthole in the south-eastern corner of the latter. An area of 4.55 m north-south and 4.2 m east-west of this house was exposed in the trench EZ'1. Between the eastern wall of this house and the western wall of house 58 was a lane 60 cm broad. The southern portion of the floor of this house was eaten away by later disturbances. On the north the southern wall of house 57 formed a common wall with it. A small circular hearth, 30 cm in diameter and with burnt walls, was exposed in this house near the western section of the unexposed part of the trench.

(d) House 62 (fig. 19) was located to the north of house 38 with an east-west lane between the two varying in width from 90 cm to 1 m. It was a large house but was only partly exposed in the trench DZ'4, the exposed portion measuring 5.6 east-west and 4.6 m north-south. The breadth of the mud-walls varied from 10 to 20 cm. Two floor-levels of this house could be noticed. The one on the top consisted of 2 to 3 cm thick rammed layer of yellow kankary silt plastered with a fairly thick coat of brownish mud. The underlying floor was also made in the same fashion. Cut into the floor of this house were found seven burials, 68-74, three, 68-70, of which were located in a single burial pit (fig. 19; pl. LXXI; p. 205). A noteworthy find from burial 72 was a mothergoddess of copper (fig. 110, 12 pl. CX-LIV, 2).

(e) House 63 (fig. 19) was located immediately to the south of house 58. It had common walls on the north and the west with the latter. The floor and the walls of this house suffered heavy damaged due to later disturbances.

(f) Floor Decoration (pl. CLVIII). In the floor of a house (not exposed) in the trench CZ'2, was found a circular decoration made of vertically embedded potsherds similar to that noticed in the floor of house 50 of the Malwa Culture.

E. Structural Phase D

(i) *Circular House*

(a) House 2 (fig. 22 pl. XLIX) was a circular hut exposed only partly in the northwest

corner of trench DZ57 on top of layer 3 in Sector-I. This hut was oriented northwest-southeast with its entrance opening towards southeast. It measured 3m in diameter and its entrance was 1.8m wide. The extant walls, made of hard clay, of the hut were about 10cm thick and 15 to 20cm high and plastered with mud both from inside and outside. In the inside of the hut was a rectangular platform, made of yellowish clay, measuring 2.1m long and 1.2m broad. On this platform were lying four flat stones, three of them in a triangular fashion meant for resting a three-footed vessel or a storage jar. The floor of the hut was marked by several depressions. Over the surface of the floor were found lying crushed fragments of storage jars and small stones. In the inside of the hut were five postholes and one was at the entrance.

(b) House 39, (fig. 23; pl. L), a circular hut, 2.8 m in diameter, had a peripheral wall, 25cm thick. In the eastern part of the hut were two platforms, 3cm high made of rammed earth and plastered on the top. One of them, roughly rectangular in shape, measured 70 X 55cm and the other, oval in shape, 65 cm in length. In the peripheral area were 7 postholes of which four were 25cm in diameter and three 20 cm. Most of the potsherds, animal bones and small-angular stones collected from this house were found lying in its northern side. The floor in the house was very much disturbed. One each a point (fig. 119, 14 pl. CLV, 22) and an awl (fig. 119, 16; pl. CLV, 10) of bone and a terracotta gamesman (fig. 103, 17; pl. CXXXIV, 5) were recovered from this houses.

(c) House 40 (fig. 23; pl. L) was 3.05m in diameter. It had five postholes along the periphery of which 4 were of 25cm in diameter and one of the 20 cm. There was also one posthole inside the house which was 25cm in diameter. Near it, in the southern part of the house, was located a group of three stones flat on the top. The floor inside the house was made of brownish silt mixed with kankar nodules and yellow silt.

(d) House 41 (fig. 23; pl. L) was the biggest of the circular houses exposed so far. It was 4.45m in diameter and had a square platform inside, 90 x 90 cm in size. It was made of hard yellowish clayey earth and plastered on the top with whitish mud. This platform was 4cm high above the floor of the house and was marked by several ash patches. The house had seven postholes of which two were of 30cm diameter, three of 25cm and two of 20cm. There was a rectangular hearth, 50 x 44 cm, containing ash. In front of the house, by side of the road, were two post holes of 40 cm diameter each.

(e) 42 and 42A (fig. 21) formed a twin house complex. The house 42A was circular and 2.4 in diameter. There was a passage inside to enter from this hut into the another. The house 42 was oval-shaped and was 2.9m east-west. There was an ovaloid patch of a platform, 1.4 m long, near the common entrance inside the hut. To the south of this platform close to the wall was a circular platform 35cm in diameter and 5cm high and with four flat stones embedded in whitish clay and arranged in a squarish form apparently to use for resting storage bin. In the adjoining house 42A were found, near the common entrance, two crushed pots. The postholes of these two huts were fairly big, measuring 35cm in diameter.

(f) House 43 (fig. 21) was only partly exposed. It was 2.8 in diameter. A head of carnelian, standard truncated bicone circular and a fragment of terracotta mothergoddess were the notable finds from this house.

(g) House 44 (fig. 21) was a small circular hut, 1.50m in diameter. It had six postholes, one of 30cm diameter, two of 25 cm, two of 20 cm and one of 15cm. On the southern side, inside the house, there was one crushed pot of Jorwe Ware. This house had a finely made and plastered floor.

(h) House 45 (fig. 23; pl. I) was of 2.70 m diameter and had a platform, 1.7 m in length and 1 m in breadth. Over this platform was a circular potrest, 10 cm high and 36 cm in diameter. It was made of flat stones embedded in yellowish white clay. This house had six postholes, each 25 cm in diameter, along its periphery. There was also one posthole, 30 cm in diameter, on the above mentioned platform.

(i) House 46 (fig. 23; pl. I) was 2 m in diameter and had four postholes along its periphery, the postholes being 20 cm in diameter. Inside the house was one more posthole of equal dimension. The floor of this house was very nicely plastered.

(j) House 47 (fig. 23; pl. I) was survived by only a quarter of its portion in the trench CZ'2. In the extant portion of the hut four postholes were observed in its peripheral area. One of them was 30 cm in diameter and the rest 20 cm. In the extant portion of this house one complete tiny *lota* was found.

(k) House 48 (fig. 23; pl. LXIX) was an interesting circular house with 1.25 m diameter. Within this house were found two burials, 66 and 67, besides four flat stones meant to be used to rest a four-footed storage vase. There was also a circular hearth containing ash by the side of four flat stones. Two of the four postholes lay on the peripheral area and two inside of the house just near the periphery. The diameter of the three postholes was 15 cm and of one 20 cm. In the open area between houses 48 and 45 was one double urn burial, 65.

(l) House 49 (fig. 23; pl. I) was a circular house having 2.8 m diameter. Almost three-fourths portion of it was exposed. In the periphery of the exposed area four postholes were observed. Of these, one was 25cm in diameter, two 20 cm in diameter and one of 18 cm diameter. Between houses 48 and 49 there were three postholes in an oblique row.

(ii) The Street (fig. 23; pl. I)

A street, 1.4 m broad, made of small sub-angular stones and potsherds embedded in a matrix of yellowish clayey earth, running east-west to a length of 12 meters and then taking a northerly turn, was encountered in the complex of the circular houses or huts described above. The mud-plastered courtyards of the circular huts touched the sides of this street. Along the southern edge of the street, in the courtyards, there were a series of postholes apparently for the wooden posts to hold a canopy or a thatched roof above.

(iii) The Lane (fig. 23)

Apart from the street, a lane, 70 cm broad, was found running along the western side of the circular hut 43 and further between the twin hut on the west and the huts 44 and 45 on the east. Made of yellowish clayey earth, it terminated at the front courtyard of houses 44 and 45.

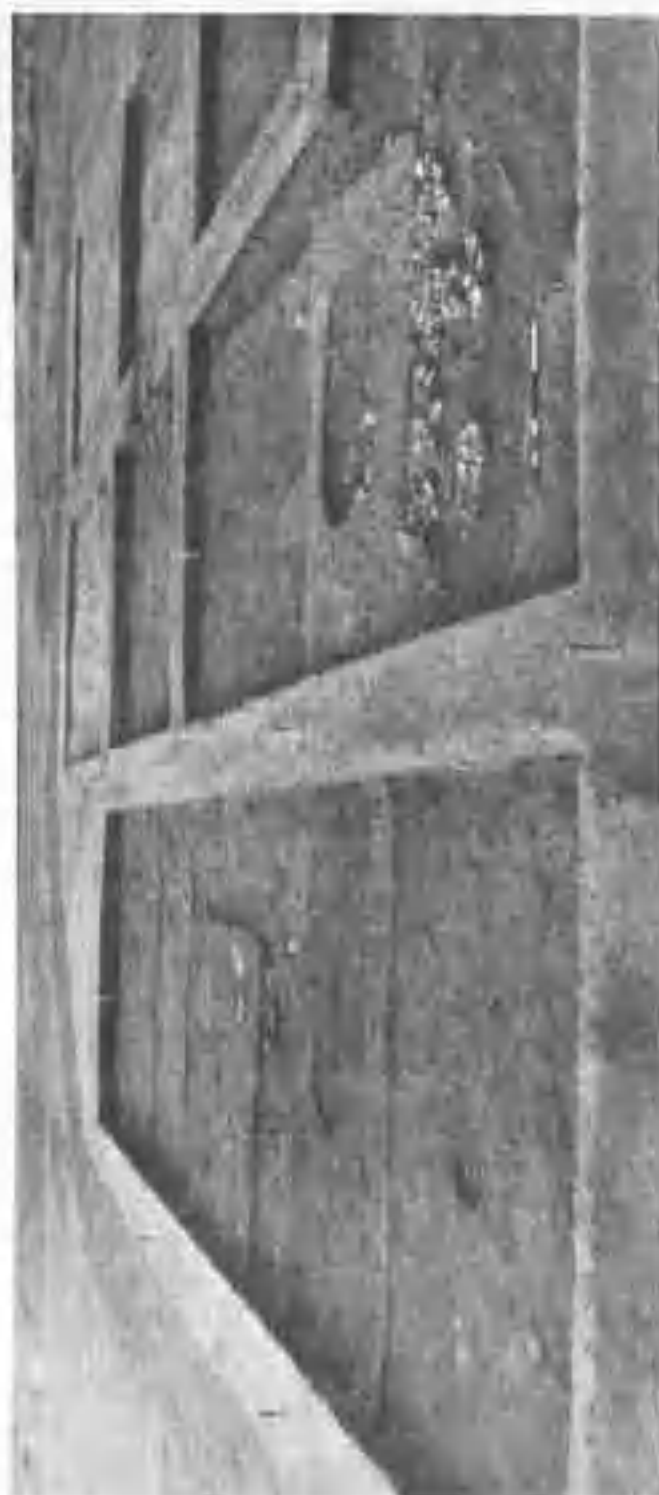


PLATE 13

General view showing mud platform, house 1 (left middle ground), and elliptical structural complex with approach paths and clusters of offerings (right foreground), looking north, Structural phase E, Phase V.



PLATE LII General view showing extant mud fortification wall, looking south. The top of the large circular bastion (fig. 24) to its west is also seen in the cutting AZ. 67 (right background). Structural Phase E; Phase V

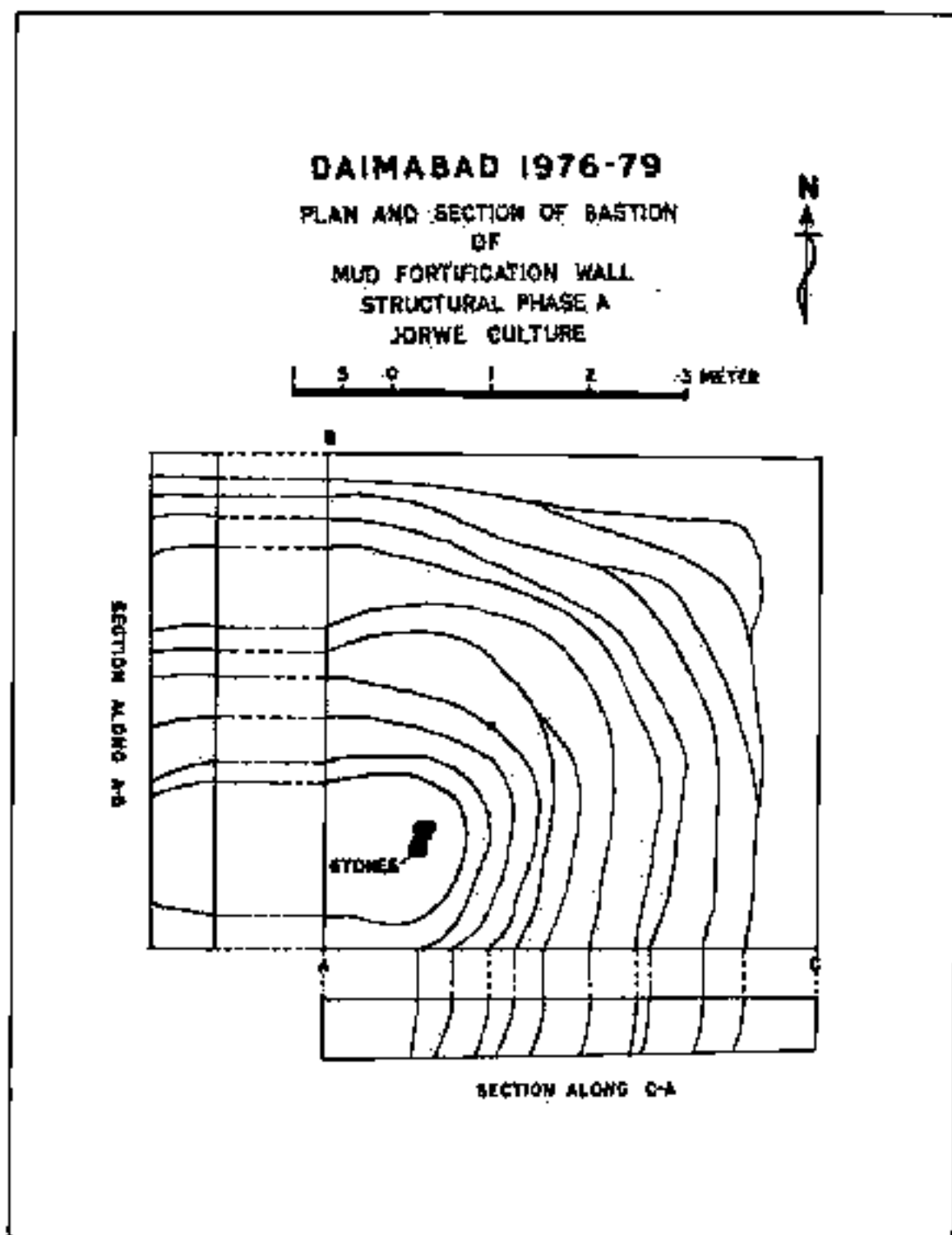


Fig. 24. Plan and section of Bastion of mud fortification wall, structural phase E, Jorwe Culture.

F. Structural Phase E

(i) Religious Structure

A. Mud Platform

House 1 (pl. LI) was a mud-platform of which 4 m long portion was exposed in the trench EZ55. It was 3.5 m broad and 10 cm high. Over this platform, on its eastern side, a few fragments of a jar of thick coarse ware were found lying. Near its southern edge were two postholes filled with gravel. One of them measured 30 cm and the other 20 cm in diameter. About 20 cm to the southwest of this platform was one vase of unbaked clay with vertical sides and a high pedestal base which was embedded in the ground. By the side of the vase was a broken piece of a miller stone, besides a few potsherds and a gravel patch. To the west of the vase was a single-urn burial, burial 17. On the east and north of the platform was a channel-like depression, 75 cm wide. Being situated very close to the complex of elliptical religious structures (see below) it appeared that this platform was connected with religious rites and was a part and parcel of the religious complex. One head of agate (fig. 116, 30; pl. CL, 14), long barrel circular was a noteworthy find from this house.

B. Elliptical Structural Complex With Approach Paths

In the trenches CZ53 – CZ56, DZ53 – DZ56 and EZ56 remains of a number of curious structures, oval in shape and joined with a pair of parallel mud-strips, were observed. One of the groups of these lay in the trenches CZ56, DZ 55, DZ 56 and EZ 56. The mud-strips joining the structures, varied in breadth from 60 to 70 cm and reaching them from cardinal points. For example, the ones in the trench DZ were from the east and those in DZ56 from the south. Except those in DZ56 and DZ55 all were in a very badly damaged state and partly eroded. The features common to all may be described as under. A low broad mudwall elliptical in shape was constructed. It was joined at either one or two sides by mudstrips, about 60 to 70 cm broad. Within the vacant elliptical space inside the walled structure and along the outer periphery of the wall various types of pots, including miniature ones were placed in clusters some in association with other finds. An idea about these structures and offerings was obtained from the one which was exposed in a well-preserved condition in the trenches DZ53 and DZ56.

The oval structure (pl. LI) in the east-west direction, measured 3.9 m north-south and 3.65 m east-west, the mud-walls varying in thickness from 60 to 70 cm. Near each end of the northern outer periphery of the mudwall was joined one mudstrip each, 75 cm in width and 5 meters in length in north-south orientation. The top of these strips had become smooth and compact due to their constant use apparently for walking. Their thickness, achieved by plastering with mud and cowdung on different occasions, varied from 1 to 1.5 cm. In a good section of the strip lying on the western side, it was possible to count as many as twentyfive

distinct laminations of cowdung plaster although quite a large number could not be counted being very closely joined together. This fact indicated that the strips were plastered with cowdung more than twenty-five times. In the open space lying inside the lenticular mudwall and along its outer periphery pottery and other objects were placed in ten clusters as offerings. The pottery in most of the clusters was very much damaged and complete specimens were only a few. The clusterwise finds were recorded as under:

Cluster 1: Consisted of only one *handi* type vase of Jorwe Ware with a carinated base, tubular spout and a funnel-shaped mouth (broken).

Cluster 2: Contained eight miniature carinated *lotas* two of them lying upside down; one base-fragment of a pedestalled *lota* of burnished grey ware, fragments of a vase of Jorwe Ware with a beaded rim and a bun-shaped lid. An important find from this cluster was a copper ring with 3.5 cm diameter and plano-convex section (fig. 110, 7; pl. CXLIII, 7).

Cluster 3: Consisted of one miniature incurved bowl of Jorwe Ware; sherds of a deep bowl of burnished grey ware with flat base, tapering sides and a flat rim decorated with incised lines; sherds of a vase of Jorwe Ware with high neck, beaded rim and bulbous body and a couple of fragments of a vase of burnished grey ware with outcurved rim.

Cluster 4: included two fragments of miniature carinated bowls of Jorwe Ware; one base of a pedestalled *lota* of burnished grey ware; fragments of a *handi*-type vase of Jorwe Ware with a funnel-shaped mouth and one flat crystal stone.

Cluster 5: yielded potsherds of a vase of Jorwe Ware with beaded rim and bulbous body, one tool-haft of rib bone of *Bos* ground along the edges to obtain a razor-shape (fig. 120, 26; pl. CLVI, 26) and one heart-shaped stone of fine-grained red basalt with the broad side purposely ground to make it flat and with circular depression on one surface (pl. CXVI, 1).

Cluster 6: consisted of two miniature concave-sided carinated bowls of Jorwe Ware; a lamp of burnished grey ware; a *lota* of burnished grey ware with a pedestal base, bulbous body and high vertical neck; one deep bowl of burnished grey ware with flat base, high tapering sides and a flat rim decorated with incised designs; a few fragments of a *handi*-type vase with carinated body, splayed out mouth and a tubular spout; a couple of fragments of a thick platter with a flat base of thick coarse ware; one badly crushed tool-haft made of rib bone of *Bos* sp. and ground to give a shape of razor (fig. 120, 25; pl. CLVI, 25); one parallel-sided blade of chalcedony found below the bone-haft; one fragment of a copper bangle of 4.5 cm diameter; one chisel of bone (fig. 119, 24; pl. CLIV, 8); one stone ball and one oval-shaped stone of fine-grained red basalt.

Cluster 7: contained very badly crushed mass of pots of ill-fired Handmade Red Ware; (i) vase with round base and splayed sides; (ii) platter and (iii) dish with stand. The other partly damaged types recovered in the same ware were a shallow bowl with a solid high pedestalled base and slightly splayed sides and a bowl-like vase with a hole in the centre of the flat base and with splayed sides. The other finds were fragments of a *handi*-type vase of Jorwe Ware with carinated body and tubular spout and one bun-shaped lid of burnished grey ware with finger-tip depression on the top.

Cluster 8: consisted of a crushed mass of the pots of an ill-fired Handmade Red Ware.

The types which could be made out were a large vase with four legs and one shallow bowl with a high solid pedestalled base. A vase of Jorwe Ware with a beaded rim and squat rounded body also occurred in this cluster.

Cluster 9: contained a badly crushed mass of a vase of ill-fired Handmade Red Ware with three legs and one vase of Jorwe Ware with a high neck, beaded rim and squat globular body.

Cluster 10: which occurred inside the lenticular structure included badly crushed mass of a vase of ill-fired Handmade Red Ware and fragmentary potsherds of a vase of thick coarse ware, a vase of Jorwe Ware and a vase of burnished grey ware, none of which were able to give any idea of the type they represented.

(ii) The Defences

A. Mud Fortification Wall (fig. 24; pl. IJ)

In Sector 1, as pointed out before (p. 74), remains of a mud-fortification wall were exposed in the cutting Z63—Z69. This wall was made of whitish, yellowish and light reddish hard clay and was very distinctly visible in the section in the river side cutting A69—Z70 to AZ69—AZ70 with its foundation cut into the layers 1–3 and 75 cm in breadth. It was exposed to a length of 55 meters north-south. In the trench Z68 its extant thickness above layer 4 measured 60 cm whereas in the trench AZ67 the circular bastion continued even below the excavated depth of 75 cm. Towards south the wall thinned down and in the trench Z62 there were no traces of it. Further north beyond the raingully too no traces of the wall could be located. In width the wall varied from 1.3 m to 2.4 m. The semi-circular bastion exposed in the trench Z68 was 4 m long north-south. On the western side of the wall was a large circular bastion exposed in the trench AZ67 measuring 6.8 m in diameter. An interesting aspect of the construction of it was that it was made of concentric layers of mud, the layers lying against each other being quite distinctly visible in plan (fig. 24). The third bastion was roughly oval-shaped and part of it lay on the east of the wall. It was 3.2 m in diameter. Over its top was a later circular pit, 1.6 m in diameter.



6. THE BURIALS

A. Introductory

A total of seventyfive burials were exposed in the excavations, all in the habitation area. Observations, however, indicated that the area lying immediately to the west of the site, between the site of the Excavation Camp and the railway tract, represented a separate burial site of the chalcolithic period; for, in this area stray clusters of potsherds of the Jorwe Ware and the black-and-red ware of the "Tekwada Class", along with fragments of human bones were noticed. An attempt was made in this area to trace out an intact or an undisturbed part of burial, but in vain. This was due to the fact that the area underwent severe erosion, leaving behind traces of burials in the form of stray clusters of pottery and human bone fragments. It was also suspected that in the south-eastern part of Sector III, close to the barbed wire fencing, but within the habitation site, burials of the Jorwe Culture were concentrated in an area about 50 x 20 meters. Excavation of this area was planned but not carried out. It thus seemed that during particularly the Jorwe Phase burials were located within as well as away from the settlement, the latter as a separate burial site. There was no way to understand whether the other earlier chalcolithic cultures at Daimabad had adopted similar practise.

Burial remains were recorded in each season's work. Barring Sector III in which no attempt was made to excavate any, burials were exposed in all the sectors. Of the seventy five burials, six, 1-6, were exposed in the 1974-75 season in the cutting CZ52-FZ52 to CZ61-FZ61 in Sector I. Being stratigraphically important as explained on p. 82, they have been dealt with in this report. In continuation of these, the eleven burials of 1975-76 season were numbered 7-18 and those two of 1976-77 as 19 and 20. But the fourteen and fortyone burials exposed in the 1977-78 and 1978-79 seasons respectively were given fresh numbers from 1-14 and 1-41 respectively in the beginning. Subsequently, however, in order to bring continuity in the numbering, their numbers were revised and they were serially numbered from 21 to 34 and 35 to 75 for 1977-78 and 1978-79 respectively.

The exposed burials have provided a hoast of information, not known before in the Deccan. There was no evidence of burial in the exposed area of Phase I. The solitary burial of Phase II was of extended inhumation type. Its occurrence within the habitation site was difficult to explain in the light of the fact that among the authors of this culture in Gujrat and the Indus basin the practise in vague was that of burying the dead in a separate burial site located away from the settlement. The location of this burial near the river bank was, howe-

ever, noteworthy since in the excavated levels of this phase in other parts of the site no burial remains were found. This burial appeared to belong to an important person as was indicated by the elaborate arrangements made to bury him such as the specially made floors, the mud-brick coffin and the use of shroud of hemp-like fibrous material. Burials with mud-brick coffin and reed-shroud have been recorded at Harappa² whereas the brick-lined coffin was found at Lothal³. The burial 10 from cemetery R37 at Harappa showed identical features, viz. the mud-brick lining and the mud-brick filling raised as a tumulus over the burial pit⁴. These features, the use of mud-brick for the coffin in the ratio of 4:2:1 and the broader headward side of the burial-pit⁵ were all in the Harappan tradition.

Each of the three exposed burials of Phase III belonged to a separate type. Thus burial 33 represented Type A, a pit-burial; 34, Type B, a symbolic burial and burial 59, Type C, a post-cremation pot-burial in clay matrix. Two examples of the last-named type, but without clay matrix, have been recorded in the levels of Ahar Culture, Period IA, at Dangwada (Ujjain) and interestingly enough they were encountered there within the habitation area⁶. In burials 33 and 34 a vase of Daimabad Ware was found placed at a higher level than that of the other pots or over another pot. Although in the pot from the latter the portion above the neck was missing, both the pots appeared to belong to one and the same type. It appeared more likely that such an arrangement would not have been without a purpose. Most unusual was, however, the occurrence of a pair of circular marks consisting of sandy silty material in relief firmly applied over the shoulder of two pots from burial 33 (fig. 48, 49, 1; pl. LXXXI; p. 179). Whether they represented sun and moon motifs or the breasts to indicate a female form was difficult to assess. As would be clear from the following the method of embedding burial urns in a clay matrix in the burial pit also continued in the Malwa and the Jorwe levels.

Of great importance was the evidence of different types of burials from the Malwa Phase and among them especially the double urn type. While it has on the one hand, pushed back the antiquity of the horizontally placed twin-urn burial type, hitherto known as characteristic of only the Jorwe Culture in the region of the Deccan, on the other also posed a complicated problem of tracing the origin of this type of burial in view of the fact that the Malwa Culture in Central India, wherefrom it is being believed to have spread in the Deccan, has not so far yielded remains of burials of such a kind and for that matter of any other type. Twin-urn burials have not been reported from the contemporary or earlier cultural levels from southern India, the Tekkalakota⁷ and Hallur⁸ evidence being of the Jorwe period. At Ramapuram

2. R.E.M. Wheeler, "Harappa 1946: The Defences and Cemetery R 37", *Ancient India*, no. 3, pp. 85-89, pl. XXXVII, A and B.
3. S.R. Rao, *Lothal: 1935-62, Memoir of the Archaeological Survey of India, No. 78, New Delhi, 1979*, p. 157, pl. CXXA, fig. 22.
4. Wheeler, *op. cit.*, p. 86.
5. M.S. Vats, *Excavations at Harappa*, Delhi 1940.
6. M.D. Khare, "Dangwada (Ujjain) — A Chalcolithic Site", *Puratatva*, No. 11, 1979-80, pp. 117-120.
7. M.S. Nagaraja Rao and K.C. Malhotra, *Stone Age Hill-dwellers of Tekkalakota*, Poona, 1965.
8. M.S. Nagaraja Rao, *Protohistoric Cultures of the Tungabhadra Valley (A Report on Hallur Excavations)*, Dharwad, 1971.

double-urn burials have come from Period IC in which iron was introduced.⁹ Urn burials have also been reported from Nagarjunakonda,¹⁰ and Brahmagiri.¹¹ From the former were reported only two examples and they appeared to be of single-urn type. They have been ascribed to the Neolithic Age. At the latter were single-urn and double-urn types. But in the single-urn burial the urn was vertically placed¹² and in the double-urn type the urns were vertically placed, one above the other.¹³ Both the types belonged to the Stone Axe Culture. Whether the examples from both these sites were earlier than those at Daimabad cannot be said with certainty. Nearer home urn burials were reported from Nevasa,¹⁴ Chandoli¹⁵ and Inamgaon.¹⁶ In the burials from Nevasa the urns were generally of grey ware and of varied types and included, besides that represented by (i) two urns kept horizontally mouth-to-mouth mostly in north-south and rarely in an east-west or northeast-southwest orientation, (ii) the symbolic type, (iii) that consisting of both the urns of Jorwe Ware, (iv) a variant in which one urn was of that Ware and another grey, (v) the single urn laid vertically and (vi) the rare types comprising three and five urns. All these types belonged to the Jorwe Culture. At Daimabad urn-burial consisting of three urns was encountered in the 1958-59 season from the levels of the Jorwe Phase.¹⁷ This type also occurred at Chandoli.¹⁸ It belonged to the Jorwe Culture. Urn burials have, however, been reported from the Malwa Phase at Inamgaon.¹⁹ But they appeared to be only of the usual mouth-to-mouth type as no variants of it have been reported although in the Early and Late Phases of the Jorwe Culture from here were recorded, besides the common mouth-to-mouth type, single-urn burial of two types, one with horizontally placed urn with its mouth towards south as in Type B of Jorwe Phase at Daimabad and the other vertically kept urn, as well as group burials similar to Sub-type AvI from Daimabad (below p. 205).

The double-pot burials from Cemetery H of Harappa²⁰ differed from those at Daimabad in that in the former the pot containing the burial remains was vertically placed and the second pot kept in an inverted position above the lower as if to serve as a lid.²¹ There is, however, an exact parallel to burial 55 of Daimabad in the Cemetery H.²² In both these, the

9. *Indian Archaeology 1960-61 - A Review*, p. 7 pls. VII A and B.

10. R. Subramanian, and others, *Nagarjunakonda (1954-60)*, *Memoirs of the Archaeological Survey of India*, No. 75, p. 105.

11. R.E.M. Wheeler, 'Brahmagiri and Chandravali 1947: Megalithic and other Cultures in Mysore State', *Ancient India*, no. 4, pp. 180-310, pls. CVII A and B and CIX A.

12. *Op. cit.*, pl. CVIII A.

13. *Op. cit.*, pl. CVIII V.

14. Sarkalia, *et al.* (1960); also *Indian Archaeology 1959-60 - A Review*, p. 28, pls. XXIX and XXXB.

15. Deo and Ansari, *op. cit.*

16. M.K. Dhavalikar, 'Chalcolithic Burials of Inamgaon', in (eds.) Srikrishna Bhatt and Murthy, *Rangavalli Recent Researches in Indology*, S.R. Rao Felicitation Volume, pp. 51-57.

17. *Indian Archaeology 1958-59 - A Review*, pl. XXV B.

18. *Op. cit.*, figs 10 a and 10 b.

19. *Op. cit.*

20. Vats, *op. cit.*

21. *Op. cit.*, pl. LVIII, 1 and 2, pl. LIX, 2, 5 and 8.

22. *Op. cit.*, pl. LIX, 1.

burial urn with a vertical neck was covered with a bowl, the latter covering the mouth of the former in inverted position. The similarity between the lota-shaped vases from Cemetery II and Navadatoli²³ is also noteworthy, although those from the former had come from the cemetery and the latter from the habitation. A major difference between these is that the urn burial from Cemetery II has come from a separate cemetery and not from the habitation area as at Daimabad.

A total of sixteen burials were exposed in the levels of the Malwa Culture. The first one to be encountered of these, burial 20, was found in the 1976-77 season. Nine, 21-29, were exposed in 1977-78 season and six, 55, 56, 62, 64 and 75, in 1978-79 season. They belonged to two major groups: I, urn-burial and II, pit-burial. No example of extended inhumation was found in this phase.

In Group I were included two main types of burials, A and B. Type A included double-urn burials and had two sub-types, viz. sub-type A_i, mouth-to-mouth and Sub-type A_{ii}, mouth-in-mouth. In the second sub-type there were two variants. In sub-type A_{ii}a both the urns were of burnished grey ware and northern one being placed in the mouth of the southern. In the variant Sub-type A_{ii}b one of the two urns was of burnished grey ware and the other of Malwa Ware, the former on the north being smaller in size was placed up to the neck in the mouth of the latter, both being enclosed in a matrix of clay. The vase of Malwa Ware in sub-type A_{ii}b was painted with interesting motifs of a dog on the neck and sun and a peacock on the shoulder (fig. 60, 1). The representation of particularly the dog and the sun appeared meaningful since "the conception of the nature of death is hinted at in the legend of the dogs of Yama"²⁴ and "it is often said that men obtain unity with the sun, which clearly means that he goes to dwell in the heaven of the sun where are the Fathers, the gods, and above all Yama"²⁵.

In all the examples of double-urn type the urns were placed in the north-south direction.

Type B represented the single-urn burial. Four sub-types were recognized in them. Sub-type B_i was represented by a burial urn of Malwa Ware placed vertically and its mouth covered with a bowl of burnished grey ware in an inverted position (fig. 61, 3, 9). In Sub-type B_{ii} the burial urn was a small vase of burnished grey ware with squat body and grooved neck placed vertically, its mouth being covered with a lid of the same ware (fig. 61, 6, 7). In the mouth of the burial urn of burnished grey ware in Sub-type B_{iii} a bowl of the same ware was placed, both being placed horizontally in the north-south orientation (fig. 63, 4; pl. LXII). The Sub-type B_{iv} was a symbolic type in which the burial urn was a jar of purplish red ware with bulbous body and button base and was placed vertically.

In Group II there were two main types, C and D. In Type C the burial-pit contained bowls. There were three sub-types in this. Sub-type C_i consisted of three bowls of the Malwa Ware, two of them placed mouth-to-mouth, in the north-south orientation and the third

23. cf. Vats, op. cit., Pl. LVIII, 6 and Pl. LXI, 13-15 with Sankalia, Deo and Anand, op. cit., Cpl. IIIA: Pl. XVD fig. 82, T 102A, T 102B, T 102C.

24. Keith, op. cit., p. 406.

25. *Ibid.*

kept vertically beside. In Sub-type Cii all the three bowls of the Malwa Ware were placed horizontally in a row, their mouths facing south. In the pit of the Sub-type Cii the bowls were of all-black burnished ware. Near the top of the tumulus of this sub-type were placed a couple of stones. An interesting feature of Sub-types Cii and Ciii was that the surface of their pit was covered with twigs of fibrous plant, in the former even the bowls were also covered with them. The type D represented a symbolic burial, containing no remains. But the surface of the burial pit was marked by remains of fibrous plant twigs. The spread of twigs of fibrous plant over the bottom of the burial pit and over the bowls reminds one spreading of *Darbha* in burial pits as mentioned in the *Grhyasutra* texts.²⁶ The finds associated with the burials were beads. Burial 75 yielded two hundred seventy seven beads, burial 20 seventy-two and burial 24 one.

In the overlap levels between the Malwa and the Jorwe phases seven burials, 44, 45, 47, 50, 51, 57 and 58, all in the 1978-79 season, were encountered. They were of two major types: Type A double-urn and Type B single-urn. In Type A there were two sub-types. Sub-type Ai was mouth-to-mouth and Sub-type Aii mouth-in-mouth. The burial-urn in both the sub-types were oriented north-south and in Sub-type Aii the southern urn being smaller in size was placed upto its neck into the mouth of the northern as in Sub-type Aii of the Jorwe Phase (below, pp. 197 and 200).

In Type B were observed two Sub-types, Bi and Bii. In Sub-type Bi the vertically kept burial urn was covered with a lid whereas in Sub-type Bii the burial urn was without the lid cover.

Largest number of burials, forty-eight, belonged to Phase V. They were divisible into three major groups, viz. I extended inhumation in a pit; II, extended inhumation in urns and III, urn-burial. Curiously enough no example of pit-burial of the types met with in the preceding Malwa and Daimabad phases was encountered in the excavated area of this phase. To the first group belonged only three examples, 6, 8 and 53, to the second only one, 7, and to the third all the rest.

Of the extended inhumation type, one, 6, was found to have been disturbed due to the floods (pp. 237-238), whereas 8 and 53 were noticed well-preserved. The skeleton in the former had its feet chopped off below the ankle whereas the latter was found in its full form. Since the latter was found in the courtyard of the house of a merchant (house 38; pp. 239), whether it tells something about the social status of the merchant was not fully understood (see also below). In the example of Group II (burial 7) the skeleton of a boy was interned in two urns of burnished grey ware placed mouth-to-mouth, the feet below the ankle of the skeleton being chopped off (pl. LXVII; p. 192). In this example the skull was found kept in a bowl of Jorwe Ware with concave carinated sides and on the backside of the bowl were found placed a bunch of wild flowery plant, *Flaveria compositae* (pp. 192 and 195).

Excluding the disturbed example, pots were found associated with the extended burials. In association with burial 8 were a lota, a bowl and the lower half of the belly of a pot in the

26. Sinha S. Dange, op. cit.

form of a bowl, all of Jorwe Ware. Interesting was the bowl, bearing on the inside patches of black spot, placed at the head of the buried body in burial 53 (pl. LXVIII), indicating that the bowl was used as a lamp, and that the lamp was lighted in the burial-pit before it was closed. It may be added that even nowadays a lamp is lighted at the spot where the dead body was kept before it was taken away for cremation. On the right-side of the body were placed one concave-sided bowl of Jorwe Ware, a small sub-rounded stone and a fresh water shell. Another aspect of this burial was that its burial pit was sealed by a layer of clay.

In Group III three types of burials, A, B and C, were found. Type A was a double-urn burial of which thirty nine examples were met with. Type B was a single urn burial represented by three examples and Type C was a jar burial to which belonged two burials.

The following were the Sub-types and their variants in Type A burials:

Sub-type Ai	: mouth-to-mouth, burials 10-13, 15, 16, 30-32, 35, 36, 38, 40, 41, 45, 60, 61, 65-67, 72 and 73.
Sub-type Aii	: mouth-in-mouth
Variant Aiii	: burials 37, 39, 46, 52 and 74
Variant Aiiib	: burial 42
Sub-type Aiii	: in clay matrix; burials 9, 14, 48 and 49.
Sub-type Aib	: associated with stone muller or stone chopper.
Variant Aiva	: burial 1.
Variant Aivb	: burial 2.
Variant Aivc	: burial 3.
Sub-type Av	: with burial urns of the Jorwe ware; burial 19.
Sub-type Avi	: group burial; burials 68, 69 and 70.

Although generally the orientation of the burial-urns was north-south, there were also examples, burials 14, 15, 40 and 45, in which it was northeast-southwest. In most of the cases the northern urn yielded skull bones and the southern bones of extremities. In burials 8 and 35 the skull fragments were placed in a concave-sided carinated bowl. Burials of the first three sub-types also occurred in the preceding Malwa Phase, those of the sub-types Aiv and

Avi being recorded only in the Jorwe phase.

Interesting was the find of a mother goddess of copper (fig. 110, 12; pl. CXLIV, 9) from burial 72. One stone ball was recovered from burial 4 and a blade of chalcedony from burial 35. Beads were usually found in the northern of the two urns. They were collected from burials 7, 11, 12, 13 and 43.

In general the burials of Sub-type Ai of this phase were similar to those of the corresponding sub-type of the Malwa Phase but differed in details. For example, in some of the examples of the former subsidiary pots such as a concave-sided eminated bowl, a *lota*, a handi-type vase with tubular spout and funnel-shaped mouth, all of the Jorwe Ware, and a bell-shaped as also a deep bowl with flat base and splayed sides, both of burnished grey ware, were placed outside the urns either at the junction of their mouths or back side of usually the southern urn whereas this feature was absent in the burials of this category in the latter phase. On the other hand the custom of keeping small subsidiary pots inside the urns was common to both the Phases. The burial urns of 38, 40, 63, 66 and 73 were comparatively smaller in size than those occurring normally, the smallest being of 66.

Burials of Sub-type Aii were much more interesting than those of Sub-type Ai. In the corresponding sub-type of the Malwa Phase the northern of the two urns was smaller in size and placed upto its neck into the mouth of the southern, the bigger urn. In the mouth-in-mouth sub-type of the Jorwe Phase the southern urn was smaller in size and it was placed upto its neck into the mouth of the bigger northern urn. It is significant that this change was first noticed in the burials of the overlap phase and hence it was possibly related to the arrival of a new group of people possessing or following a different custom from that of the authors of the Malwa Culture. It should be noted that this is one of the important aspects which does not go in favour of the idea of development of the Jorwe Culture from the Malwa Culture. There was however, an exception to this also. In burial 52 the southern urn was bigger and in its mouth the mouth of the northern urn was placed (pl. LXVIII). It should be noted that this represented another example of going away from the normal custom by the merchant's house, the previous one being that in burial 33, the extended inhumation without chopping off the feet. Perhaps this was related to the status of the family or the merchant was the follower of old traditions.

In this Sub-type occurred two variants, Aia and Aib. In the former both the urns were of burnished grey ware and of identical type, that is, with globular body and flared out mouth; but, in the latter although both the urns were of burnished grey ware each differed in type from the other. One of them, the southern, was with globular body and flared out mouth and the other, the northern, smaller in size, was with squat globular body and vertical featureless rim. The outside of this latter was coated with deep red colour which is survived in patches.

The mode of burial adopted in Sub-type Aii was earlier noticed in phase III and also in Phase IV. This feature has, however, not been reported so far from any other known Chalcolithic site in the Deccan.

Association of stone muller and stone chopper with the double-urn type was a unique



PLATE LIII Cutting CZ 01: mudbrick-lined coffin, burial 18, looking north. Phase II.



PLATE LIV. Cutting C261: close view of part of the skeleton of burial 18 showing sticking remnants of fibrous plant material, Phase II.

feature of sub-type Aiv. This sub-type has not been reported so far from any other chalcolithic site in the Deccan. Three variants, Aiva, Aivb and Aivc, were recognized in this Sub-type. In variant Aiva the oval-shaped stone muller was placed to the west of the southern of the two urns placed mouth-to-mouth in the north-south orientation. Both the urns of the variant Aivb were of the Jorwe Ware and by the side of the southern urn was placed one stone muller, oval in shape. The two urns of variant Aivc were of burnished grey ware and to the southwest of the southern urn was kept one chopper of basalt.

The use of vases of the black-painted Jorwe Ware as burial urns in Sub-type Av suggested special social status of the family of the dead.

The group-burial of Sub-type Avi in which three burials occurred in one burial-pit, indicated sudden death of three children perhaps in an epidemic.

The burials of Type B₁ of which only three examples, 17, 54 and 74, were found, were no less interesting. In the single urn burials of the Malwa Phase various types of burial urns used whereas in the corresponding type in the Jorwe Phase all the urns used were of the burnished grey ware with globular body and flared out rim and were placed horizontally with their mouth towards south.

The importance of burials of Type C has been already explained (p. 43). It needs to be mentioned here that in the season 1975-76 a few more examples of this type were partly exposed in the trench FZ52 but the trench was abandoned.

B. Description of Burials

The exposed burials are Phase-wise described below.

1. PHASE-II

Burial 18 (pls. LIII-LIV) was exposed in the trench CZ61. It was very much disturbed by large later pits and as a result, the mud-bricks, save for those around the head, were found missing. An outline of the burial pit was, however, quite clearly visible. The oval-shaped pit was wider at the head side than at the feet-side. At the former it was 2.3 m and at the latter 1.7 m. The exposed length of the pit measured 2.9 m, a part of it lying in the unexcavated area. The bottom of the pit was made in two stages. In the first stage the floor of the pit was made of yellowish-whitish clayey earth mixed with mud-brick bats and small river pebbles or coarse gravel and rammed. Over this floor was laid down another layer of whitish earth mixed with fine gravel and burnt clay lumps. It was rammed and plastered with brownish white mud. The corpse was placed over this floor almost in the centre of the pit in an extended position with the head towards north but tilted to its left. The body was covered with twigs of hemp-like fibrous plant the remains of which were found sticking to the skeleton (pl. LIV). Complete mud-bricks in two sizes, (1) 32 x 16 x 8 cm and (2) 28 x 14 x 7 cm, in the ratio of 4:2:1, as well as large mud-brick bats were placed on-edge around the body to form an encasing. It was not possible to know if any grave goods were placed in



PLATE LV *Daimabad* - burial 33, Phase III.



PLATE LVI. Dalmabad (burial 54, Phase III).



PLATE LVII Daimabad : burial 59 embedded in clay. Phase III.

the coffin. A stone was placed at the head, on the right, over the mud-bricks and the coffin was then covered with loose earth mixed with mud-brick bats. This filling raised a tumulus above the mud-brick-encasing to a height of 45 cm. at its crest.

2. PHASE III

(a) Type A (pl. LV)

Burial 53 was encountered in the trench FZ63 in Sector I. It was sealed by 12 and cut into 13, 14 and 15. An oval-shaped pit, 1.6 m long and 1 m broad, was sunk in the north-south orientation. At the southern end of the pit one vase of Daimabad Ware with globular body, narrow neck and beaded rim (fig. 48, pl. LXXXI, 1) was placed horizontally with its mouth facing south almost at the level of the mouth of another vase of the same ware with carinated body and out-curved rim (fig. 49, 1) which was kept in vertical position at a lower level than that and by the side of the former. The unusual feature of these two pots has been that each one possessed on its shoulder a group of two circular-to-ovaloid marks in relief made by applying clayey earth mixed with fine sand. These marks have been adhered to the pots very hard. This is a unique feature not so far observed anywhere else in the Indian sub-continent. To the north of these pots were three small *handi*-type pots of black burnished ware with carinated body and slightly flaring rim along with lids of the same ware, all bearing a rim-band painted in ochre red colour. The star motif was engraved as graffiti on most of the pots (fig. 50, 3).

(b) Type B (pl. LVI)

Burial 34 representing this type was exposed in trench Z'4 in Sector II. Six pots were found placed in a circular pit sealed by 9 and cut partly into the black soil. Of these, one was of Daimabad Ware and the rest of burnished grey ware. Interestingly enough the vase of Daimabad Ware with globular body and painted in black on the shoulder with horizontal bands and pannels of cross-hatched diamonds, (fig. 50, 1; pl. LXXXI, 2), its mouth being missing, was also found kept at a higher level than that of the rest, as observed in burial 53, it lying over one of the vases of burnished grey ware in an upside down position. The five pots of burnished grey ware were placed along the periphery of the pit. All belonged to an identical type namely, vase with oval body, sides converging into a narrow mouth with a slightly thickened rim. The ash in the pit suggested post-cremation burial but since not a single fragment of bone was found in it, it appeared to be a symbolic burial.

(c) Type C (pl. LVII)

Burial 59 was a unique burial of Phase III, exposed in ZD61. The pit containing this burial, cut into 8, 9 and 10 and sealed by 7, was filled with clay instead of loose earth. The



PLATE LVIII Daimabad : view of burial 21, Sub-type A1 showing contents inside the northern urn.
Phase IV.



PLATE LIX. Dalmatian : burial 24, Sub-type A1. Phase IV.



PLATE LX Daimabad : Burial 36, Variant A1a of Sub-type A11, Phase IV.

burial consisted of a vertically placed oval-shaped vase of burnished grey ware with narrow mouth which was covered with a lid of the same ware placed upside down. On the eastern side of this pot was placed, reclining against it, a *kunda*-type vase of thick coarse red ware with a flattish base and flaring sides. The edge of this vase was indented in such a way as to accommodate in it the peripheral portion of the inverted lid. The pot was filled with ash and a few bits of bones some of which were semi-charred and charred.

5. PHASE IV

A. Group I

1. Type A

(a) Sub-type A_i

Burial 21 (fig. 13; pl. LVIII) was the first burial of this type to be encountered in the levels of the Malwa Culture in the trench Y'S. Two urns of burnished grey ware with globular body and flared out mouth were placed mouth-to-mouth in an oval-shaped pit, 1.25 m long, sealed by 4, in the north-south orientation. In the northern urn were found placed one each a carinated handi with a tubular spout and a concave-sided carinated bowl of Malwa Ware and bones of skull, fragments of upper jaw and a few bones of extremities.

Burial 24 (pl. LIX) was found in X'3. Its pit was oval-shaped, 1.1 m x 70 cm, cut into 4 and 5 and sealed by 3. In this pit two urns of burnished grey ware with bulbous body and flared mouth were placed mouth-to-mouth in the north-south orientation.

Burial 27 was encountered in X'5. Its ovaloid pit, measuring 1.2 m x 75 cm, was sealed by 5 and cut into 6, 7 and 8. One *loti* each of burnished grey ware with splayed out mouth and carinated globular body was found kept in the southern and the northern urns (fig. 63, 7) and except these no other remains were found in the urns.

Burial 28 was located only about 50 cm to the east of burial 27 in X'5. The oval-shaped pit, 1 m x 75 cm, sealed by 5 and cut into 6, 7 and 8, contained two urns of burnished grey ware with bulbous body and flared out mouth, placed mouth-to-mouth in the north-south orientation.

Burials 62 and 64 were partly exposed on the river side in the cutting Z69-Z70 to AZ69-AZ70. The burial urns of burnished grey ware in both were placed mouth-to-mouth in the north-south orientation. Of these 62 was sealed by 12 and 64 by 14. None of these was fully exposed for removing their contents.

(b) Sub-type A_{ii}

(i) Variant A_{iii}

Burial 56 (pl. LX) was exposed in ZD61. The oval-shaped pit, cut into 6, 7 and partly 5 and sealed by 5, was 1.05 m long and 75 cm broad. The northern of the two burial urns of the burnished grey ware in this pit was smaller in size than that of the southern and the mouth of the former was placed inside that of the latter.



PLATE LX3 Daimabad : burial 75, Variant A ii b of Sub-type Aii, Phase IV.



PLATE LXII Daimabad: burial 25, Sub-type III, Phase IV

(iii) *Variant Aūb (pl LXI)*

Burial 75, this variant was exposed in ZD60. Its pit, oval in shape, sealed by 5 and cut into 6 and 7, was 80 cm x 60 cm in size and in it were placed two burial urns in the north-south orientation and covered with a clay packing. The northern urn was of burnished grey ware with globular body and flared out mouth. Its mouth was placed inside that of the southern urn which was of the Malwa Ware²⁷ with almost vertical neck, slightly everted rim and bulbous body. It was painted in black both on the inside and outside with a rim-band and on the outside on the neck with pairs of oblique lines joining each other at the ends and thus forming a broad zig-zag design. Within one of the conical arches formed by these lines was painted a motif of a standing dog with four legs and a curved tail. The representation of four legs in this example appeared a special feature since in all the paintings of dogs only two legs have been drawn (cf. fig. 53; pl. LXXXIII). Besides the above designs, two horizontal bands of festoon design were painted at the junction of the neck and the shoulder and on the shoulder a sun and a peacock motif (fig. 60, 1). From the northern urn were recovered a few pieces of skull, three teeth, two hundred fiftyfive beads of steatite (fig. 114, 8; pl. CXLVIII, II) and twenty two of carnelian (unillustrated) and one deep bowl of burnished grey ware. No remains were found in the southern urn.

2. *Type B*(a) *Sub-type Bī*

Burial 55 was found in the trench ZD62 in its eastern section but before it could be photographed *in situ* it came down, the filling in the pit being too loose to withstand the exposure. It was sealed by 5 and cut into 6, 7 and partly 8. A few very much decomposed bone-fragments were found inside the burial urn (fig. 61, 8, 9).

(b) *Sub-type Bū (fig. 61; 6).*

Burial 29 was encountered in the trench X'5 between burials 27 and 28 described before. In a small circular pit with a diameter of 30 cm, sealed by 5 and cut into 6 and 7 was placed a small vase of corrugated variety of burnished grey ware with squat body and corrugated neck in vertical position. The mouth of this pot was covered with a lid of burnished grey ware.

(c) *Sub-type Bū (pl. LXII)*

Burial 25 occurred in Z'3. It was a single-urn burial, the burial urn being of burnished grey ware with bulbous body and flared out mouth placed horizontally in the north-south orientation in an oval-shaped pit, 1 m long and 70 cm broad, cut into layers 4 and 5 and sealed by 3. In its mouth, on the north, was placed a bowl of the same ware in the same position and orientation (fig. 63, 4)

27. *Indian Archaeology 1976-79 - A Review*, fig. 7 (below).



PLATE LXIII. Daboudi: burial 29, Sub-type C1, Phase IV.



PLATE LXIV Daimabad : view of partly exposed burial 22 (right), Sub-type CII and burial 23 (left), Sub-type CII, Phase IV.

(d) *Sub-type Bin*

Burial 63 exposed in the cutting Z69-Z70 to AZ69-AZ70 was sealed by 14. It was a burial urn of purplish red thick coarse ware with a squat bulbous body and a button base. Its rim was missing. Around its neck were two bands in applique decorated with finger-tip design. The upper one surrounded the girth of the neck but the lower had its two ends curved to form a loop opposite each other, leaving a space in between.

B Group II

3. *Type C*(a) *Sub-type Ci (pl. LXIII)*

Burial 20 was the first burial to be encountered in the Malwa levels. It was found in the trench X'4 in a deep pit sealed by 7 and cut into 8-11. It consisted of three bowls of Malwa Ware with squat body saggar base and outcurved lip, two of them placed mouth-to-mouth in the north-south direction and third in vertical position to their west. Outside these bowls were found bones including teeth and phalanges and sixty-nine heads of statite (fig. 114, 10; pl. CXLVIII, 12).

(b) *Sub-type Cii*

Burial 22 (fig. 14; pl. LXIV) was exposed in the trench Y'3. In a rectangular pit, 95 cm long and 25 cm broad, and cut into 8 and partly in 9 and sealed by 7 were found horizontally placed in north-south orientation three small bowls of Malwa Ware similar in type as those in Burial 20, in a row, with the mouth of each facing south. All the bowls and the base of the burial pit were also covered with remains of twigs of fibrous plant. This burial did not contain any other remains.

(c) *Sub-type Ciii*

Burial 23 (fig. 14; pl. LXIV) was found by the side of the above described burial 22. It was an elongated oval-shaped pit, 70 x 40 cm in the north-south orientation, cut into 8 and partly into 9 and sealed by 7, the base of which was covered with remains of fibrous plant twigs. Near its northern end was placed one fragment of a thick coarse ware whereas towards the southern end were kept four bowls of all-black burnished ware, two each of U-shaped type and of flat base and splayed sides (fig. 63, 5, 6, 8). In the upper part of the heap of the filling near the northern end were found a few stones.

4. *Type D*

Burial 26 was represented by an elongated oval-shaped pit, 50 x 30 cm, cut into layers 7 and 8 and sealed by 6 in the trench X'3. The surface of the pit was characterized by the spread of twigs of fibrous plant. Except this the burial did not yield any remains and as such appeared symbolic.



PLATE LXV Daimabad : Initial 57, Sub-type III. Overlay phase between Phase IV and phase V.

4. OVERLAP BETWEEN THE MALWA AND JORWE PHASES

1. *Type A*(a) *Sub-type Ai*

Burial 45 was exposed in the eastern baulk of the trench AZ'3. The pit of this burial, oval in shape and 65 x 40 cm in size, was sealed by layer 4. In this pit were found placed two urns of burnished grey ware with bulbous body and flared out mouth, mouth-to-mouth, in the northwest-south orientation.

Burial 47 was found in the northwest corner of the trench BZ'3 and was sealed by layer 4. It was represented by an oval-shaped pit, 65x40 cm in size, cut into layer 5, in which were placed two urns in the north-south orientation, mouth-to-mouth. The northern urn was found a little misplaced and as a result of which its mouth was found a little away from that of southern.

Burial 50 was found about half-a-meter east of the Apsidal Sacrificial Temple of the Malwa Phase. The burial urns of the burnished grey ware with globular body and flared out rim were placed in a pit sealed by layer 4 in the north-south orientation.

Burial 51 was located only about half-a-meter east of the above described burial 50. As in the case of the latter in this case also the two urns of burnished grey ware with globular body and flared out rim were placed in the north-south direction, mouth-to-mouth, in a pit sealed by 4 and cut into 5, 75 x 45 cm in size.

(b) *Sub-type Aii*

Burial 44 occurred in the northern baulk of trench AZ'3 and was sealed by 4. The oval-shaped burial pit was 65 x 40 cm in size and in it were placed two burial urns of burnished grey ware in the north-south orientation. The northern urn among these was bigger than the southern and the neck of the latter was placed inside the mouth of the former.

2. *Type B*(a) *Sub-type Bi (pl. LXV)*

Burial 57 was found in trench BZ'3 about 40 cm east of the pit of burial 51. In a pit, 40 cm in diameter, sealed by 4 and cut into 5 and partly into 6, was placed one burial urn of Malwa Ware with round body and outcurved rim (fig. 57, 2), painted in black with horizontal bands and a pair of close spaced crinkled lines. The graffiti on its shoulder consisted of two opposed hooked vertical lines. One bowl of burnished grey ware with flat base, splayed sides and outcurved rim was placed in the mouth of this urn (fig. 63, 9).

(b) *Sub-type Bii*

Burial 58 lay about a meter south-east of burial 57 in the trench BZ'3. The burial urn in this case was a vase of Malwa Ware with globular body and high vertical neck similar to the burial urn of burial 55 of the Malwa Culture (p. 186). On the shoulder of this burial urn was a graffiti consisting of two vertical hooks. This urn was not removed from its pit cut into layer 6.

5. PHASE V

A. Group I

1. Type A

Burial 6 (pl. LXVI) was found to be very much disturbed on the surface of layer 3 and covered by the flood deposit of layer 2 in trench DZ60. The extant skeletal remains were found lying in the north-south orientation and included pieces of a skull, lower jaw, ribs and bones of extremities and vertebral column. Closely by the bones of vertebral column was also found lying one angular stone. Near the skull pieces were lying pot-sherds of a vase of Jorwe Ware.

Burial 8 (pl. LXVII) was exposed in the bank of CZ 59 and DZ59. The roughly oval-shaped burial pit of this burial, cut into 4 and sealed by 2 measured 2.3 m long and 2 m broad. In the centre of the pit a human skeleton with its feet chopped off below ankle, was placed in the north-south orientation, head being on the north. Close to the skull was placed concave-sided carinated bowl and to its left were one each a *lota* (fig. 72, 5) and a lower half of the base of a pot with globular body, all of the Jorwe Ware. Both the hands were placed on the abdomen.

Burial 53 was one of the most important burials (pl. LXVIII) as it was the only example from the Jorwe levels of a complete inhumation, in the other examples the feet below the ankles being chopped off. It occurred in the trench CZ 3 in the eastern courtyard of House 38, the house of a merchant. The pit of the burial almost rectangular or elongated oval in shape, was shallow, about 20 cm deep, 1.15 m x 60 cm, and covered with a thick coat of plaster which prominently stood in relief above the surrounding ground level. The skeleton in the pit measured 1.05 m. It was placed north-south, the head being towards north. Its both the hands were placed by the side of the pelvis. To the left of the head was placed one conical deep bowl of coarse red ware, in a slanting position against the wall of the pit. The inside of this bowl was covered with a coat of black soot, apparently suggesting that it was utilized as a lamp. To the right of the skull, over the right arm was kept one concave-sided carinated bowl and adjoining it were one each a sub-rounded small stone and a fresh water shell.

B. Group II

Burial 7 consisted of two urns of burnished grey ware with bulbous body and flared out mouth placed mouth-to-mouth in the north-south orientation in a pit, which lay above that of Burial 8 in the bank of CZ59 (pl. LXVII). Inside these two urns was found a skeleton of a small boy in the north-south orientation, head being towards north. Its feet below the ankle were chopped off. The skull was placed in a concave sided carinated bowl. Below this bowl was placed another similar bowl and by the side of the latter a *lota* with squat body, all the three being of the Jorwe Ware. One bead of onyx, long barrel circular was collected from the neck. An interesting feature of this burial was that behind the bowl containing the skull was



PLATE LXVI. Burial 6 on surface of layer 3 disturbed by the flood of the river Pravara.
Photo V.



PLATE LNVII Daimabad : burial 7, Group II, (top) and burial 8, Group I (below), Phase V.

found placed a bunch of wild flowers which was identified as that of *Flaveria campyrisae*.²⁸

C. Group III

I. Type A

(a) Sub-type A1

Burial 10 was exposed in the eastern part of CZ60. It was represented by two pots of burnished grey ware with globular body and flared out mouth placed mouth-to-mouth in an oval-shaped pit, 75 x 40 cm, cut into layer 4 and sealed by 3. The southern of the burial urns yielded a few very fragile bones of extremities of a child.

Burial 11 was exposed in the trench CZ60, almost in its centre. In this burial in an oval-shaped pit, 70 x 40 cm, cut into 4 and sealed by 3, were placed two urns of burnished grey ware with globular body and flared out rim, mouth-to-mouth, in the north-south orientation. In the southern of the urns was found placed one carinated bowl of Jorwe Ware with concave sides. One bead of banded agate, long barrel circular, was obtained from the northern urn.

Burial 12 was found only about one meter to the east of the above described burial 11. In details it was similar to the latter. The burial pit in this example was 60 x 35 cm, cut into 4 and sealed by 3. The northern of the two urns yielded highly decomposed bones of a child including a jaw, fragments of a skull and ribs and one bead of carnelian, long barrel circular.

Burial 13 was almost in the same row of the above described 11 and 12, some 50 cm to the east of the last-named. Its oval-shaped pit measured 75 x 40 cm and was cut into 4 and sealed by 3. In this pit the urns of the burnished grey ware were placed mouth-to-mouth in the north-south orientation. The northern urn yielded a few decomposed fragments of a skull and the southern one small *lotsa* with a globular body, high neck and beaded rim. One steatite bead, short cylindrical circular was recovered from the northern urn.

Burial 15 was found in the eastern section of DZ58. The burial urns of burnished grey ware with globular body and flared out mouth were placed mouth-to-mouth in the northeast-southwest orientation. The burial pit was cut into 2 A and 3 and sealed by 2. This was not fully exposed.

Burial 16, being the simple double-urn type, with the urns of burnished grey ware with bulbous body and flared out mouth, placed mouth-to-mouth in the north-south orientation, was found in the trench DZ58. Its pit was cut into 3 and sealed by 2A. This burial was not removed.

Burials 30, 31 and 32 were exposed in the bank of FZ64 and FZ65 when its upper portion had to be removed for the safety purpose. The pits of all were sealed by 4 and cut into 5 and 6. In all of them two burial urns of the burnished grey ware with globular body and flared out mouth were placed mouth-to-mouth in the north-south orientation. By the side of the southern urn of burial 32 was found placed one bowl of Jorwe Ware with concave carinated sides. None of the burial urns was exposed to recover the contents.

28. Kindly identified by Dr. M.D. Kajale of the Deccan College Postgraduate and Research Institute, Pune (per. com.)

Burial 35 was exposed in the trench Z'1. The burial pit, 68 x 35 cm, was sealed by 1 and cut into 2 and 3. In layer 3 the pit had cut the floor of house 29, the potter's house. The burial was very much disturbed. Only about one-thirds of the northern urn was survived while the southern was almost complete. In the extant portion of the northern urn was placed one concave-sided carinated bowl of Jorwe Ware from which were recovered fragments of a skull and other bones of child. In the southern urn was found, facing south, one miniature *handi*-type vase with tubular spout and funnel-shaped mouth of the Jorwe Ware. In this urn were also found bones of extremities and one blade of chalcodony.

Burial 36 was survived by only a small base-fragment of the southern urn in which were found a few decomposed bones of a child. The oval-shaped pit of this burial was partly cut in the floor of house 28 and was 70 x 40 cm in size.

Burial 38 was found in the trench BZ'3 in its northeast corner and was sealed by 1. The burial urns of burnished grey ware with bulbous body and flared out mouth, placed in an oval-shaped pit measuring 54 x 40, in the north-south orientation, mouth-to-mouth, were smaller in size than those normally found. On either side of the neck of the northern urn were placed one each a small carinated *handi*-type vase with tubular spout of Jorwe Ware and a bell-shaped bowl of burnished grey ware on the east and west respectively whereas one bell-shaped bowl of burnished grey ware was placed on the east of the neck of the southern urn.

Burial 40 was exposed near the southern bank of BZ'4. The roughly oval-shaped pit of this burial varied in width from 30 to 45 cm and measured 60 cm in length. The burial pit, sealed by 1 and the urns of burnished grey ware with round body and funnel-shaped mouth were in the northwest-southeast alignment rather than in north-south. The burial urns were smaller in size than those normally occurring in such burials. Along the eastern periphery of the pit were found placed four small pots, two bell-shaped bowls of burnished grey ware and two *chambus* with tubular spout of the Jorwe Ware. At the western side of the neck of the northern urn was kept one bell-shaped bowl of burnished grey ware.

Burial 41 was found in the bank of AZ'3 and AZ'4 and sealed by 3. It was partly damaged by a later pit. Only a few fragments of the southern urn were survived. The northern urn was also very badly damaged, although it could be reconstructed.

Burial 43 was exposed in the north-east corner of BZ'2. Its burial pit, oval in shape, measured 95 x 60 cm. Both the urns in this burial were, however, found damaged. The northern one was survived by almost half of its portion whereas the southern by the base portion and a few fragments of flaring rim. On either side of the neck of the northern urn was found kept one each a *handi*-type vase of Jorwe Ware with tubular spout and funnel-shaped mouth and a bell-shaped bowl of burnished grey ware on the east and the west respectively. Seven beads, including one pendant of *Oliva* sp., two beads of carnelian, long barrel circular (fig. 115, 6; pl. CL, 6), and four of steatite, short barrel creslar (fig. 116, 32pl. CL, 44), were recovered from the northern urn.

Burial 60 was exposed in the river side cutting of Z 69. The urns of the burnished grey ware were placed horizontal in the north-south orientation in a pit sealed by 5 and cut into 6, 7 and 8. This was not removed.

Burial 51 was found about 30 cm east of Burial 60. Its pit was sealed by 6 and cut into 7 and 8. Only a part of the southern urn was exposed in the section. On the back side of this urn were found placed two small concave-sided carinated bowls and one small lota, all of Jarwe Ware.

Burial 65 was found in the open space lying in front of houses 44, 45, 46 and 48, the circular houses. The oval-shaped pit of it measured 65 x 50 cm and was sealed by 1. The burial urns of burnished grey ware with globular body and flared out mouth were placed mouth-to-mouth in the north-south orientation. The burial urns, like those in 38 and 50, were small in size.

Burial 66 (pl. LXIX) occurred inside house 48, a circular house (p. 159). In an oval-shaped pit, measuring 60 x 30 cm, were placed, mouth-to-mouth, in the north-south orientation, two urns of burnished grey ware with globular body and flared out mouth. The burial urns of this burial were the smallest in size among the burial urns of this type so far met with.

Burial 67 was exposed just by the side of the above described burial 66 inside the house 48 (pl. LXIX). The oval-shaped burial pit of this burial, measuring 90 x 50 cm, slightly encroached upon the fringe of that of burial 66 and was oriented northeast-southwest. In the same orientation were placed, mouth-to-mouth, two urns of burnished grey ware with bulbous body and flared out mouth. At the back side of the northern urn, at its western end, was placed one concave-sided carinated bowl and over it a *handi*-type carinated vase with tubular spout and funnel-shaped mouth, both of the Jarwe Ware.

Burial 72 was one of the most interesting burials that was found in the south-western corner of house 62. Although the pit of it was cut into the flooring of this house the burial belonged to an upper level and not that of the house. Inside an oval-shaped burial pit, 50 x 40 cm, oriented north-south, were found survived about half of the southern urn and only a small base-fragment of the northern. From the extant part of the southern urn was recovered a mother goddess of copper (fig. 110, 12; pl. CXLIV, 2; p. 516).

Burial 73 was found about 1 m west of burial 72 in EZ'4. In an ovaloid pit, 70 x 50 cm, were placed two burial urns of burnished grey ware with globular body and flared out rim, mouth-to-mouth, in the north-south orientation. About half of the southern urn was survived. Both the urns were smaller in size than those occurring normally.

(b) *Sub-type Añ*

(1) *Variant Aññ*

Burial 37 was found in the baulk of trench BZ'4 near the peg AZ'3. Its oval-shaped burial pit was 70 x 60 cm in size and sealed by 1 and in it were placed two urns of burnished grey ware with bulbous body and flared out mouth in the north-south orientation; the southern being smaller in size it was placed upto its neck inside the mouth of the northern. On either side of the neck of the northern urn was placed one *lota* of Jarwe Ware.

Burial 39 was exposed in the southeastern corner of the southern baulk of BZ'4. The burial pit, oval in shape, measuring 60 x 40 cm, was sealed by 1 and contained two urns of burnished grey ware with bulbous body and flared out mouth placed in north-south orientation, the southern of the two being smaller in size was placed upto its neck in the mouth of



PLATE LXVIII View showing burial 52, Variant Aua of Sub-type Aii, and burial 53 of Group I in the eastern courtyard of a merchant's house (house 28), Phase V.



PLATE LXIX Bird's-eye view of house 43 (Circular hut) of structural phase D showing burials 66 and 67, the first stones to form a storage jar and the hearth beside. Phase V.

the northern urn. On the eastern and the western sides of the northern urn were found placed one each a bell-shaped bowl of burnished grey ware and a *chambu* with tubular spout of Jorwe Ware respectively.

Burial 46 was met with partly in the northern baulk of BZ'2 and was sealed by 2. The oval-shaped burial pit measured 60 x 40 cm and in it were placed two burial urns of burnished grey with globular body and flared out mouth in the north-south orientation. The southern of the two urns was smaller in size than that of the northern and it was placed upto its neck inside the mouth of the latter.

Burial 52 (pl. LXVIII) was found in the trench CZ'3. The oval-shaped burial pit was cut into 3 and partly into 4 and sealed by 1B. This was found 25 cm west of burial 53 in the courtyard of house 58. Stratigraphically it was contemporary with the structural phase C and belonged to the fifth floor level of house 38, the house of a merchant (p. 147). The two burial urns of burnished grey ware with globular body and flared out mouth were placed inside the pit in the north-south orientation. The southern of the two urns was bigger in size and the neck of the northern urn was placed inside its mouth. At the back side of the southern urn was placed one *handi*-type vase of Jorwe Ware with carinated body and tubular spout.

Burial 74 occurred 40 cm west of burial 73 in EZ'4. In an ovaloid pit, 70 x 50 cm, sealed by 1 were found placed two urns of burnished grey ware with globular body and flared out mouth in the north-south orientation. The southern of the two being small in size was placed upto its neck into the mouth of the northern urn. To the west of the neck of the northern urn was placed one *handi*-type vase with carinated base and tubular spout whereas from inside this urn was recovered one small incurved bowl of the Jorwe Ware.

(ii) Variant Aib

Burial 42 was found in the baulk of FZ'3 and BZ'4 near the peg AZ'3 and close to burial 37 described above. The oval-shaped burial pit, sealed by 1, measured 64 x 40 cm and in it were placed two urns of the burnished grey ware in the north-south orientation. The one on the north was with round body and funnel-shaped mouth and in its mouth was placed an urn of smaller size with squat bulbous body and vertical featureless rim. Besides being an unusual type of burial urn, this latter one was covered with patches of deep red colour (fig. 81, 6). On the western side of the southern urn was placed one small *handi*-type carinated vase with funnel-shaped mouth and tubular spout of the Jorwe Ware.

(c) Sub-type Aii

Burial 9 was exposed in DZ59. The burial pit, oval in shape, 65 x 65 cm, cut into 3 and partly in 4 sealed by 2A, contained loose earth-filling, but around the burial urns was a coat of clay. The burial urns were of burnished grey ware with a bulbous body and flared out rim and were placed mouth-to-mouth in the north-south orientation. One small concave-sided carinated bowl of Jorwe Ware was obtained from the northern urn.

Burial 14 was exposed close to the eastern section of DZ58 and burial 13. Although the orientation of the burial urns in this case did not change from that of the latter, viz. north-



PLATE LXX Daimabad : burial 3, Variant Aloc. Phase V.



View, showing a group burial of mid-type Aot, burials 68, 69 and 70, and a single
 with burial beside of Type II, burial 71, looking east, Phase V.

PLATE LXXI



PLATE LXIII Daimabad : burial 17, Type B. By its side is a *Kunda* of sun-baked clay.

east-southwest, it differed from the burial 15 in its filling material. In the burial under description the entire area of the oval-shaped burial pit, 70 x 35 cm, around the pots was filled with hard clay, the filling of the burial 15 on the other hand being loose earth. The northern urn yielded a few decomposed fragments of skull and ribs. The southern urn did not yield any remains. The burial pit of this burial was cut into 2A and 3 and sealed by 2.

Burial 48 was exposed in the trench BZ'1. Its oval-shaped pit, measuring 95 x 60 cm, was sealed by 1 and cut into 2, 3 and partly 4. The two burial urns of burnished grey ware with globular body and flared out mouth, in the north-south orientation, were found damaged due to a later pit. The extant portions of the urns were found lying in the pit within a matrix of clay. The southern of the urns yielded bones of extremities and thorax.

Burial 49 was exposed in BZ'1. Its almost circular pit was 65 cm in diameter, sealed by 1B and cut into 2. Only about one-thirds portion of each of the two urns, in the north-south orientation, mouth-to-mouth, was survived, the survived portions being found coated with a thick coat of clay.

(d) *Sub-type A5a*

(i) *Variant A5a*

Burial 1 was found in the trench CZ 61. In an oval-shaped pit, measuring 70 x 45 cm and cut into 2 and sealed by 1, were placed mouth-to-mouth and in the north-south two urns of burnished grey ware with globular body and flared out mouth. The urns were decorated with an incised band of dots along the neck. One oval-shaped muller stone was found kept to the west of the southern urn.

(iii) *Variant A5b*

Burial 2 was an eroded burial exposed in CZ61. The oval-shaped pit, 80 x 50 cm, of the burial was partly cut into 2. Only the base of the northern urn of the Jorwe Ware and stray potsherds of the southern urn of the same ware were survived. Inside the burial pit, near the sherds of southern urn was lying one oval-shaped muller stone. A few very much fragile fragments of skull of a child were recovered from the extant base of the northern urn.

(iii) *Variant A5c*

Burial 3 occurred in CZ60 (pl. LXX). It consisted of two severely damaged burial urns of the Jorwe Ware with oval-shaped body, wide mouth and beaded rim, placed mouth-to-mouth in the north-south orientation in an oval-shaped pit cut into 2. Within the pit, to the south-west of the southern urn, was found kept one chopper of basalt. A few very much fragile and decomposed bones of extremities were recovered from the northern urn.

(e) *Sub-type A5*

Burial 19 was exposed in L 48 in its eastern section (fig. 7; pl. VII). The urns of Jorwe

Ware with oval-shaped body and wide mouth with beaded rim were placed mouth-to-mouth in the north-south orientation. The burial pit was sealed by 2 and cut into 3, 4 and 5. The northern urn and part of the southern collapsed before the subject could be photographed.

(f) *Sub-type A vi*

Burials 68, 69 and 70 were found in DZ'4, within a common burial pit, measuring 1.1 m x 90 cm, cut into the floor of house 62 (pl. LXXI). All the three burials were of the double-urn and mouth-to-mouth type. Of these, two, 69 and 70, were located in a row and the third, 68, to the north of these former two. In all the cases the urns of burnished grey ware were placed mouth-to-mouth in the north-south orientation. The burial urns of 69 and 70 were smaller in size than those of 68. Of the burial urns of 70, almost half of the northern and about one-third of the southern were survived. At the junction of the mouths of the urns of 68 was placed one *loto* of Jorwe Ware with aquat round body, tubular spout, high narrow neck and outcurved thickened rim.

3. *Type C*

Burial 17 (pl. LXXII) was found to the south of house 1, the mud platform, in EZ 35, by the side of a sun-baked *kunda* with pedestal base. The burial urn of burnished grey ware with bulbous body and flared out mouth was placed horizontally facing south in a circular pit, 55 cm in diameter. The pit contained, besides loose earth, also clay clods as a filling.

Burial 54 was met with in the eastern section of ZD 62 in a pit with 70 cm diameter, cut into 2, 3 and 4 and sealed by 1. It was represented by an urn of burnished grey ware with globular body and flared out mouth placed in a pit horizontally with its mouth facing south.

Burial 71 was found in DZ'4 to the west of the group burial described above. Its pit, oval in shape and 55 x 35 cm in size, was sealed by 1 and cut into the floor of house 62 but did not belong to the house. The burial urn of the burnished grey ware, oriented roughly north-south or rather northeast-southwest, was survived by only a part of its base.

3. *Type V*

Burial 4 occurred in the trench DZ 55. The burial jar of thick coarse ware was survived by the flat base only. Inside it were found placed one miniature vase of Jorwe Ware with striated body, its rim being missing, and one stone ball. The extant pit, 40 cm in diameter, was cut into layer 1A.

Burial 5 which occurred some 20 cm to the east of the above described burial, was survived by only the flat base of the burial jar of thick coarse red ware placed in the pit, 35 cm in diameter and cut into layer 1A.

7. CHRONOLOGY

For computing an absolute time-table for the site help was sought of Carbon-14 and thermoluminescence dates. For radioactive Carbon determinations thirty-eight samples were collected from different levels of the cultural deposit. Of these, thirty-one, PRL 410-429¹ and PRL 652-657 were sent to Physical Research Laboratory (PRL), Ahmedabad and seven, to the Birbal Sahni Institute of Palaeobotany, (BSIP), Lucknow. The PRL have run only thirteen samples and the BSIP all those sent to them. In Table 2 are arranged the Carbon-14 dates stratigraphically and phase-wise from the top downwards.

The samples BS-179, PRL-656 and BS-178 have given the dates 1100 B.C., 1100 B.C. and 1090 B.C. respectively. The last two are for the potter's Kiln 1 of structural phase A and the first for house 38 of structural phase B and they thus show stratigraphical inconsistency. The only plus point in them is that none falls outside the date - bracket of 1400 - 1000 B.C. determined for the Jorwe Culture of Maharashtra on the basis of the Carbon-14 dates obtained for Inamgaon² Nevase,³ Chandoli⁴ and Songaon.⁵ Consistent are, however, the dates of PRL-411 and PRL 412, being 1379 B.C. for the overlap between the Malwa and Jorwe Cultures and 1390 B.C. for the end of the Malwa Culture respectively. Both these dates also appear to agree with the Carbon-14 determination of 1400 B.C. obtained from Inamgaon⁶ for the end of the Malwa Culture there. At the latter site Malwa Culture settled around 1600 B.C.⁷ and it would be logical to believe that the date-bracket 1600-1400 B.C. for this culture there should also hold good for Daimabad. In view of the above, the date 1150 B.C. (BS-181) for the lowest layer of the Malwa Culture seems too low to be taken into account.

Once 1600 B.C. is accepted as the lower limit of the Malwa Culture it follows then that the dates of the three preceding cultures, viz. the Daimabad, the Late Harappa and the Savatka, should lie earlier than this limit. But none of the three dates, 1550 B.C. (PRL-428),

1. In some of these cases, two samples were given same number, e.g., PRL-415, PRL-420, PRL-426 PRL-428 and PRL-427, whereas two samples, PRL-655 and PRL-657, have two dates each.

2. M.K. Dhavalikar, "Inamgaon : The Pattern of Settlement, Man and Environment", 1 (Ahmedabad, 1977), pp. 46-47.

3. H.D. Sankalia, *Prehistory and Protohistory of India and Pakistan*, (Poona, 1974), Appendix II, p. 565.

4. Deo and Ansari, *op. cit.*

5. Deo, *op. cit.*

6. Dhavalikar, *op. cit.*

7. *Ibid.*

1120 B.C. (PRL-419) and 1280 B.C. (BS-182), obtained for the upper layers of the Daimabad Culture have even touched the 1600 B.C. mark. With regard to the three dates for the lowest layer of this culture, viz. 1650 B.C. (PRL-655), 1540 B.C. (PRL-655) and 1610 B.C. (BS-177), it can only be said that the first and the third have merely crossed the datum line of 1600 B.C. whereas the second was a little short to reach it. An interesting aspect in respect of the sample PRL-655 is that there are two dates for it run by the same laboratory (PRL) and yet they showed a difference of one hundred years. Strange is the fact that maximum number of samples (six) were run from the levels of Phase III and not a single has given stratigraphically constant date. Those available appear too low to be considered as representing the true age of this Phase. The internal evidence, however, would place the Daimabad Culture within the date bracket circa 1800 B.C. - 1600 B.C.

For the Late Harappan Phase at Daimabad there are, besides the Carbon-14 dates, the thermoluminescence dates as well. In addition, the probable period of movement of the Harappans into the Deccan will have also to be taken into consideration. The Harappan chronology has been a problem of debate and more so because of the fact that in recent years it has become amply clear that the Carbon-14 method of dating is not without disparities. Corrections have therefore, been applied to the radiocarbon dates to adjust them to true ages. On the basis of the MASCA-correction the Mature Phase of the Harappa Culture or the Indus Civilisation has been ascribed to 2500-2200 B.C. and the Late Phase to 2200-2000 B.C.⁸ As has been explained before, (pp. 23-26) the Late Harappan Phase at Daimabad was not hereof of the elements of true Harappan tradition which fact indicated that this Phase was not of developed form. This would also suggest that the Harappans probably settled at Daimabad between 2300 and 2200 B.C. Without MASCA-correction this period would fall between 1990 and 1950 B.C.⁹

The five Carbon-14 dates obtained for the Late Harappan Phase at Daimabad are examined first in the light of the above. The sample PRL-420 was already suspected to have been contaminated since it was buried by a patch of sand and silt deposited in a rain-gully. Therefore the date 540 A.D. for this sample was not surprising. But surprising are the three dates 1250 B.C. (PRL-657), 1190 B.C. (PRL-657) and 1530 B.C. (BS-180) which were obtained from a single sample of charcoal collected from the hearth sealed by layer 11 of trench ZD60. A part of this sample, 50 grams, was sent to the PRL, Ahmedabad and the remaining 65 grams to the BSIP, Lucknow. Apart from being stratigraphically inconsistent, these three erratic dates showed a difference of as many as 340 years. Still more surprising are the two dates, 1250 B.C. (PRL-657) and 1190 B.C. (PRL-657), obtained by the same laboratory (PRL) for a sample of charcoal collected from one and the same hearth and yet showing a difference of 60 years. Hence one is fully justified in rejecting these dates. The date 1760 B.C. (PRL-426) was obtained for the charcoal sample collected from a pit (Pit 25) cut

8. Robert H. Brayshaw, "Radiocarbon Dating and the Indus Civilization: Calibration and Chronology" *East and West*, Vol. 25, 1-2, 1975, 111-45.

9. Elizabeth K. Ralph, H.N. Michael and M. Han, 'Radiocarbon Dates and Reality', in (ed) Gregory L. Possehl, *Ancient cities of the Indus*, 1979, pp. 339-42, Supplement to Table 4.

Table 2

Carbon-14 dates obtained for different phases of the Chalcolithic at Daimabad by the Physical Research Laboratory (PRL), Ahmedabad and Birbal Sahni Institute of Palaeobotany (BSIP), Lucknow.

(The dates in parenthesis are based on half-life value 5730 \pm 40 years)

Phase/Culture	PRL No. and Date	BSIP No. and Date
Phase V, Jorwe Culture, (House 38)	—	BS-179 2970 \pm 100 (3050 \pm 100) 1100 B.C. (MASCA-correction 1270 B.C.)
Phase V, Jorwe Culture, Kiln No. 1	PRL-656 (3050 \pm 150) 1100 B.C. (MASCA-correction 1270 B.C.)	BS-178 2950 \pm 100 (3050 \pm 100) 1090 B.C. (MASCA-correction 1240-1270 B.C.)
Overlap between Phase IV Malwa Culture, and Phase V, Jorwe Culture	PRL-411 3250 \pm 100 (3320 \pm 100) 1370 B.C. (MASCA-correction 1570-1600 B.C.)	— — —
Topmost layer of Phase IV Malwa Culture	PRL-412 3250 \pm 100 (3340 \pm 100) 1390 B.C. (MASCA-correction 1600-1630 B.C.)	— — —
Lowest layer of Phase IV, Malwa Culture	—	BS-181 2990 \pm 100 (3080 \pm 110) 1150 B.C. (MASCA-correction 1290 B.C.)
Phase III, Daimabad Culture (Upper Layers)	PRL-428 (3500 \pm 140) 1550 B.C. (MASCA-correction 1720-1870 B.C.) PRL-419 (3070) 1120 B.C. (MASCA-correction 1270-1300 B.C.)	BS-182 3130 \pm 90 (3230 \pm 100) 1280 B.C. (MASCA-correction 1500 B.C.)
Phase III Daimabad Culture (Lowest Layer)	PRL-655 (3600 \pm 110) 1650 B.C. (MASCA-correction 2000-2020 B.C.)	BS-177 (3460 \pm 105) (3560 \pm 105) 1610 B.C. (MASCA- correction 1920-1950 B.C.)

	PRL-655 (3490 \pm 110) 1540 B.C. (MASCA-correction 1720-1760 B.C.)	
Phase II, Late Harappa Culture (Upper Layer)	PRL-657 (3220 \pm 110) 1250 B.C. (MASCA-correction 1460-1480 B.C.) PRL-657 (3140 \pm 100) 1190 B.C. (MASCA-correction 1370-1390 B.C.)	BS-180 3590 \pm 100 (3480 \pm 100) 1530 B.C. (MASCA-correction 1710-1750 B.C.)
Phase II, Late Harappa Culture (Lower Layer)	PRL-420 (1410) 540 A.D. (The sample was contaminated). PRL-426 (3710 \pm 210) 1760 B.C. (MASCA-correction 2110 B.C.)	
Phase I, Savalda Culture	PRL-429 (3490 \pm 220) 1540 B.C. (MASCA-correction 1720-1760 B.C.). PRL-654 (3460 \pm 100) 1510 B.C. (MASCA-correction 1690- 1730 B.C.)	BS-176 3590 \pm 90 (3695 \pm 95) 1745 B.C. (MASCA-correction 2110 B.C.)

into layers 15, 16 and 17 and sealed by 14 which was the lower of the two layers of the Late Harappan Phase in trench CZ 61, the guide trench. As has already been pointed out before, the site remained uninhabited for about half-a-century or so after the Harappans abandoned it and before it was occupied by the Daimabadians. In that case the end of the Harappans at Daimabad may be considered to have taken place around 1850 B.C. As discussed above, the Harappans are likely to have occupied Daimabad around 2000 B.C. (without MASCA - correction). The date 1760 B.C. thus appears not so erratic as those discussed above and far removed from the date - bracket of circa 2000 B.C. - 1800 B.C. proposed for this Phase.

For obtaining TL dates for the Late Harappan Phase thirteen potsherds were collected from layers 11 and 12 of N4 in the season 1976-77 and ten from the layer 10 of ZD60 in 1978-79. All of them were sent to the Health Physics Division of the Bhabha Atomic Research Centre, Bombay. The dates obtained for six samples TLQ 10 - TLQ 15, were as follows:¹⁰

Sample No.	Age in years B.P.
TLQ 10	3988
TLQ 11	4786
TLQ 12	4796
TLQ 13	3295
TLQ 14	4029
TLQ 15	5082

The date 3295 for TLQ 13 is much younger whereas the dates 4786, 4796 and 5082 for the samples TLQ 11, TLQ 12 and TLQ 15 respectively appear very high. Only the dates 3988 for TLQ 10 and 4029 for TLQ 14 are closer to the time-bracket for this Phase.

On the above showing the date for the end of the Savalada Culture at Daimabad is not likely to be later than 2000 B.C. and it would not be too much if it is said that the authors of this culture occupied Daimabad around 2200 B.C., the MASCA - correction of which comes to 2630, 2670 B.C.¹¹ Suffice it would say, the Savaldans of the Deccan were the contemporaries of the Harappans of the Mature Phase in north-west India. It is quite evident, therefore, the three Carbon-14 dates 1540 B.C. (PRL-419), 1510 B.C. (PRI-654) and 1745 B.C. (BS-176) for Phase I, being stratigraphically inconsistent, need to be discarded.

To sum up, the various Phases at Daimabad may be dated as follows (with MASCA-correction)¹²:

10. M. David and C.M. Sinto, *Applications of Thermoluminescence of Quartz*, B.A.R.C. 1974, Bhabha Atomic Energy Centre, Bombay, 1980.

11. Elizabeth Ralph, *et al.* op. cit.

12. *Ibid.*

Phase I	:	<i>circa</i> 2200 - 2000 B.C. (MASCA-correction 2630, 2670 - 2330, 2440 B.C.)
Phase II	:	<i>circa</i> 2000 - 1800 B.C. (MASCA-correction 2330, 2440-2120 - 2140 B.C.)
Phase III	:	<i>circa</i> 1800 - 1600 B.C. (MASCA-correction 2120-2140 1800 B.C.)
Phase IV	:	<i>circa</i> 1600 - 1400 B.C. (MASCA-correction 1800 - 1600-1640 B.C.)
Phase V	:	<i>circa</i> 1400 - 1000 B.C. (MASCA - correction 1600 -1640 B.C., - 1110 - 1140 B.C.)

8. THE POTTERY

A. Introductory

Primarily the identification of different cultures of the Chalcolithic period at Daimabad was done on the basis of painted pottery characteristic of each culture. This became possible only because each group of characteristic painted ware was easily distinguishable from the other. The four of the five painted wares, viz. the Jorwe, the Malwa, the Late Harappan and the Savaldi, were also designated after these painted wares. The remaining phase, viz. the Phase III, was, in the beginning, designated as the Buff and Cream Ware. Subsequent study, however, revealed that although this ware had a wide distribution (below, pp. 248–258) it was not recognized as representing a distinct Chalcolithic Culture on any other site except at Daimabad. Hence, opportunity was taken to properly designate it. Accordingly, its clumsy name was replaced by Daimabad Ware and that of the culture represented by it by Daimabad Culture.¹

As will be clear from the following each of the characteristic painted wares differs from the other not only in the manufacturing process but also in the style of paintings. Except for the Savaldi Ware which is chiefly painted in ochre red colour, the pigment used for executing paintings in the painted wares is black. The paintings of arms and weapons on the Savaldi Ware is its chief characteristic feature. It is not to be found on any of the painted wares of the succeeding phases. The Late Harappan Red Ware is marked by geometric designs. Most of these designs also occur on the Daimabad, the Malwa as well as the Jorwe Wares. But those on the first-named Ware were carelessly drawn. This feature is observed even in the simple horizontal bands. It appears in the case of other painted wares that the horizontal bands were drawn by placing the pot on a wheel. The style of painting elongated hatched forms of animals is typical of only the Daimabad Ware. On the Malwa Ware the designs are comparatively much carefully drawn. The so-called potter's marks made their appearance for the first time on this Ware. A further refinement in drawing the paintings is clearly visible on the Jorwe Ware although the designs continued to be chiefly geometric. Representation of human body in round form, as in the painting of a dancer (fig. 69, 38, pl. XCII, 5), is the earliest and unique feature of its kind.

The use of fast wheel and finely levigated clay, almost uniformly thick walls of the pots and baking the pots under controlled uniform heat under oxidizing conditions of the kiln were the chief features of the Late Harappan and the Jorwe black-on-red pottery. The Savaldi

1. Sall, *op. cit.* (1983).

Ware, the Daimabad Ware and the Malwa Ware, on the other hand, were turned on relatively slow wheel. In the first-named ware, in the main, the clay contained sandy and other gritty material and the pottery was indifferently fired. Under-firing and the resultant presence of ashy grey or very black streak in the middle of the core were the chief characteristic features of the Daimabad Ware. It was made of well-leigated clay almost bereft of coarse gritty material. The Malwa Ware was well-fired under oxidizing conditions of the kiln but comparatively the pottery is brittle and the walls of the pots have not been uniformly built.

It should be recorded that the characteristic painted wares of all the phases were by far in largest quantity. The Savalda Ware covered as high as 80% of the total, the Late Harappan Red Ware 78%, the Daimabad Ware 77%, the Malwa Ware 73% and the Jorwe Ware 76%. The associated burnished grey ware stood second in the rank, it being 16%, 15%, 19%, 20% and 3% respectively.

Apart from the painted wares characteristic of each phase, there were minor painted wares too in each Phase. For example, in Phase I there were present four sherds with paintings which totally differed in fabric and surface treatment from the Savalda Ware. They have, therefore, been grouped into Miscellaneous Painted Wares. In the Savalda Ware there are also a few potsherds which are burnished black from inside and reddish from outside. But they have not been treated in a separate group of black-and-red ware. In Phase II there is Ribbed Bichrome Ware and Deep Red-slipped Ware. The Red Ware in Phase III and the Imitation Daimabad Ware in Phase IV are the noteworthy other painted wares. In Phase V there are hardly two or three sherds which resemble closely the Lustrous Red Ware and in addition there are a few examples of Red Ware With Waxy Touch and other minor wares.

While by and large, painted pottery characteristic of each Phase may be said to be of finer fabric, there were comparatively coarse wares also in each Phase. The main among these, which persisted throughout in all the Phases were the Burnished Grey Ware and the Thick Coarse Ware. Basically, these two wares remained unchanged in their main characteristic features except that in Phase IV and Phase V they became comparatively more refined. In the Burnished Grey Ware there were also varieties. For example, in Phase I the Corrugated Ware and the Grooved Ware class and hence although in details they appeared different they have been treated as its varieties. The black bowls from burials of Phase III and Phase IV have also been treated likewise. In Phase V the exceptionally small-sized burial urns are black in colour like the above mentioned black bowls. But they have been considered part and parcel of Burnished Grey Ware. In particularly Phase IV and Phase V it was observed that there was no difference in the domestic and burial pottery and as such no separate category of burial pottery was made. However, wherever burial pottery is illustrated it has been appropriately mentioned.

In the following pages pottery of each Phase is described in chronological order:

B. Phase I: The Savalda Culture

(a) *The Savalda Ware*

The Savalda Ware, characteristic of the earliest hitherto known Chalcolithic culture of the

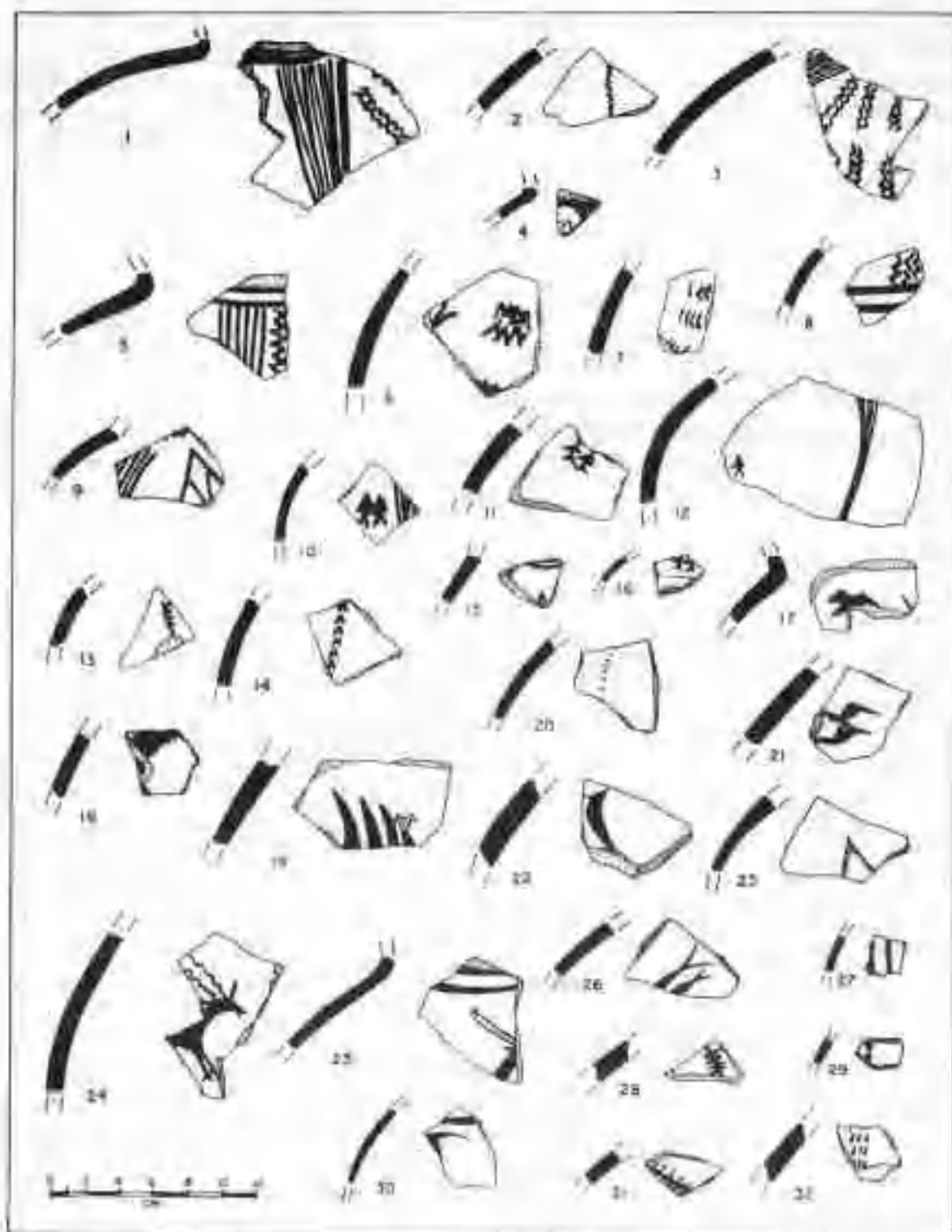


Fig. 25. Serinda Ware, painted designs. Plate 1.

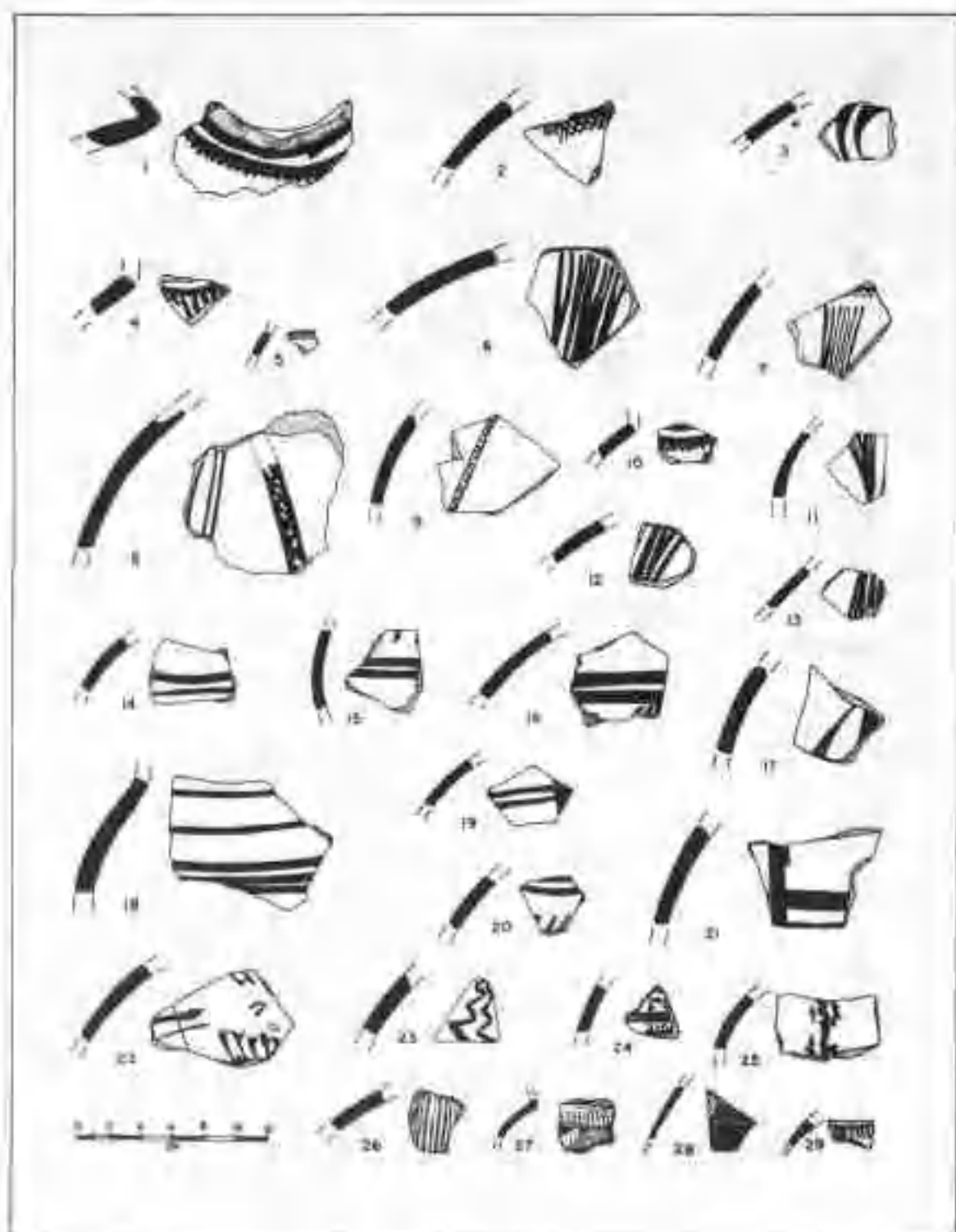


Fig. 26. Savaldu Ware, painted designs, Phase 1.

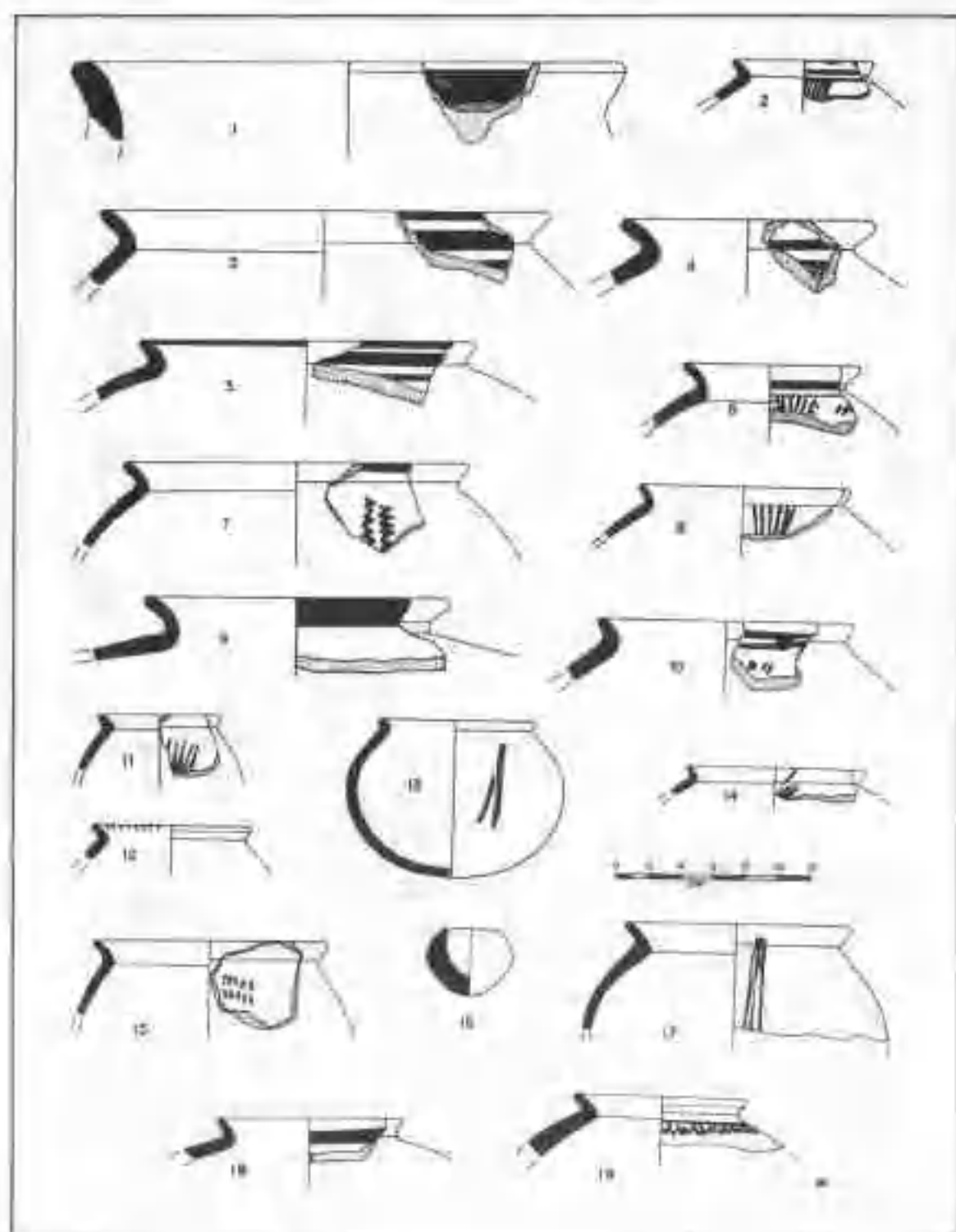


Fig. 27. Savalda Ware, types. Phase I.

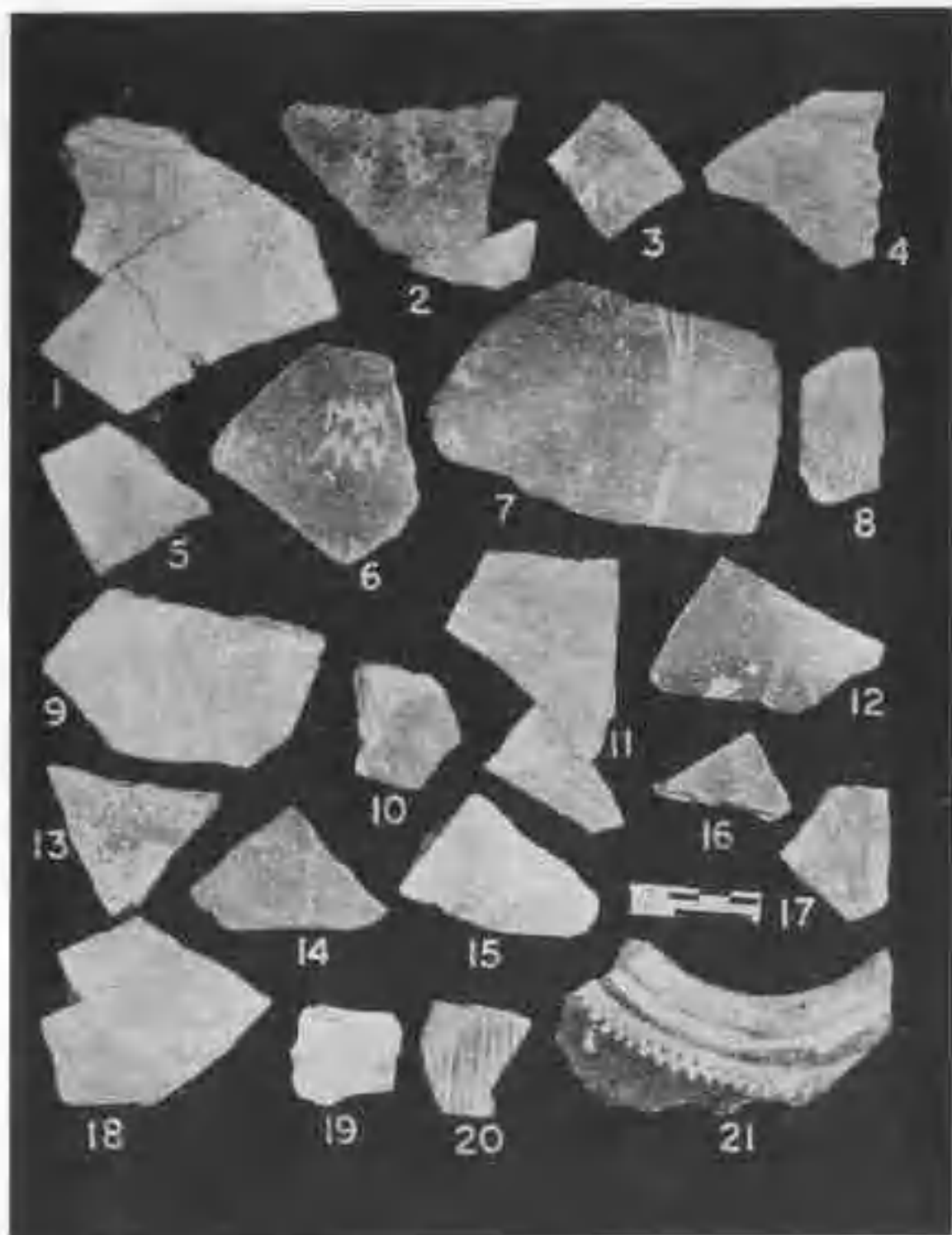


PLATE LXXIII Sivalda Ware, Phase I.

PLATE LXXIVA *Lota*, ware. Phase I.

PLATE LXXIVB Painting of arrow motif, Savitda ware. Phase I.

Deccan, was named after the types-site Savalda (21° 51'45" North Latitude and 74° 19'45" East Longitude), situated on the left bank of the river Tapi, in Dhule district of Maharashtra, where it was first identified as a distinct class of Chalcolithic ceramic in the year 1958.² It has since been known to occur, besides the Tapi Valley and the Godavari Valley, in the Upper Krishna Valley³ as well as Kaveri Valley⁴ in the south, the north-south distance covered being roughly 900 km as the crow flies.

The main characteristic features of this ware are that it is, on the whole, of medium-to-coarse fabric, made on a slow wheel by paring technique as is indicated by marks of removal of excessive clay from the inside and treated on the outside with a slip which is usually thick and shows crackles. But the most important feature which distinguishes it from the other painted wares is the paintings of arms and weapon motifs including the antennae-ended arrow, notched arrow-head, double barbed fish – hooks, unilaterally barbed tool resembling a saw and harpoon.⁵ The types met with were high-necked jar with squat body and blunt carination, dish, platter, dish-on-stand, trough or basin, bowl, ring-stand, beaker, vase with spayed out rim, *handi*-type vase and lid with knob.⁶

The Savalda Ware of Daimahad (figs. 25, 26 and 27; pls. LXXIII, LXXIVA, LXXIVB, and LXXV) possessed all the main characteristics detailed above. The clay used in the preparation of this pottery generally contained particles of sand and lime or shells but examples almost devoid of coarse tempering material are not wanting. The ware was made on a slow wheel by paring technique. The inner side showed disturbed striation marks apparently due to the removal of excess clay. There are, however, some examples in which the striation marks run uniformly at the junction of the shoulder and the neck. The ware was fired under low temperature and the core shows varying shades of brick red, ivory black and black colour. Owing to indifferent firing the surface shows blotches. It was treated with a slip which is thick in the specimens of coarse fabric and thin in those of fine fabric, the latter also producing a very dull metallic ring. In contrast to the light red, orange and pink colours of the Savalda Ware of the Tapi and the Krishna valleys this pottery at Daimahad is mainly of brown, blackish, tan and chocolate colours and their shades, examples of orange, light red and pink colours being met with only occasionally. A few of the potsherds were chemically examined with a view to know the elements which could have produced the brown, blackish, tan and chocolate colours. Manganese was found present in the samples of the slip tested.⁷ On the inside of some of the pots patches of black spot were observed.

2. Sali, *op. cit.* (1963).

3. A. Sundara, 'Chalcolithic Phase of the Upper Krishna Valley', *Studies in Indian History and Culture*, Prof. P.B. Desai Felicitation Volume, (eds.) Shrinivasa Ritti and B.R. Gopal, (Dharwar, 1971), pp. 15–30.

4. M. Seshadri, *Excavation at T. Narasipur*, (Mysore, 1971), pl. 6B. The potsherd illustrated in pl. 6B and described as "urray Red pottery piece, black painted Chalcolithic" is typical of the Savalda Ware.

5. Sali, *op. cit.* (1963), p. 208, figs 2–4 and 6; also Sundara, *op. cit.* (1971), p. 17.

6. *Op. cit.*

7. This testing was done by Shri V.R. Mangraji, Chemical Assistant, Archaeological Survey of India, Ajanta Caves at my request. I am grateful to Shri Mangraji for this work.

As against the Savalda Ware of the Tapi and the Upper Krishna valleys, in which the painted designs were mainly executed in black and occasionally in red and sometimes both in black and red colours, this ware at Daimabad was painted chiefly in ochre red and only in one example in both black and ochre red colours. The painted designs may be divided into the following groups:

- (1) Arms and Weapon motifs
- (2) Human motifs
- (3) Animal motifs
- (4) Plant motifs
- (5) Geometrical and other motifs.
- (1) In this group are included notched arrowheads of angular and heart-shaped types in vertical lines, arrow, harpoon, sword-blade-like design, and saw-like design.
- (2) Stylized human figures in pairs and in single formed this group.
- (3) Running antelope, fish, birds and a pair of snakes are included in this group.
- (4) One of the designs in this group resembles wheat or barley corn
- (5) The designs in this group included horizontal bands, crinkled line below horizontal band, criss-cross pattern, vertical lines of oval pointed short strokes, crescentic strokes, broom motif, festoon design, short strokes between horizontal and oblique lines and some indeterminate designs.

The shapes represented in this ware are comparatively few and simple. These consist of vase with outcurved rim (fig. 27, 1), *loti* with out-turned thickened rim and globular body (fig. 27, 13 and pl. LXXIV A), vase with splayed out mouth and an oblique shoulder (fig. 27, 9) and vase with outcurved rim and globular body (fig. 27, 5, 7, 17, 18 and 19).

In the upper Godavari valley the other excavated site yielding Savalda Ware is Apegaon in District Aurangabad. The excavators have, however, named it Ramatirtha Ware although it possessed all the characteristic features of the Savalda Ware of Daimabad.

The following sherds represent the range of designs. To avoid repetition sherds illustrated on pls. LXXIII and LXXIV B have not been separately described but are indicated against the respective number 1, 2, 3, 5, 6, 7, 9, 10, 12, 14, 18, 19, 23, 24, 26 and 28 of fig. 25 and 1, 2, 9, 26 and 27 of fig. 26.

Figs. 25 and 26; pls. LXXIII and LXXIV B

1. Fragment of a shoulder of a vase of ochre red ware. Of coarse fabric, it is treated on the outside with a slip and is painted in ochre red colour on the outside with a broom pattern, chains of notched arrowheads and two horizontal bands at the junction of the neck and the shoulder. Also pl. LXXIII, 1.
2. Fragment of a vase of brown ware. Of coarse fabric, it is treated on the outside with a slip and is painted in ochre red colour on the outside with a vertical chain of close-spaced notched arrowheads. Also pl. LXXIII, 14.
3. Fragment of a vase of dark brown ware. Of coarse fabric, it is treated on the outside

with a slip and is painted in ochre red colour on the outside with a broom pattern and pairs of vertically arranged chains of notched arrowheads.

4. Shoulder fragment of a vase of tan brown ware. Of coarse fabric, it is treated on the outside and inside with a slip and is painted in ochre red colour on the outside with a pair of notched arrowheads, horizontal bands at the junction of the neck and the shoulder and some indeterminate design below the horizontal band.
5. Shoulder-fragment of a vase of tan brown ware. Of coarse fabric, it is treated on the outside with a slip and is painted in ochre red colour on the outside with a pair of horizontal bands at the junction of the neck and the shoulder, a broom pattern and a verticle chain of notched arrowheads. Also pl. LXXIII, 4.
6. Fragment of the belly of a pot of chocolate ware. Of coarse fabric, it is treated on the outside with a slip and is painted in ochre red colour on the outside with notched arrowheads. Also pl. LXXIII, 6.
7. Fragment of an ivory black ware. Of coarse fabric, it is treated on the outside with a slip and is painted in ochre red colour on the outside with horizontal rows of crescentic strokes. Also pl. LXXIII, 8.
8. Fragment of an ivory black ware. Of coarse fabric, it is treated on the outside with a slip and is painted in ochre red colour on the outside with two horizontal bands and three vertical crinkled lines above. The slip has been peeled off at places.
9. Shoulder-fragment of a vase of pink ware. Of fine fabric, it is treated on the outside with a thin slip and is painted in ochre red colour on the outside with a broom and arrow motifs. Also pl. LXXIV B.
10. Fragment of a vase of a pink ware. Of fine fabric, it is treated on the outside with a thin slip and is painted on the outside in ochre red colour with a broom pattern and a pair of stylized human figures. Also pl. LXXIII, 3.
11. Fragment of a vase of ivory black ware. Of medium fabric, it is treated on the outside with a slip and is painted on the outside with a pair of stylized human figures.
12. Fragment of a vase of tan brown ware. Of medium fabric, it is treated on the outside with a slip and is painted in ochre red colour on the outside with a broom pattern and a stylized human figure. Also pl. LXXIII, 12.
13. Fragment of a vase of ivory black ware. Of coarse fabric, it is treated on the outside with a slip, which has been peeled off at places, and is painted in ochre red colour on the outside with a harpoon motif.
14. Fragment of a vase of pink ware. Of coarse fabric, it is treated on the outside with a slip and is painted on the outside in ochre red colour with a vertical row of notched arrowheads. Also pl. LXXIII, 5.
15. Shoulder-fragment of a vase of chocolate ware. Of coarse fabric, it is treated on the outside in ochre red colour with a pair of horizontal bands and a harpoon-like design.
16. Fragment of a vase of reddish ware. Of medium fabric, it is treated on the outside with a slip, and is painted on the outside in ochre red colour with a pair of stylized

human figures.

17. Shoulder-fragment of a vase of tan brown ware. Of coarse fabric, it is treated on the outside and inside with a slip, the slip on the inside being ivory black in colour. It is painted on the outside with a pair of stylized human figures.
18. Fragment of a vase of tan brown ware. Of coarse fabric, it is treated on the outside with a slip and is painted in ochre red colour on the outside with a saw-like design represented by dentitions on either side of a thick line. Also pl. LXXIII, 10.
19. Fragment of a vase of dark brown ware. Of fine fabric, it is treated on the outside with thin slip and is painted in ochre red colour on the outside with sword-blade-like designs. This potsherd is of exceptionally fine fabric, thick, sturdy and produces a fine metallic ring when struck. Also pl. LXXIII, 9.
20. Fragment of a vase of orange ware. Of medium fabric, it is treated on the outside with a thin slip and is painted in ochre red colour with a vertical row of pointed oval strokes.
21. Fragment of a vase of pinkish brown ware. Of medium fabric, it is treated on the outside with a slip which has been peeled off at places. It is painted on the outside in ochre red colour with a pair of flying birds.
22. Fragment of a vase of ivory black ware. Of fine fabric, it is treated on the outside with a slip which has been peeled off at places, and is painted in ochre red colour on the outside with a sword-like design. This potsherd is of as fine a fabric as that of No. 19 above and also produces fine metallic ring when struck.
23. Fragment of a vase of ivory black ware. Of fine fabric, it is treated on the outside with a slip and is painted in ochre red colour on the outside with a design consisting of dentition-like strokes on two lines which meet together to make an angle, perhaps representing a fork-like motif. Also pl. LXXIII, 12.
24. Fragment of a vase of reddish tan ware. Of medium fabric, it is treated on the outside with a slip and is painted in ochre red colour on the outside with a motif of running deer with wavy horns, erect ear and open mouth. Also pl. LXXIII, 11.
25. Shoulder-fragment of a vase of tan brown ware. Of medium fabric, it is treated on the outside with a slip and is painted in ochre red colour on the outside with two horizontal bands at the junction of the neck and the shoulder and the motif of a deer.
26. Fragment of a vase of pink ware. Of medium fabric, it is treated on the outside with a slip and is painted in black colour on the outside with a fish motif. Also pl. LXXIII, 13.
27. Fragment of a vase of ivory black ware. Of medium fabric, it is treated on the outside with a slip and is painted in ochre red colour with a plant motif resembling wheat or barley corn.
28. Fragment of a vase of chocolate brown ware. Of fine fabric, it is treated on the outside with a slip and is painted on the outside in ochre red colour with a plant motif. Also pl. LXXIII, 16.

29. Fragment of a vase of pink ware. Of medium fabric, it is treated on the outside with a slip and is painted in ochre red colour on the outside with ovaloid solid dots.
30. Fragment of a vase of reddish brown ware. Of medium fabric, it is treated on the outside with a slip and is painted on the outside in black colour with a horizontal band and what looks like the hind portion of an animal with a pointed tail.
31. Fragment of a vase of red ware. Of coarse fabric, it is treated on the outside with a slip and is painted in ochre red colour on the outside with a plant motif.
32. Fragment of a vase of ivory black ware. Of coarse fabric, it is treated on the outside with a slip and is painted in ochre red colour on the outside with vertically arranged groups of three vertical short strokes.

Fig. 26

1. Shoulder-fragment of a vase of ivory black ware. Of medium fabric, it is treated on the outside and partly on the inside with a slip and is painted in reddish colour with a horizontal band at the junction of the neck and the shoulder and a festoon design below. Also pl. LXXIII, 21.
2. Fragment of a vase of reddish brown ware. Of medium fabric, it is treated on the outside with a thick slip which has been peeled off at places and is painted in ochre red colour with a criss-cross design below a horizontal band. Also pl. LXXIII, 19.
3. Fragment of a vase of light ivory black colour. Of medium fabric, it is treated on the outside with a slip and is painted in ochre red colour on the outside with sword-blade-like designs.
4. Shoulder-fragment of a vase of tan brown ware. Of medium fabric, it is treated on the outside with a slip and is painted on the outside in ochre red colour with a horizontal band.
5. Fragment of a vase of chocolate ware. Of medium fabric, it is treated on the outside with a slip and is painted in ochre red colour with short strokes between two horizontal thin lines.
6. Fragment of a vase of chocolate brown ware. Of coarse fabric, it is treated on the outside with a slip and is painted in ochre red colour with a plant motif.
7. Fragment of a vase of blotchy red ware. Of medium fabric, it is treated on the outside with a slip and is painted in ochre red colour with a festoon design below horizontal band and a band below.
8. Fragment of a vase of blotchy red ware. Of coarse fabric, it is treated on the outside with a slip which has been peeled off at places and is painted in ochre red colour on the outside with two oblique lines and a criss-cross design within a pair of oblique lines.
9. Fragment of a vase of red ware. Of medium fabric, it is treated on the outside with a slip and is painted on the outside with short strokes between a pair of oblique lines. Also pl. LXXIII, 18.

10. Shoulder-fragment of a vase of ivory black ware. Of medium fabric, it is treated on the outside with a slip and is painted in ochre red colour on the outside with horizontal bands at the junction of the neck and shoulder.
11. Fragment of a vase of pink ware. Of fine fabric, it is treated on the outside with a thin slip and is painted in black colour on the outside with a broom design. Also pl. LXXIII, 17.
12. Fragment of a vase of red ware. Of medium fabric, it is treated on the outside with a slip and is painted in ochre red colour with a plant motif.
13. Fragment of a vase of deep red ware. Of medium fabric, it is treated on the outside with a slip and is painted in black colour on the outside with a broom-like design.
14. Fragment of a vase of ivory black ware. Of medium fabric, it is treated on the outside with a slip and is painted on the outside in red ochre colour with two horizontal bands.
15. Fragment of a vase of ivory black ware. Of medium fabric, it is treated on the outside with a slip and is painted on the outside in ochre red colour with two horizontal bands and an indeterminate design above.
16. Fragment of a vase of tan brown ware. Of fine fabric, it is treated on the outside with a slip and is painted on the outside in red ochre colour with two horizontal bands and an indeterminate design below.
17. Fragment of a vase of ivory black ware. Of medium fabric, it is treated on the outside with a slip and is painted on the outside in ochre red colour with an indeterminate design.
18. Fragment of a vase of chocolate brown ware. Of medium fabric, it is treated on the outside with a slip and is painted in black colour on the outside with a series of horizontal bands.
19. Fragment of a vase of black ware. Of fine fabric, it is treated on the outside with a slip and is painted in terminate design.
20. Fragment of a vase of orange ware. Of medium fabric, it is treated on the outside with a slip and is painted in ochre red colour with an indeterminate design.
21. Fragment of a vase of black ware. Of medium fabric it is treated on the outside with a slip and is painted in red ochre colour with horizontal bands meeting a thick vertical line.
22. Fragment of a vase of red ware. Of medium fabric, it is treated on the outside with a slip and is painted in red ochre colour with an indeterminate design.
23. Fragment of a vase of reddish ware. Of fine fabric, it is treated on the outside with a slip and is painted in ochre red colour with a pair of snakes.
24. Fragment of a vase of black ware. Of medium fabric, it is treated on the outside with a slip and is painted in ochre red colour with horizontal bands and an indeterminate design.
25. Fragment of a vase of ivory black ware. Of fine fabric, it is treated on the outside with a slip and is painted in ochre red colour on the outside with an indeterminate

design.

26. Fragment of a vase of ivory black ware. Of fine fabric, it is treated on the outside with a slip and is painted in reddish white pigment with a series of vertical lines.
27. Shoulder-fragment of a vase of thin grey ware. Of medium fabric, it is treated on the outside and inside with a slip and burnished and is painted on the outside in white colour with a horizontal band at the junction of the neck and the shoulder and vertical strokes below. Down below have been painted a comb motif and a group of five vertical short strokes on the shoulder. Also pl. LXXIII, 19.
28. Fragment of a vase of thin sturdy deep grey ware. Of fine metallic fabric, it is treated on the outside with a thin slip and is painted on the outside in white colour with an indeterminate design.
29. Shoulder-fragment of a vase of grey ware. Of medium fabric, it is treated on the outside and inside with a slip and burnished and is painted on the outside in dull ochre-red colour with a horizontal band and oblique short strokes below like a festoon design.

The selected types are illustrated.

Fig. 27; pl. LXXIV A

1. Rim-fragment of a vase of reddish brown ware with outcurved feature-less rim. Of medium fabric, it is treated both on the inside and outside with a slip and burnished and is painted on the outside in black with a rim band and below a horizontal band in ochre red colour.
2. Rim-fragment of a vase of dark brown ware with an out-turned rim. Of medium fabric, it is treated on the outside and partially on the inside with a slip and is painted in ochre red colour with a rim band, a horizontal band at the junction of the neck and the shoulder and oblique vertical lines below.
3. Rim-fragment of a vase of jet black ware with splayed out rim. Of medium fabric, it is treated both on the inside and outside with a slip and is painted in ochre red colour with a horizontal band on the rim-top, at the junction of the rim and the shoulder and on the shoulder below.
4. Rim-fragment of a vase of reddish brown ware with splayed out rim. Of fine fabric, it is treated on the outside with a slip and is painted on the outside in ochre red colour with a horizontal band at the junction of the rim and the shoulder and a meander pattern on the shoulder below.
5. Rim-fragment of a vase of red ware with splayed out rim. Of medium fabric, it is treated on the outside and partly on the inside with a slip and is painted with horizontal bands in ochre red colour one each on the rim-top, at the junction of the rim and the shoulder and on the shoulder below.
6. Rim-fragment of a vase of black ware with out-turned rim and narrow neck. Of medium fabric, it is treated on the outside and partly on the inside with a slip and

is painted in ochre red colour on the outside with a horizontal band at the junction of the rim and the neck, thin horizontal band below, notched arrow-heads in a horizontal row and four verticle lines flanked by an oblique line with strokes on the opposite sides.

7. Rim-fragment of a vase of reddish ware with splayed out rim. Of medium fabric, it is treated both on the inside and outside with a slip and is painted on the outside in ochre red colour with a pair of vertical chains of notched arrowheads and a horizontal band on the rim top.
8. Rim-fragment of a vase of black ware with slightly outcurved rim. Of fine fabric, it is treated both internally and externally with a slip and is painted in ochre red colour on the shoulder with a broom motif.
9. Rim-fragment of a sturdy vase of ivory black blotchy ware with out-turned rim and an obliquely splayed out shoulder. Of fine fabric, it is treated on the outside with a slip which has been considerably peeled off and is painted in ochre red colour on the outside with a broad rim band.
10. Rim-fragment of a vase of red blotchy ware with outcurved short rim. Of medium fabric, it is treated on the outside and partly on the inside with a slip and is painted in red ochre colour on the outside at the junction of the neck and the shoulder with two horizontal bands cut up by two vertical strokes and a horizontal row of short vertical strokes below.
11. Rim-fragment of a vase of reddish brown ware with out-turned short rim and globular body. Of medium fabric, it is treated on the outside with a slip and is painted in ochre red colour with broom motif on the shoulder.
12. Rim-fragment of a vase of black ware with outcurved short rim. Of medium fabric, it is treated both from outside and inside with a slip and is painted on the rim from inside with oblique pointed strokes.
13. *Lota* of brown ware with slightly outcurved thickened rim and globular body. Of fine fabric, it is treated both internally and externally with a slip and is painted in ochre red colour with two vertical lines on the body. Also pl. LXXIV A.
14. Rim-fragment of a vase of pinkish brown ware with an outcurved pointed rim. Of medium fabric, it is treated both on the inside and outside with a slip and is painted in red ochre colour on the outside on the shoulder with three oblique lines.
15. Fragment of a vase of reddish ware. Of medium fabric, it is treated on the outside and partly on the inside with a slip and is painted on the outside in ochre red colour, with two horizontal rows of short strokes.
16. A miniature bowl of handmade thick red ware with globular body. Of fine fabric, it is bereft of any slip or wash.
17. Rim-fragment of a vase of ivory black ware with outcurved rim and globular body. Of fine fabric, it is treated on the outside with a slip and is painted in ochre red colour on the outside with three vertical lines meeting in a point near the rim-top.
18. Rim-fragment of a vase of light red ware with out-turned rim. Of fine fabric, it is

treated on the outside with a wash and is painted on the outside in red ochre colour with horizontal band at the junction of the rim and the shoulder.

19. Rim-fragment of a vase of ivory black ware with out-curved rim. Of medium fabric, it is treated on the outside with a slip which has been peeled off at places and is painted in ochre red colour with a horizontal band and a festoon design below.

(ii) Miscellaneous Painted Wares

This group consists of only four potsherds which, being distinct in all respects from the Savalada Ware have been treated separately. Of these, one is a fragment of a thick blotchy ivory black ware, of medium fabric, treated on the outside with a slip and painted in reddish white pigment with a series of vertical lines (fig. 26, pl. LXXIII, 20). Among the rest two belong to the thin grey ware. They are treated with a slip both internally and externally and burnished. One of them is painted on the outside in white pigment with a horizontal band at the junction of the neck and the shoulder and almost vertical strokes as in a festoon design and a group of five vertical strokes and a comb motif below (fig. 26, 27, pl. LXXIII, 19). The other of the two is painted on the outside in dull ochre red colour with a horizontal band at the junction of the neck and the shoulder and almost vertical strokes below like a festoon design (fig. 26, 29). The fourth sherd is of deep grey ware. It is of exceptionally fine thin sturdy metallic fabric treated on the outside with a thin slip and painted in white pigment with an indeterminate design (fig. 26, 28). In what way these associated painted wares were related to the Savalada Ware needs to be investigated.

(iii) Burnished Grey Ware

In this class are included (i) the burnished grey ware; (ii) the corrugated ware; (iii) the grooved ware (iv) the lids and (v) the decorated variety of burnished grey ware, of the last-named there being only one example represented by a fragment with two horizontal punctured rows (fig. 28, 14).

The first variety in these covers major portion of the lot. This is a coarse ware mostly made on a wheel as is indicated by faint traces of striation marks on the inside. The ware is burnished and its colours included grey, blotchy grey, drab and black. This was relatively low fired as a result of which the core shows various shades of black colour. The shapes included *lots* with globular body (fig. 28, 1); *lots* with bluntly carinated neck and outcurved rim (fig. 28, 2); bowl with an internally bevelled grooved rim (fig. 28, 3); bowl with splayed out mouth (fig. 28, 17); cup-on-stand (fig. 28, 15); vase with oblique shoulder and outcurved featureless rim, *kunda* with almost vertical profile and flat top; vase with outcurved rim and globular body (figs. 28, 4-6) and vase with flared out mouth and globular body (fig. 28, 16). The last-named, it should be mentioned, is akin to the urns used in the double-urn burials of the Malwa and the Jorwe Cultures.

The corrugated and grooved varieties are represented by a small number of sherds. But

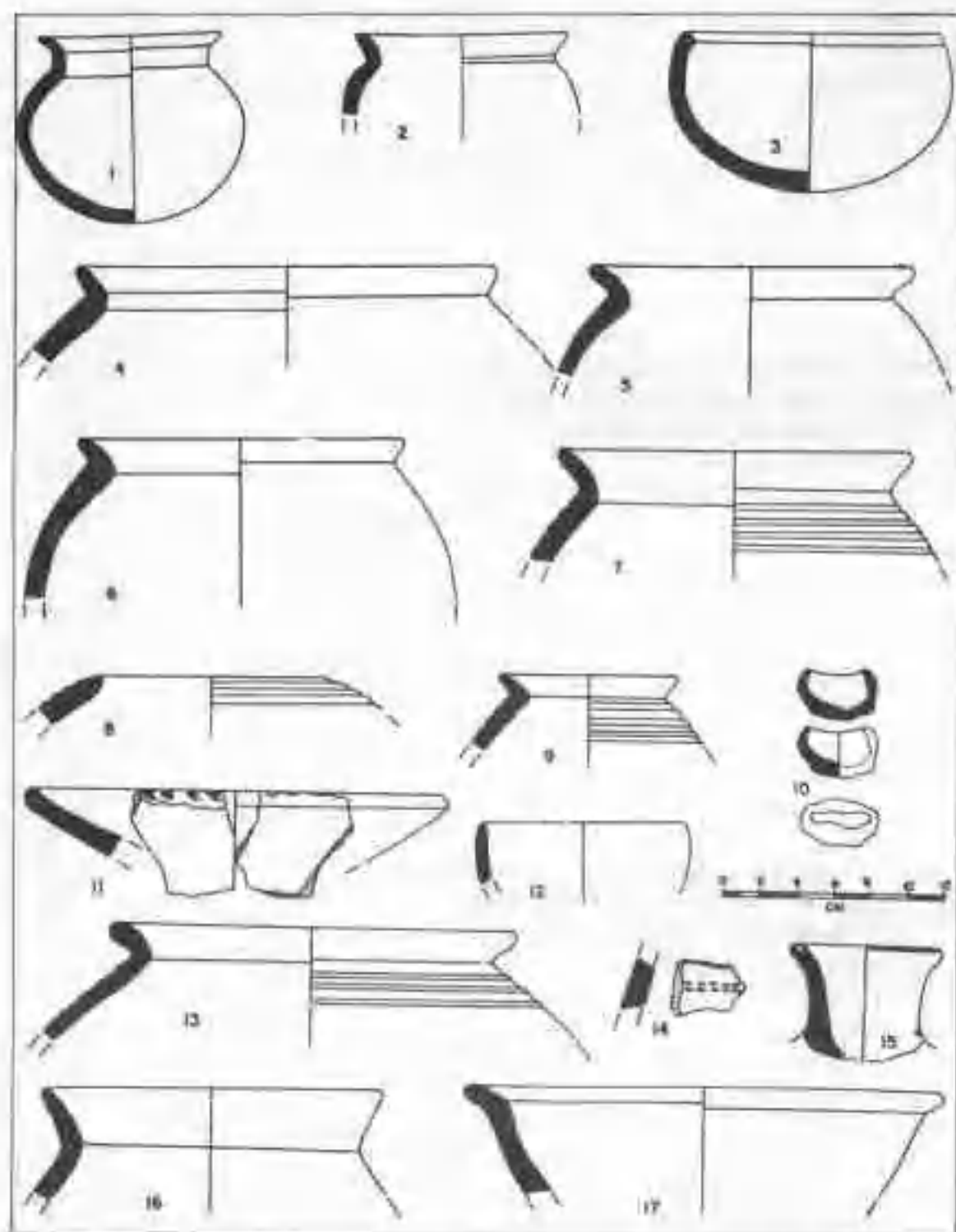


Fig. 28. 1-6 and 14-17 Burnished Gray Ware; 7-9 and 10, corrugated and grooved ware; 10-12, Thick Coarse Ware, Phase I.

for the grooves and the corrugations on the shoulder, these varieties possess all the features of the burnished grey ware described above. The types represented are vase with outcurved rim and globular body (fig. 28, 7, 9 and 13) and vase with rimless narrow mouth and bulbous body (fig. 28, 8).

Only about half-a-dozen examples of lids are present in this ware, all being fragments. They are of saucer type and their knobs are concave-sided and with a slightly convex as well as concave top.

The following types are illustrated.

Fig. 28

1. Lots of blotchy grey ware with an outcurved rim, bluntly carinated shoulder and globular body. Of coarse fabric, it is treated on the outside and up to the neck on the inside with a slip and burnished. Its surface is rough indicating that it has been hand-modelled.
2. Rim-fragment of a bowl of grey ware. Of medium fabric, it is treated both internally and externally with a slip and burnished.
3. Bowl of burnished grey ware with internally bevelled rim, a shallow groove on the outside of the rim and convex body. Of medium fabric, it is treated both internally and externally with a slip and is burnished.
4. Rim-fragment of a vase of light red ware with outcurved rim. Of coarse fabric, it is treated on the outside and partly on the inside with a slip and burnished.
5. Rim-fragment of a vase of black ware with outcurved rim. Of medium fabric, it is treated on the outside and partly on the inside with a slip and burnished. Traces of a rim band in ochre red colour are visible on the rim.
6. Rim-fragment of a vase of blotchy grey ware with splayed out rim. Of coarse fabric, it is treated with a slip on the outside and partly on the inside upto the rim and burnished.
7. Rim-fragment of a vase of deep grey ware with outcurved rim and grooved shoulder. Of coarse fabric, it is treated both externally and partly internally with a slip and burnished.
8. Rim-fragment of a vase of black ware with incurved featureless rim and corrugated shoulder. Of coarse fabric, it is treated on the outside with a slip and burnished.
9. Rim-fragment of a vase of black ware with outcurved rim and grooved shoulder. Of medium fabric, it is treated on the outside with a slip and burnished.
10. Rim-fragment of a vase of corrugated burnished grey ware. Of coarse fabric, it is treated on the outside and over the rim on the inside with a slip and burnished. It possesses traces of a horizontal band painted in red ochre on the rim-top.
14. Fragment of a vase of burnished pink ware. Of coarse fabric, it is treated both from inside and outside with a slip and burnished and is decorated on the outside with two rows of punctured marks.

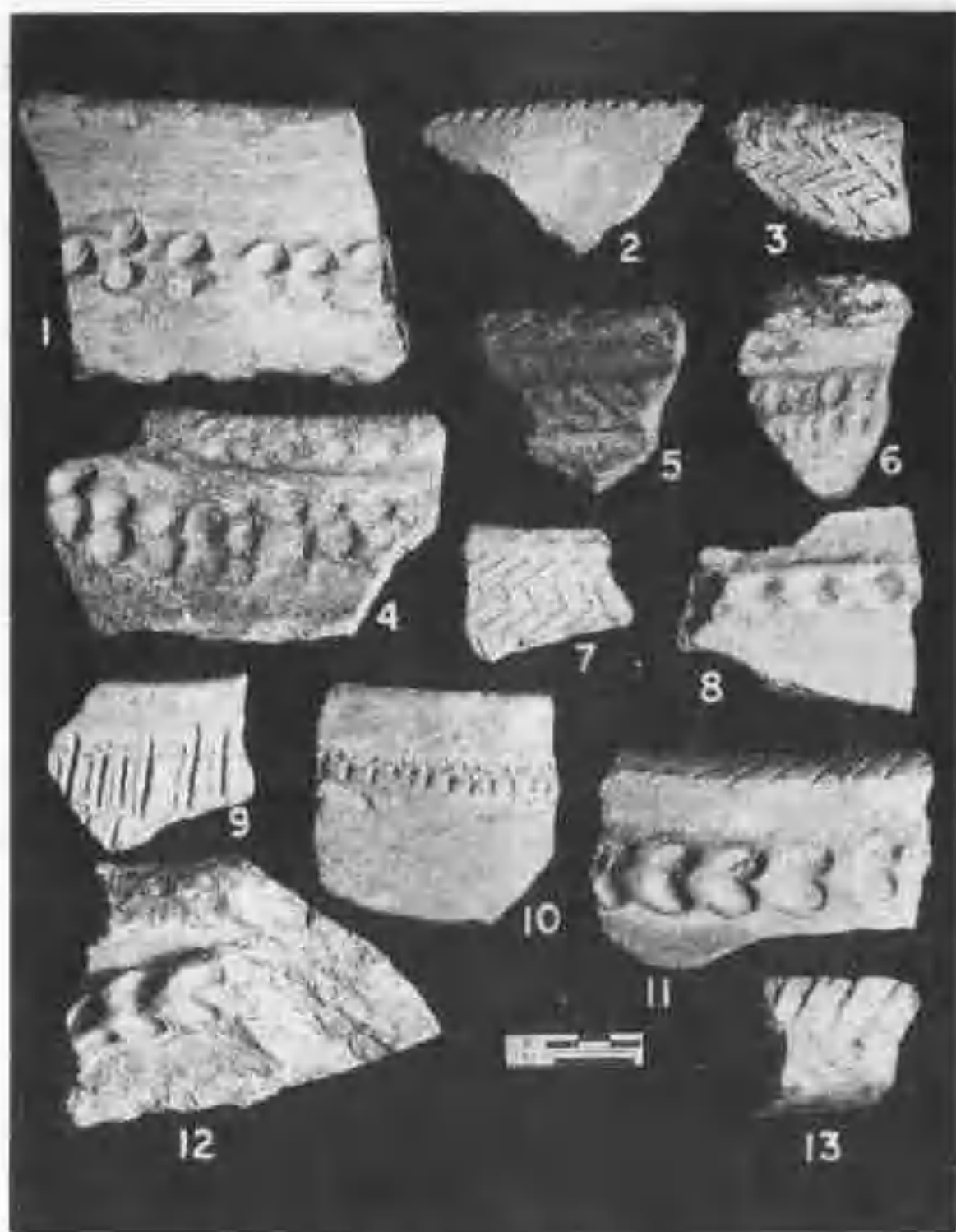


PLATE LXXV Thick Coarse Ware with applique and incised designs: 1-6, Phase I; 7-8 Phase II and 9-13 Phase III.

15. Cup-on-stand of burnished grey ware. Of coarse fabric, it is treated with a slip both from inside and outside and burnished. It shows traces of a rim-band painted in ochre red colour.
16. Rim-fragment of a vase of burnished black ware with flared out mouth. Of medium fabric, it is treated internally and externally with a slip and burnished. This type is akin to that of the burial urns of burnished grey ware of the Malwa and Jorwe cultures.
17. Bowl of reddish grey ware with flared out mouth. Of coarse fabric, it is treated on the outside and inside with a slip and burnished.

(iv) *Thick coarse ware* (fig. 28, 10-12; pl. LXXV, 1-4).

This is a handmade ware of coarse gritty fabric and light red and pink in colour. The common type met with in this ware is storage jar with outcurved rim generally decorated with finger-tip designs on applique hand mostly around the neck and on the top of the rim (pl. LXXV, 1 and 4). Among the other types are included miniature and small bowls and large *kunda* type vase with splayed or almost vertical sides decorated with either finger-tip designs or incised lines on the rim-top. Incised decorations of chevrons also occur on the neck of the vase (pl. LXXV, 2 and 3).

The following selected types illustrated in fig. 28 are described.

10. A shapeless miniature bowl of handmade red ware. Of medium fabric, it is bereft of any slip or wash.
11. Rim-fragment of a bowl of red blotchy ware with splayed sides and decoration of finger tip design on the rim top. Of coarse fabric, it is treated with a wash on the inside and partly on the outside.
12. Rim-fragment of a bowl of hand-modelled red ware with a convex body. Of coarse fabric, it is treated on the outside with a wash.

C. Phase II: The Late Harappa Culture

(i) *The Late Harappan Red Ware*

Of all the painted wares at Daimabad, the Late Harappan Red Ware is sturdier, thicker and of finer fabric and as such easily distinguishable from the other characteristic painted wares. This ware is, however, very well comparable in fabric, shapes and surface treatment with the Red Ware or Late Harappan Ware of the Tapi Valley⁹ although the former shows a little degeneration perhaps due to the quality of raw material, particularly the clay, available in the region for the manufacture of pottery. It is made of well-levigated clay with an admixture of

9. Sali, *op. cit.* (1970)

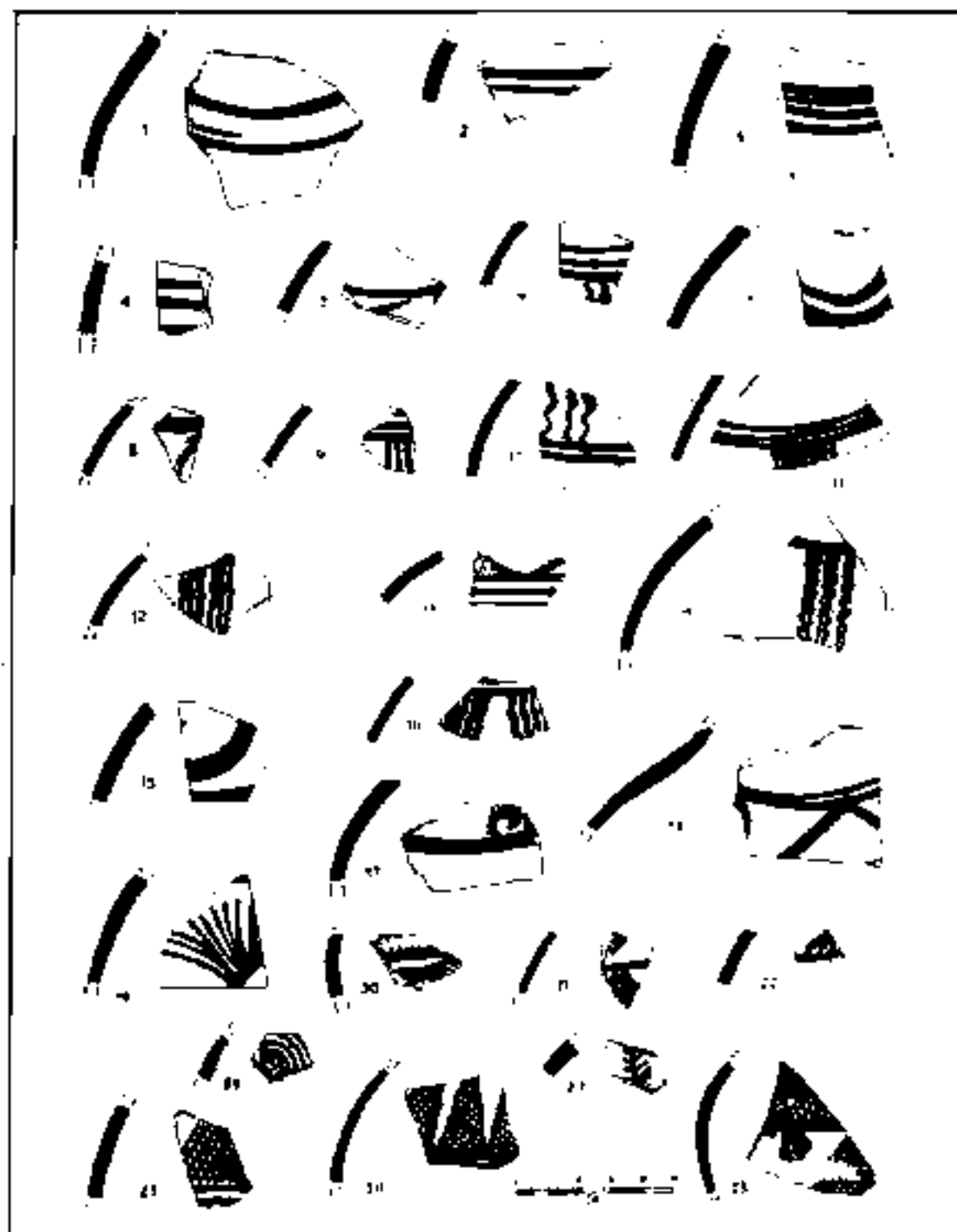


Fig. 25. Late Harappan Red Ware, painted designs, Phase II.

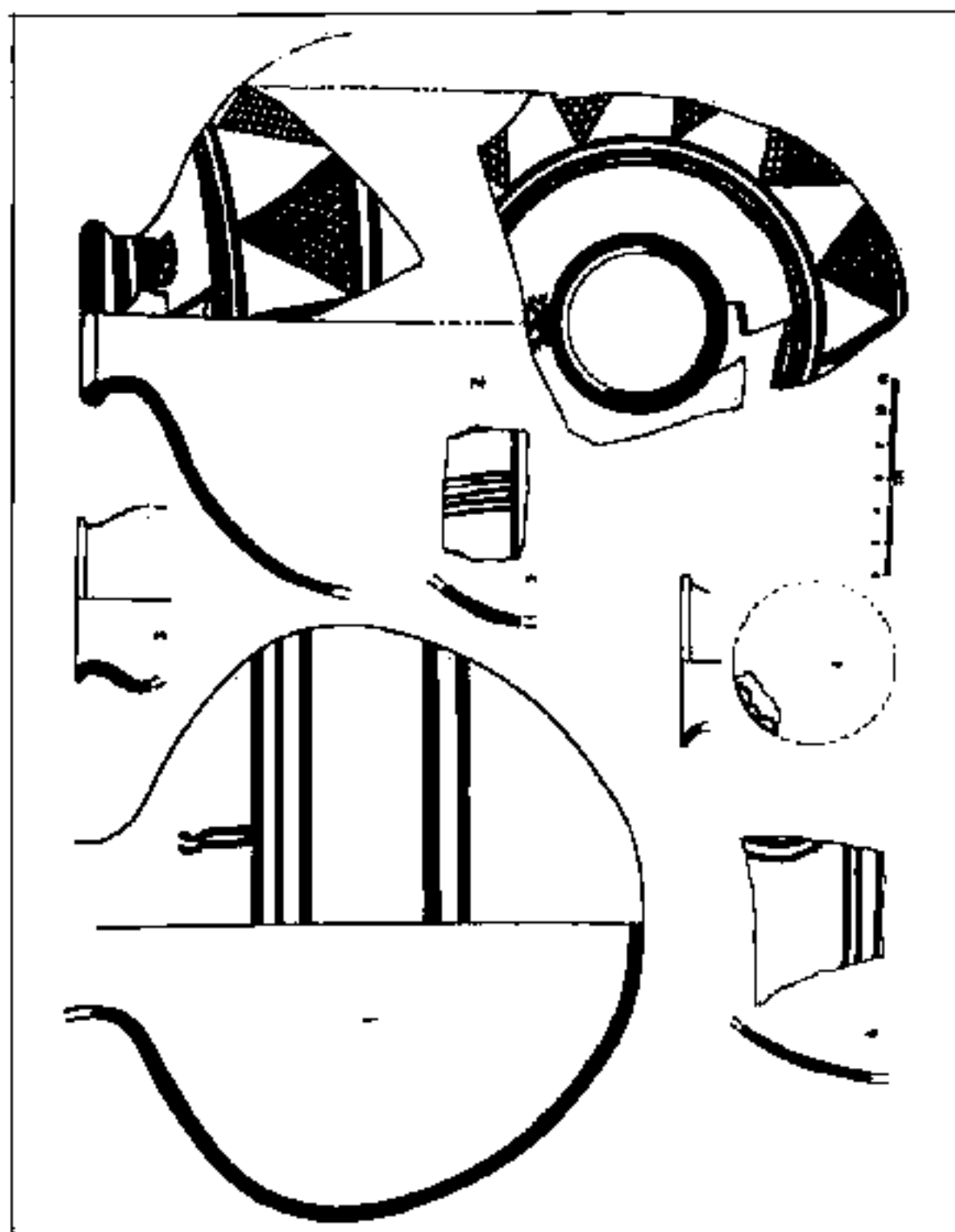


Fig. 50 Eute Harappan Red ware, typical and painted designs. Figure 11.

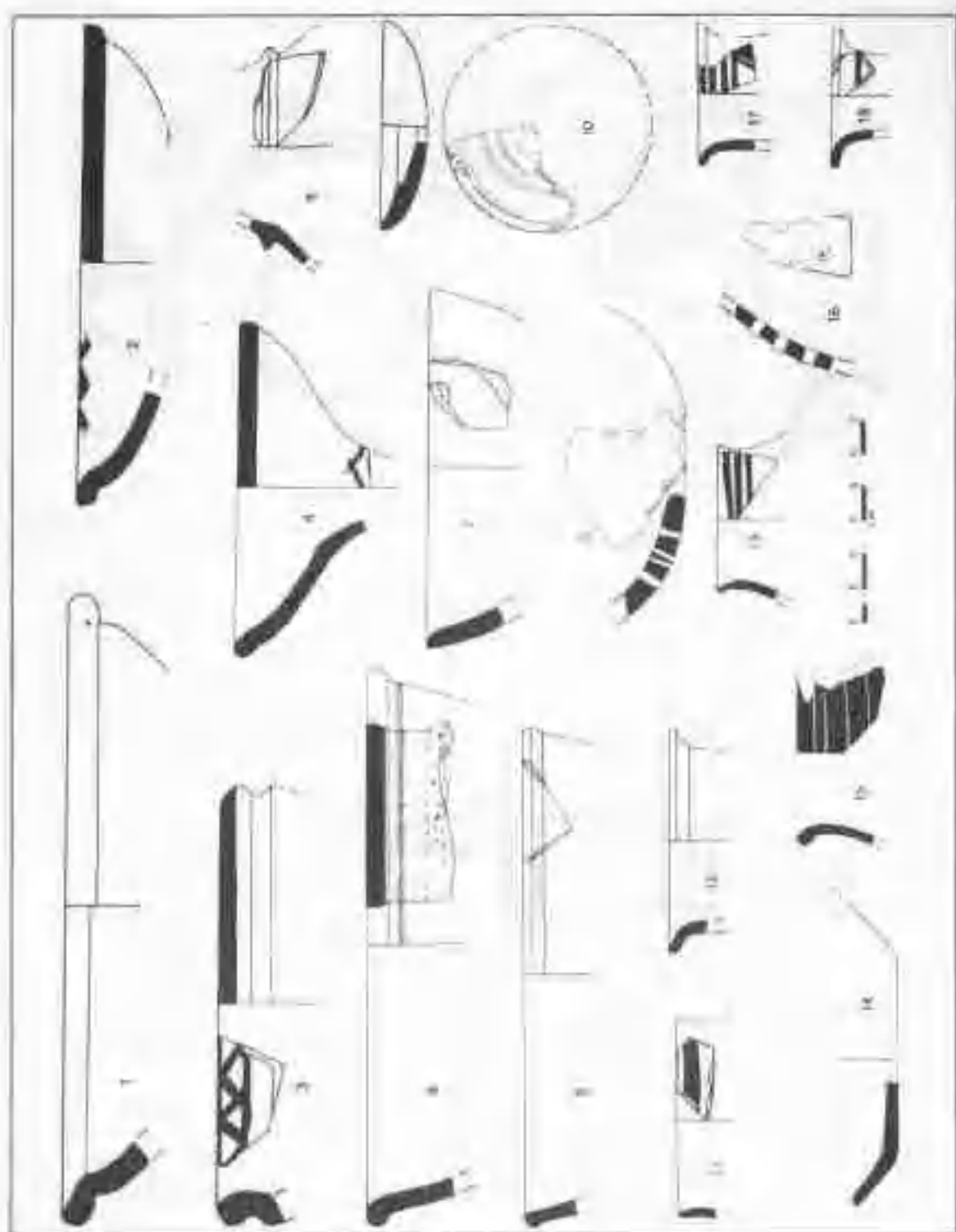


Fig. 31. Late-Harappan Red Ware, types. Phase II.

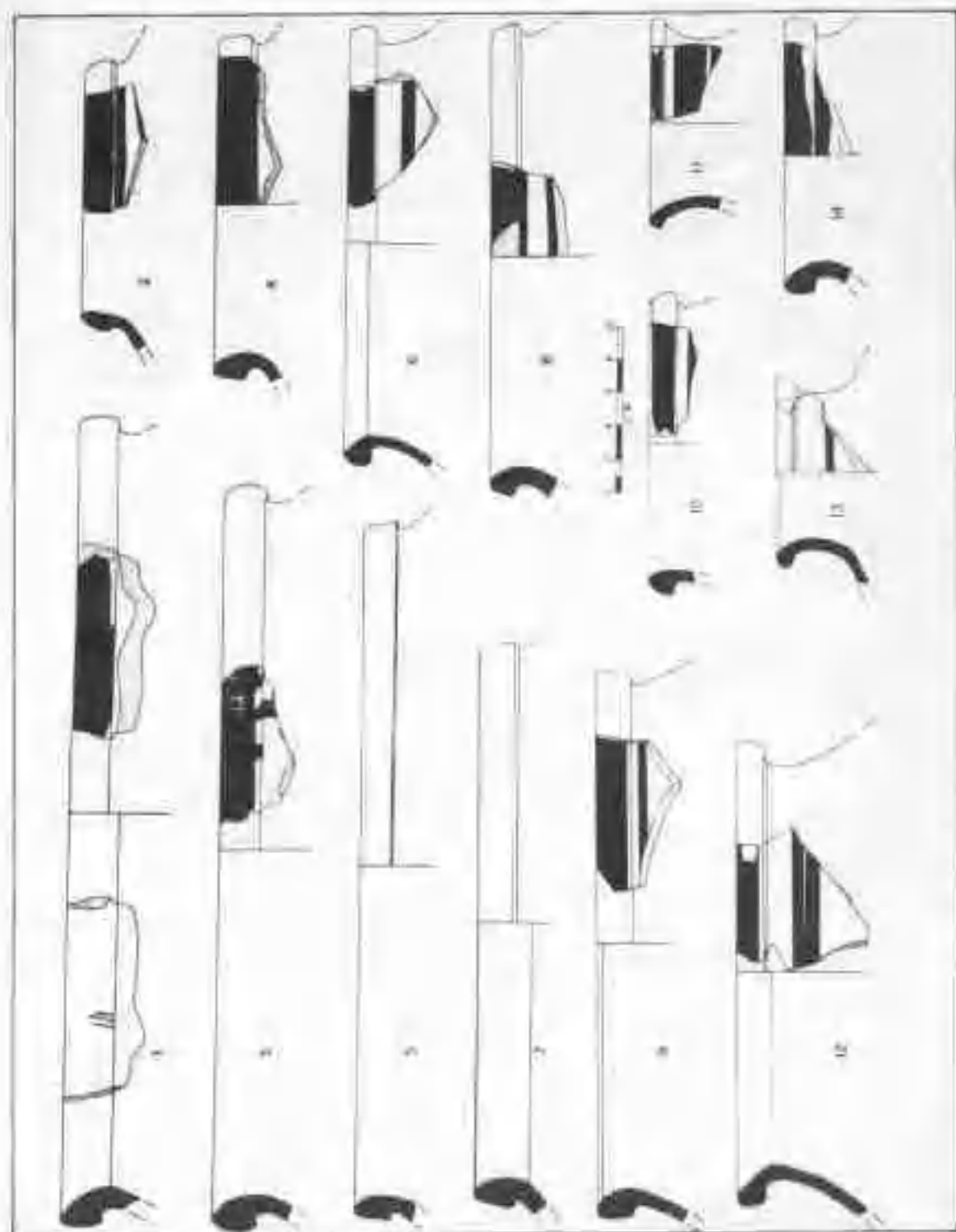


Fig. 32. Late Harappan Red Ware, Types, Phase II.

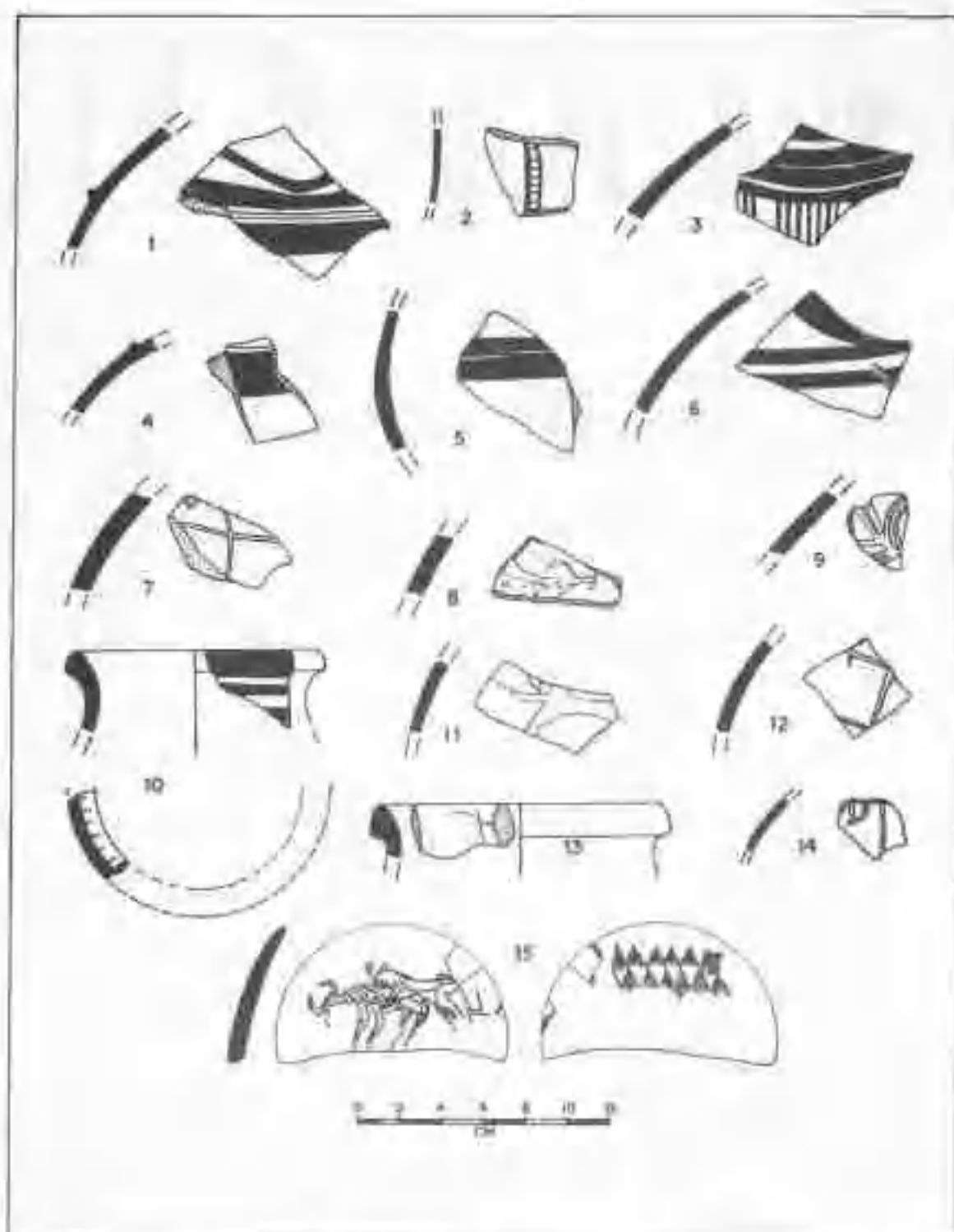


Fig. 55. 1 and 4, Ribbed Bichrome Ware; 2, 3, 8 and 6, Deep Red Ware; 7-14, Glauconite-bearing sherds. 15, graffiti on the cult object. Phase II.

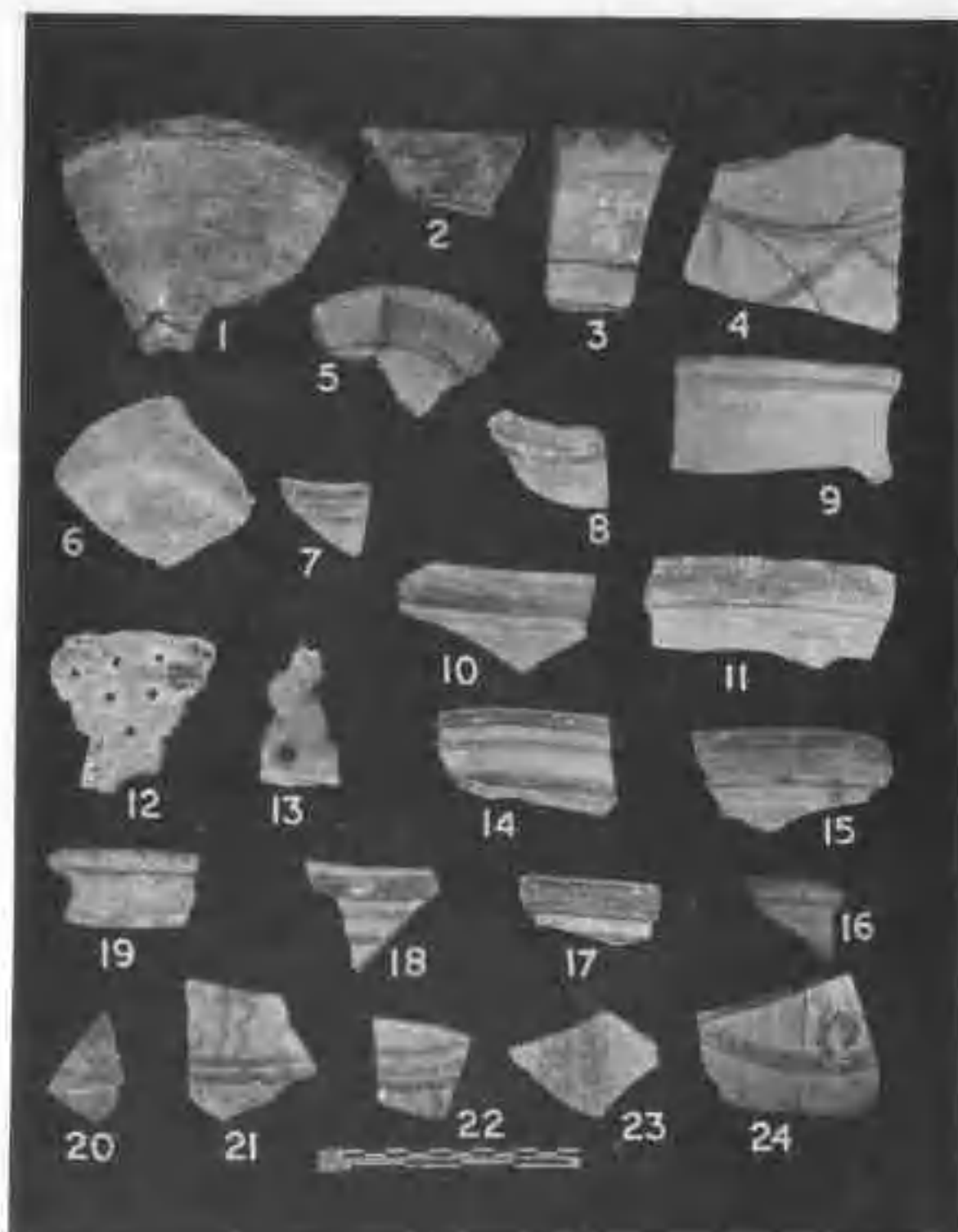


PLATE LXXVI Late Harappan Red Ware, Phase II.



PLATE LXXVII Vase of Late Harappan Red Ware, Phase III

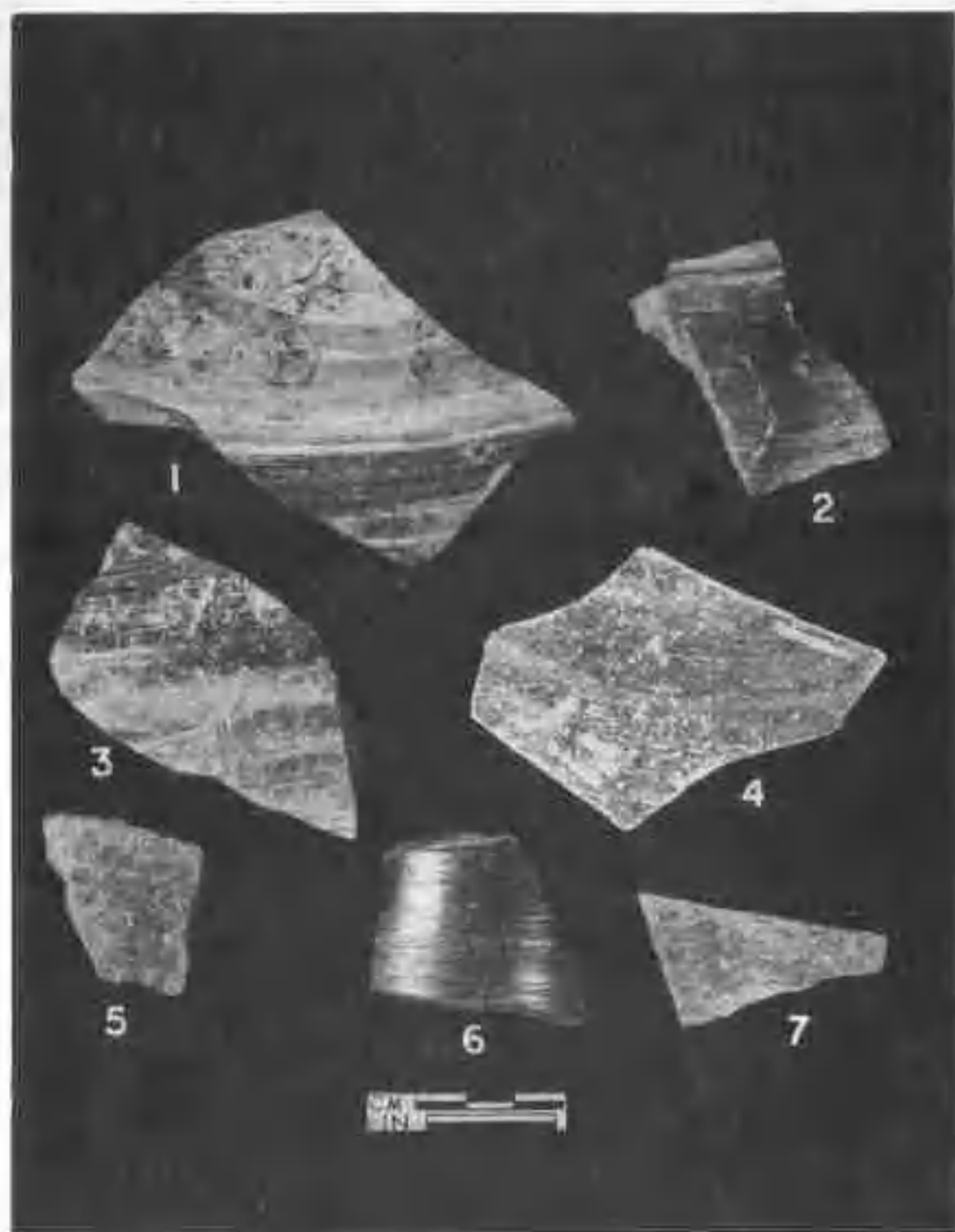


PLATE LXXVIII. Rubbed gaduime ware, 1 and 2; Deep-red ware, 3-7. Phase II.

fine sand, and powder of lime and/or shell as tempering material. The ware was produced on fast wheel as is indicated by uniformity of the parallel striation marks on the inside. The core of the ware is fairly dense and uniformly light red or brick red in colour suggesting that the pottery was baked under controlled, uniform heat under oxidizing conditions. The outside of this ware was treated with a thin slip which is usually red, but occasionally chocolate or light brown, pink and light grey. The designs included horizontal bands on the rim, neck, shoulder and body, cross-hatched triangles, groups of vertical wavy and straight lines between horizontal bands, pairs of wavy lines, a bucranian or double horn motif, interlaced loops, spiral with strokes above, concentric circles, rows of dots above and below horizontal bands and plant motif (fig. 29). The rim bands and horizontal bands were common on the big jars. An interesting design was found on the body of a globular pot lacking only the neck and rim. There were three black bands painted around the body of this vessel. Above the topmost of these bands were two vertical lines painted in black, the upper parts of which had been curved to resemble the motif of a snake (fig. 30, 1). This design is comparable with that of the snakes painted on a potsherd from Lothal.¹⁰ Other shapes in this ware are dish-on-stand, bowl-on-stand, dish with internally collared rim, *lota*, vase with flat base, vase with beaked rim, vase with beaded rim and globular body.

The following sherds illustrate the designs on the Late Harappan Red Ware at Daimabad.

Fig. 29: pl. LXXVI, 2-4 and 20-24

1. Shoulder-fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black colour on the outside with horizontal bands.
2. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with horizontal bands.
3. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with four horizontal bands.
4. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with horizontal bands.
5. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a horizontal band and an indeterminate design.
6. Fragment of a vase of pink ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with three horizontal bands and an indeterminate design below. Also pl. LXXVI, 5.
7. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted on the outside in black colour with two curved lines.
8. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip

10. S.R. Rao, 'Excavation at Rangpur and other explorations in Gujarat', *Ancient India*, 18 and 19, 1962 and 1963, (New Delhi, 1963), Pl. XLVIII, 9.

and is painted in black on the outside with a horizontal band and an indeterminate design below.

9. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with horizontal bands and vertical lines below.
10. Fragment of a vase of pink ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with two horizontal bands and three wavy lines above. Also pl. LXXVI, 21.
11. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with three horizontal bands and a group of seven wavy lines below.
12. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with two groups of three vertical wavy lines each. Also pl. LXXVI, 29.
13. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with horizontal bands, a criss-cross design and a loop above.
14. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a horizontal band and three pairs of wavy lines below.
15. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a horizontal band and a loop above.
16. Fragment of a vase of chocolate ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with two horizontal bands and two groups of vertical wavy lines below.
17. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a horizontal band and a loop with strokes above. Also pl. LXXVI, 24.
18. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with horizontal bands and a buchranean motif below. Also pl. LXXVI, 4.
19. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a plant motif.
20. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with horizontal bands and dots below and above.
21. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a cross-hatched diamond pattern between horizontal bands. Also pl. LXXVI, 21.
22. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with an indeterminate pattern.
22. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip

and is painted in black on the outside with an indeterminate pattern.

23. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a cross-hatched triangle above horizontal bands.
24. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a panel of cross-hatched triangles above horizontal bands.
25. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a criss-cross design and horizontal bands.
26. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with concentric circles.
27. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a plant motif.

The selected types are illustrated in figs. 30, 31 and 32 and pls. LXXVI, 1-3 5-19 and LXXVII.

Fig. 30

1. Rimless vase of red ware with globular body. Of fine fabric, it is treated on the outside with a slip which has been peeled off from a large portion of the vase and is painted in black on the outside with two horizontal bands on the belly, three horizontal bands on the junction of the belly and the shoulder and a pair of snakes on the top of the topmost horizontal band. Also pl. LXXVII.
2. Fragment of a vase of red ware with short neck. Of fine fabric, it is treated on the outside with a slip and is painted on the outside with a rim band, two horizontal bands on the neck, an indeterminate design below the lower of the two horizontal bands, and a panel of cross-hatched triangle between horizontal bands.
3. A lota of brown ware with blunt carination. Of fine fabric, its slip is lost except for a few patches.
4. Rim-fragment of a vase of red ware with outcurved square rim. Of fine fabric, it is treated on the outside and inside with a slip and is painted in black on the inside of the rim with a rim band and loops.
5. Fragment of a vase of pink ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a horizontal band and a group of five vertical lines above.
6. Fragment of a vase of light red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with three horizontal bands and an indeterminate design above.

Fig. 31

1. Fragment of a dish-on-stand of red ware. Of medium fabric, it is ill-fired and treated

on the outside and inside with a slip.

2. Fragment of a dish-on-stand of red ware. Of fine fabric, it is treated on the inside and outside with a slip and is painted in black on the inside of the rim with a loop design and on the outside a rim band. Also pl. LXXVI, 3.
3. Fragment of a bowl-on-stand of reddish brown ware. Of fine fabric, it is treated on the inside and outside with a slip and is painted in black on the inside with a wavy band between horizontal bands and a rim band on the outside. Also pl. LXXVI, 2.
4. Fragment of a bowl-on-stand of red ware. Of fine fabric, it is treated on the inside and outside with a slip and is painted in black on the outside with a rim band and an indeterminate design at the junction of the base and the stem of the stand. Also pl. LXXVI, 1.
5. Fragment of a ledged stem of a stand of red ware. Of fine fabric, it is treated on the outside with a wash. Also pl. LXXVI, 8.
6. Fragment of a deep bowl of red ware with a beaded rim. Of fine fabric, it is decorated on the outside with incised rope pattern and is painted in black with a rim band. Also pl. LXXVI, 9.
7. Fragment of a bowl of red ware. Of fine fabric, it has lost its slip.
8. Fragment of a bowl of chocolate ware with an externally bevelled rim.
9. Fragment of a perforated vase of red ware with a large perforation at the base and smaller ones on the body. Its inside is covered with whitish encrustation. Also pl. LXXVI, 12.
10. Fragment of a dish of reddish brown ware with an internally oval collared rim. Of fine fabric, its inside is marked by parallel striation marks. Also pl. LXXVI, 5.
11. Fragment of a bowl of almost vertical profile. Of fine fabric, it is treated both internally and externally with a slip and is painted in black on the outside with a horizontal band.
12. Fragment of a vase of red ware with an outcurved square rim and vertical neck.
13. Fragment of a vase of red ware with an outcurved lip. Of fine fabric, it is treated on the outside with a slip and is painted on the neck with three horizontal bands. Also pl. LXXVI, 7.
14. Base-fragment of a vase of red ware with a flat base. Of fine fabric, it is treated on the outside with a slip. Also pl. LXXVI, 6.
15. Fragment of a vase of red ware with a beaded rim. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a series of thick horizontal bands on the neck and a rim band.
16. Fragment of a perforated vase of brown ware. Also pl. LXXVI, 13.
17. Fragment of a vase of red ware with an outcurved featureless rim. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with horizontal band and a loop with strokes above. Also pl. LXXVI, 24.
18. Fragment of a vase of red ware with a splayed out square rim and a high narrow neck. Of fine fabric, it is treated on the outside with a slip and is painted in black

on the outside with a horizontal band on the neck.

Fig. 32

1. Fragment of a jar of red ware with thick out-turned collared rim. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a rim band. On the inside of the rim is engraved a graffiti consisting of three vertical lines, two long and one short, resembling an Indus sign! Also pl. LXXVI, 11.
2. Fragment of a jar of red ware with collared rim. Of fine fabric, it is treated on the inside and outside with a slip and is painted in black on the outside with a rim band and a horizontal band on the neck. Also pl. LXXVI, 10.
3. Fragment of a jar of red ware with elliptical collared rim. Of fine fabric, it is treated on the outside with a slip and is painted on the outside with a rim band. The excess paint is spilled over the neck. Also pl. LXXVI, 15.
4. Fragment of a jar of red ware with squarish rim. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a rim band and a horizontal band below.
5. Fragment of a jar of red ware with undercut ledged collared rim. Of fine fabric, the slip on a considerable part of the example is lost.
6. Fragment of a jar of red ware with a beaded rim. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a rim band and a horizontal band on the neck.
7. Fragment of a jar of chocolate ware with an oval collared rim. Of fine fabric, it is treated on the outside with a slip.
8. Fragment of a jar of red ware with an externally thickened out-turned rim. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a rim band and horizontal band on the neck.
9. Fragment of a jar of red ware with an internally bevelled collared rim. Of fine fabric, it is treated on the outside with a rim band and a horizontal band on the neck.
10. Fragment of a jar of red ware with a beaded rim. Of fine fabric, it is treated on the outside with a rim band and a horizontal band on the neck.
11. Fragment of a vase of red ware with an outcurved thickened rim. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a rim band and thick horizontal bands on the neck.
12. Fragment of a jar of red ware with an outcurved squarish rim. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a rim band and two horizontal bands on the neck.
13. Fragment of a vase of red ware with a beaded rim. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a horizontal band on

11. Mahadevan, *op. cit.* (1972), p. 32. Sign No. 102.

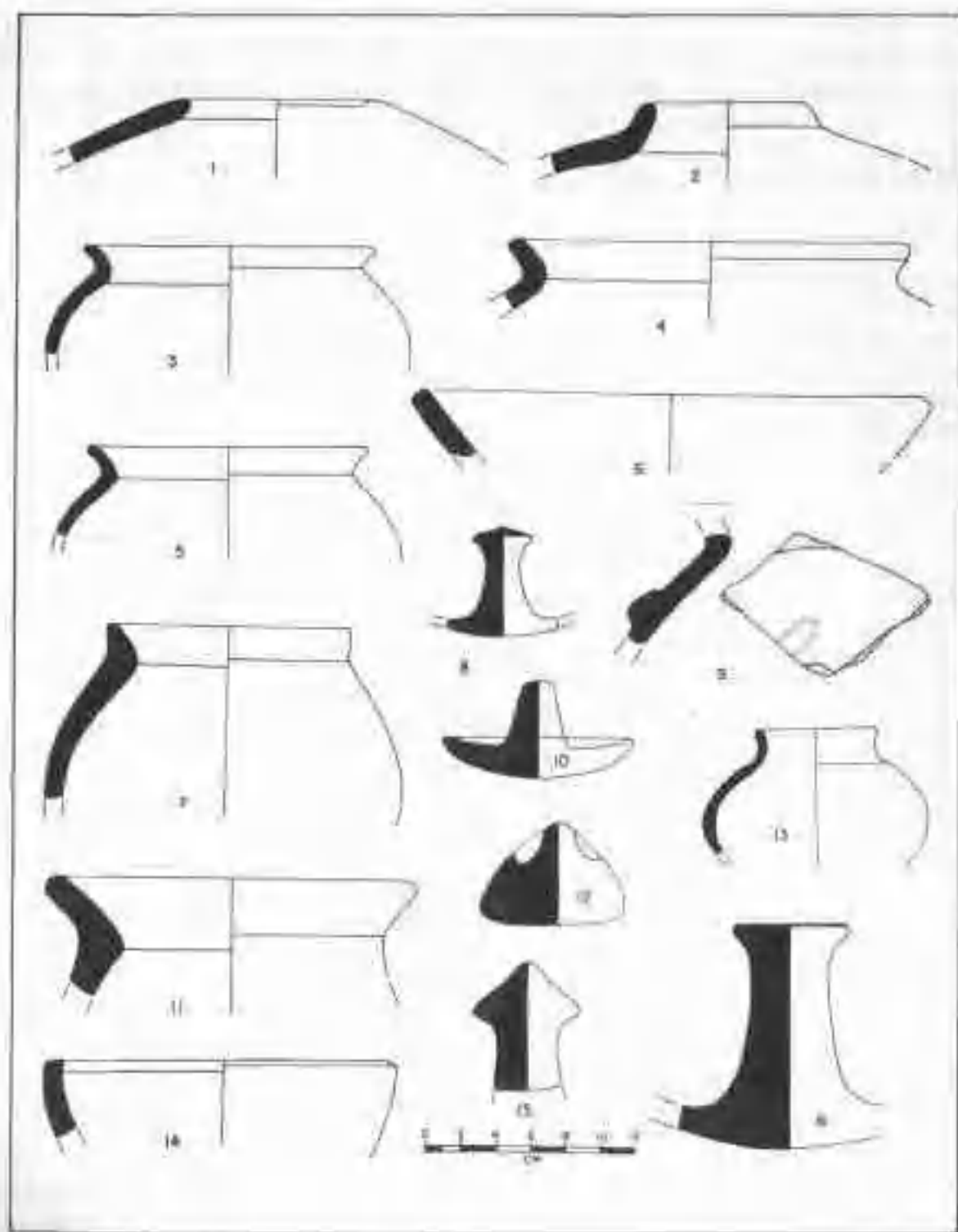


Fig. 74. Burnished Gray Ware, types, Phase II.

the neck.

14. Fragment of a vase of red ware with an outcurved oval collared rim. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a rim band and a horizontal band on the neck.

(ii) Ribbed Bichrome and Deep Red Wares

A few examples of the Ribbed Bichrome Ware are of exceptionally fine fabric. The ware was made from a special paste, very dense in texture and without any tempering material. The core is greyish in colour. The slip on one side of the rib is bright chocolate in colour and on the other side it is cream coloured. The surface of the latter was painted in black with a loop design and a horizontal band below and of the former with a broad horizontal band (fig. 33, 1 and 4; pl. LXXVIII, 1).

The Deep Red Ware is as fine in fabric as that of the Ribbed Bichrome Ware. It is represented by about half-a-dozen sherds of varied thickness of different vases. Of the illustrated examples, one is a fragment of a neck painted on the outside in black colour with a ladder pattern. Its slip shows a gloss (fig. 33, 2; pl. LXXVIII, 6). The second example is a fragment of a belly. Its bright red slip on the outside is peeled off at places. It is painted in black on the outside with a broad horizontal band (fig. 33, 5; pl. LXXVIII, 3). The third specimen is a fragment of a shoulder of a vase. It is painted on the outside in black with probably a loop design and horizontal bands below (fig. 33, 6). The fourth illustrated example, although not deep red in colour, is of as fine the fabric as that of the others in this group and is painted in red colour on the outside with horizontal bands and groups of vertical lines below (fig. 33, 3; pl. LXXVIII, 4).

(iii) Burnished Grey Ware

This class of pottery is akin in almost all respects to that of Phase I but for the absence of corrugated and grooved varieties. The ware is, on the whole, of coarse fabric with only occasional examples of medium fabric. The core shows air holes and is either entirely black in colour or has a black streak in the middle. The ware was treated with a slip and burnished. The surface colours include grey, blotchy grey, drab, black and their shades. The commoner types included in this ware are *lota*, vase with outcurved rim and globular body, *kunda*-type vase with flat rim-top, bowl, vase with oblique shoulder and narrow mouth, and *ghamela* (figs. 34 and 46, 2).

The lids are handmade, treated with a slip and burnished. The knob of the lids are concave-sided with flat top, tapering with flat top and with umbrella pinnate top. Of the two complete specimens, one is a saucer-type with a tapering knob flat on the top (fig. 34, 10) and the other having a high tapering body with two finger depressions on the top to facilitate a hold (fig. 34, 12).

The selected examples are illustrated in figs. 34 and 46.

Fig. 34

1. Vase of burnished grey ware with incurved sides, narrow mouth and perhaps bulbous body. Of coarse fabric, it is treated with a slip and is burnished.
2. Vase of burnished orange ware with almost vertical neck and oblique shoulders. Of coarse fabric it is treated with a slip and is burnished.
3. Vase of burnished grey ware with out-turned rim and globular body. Of medium fabric, it is treated with a slip and is burnished.
4. Vase of burnished grey ware with outcurved rim. Of coarse fabric, it is treated with a slip and burnished.
5. Vase of burnished grey ware with outcurved featureless rim and globular body. Of medium fabric, it is treated with a slip and burnished.
6. Bowl of burnished grey ware with externally bevelled rim and splayed out sides. Of coarse fabric, it is treated on the outside and inside with a slip and burnished.
7. Vase of burnished pink ware with outcurved sharpened rim and globular body. Of coarse fabric, it is treated with a slip and is burnished.
8. Lid-knob with a pointed top painted in ochre red colour.
9. Fragment of a vase of burnished orange ware. Of medium fabric, it is treated on the outside with a slip and bears on the outside an extant part of decoration in applique.
10. Saucer-type lid with a tapering knob.
11. Vase of burnished pink ware with splayed out mouth. Of coarse fabric, it is treated with a slip and burnished.
12. Lid with high tapering upper side with two deep finger impressions to serve as a hold.
13. *Lota* of burnished grey ware with almost vertical neck and globular body. Of medium fabric, it is treated with a slip and burnished.
14. Bowl of burnished orange ware with flat rimtop and convex body. Of coarse fabric, it is treated with a slip and burnished.
15. Lid-knob with umbrella-pinnacle top.
16. Lid-knob with a flat top painted in ochre red colour.

Fig. 46

2. *Ghamela* of burnished grey ware with rounded rimtop. Of coarse fabric, it is treated with a slip and burnished.

(iv) Thick Coarse Ware

In this group is included mainly the handmade pottery which is by far without slip. This ware is almost similar to that of the Phase L. Majority of the vases in this ware are big storage jars and almost vertical-sided *kunda*-type vases, although small vessels such as bowl and platter

also occur occasionally. The lower portion of a storage vase from house 17 has a short pedestal base (fig. 46, 1). The ware, as its name implies, is coarse and gritty in fabric. Indifferent firing has caused black blotches and also occasional black streaks in the core. Otherwise the ware is red in colour. It was treated with a wash rather than slip and decorated with applique and incised designs. The decorations consist of finger-tip marks chiefly around the neck of large storage jars, rope pattern, chevrons and a horizontal row of scooped circular depressions at the junction of the neck and the shoulder, besides finger-tip depressions. (pl. LXXV, 5-8).

(v) *Graffiti*

About a dozen potsherds of the Late Harappan Red Ware possessed graffiti. The illustrated examples are described below.

Fig. 33

7. Intersecting lines. On the outside of a vase of red ware.
8. Animal-like (perhaps a goat) engraving. On the outside of a vase of chocolate ware.
9. Plant-like mark. On the outside of the shoulder of a vase of red ware.
10. Short lines engraved on the inside of the rim of chocolate ware. The breadth of the five segments measured as under:
1. 8 mm; 2. 7 mm; 3. 7 mm; 4. 6 mm and 5. 6 mm.
There was thus no uniformity.
11. Lizard-like form. On the outside of the vase of red ware.
12. Indeterminate form. On the outside of the vase of chocolate ware.
13. A vertical line intersected by a hooked line. On the inside of the rim of a vase of red ware with an oval rim.
14. Indeterminate mark. On the outside of a vase of red ware.

D. Phase III: The Daimabad Culture

(i) *The Daimabad Ware*

In contrast to the Late Harappan Red Ware of the preceding Phase which is of fine fabric and produced on a fast wheel, the Daimabad Ware is, on the whole, of medium-to-fine fabric and made partly on a wheel and partly hand-modelled. This is indicated by striation marks nearer the shoulder and the rim, uneven thickness of the pots and press-marks occurring on the inside of the shoulder, belly and bottom. The inside also shows marks of scooping. The paste is dense and bereft of coarse material. The air-holes suggest admixture of vegetable matter in the clay. Very occasionally the core is pinkish or brick red in colour, otherwise the most common feature of the core of this ware is that in its mid-section it has a thin unoxidized band of dark grey or ivory black colour flanked by brown, pink or brick red. It is interesting

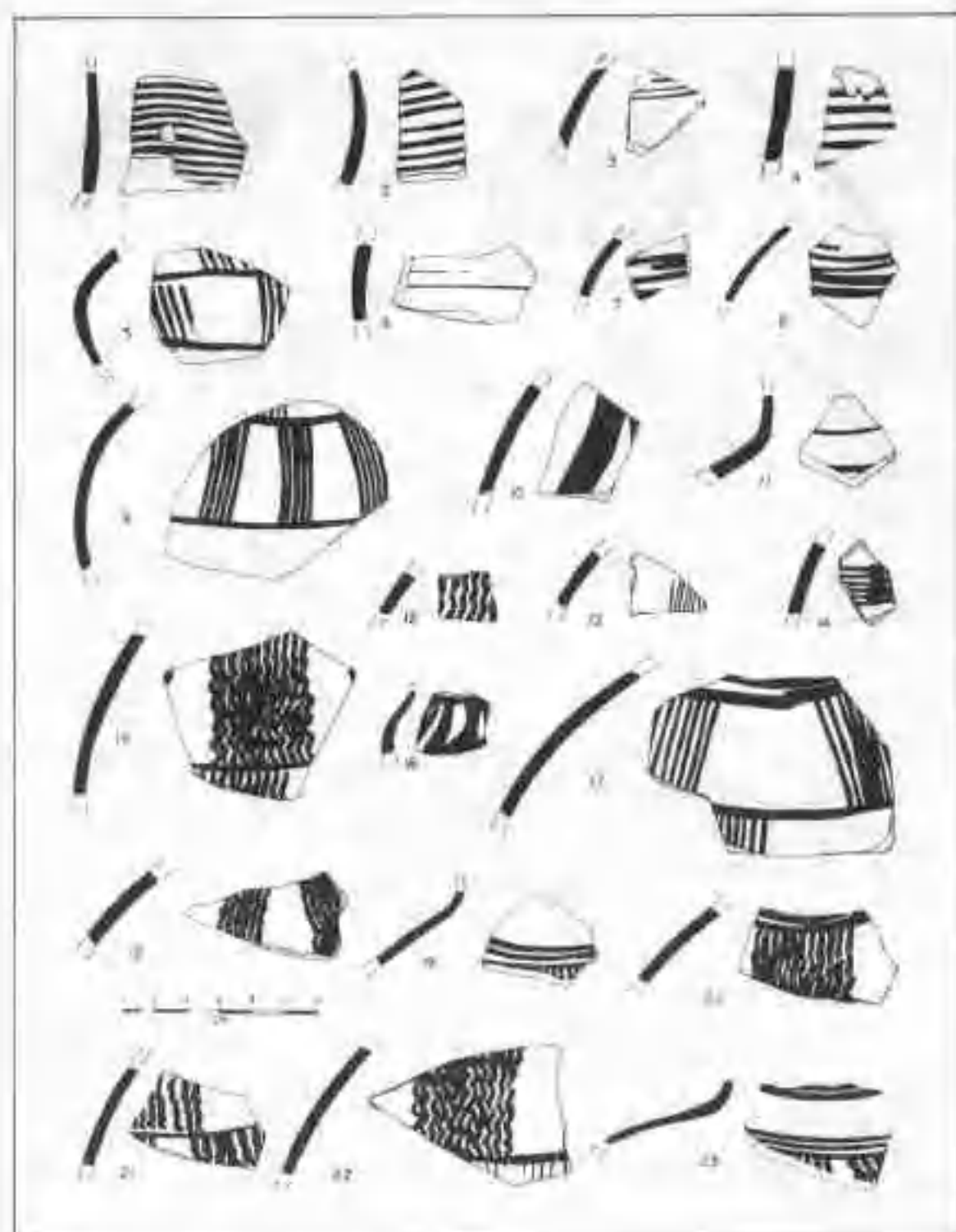


Fig. 35. Daimishad Ware, painted designs, Phase III.



Fig. 36. Daimabad Ware, painted Design, Phase III.

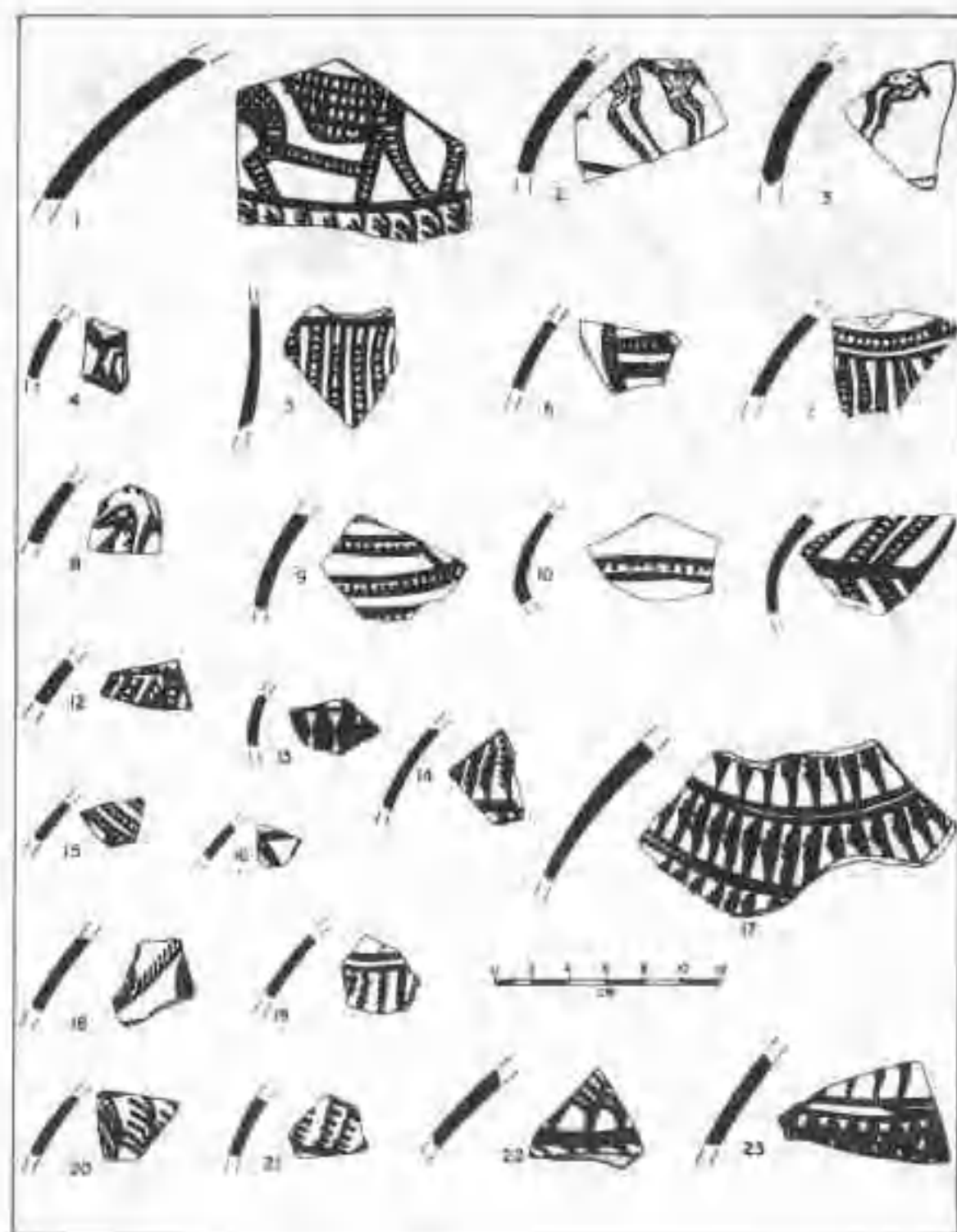


Fig. 37. Dalmatian Ware, painted designs. Phase III.



Fig. 38. Daimabad Ware, 1-25 and 25 miscellaneous painted designs and 24 inscribed signs resembling Indus script. Phase III.

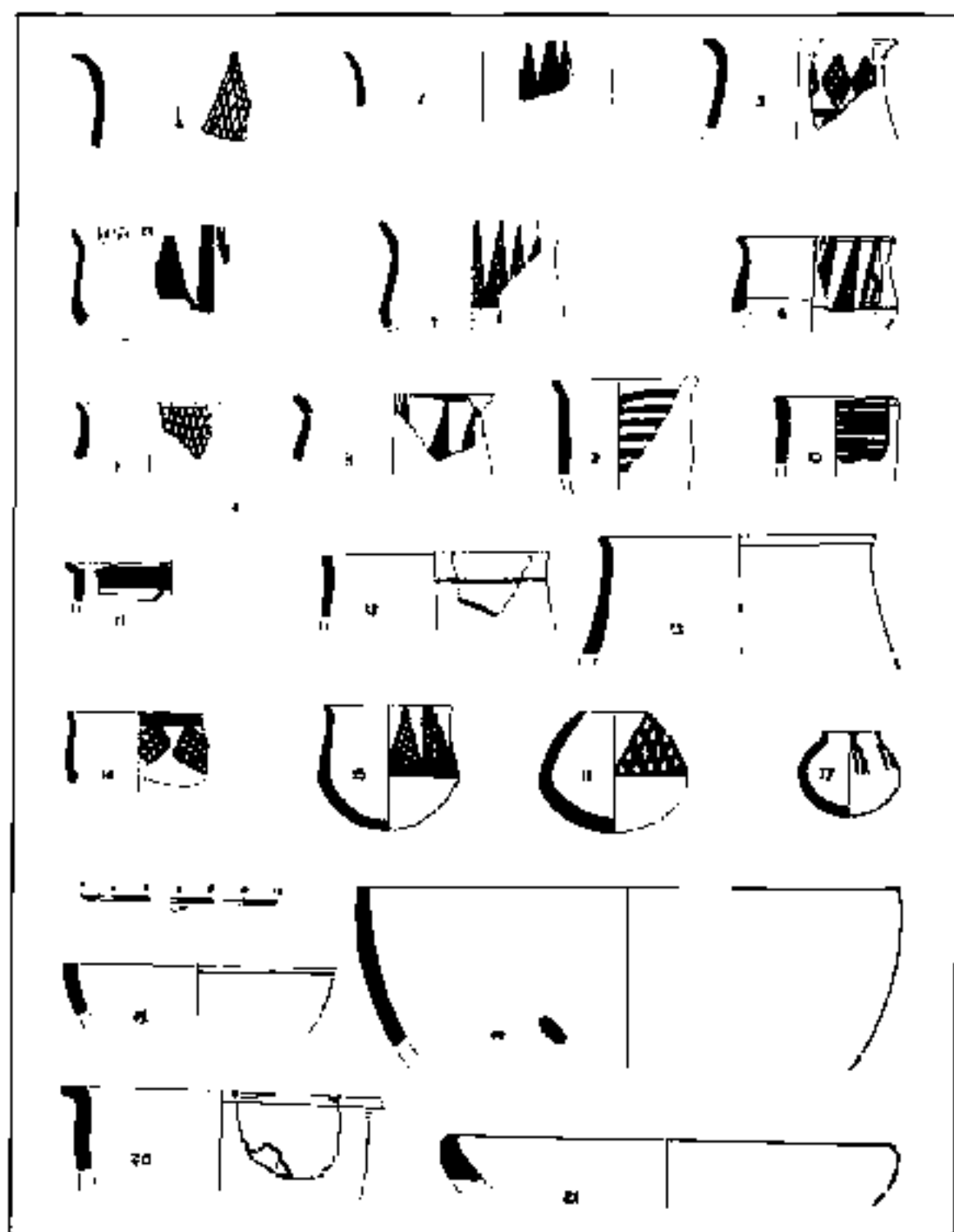


Fig. 39 1-17, Estimated Ware, types and 18-21, Burnished Grey Ware, types. Plate III.

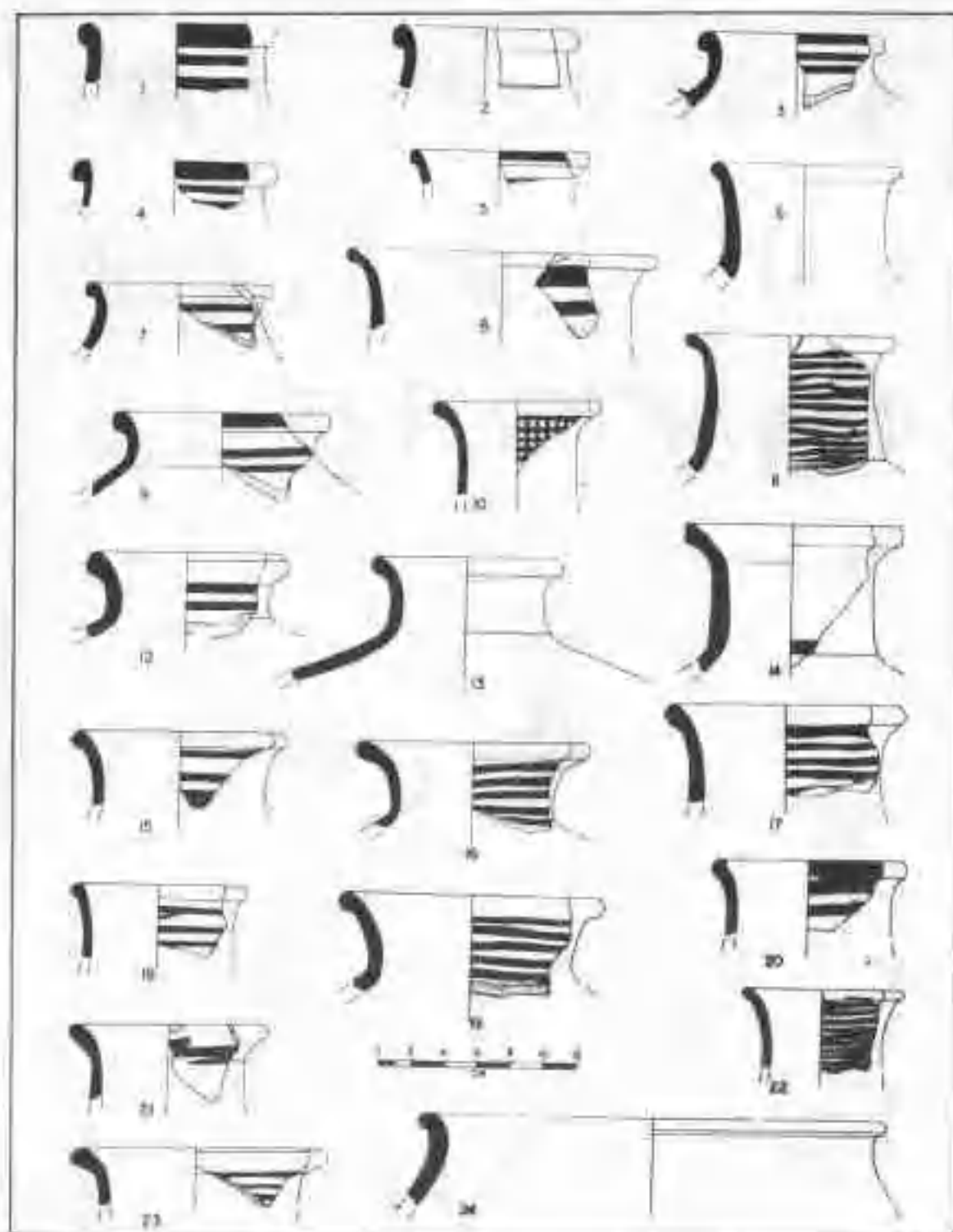


Fig. 49. Daimabad Ware, types, Phase III.

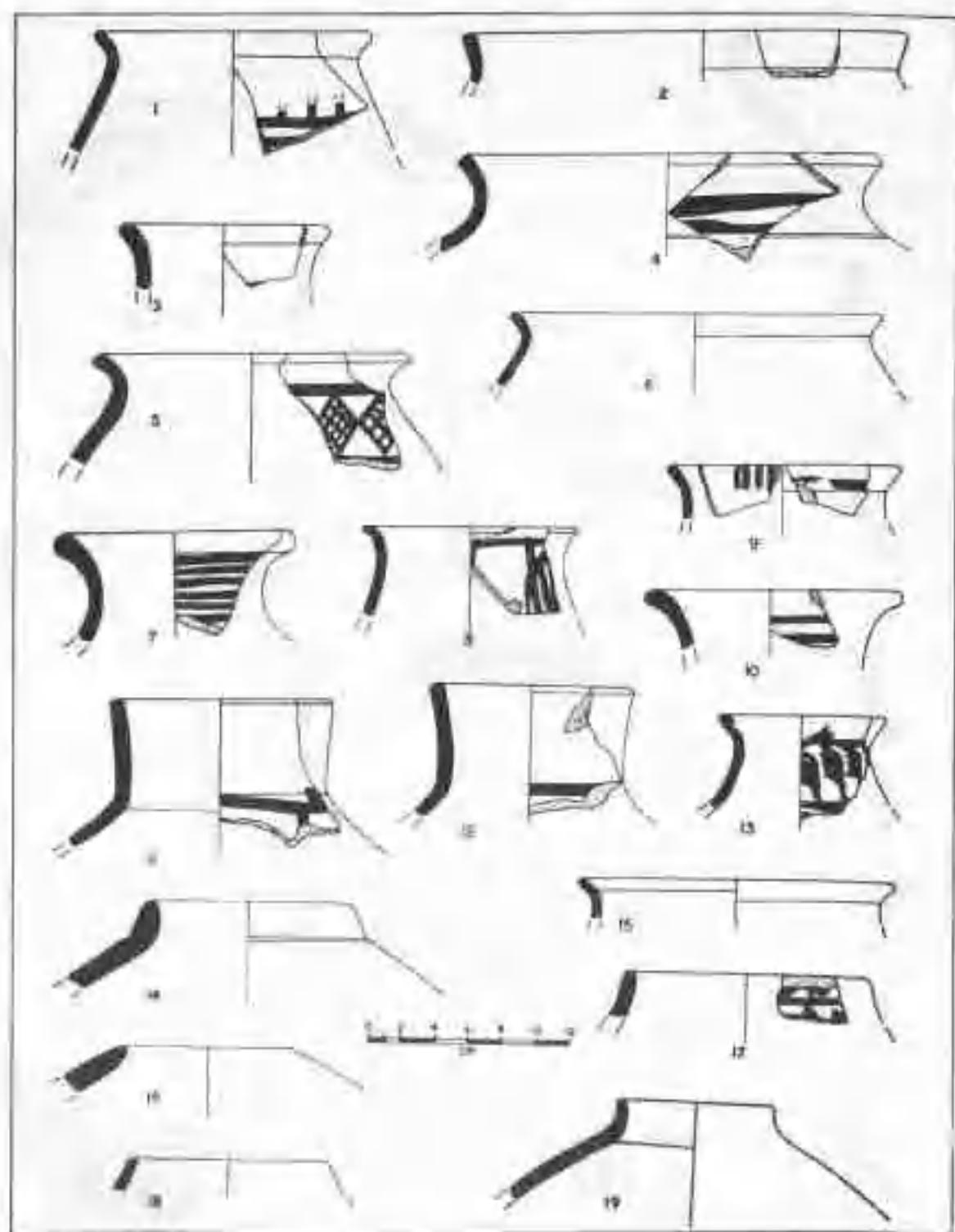


Fig. 41. Dalmatian Ware, types, Phase III.

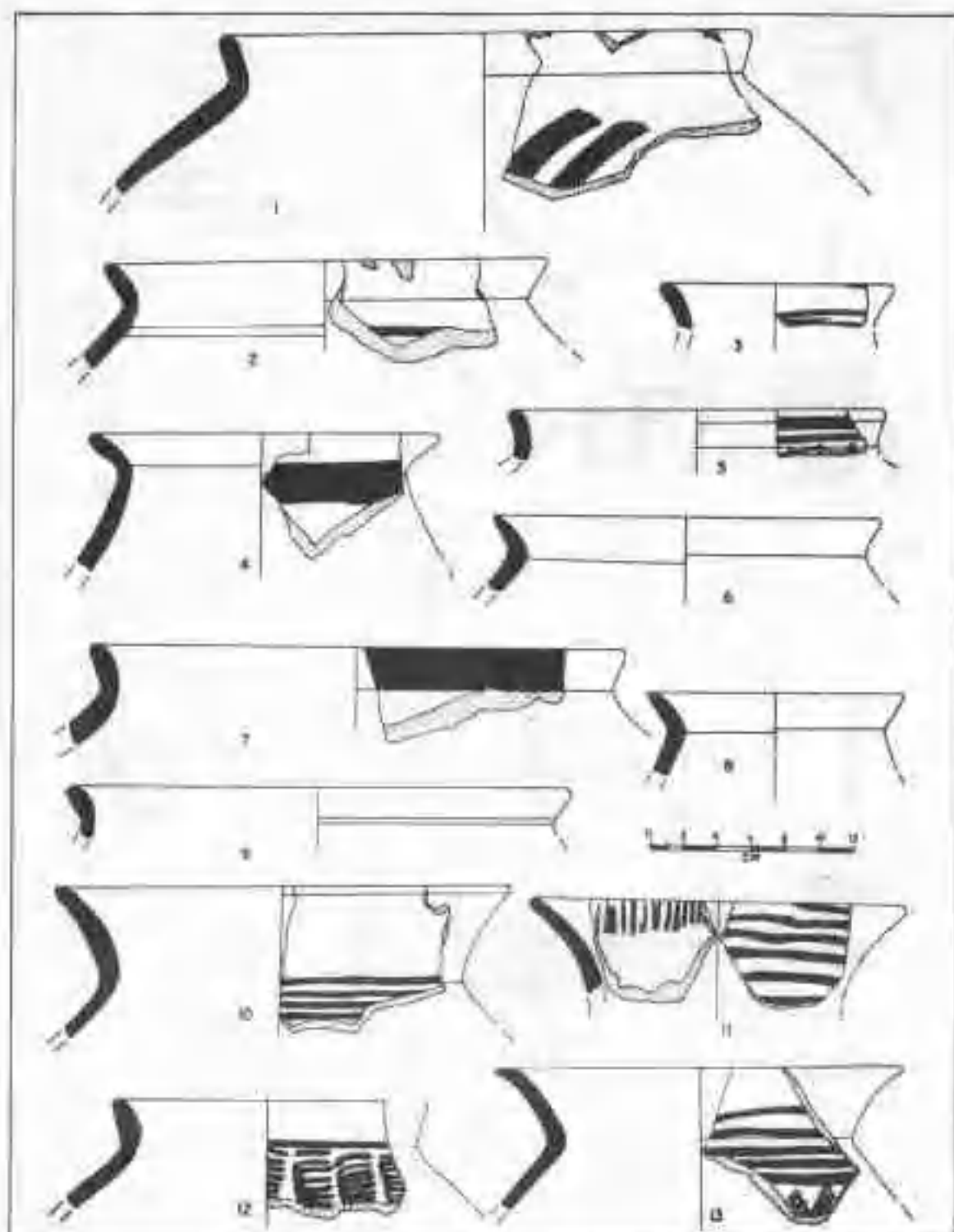


Fig. 42. Dalmatian Ware, types, Phase III.

to record that the above mentioned features of the Daimabad Ware were also observed in the Cream — Slipped Ware of Phase I of Navdatoli¹² and the black-painted pottery of Period I of Paunar.¹³ On the outside the ware is treated with a thin slip which has been worn out at places in a large number of examples exposing the brown, red or pink underlying surface. The colour of the slip in majority of the cases is buff and occasionally cream and red.

The painted designs have been executed in black. A note-worthy aspect of the paintings is that, on the whole, they have been carelessly drawn. Generally, the thickness of the horizontal lines is not uniform and they are not straight (fig. 35, 1, 2, 17, 22, fig. 36, 1-4, 10). The lines of the latticed diamond run beyond the borders (fig. 36, 1-5, 9, 10, 13). At times, the lines are left unfinished (fig. 35, 5, 6, 8). There are also a couple of examples in which the brush contained insufficient paint (fig. 38, 15 and 20). In short, the execution of paintings does not show refinement which is generally seen in those on the pots of the preceding and succeeding cultures at Daimabad. Interestingly enough the Cream — Slipped Ware of Phase I of Navdatoli,¹⁴ the variant of Malwa Ware of Period I at Prakash¹⁵ and the painted ware of Period I of Paunar¹⁶ show identical features. The excavators of Paunar opined, "some of the designs (D-14) are drawn very carefully with a sense of artistic precision. But a majority of them are crude, hurried and unsure"¹⁷. The ware was thought to show features of degenerate Malwa Ware.¹⁸

The painted designs are varied and include (1) rim band, (2) one, two or multiple horizontal bands on the neck (fig. 35, 1, 2 and 4; fig. 36, 7; fig. 39, 9 and 10, fig. 40, 11, 15-20, 22 and 23; fig. 41, 7 and fig. 42, 11); (3) groups of vertical lines between horizontal bands (fig. 35, 5, 9, 17 and 19); (4) groups of vertical wavy lines between horizontal bands (fig. 35, 12, 15, 18, 20-23); (5) cross-hatched diamonds and a variant with elongated lower ends (fig. 36, 1-5 and 7-15); (6) parallel lines filled with strokes (fig. 37, 5-7, 9, 10, 12 and 15); (7) chevrons formed by pairs of lines filled with strokes (fig. 37, 11); (8) vertical crinkled lines (fig. 37, 19); (9) comb design (fig. 37, 21); (10) handled-comb design (fig. 37, 14, 17, 18 and 20-23 and fig. 42, 12); (11) cross-hatched triangles (fig. 39, 16); (12) cross-hatched elongated triangles (fig. 39, 1, 5 and 15); (13) elongated solid triangles (fig. 39, 2); (14) chequer pattern (fig. 40, 10); (15) a line crossed by horizontal strokes (fig. 47, 4) and (16) animal motifs with stippled body (fig. 37, 1-4 and 8). Of these, except (7), all the designs are present on the Cream — Slipped Ware of Phase I of Navdatoli.¹⁹ The variant of Malwa Ware of Period I of Prakash bears the designs 2, 4-7, 10, 13 and 15.²⁰

12. Sankalia, Deo and Ansari, *op. cit.*, (1971).

13. Deo and Dhavalikar, *op. cit.*, (1968).

14. *Op. cit.*, D6, D7, D102, D49 and D108.

15. *Op. cit.*, fig. 7, patterns G and Q.

16. *Op. cit.*, fig. 4, 1A, 7, D1, D6 and D7.

17. *Op. cit.*, p. 18.

18. *Op. cit.*, p. 7.

19. cf. Sankalia, Deo and Ansari, *op. cit.* (1971), D 125, D35, D269, D103, D273, D149, D 150, D47, D30, D159, D277, D264 D65 and D162.

20. cf. Thapar, *op. cit.* (1967), fig. 7, Q, V, G, V, N.J.K. and W; fig. 12, 1-7.

The designs 2, 5, 9, or 10, 15, are also found on the black-on-red ware of Period I of Paunhar.²¹ The vase of buff ware with an externally oval-collared rim and depicting on the outside in black a man and a jungle scene (pl. LXXX) recovered in the season of 1958-59 belongs to the Daimabad Ware.²²

A large number of shapes are represented in this ware. They are (1) *lots* or *lots* with high concave sides, carinated base and outcurved rim (fig. 39, 1-7, 13 and 15; pl. LXXXI, 4); (2) bowl with convex sides and outcurved rim (fig. 39, 8, 9, 11, 12 and 14); (3) cup with convex sides (fig. 39, 9); (4) cup with vertical sides and internally bevelled rim (fig. 39, 10); (5) bowl with incurved sides and blunt carination (fig. 39, 16; pl. 5); (6) *lots* (fig. 39, 17); (7) vase with high narrow neck, globular body and beaded rim (fig. 40, 1; pl. LXXXI, 1 and probably also 2); (8) vase with beaded rim and short incurved neck (fig. 40, 2-5, 7-9 and 19); (9) vase with high narrow neck and outcurved rim (fig. 40, 6, 10, 11, 14, 17 and 22); (10) vase with nail-headed rim and concave neck (fig. 40, 15); (11) vase with thickened outcurved ovaloid rim (fig. 40, 21); (12) vase with grooved rim (fig. 40, 12, 23 and 24); (13) vase with thickened rim and concave neck (fig. 40, 13 and 16); (14) vase with internally curved or hooded rim (fig. 40, 20); (15) vase with short flaring featureless rim (fig. 41, 1-10, 13 and 15); (16) vase with vertical narrow neck (fig. 41, 11 and 12); (17) vase with incurved sides and oval rim (fig. 41, 14); (18) vase with short vertical featureless rim and narrow mouth (fig. 41, 17-19); (19) vase with splayed out rim (fig. 42, 1-13) and (20) vase with flat base (fig. 43, 10 and 11).

The figs. 35-38 and pl. LXXXIX illustrate the range of designs.

Fig. 35

1. Neck-fragment of a vase of red ware with a narrow high neck. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a series of horizontal bands.
2. Neck-fragment of a vase of buff ware with a high narrow neck. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a series of horizontal bands. Also pl. LXXXIX, 2.
3. Fragment of a vase of chocolate ware. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with thin horizontal bands.
4. Neck-fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a series of horizontal bands.
5. Fragment of a vase of buff ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with two horizontal bands and groups of vertical lines between them.

21. cf. Deo and Dhavalikar, *op. cit.*, (1968), fig. 4, 2, D1, D6-D9 and D17.

22. *Indian Archaeology 1958-59 - A Review*, fig. 8.

6. Fragment of a vase of buff ware. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with thin horizontal bands.
7. Fragment of a vase of brown ware. Of medium fabric, is treated on the outside with a slip and is painted in black on the outside with horizontal bands.
8. Fragment of a vase of reddish ware. Of fine fabric, it is treated with a slip on the outside and is painted in black on the outside with horizontal bands which are not of uniform thickness.
9. Fragment of a vase of buff ware. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with groups of five vertical lines between horizontal bands.
10. Fragment of a vase of buff ware. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with a thick vertical line.
11. Fragment of a vase of light red ware. Of medium fabric, it is treated on the outside with a slip and is painted on the outside in black with horizontal bands.
12. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with wavy lines.
13. Fragment of a vase of pink ware. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with thin vertical lines.
14. Fragment of a vase of buff ware. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with horizontal bands, the joints of which are clearly to be seen.
15. Fragment of a vase of light red ware. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with a series of vertical wavy lines below and above a horizontal band.
16. Fragment of a vase of buff ware. Of fine fabric, it is treated on the outside with a slip and is painted on the outside in black with an indeterminate design.
17. Fragment of a vase of buff ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with groups of oblique lines between horizontal bands.
18. Fragment of a vase of buff ware. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with groups of six wavy lines.
19. Fragment of a vase of pink ware. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with horizontal bands and vertical lines.
20. Fragment of a vase of red ware. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with horizontal bands and several wavy lines below. There also occurs a graffiti mark consisting of a vertical and oblique lines.
21. Fragment of a vase of light red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with groups of wavy lines above and below a horizontal band.
22. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted on the outside in black with a series of wavy lines above the horizontal band.

and vertical lines below. It also bears a graffiti mark similar to that on No. 20 above. Also pl. LXXXIX, 13.

23. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with horizontal bands and vertical lines below.

Fig. 36

1. Fragment of a vase of buff ware. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with pairs of horizontal bands and panels of cross-hatched diamonds. Also pl. LXXXIX, 1.
2. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a panel of cross-hatched diamonds between horizontal bands.
3. Fragment of a vase of buff ware. Of coarse fabric, it is treated on the outside with a slip and is painted in black on the outside with four horizontal bands and a panel of cross-hatched diamonds the lower ends of which are elongated.
4. Fragment of a vase of red ware. Of coarse fabric, it is treated on the outside with a slip and is painted in black on the outside with panels of cross-hatched diamonds between horizontal bands.
5. Fragment of a vase of reddish brown ware. Of fine fabric, it is treated with a slip on the outside and is painted in black on the outside with cross-hatched diamonds below and perhaps also above the horizontal band.
6. Fragment of a vase of pink ware. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with cross-hatched diamonds and a vertical row of five dots between two converging lines.
7. Fragment of a vase of pink ware. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with horizontal bands and perhaps a panel of cross-hatched diamonds below.
8. Fragment of a vase of buff ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a panel of cross-hatched small diamonds above a pair of horizontal bands.
9. Fragment of a vase of buff ware. Of coarse fabric, it is treated on the outside with a slip and is painted in black on the outside with a panel of cross-hatched diamonds with their lower part elongated, between two horizontal bands below and three above.
10. Fragment of a vase of pink ware. Of coarse fabric, it is treated on the outside with a slip and is painted on the outside with panels of cross-hatched diamonds between pairs of horizontal bands on the shoulder and two groups of four horizontal bands each above.
11. Fragment of a vase of buff ware. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with panels of cross-hatched diamonds perhaps with elongated lower end.
12. Fragment of a vase of pink ware. Of medium fabric, it is treated on the outside with a

slip and is painted in black on the outside with criss-cross design.

13. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a panel of cross-hatched diamonds between horizontal bands.
14. Fragment of a vase of pink ware. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with a panel of an indeterminate design with a pointed lower end above horizontal band. Also pl. LXXIX, 11.
15. Fragment of a vase of buff ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a panel of cross-hatched diamonds with a elongated lower end between horizontal bands.

Fig. 37

1. Fragment of a vase of buff ware. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with an elongated form of an animal with hatched body and plant-like motif below horizontal band. Also pl. LXXIX, 7.
2. Fragment of a vase of red ware. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with an elongated form of a running animal with hatched body. Also pl. LXXIX, 9.
3. Fragment of a vase of red ware. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with hind portion of an animal with stippled body.
4. Fragment of a vase of pink ware. Of fine fabric, it is treated on the outside with a slip and is painted on the outside in black with legs of animal.
5. Fragment of a vase of buff ware. Of medium fabric, it is treated on the outside with a horizontal band and hatched pairs of vertical lines.
6. Fragment of a vase of buff ware. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with a curved hatched pair of lines and two horizontal hatched pairs of lines.
7. Fragment of a vase of pink ware. Of medium fabric, it is treated on the outside with a slip and is painted on the outside in black with vertical strokes between horizontal bands and elongated hatched triangles below horizontal band.
8. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with perhaps a bird.
9. Fragment of a vase of buff ware. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with dots between horizontal pairs of lines. Also pl. LXXIX, 12.
10. Fragment of a vase of cream ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with dots between a horizontal pair of lines.
11. Fragment of a vase of pink ware. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with leaf motif. Also pl. LXXIX, 4.
12. Fragment of a vase of cream ware. Of fine fabric, it is treated on the outside with a slip

and is painted in black on the outside with hatched pairs of lines.

13. Fragment of a vase of buff ware, of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with an indeterminate design.
14. Fragment of a vase of pinkish buff ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a panel of handled comb-like design. Also pl. LXXIX, 10.
15. Fragment of a vase of red ware. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with hatched pairs of lines.
16. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a hatched pair of lines and horizontal band.
17. Fragment of a vase of buff ware. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with registers of handled comb-like design.
18. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a comb-like design.
19. Fragment of a vase of pink ware. Of medium fabric, it is treated with a slip on the outside and is painted on the outside in black with wavy lines below horizontal bands.
20. Fragment of a vase of cream ware. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with plant motif.
21. Fragment of a vase of pink ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with thin vertical lines intersected by thick horizontal strokes.
22. Fragment of a vase of buff ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a horizontal band and an indeterminate design.
23. Fragment of a vase of buff ware. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with two horizontal bands and comb-like designs.

Fig. 38

1. Fragment of a vase of buff ware. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with vertical strokes between horizontal bands and groups of wavy lines below. Also pl. LXXIX, 8.
2. Fragment of a vase of red ware. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with a series of horizontally placed wavy lines.
3. Fragment of a vase of burnished black ware. Of medium fabric, it is treated both on the outside and inside with a slip and burnished and is painted in black on the outside with vertical wavy lines.
4. Fragment of a vase of pinkish buff ware. Of fine fabric, it is treated on the outside with a slip and is painted on the outside in black with a trellis design formed by intersecting wavy lines.
5. Fragment of a vase of pink ware. Of medium fabric, it is treated with a slip on the outside

and is painted in black on the outside with a chain pattern.

6. Fragment of a vase of buff ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with vertical lines below horizontal band and an indeterminate design above.
7. Fragment of a vase of buff ware. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with horizontal bands and an indeterminate design.
8. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with vertical crescentic lines between horizontal bands.
9. Fragment of a vase of pinkish buff ware. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with vertical lines between horizontal bands and an indeterminate design below.
10. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted on the outside in black with trellis design below horizontal band.
11. Fragment of a vase of buff ware. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with horizontal bands and a panel of handled comb-like design surmounted by oblique strokes.
12. Fragment of a vase of red ware. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with a cross-hatched design between horizontal bands.
13. Fragment of a vase of dull red ware. Of medium fabric, it is treated on the outside with a slip and is painted in black colour on the outside with groups of curved lines above horizontal band.
14. Fragment of a vase of buff ware. Of medium fabric, it is treated on the outside with a slip and is painted in purplish pigment on the outside with a handled comb-like design above the horizontal band and an indeterminate design below.
15. Fragment of a vase of pinkish buff ware. Of medium fabric, it is treated with a slip on the outside and is painted in black on the outside with a circle between horizontal bands and a group of five oblique lines above the upper band. The circle was drawn with an insufficient paint in the brush.
16. Fragment of a vase of pink ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a trellis design. Also pl. LXXIX, 6.
17. Fragment of a vase of buff ware. Of medium fabric, it is treated with a slip on the outside and is painted in black on the outside with a circle.
18. Fragment of a bowl of light red colour. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with a lozenge pattern formed by pairs of lines between horizontal bands.
19. Fragment of a vase of cream ware. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with a series of vertical lines and a horizontal band.
20. Fragment of a vase of cream ware. Of medium fabric, it is treated on the outside with a

slip and is painted in black on the outside with a loop and horizontal bands. The loop is drawn with insufficient paint in brush.

21. Fragment of a vase of buff ware. Of fine fabric, it is treated with a slip on the outside and is painted in black on the outside with a panel of a design consisting of an oblique line surmounted by a group of four oblique lines and a horizontal band above.
22. Fragment of a vase of light red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with an indeterminate design.
23. Fragment of a vase of pinkish buff ware. Of fine fabric, it is treated on the outside with a horizontal band and two circular lines.
24. Fragment of vase bereft of slip. Of fine fabric, it bears on the outside a graffiti consisting of about five or six signs resembling those of the Indus script.
25. Fragment of a vase of brown ware. Of fine fabric, it is treated with a slip on the outside and is painted in black on the outside with concentric circles with strokes around. Also pl. LXXIX, 14.

The selected types are illustrated in figs. 39-42 and pl. LXXXI.

Fig. 39

1. *Lota* of buff ware with out-turned rim. Of medium fabric, it is treated on the outside with a slip and is painted on the outside in black with cross-hatched elongated triangle.
2. Vase of buff ware with outcurved featureless rim. Of medium fabric, it is treated on the outside with a slip and is painted on the outside in black with elongated solid triangles.
3. *Lota* of pinkish buff ware. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with a panel of cross-hatched diamonds above horizontal band.
4. Bowl of buff ware with outcurved featureless rim. Of medium fabric, it is treated on the outside and inside with a slip and is painted in black on the outside with triangle and vertical lines and on the inside with strokes below the rim.
5. Bowl of buff ware with outcurved featureless rim and bluntly carchated body. Of medium fabric, it is treated with a slip both internally and externally and is painted in black on the outside with elongated cross-hatched triangles. Also pl. LXXIX, 2.
6. Bowl of pink ware with outcurved featureless rim. Of medium fabric, it is treated on the outside and inside with a slip and is painted in black on the outside with an indeterminate design.
7. Bowl of buff ware with outcurved featureless rim. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with a tellis pattern below horizontal band.
8. *Lota* of pink ware with out-turned featureless rim. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with solid elongated diamonds.
9. Cap with convex profile and outcurved featureless rim. Of fine fabric, it is treated on the

outside with a series of horizontal bands.

10. Cup with vertical sides and internally bevelled rim. Of medium fabric, it is painted in black on the outside with a series of horizontal bands.
11. *Lota* of light red ware. Of fine fabric, it is painted in black on the inside with a rim band.
12. *Lota* of buff ware with slightly outcurved rim and vertical sides. Of medium fabric, it bears grooves on the neck.
13. *Lota* of pink ware with slightly thickened rim. Of fine fabric, its slip has been almost completely peeled off.
14. Bowl of buff ware with convex sides and outcurved featureless rim. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with a panel of cross-hatched diamonds below horizontal band.
15. *Loti* (a miniature or smaller form of *Lota*) with blunt carinated body and outcurved featureless rim. Of fine fabric, it treated with a slip on the outside and painted in black on the outside with a panel of elongated cross-hatched triangles above horizontal band. Also pl. LXXXI, 4.
16. Bowl of pink ware with incurved sides and bluntly carinated base. Of fine fabric, it is treated on the outside with a slip of which only a few patches have survived, and is painted on the outside in black with cross-hatched triangles. Also pl. LXXXI, 5.
17. *Loti* of chocolate ware with outcurved rim and globular body. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with a panel of a design consisting of a vertical line joined with a curved line forked at the end.
18. Bowl of brown ware with a groove on the rim with flat top and convex profile.
19. Bowl of red ware with convex profile.
20. Bowl of buff ware with horizontally splayed out rim and convex profile.
21. Bowl of brown ware with pointed rim and convex profile.

Fig. 40

1. Fragment of a vase of pink ware with externally thickened rim and narrow neck. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with a rim-band and horizontal bands.
2. Fragment of a vase of buff ware with beaded rim.
3. Fragment of a vase of red ware with an outcurved beaded rim. Of medium fabric, it is treated on the outside with a slip and is painted on the outside with a rim band and horizontal bands.
4. Similar to 2 above but painted in black on the outside with a rim and horizontal bands.
5. Fragment of a vase of buff ware with oval rim. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with a rim band.
6. Vase of buff ware with externally thickened rim and almost vertical neck.
7. Fragment of a vase of dark grey ware with outcurved beaded rim and concave neck. Of

fine fabric; it is treated on the outside with a slip and is painted on the outside with horizontal bands on the neck.

8. Vase of pinkish buff ware with out-turned externally thickened rim. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with horizontal bands.
9. Vase of red ware with out-turned slightly beaded rim and oblique shoulders. Of medium fabric, it is treated on the outside with a slip and is painted on the outside with a rim band and horizontal bands on the neck.
10. Vase of buff ware with slightly thickened outcurved rim and high narrow neck. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with chequer pattern.
11. Vase of buff ware with outcurved slightly thickened rim and almost vertical high narrow neck. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with a series of horizontal bands on the neck.
12. Vase of pinkish buff ware with out-turned externally thickened rim and constricted neck. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with horizontal bands.
13. Vase of grey ware with slightly thickened outcurved rim and narrow neck. Of medium fabric, it is over-fired.
14. Vase of red ware with externally bevelled out-turned rim and high almost vertical neck. Of coarse fabric, it is treated on the outside with a slip and is painted in black on the outside with a horizontal band.
15. Vase of buff ware with thickened externally bevelled and outcurved rim. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with horizontal bands.
16. Vase of buff ware with externally thickened and outcurved rim. Of medium fabric, it is treated on the outside with a slip and is painted on the outside in black with horizontal bands on the neck.
17. Vase of buff ware with a slightly beaded outcurved rim and high vertical neck. Of medium fabric, it is treated on the outside with a slip and is painted on the outside in black with horizontal bands.
18. Vase of pinkish buff ware with a slightly beaded rim and high narrow neck. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with horizontal bands.
19. Vase of pinkish buff ware with out-turned slightly thickened rim and concave neck. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with horizontal bands.
20. Vase of buff ware with a "hooded" outcurved rim and high narrow neck. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with horizontal bands.
21. Vase of pink ware with outcurved slightly thickened rim and vertical neck. Of medium

fabric, it is treated on the outside with a slip and is painted in black on the outside with incomplete bands.

22. Vase of red ware with outcurved featureless rim and high narrow neck. Of medium fabric, it is treated on the outside with a slip and is painted on the outside in black with a series of horizontal bands.
23. Vase of buff ware with an out-turned grooved rim. Of medium fabric, it is treated on the outside with a slip and is painted on the outside with horizontal bands.
24. Vase of red ware with an outcurved slightly thickened and grooved rim. Of fine fabric, it is treated on the outside with a slip.

Fig. 41

1. Vase of buff ware with outcurved featureless rim and oblique shoulders. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with horizontal bands and vertical lines.
2. Vase of buff ware with slightly thickened outcurved rim flat on the top.
3. Vase of purplish ware with outcurved slightly thickened rim. Of fine fabric, it is devoid of slip.
4. Vase of greyish ware with splayed out externally bevelled rim. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with horizontal bands.
5. Vase of buff ware with outcurved slightly thickened rim and globular body. Of coarse fabric, it is treated on the outside with a slip and is painted on the outside in black with cross-hatched diamonds between horizontal bands.
6. Vase of buff ware with outcurved featureless rim and oblique shoulders.
7. Vase of buff ware with out-turned slightly thickened rim and concave neck. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with horizontal bands.
8. Bowl of buff ware with slightly beaded out-turned rim and almost vertical neck. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a horizontal band and an indeterminate design below.
9. Vase of light red ware with an outcurved featureless rim. Of fine fabric, it is treated on the outside and inside with a slip and is painted in black on the outside with a rim band and on the inside with short strokes.
10. Vase of pink ware with externally thickened out-turned rim. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with a horizontal band.
11. Vase of buff ware with vertical narrow neck, featureless rim and oblique shoulder. Of medium fabric, it is treated on the outside with a slip and is painted on the outside with a hook-like line and a vertical line, below.
12. Vase similar to 11 but painted with a horizontal band in black on the outside.

13. Vase of buff ware with slightly thickened outcurved rim and narrow neck. Of medium fabric, it is treated on the outside with a slip and is painted on the outside in black with a panel of handled comb-like motif between horizontal bands. Also pl. LXXIX, 5.
14. Vase of grey ware with oval rim, ledged shoulder and narrow mouth.
15. Vase of buff ware with outcurved slightly thickened rim.
16. Vase of buff ware with pointed rim, narrow mouth and oblique shoulders.
17. Vase of pink ware with almost vertical neck and featureless rim. Of medium fabric, it is treated on the inside and outside with a slip and is painted in black on the outside with a horizontal band and an indetermined design.
18. Vase of buff ware with narrow mouth and featureless rim.
19. Vase of buff ware with narrow mouth, featureless rim and globular body.

Fig. 42

1. Jar of buff ware with splayed mouth and globular body. Of coarse fabric, it is treated on the outside with a slip and is painted in black on the outside with thick curved lines.
2. Jar of buff ware with splayed out mouth. Of coarse fabric, it is treated on the outside with a slip and is painted in black on the outside with a horizontal band.
3. Vase of red ware with slightly outcurved featureless rim. Of coarse fabric, it is treated on the outside with a slip and is painted in black on the outside with horizontal bands.
4. Jar of pink ware with splayed out mouth and oblique shoulder. Of coarse fabric, it is treated on the outside with a slip and is painted in black on the outside with a thick horizontal band.
5. Jar of pink ware with slightly outcurved featureless rim. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with a horizontal band.
6. Jar of light red ware with splayed out mouth and pointed rim.
7. Jar of buff ware with outcurved oval rim. Of coarse fabric, it is treated on the outside with a slip and is painted in black on the outside with a thick rim-band.
8. Vase of red ware with outcurved slightly pointed rim.
9. Jar of red ware with out-turned oval rim.
10. Jar of buff ware with splayed out mouth, featureless rim and constricted neck. Of coarse fabric, it is treated on the outside with a slip and is painted in black on the outside with horizontal bands.
11. Vase of buff ware with splayed out mouth, featureless rim and constricted neck. Of coarse fabric, it is treated both on the inside and outside with a slip and is painted on the outside with horizontal bands and on the inside with short vertical strokes.
12. Vase of buff ware with slightly out-turned internally thickened and oval rim. Of coarse fabric, it is treated on the outside with a slip and is painted in black on the outside with a horizontal band and a panel of comb-like design surmounted by a horizontal stroke.
13. Jar of pinkish buff ware with splayed out mouth, out-turned featureless rim and constricted neck. Of coarse fabric, it is treated on the outside with a slip and is painted on the

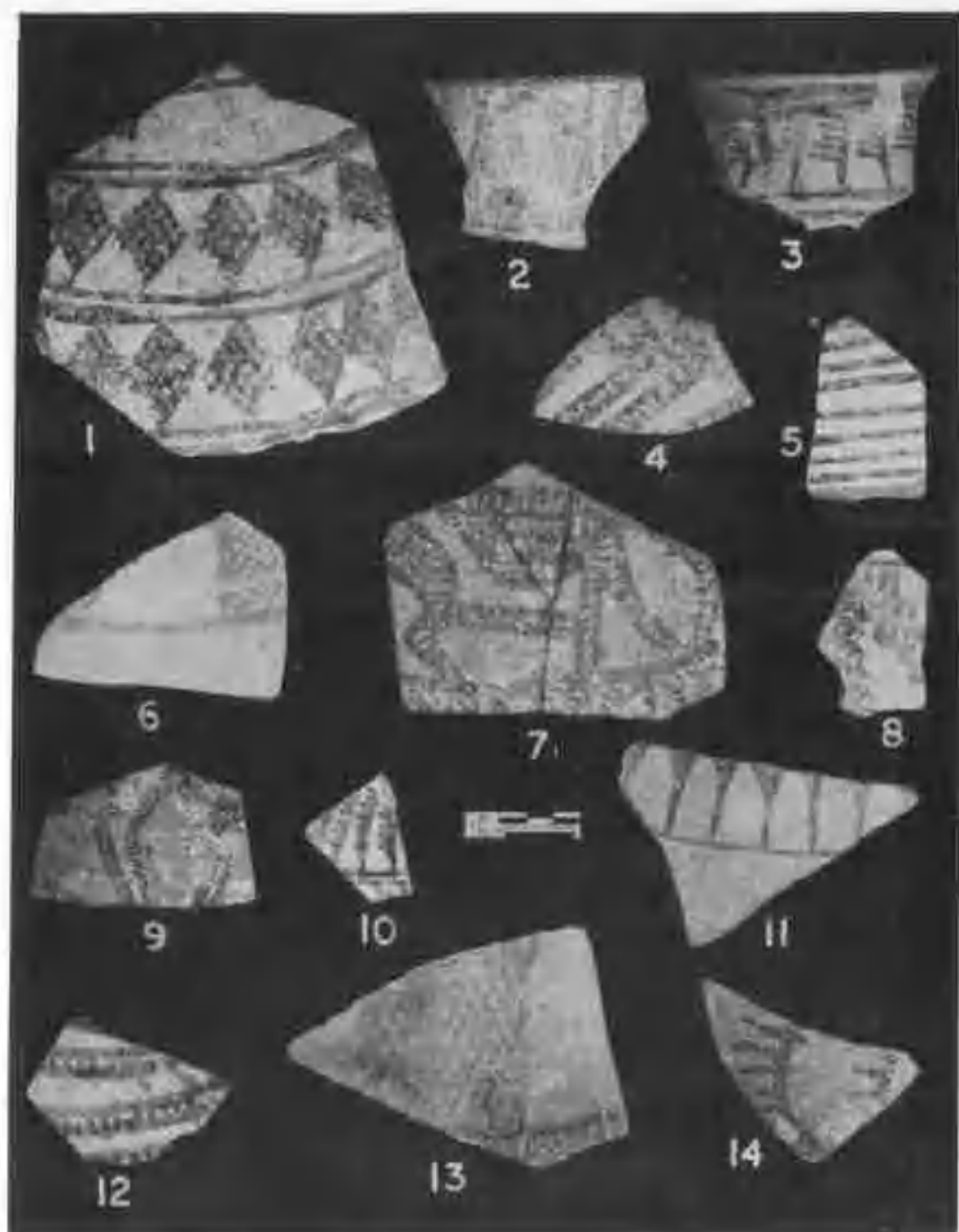


PLATE LXXIX Daulatabad Ware, Phase III



PLATE XXX: Daimabad Ware found in 1976-80 season.

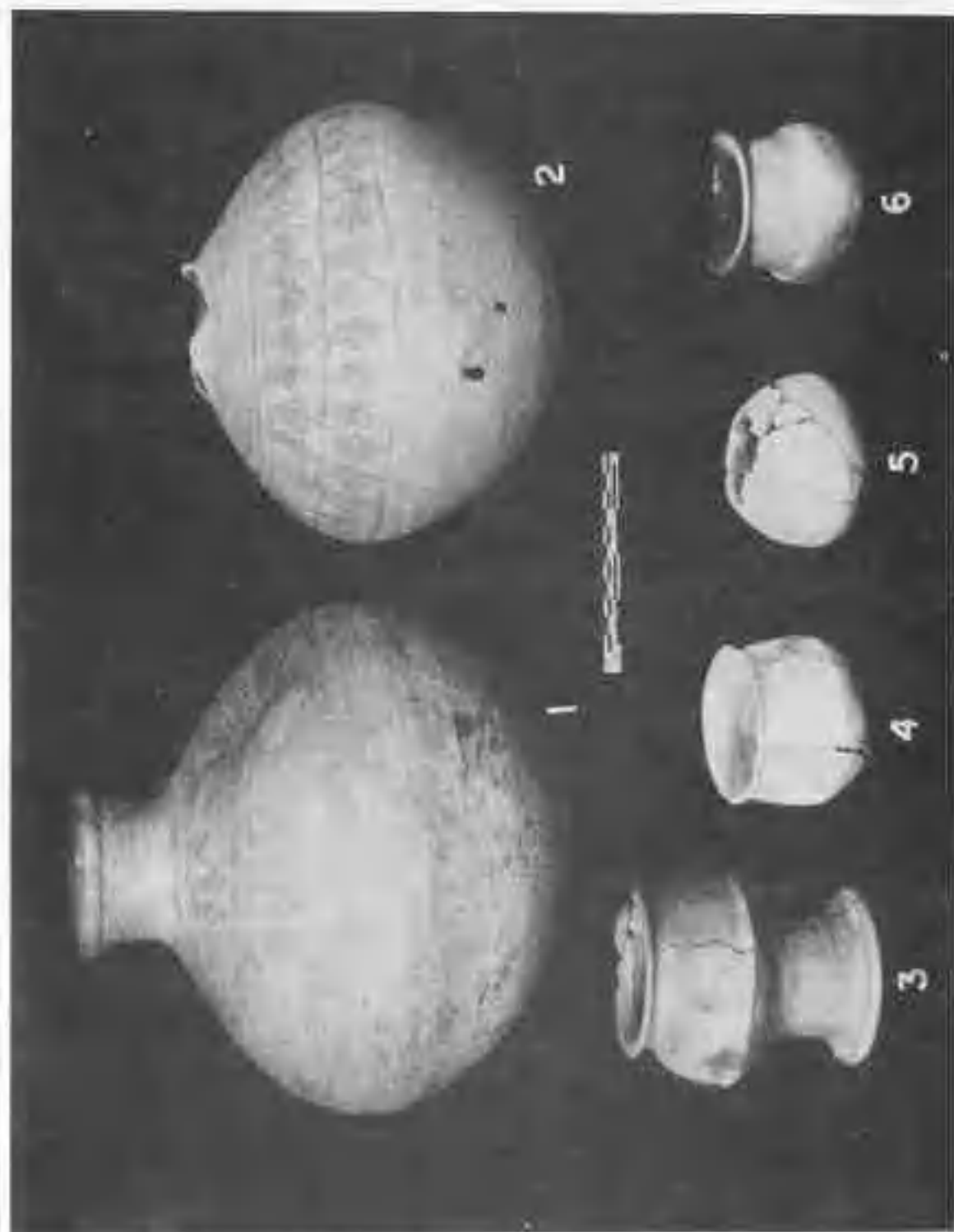


PLATE LXXXI. Dalmabad Ware 1, 2, 4 and 5, burnished gray ware 3 and black-and-gray ware 6.
Phase II

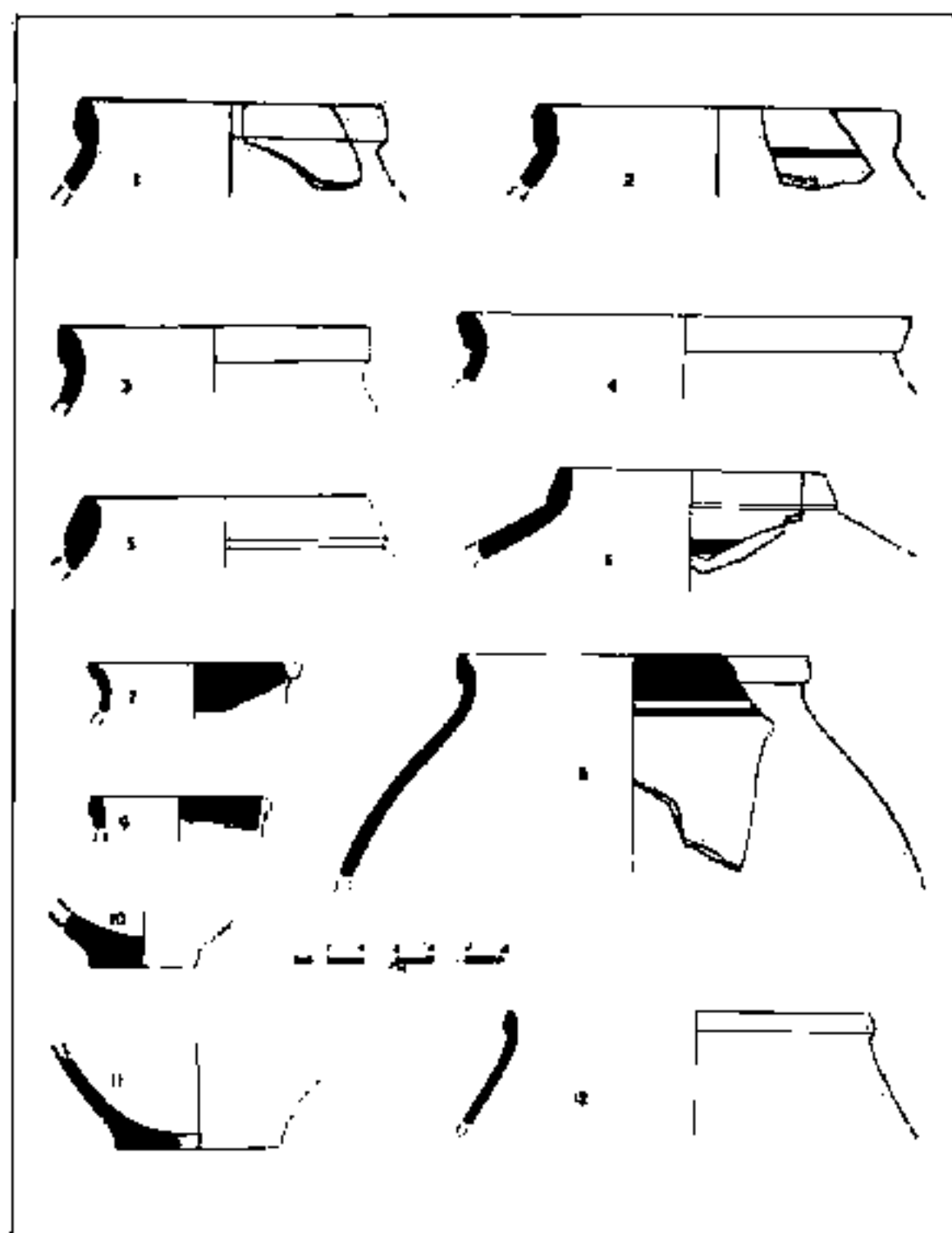


Fig. 43 Black-painted Rod Ware, types Phase III.

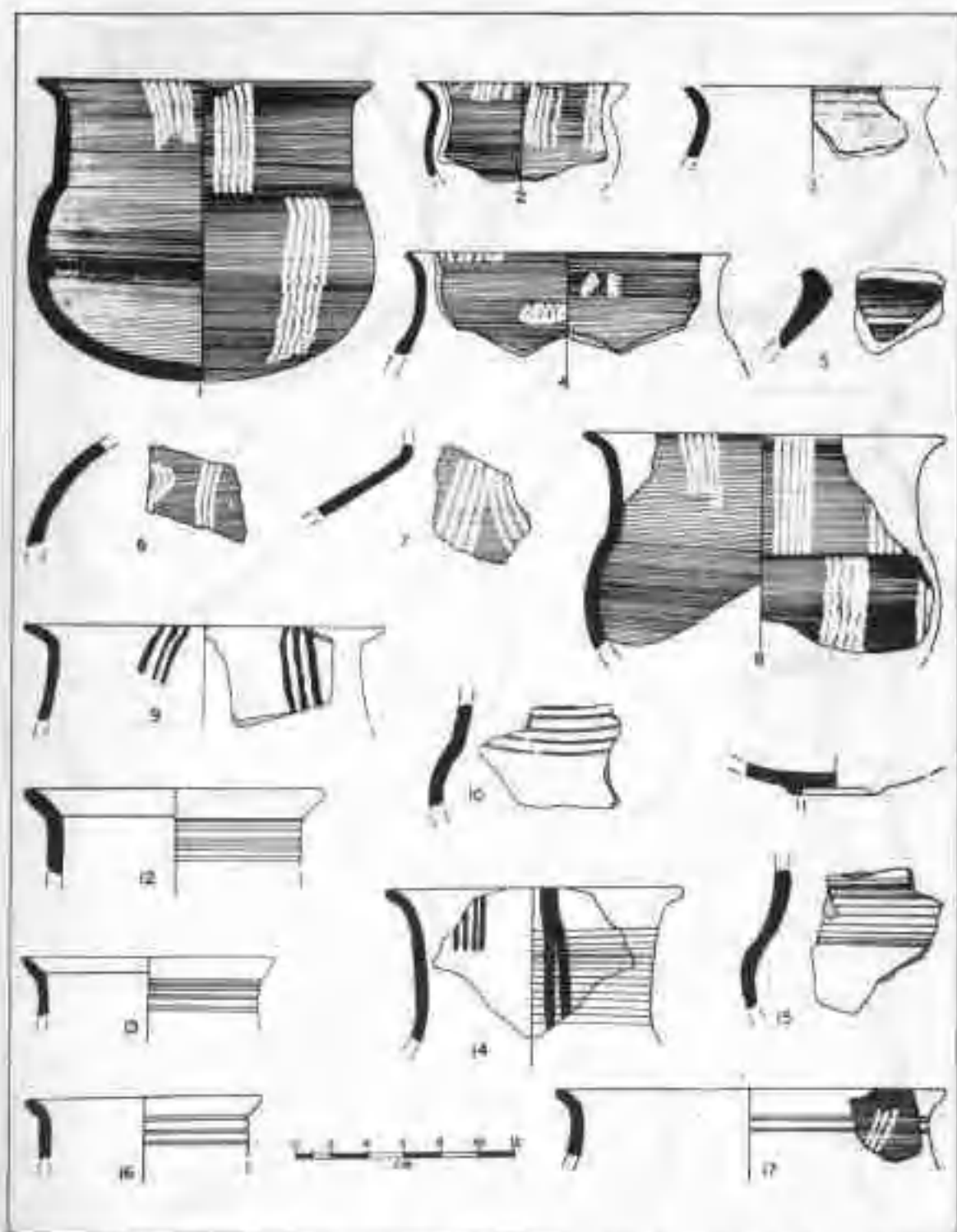


Fig. 44. The Black, Black-and-Gray, Pale Gray and Corrugated Ware, types and painted designs, Phase III.

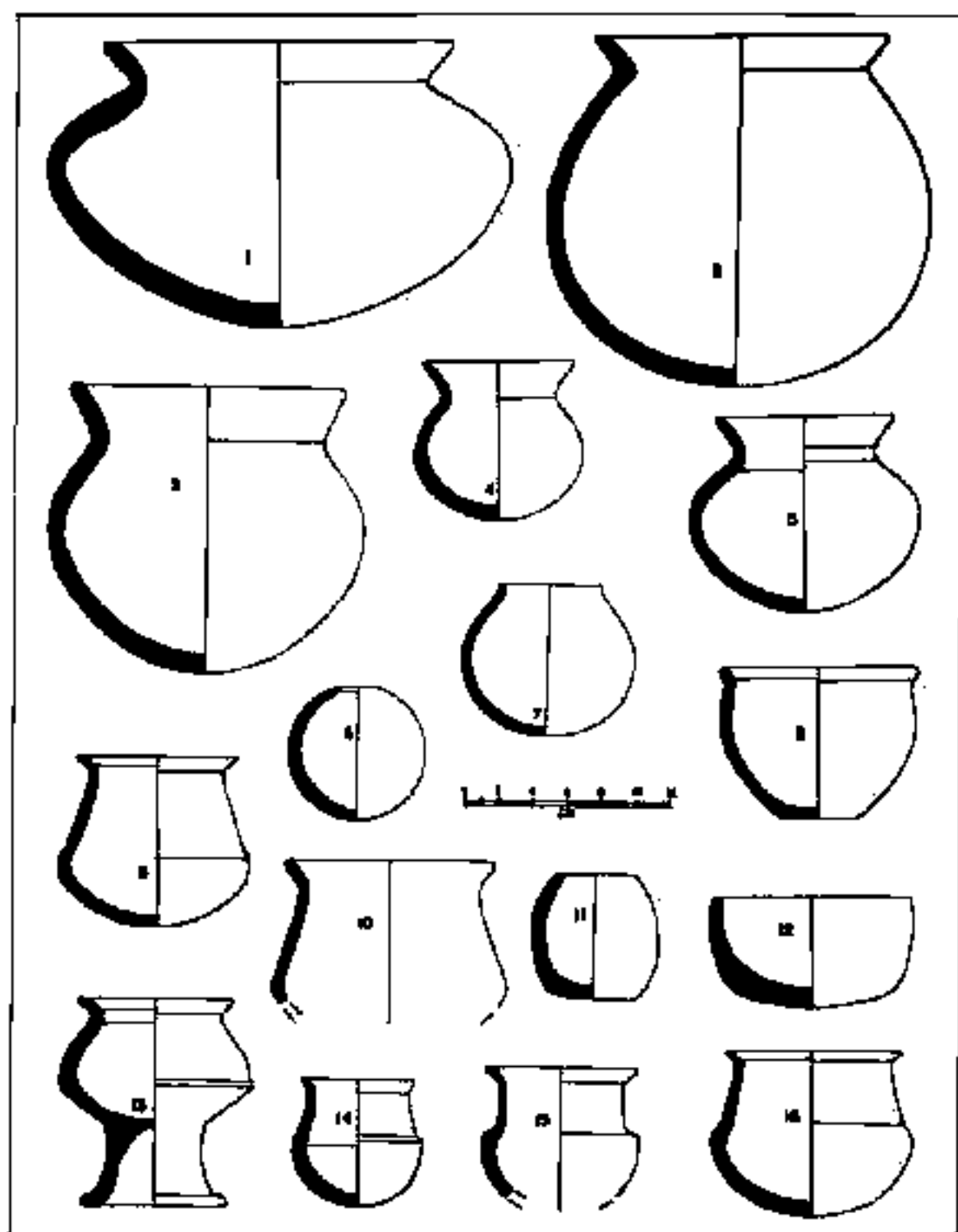


Fig. 46. Earthenware Gray Ware, types. Phase III.

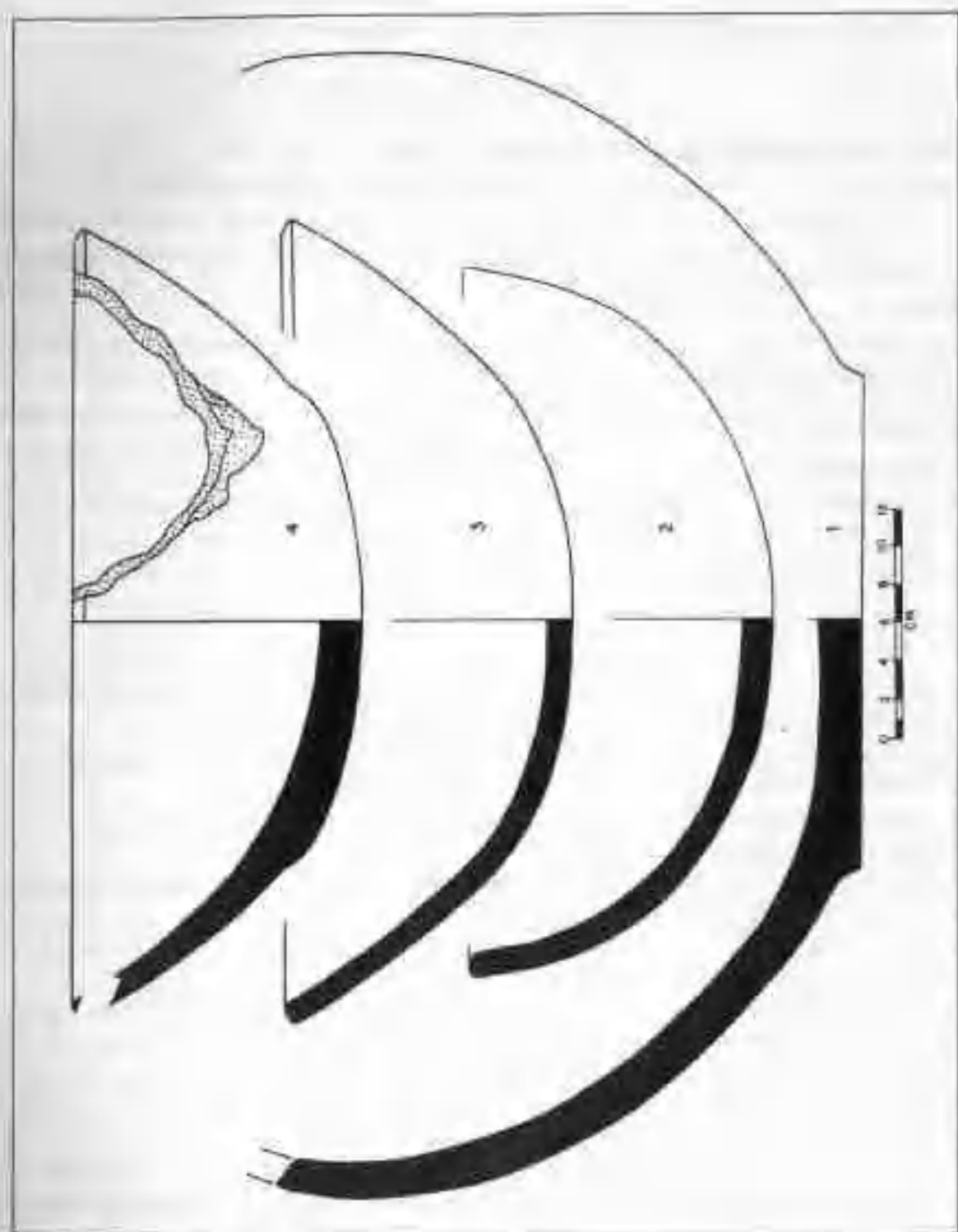


Fig. 46. 1, Thick Coarse Ware, and 2, Burnished Gray Ware, Phase II; 3, Burnished Gray Ware and 4, Thick Coarse Ware (Burial 59), Phase III.

outside in black with horizontal bands and cross-hatched designs below.

The Black-Painted Red Ware

A very small quantity of this class of painted pottery was noted first in the lower levels of this Phase in the 1976-77 season in the trenches FZ64, GZ 64 and it appeared that it perhaps represented a degenerate Late Harappan Red Ware. But its further study and close observations in the season of 1977-78 showed that it occurred in all the levels of the phase. Although this group is called black-painted red ware in it are also included sherds without black paintings, the consideration in such cases being the red colour.

This ware was made on a fast wheel as is apparent from the regular striation marks on the inside. Of medium-to-fine fabric, it is treated with a thin slip which has turned red. The core in some of the cases is brick red and in some others like that of the Daimabad Ware showing unoxidized thin band of dark grey or ivory black colour in the midsection. The painted designs are represented by simple horizontal bands (fig. 43, 2 and 6-9). The types T39A and T39 Ai of the Metallic Matt Painted Ware of Phase I of Navdatoli have parallels in this ware (cf. fig. 43, 8 and 12).

The following selected types are illustrated.

Fig. 43

1. Fragment of a vase of red ware with outcurved collared rim. Of medium fabric, it is treated on the outside with a slip.
2. Fragment of vase of red ware with oval rim. Of medium fabric, it is painted on the outside in black with a horizontal band.
3. Fragment of a vase of red ware with pointed oval rim. Of medium fabric, it is treated on the outside with a slip.
4. Fragment of a vase of red ware with an oval undercut rim. Of fine fabric, it is treated on the outside with a thin slip.
5. Fragment of a vase of red ware with a tapering oval rim. Of fine fabric, it is treated on the outside with a slip.
6. Fragment of a vase of red ware with a narrow mouth and oval rim. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a horizontal band on the shoulder.
7. Fragment of a vase of red ware with out-turned oval collared rim. Of fine fabric, it is treated on the outside with a rim band and a broad band below.
8. Jar of red ware with an oval collared rim. Of fine fabric, it is treated with a slip on the outside and is painted in black on the outside with a rim band and two horizontal bands below.
9. Fragment of a vase of brown ware with undercut thickened rim. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a rim band

and a horizontal band below.

10. Base-fragment of a vase of red ware with a short pedestal base. Of fine fabric, it has lost its slip.
11. Base-fragment of a vase of red ware with a flat base.
12. Fragment of a jar of red ware with oval rim. Of fine fabric, it is treated on the outside with a slip which has been peeled off in places.

(iii) *The Black, Black-and Grey, Grey and Corrugated Wares with or Without Paintings*

Although small in quantity, hardly one percent, this is an important group of pottery of Phase III of Daimabad. All the above mentioned varieties have been grouped together since they appear to belong to a single class of ware. They are of medium-to-fine fabric and treated both internally and externally with a slip and burnished. It needs to be mentioned here that the corrugated variety in this group markedly differs from that of Phase I in having the corrugations on the high neck as against those on the shoulder in the case of the latter.

The paintings are in white (fig. 44, 1-8 and 17) and in some cases in black pigments (fig. 44, 9 and 14). Those in white include groups of wavy lines on the outside and vertical short strokes on the inside on the rim (fig. 44, 2); groups of vertical and curved lines (fig. 44, 6), comb design on the inside and outside (fig. 44, 4), horizontal band on the neck (fig. 44, 5) and converging groups of lines (fig. 44, 7). The paintings in black include a group of three oblique lines both on the inside and outside (fig. 44, 9) and a vertical line with an off-shoot on the outside and a group of lines on the inside (fig. 44, 14). The types represented are: (1) vase with an out-turned rim, vertical high neck and ledged shoulder (fig. 44, 1, 4 and 8); (2) bowl with convex sides and outcurved rim (fig. 44, 2); (3) vase with out-curved rim (fig. 44, 3 and 17), vase with ring base (fig. 44, 11), vase with almost vertical corrugated neck and flared out mouth (fig. 44, 12-14 and 16), *lota* with almost vertical sides, outcurved featureless rim and carinated body (fig. 44, 9, 15 and 16) and *loti*, a small-sized *lota*, (fig. 45, 14; pl. LXXXI, 6).

Except the corrugated variety, all the varieties of the above detailed wares occur in their typical forms in Period I of Prakash. The corrugated or ribbed variety has a parallel in Phase II of Ahir.

The illustrated examples are listed below.

Fig. 44

1. Bowl of black ware with ledged shoulder and bulbous body. Of medium fabric, it is

23. Thapar, op. cit. (1967), pp. 28-35 and figs. 3-5.

24. H.D. Sankalia, S.B. Deo and Z.D. Ansari, *Excavations at Ahir (Tambharati)*, Deccan College Building Centenary and Silver Jubilee Series, 45, (Poona, 1969), fig. 45, T.109.

- treated with a slip both from inside and outside and burnished and is painted in white on the outside with a group of five vertical lines on the neck and of five vertical wavy lines on the body and on the inside with six short lines.
2. Bowl of pale grey ware with outcurved rim and globular body. Of fine fabric, it is treated on the outside and inside with a slip and burnished and is painted in white on the outside with groups of five vertical lines and on the inside with five short vertical strokes.
 3. Bowl of grey ware with outcurved rim. Of medium fabric, it is treated both internally and externally with a slip and burnished and is painted in white on the outside with oblique lines.
 4. Bowl of black-and-grey ware with ledged shoulder and outcurved rim. Of fine fabric, it is treated on the inside and outside with a slip and burnished and is painted in white on the inside and outside with comb designs and on the inside with short strokes.
 5. Fragment of a vase of black ware. Of coarse fabric, it is treated on the inside and outside with a slip and burnished and is painted in white on the outside with a horizontal band.
 6. Fragment of a vase of black-and-grey ware. Of medium fabric, it is treated both internally and externally with a slip and is painted in white on the outside with three vertical lines and three crescentic lines.
 7. Fragment of a vase of black ware. Of medium fabric, it is treated on the inside and outside with a slip and is painted on the outside in white with covering groups of lines.
 8. Bowl of black-and-grey ware with a ledged shoulder. Of fine fabric, it is treated on the outside and inside with a slip and burnished and is painted in white on the outside with groups of five vertical and wavy lines and on the inside with five short lines.
 9. Bowl of grey ware with almost horizontally splayed out rim. Of medium fabric, it is treated both internally and externally with a slip and burnished and is painted in black both on the inside and outside with three lines.
 10. Fragment of a vase of corrugated black-and-grey ware. Of medium fabric, it is treated both on the inside and outside with a slip and burnished.
 11. Base-fragment of a vase of grey ware with a flat ring base. Of medium fabric, it is treated internally and externally with a slip and burnished.
 12. Bowl of corrugated black-and-grey ware with splayed out rim and almost vertical corrugated neck. Of medium fabric, it is treated on the inside and outside with a slip and burnished.
 13. Bowl of corrugated vertical neck. Of fine fabric, it is treated both on the outside and inside with a slip and burnished.
 14. Bowl of black corrugated ware with splayed out rim and slightly concave corrugated neck. Of medium fabric, it is treated on the outside and inside with a slip and is

painted in black on the outside with two vertical lines and on the inside four short lines.

15. Bowl of corrugated black-and-grey ware with almost vertical corrugated neck. Of medium fabric, it is treated on the outside and inside with a slip and burnished.
16. Bowl of corrugated black-and-grey ware with almost vertical corrugated neck. Of medium fabric, it is treated on the outside and inside with a slip and burnished.
17. Bowl of corrugated pinkish grey ware with out-curved rim and corrugated neck. Of medium fabric, it is treated both from outside and inside with a slip and burnished.

(iv) Burnished Grey Ware

As compared to the burnished grey ware of the preceding phases this ware in Phase III is much better represented and besides, better made. It is mostly handmodelled and the use of wheel appears only occasional as is indicated by faint striation marks here and there from inside of a few of the vases. The smaller vessels are of medium fabric and bigger of coarse fabric. The core in all the cases shows airholes apparently due to the burning of vegetable matter mixed with clay. A small percentage of the vases which are almost red in colour appears to have been fired under oxidising conditions of the kiln. Otherwise, the surface colours include grey, blotchy grey, tan, drab and black. The ware is treated with a slip and burnished. The types represented in this ware are vase with splayed out mouth and globular body (fig. 45, 1 and 3); *handi* with dull carinated squat body and splayed out mouth (fig. 45, 1); *handi* with sharp carinated body and splayed out mouth (fig. 50, 3 and 5); oval-shaped vase with narrow mouth and thickened rim (fig. 50, 2); *lota-on-stand* (fig. 45, 13 pl. LXXXI, 3); *lota* with globular body and splayed out mouth (fig. 45, 5); *loti* with globular body and splayed out mouth (fig. 4, 4); spherical bowl (fig. 45, 6); bowl with globular body and tapering sides (fig. 45, 7); bowl with flat base, convex body and outcurved rim (fig. 45, 8); bowl with flat base, convex body and incurved mouth (fig. 45, 11); bowl with convex sides and grooved rim (fig. 39, 18); bowl with convex profile (fig. 39, 19); bowl with convex sides and almost horizontally splayed rim (fig. 39, 20); bowl with incurved pointed rim and convex body (fig. 39, 21); bowl with convex base and vertical sides (fig. 45, 12); and *ghumelo* (fig. 46, 3). A few examples with incised decorations such as punctured marks and strokes, are also present in this ware.

The lids in this ware are handmade. The types represented in them are: (1) saucer-type with umbrella-pinnacle type knob (fig. 50, 4 and 6), (2) saucer-type with cylindrical knob having convex top (fig. 51), (3) with flat base and cylindrical knob having flat top and four finger depressions at the base of the knob, (4) plano-convex lid with conical knob, (5) plano-convex lid with raised knob, (6) flat lid with ribbed upper surface and two finger depressions for hold, (7) flat lid with high raised top bearing four finger depressions for hold (8), biconvex with three finger depressions and (9) bunshaped. A knob of double umbrella-pinnacle type is also present in the collection. The knobs of umbrella-pinnacle type are painted in ochre red colour.

The selected types are illustrated.

Fig. 45

1. *Handi* of burnished tan ware with splayed out mouth and bluntly carinated body. Of coarse fabric, it is treated with a slip from inside and outside and burnished.
2. Vase of black burnished ware with splayed out mouth and globular body. Of medium fabric, it is treated from inside and outside and burnished.
3. Vase of reddish grey burnished ware with splayed out mouth and globular body. Of coarse fabric it is treated on the outside with a slip and burnished.
4. *Loti* of black burnished ware with splayed out mouth and globular body. Of medium fabric, it is treated both internally and externally with a slip and burnished.
5. *Lota* of red burnished ware with splayed out mouth and globular body. Of coarse fabric, it is treated with a slip from outside and inside and burnished.
6. Spherical bowl of burnished blotchy grey ware. Of fine fabric, it is treated with a slip on the outside and burnished. This is one of the two bowls which contained a hoard of one hundred seventeen beads.
7. Bowl of burnished black ware with globular body and tapering sides. Of medium fabric, it is treated on the outside with a slip and burnished. This is another bowl which contained a hoard of eleven beads.
8. Bowl of blotchy grey burnished ware with flat base, convex sides and outcurved rim. Of medium fabric, it is treated both internally and externally with a slip and burnished.
9. *Lota* of black-and-grey ware with tapering sides, outcurved rim and ledged shoulder. Of medium fabric, it is treated both internally and externally with a slip and burnished.
10. *Lota* of buff ware with tapering sides, outcurved rim and carinated body. Of fine fabric, it is treated on the outside and inside with a slip. The inside of this example is marked by distinct parallel striation marks.
11. Bowl of burnished grey ware with flat base convex sides and incurved mouth. Of medium fabric, it is treated on the outside with a slip and burnished.
12. Bowl of burnished pink ware with convex base and almost vertical sides. Of medium fabric, it is treated with a slip both internally and externally and burnished.
13. *Lota-on-stand* of red burnished ware with globular body with a ledge, hollow stand and outcurved rim. Of medium fabric, it is treated both from inside and outside with a slip and burnished.
14. *Loti* of black-and-grey ware with almost vertical sides, outcurved rim and ledged shoulder. Of fine fabric it is treated on the outside and inside with a slip and burnished.
15. *Loti* of pale grey ware with almost vertical sides, outcurved rim and ledged shoulder.

der. Of fine fabric, it is treated with a slip both from inside and outside.

16. *Lota* of black ware with vertical sides, outcurved rim and ledged shoulder. Of medium fabric, it is treated on the outside and inside with a slip and burnished.

Fig. 46

3. *Ghamela* of burnished grey ware with flat rim-top and splayed sides. Of coarse fabric, it is treated on the outside with a slip and burnished.

(v) *Thick Coarse Ware*

As its name implies, this ware is thick and of coarse gritty fabric. It is comparatively much better made than the thick coarse ware of both the preceding phases. The ware is hand-made, treated on the outside with a wash in the nature of slush and is decorated with applied and incised designs (pl. LXXVII, 9-13). The former comprised finger-tip marks on applique bands either horizontal along the neck of jars or curved, as also on the top of rim. Noteworthy in these are those forming heart-shaped pattern (pl. LXXVII, 11 and 12). In the latter are included pictured marks on applique bands, chevrons on the top of rim and horizontal lines intersected by vertical lines at the neck. Large storage jars are the chief types in this ware although occasionally miniature bowls are also present. Jar with splayed out mouth, vase with incurved mouth and globular body, large platter with convex sides as well as with vertical sides are the common types in this ware. A *Ghamela* with convex base and splayed out side purposely indented at the edge to fit into the lid cover of burial urn of burial 59 is a noteworthy type in this ware (fig. 46, 4; pl. LVII).

(vi)

(vi) *Graffiti*

Graffiti marks occur on the Daimabad Ware and the burnished grey ware (fig. 47). They are found drawn mostly on the outside of the pots and only occasionally on the inside of rim and lid. The marks include single and multiple lines, hooked lines, tasseled lines, plant-like mark, sun and animal motifs. Most interesting are, however, those which occur on a potsherd in a group of five or six signs resembling those of the Indus script (fig. 38, 24; pl. CXL)²³ A noteworthy feature of them is that they have been engraved carefully unlike the other graffiti signs which were scratched. Perhaps this is the only hitherto known example in which occur the Indus Signs in so large a number in a group on the post-Hazappan Chalcolithic pottery. The following marks are illustrated.

23. They roughly resemble (from right to left) Sign Nos. 161, 132, 127, 271 and 363 in Mahadevan, op. cit. (1977), pp. 33-35.

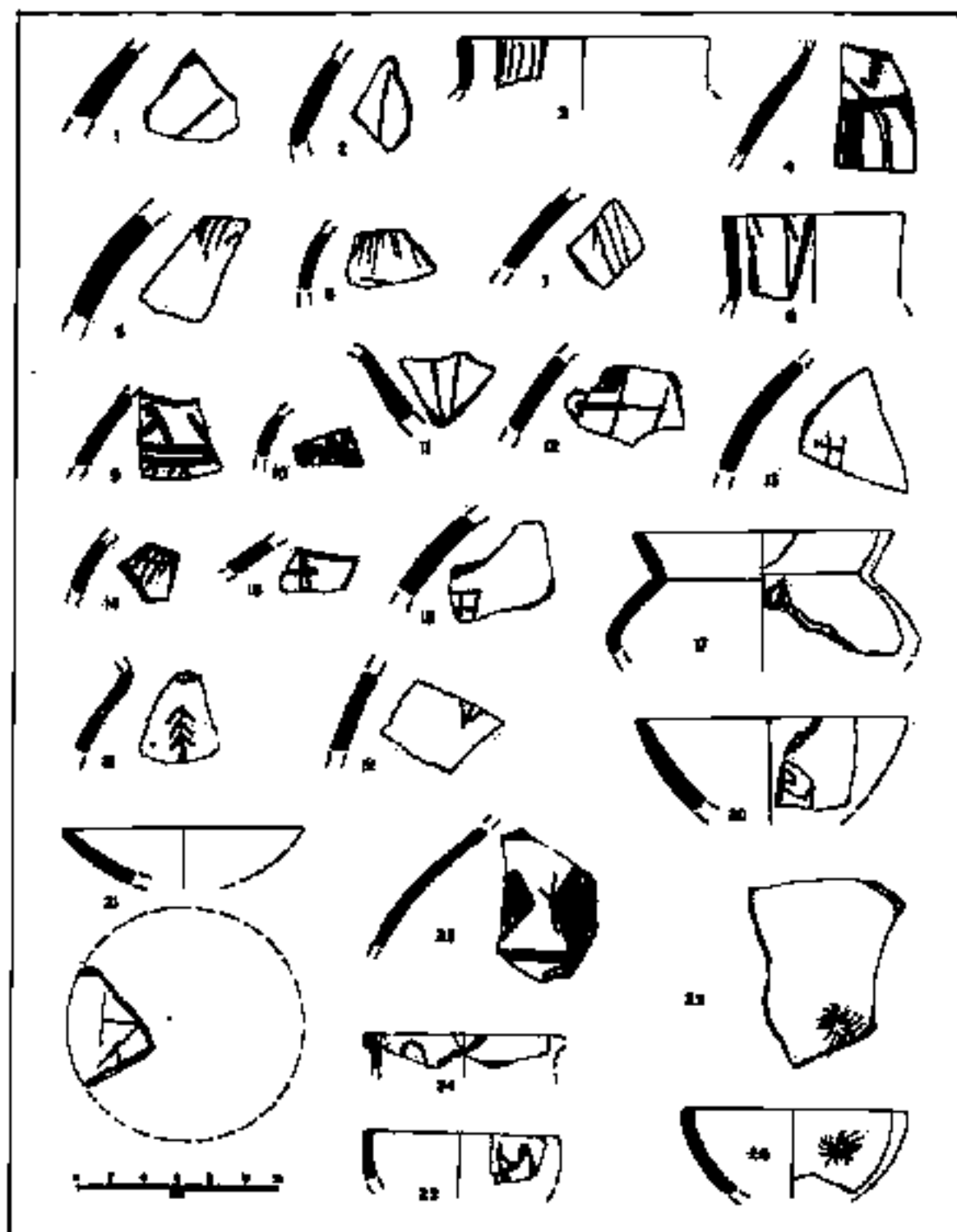


Fig. 47: Graffiti-bearing pottery, Phase III.

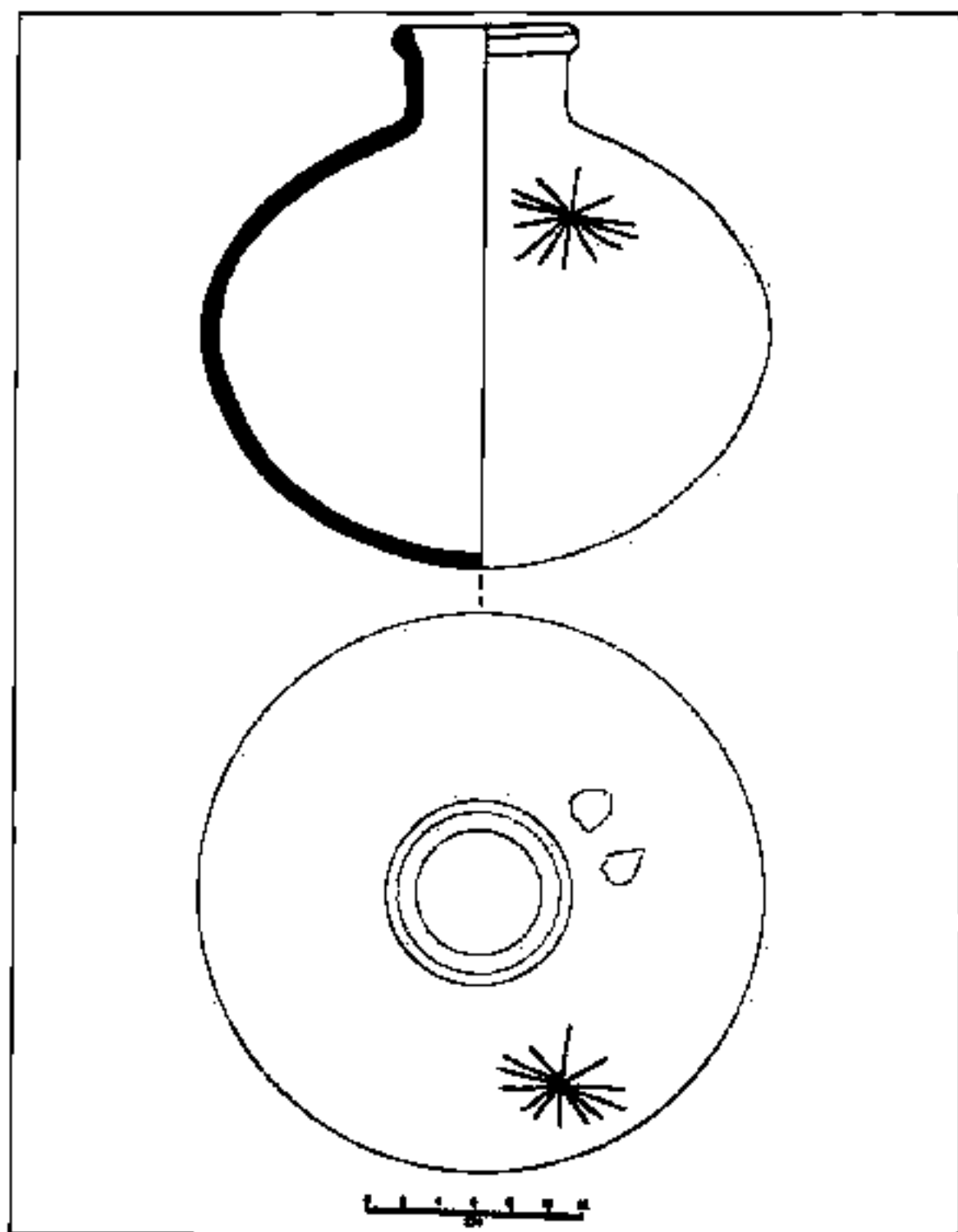


Fig. 68. Dalmatian Ware, Burial 53, Phase III.

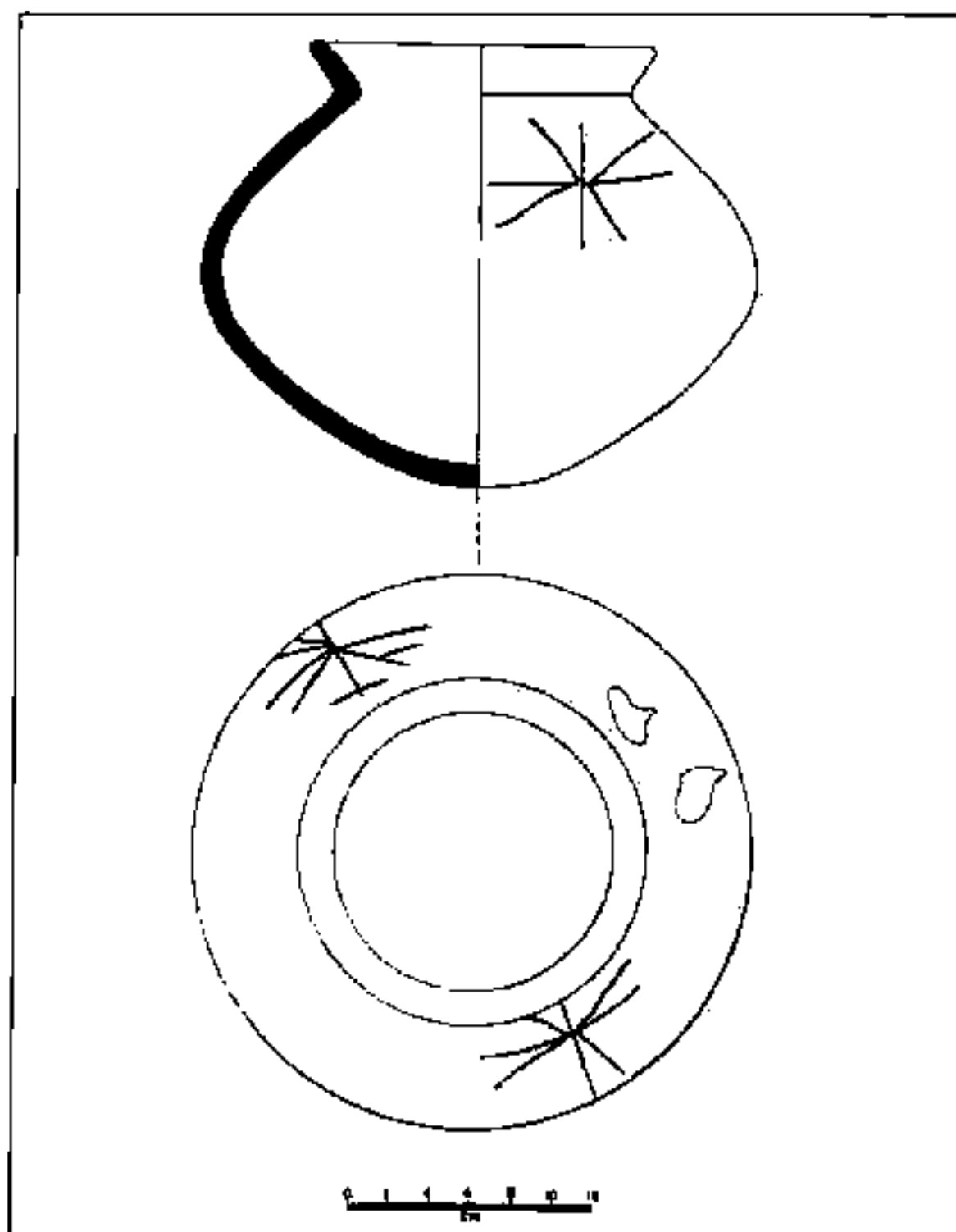


Fig. 49. Deinabad Ware, Burial 55. Phase III.

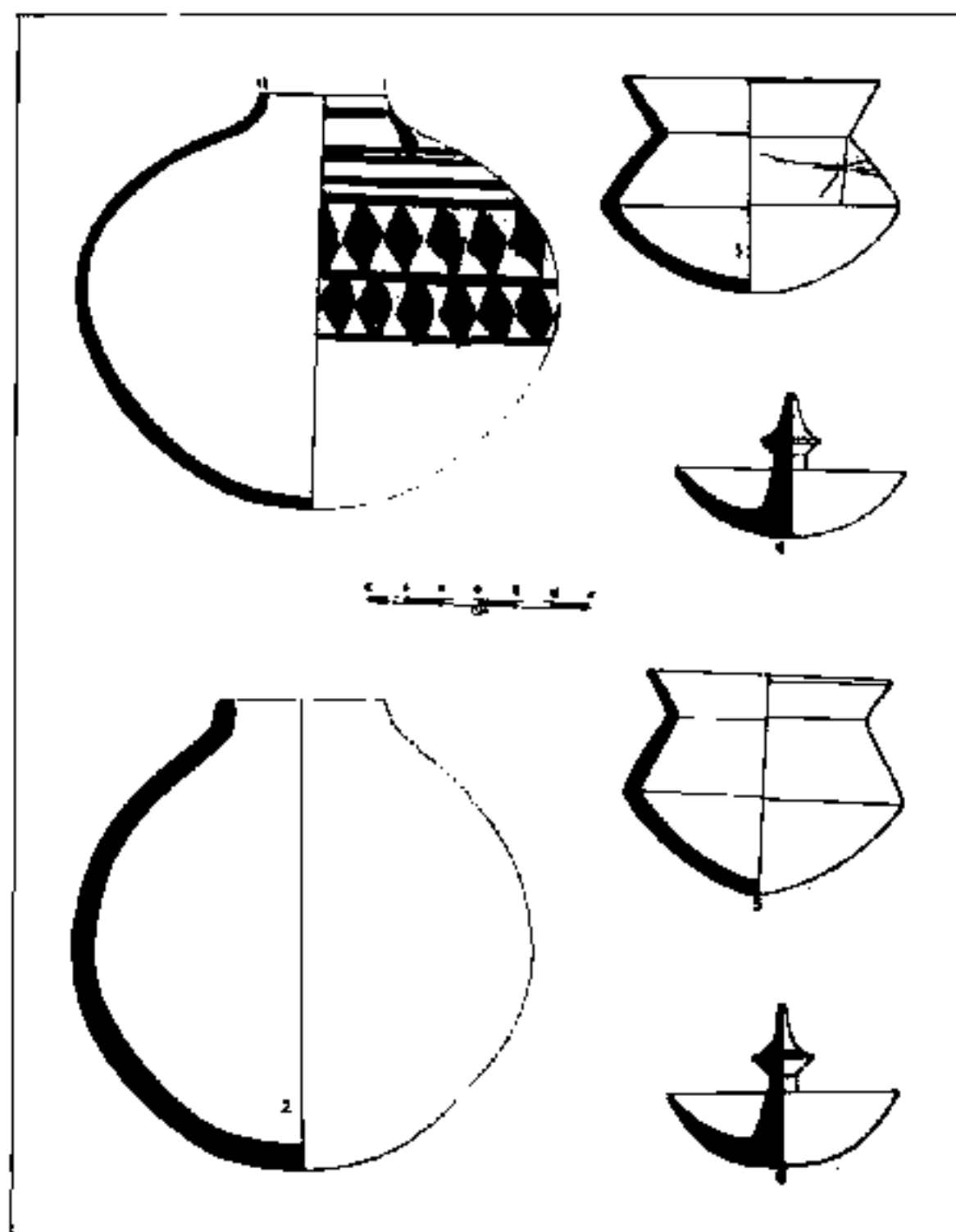


Fig. 80. 1 and 2, Burial 34; 3-4, Burial 35. Phase III.

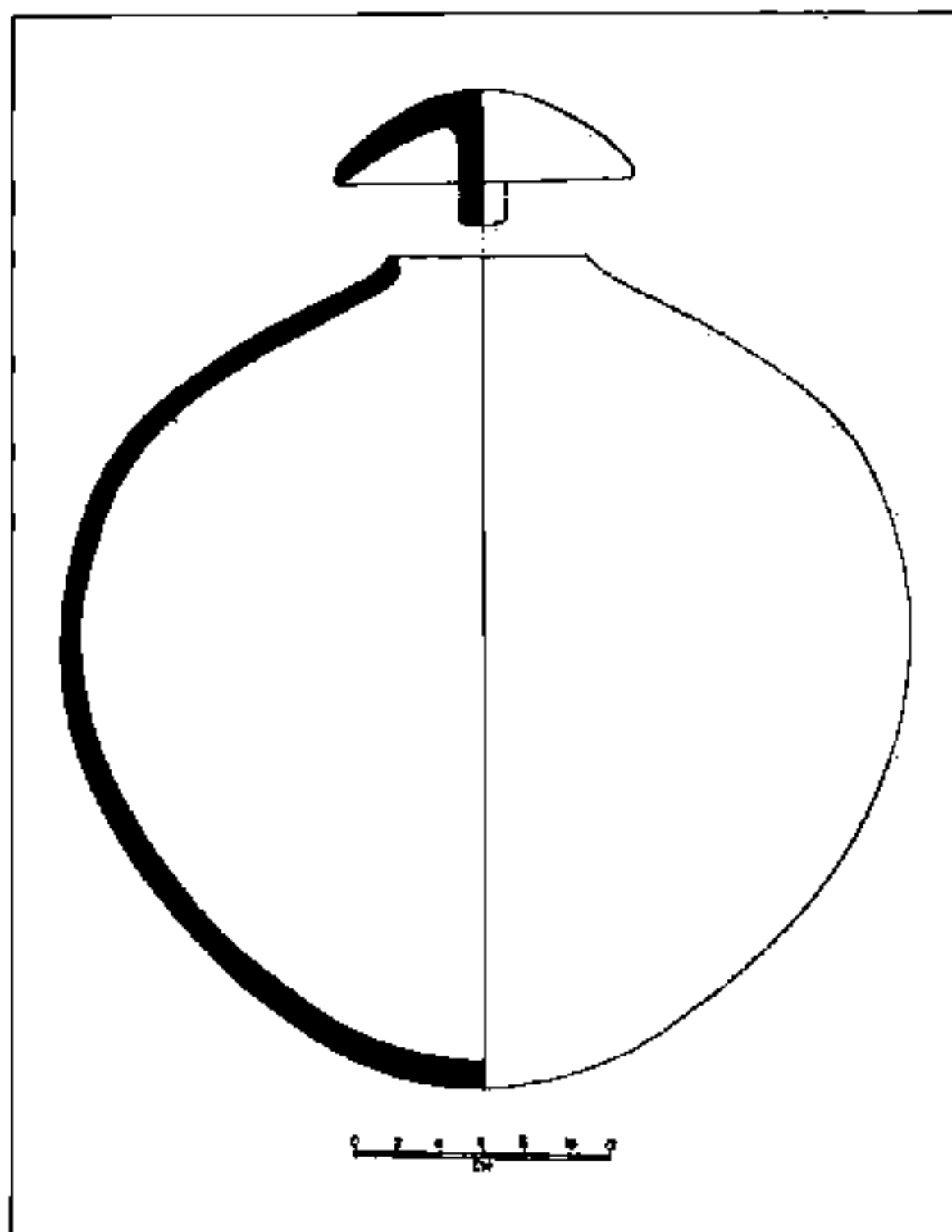


Fig. 51. Burial Urn and lid cover, Burial 59, Phase III.

Fig. 47

1. Oblique line. On the outside of a ivory black ware.
2. Vertical line. On the outside of burnished grey ware.
3. Vertical lines on the inside of a rim of Daimabad Ware.
4. A curved line and another shoot drooping down. On the outside of Daimabad Ware.
5. Incomplete. On the outside of burnished grey ware.
6. Tasseled lines. On the outside of burnished grey ware.
7. Incomplete. On the outside of Daimabad Ware.
8. Hooked lines, on the outside of Daimabad Ware.
9. Incomplete, but perhaps a vertical line flanked by a hooked line. On the outside of Daimabad Ware.
10. Incomplete. On the outside of Daimabad Ware.
11. Two non-parallel lines. On the outside of burnished grey ware.
12. Horizontal line intersected by three vertical lines. On the outside of Daimabad Ware.
13. Two vertical lines and one horizontal line intersecting the first and meeting the second. On the outside of Daimabad Ware.
14. Two horizontal lines and four vertical lines. On the outside of Daimabad Ware.
15. Two pairs of intersecting lines. On the outside of Daimabad Ware.
16. Incomplete. On the outside of burnished grey ware.
17. Downward radiating lines emerging from one apex. On the outside of burnished grey ware.
18. Drooping plant motif. On the outside of burnished grey ware.
19. Three lines shooting up from one stem like a *trishula*. On the outside of Daimabad Ware.
20. Incomplete. On the outside of burnished grey ware.
21. Incomplete. On the inside of a lid of burnished grey ware.
22. V-mark and two oblique lines. Inside the former meet two other lines, one emerging from the left arm of the V and the other meeting it horizontally.
23. Sun motif. On the outside of Daimabad Ware.
24. Incomplete. On the inside of rim of Daimabad Ware.
25. Animal motif. On the outside of burnished grey ware.
26. Sun motif. On the outside of burnished grey ware.

The selected pottery from burials is illustrated in figures 48 — 51.

Fig. 48

1. Vase of buff ware with a hooded rim, narrow neck and globular body. Of fine fabric, it is treated on the outside with a slip. On its shoulder is engraved a graffiti of a star

consisting of thirteen lines and two roughly circular marks of sandy material applied on the shoulder. Also pl. LXXXI, 1. Burial 33.

Fig. 49

1. *Handi* of buff ware with splayed out mouth and bluntly carinated shoulder. Of fine fabric, it is treated on the outside with a slip. On its shoulder are engraved two eight pointed stars and two applied marks of sandy material as that on pot in fig. 48, Burial 33.

Fig. 50

1. Vase of red ware without neck and with globular body. Of fine fabric, it is treated on the outside with a slip and is painted on the outside in black with two panels of cross-hatched diamonds between horizontal bands, horizontal bands above and a panel of chain pattern at the junction of the neck and the shoulder between horizontal bands. Also pl. LXXXI, 2. Burial 34.
2. Oval-shaped vase of burnished grey ware with a vertical short featureless rim and narrow-mouth. Of coarse fabric, it is treated on the outside with a slip and burnished. Burial 34.
3. *Handi* of burnished grey ware with splayed out mouth and carinated body. Of medium fabric, it is treated both on the inside and outside with a slip and burnished. On its shoulder is engraved a graffiti of an eight pointed star. Burial 33.
4. Lid of burnished grey ware. Saucer-type with an umbrella-pinnacle type knob coated with ochre red colour. Burial 33. Lid of 3 above.
5. *Handi* of burnished grey ware with splayed out mouth and carinated shoulder. Of medium fabric, it is treated with a slip both from inside and outside and burnished. Burial 33.
6. Lid of burnished grey ware as 4 above. Burial 33. Lid of 5 above.

Fig. 51

1. Oval-shaped vase of burnished grey ware with slightly outcurved sharpened rim. Of medium fabric, it is treated on the outside with a slip and burnished. Burial 59.
2. Lid covering the mouth of the burial jar described above. Saucer-type with cylindrical knob. Burial 89.

E. Phase IV: The Malwa Culture

(i) *The Malwa Ware*

The Malwa Ware is the only chalcolithic black-on-red ware in this country that bears a

regional name after the Malwa Plateau in Madhya Pradesh in which it was first identified in the early fifties of this century, the best known site being Navdatoli.²⁶ It is now known to occur in a vast area between the Chambal basin in the north and the Bhima basin in the south.

The Malwa Ware of Daimabad is of medium-to-fine fabric and treated with a slip which has turned orange, red, pink, and yellow in colours and their shades. In fact there is no comparable ware in any of the cultural levels of Daimabad which shows so varied and pleasing shades of colours. The surface has a smoothened semi-gloss resulting from the dressing of the slip. The clay contains powder of shells. The ware was made on wheel using paring technique. The base of big vases was beaten up in green hard state. The pottery, on the whole, is well-fired in oxidizing conditions and the core is light red or pink in colour. The ware is of medium thickness but there are also thin and thick varieties, the latter being of coarse fabric and underfired so that the core shows air holes and occasionally black streak. The thin variety is of fine fabric, with smooth external surface and treated with a thin slip. It produces a dull metallic ring. All the varieties, however, occurred in all the levels of the Phase.

The ware was painted in black colour mainly in the area between the rim and the body on the outside and only occasionally on the inside of especially bowls. The painted designs may be classified into three major groups: (1) geometric designs; (2) animal and other motifs and (3) the so-called potter's marks.

(1) *The geometric designs* (figs. 52-61; pl. LXXXII): These include (1) horizontal bands on the rim, at the junction of the neck and the shoulder and around the body; (2) a single or double crinkled or zigzag horizontal line like a festoon below or between horizontal bands; (3) a pair of crinkled vertical lines, when close-spaced forming a chain pattern; (4) a single vertical crinkled line; (5) intersecting pairs of lines inside and outside bowl; (6) converging groups of oblique lines; (7) a horizontal row of hatched cones between horizontal bands; (8) cross-hatched diamonds with elongated ends; (9) cross-hatched triangles; (10) cross-hatched diamonds; (11) loops surmounted by groups of vertical strokes; (12) cross-hatched squares; (13) groups of vertical lines below rim-band; (14) opposed cross-hatched triangles; (15) trellis pattern; (16) strokes above a solid square; (17) wavy line between pairs of vertical lines; (18) groups of vertical lines; (19) a register of tanged arrowhead; (20) semi-circles; (21) interconnecting loops; (22) pointed strokes and (23) intersecting thick bands.

(2) *Animal and other motifs* (fig. 55; pl. LXXXIII): In this group are included the motifs of dog, fish, peacock, human, deer, sun, plant, and buttocks. Of these, that of dog, seemed to be more favourite as it has occurred quite frequently painted on especially the high but slightly concave neck of a vase of Malwa Ware. In these there is also present a representation of a pair of dogs in united posture (fig. 53, 7; pl. LXXXIII, 9). In contrast to the representation of the dog with four legs on the burial pot of burials 75 (p. 186) painted in association with the sun and peacock motifs, in all the other motifs the dogs have been painted

26. Sankalia, Subbaram and Deo, *op. cit.* (1958); also Sankalia, Deo and Ansari, *op. cit.* (1971).

with two legs.

Equally interesting is the scene painted on the outside of a *loti* in which a man is shown standing in a pool of water or on the bank of a stream with fish and aquatic plant around him (fig. 55, 27, pl. LXXXIII, 17).

A deer with spiral horns was painted on a thick variety of the Malwa ware (fig. 55, 28, pl. LXXXIII, 18).

The significance of representation of buttocks is explained elsewhere (below, p. 301).

It needs to be mentioned that the style of animal representation on the Malwa Ware differed from that on the Daimabad Ware of the preceding phase in that the latter was characterized by elongated forms and stippled body and the former by stylized and linear patterns. The motifs of dog, peacock, deer and sun occurred also on the Malwa Ware of Madhya Pradesh. The representation of dog on the Malwa Ware at Chandoli²⁷ is very akin to that from Daimabad.

(3) *Potter's marks* (?) (fig. 54; pl. LXXXIV): This group of paintings is a class by itself. Occurrence of these so-called potter's marks on the Malwa Ware has been recognized for the first time at Daimabad. They continued to occur on the Jorwe Ware of the succeeding phase but were not noticed on the painted wares of any of the preceding phases. Evidence from the pottery kiln of Jorwe Culture has cast doubts on using the term potter's marks in them.²⁸ Until, however, convincing explanation is obtained the term "potter's marks" is retained here in order to distinguish them from the other painted designs. These were found painted on the outside as well as on the inside of the pots. Usually they are single, but there is an exception in which two different marks are painted on a single pot. It is a *loti* (fig. 57, 5). On its shoulder a mark consisting of two cinkled lines meeting at either end is painted twice and in addition there is another comprising a horizontal straight line.

The types in this ware are (1) *handi* with bluntly carinated body, funnel-shaped mouth and tubular spout (figs. 58, 4 and 5; 59, 1 and 2 and 61, 3, 5, 10 and 11; pl. LXXXV, 1 and 3); (2) same as above but without spout (fig. 61, 2; pl. LXXXV, 7); (3) carinated bowl with concave sides (fig. 55, 3, 6-9, 12-15, 17 and 18, fig. 57, 6, 13 and 14; pl. LXXXV, 8); (4) incurved bowl fig. 55, 14 and 5 and fig. 57, 12); (5) bowl with slightly outcurved featureless rim and squat bulbous body (fig. 57, 1); (6) bowl with bluntly carinated body, outcurved sharpened rim, and round base (figs. 57, 3 and 11 and 59, 3; pl. LXXXV, 5); (7) bowl with outcurved featureless rim and squat globular body (figs. 57, 4, 7 and 10, 59, 4 and 7 and 61, 1 and 4; pl. LXXXV, 6); (8) bowl with convex base and splayed sides (fig. 57, 9; pl. LXXXV, 9); (9) bowl with tapering sides, rimless narrow mouth, bluntly carinated body and tubular spout (fig. 58, 1-3); (10) bowl with splayed out mouth and vertical sides (fig. 55, 1); (11) bowl with flat base and flaring sides (fig. 55, 19); (12) bowl with convex profile (fig. 55, 16);

27. Des and Ansari, *op. cit.* (1965), fig. 52, 69.

28. Sali, *op. cit.* (1981).

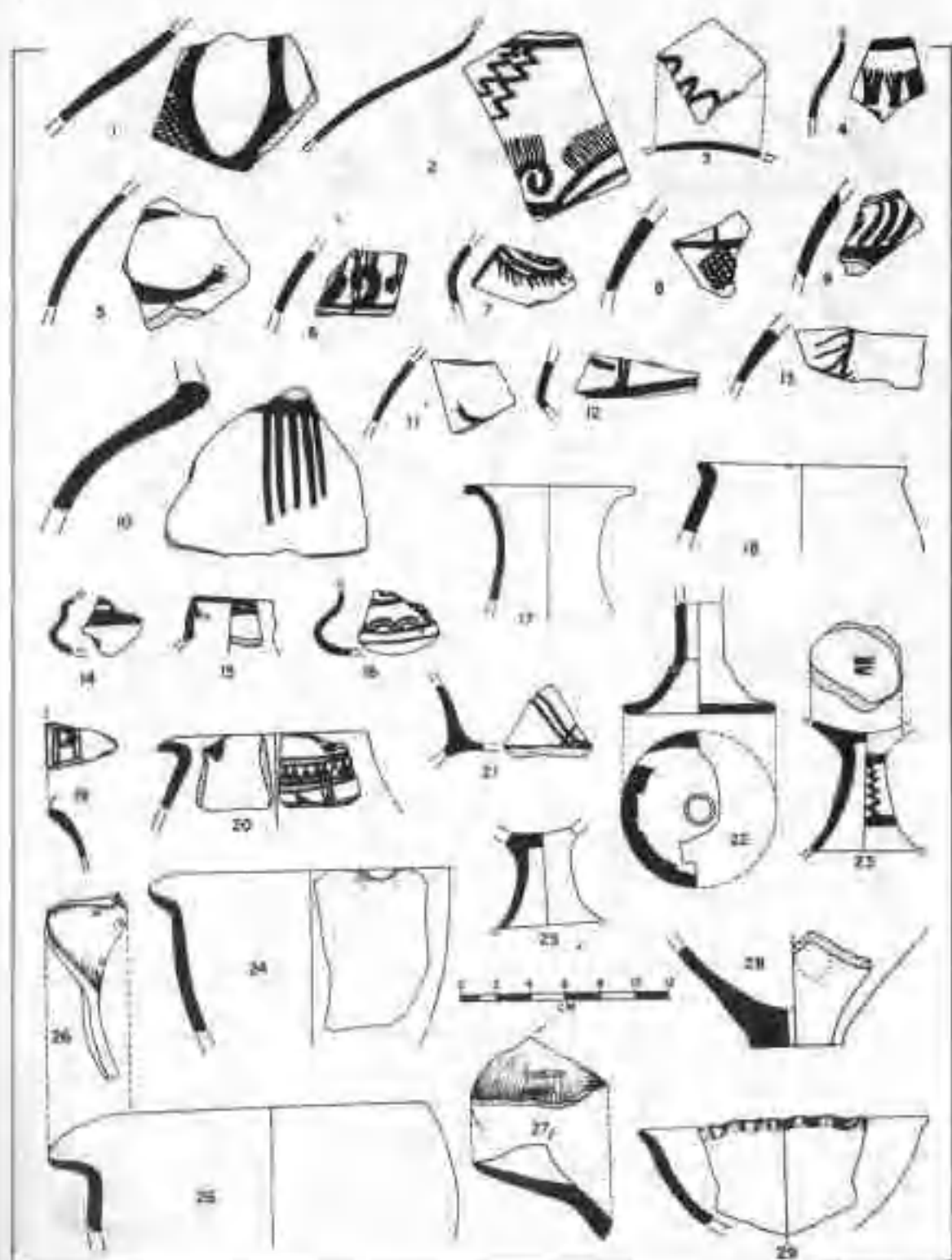


Fig. 52. Malwa Ware, painted designs and types. Phase IV.

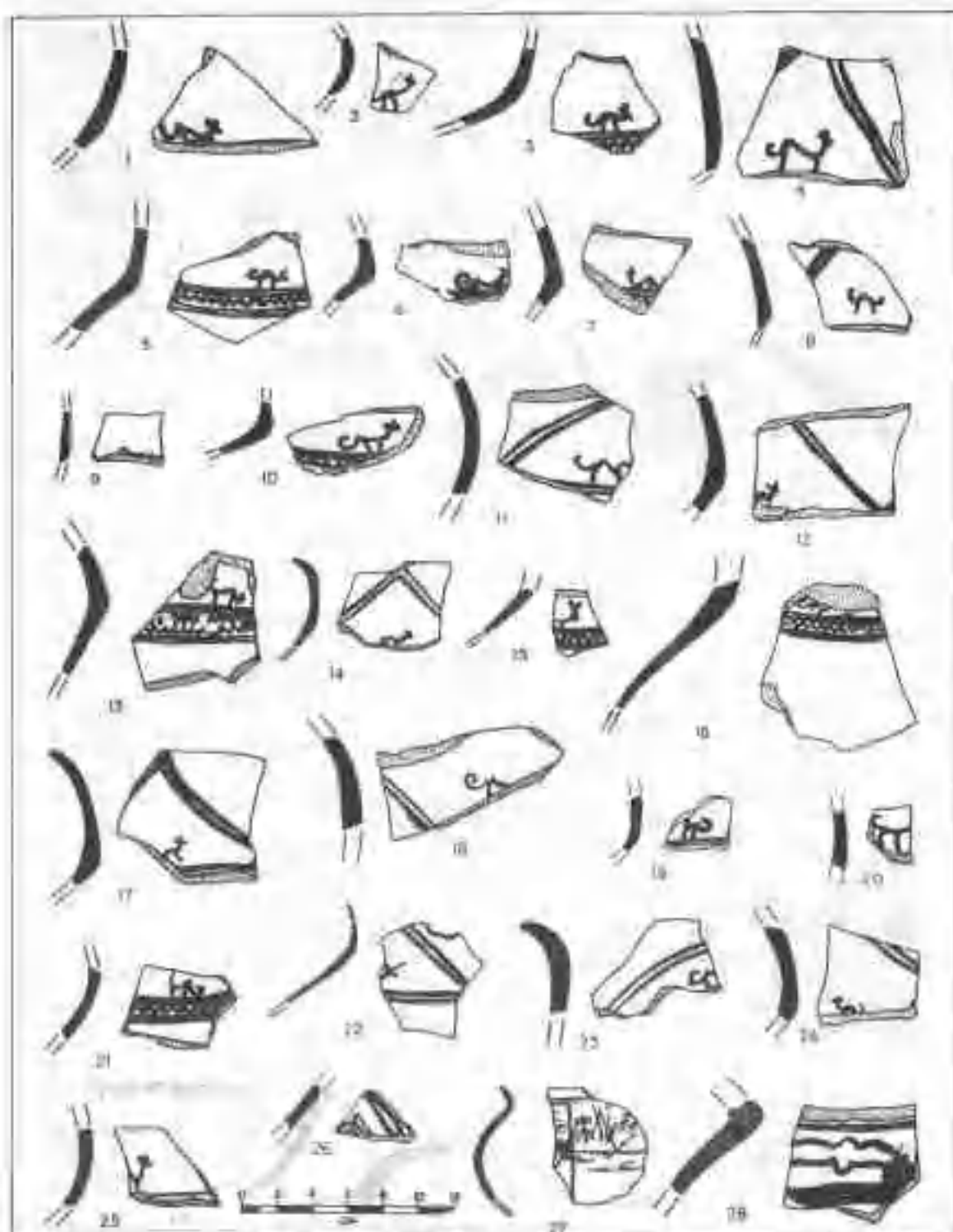


Fig. 53. Malwa Ware, animal and human motifs, Phase IV

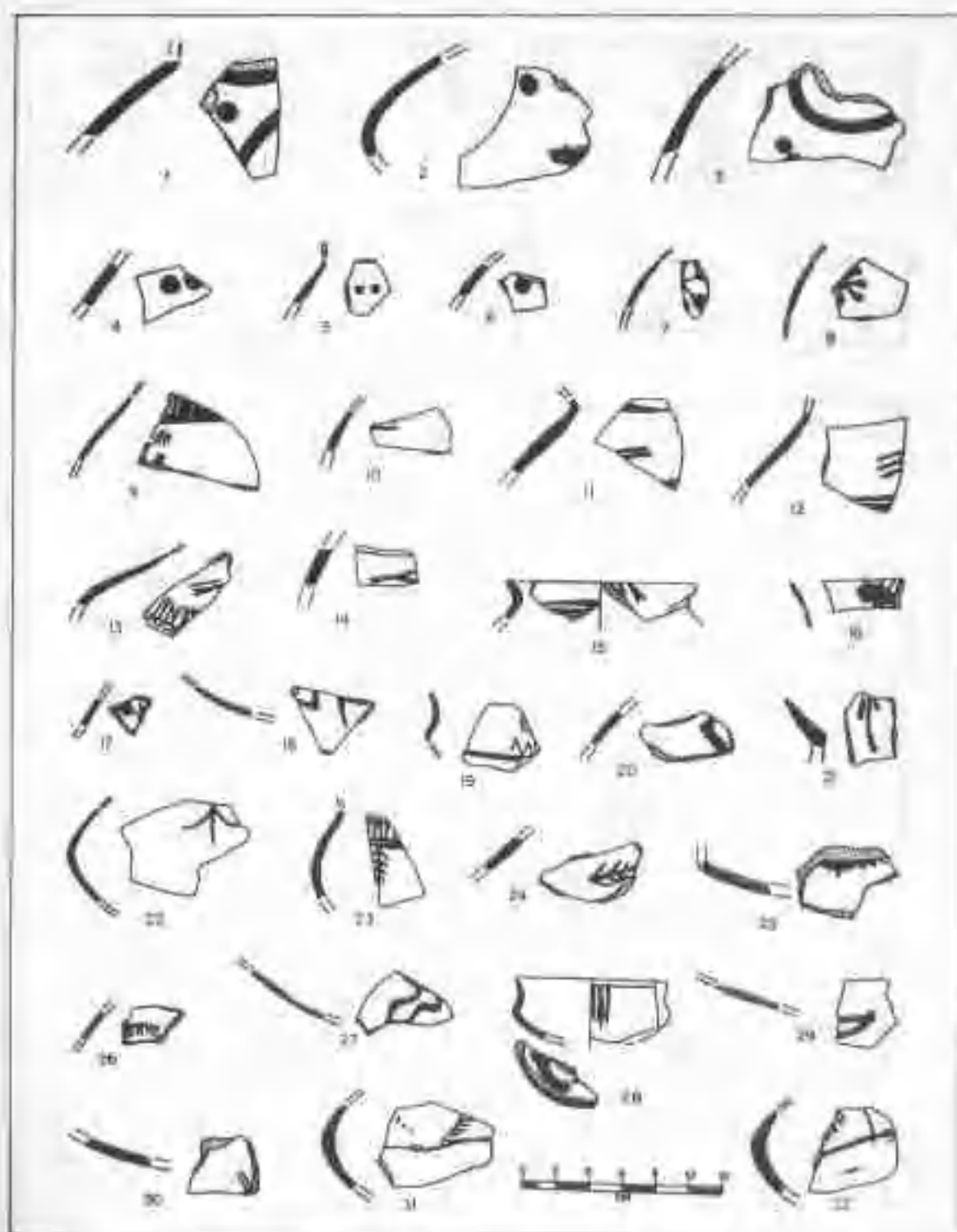


Fig. 54. Malva Ware, Fetter's marks, Phase IV.

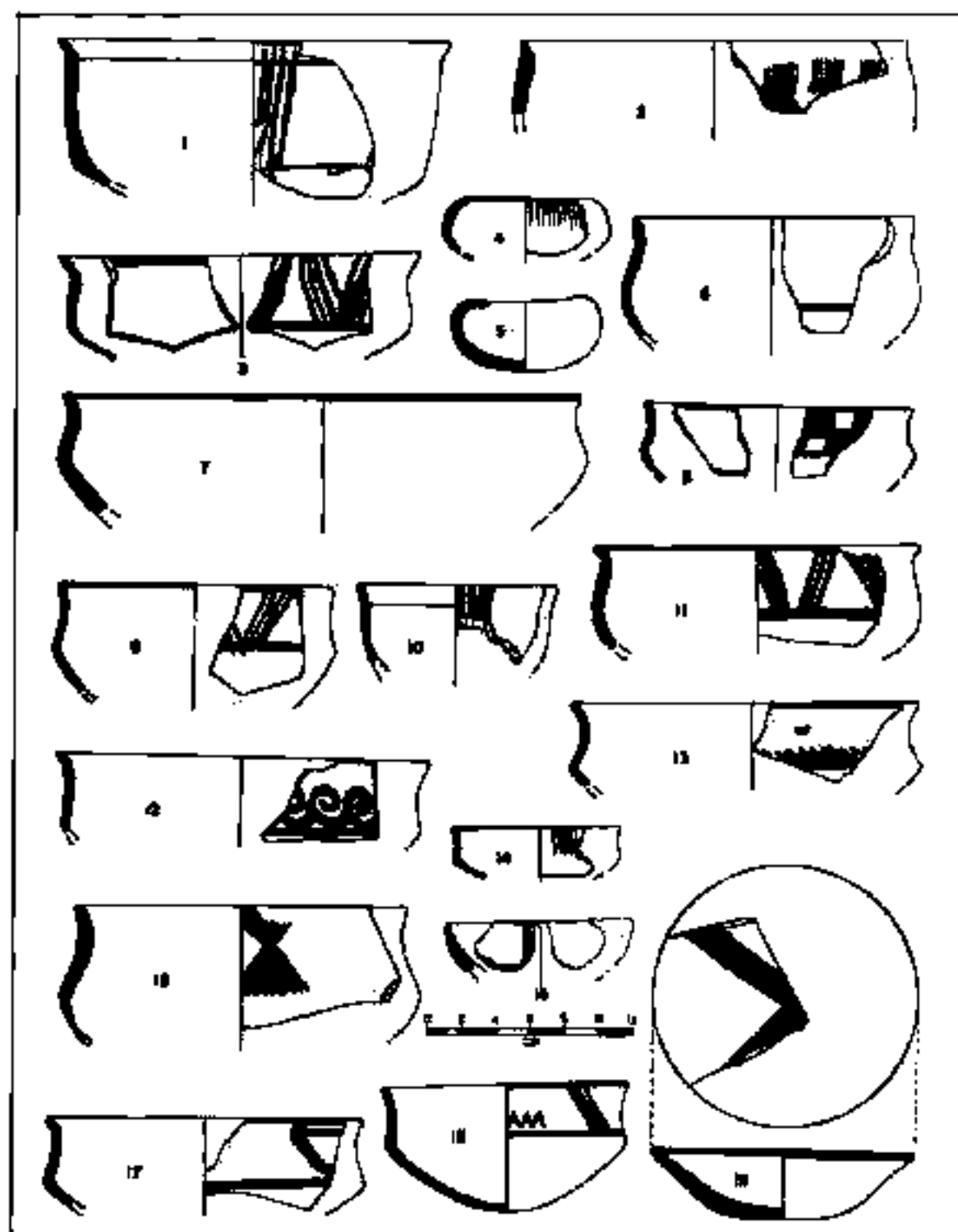


Fig. 53. Mohenjo-daro, Phase IV.

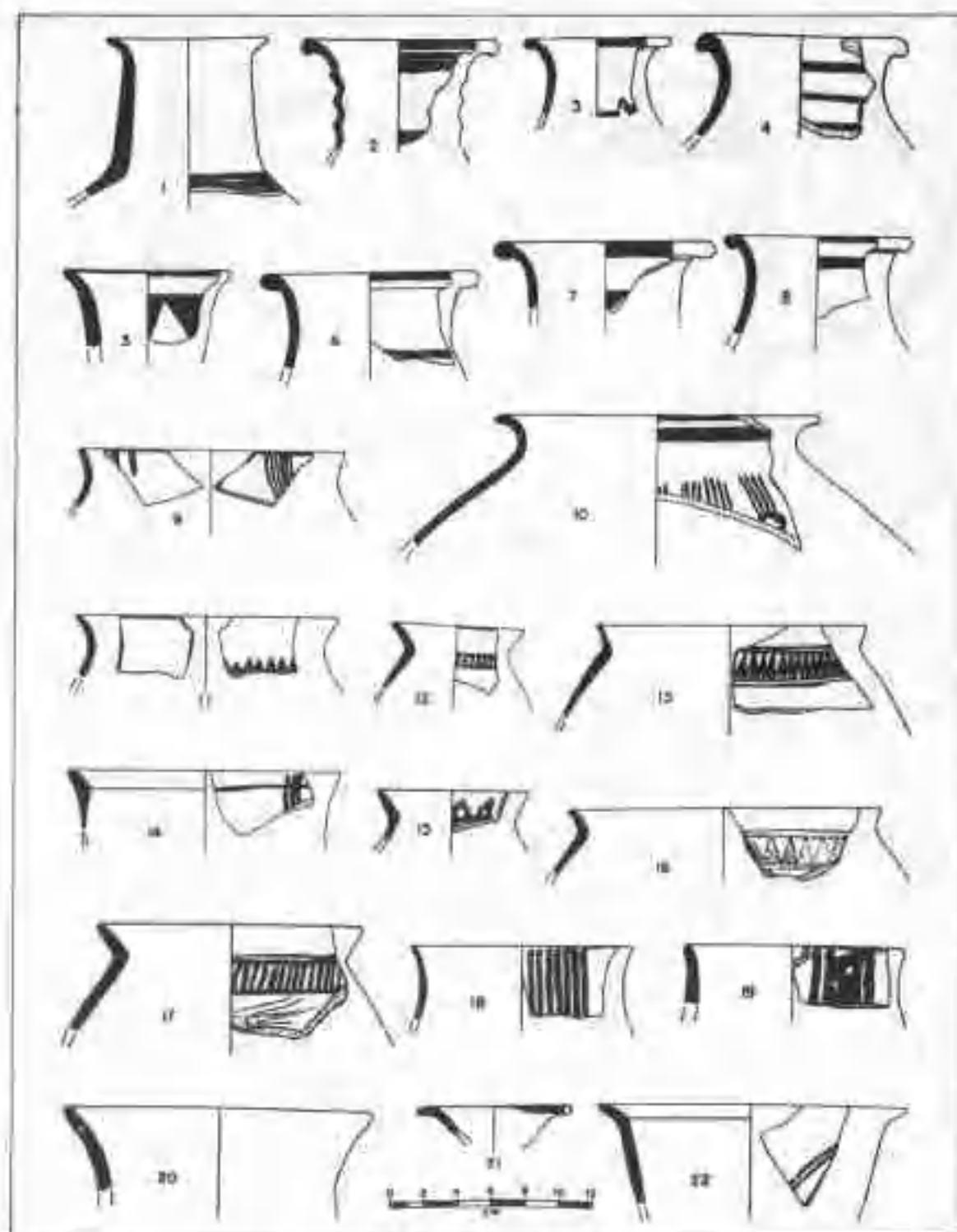


Fig. 56. Malwa Ware, Types, Phase IV.

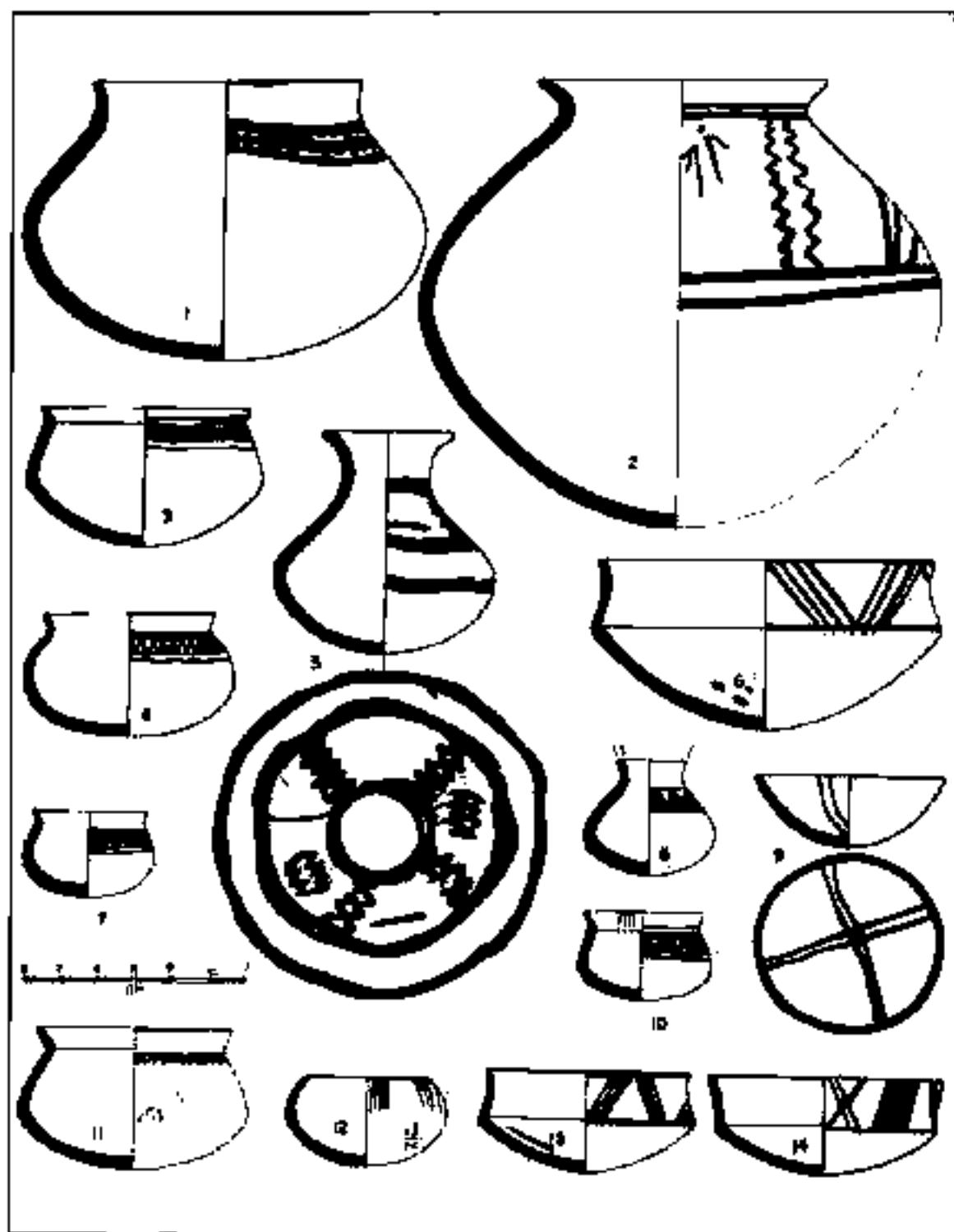


Fig. 37. Malwa Ware, types, Plate IV.

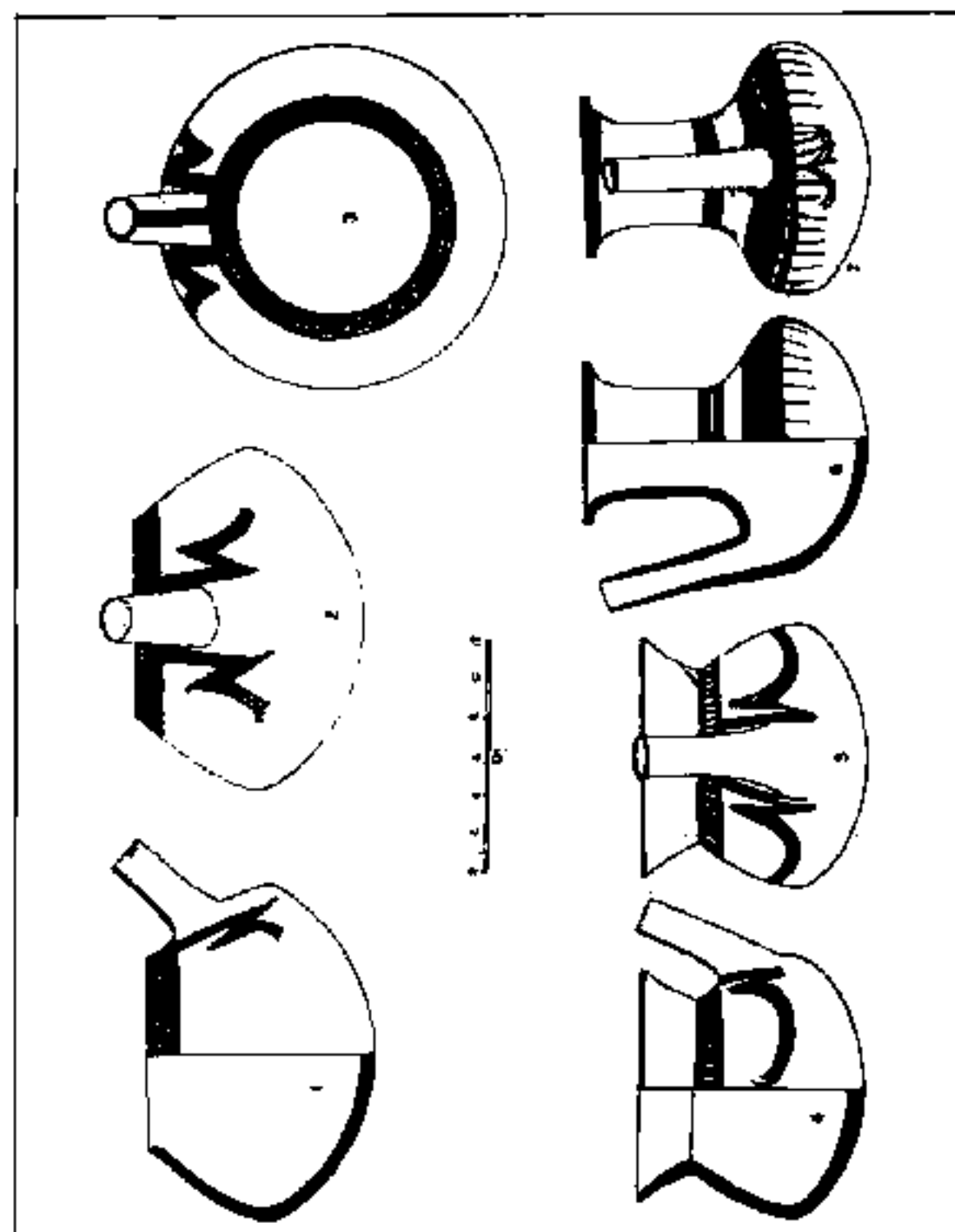


Fig. 58. Figural Schematization. 1-3, Malwa Ware, 800-700 B.C.

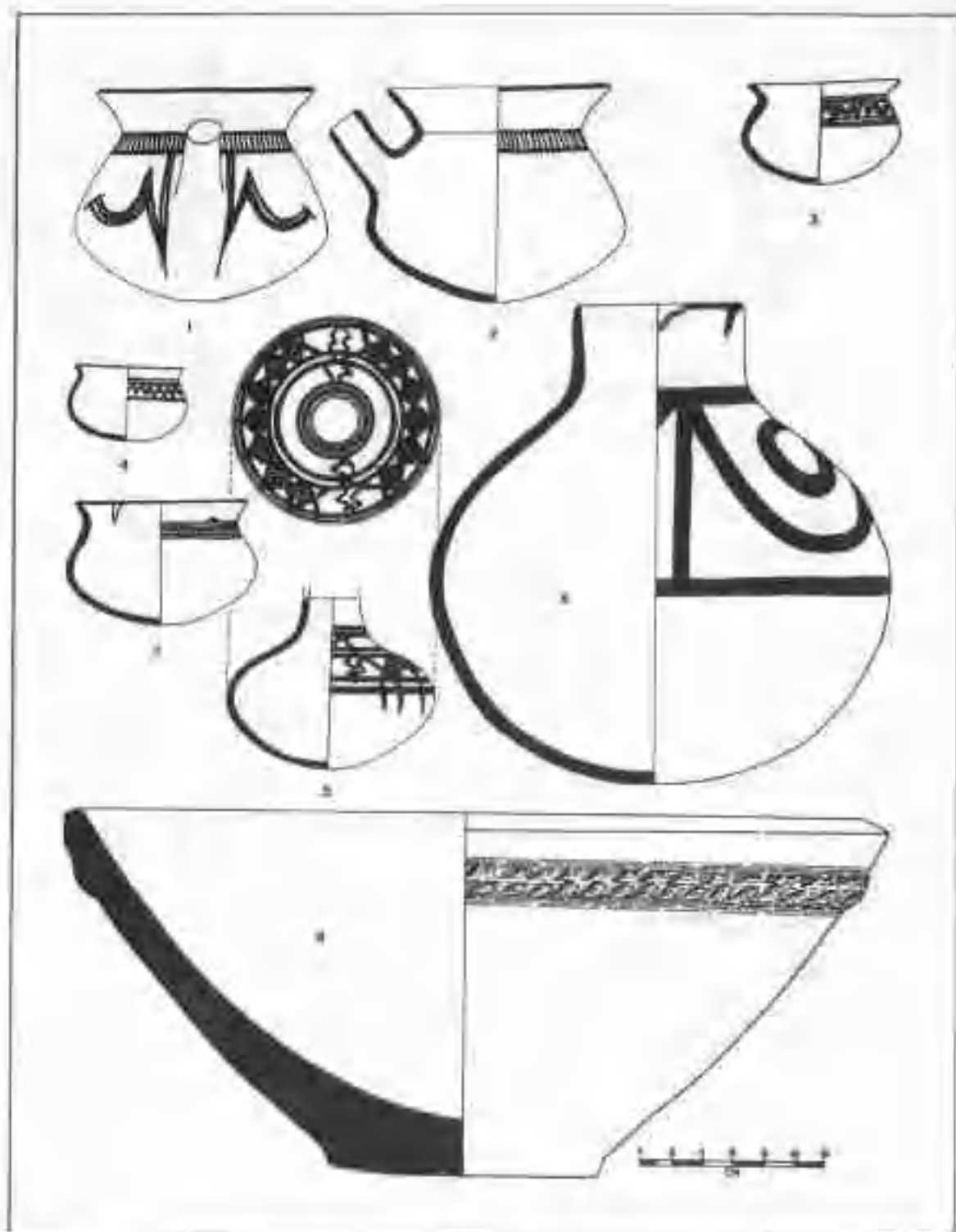


Fig. 55. 1-7, Malwa Ware; 8 Thick Coarse Ware, Phase IV.

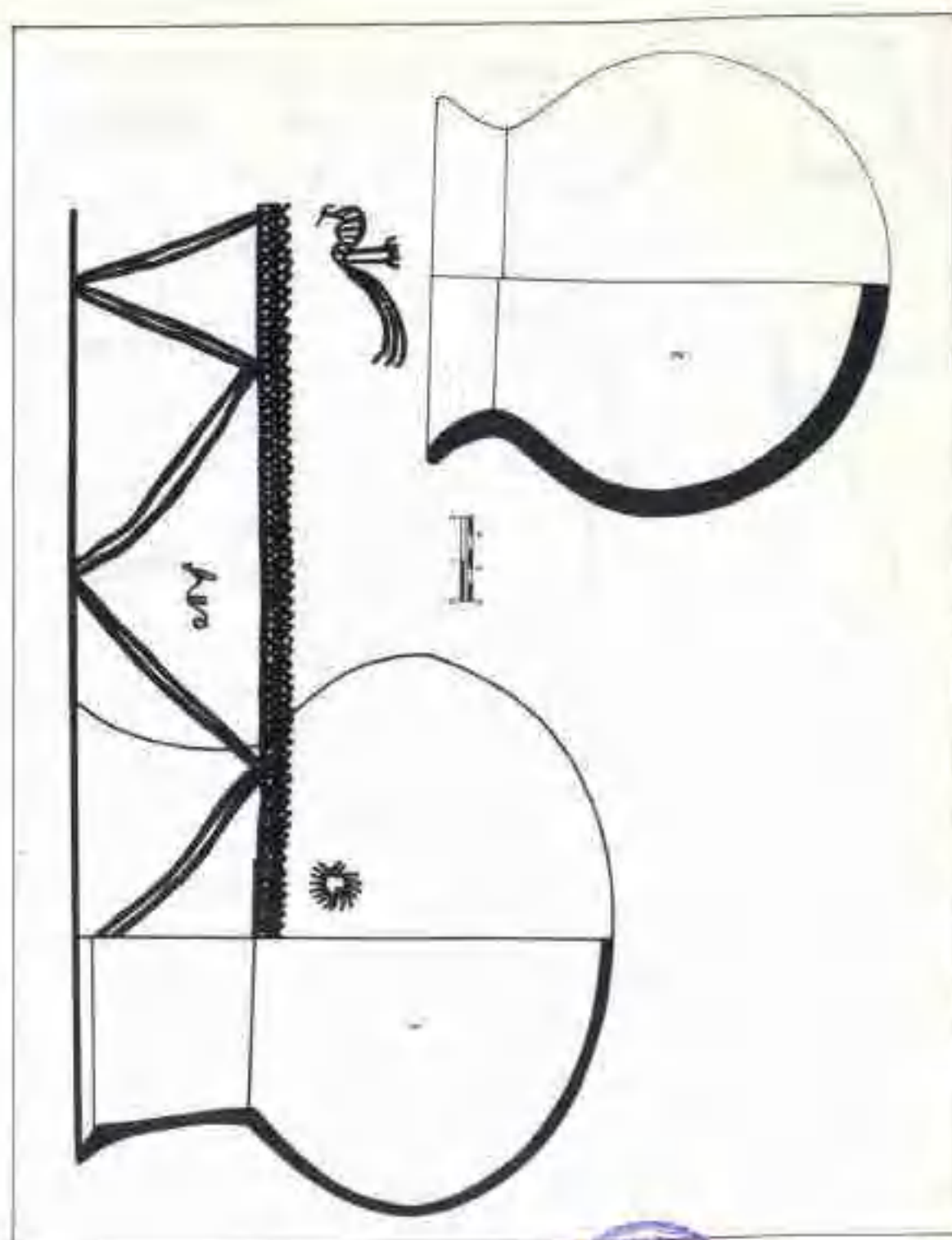


Fig. 60. Burial Urn: Burial 73, 1, Malwa Ware, 2, Burnished Gray Ware, Phase IV



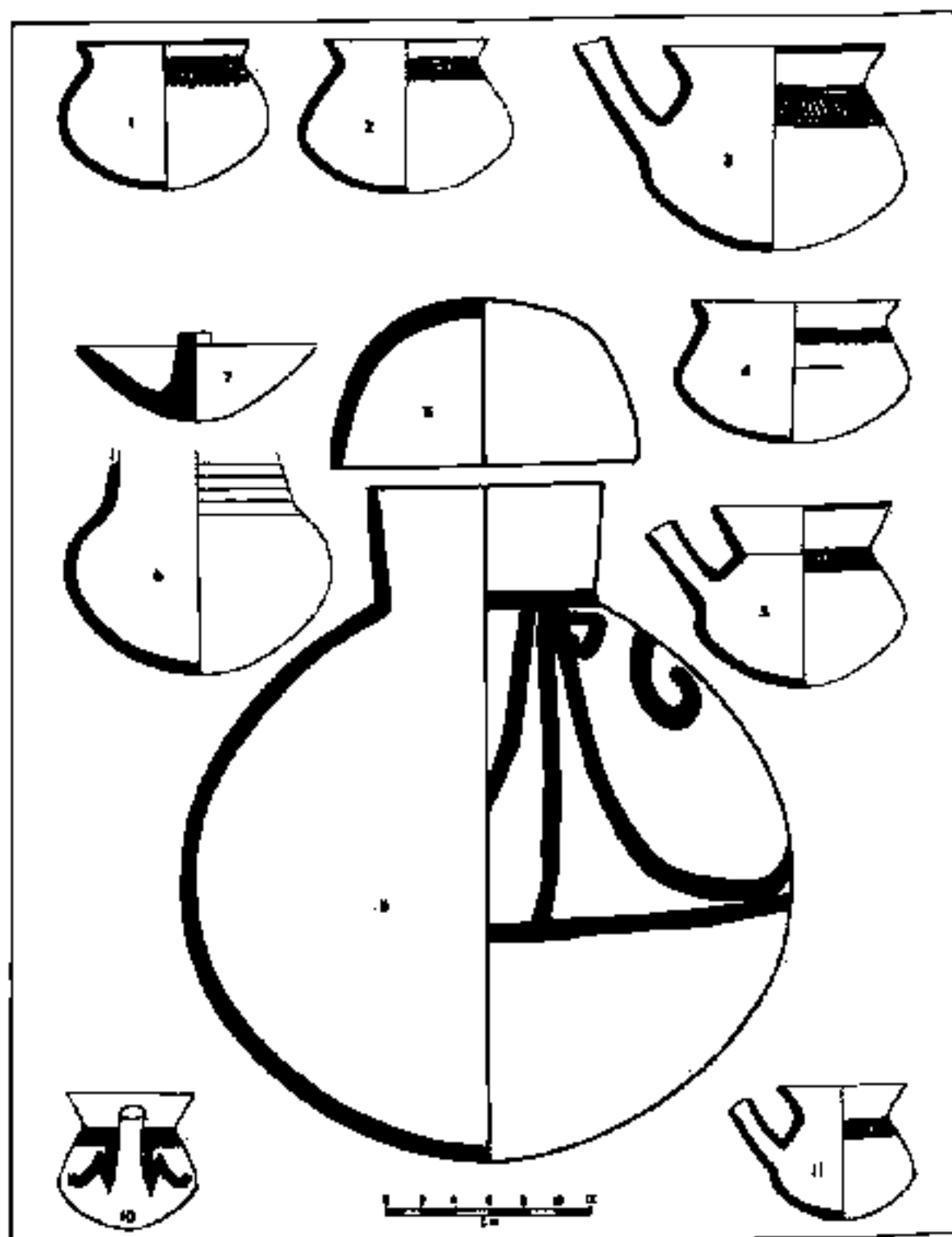


Fig. 61. Neolithic pottery. Phase IV.

(13) bowl with channel spout (fig. 52, 19, 20, 24 and 27); (14) stem of bowl or dish-on-stand (fig. 52, 21–23 and 25); (15) *loti* with concave sides, outcurved featureless rim and globular body (fig. 57, 5); (16) *Chambu* with bottle-neck and squat globular body (fig. 59, 7); (17) miniature pots (fig. 52, 14–16); (18) *Loti* (fig. 57, 8; pl. LXXXV, 11); (19) vase with high corrugated neck and beaded undercut rim (fig. 56, 2); (20) vase with high narrow neck and outcurved rim (fig. 56, 1); (21) vase with splayed out mouth and oblique shoulder (fig. 56, 10, 12, 13, 15, 16 and 17); (22) vase with splayed out mouth and globular body (fig. 57, 2); (23) vase with cylindrical neck and globular body (fig. 59, 6 and 61, 9); (24) vase with vertical neck, slightly outcurved internally bevelled rim and bulbous body (fig. 60, 1) and (25) miniature lid with flat topped short cylindrical knob (pl. LXXXVII, 6). The types 23 and 24 occurred also as burial urns. The types 1, 2, 4, 5, 7–11, 17 and 18 are absent in the Malwa Ware of Madhya Pradesh. The types 4, 7, 9, 10, 22 and 24 have analogues at Chandoli. The types 22 represented burial urn of burial 57 of overlap phase between Phase IV and Phase V. The types 1–8, 23 and 24 occurred in association, with residences as well as burials. The spouts were of two types, (1) tubular and (2) channel or lipped, the former being luted to the body. In general they are slightly curved and constricted in the middle widening towards the end. Occasionally well-shaped tubular spouts little tapering towards the end were also found.

Among the above listed types, 1 and 9 deserve special mention. In both the examples occurs a peculiar painted design on either side of the tubular spout. When looked from the front facing the spout, the pot appears to be a figural schematization of a female with her thighs stretched apart and the male penis inside the vagina, the vertical painted pair of lines on either side representing the perineum and the connected concave curved lines the buttocks. Schematization of buttocks also occurred in graffiti on the Malwa Ware and burnished grey ware, the male organ below the buttocks being represented on the former by two parallel lines (fig. 64, 29; pl. XC, 22). A similar type of figural schematization in painting occurred on the *handi*-type vase with tubular spout in Jorwe Ware at Inamgaon but the painted design has been described as that of a boat. On the Jorwe Ware at Daimabad figural schematization was represented in graffiti (fig. 58, –7; pl. CV, 1).

The selected examples of paintings and types are illustrated in figs. 52–61 and pls. LXXXII–LXXXV.

Fig. 52

1. Shoulder-fragment of a vase of orange ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with perhaps cross-hatched diamonds. Also pl. LXXXVI, 2.
2. Shoulder-fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a horizontal band, a pair of vertical

29. Deo and Anand, *op. cit.* (1965), figs. 34 and 35.

30. Sankalia, *op. cit.* (1974), fig. 204.

- crinkled lines below and a loop surmounted by oblique strokes. Also pl. LXXXII, 1.
3. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a wavy line.
 4. Shoulder-fragment of a vase of orange ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with four strokes rising from a solid semi-circle and a horizontal band above. Also pl. LXXXII, 14.
 5. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with an indeterminate design.
 6. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with loop-and-chain pattern. Also pl. LXXXII, 10.
 7. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a design consisting of three curved lines and oblique strokes below the lowest line. Also pl. LXXXII, 9.
 8. Fragment of a vase of red ware. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with a horizontal band, a vertical line above and cross-hatched diamond below. Also pl. LXXXII, 16.
 9. Fragment of a vase of orange ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with curved lines above a horizontal band. Also pl. LXXXII, 6.
 10. Shoulder-fragment of a vase of red ware. Of coarse fabric, it is treated on the outside with a slip and is painted in black on the outside with a horizontal band and a group of five strokes below.
 11. Fragment of a vase of orange ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a fish tail.
Also pl. LXXXII, 11.
 12. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a horizontal band and an indeterminate design.
 13. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted on the outside in black with three lines on its right and two curved on the left down below. Also pl. LXXXII, 20.
 14. Fragment of a miniature vase of orange ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with horizontal bands.
 15. Neck-fragment of a miniature vase of orange ware with a bottle-mouth. Of fine fabric, it is treated on the outside with a slip and is painted in black on the inside and outside with a rim-band and on the outside with a horizontal band below.
 16. Fragment of a *loti* of orange ware with a bluntly carinated body. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with two horizontal bands, double semi-circular lines on the upper of the two bands, a crinkled vertical line and a horizontal band above. Also pl. LXXXII, 18.
 17. Neck fragment of a vase of black-and-red ware with an out-turned thickened rim. Of fine fabric, it is treated both on the outside and partly on the inside with a slip and burnished.

18. Fragment of a vase of black-and-red-ware with an outcurved sharpened rim and convex profile. Of medium fabric, it is treated on the outside and inside with a slip and burnished.
19. Fragment of a channel spout of orange ware. Of fine fabric, it is treated on both the sides with a slip and is painted on the inner side with a band on the lip, and two pairs of horizontal crinkled line in between. Also pl. LXXXII, 17.
20. Bowl of orange ware with a lipped channel and oblique sides. Of fine fabric, it is treated on the inside and outside with a slip and is painted in black on the inside of the lip with a thick line and on the outside on the shoulder with tanged arrowhead motif between pairs of horizontal bands and indeterminate designs below. Also pl. LXXXII, 15.
21. Fragment of a bowl or dish on stand. Of fine fabric, it is treated on the inside and outside with a slip and is painted in black on the outside with a pair of oblique lines and an intersecting line above a horizontal band.
22. Stand of red ware with a hollow stem. Of fine fabric, it is treated on the outside with a slip and is painted in black on the inside and outside with a horizontal band at the base.
23. Stand of orange ware with hollow stem. Of fine fabric, it is treated with a slip and is painted in black on the inside of the dish or bowl with a porter's mark consisting of four horizontal lines and on the stem with a crinkled vertical line between horizontal bands.
24. Lipped bowl of yellowish orange ware with a convex body and a prominent lip. Of fine fabric, it is treated both on the inside and outside with a slip.
25. Stem of dish or bowl on stand of orange ware with a hollow stem.
26. Lipped bowl of pink ware with a prominent lip and convex body.
27. Lip of a bowl.
28. Bowl of red ware with a short pedestal base and splayed out sides.
29. Bowl of orange ware with a wavy outcurved rim and convex body.

Fig. 53: pl. LXXXIII.

1. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a motif of dog probably in sitting position.
2. Fragment of a vase of chocolate ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a motif of dog with elongated neck.
3. Fragment of a vase orange ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a motif of dog, perhaps in agitated mood.
4. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a dog motif and a pair of oblique lines.
5. Fragment of a vase of blotchy orange ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a motif of dog, perhaps in agitated mood, and a festoon design between horizontal bands below.
6. Fragment of a vase of yellowish ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a motif of dog, perhaps in moving or

walking position.

7. Fragment of a vase of red ware. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with a pair of dogs in united posture above two horizontal bands.
8. Fragment of a vase of orange ware. Of fine fabric, it is treated with a slip on the outside and is painted in black on the outside with a motif of dog and two oblique lines.
9. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a motif of dog.
10. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a motif of dog above horizontal band.
11. Fragment of a vase of blotchy orange ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a motif of dog above horizontal bands and two oblique lines.
12. Fragment of a vase of blotchy red ware. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with a motif of dog and a pair of oblique lines.
13. Fragment of a vase of red ware. Of fine fabric, it is painted in black on the outside with a motif of dog and a pair of horizontal wavy lines between horizontal bands.
14. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a motif of dog and two pairs of oblique lines meeting in an angle above the dog.
15. Fragment of a vase of orange ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a motif of dog and a wavy line between horizontal bands.
16. Fragment of a vase of blotchy red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a motif of dog and a festoon design between horizontal bands.
17. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a motif of dog and a pair of oblique lines.
18. Fragment of a vase of orange ware. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with a motif of dog and two oblique lines.
19. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a motif of dog above horizontal band.
20. Fragment of a vase of red ware. Of fine fabric, it treated on the outside with a slip and is painted in black on the outside with a motif of dog.
21. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a motif of dog and a festoon design between horizontal bands.
22. Fragment of a vase of yellow ware. Of fine thin fabric, it is treated on the outside with a slip and is painted in black on the outside with a motif of dog, two horizontal bands and two oblique lines.

23. Fragment of a vase of red ware. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with a motif of dog and two oblique lines.
24. Fragment of a vase of yellow ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a motif of dog and two oblique lines.
25. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a motif of dog and a horizontal band.
26. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a hind portion of an animal with a tail and two oblique lines.
27. *Loti* of orange ware with splayed out mouth and globular body. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside in a compartment, a stylized human figure standing in a pool of water or on the bank of a stream with fish and aquatic plants around him.
28. Fragment of a vase of red ware. Of coarse fabric, it is treated on the outside with a slip and is painted in black on the outside with a motif of deer.

Fig. 54: pl. LXXXIV

1. Solid single dot. On the outside of a fragment of chocolate ware.
2. Solid single dot and another mark. On the outside of a fragment of orange ware.
3. Two solid dots, one below the other, in oblique position. On the outside of a fragment of chocolate ware.
4. Two solid dots, one by the side of the other in oblique position. On the outside of a fragment of a red ware.
5. Two horizontally placed solid dots. On the outside of a fragment of orange ware.
6. Incomplete. On the outside of a fragment of red ware.
7. Star with solid pillets at the end of the radial lines. On the outside of a fragment of orange ware.
8. Same as 7 above. On the outside of reddish ware.
9. Astrik mark. On the outside of a fragment of red ware.
10. One horizontal line. On the outside of a fragment of red ware.
11. Two horizontal lines. On the outside of a fragment of red ware.
12. Three horizontal lines. On the outside of a fragment of brown ware.
13. One oblique line and a forked line. On the outside of a fragment of orange ware.
14. Forked line. On the outside of a fragment of orange ware.
15. A forked line and incomplete mark. On the outside of the rim of a vase of orange ware with outcurved rim.
16. A *triskula* and an intersecting thick line. On the outside of a fragment of orange ware.
17. Double-hooked line. On the inside of a fragment of red ware.
18. Opposed 'V'. On the inside of a fragment of red ware.
19. Horizontal wavy line. On the outside of a fragment of red ware.

20. Incomplete. On the inside of a fragment of red ware.
21. Arrow. On the inside of a fragment of a rim of red ware.
22. Arrow (?). On the outside of a fragment of blotchy orange ware.
23. Plant-like. On the outside of a fragment of red ware.
24. Horizontally placed plant. On the outside of a fragment of red ware.
25. Incomplete. On the inside of a fragment of red ware.
26. Vertical strokes below horizontal line. On the inside of a fragment of red ware.
27. Two curved lines. On the inside of a fragment of red ware.
28. Fork with wavy lines. On the inside of a fragment of red ware.
29. 'D' pattern. On the inside of a fragment of red ware.
30. Incomplete. On the inside of a fragment of orange ware.
31. An oblique line with oblique strokes on one side. On the outside of a fragment of red ware.
32. Incomplete. On the outside of a fragment of red ware.

Fig. 55

1. Bowl of orange ware with a dull carination at the base and outcurved pointed rim. Of medium fabric, it is treated both on the outside and inside with a slip and is painted in black on the outside with a rim-band and a group of four vertical lines between horizontal bands. Also pl. LXXXII, 4.
2. Bowl of red ware with a slightly outcurved sharpened rim. Of medium fabric, it is treated both internally and externally with a slip and is painted in black on the outside with loops surmounted by vertical strokes.
3. Bowl of orange ware with outcurved featureless rim and blunt carination. Of fine fabric, with a slip on the outside and the inside and is painted in black on the inside with a rim-band and on the outside with groups of four oblique lines standing on a horizontal band and going apart from each other. Also pl. LXXXII, 21.
4. Incurved bowl of red ware. Of fine fabric, it is treated both internally and externally with a slip and is painted in black on the outside with vertical strokes, pointed at the lower end.
5. Incurved bowl of red ware. Of fine fabric, it is devoid of slip.
6. Bowl of red ware with slightly outcurved featureless rim and convex body. Of fine fabric, it is treated both on the inside and outside with a slip and is painted in black on the outside with a horizontal band.
7. Bowl of pink ware with slightly outcurved featureless rim and bluntly carinated body. Of fine fabric, it is treated both on the inside and outside with a slip and is painted in black with a rim-band internally and externally.
8. Bowl of red ware with concave sides and carinated body. Of fine fabric, it is treated on the inside with a rim band and on the outside with registers of alternately cross-hatched

and black squares between horizontal bands. Also pl. LXXXII, 19.

9. Bowl of red ware with slightly outcurved featureless rim and bluntly carinated body. Of fine fabric, it is treated on the inside with a rim-band and on the outside with converging groups of oblique lines between horizontal bands.
10. Bowl of orange ware with slightly outcurved featureless rim and round body. Of medium fabric, it is treated both on the inside and outside with a slip and is painted in black on the outside with vertical lines.
11. Bowl of red ware with slightly beaded outcurved rim and round body. Of medium fabric, it is treated with a slip internally and externally and is painted in black on the inside with a rim-band and on the outside with converging groups of lines between the rim-band and the thick band below.
12. Bowl of orange ware with a carinated body and slightly outcurved featureless rim. Of fine fabric, it is treated on the outside and inside with a slip and is painted in black on the outside with a rim-band and loops above a horizontal band.
13. Bowl of red ware. Of fine fabric, it is treated on the inside and outside with a slip and is painted in black on the outside with a rim-band, a solid single dot and a crinkled line above a horizontal band. Also pl. LXXXII, 22.
14. Bowl of red ware. Of fine fabric it is treated with a slip both from inside and outside and is painted in black on the inside and outside with a rim-band and on the outside a group of six vertical lines below.
15. Bowl of orange ware with slightly outcurved rim and convex body. Of fine fabric, it is treated with a slip internally and externally and is painted in black on the outside with cross-hatched opposed triangles.
16. Bowl of orange ware with a sharpened rim and round body. Of medium fabric, it is treated both on the outside and inside with a slip and is painted in black on the inside with a rim-band and two lines.
17. Bowl of red ware. Of fine fabric, it is treated on the outside and inside with a slip and is painted in black on the outside with an indeterminate design, perhaps a boat (?), between horizontal bands.
18. Bowl of chocolate ware. Of fine fabric, it is treated on the outside and inside with a slip and is painted in black on the outside with a group of three oblique lines between horizontal bands and a potter's mark consisting of a crinkled horizontal line.
19. Bowl of red ware. Of medium fabric, it is treated on the inside and outside with a slip and is painted in black on the inside with intersecting thick lines and a rim-band and on the outside with a rim-band.

Fig. 56

1. Neck-fragment of a vase of pink ware with a high narrow neck and outcurved featureless rim. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with a pair of horizontal bands at the junction of the neck and the

shoulder.

2. Neck-fragment of a vase of red ware with a corrugated neck and outcurved beaded rim. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with horizontal bands.
3. Neck-fragment of a vase of red ware with a narrow neck and outcurved beaded rim. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a rim-band and a horizontal band below.
4. Neck-fragment of a vase of red ware with outcurved beaded rim. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with horizontal bands.
5. Neck-fragment of a vase of red ware with an outcurved featureless rim and narrow neck. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with a rim-band and inverted cross-hatched triangles below a horizontal band. Also pl. LXXXII, 11.
6. Neck-fragment of a vase of orange ware with an out-turned slightly beaded rim. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with a rim-band and a horizontal band below.
7. Neck-fragment of a vase of orange ware with an out-turned slightly beaded rim and a ledge below. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a rim-band and a horizontal band below.
8. Neck-fragment of a vase of orange ware with an under-cut beaded rim. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with a rim-band and a horizontal band below.
9. Neck-fragment of a vase of red ware with an outcurved featureless rim. Of fine fabric, it is treated on the outside and inside with a slip and is painted in black on the outside with a rim-band and two vertical lines below and on the outside with a rim-band and a group of six oblique lines below.
10. Vase of red ware with a slightly rounded out-turned rim and globular body. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a rim-band, horizontal band below and perhaps loops surmounted by oblique strokes.
11. Vase of orange ware with a featureless outcurved rim. Of medium fabric, it is treated both externally and internally with a slip and is painted in black on the inside with a rim-band and on the outside with a crinkled line.
12. Neck-fragment of a vase of orange ware with an out-turned featureless rim. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with a rim-band and vertical strokes between horizontal bands.
13. Vase of orange ware with splayed out mouth and oblique shoulder. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a tanged arrow head motif between pairs of horizontal lines. Also pl. LXXXII, 5.
14. Neck-fragment of a vase of orange ware with out-turned thickened rim. Of medium fabric, it is treated on the outside and inside with a slip and is painted in black on the

outside with a group of three vertical lines intersected by a horizontal band.

15. Neck-fragment of a vase of red ware with splayed out mouth. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with roughly semi-circular designs above a horizontal band.
16. Neck-fragment of a vase of chocolate ware with splayed out mouth. Of fine fabric, it is treated on the outside with a slip and is painted in whitish colour at the junction of the neck and the shoulder with cross-hatched triangles between horizontal bands.
17. Vase of orange ware with a splayed out featureless rim and oblique shoulder. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with oblique lines between two horizontal bands above and one below. Lower down is an incomplete graffiti consisting of horizontally placed oblique lines and a hooked vertical line.
18. Neck-fragment of a vase of orange ware with almost vertical neck. Of fine fabric, it is treated on the outside and inside with a slip and is painted in black on the outside with a group of seven vertical lines.
19. Neck-fragment of a vase of orange ware with a slightly outcurved featureless rim. Of medium fabric, it is treated both internally and externally with a slip and is painted in black on the outside with a rim-band and a thick wavy vertical line between pairs of vertical lines. Also pl. LXXXII, 7.
20. Neck-fragment of a vase of orange ware with splayed out mouth. Of medium fabric, it is treated externally and internally with a slip.
21. Fragment of a miniature bowl of red ware with almost horizontally splayed out featureless rim. Of medium fabric, it is treated both from inside and outside with a slip and is painted in black on the outside with a rim band.
22. Bowl of orange ware with splayed out oval-shaped rim and splayed sides. Of fine fabric, it is treated on the outside and inside with a slip and is painted in black on the outside with two lines.

Fig. 57

1. Bowl of red ware with slightly outcurved featureless rim and squat bulbous body. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a festoon design and a horizontal band.
2. Vase of red ware with splayed out mouth and globular body. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with a pair of crinkled lines between pairs of horizontal bands. Burial urn of burial 57 of the overlap phase between Phase IV and Phase V.
3. Bowl of orange ware with outcurved sharpened rim, vertical sides and round base. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a rim-band and a horizontal crinkled line between pairs of horizontal lines. Also pl. LXXXVb.
4. Bowl of orange ware with outcurved featureless rim and squat globular body. Of fine

fabric, it is treated on the outside with a slip and is painted in black on the outside with a rim-band and a crinkled line between pairs of horizontal bands. Also pl. LXXXV, 6.

5. *Lota* of red ware with concave sides, outcurved featureless rim and globular body. Of fine fabric, it is treated with a slip on the outside and is painted on the outside in black with horizontal bands, pairs of close-spaced crinkled vertical lines forming a chain pattern, and two types of potter's marks one formed by a single horizontal line and the other by two crinkled lines meeting at either end.
6. Concave-sided carinated bowl of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with converging groups consisting of four lines each on the concave sides between horizontal bands. On the inside of the bowl is a potter's mark comprising three solid dots. Also pl. LXXXV, 8.
7. Miniature bowl of orange ware with outcurved sharpened rim and squat globular body. Of fine fabric, it is treated on the outside with a slip and is painted on the outside with a rim-band and a crinkled line between pairs of horizontal bands. Also pl. LXXXV, 10.
8. *Lota* of red ware with bulbous body. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a panel of cross-hatched triangles between horizontal bands. Also pl. LXXXV, 11.
9. Semi-circular bowl of red ware. Of fine fabric, it is treated both on the outside and inside with a slip and is painted in black with a rim-band and on the inside with intersecting pairs of lines. Also pl. LXXXV, 9.
10. Miniature bowl of blotchy orange ware with outcurved featureless rim and squat bulbous body. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a crinkled line between pairs of horizontal bands. It also bears a graffiti mark on the inside of the rim consisting of vertical lines.
11. Bowl of red ware with splayed out mouth, oblique shoulders and slightly carinated round base. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a rim-band and a festoon design. On the outside it also bears a graffiti mark which comprises a *trishula*, a fork and three strokes.
12. Incurved bowl of chocolate ware. Of fine fabric, it is treated both on the inside and outside with a slip and is painted in black on the outside with groups of vertical strokes. It also bears a graffiti mark consisting of a tree pattern.
13. Concave-sided carinated bowl of orange ware with tapering sides. Of fine fabric, it is treated with a slip both from inside and outside and is painted in black with a rim-band and converging groups of lines. On the inside is also painted a single horizontal line as a potter's mark.
14. Concave-sided carinated bowl of red ware. Of fine fabric, it is treated with a slip both from inside and outside and is painted in black with a rim-band and on the outside intersecting pairs of lines and groups of vertical lines.

Fig. 58

1-5 Bowl of yellowish orange ware with tapering sides, rimless narrow mouth, bluntly

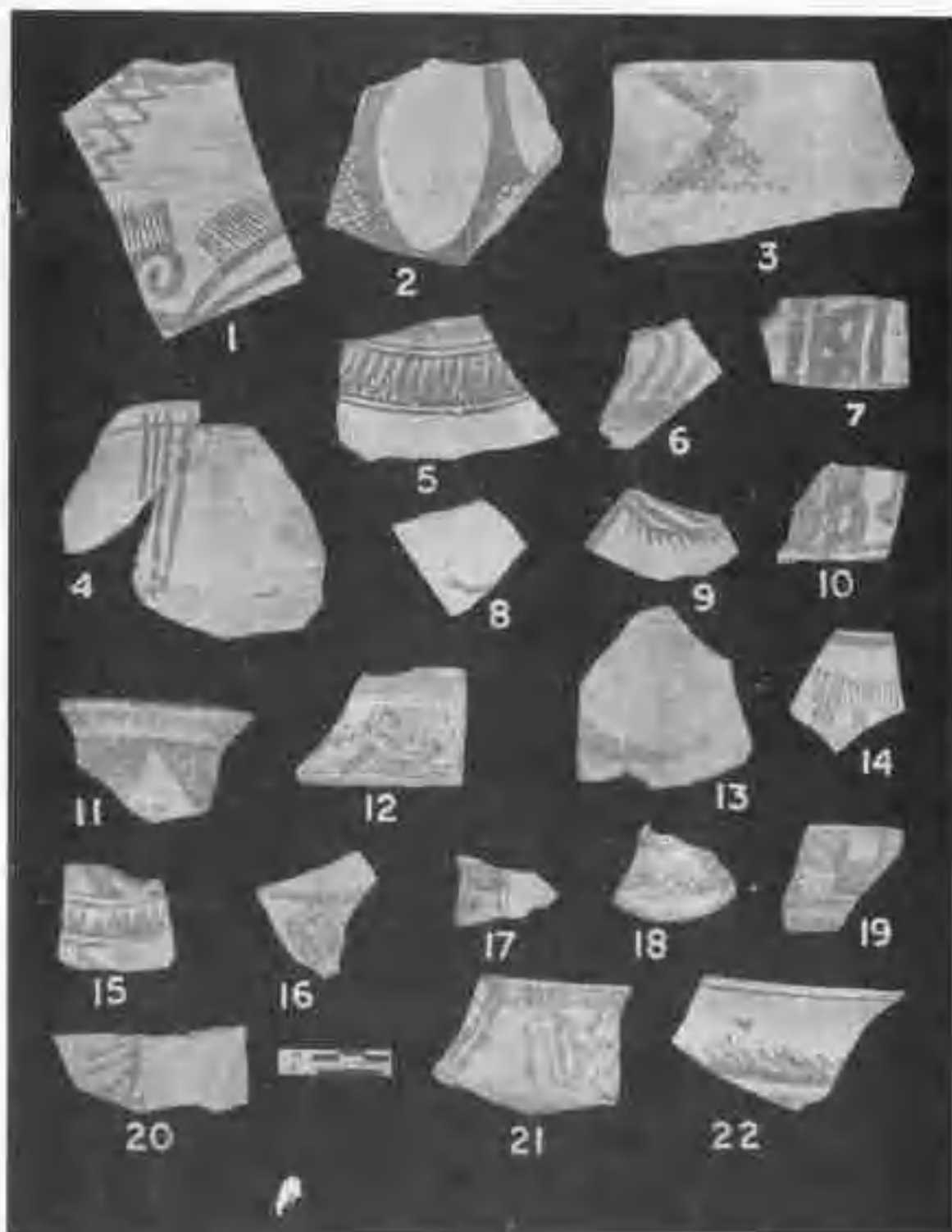


PLATE LXXXII Malva Ware, geometric designs, Phase IV.

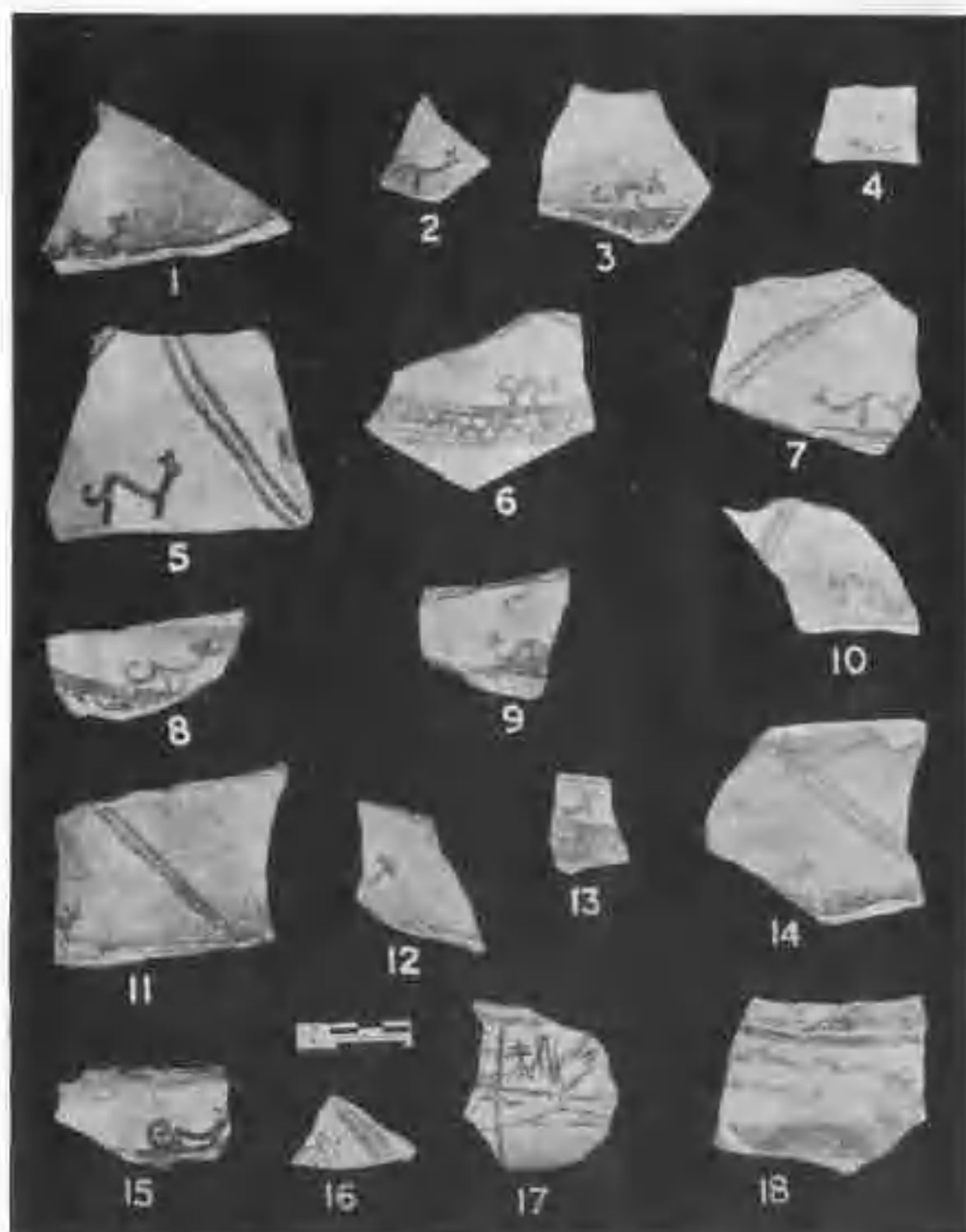


PLATE LXXXIII Mañcha Ware, animal motifs, Phase IV.

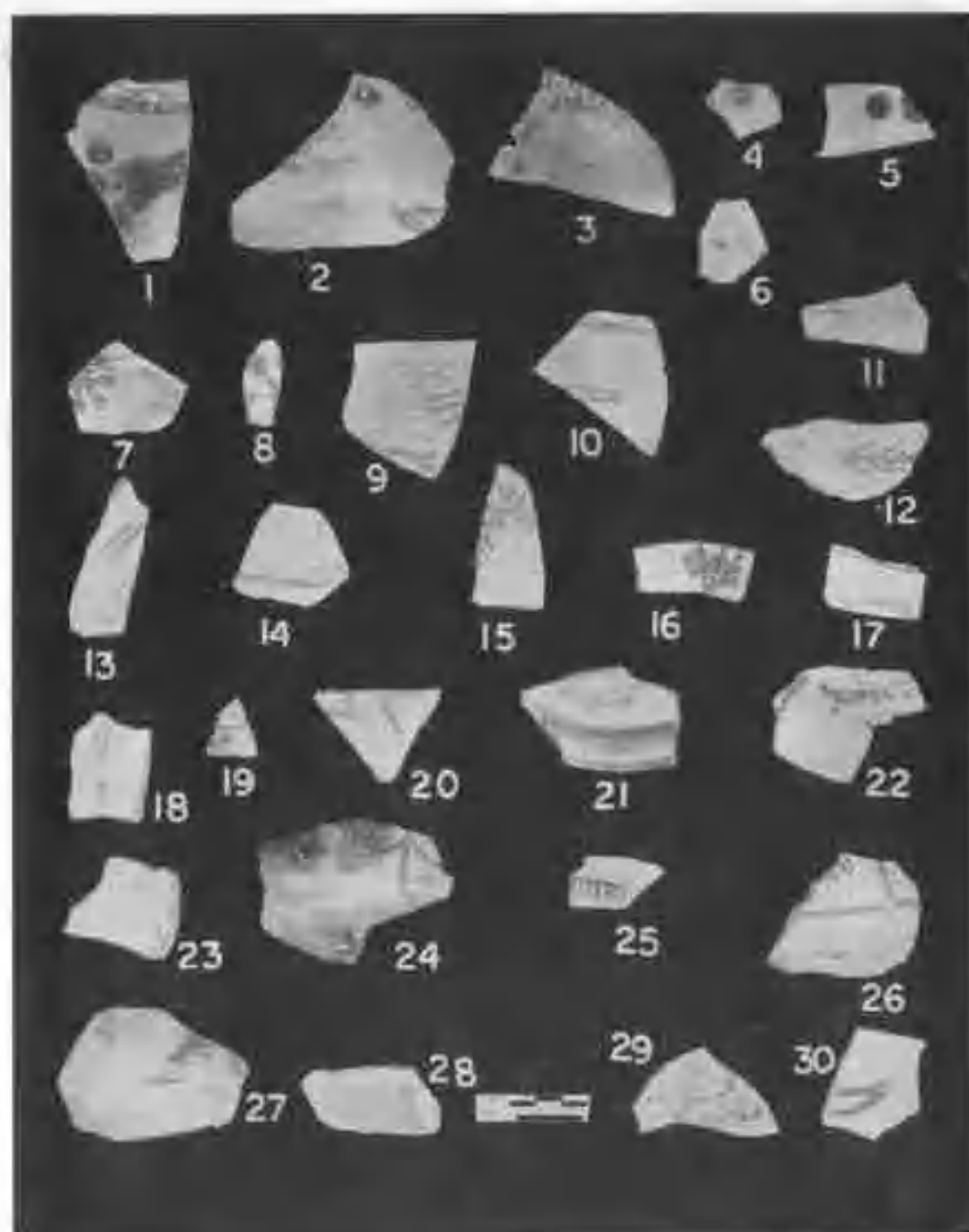


PLATE LXXXIV Malwa Ware, potter's marks, Phase IV.

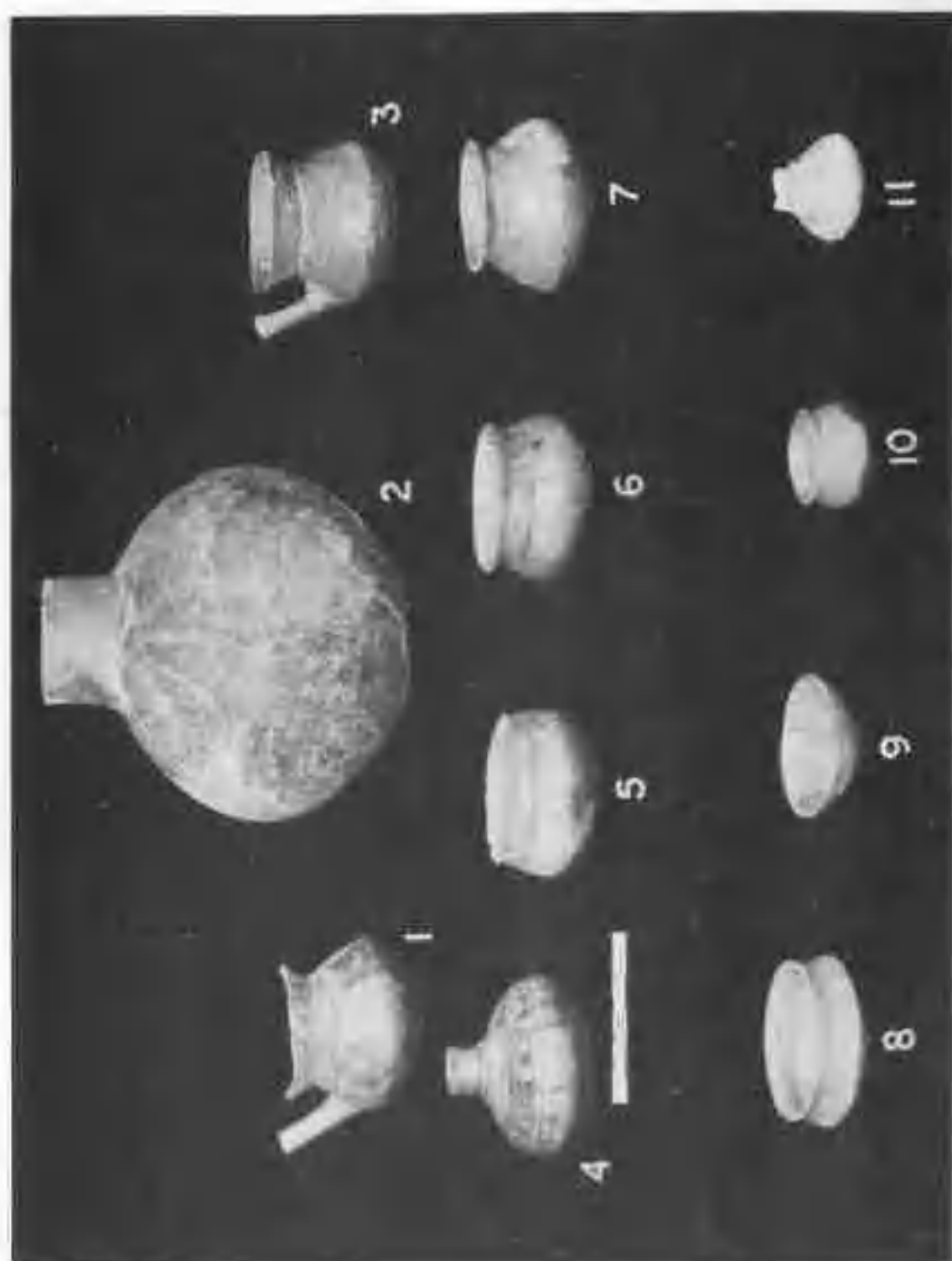


PLATE LXXXV Malwa Ware, types. Phase IV.

carinated body and tubular spout. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a crinkled line between pairs of horizontal bands, a straight line on the upper part of the spout, a band on the end of the spout and a figural schematization of buttocks on either side of the spout. 2 and 3 represent front and the top views respectively.

- 4-5 *Handi* of red ware with splayed out mouth and bluntly carinated body. Of fine fabric, it is treated on the outside and inside the rim with a slip and is painted in black on the outside with a rim-band, vertical short lines between horizontal bands at the neck, a straight line on the upper side of the spout, and a figural schematization of buttocks on either side of the spout. 4 and 5 represent side and front views respectively. Also pl. LXXXV, 1 and CV, 2.
- 6-7 *Chamba* of red ware with high narrow neck, outcurved square rim, squat globular body and tubular spout. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a rim-band, a pair of horizontal bands at the junction of the neck and the shoulder, crinkled vertical lines below, cross-hatched diamonds and triangles between horizontal bands, vertical lines below and a band at the end and the joint of the spout. Below the spout is a graffitti schematizing the buttocks. 6 and 7 represent the side and the front views respectively. Phase V. Also pl. CV, 1.

Fig. 59

- 1-2 *Handi* of orange ware with tubular spout, funnel-shaped mouth and bluntly carinated body. Of fine fabric, it is treated with a slip and is painted in black on the outside with a rim-band, vertical strokes between horizontal bands at the junction of the neck and the shoulder and a figural schematization of stretched thighs and a penis inside the vagina. Also pl. LXXXV, 1.
3. Miniature bowl of orange ware with outcurved featureless rim and squat bulbous body. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a wavy line between pairs of horizontal bands.
4. Similar to 3 above but with a more globular form.
5. *Chamba* with bottle-neck and squat globular body. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with horizontal bands, pairs of crinkled lines and cross-hatched diamonds between horizontal bands. Also pl. LXXXV, 4.
6. Vase of red ware with globular body and vertical narrow neck. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with a vertical line and loops. Also pl. LXXXV, 2.
7. Bowl of orange ware similar to 3 and 4 above. On the inside of its rim is painted in black a V-shaped potter's mark and on the outside a crinkled line between pairs of horizontal bands.
8. *Ghamela* of thick coarse red ware with a short pedestal base and convex body. Of coarse

fabric, it is treated with a slip from outside and inside and is decorated near the rim with a horizontal band in applique with two rows of finger-tip depressions.

Fig. 60

1. Burial urn of orange ware with almost vertical neck, slightly outcurved internally bevelled rim and bulbous body. Of fine fabric, it is treated on the outside and on the inside of the rim with a slip and is painted in black on the outside with a rim-band, pairs of lines in pyramid shape, a standing dog motif with four feet and a curved tail below one of the pyramids on the neck, a festoon design in two rows at the junction of the neck and the shoulder and the motifs of sun and peacock on the shoulder. Burial 75.
2. Burial urn of burnished grey ware with splayed out mouth and globular body. Of coarse fabric, it is treated on the outside with a slip and burnished. Burial 75.

Fig. 61

1. Bowl of orange ware with outcurved featureless rim and squat bulbous body. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside and inside with a rim-band and on the outside with three horizontal bands and a horizontal crinkled line like a festoon below the lowest band. Burial 22.
2. *Handi* of red ware with a carinated body, splayed out mouth and without a spout. Of medium fabric, it is treated with a slip on the outside and is painted in black with a crinkled horizontal line between horizontal bands and a pointed oval-shaped solid dot as potter's mark below the lowest of the horizontal bands like a leaf of tree. Burial 28.
3. *Handi* of red ware with splayed out mouth and slightly curved tubular spout. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a rim-band and oblique lines between pairs of horizontal bands. Burial 24.
4. Bowl of orange ware similar to 2 above. Of fine fabric, it is treated on the outside with a pair of horizontal band and a crinkled horizontal line below the lower horizontal band, like a festoon, and below a potter's mark of wavy line like a snake motif. Burial 22.
5. *Handi* of red ware similar to 3 above but with an almost straight tubular spout. Burial 45.
6. Rimless burial urn of corrugated burnished grey ware with a corrugated neck and bulbous body. Of medium fabric, it is treated on the outside with a slip and burnished. Burial 29.
7. Lid of burnished grey ware. Saucer type with a slightly tapering knob flat on the top. Of medium fabric, it is treated with a slip and burnished. It was found covering the burial urn 6 above. Burial 29.
8. Burial urn with vertical narrow neck and globular body. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a horizontal band around the neck and on the belly and a loop design and a vertical line in between. The top of the vertical line is joined by a roughly circular thick line. Burial 55.

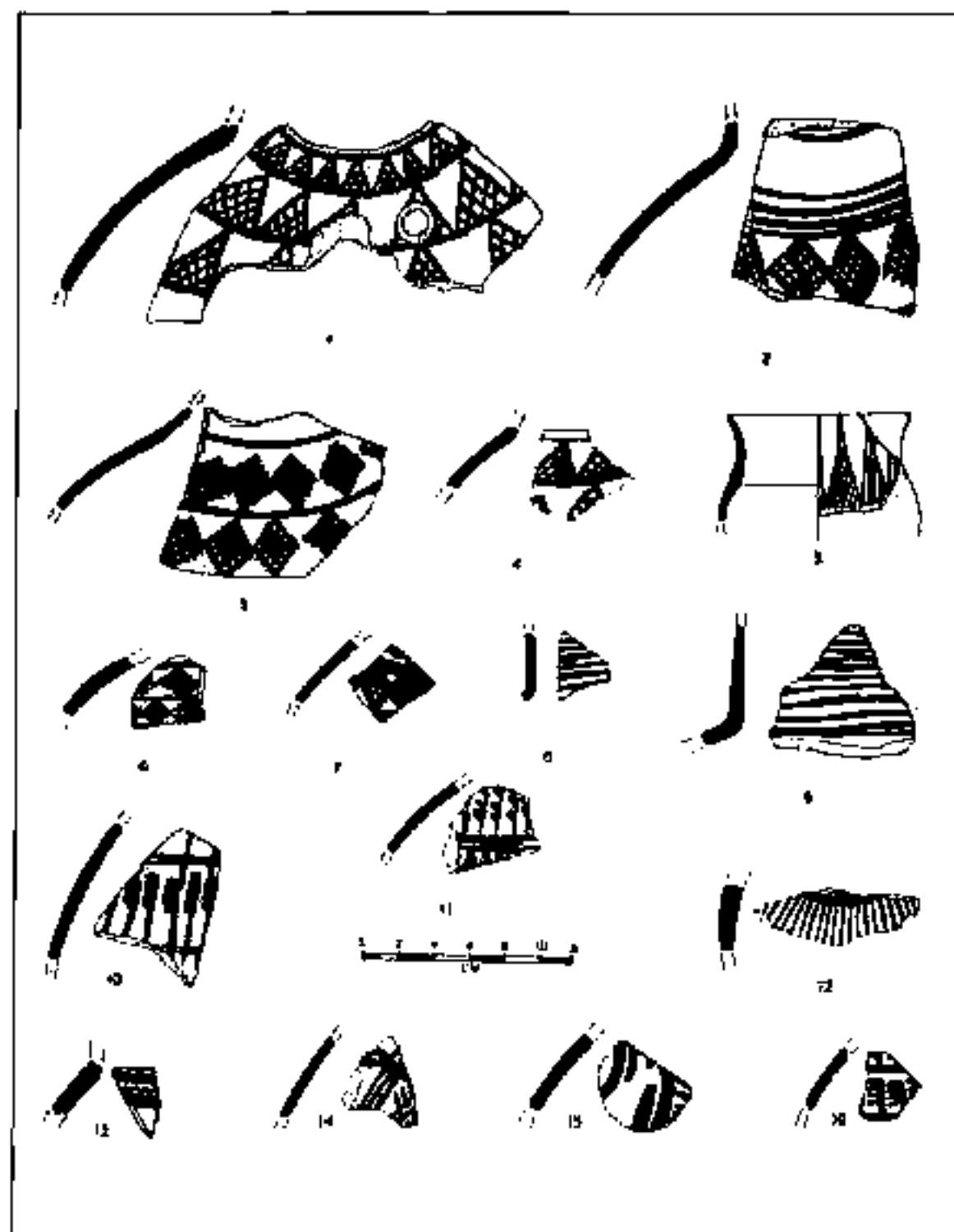


Fig. 63. Immaculate Dalmatian Ware. Plate IV.

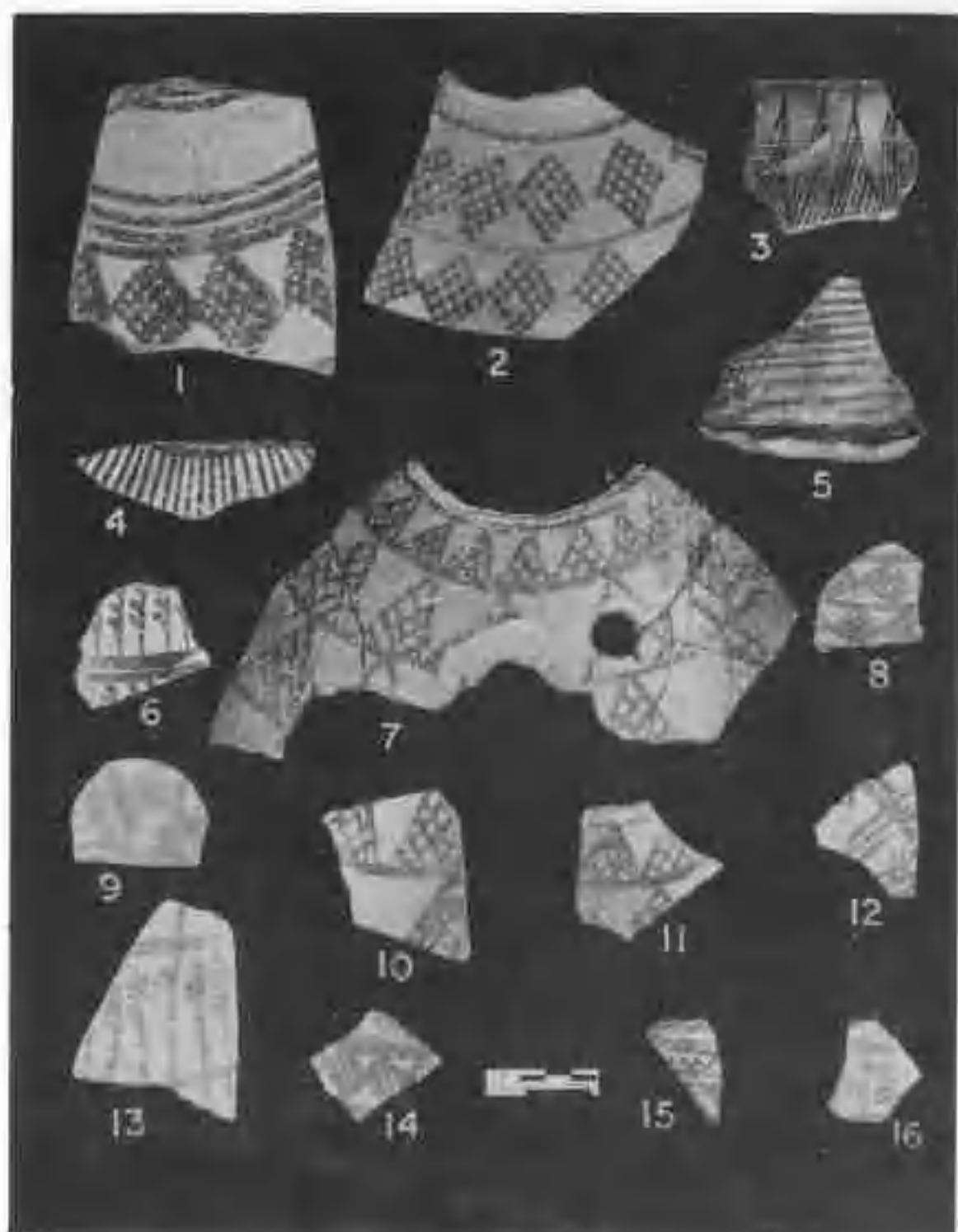


PLATE LXXXVI Imitation Daimabad Ware, Phase IV.

9. Bowl of burnished grey ware. Of coarse fabric, it is treated with a slip on the inside and outside and burnished. This bowl was found covering the burial urn 8 above, Burial 55.
- 10-11 Respectively the front and side views of miniature *Handi* of greyish pink ware with splayed out mouth carinated body and slightly curved tubular spout. Of fine fabric, it is treated on the outside with a slip and is painted on the outside with a row of vertical short lines between horizontal bands and a figural schematisation of buttocks on either side of the spout. Burial 57 (overlap phase between Phase IV and Phase V).

(ii) Imitation Daimabad Ware

A small number of sherds showing similarities with the Daimabad Ware were found in the levels of Phase IV. A close examination of these, however, showed that they are all imitations. This ware was produced in the same fashion as that of the Malwa Ware. Even the core of all these sherds is brick red or pink in contrast to that of the Daimabad Ware which showed an ivory black streak in the centre of the core. The painted designs in black are, however, similar to those on the latter ware, viz. panels of cross-hatched diamonds, lozenges and triangles between horizontal bands, panels of elongated triangles hatched by oblique lines, series of horizontal bands on the vertical narrow neck of the vase, handled comb-like designs, vertical lines below horizontal band and horizontal wavy line between horizontal bands. The style of paintings possesses all the characteristics of those of the Daimabad Ware.

The following sherds are illustrated.

Fig. 62 : pl. LXXXVI

1. Shoulder-fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with panels of cross-hatched triangles between horizontal bands. A hole was purposely bored in its shoulder.
2. Shoulder-fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with panels of cross-hatched diamonds between horizontal bands.
3. Shoulder-fragment of a vase of pink ware. Of fine fabric, it is treated on the outside with a slip and is painted on the outside with a panel of cross-hatched diamonds between horizontal bands.
4. Fragment of a vase of orange ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a panel of cross-hatched diamonds between horizontal bands.
5. Vase of chocolate ware with outcurved featureless rim and globular body. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a panel of hatched elongated triangles.
6. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and

is painted in black on the outside with panels of cross-hatched diamonds between horizontal bands.

7. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with cross-hatched diamonds between horizontal bands.
8. Neck-fragment of a vase of pink ware. Of fine fabric, it is treated on the outside with a slip and is painted on the outside in black with a series of horizontal bands.
9. Similar to 8 above, but of medium fabric.
10. Fragment of a vase of pink ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a register of handled-comb motif.
11. Fragment of a vase of pink ware. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with handled-comb motif.
12. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with radiating lines below a band.
13. Fragment of a vase of chocolate ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a crinkled line between pairs of horizontal lines.
14. Fragment of a vase of red ware. Of medium fabric, it is treated on the outside with a slip and is painted in black on the outside with three lines intersected by two lines and an indeterminate design.
15. Fragment of a vase of blotchy orange ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with an indeterminate design.
16. Fragment of a vase of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with handled-comb motif between horizontal bands.

(iii) Black-And-Red Ware

Of this class there are only two sherds present in the entire assemblage of pottery of the Malwa Phase. Of these, one is of a vase with high concave-sided narrow neck and out-turned thickened rim. Of fine fabric, it is treated on the outside and partly on the inside with a slip and burnished. It is deep red on the outside and black on the inside (fig. 52, 17). The second sherd is of a vase with out-turned pointed rim and convex profile. Of medium fabric, it is treated both externally and internally with a slip and burnished. It is reddish on the outside and black on the inside (fig. 52, 18).

(iv) Burnished Grey Ware

Further refinement in the production of the burnished grey ware over that of the preceding phases is clearly visible in this phase. Although handmade, it is well-finished. The clay contains coarse sandy material and the core shows airholes apparently due to the burning of vegetable material used as temper. The ware was treated with a slip and burnished. It was in-

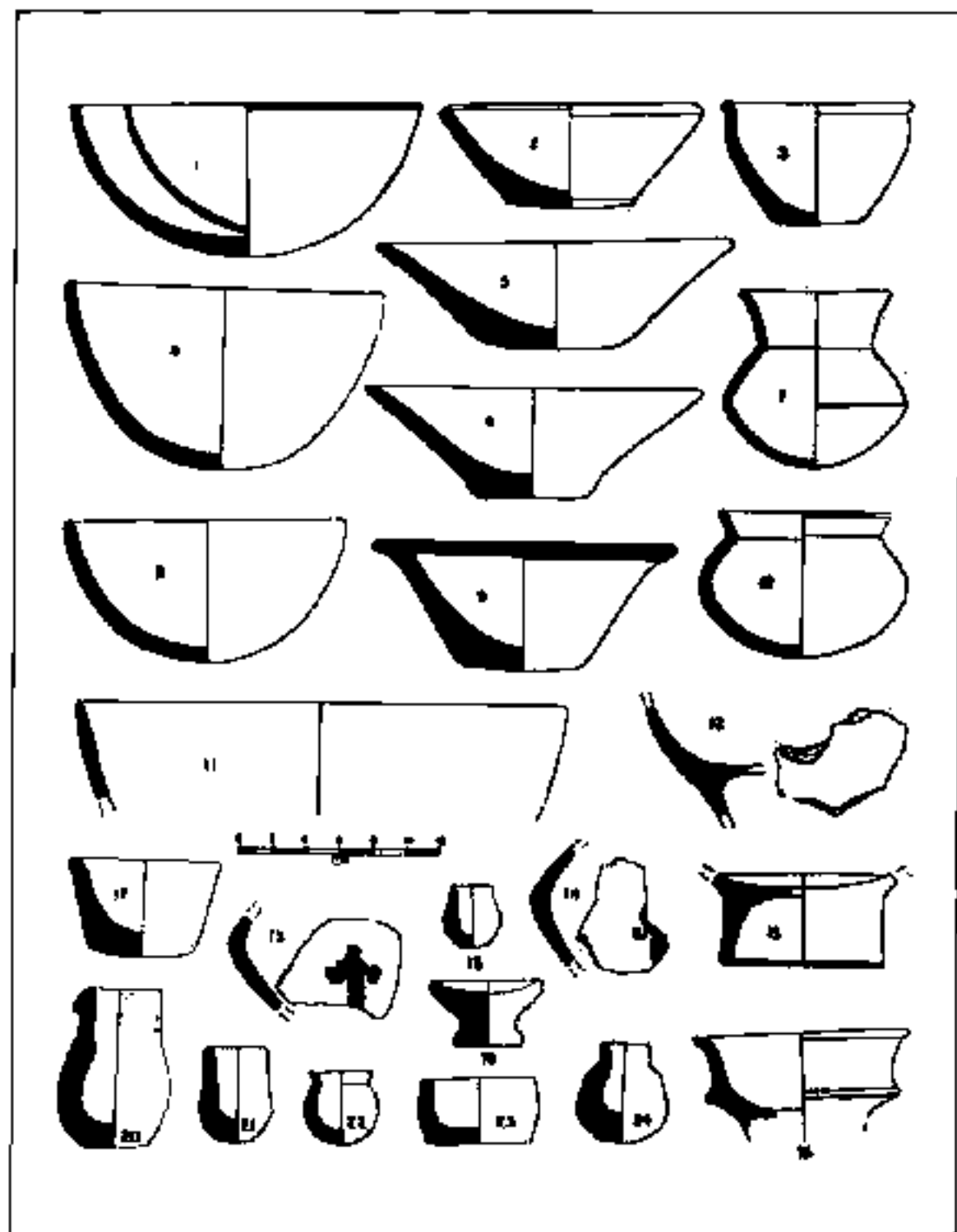


Fig. 65. Burnished Gray Ware and 17—24 Flaked Coarse Ware, Phase IV.

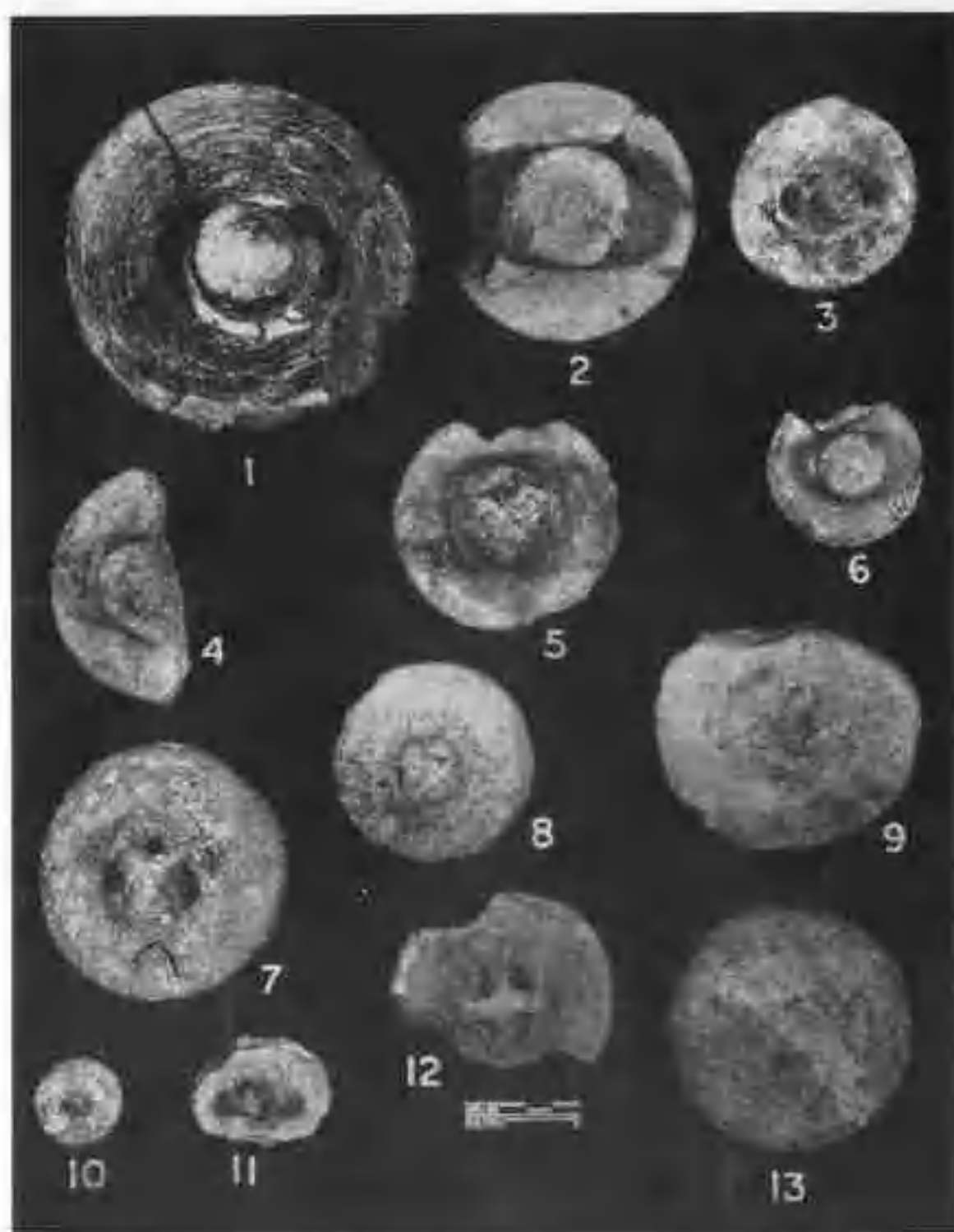


PLATE LXXXVII Lids, burnished gray ware, Phase IV.

sufficiently fired and the core shows black and grey colours. The ware consists of six varieties, viz. (1) plain, (2) decorated, (3) all-black and black-and-grey, (4) corrugated (5) lids and (6) lamps.

The plain variety is chiefly represented by burial urns with flared out mouth and bulbous body (figs. 60, 2, 63, 1 and 2, and 81, 5). The other types included bowl with splayed sides outcurved rim and almost flat base (fig. 63, 9); semi circular bowl (fig. 63, 1); bowl with outcurved rim and squat globular body (fig. 63, 10; cf. fig. 61, 1); bowl with flat base oval-shaped body and grooved rim (fig. 63, 3); bowl with flat base, splayed out sides and externally bevelled incurved rim with a groove from inside (fig. 63, 2); concave-sided carinated bowl-on-stand (fig. 63, 16); convex-sided bowl-on-stand (fig. 63, 12) and vase with ring-stand (fig. 63, 15). Occasionally a rim-band in ochre red colour occurs in the plain burnished grey ware. A few examples with paintings of a human figure in curly lines deserve special mention (fig. 63, 13 and 14). The human figure has turned its head to its right. It has a sharp pointed beak-type nose, receding forehead and over its head is a globular head-dress. Its body has been shown by only a vertical line and the curly line on its either side perhaps represents its long hair. The shoulders and the hands have been depicted by a loop on either side with a broad rounded end denoting the palms. There is something in front of its mouth over the right arm.

The decorations are in applique and incised, the former being chiefly finger-tip marks on applied bands on the neck (fig. 64) and on the top of rim and the latter as lines on the top of the rim. The main types included in this variety are platter with slightly raised edge, and *kunda*-type vase with splayed sides.

The examples of the third variety have come from burials. They are represented by bowls of U-shaped type (fig. 63, 4 and 8) and with flat base and splayed out sides (fig. 63, 5 and 6), besides a *loti* with splayed out mouth and carinated globular body (fig. 63, 7).

The corrugated variety was represented by a solitary example of a burial urn of burial 29 with a corrugated neck and globular body (fig. 61, 6). Its rim was missing. It was found covered with a lid of burnished grey ware of saucer type with slightly tapering knob (fig. 61, 7).

The types included in the lids are (1) saucer-type with cylindrical, T-shaped and tapering knobs (fig. 61, 7; pl. LXXXVII, 1); (2) bun-shaped (pl. LXXXVII, 13); (3) plano-convex with finger-tip depressions in the centre (pl. LXXXVII, 9); (4) convex base and raised upper side marked with finger tip depressions (pl. LXXXVII, 7 and 12); (5) convex base and short knob (pl. LXXXVII, 4 and 5) (7) miniature lids of saucer-type (pl. LXXXVII, 10 and 11). On the upper surface of three examples are incised marks or decorations (pl. LXXXVII, 4, 7 and 8).

Lamps were not noticed in the previous three phases. Those in the Malwa Phase are with and without stand. The former was represented by only one fragment with a protruding conical wick-end and vertical sides. In the latter are included circular, diamond-shaped and ovaloid on plan. The circular type is either with concave or flat base. The base of the diamond-shaped is flat. The oval-shaped lamps with broad lip for wick and shallow channels at the bottom meeting the wick-end are in two varieties. One of them has a convex base and sides and the other flat base and almost vertical sides (pl. LXXXVIII, 2 and 3).

The selected types are illustrated in figs. 63, 64 and 65.

Fig. 63

1. Semi-circular bowl of burnished grey ware. Of medium fabric, it is treated with a slip on the inside and outside and is painted in black on the inside with a line and in ochre red colour with a rim-band.
2. Bowl of burnished blotchy grey ware with a slightly convex base, splayed out sides and externally bevelled slightly incurved rim with a groove from inside. Of medium fabric, it is treated with a slip externally and internally and burnished.
3. Bowl of blotchy grey ware with flat base, oval body and slightly thickened rim. Of fine fabric, it is treated with a slip both from inside and outside and burnished.
4. U-shaped bowl of burnished blackish grey ware. Of fine fabric, it is treated on the inside and outside with a slip and burnished. This was found in the mouth of burial 25.
5. Bowl of all-black burnished ware with flattish base and splayed out sides. Of medium fabric, it is treated on the outside and inside with a slip and burnished. Burial 23.
6. Bowl of all-black burnished ware with a flat base and splayed out sides. Of medium fabric it is treated externally and internally with a slip and burnished. Burial 23.
7. *Lon* of all-black burnished ware with a splayed out mouth and slightly carinated round body. Of medium fabric, it is treated on the outside with a slip and burnished. Burial 27.
8. U-shaped bowl of all-black ware. Of medium fabric, it is treated with a slip from inside and outside and burnished. Burial 23.
9. Bowl of burnished grey ware with slightly convex base, splayed out sides and outcurved slightly thickened rim. Of medium fabric, it is treated from inside and outside with a slip and burnished and painted in red ochre colour with a rim-band. This was found as a cover in the mouth of the burial urn of burial 57. Of overlap phase between Phase IV and Phase V.
10. Bowl of burnished grey ware with splayed out mouth and squat bulbous body. Of medium fabric, it is treated with a slip on the outside and burnished. This type also occurs in the Malwa Ware.
11. Bowl of red ware. Of fine fabric, it is treated with a slip on the outside and inside.
12. Bowl-on-stand of burnished grey ware. Of medium fabric, it is treated on the outside and inside with a slip and burnished.
13. Fragment of a vase of burnished grey ware with carinated body. Of medium fabric, it is treated on the outside with a slip and burnished and is painted in black on the outside with a human figure with his head turned to the right, a sharp pointed beak-type nose, prominent forehead, a bulbous headwear, hands represented by curved lines with thick round end and body by a vertical line flanked by curly long hair. In front of his head is some object.
14. Fragment of a vase of burnished grey ware similar to 13 above. It is painted on the outside with a figure perhaps similar to the one described above.

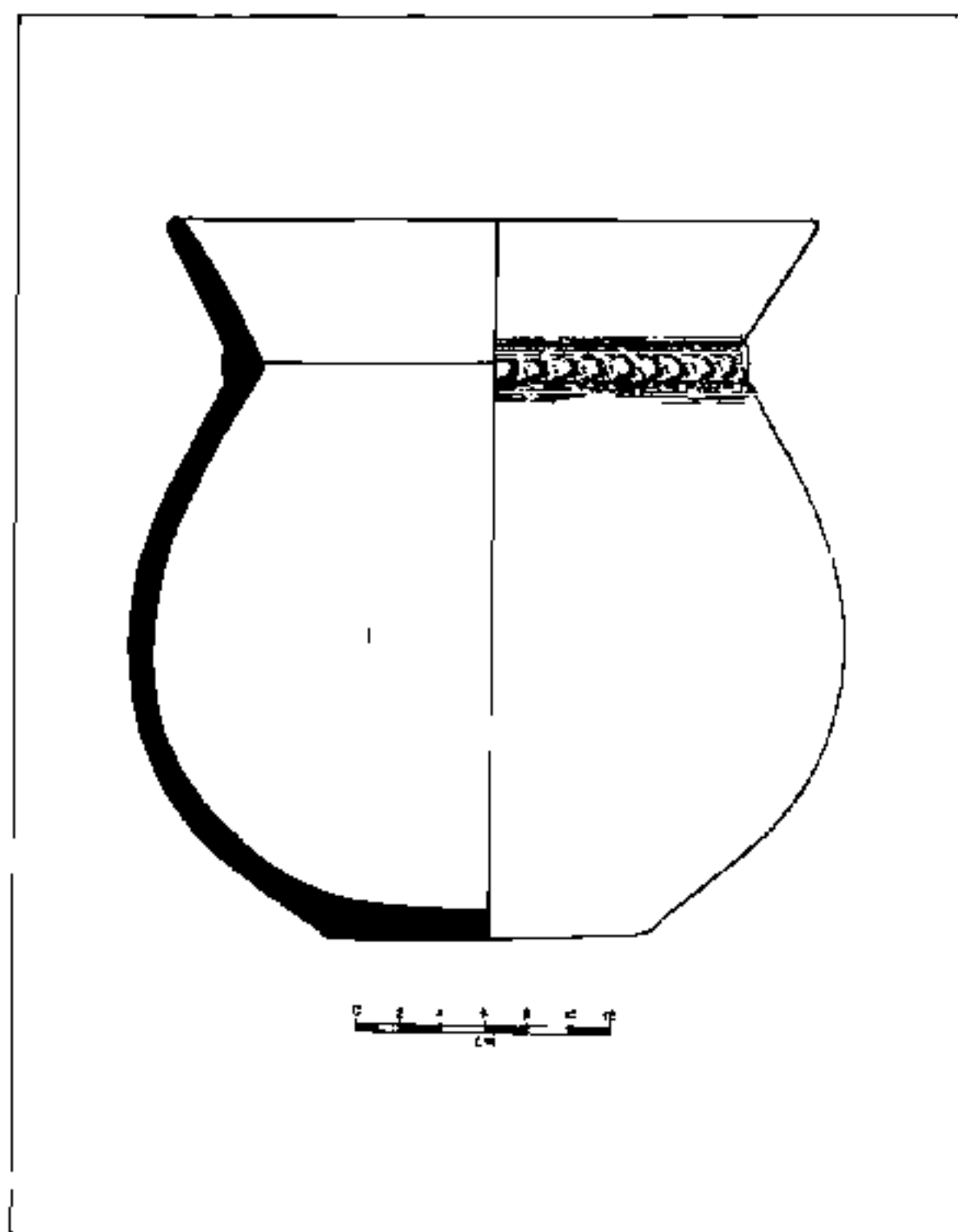


Fig. 24 Harbiya Uzun, Rural 21 Phase IV

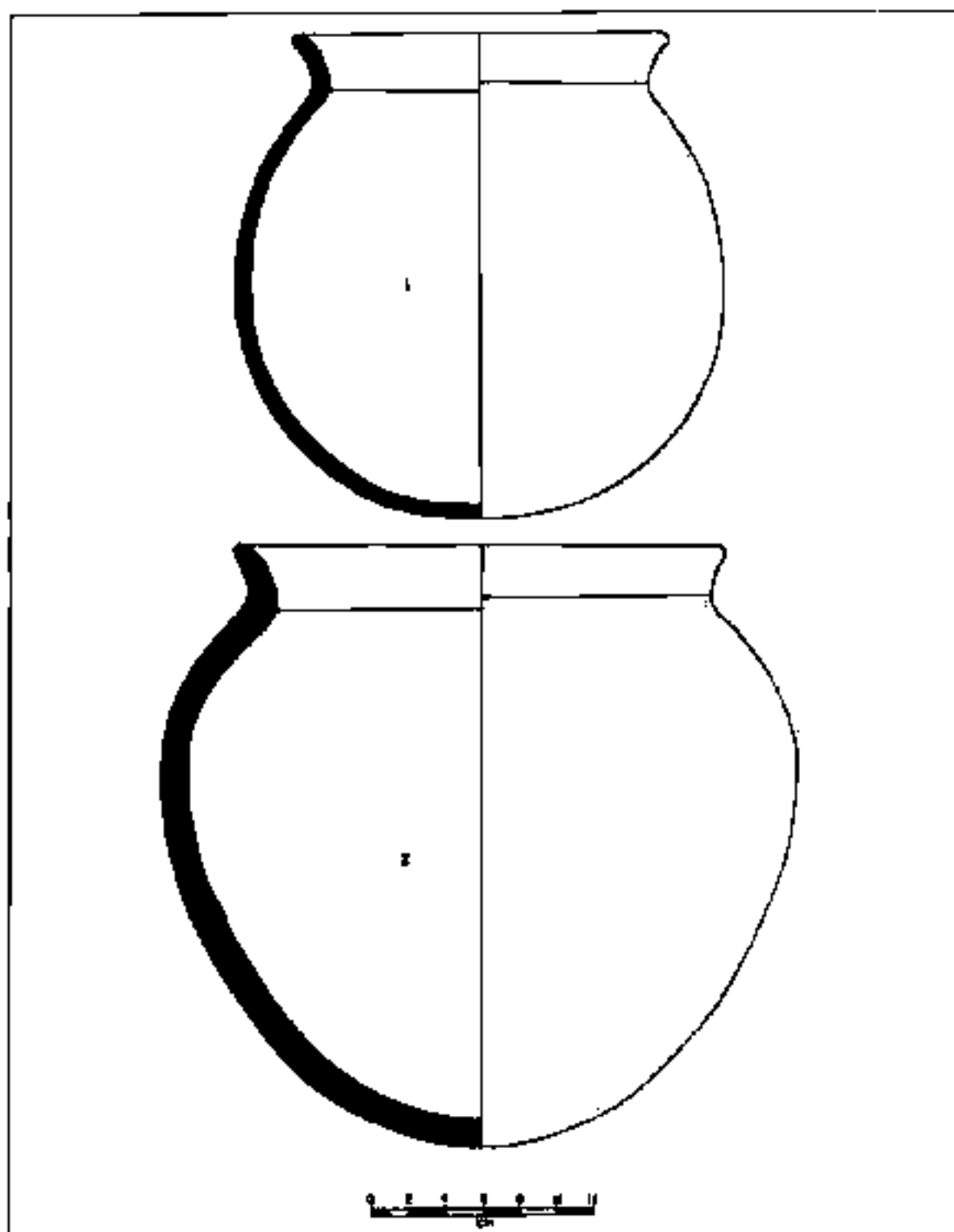


Fig. 65 Burial 137a, Burial 28, Phase IV

15. Vase of burnished grey ware with ring-stand.
16. Concave-sided carinated bowl-on-stand of burnished grey ware. Of medium fabric, it is treated on the outside with a slip.
17. Bowl of thick coarse ware with slightly convex base and splayed sides. It is bereft of slip.
18. Miniature bowl of thick coarse ware with oval body.
19. Miniature bowl-on-stand of thick coarse ware.
20. Crucible of thick coarse ware with a pecked ledge around the rim. House 10.
21. Miniature bowl of thick coarse ware with round base and almost vertical sides.
22. Miniature *loti* of thick coarse ware with splayed out mouth and bulbous body.
23. Miniature bowl of thick coarse ware with flat base and convex sides.
24. Miniature bowl of thick coarse ware with bulbous body and vertical narrow neck.

Fig. 64

1. Burial urn of burnished blotchy pinkish chocolate ware with splayed out mouth, globular body and flat short pedestalled base. Of coarse fabric, it is treated on the outside and inside with a slip and burnished and decorated with a rim-band in applique with finger-tip depressions. Southern urn of burial 21.

Fig. 65

1. Burial urn of burnished blotchy pinkish grey ware with splayed out mouth and globular body. Of medium fabric, it is treated on the outside and inside with a slip and burnished. Burial 28.
2. Burial urn of burnished blotchy pinkish grey ware with splayed out mouth and oval-shaped body. Of coarse fabric, it is treated both externally and internally with a slip and burnished. Burial 28.

(c) Thick Coarse Ware

This handmade thick ware is of coarse-gritty fabric, and is represented by large jars as well as smaller and miniature pots (fig. 63, 17–24). The larger vases include storage jars with outcurved rim, large deep and shallow platters with vertical sides and *hunda*-type vases with convex body. The ware is decorated with applied and incised designs. The designs in applique are varied and include horizontal and wavy bands around neck and body with finger-tip depressions, chain pattern on wavy bands, a crescent motif and a flower design with four petals (pl. LXXXIX). The incised decorations consist of oblique lines and chevrons on rim-top and on the body. An example of basket impression is also present. Noteworthy among the miniature pots is a crucible with punctured ledge along the rim recovered from house 10, a coppersmith's house, in front of his workshop (fig. 63, 20).

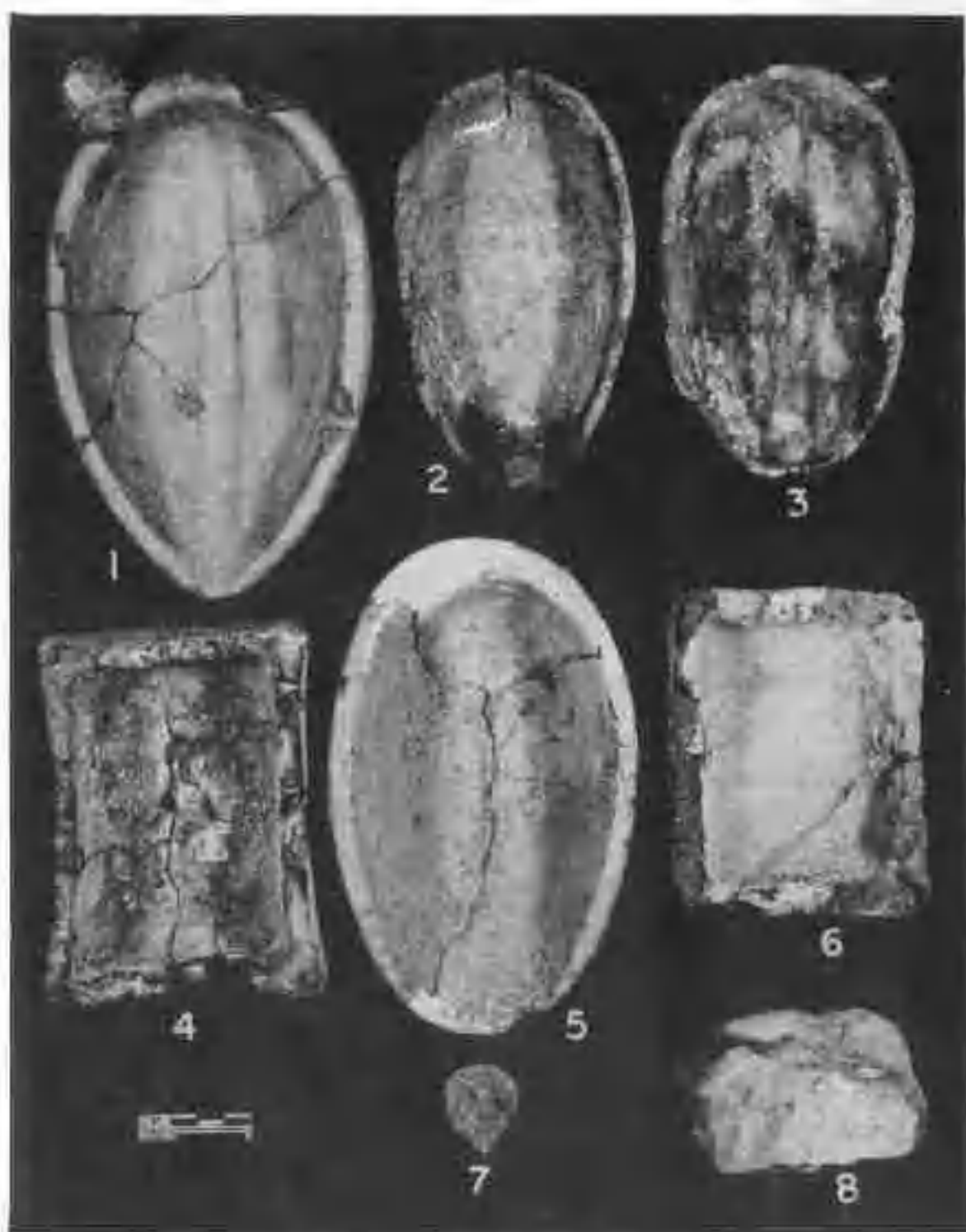


PLATE LXXXVIII Lamps, burnished gray ware; 2, 3, Phase IV, 1, 4-6, Phase IV.



PLATE LXXIX. Decoration in applique on thick coarse ware, Phase IV.

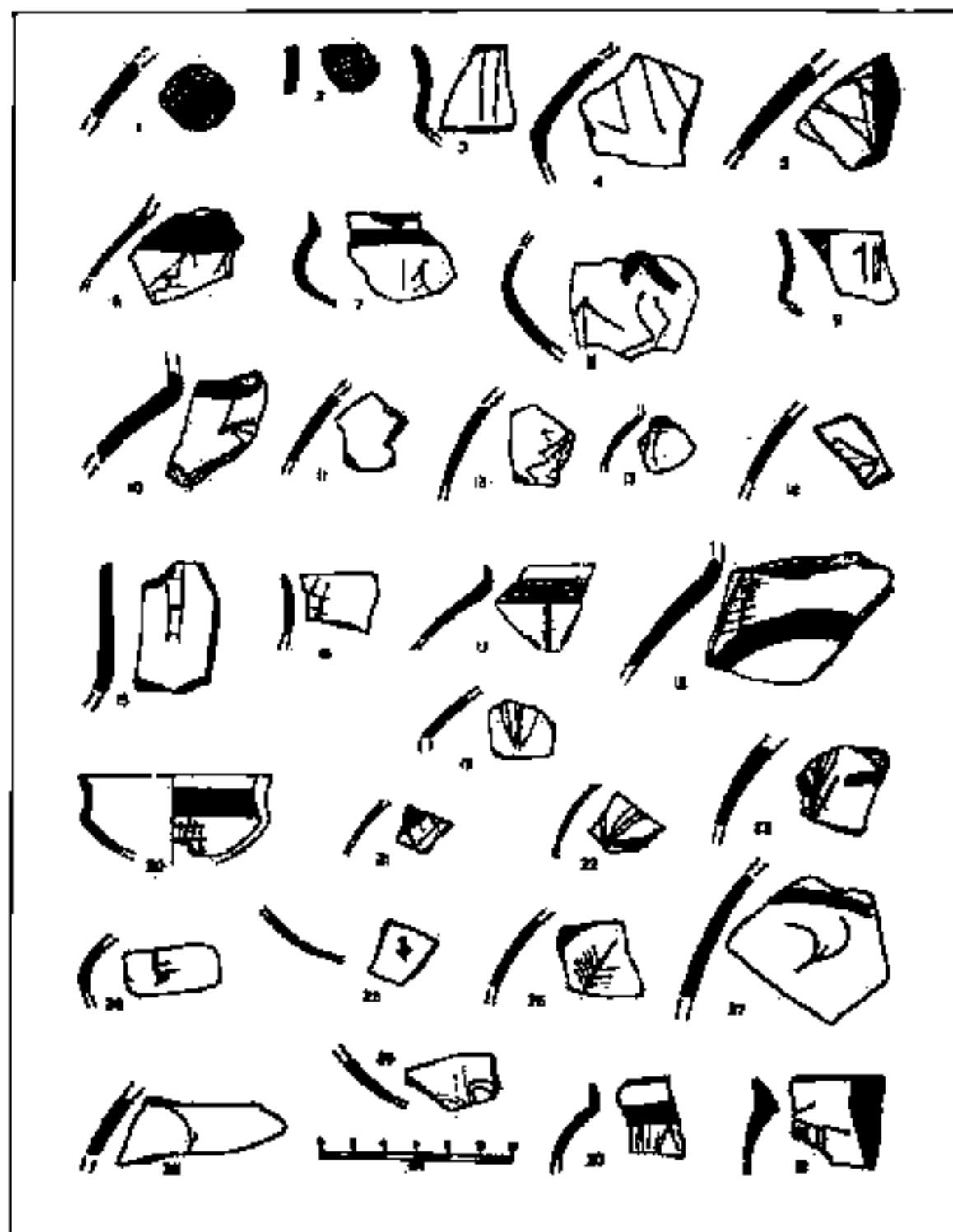


Fig. 65. Graffiti on Nigwa Ware. Phase IV.

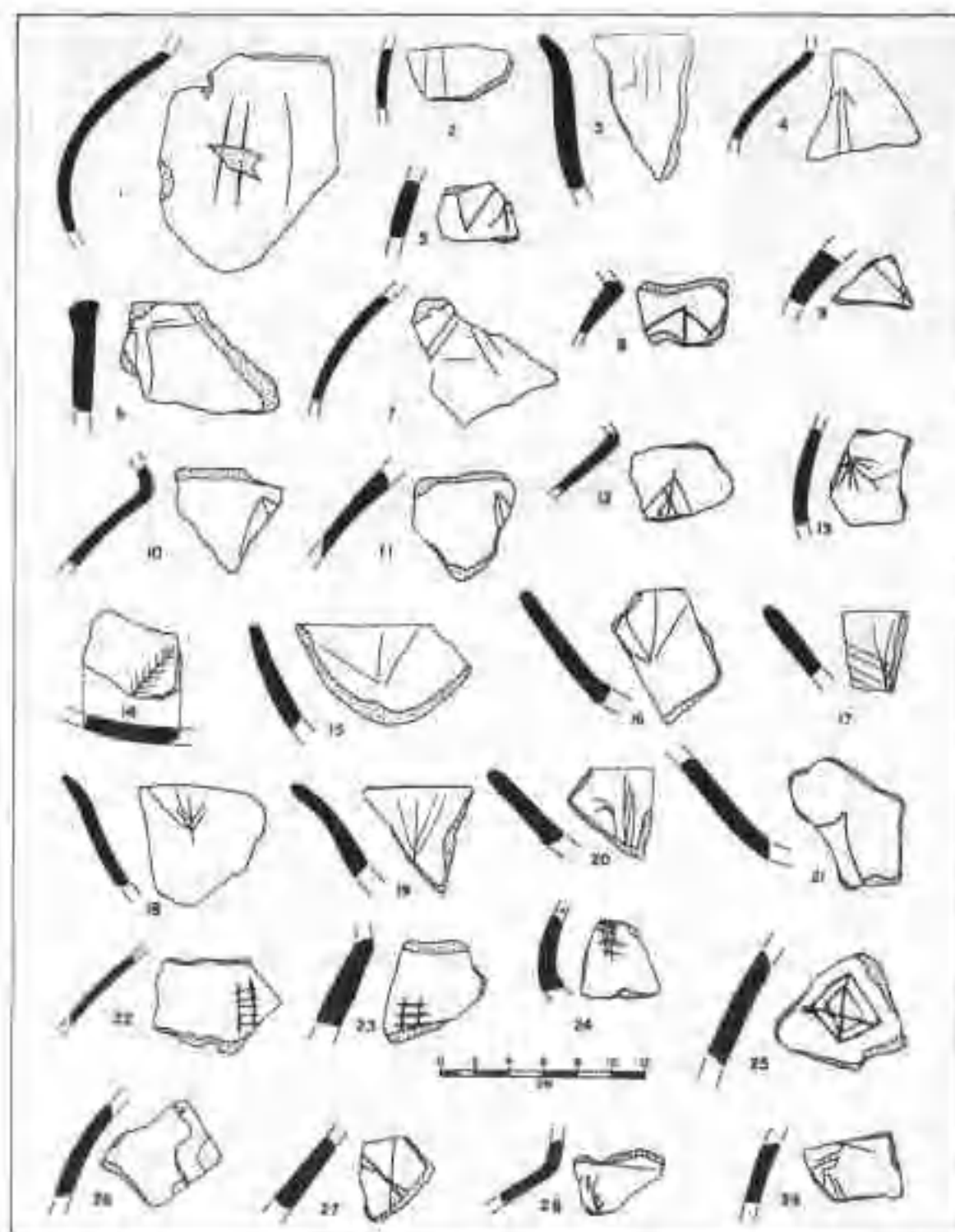


Fig. 467. Graffiti on Burnabest Grey Ware, Phase IV.

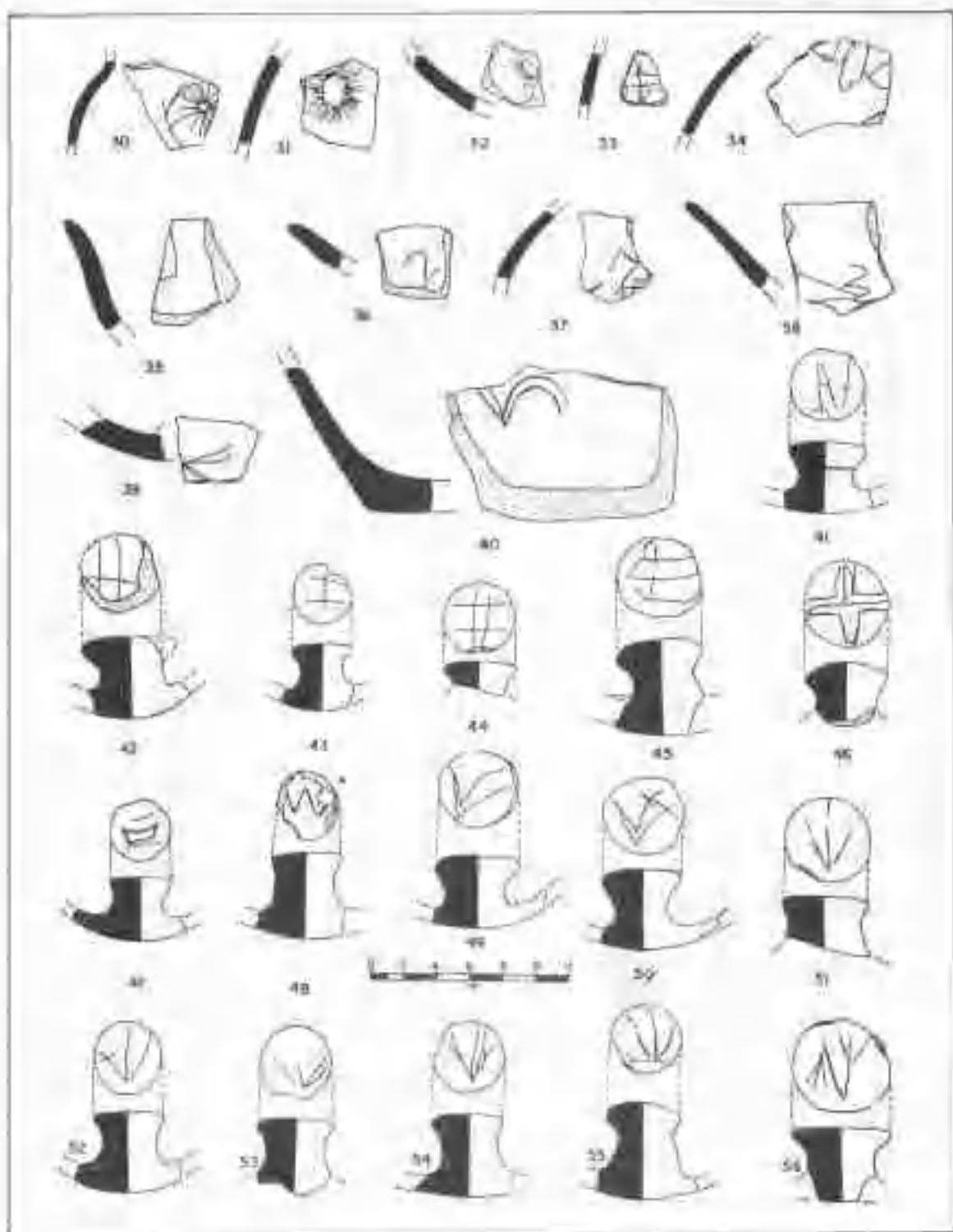


Fig. 68. Graffiti on Burnished Gray ware, Phase IV.

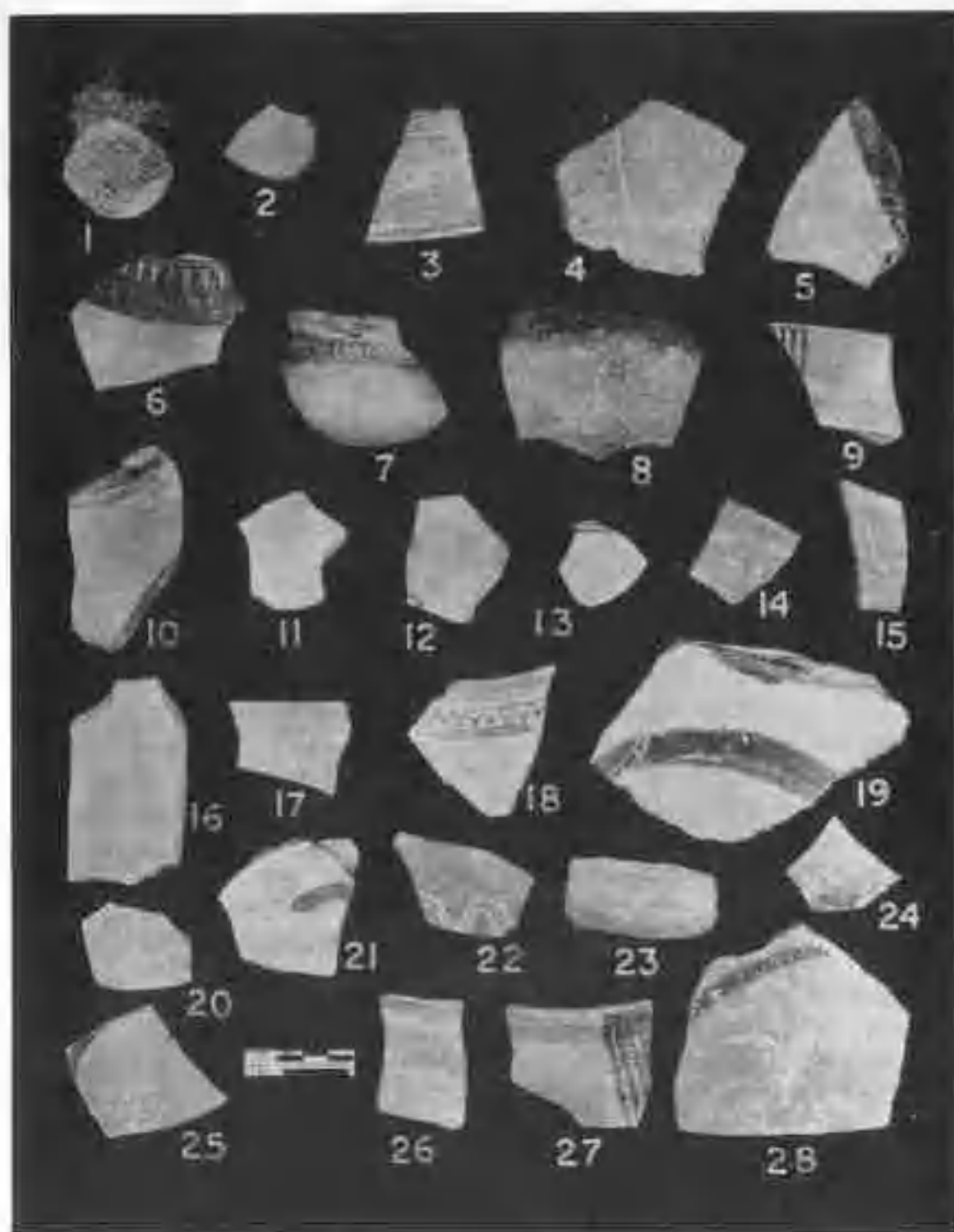


Plate XC. Graffiti, Malibu Ware, Phase IV.

(vi) *Graffiti*

Graffiti marks are present on the Malwa Ware (fig. 66) and the burnished grey ware, those on the latter being exceptionally in large number (figs. 67 and 68). While majority of the marks are common to both the wares, the occurrence of graffiti on the top of lid-knobs (fig. 68) may be considered a distinct feature of the latter which was not noticed in the preceding phases and also in the succeeding phase. In the latter, however, in a few examples, the graffiti was engraved on the flat surface of the lids. The marks common to both are ladder, sun, hook, two vertical lines, two vertical lines and a hook, arrow, plant and the buttocks and the penis. The graffiti on the top of the flat lid-knobs include trapezoidal mark resembling a boat, three lines meeting together, radiating lines emerging from one point, two parallel vertical lines and an oblique line in between, two vertical parallel lines intersected by one or two horizontal lines and 'V' within 'V'. The other graffiti marks on the burnished grey ware include sun motif, diamonds within diamond intersected by vertical and horizontal lines, lines turning at right angle placed opposite to each other and surmounted by a horizontal short line. The chequer designs (fig. 66, 1 and 2) on the Malwa Ware are unique. Sun motif also occurred in the preceding Phase III.

The selected graffiti marks are illustrated.

Figs. 66, 67 and 68; pl. XC.

Fig. 66, pl. XC

1. Chequer pattern. On the outside of a fragment of red ware.
2. Similar to one above.
3. Two vertical lines. On the inside of a rim-fragment of a bowl of red ware.
4. A hooked line and two lines. On the outside of a fragment of orange ware.
5. Incomplete. On the outside of a fragment of red ware.
6. A forked line and other indeterminate pattern. On the outside of a fragment of red ware.
7. A vertical line and a stylized human figure. On the outside of a bowl with outcurved rim and squat globular body of orange ware.
8. Arrow and two crinkled lines. On the outside of a fragment of red ware.
9. Hooked line and two vertical lines. On the outside of a fragment of red ware.
10. Incomplete. On the outside of a fragment of brown ware.
11. Incomplete. On the outside of a fragment of orange ware.
12. Crinkled lines. On the outside of a fragment of brown ware.
13. Two vertical lines and one horizontal line on their top. On the outside of a fragment of orange ware.
14. Incomplete. On the outside of a fragment of red ware.
15. Ladder. On the inside of a rim-fragment of red ware.
16. Similar as 15. On the outside of red ware.

17. Similar as 15 and 16 but on the outside of a fragment of orange ware.
18. Similar as 17. On the outside of red ware.
19. Double 'V' with the left arm of the left-side 'V' forked. On the outside of a fragment of red ware.
20. Ladder. On the outside of a fragment of a bowl of orange ware.
21. Incomplete. On the outside of a fragment of brownish ware.
22. Plant. On the outside of a fragment of red ware.
23. Plant. On the outside of a fragment of orange ware.
24. Plant. On the outside of a fragment of red ware.
25. Plant. On the inside of a fragment of red ware.
26. Plant. On the outside of a fragment of red ware.
27. Plant. On the outside of a fragment of red ware.
28. Plant. On the outside of a fragment of red ware.
29. Buttocks and penis. On the outside of a fragment of orange ware.
30. Forked and vertical lines. On the outside of a bowl of red ware.
31. Perhaps animal. On the outside of a bowl of red ware.

Fig. 67

1. Three vertical lines. On the outside of a vase of burnished grey ware.
2. Two vertical lines. On the outside of a fragment of a vase of grey ware.
3. One hooked and two vertical lines. On the inside of a bowl of grey ware.
4. Two hooked lines. On the outside of a vase of burnished grey ware.
5. A 'V' mark and a forked line. On the outside of a fragment of a vase of burnished grey ware.
6. Two lines turned on the opposite sides at right angles, each with a horizontal short line above. On the outside of a bowl of burnished grey ware.
7. Two pairs of oblique lines and a short horizontal line in the open space in the middle. On the outside of a fragment of a vase of burnished grey ware.
8. A vertical line with one shoot on either side. On the outside of a shoulder-fragment of a vase of burnished grey ware.
10. One oblique line on either side of a vertical line a little away from the top of the latter. On the shoulder fragment of a vase of burnished grey ware.
11. Three drooping vertical lines, one vertical and one each oblique on its either side strating from the top of the former. On the outside of a fragment of a vase of burnished grey ware.
12. A vertical line and lines drooping on either side. On the outside of a fragment of a vase of burnished grey ware.
13. A vertical line and lines drooping on either side. On the outside of a fragment of a vase

of burnished grey ware.

14. Plant motif. On the inside of a dish or platter of burnished grey ware.
15. Plant-like motif consisting of three radiating lines. On the outside of a fragment of a bowl of burnished grey ware.
16. Plant-like motif. On the outside of a fragment of a bowl of burnished grey ware.
17. Plant motif. On the inside of a fragment of a bowl of burnished grey ware.
18. Plant motif. On the inside of a fragment of bowl of burnished grey ware.
19. Plant motif. On the outside of a fragment of a bowl of burnished grey ware.
20. Plant motif. On the outside of a fragment of a bowl of burnished grey ware.
21. Two lines going apart from one point. On the outside of a fragment of a vase of burnished grey ware.
22. Ladder. On the outside of a fragment of a vase of burnished grey ware.
23. Ladder. On the outside of a fragment of a vase of burnished grey ware.
24. Ladder. On the outside of a fragment of a vase of burnished grey ware.
25. Diamond within a diamond and an intersecting line on the inside. On the outside of a fragment of a vase of burnished grey ware.
26. Plant-like motif. On the outside of a fragment of a vase of burnished grey ware.
27. Intersecting lines. On the outside of a fragment of a vase of burnished grey ware.
28. Vertical, oblique and angular lines. On the outside of a shoulder-fragment of a vase of burnished grey ware.
29. Two lines going away from each other, a horizontal line with a loop below and three vertical lines. On the outside of a fragment of a vase of burnished grey ware.

Fig. 68

30. Sun motif. On the outside of a fragment of a vase of burnished grey ware.
31. Sun motif. On the outside of a fragment of a vase of burnished grey ware.
32. Sun motif. On the outside of a fragment of a vase of burnished grey ware.
33. Plant-like design. On the outside of a fragment of a vase of burnished grey ware.
34. Penis and buttocks. On the outside of a vase of burnished grey ware.
35. Incomplete. On the inside of a fragment of a lid of burnished grey ware.
36. One curved line and one hooked line. On the inside of a fragment of a lid of burnished grey ware.
37. Boat motif. On the outside of a fragment of a vase of burnished grey ware.
38. Two converging lines and a wavy line. On the inside of a fragment of a lid of burnished grey ware.
39. Two hooked and two oblique lines. On the inside of a fragment of a lid of burnished grey ware.
40. Buttocks. On the inside of a *kunda* of burnished grey ware.
41. One oblique line between two vertical lines. On the top of lid-knob of burnished grey ware.

42. Two vertical lines intersected by a horizontal line. On the top of a lid-knob of burnished grey ware.
43. Two horizontal lines intersected by a vertical line. On the top of a lid-knob of burnished grey ware.
44. Two vertical lines intersected by two horizontal lines. On the top of lid-knob of burnished grey ware.
45. Boat motif and a curved line below. On the top of lid-knob of burnished grey ware.
46. A cross. On the top of lid-knob of burnished grey ware.
47. Boat motif and one line each below and above. On the top of lid-knob of burnished grey ware.
48. 'W'-like sign. On the top of lid-knob of burnished grey ware.
49. 'V' in 'V' sign. On the top of lid-knob of burnished grey ware.
50. Similar to 20 above but intersected by a hooked line. On the top of lid-knob of burnished grey ware.
51. Tree motif. On the top of lid-knob of burnished grey ware.
52. Tree motif. On the top of lid-knob of burnished grey ware.
53. Tree motif. On the top of lid-knob of burnished grey ware.
54. Tree motif. On the top of lid-knob of burnished grey ware.
55. Like a rising sun motif. On the top of lid-knob of burnished grey ware.
56. Plant motif and three downward going lines. On the top of lid-knob of burnished grey ware.

F. Phase V: The Jorwe Culture

(i) *The Jorwe Ware*

Production on a fast wheel, fine sturdy fabric, quality of producing metallic ring when struck and matt red as the common colour are some of the important features which clearly distinguish the Jorwe Ware from the Malwa Ware although borrowing or continuance of some important types and painted designs from the latter are clearly discernible in the former. The study of the Malwa Ware and the pottery from the overlap phase between Phase IV and Phase V has provided interesting information about the transitional stage in the process of the change over. The orange, red, pink and yellowish colours of the Malwa Ware were deep. In the transitional phase the Jorwe Ware possessed deep shades of red and orange and also showed a slight luster or gloss. In the manufacturing process the fast wheel made its appearance for the first time during this transitional phase. A count of the pottery recovered from the layers of this phase in the large cutting X'S - Z'S to X'S - Z'S showed that out of the 10854 sherds of the black-on-red ware, 7369 (67.9%) were with parallel running striation marks from inside as in the Jorwe Ware and the rest 3485 (32.1%) with irregular marks as in the Malwa Ware*. In fabric the former were finer and sturdier than the latter and produced better ring when struck. In this transitional period began to appear the straight and tapering tubular spouts in

* Please see Annexure I, p. 745.

larger number along side those slightly curved and constricted in the middle which were characteristic of the Malwa Ware. Thus, during this period began occurring important changes in the manufacturing technique of the painted pottery.

The culmination of this process of the change over was visible in the lowest layer of the Jorwe Phase in the adjoining cuttings in which the painted pottery manufactured by using the technique of that of the Malwa Ware disappeared and instead occurred the black-on-red ware thrown on fast-wheel, of fine fabric, sturdy, producing excellent metallic ring when struck and with a thin slip of chiefly red colour. The exposed pottery kiln (Kilo 1), has amply demonstrated that the pottery of particularly Jorwe Ware was baked under controlled, uniform heat under oxidizing conditions, in a scientifically constructed advanced type of kiln which was provided with arrangements of raising artificially the temperature and preservation of the required heat inside the kiln (pls. XXXII-XXXV). The Jorwe Ware, it should be emphasised, marks culmination in the pottery manufacturing technique in the Chalcolithic period in the Deccan.

As in the case of the Malwa Ware, the paintings on the Jorwe Ware may also be classified into three groups: (1) *geometric*, (2) *animal and other motifs* and (3) *potter's marks*.

(1) The geometric designs (fig. 69; pl. XCI): These are (1) horizontal bands on the rim, at the junction of the neck and shoulder and round the body, (2) crinkled or zigzag line between horizontal bands, (3) pair of close-spaced crinkled lines forming a chain pattern, (4) solid diamonds and rectangles between horizontal bands, (5) loops surmounted by strokes, (6) spiral design, (7) fish-scale pattern, (8) vertical line and crinkled line on its either side, (9) alternating groups of vertical and horizontal lines, (10) alternating groups of semicircles and curved lines between horizontal bands, (11) chequered rectangles, (12) criss-cross band, oblique strokes below and three upright lines over the criss-cross band, (13) rectangles and lozenges with and without criss-cross design, (14) panel of cross-hatched diamonds between horizontal bands, (15) panels of cross-hatched diamonds and ovals with elongated lower end joined with each other between horizontal bands, (16) cross-hatched diamonds and a chevron, (17) a panel of cross-hatched diamonds between horizontal bands with lower end joined by a vertical line, (18) vertical strokes between horizontal bands, (19) converging groups of lines, (20) group of short wavy lines below horizontal band, (21) pairs of curved lines, (22) short strokes on the rim of incurved bowl, (23) panel of cross-hatched triangles, (24) crinkled line above horizontal band, (25) hill pattern between horizontal bands, (26) two horizontally placed crinkled lines and a group of vertical lines between horizontal bands, (27) alternating squares in two rows with and without cross-hatched design, (28) crinkled line below horizontal band and, (29) intersecting loops on the inside of rim. Of these, designs, 1, 2, 4, 14, 17, 19, 21 and 23 only had occurred on the Malwa Ware. The painted designs on the Jorwe Ware at Daimabad are comparable with those from Nevasi¹¹ and Chandoli¹².

11. Sankalia, Deo, Ansari and Ehrhardt, *op. cit.* (1960), figs. 83-93.

12. Deo and Ansari, *op. cit.* (1965), figs. 50, 53.



Fig. 109. Jorwe Ware, painted designs. Phase V.

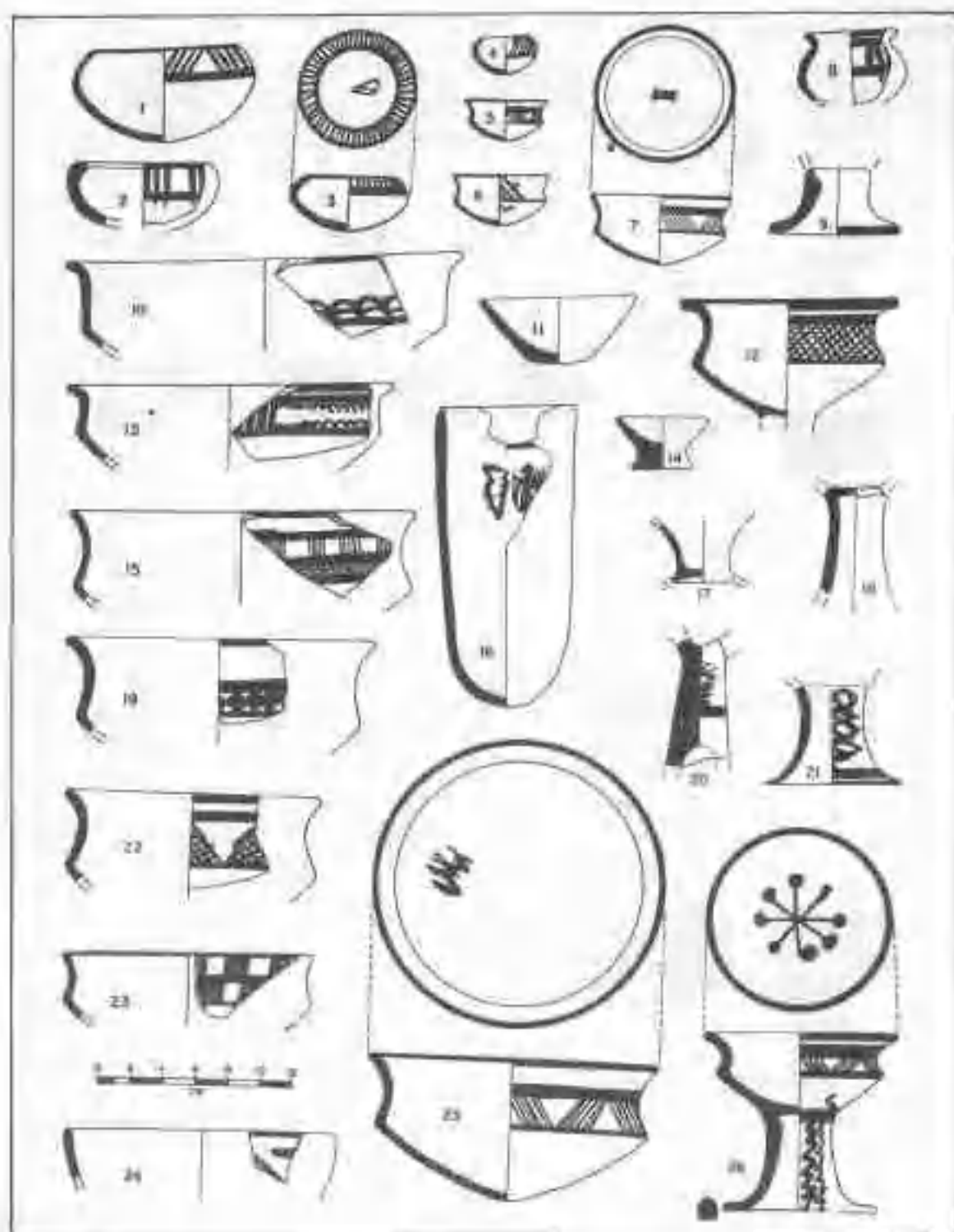


Fig. 70. Jervis Ware, types, Phase V.

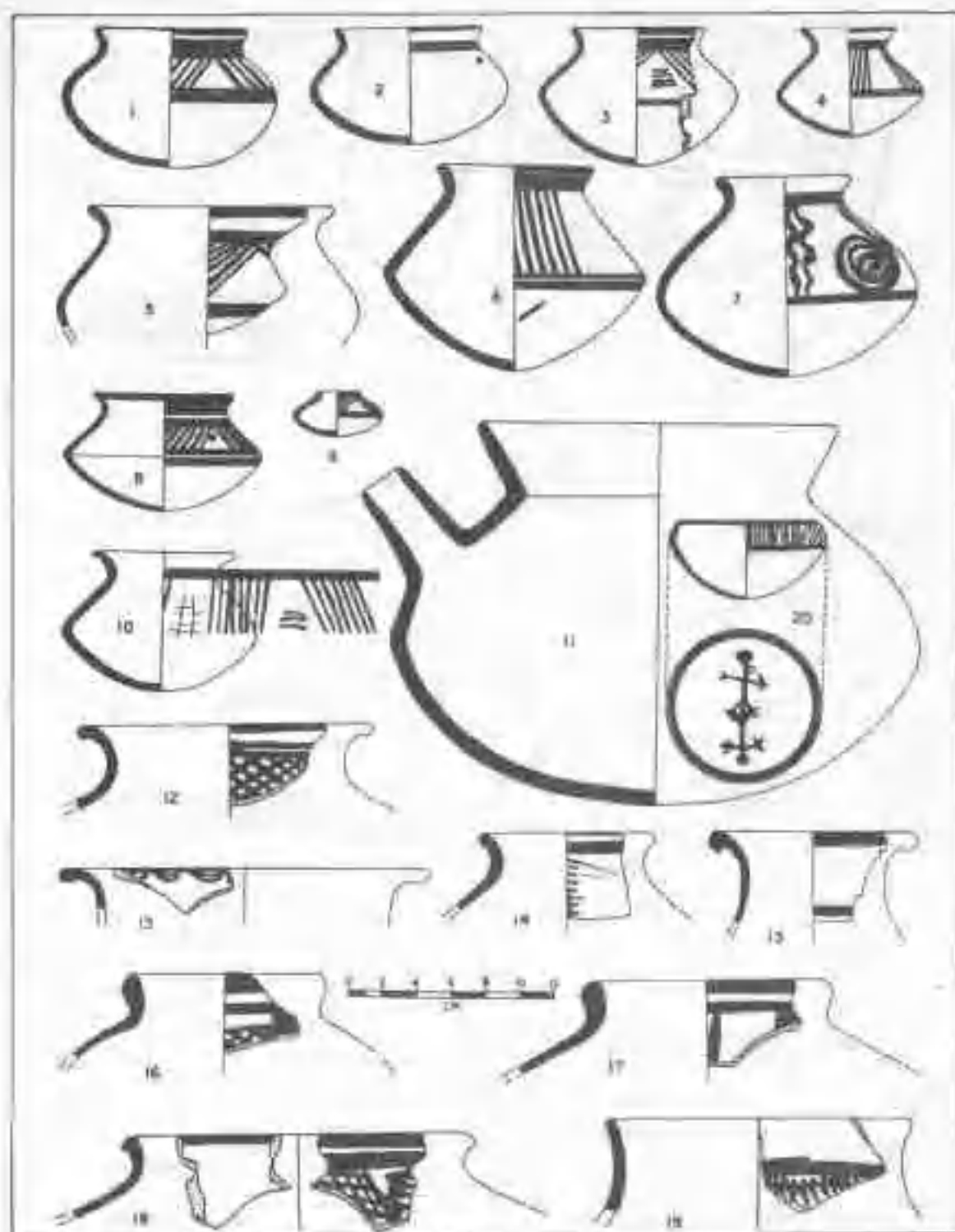


Fig. 71. Jirwe Ware, types, Phase V.

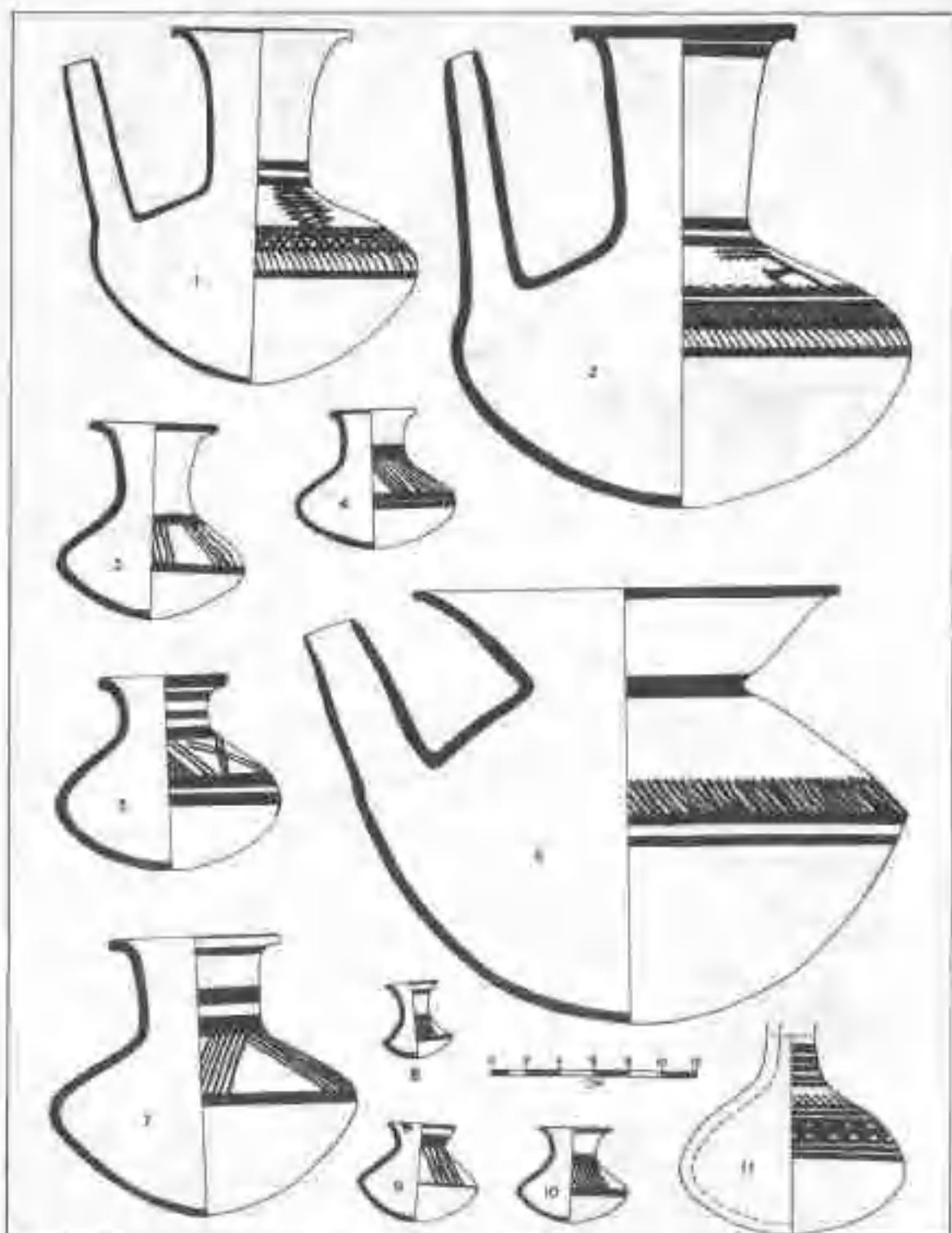


Fig. 12. Jorwe Ware, types, Phase V.

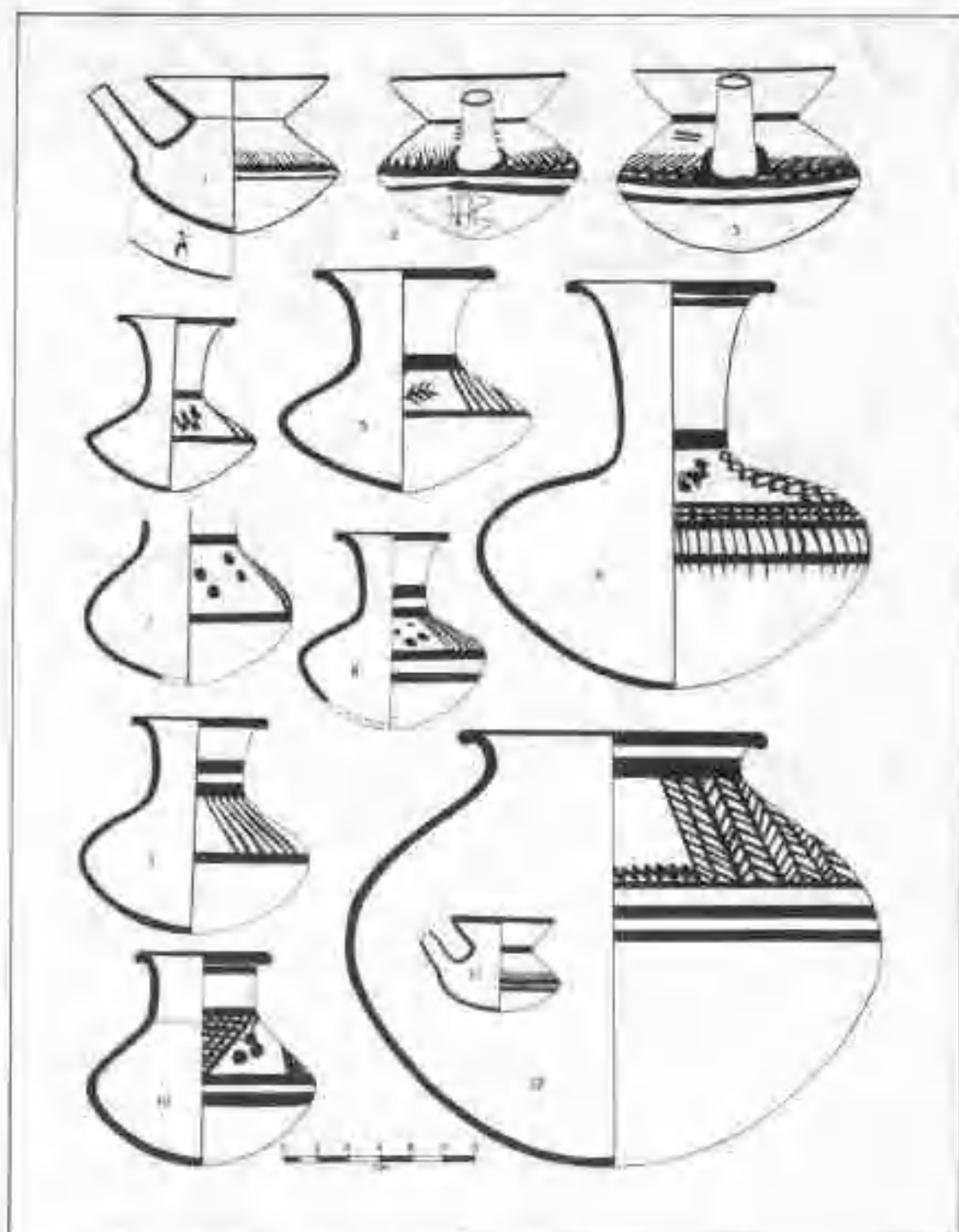


Fig. 73. Jorwe Ware, types, Phase V.

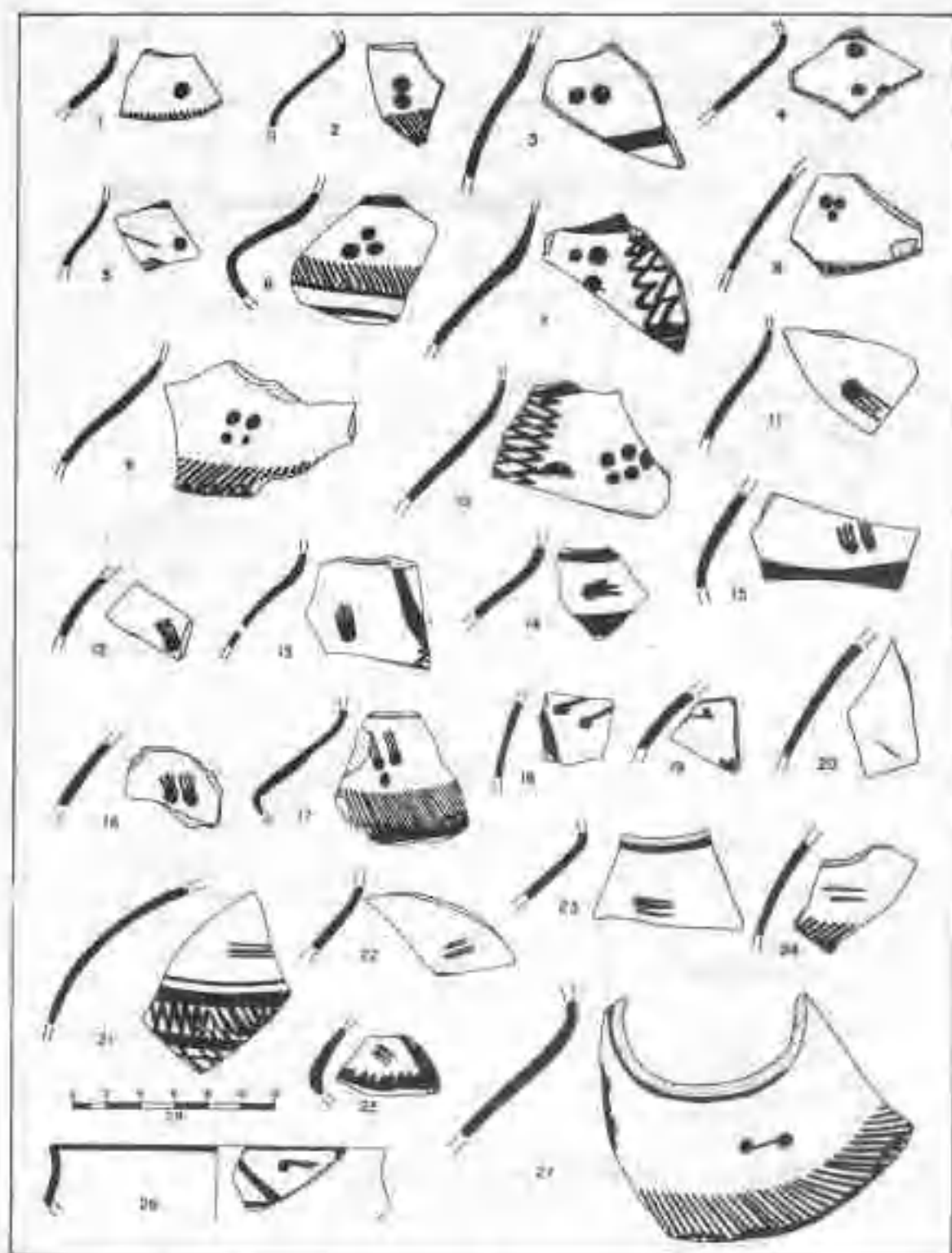


Fig. 74. Jorwe Ware, potter's marks (outside). Phase V.

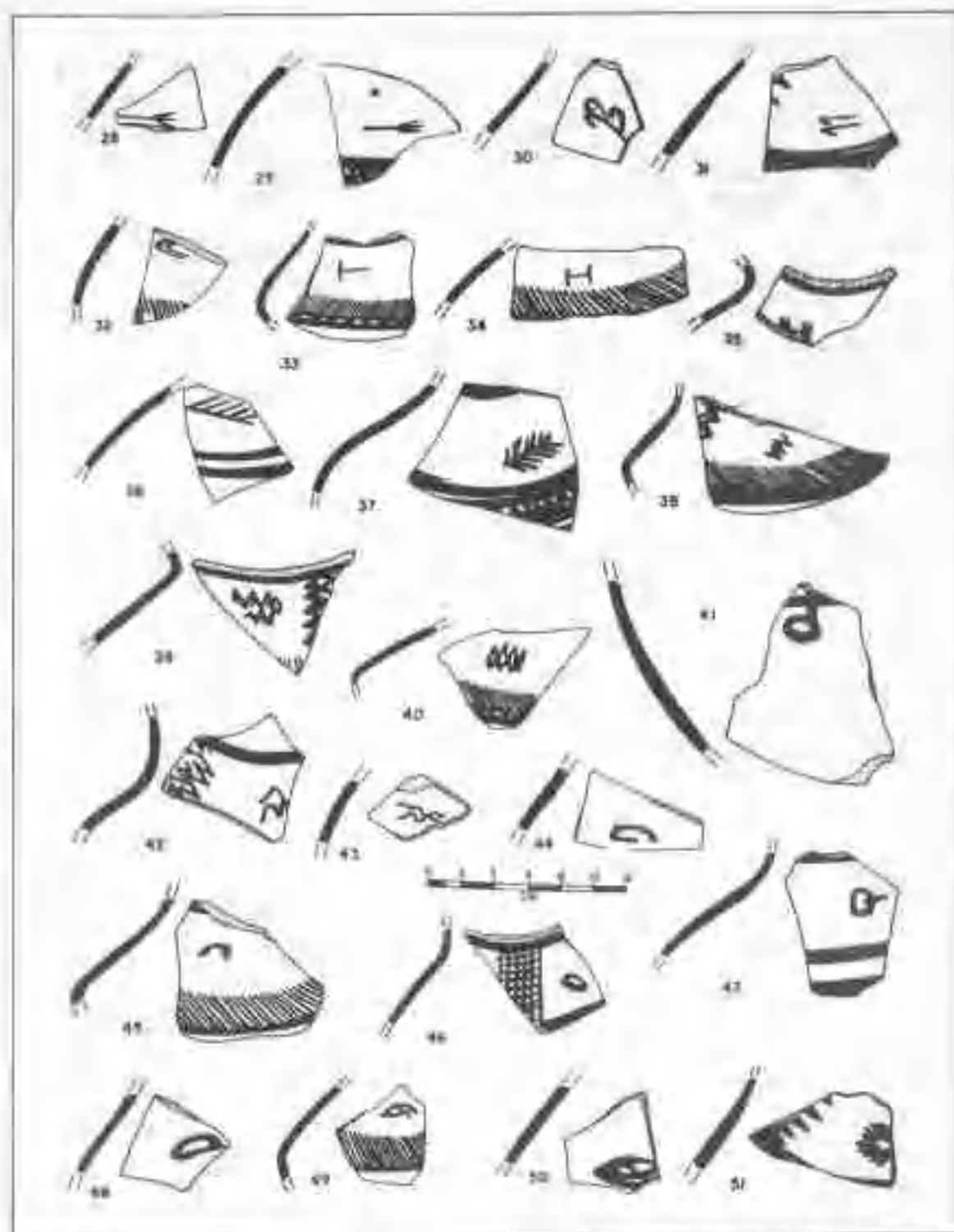


Fig. 75. Jorwe Ware, potter's marks (outside). Plate V.

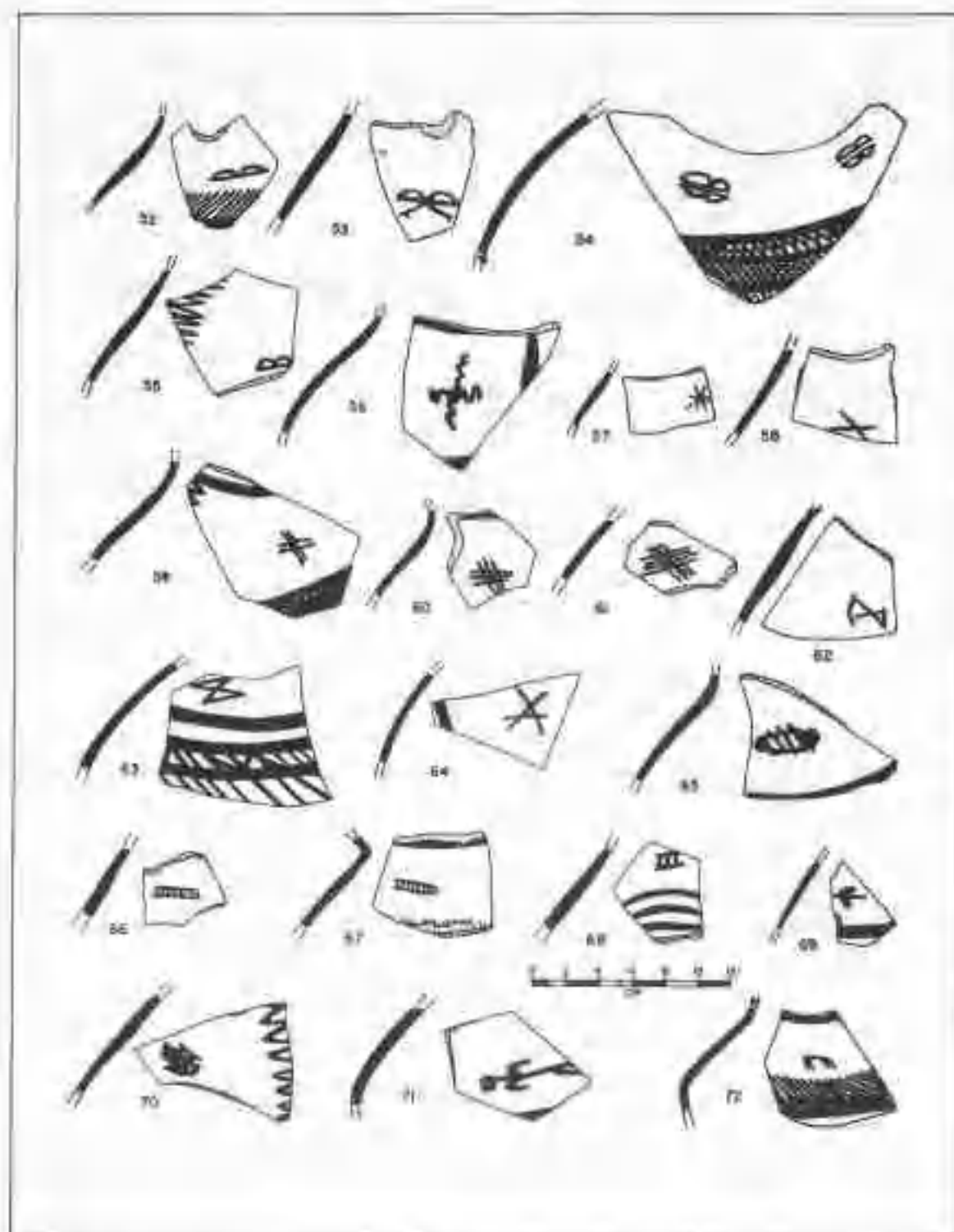


Fig. 76. Jorwe Ware, potter's marks (outside), Phase V.

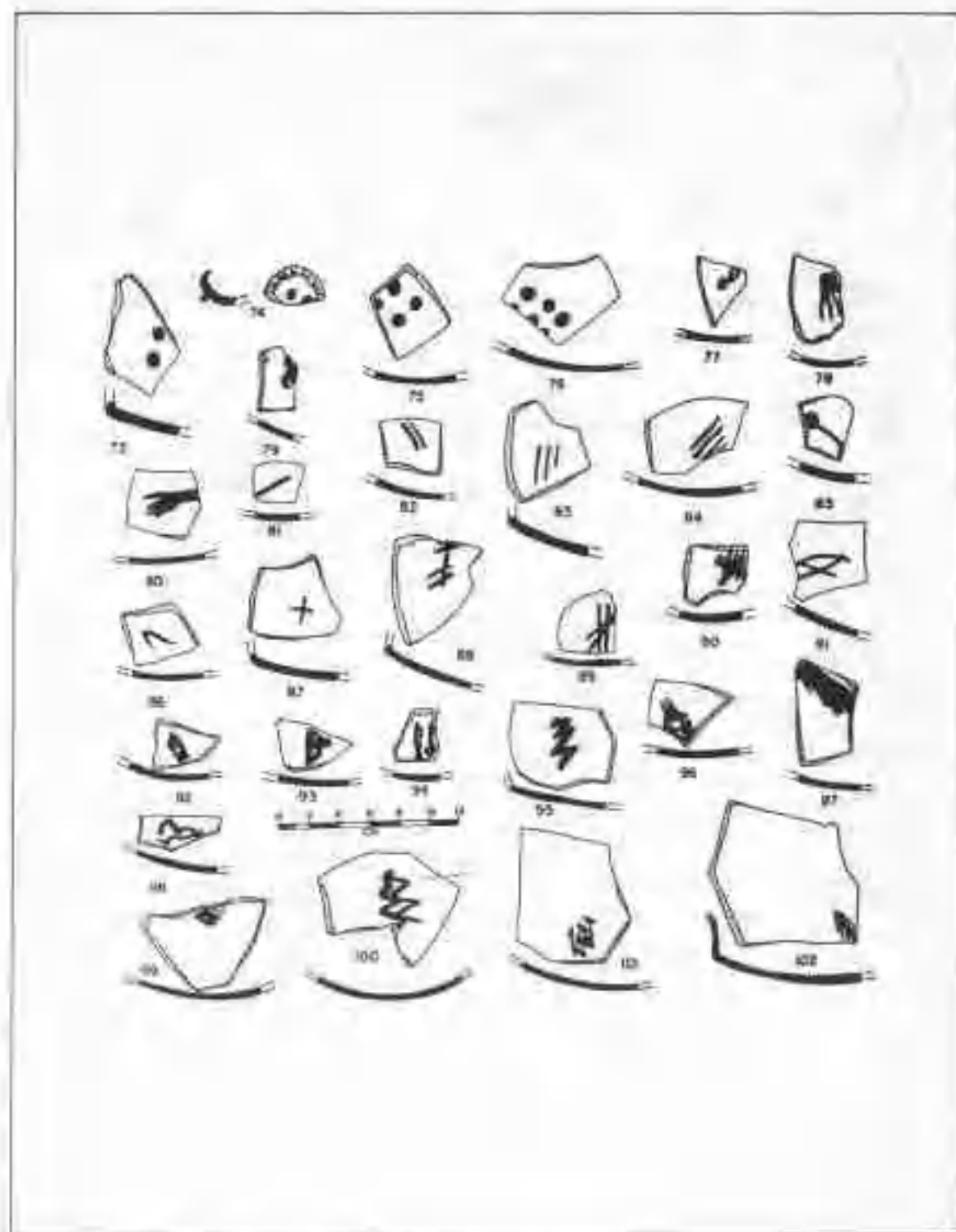


Fig. 77. Jorwe Ware, potter's marks (inside), Phase V.

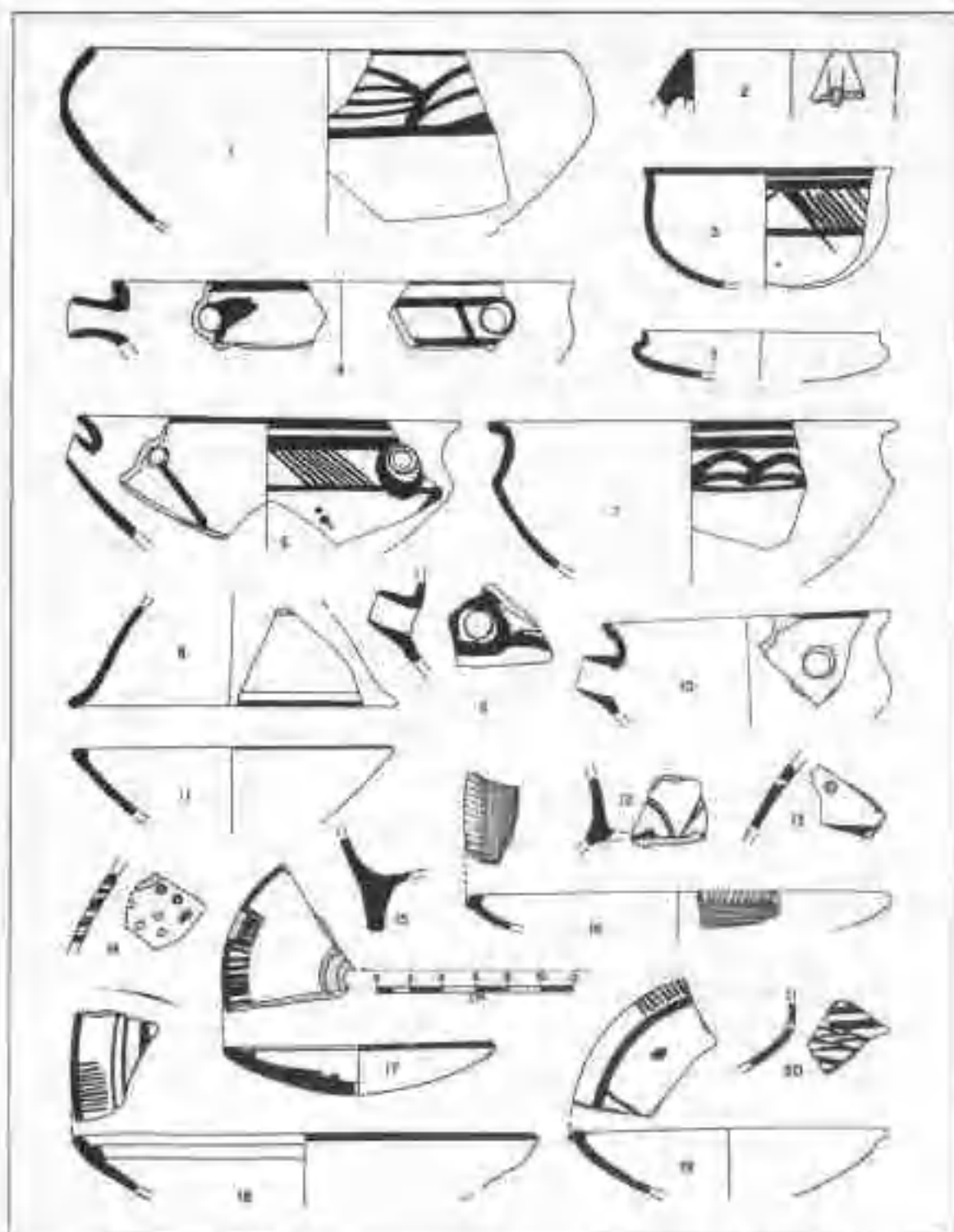


Fig. 78. Jurwe Ware, Deep Red Ware with wavy-touch, Reddish painted ware, Perforated Ware and Miscellaneous Ware, Phase V.

(2) In the second group are included representations of such animals and birds (fig. 69; pl. XCII) as deer, camel, snake, heron (?), crane, fish and cockroach. A file of birds also deserves mention. In the human motifs one is survived by its lower portion while the other, in silhouette, is a beautiful representation of a dancer who has bent his body and knees forward and held his right hand opposite his chest and the left on the left hip. The figure wears a turban. This is an earliest and unique representation of an individual dancer in a typically Indian dance pose showing rounded features of the body in a very bold form (fig. 69, 38; pl. XCII, 5). Mention should also be made of a curious painting of a human being very faintly visible on a beaker recovered from a cluster of pots from one of the elliptical structures of structural phase E. This figure appears wearing a robe or a gown and is having on his left arm something with flames of fire (fig. 70, 16). The motifs of dog, peacock, sun and buttocks which have occurred on the Malwa Ware are absent on the Jorwe Ware. But dog in silhouette has occurred on the Jorwe Ware at Nevsa.³³ At this site deer and heron (?) were also represented³⁴ whereas at Chandoli the former was present.³⁵ The palm-leaf motif is no less interesting (fig. 69, 27; pl. XCII, 12).

(3) Except marks 9 and 14-22 (fig. 74), all those potter's marks which were noticed on the Malwa Ware have been repeated on the Jorwe Ware. On the other hand the marks 4-21, 26-35, 38, 43-49, 51-57 and 59-71 were not noticed on the Malwa Ware. It is interesting to note that pots possessing different potter's marks as well as graffiti marks were recovered from the pottery kiln 1 (fig. 87, 1-8).³⁶ This evidence has amply proved that what are being called as potter's marks cannot be the marks of the potters. Pottery bearing different potter's marks and graffiti marks was also collected from the surface of the second floor of house 38, the merchant's house (fig. 88). It is, therefore, difficult at this stage to understand the significance of these marks. Potter's marks also occur on the Jorwe Ware at Nevsa³⁷ and Chandoli.³⁸

Compared to the Malwa Ware the types in this ware are varied and in large number. Those frequently occurring and considered as characteristic or 'fossil' types are (1) concave-sided carinated bowl (fig. 70, 5-7, 13, 15, 19, 22, 23 and 25; pl. XCV, 9), (2) *handi* with splayed out mouth, carinated body and tubular spout (figs. 71, 11, 72, 6 and 73, 1-3 and 6; pl. XCV, 1 and 5), and (3) *chamba* with high narrow neck and globular body (fig. 73, 6). Of less frequent occurrence are (4) incurved bowl (fig. 70, 1-3, pl. XCV, 10), (5) concave-sided carinated bowl-on-stand (fig. 70, 120 and 26; pl. XCV, 13), (6) concave-sided carinated bowl with short tubular spout (fig. 78, 4, 6, 9 and 10), (7) bowl with vertical sides, outcurved rim and carinated base (fig. 70, 10), (8) bowl with bluntly carinated body and outcurved beaded rim (fig. 78, 7), (9) bowl with outcurved lip and convex body (fig. 78, 3), (10) slightly incurved bowl (fig. 78, 1), (11) bowl with splayed out mouth and squat convex body (fig. 78, 5), (12) bowl with slightly convex sides (fig. 70, 24), (13) bowl with internally oval-collared

33. Sankalia, Deo, Ansari and Ehrhardt, *op. cit.* (1960), fig. 104, 14 and fig. 105, 2.

34. *Op. cit.*, fig. 104, 10.

35. Deo and Ansari, *op. cit.*, (1965), fig. 50, 49.

36. Sali, *op. cit.* (1981), p. 61.

37. *Op. cit.* figs. 111-113.

38. *Op. cit.* fig. 54.

rim and splayed sides (fig. 78, 11), (14) bowl with outcurved oval rim and splayed sides (15) cup with earhandle (fig. 78, 2), (16) *lota* with outcurved rim and squat globular body (fig. 71, 1 and 2) (17) *lota* with globular body and beaded rim (figs. 71, 7 and 72, 5; pl. XCV, 6), (18) *lota* with high cylindrical neck and squat round body (fig. 72, 3, 7, 73, 4, 5 and 8; pl. XCV, 4, and 5), (19) *lota* with carinated body and outturned rim (fig. 71, 5-6, 8 and 10; pl. XCV, 7) (20) *lota* with beaked rim and globular body (fig. 73, 10; pl. XCV, 4), (21) *loti* with concave-sided neck, outcurved rim and carinated round body (fig. 72, 8-10, pl. XCV, 12), (22) *loti* with squat globular body and outcurved rim (fig. 71, 9), (23) spouted *chambu* with high narrow neck and squat bulbous body (fig. 58, 5-7; pl. XCV, 2) (24) *chambu* with bottle-neck and globular body (fig. 72, 11), (25) cylindrical vase with round base (fig. 70, 16; pl. XCV, 11) (26) *chambu* with slightly widening high neck, square rim, squat bulbous body and tubular spout (fig. 72, 1 and 2; pls. XCIII and XCV, 3), (27) vase with pear-shaped body, short narrow neck and beaded rim (pl. XCIVB), (28) oval-shaped vase with narrow mouth and externally beaded rim (pl. XCIV C), (29) vase with round body and outcurved beaded rim (pl. XCIVA), (30) vase with splayed out beaded rim (fig. 71, 13), (31) vase with oval rim and oblique shoulder (fig. 71, 16), (32) vase with outcurved slightly beaded rim and concave neck (fig. 71, 12), (33) vase with externally thickened outcurved rim and oblique shoulder (fig. 71, 17), (34) jar with splayed out rim and concave neck (fig. 71, 14), (35) vase with narrow neck and outcurved beaded rim (fig. 71, 15), (36) vase with outcurved beaked rim (fig. 71, 18) and (37) vase with outcurved featureless rim and concave short-neck (fig. 71, 19). Of these, types 1, 2, 4, 14, 16, 19, 22 and 24 had occurred in the Malwa Ware. In the Jorwe Ware these types occur in modified form. For example, the carination in types 1, 2 and 19 has become sharp and the splayed out mouth of type 2 became wide and the height pronounced. The bottle-neck of type 24 was further narrowed and the neck of the *lota*, type 19, became short. The type 2 also resembles hole-mouthed globular bottle from Period IA of Surkotada.³⁹ The concave-sided carinated bowl-on-stand occurred in the Malwa Phase in the burnished grey ware. One example each of incurved and concave-sided carinated bowls recovered from the clusters from the elliptical religious structure bears purposely bored hole near the rim (fig. 70, 4 and 6). When compared with those from Nevasa⁴⁰ and Chandoli it was found that all the type from the former find place at Daimabad whereas the types IVc, IVc(1), VII, IX, X, XI from the latter are absent.

The range of designs is illustrated.

Fig. 69: pls. XCI and XCII

1. Vertical strokes between horizontal bands, the lower ends running beyond the lower

39. J.P. Joshi, "Exploration in Kutch and Excavation at Surkotada and New Light on Harappan Migration", *Journal of the Oriental Institute, M.S. University of Baroda*, Vol. XXII, Nos. 1-2, 1972, pp. 98-144, fig. 8, 11-13.

40. Sankalia, Deo, Ansari and Ehrhardt, op. cit., (1960), fig. 85-93.

41. Deo and Ansari, op. cit., (1965), figs. 30-33.

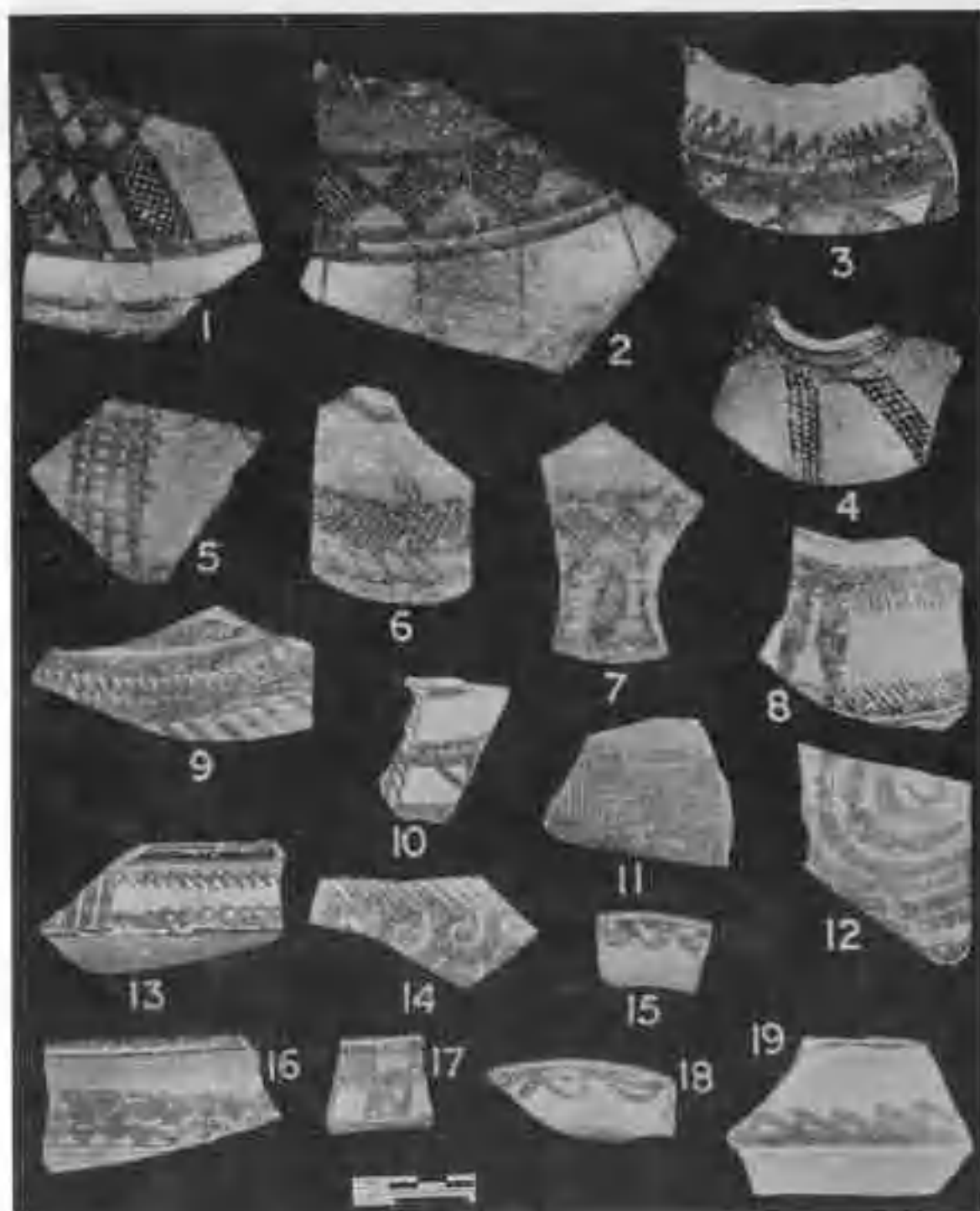


PLATE XCI Jorwe Ware, geometric designs, Phase V.



PLATE XCH Jorwer Ware, animal and human motifs. Phase V.



PLATE XCIII Jarwe Ware, Chamba, Phase V.



PLATE XCIV A. Jar or Watt, painted vase Phase V



PLATE XCIV B Jorwe Ware, painted vase, Plate V.



PLATE XCIV C *Jorvet Ware, painted vase, Phase V.*

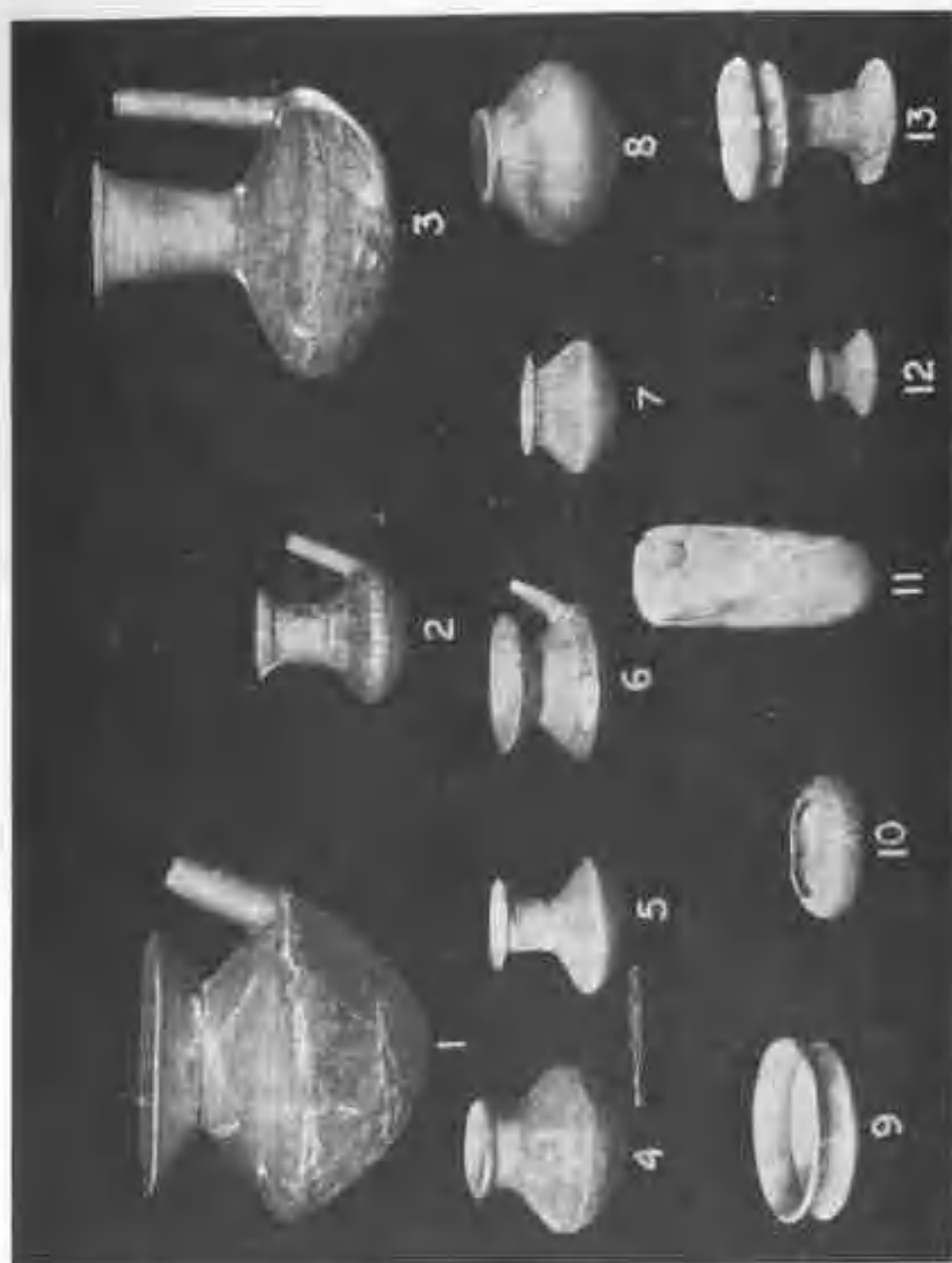


PLATE XCV. Jorwe Ware, types, Phase V.

- band.
2. Cross-hatched diamonds between horizontal bands. From the lower end of each diamond runs down a vertical thin line to meet a horizontal band below.
3. Cross-hatched diamonds.
4. Cross-hatched diamonds and a chevron between horizontal bands.
5. A panel of cross-hatched diamonds between horizontal bands above the register of cross-hatched ovals joined with each other with two lines and a thick line extending lower down from the lower end.
6. Cross-hatched diamonds between thick horizontal bands and a line extending below from the lower end of each diamond.
7. Chequer pattern below horizontal band.
8. Chequer pattern.
9. Two semi-circular lines one above the other and an oblique line between horizontal bands.
10. Cross-cross design within lozenges and rectangles formed by intersecting lines above a horizontal band.
11. Cross-hatched band bordered by horizontal bands, three oblique strokes above the upper horizontal band and oblique lines between horizontal bands below, the pointed ends of which run beyond the lower horizontal band.
12. Fish-scale pattern.
13. Hill pattern above a horizontal band.
14. Concentric circles. The brush carried insufficient paint.
15. Concentric circles.
16. Alternating groups of vertical and horizontal lines between horizontal bands.
17. Crinkled line on either side of a vertical line.
18. Loops above horizontal bands.
19. Loops surmounted by oblique strokes.
20. Loops above horizontal band, solid diamonds between horizontal bands, from the lower end of each running down below a thin vertical line.
21. A cross-hatched vertical design between thick horizontal bands and a chain of loops above a horizontal band.
22. A thick wavy band between thick horizontal bands and a thin chevron inside a curve of the thick wavy line.
23. A crinkled line between horizontal bands and oblique lines below the lower band.
24. A crinkled horizontal line and solid triangles above a thick horizontal band and cross-hatched designs below.
25. A crinkled line between horizontal bands, oblique lines below and a double-hill potter's mark above.
26. Drooping palm-leaf motif below a horizontal band.
27. Palm-leaf motifs above and below a horizontal band.
28. Drooping plant motif.

29. Chevrons and snake-like motif.
30. Wavy lines resembling a snake motif.
31. Wavy lines below a thick horizontal band.
32. A row of herons (?)
33. Fish-like motif and short strokes between pairs of horizontal bands.
34. Cross-hatched diamonds between horizontal bands and a cockroach motif above the upper horizontal band.
35. Lower part of human motif and a horizontal band below.
36. Crane and double crinkled lines between horizontal bands.
37. Standing deer with wavy horns, head of another on the back side and a chequer pattern below.
38. A man in dancing pose with a bent body and legs, right hand opposite his chest, left hand resting over the left hip. He wears a turban.
39. A row of ducks (?) between horizontal bands.
40. Camel with a prominent hump and long neck.

The selected types are illustrated in figs. 70–73 and pls. XCIII, XCIV A–C and XCV.

Fig. 70

1. Incurved bowl of red ware. Of fine fabric, it is treated with a slip both from inside and outside and is painted in black on the inside and outside with a rim-band and on the outside with converging groups of lines between horizontal bands.
2. Incurved bowl of red ware with internally beaded rim. Of fine fabric, it is treated on the inside and outside with a slip and is painted in black on the outside with vertical pointed lines between horizontal bands.
3. Incurved bowl of red ware. Of fine fabric, it is treated both on the inside and outside with a slip and is painted in black on the inside with a rim-band and a potter's mark consisting of a horizontal line within 'D' and on the outside with vertical short lines between horizontal bands.
4. Miniature incurved bowl of red ware with a purposely bored hole on the body. Of fine fabric, it is treated with a slip both on the inside and outside and is painted in black on the outside with vertical lines and a horizontal band.
5. Miniature concave-sided carinated bowl of red ware. Of fine fabric, it is treated on the outside and inside with a slip and is painted in black on the outside with converging groups of oblique lines between horizontal bands.
6. Miniature concave-sided carinated bowl of red ware. Of fine fabric, it is treated on the inside and outside with a slip and is painted in black on the inside with a rim-band and on the outside with oblique lines between horizontal bands. Near its rim is a purposely bored hole.

7. Small concave-sided carinated bowl of red ware. Of fine fabric, it is treated on the inside and outside with a slip and is painted on the outside with a rim-band and groups of converging lines between horizontal bands and on the inside with a rim-band and a potter's mark consisting of three horizontal short lines and a vertical line at one of the ends.
8. Miniature *loti* of red ware with outcurved rim and globular body. Of fine fabric, it is treated with a slip on the outside and is painted in black on the outside with a rim-band and vertical lines between horizontal bands.
9. Hollow stand of red ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a horizontal band at the base.
10. Bowl of red ware with outcurved slightly thickened rim, almost vertical sides and carinated body. Of fine fabric, it is treated on the inside and outside with a slip and is painted in black on the outside with a rim-band and double-hill pattern above a horizontal band.
11. Bowl of red ware with slightly convex base and splayed out sides.
12. Concave-sided carinated bowl-on-stand of red ware with a beaded rim. Of fine fabric, it is treated with a slip on the inside and outside and is painted in black on the inside with a rim-band and on the outside with a rim-band and a cross-hatched design between horizontal bands.
13. Bowl of red ware with outcurved rim and carinated body. Of fine fabric, it is treated both internally and externally with a slip and is painted in black on the outside with a rim-band, crinkled lines between horizontal bands and vertical lines.
14. Miniature bowl-on-stand.
15. Concave-sided carinated bowl of red ware. Of fine fabric, it is treated on the inside and outside with a slip and painted in black on the outside with a rim-band and groups of vertical lines and a cross-hatched design below between horizontal bands.
16. Beaker of red ware with rounded bottom, vertical sides, sharpened rim and an indented mouth. Of fine fabric, its red slip is lost from almost the whole area leaving a few tiny patches here and there. The paintings in black are survived faintly. The designs visible include a horizontal band, a potter's mark consisting of two forked wavy lines meeting together and a figure of a human being wearing a robe or gown and having on his left arm something looking like flames of fire. It is interesting to note that it was recovered from a cluster of pots from one of the elliptical structures of the structural phase E connected with child welfare rituals and represented an offering bowl.
17. Stem of stand.
18. Stem of stand.
19. Bowl of red ware with concave sides and carinated body. Of fine fabric, it is treated both on the inside and outside with a slip and is painted on the outside with a rim-band and solid diamonds between horizontal bands.
20. Solid stem of stand of red ware. Of fine fabric, it is treated with a slip and is painted in black with a horizontal band and a wavy line with side-wise short strokes.
21. Stem of hollow stand of red ware. Of fine fabric, it is treated with a slip on the outside and is painted in black on the outside with a chain pattern and two horizontal bands

below.

22. Concave-sided carinated bowl of red ware. Of fine fabric, it is treated on the outside and inside with a slip and is painted in black on the outside with a rim-band and cross-hatched triangles between horizontal bands.
23. Concave-sided carinated bowl of red ware. Of fine fabric, it is treated with a slip on the outside and inside and is painted in black on the outside with two rows of alternate cross-hatched and blank squares between horizontal bands.
24. Bowl of red ware with convex sides. Of fine fabric, it is treated on the inside and outside with a slip and is painted in black on the outside with a rim-band and an indeterminate design.
25. Concave-sided carinated bowl of red ware. Of fine fabric, it is treated with a slip on the outside and inside and is painted in black on the inside with a rim-band and a potter's mark consisting of a wavy line and short strokes and on the outside with a rim-band and converging groups of lines between horizontal bands.
26. Concave-sided carinated bowl-on-stand of red ware. Of fine fabric, it is treated on the inside and outside with a slip and is painted in black on the inside with eight-pointed star with a pillet at the end of each line and on the outside of the bowl with a rim-band and groups of converging lines between horizontal bands, at the junction of the bowl and stem of stand with a horizontal band and above it a curved line resembling a snake motif and a pair of vertical crinkled lines on the hollow stem.

Fig. 71

1. *Lota* of red ware with outcurved featureless rim and squat globular body. Of fine fabric, it is treated on the outside with a slip and is painted on the inside with a rim-band and on the outside with a rim-band and groups of converging lines between horizontal bands.
2. *Lota* of red ware with outcurved featureless rim and bluntly carinated body. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a rim-band, a horizontal band at the junction of the neck and the shoulder and a single solid dot below as a potter's mark.
3. *Lota* of chocolate ware with out-turned featureless rim and carinated body. Of fine fabric, it is treated on the outside with a slip and is painted on the outside in black with a rim-band, converging groups of lines and two three-hill potter's marks one above the other.
4. *Lota* of red ware with splayed out mouth and carinated body. Of fine fabric, it is treated with a slip on the outside and is painted in black on the outside with a rim-band and groups of lines between horizontal bands.
5. *Handi* of red ware with splayed out mouth and bluntly carinated body. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a rim-band and groups of converging lines between horizontal bands.
6. *Lota* with outcurved featureless rim and carinated body. Of fine fabric, it is treated on

the outside with a slip and is painted in black on the outside with a rim-band and groups of oblique lines between horizontal bands, another horizontal band and a single oblique line below.

7. *Lota* of chocolate red ware with outcurved rim and squat globular body. Of fine fabric, it is treated with a slip on the outside and is painted in black on the outside with a pair of wavy vertical lines and loops between horizontal bands.
8. Small *handi* of red ware with splayed out mouth and carinated body. Of fine fabric, it is treated on the outside with a slip and is painted in black on the inside with a rim-band and on the outside with a rim-band, converging groups of lines between horizontal bands, a single solid dot as potter's mark between the open space formed by converging groups of lines and a horizontal band below.
9. Miniature *handi* of red ware with squat body and outcurved pointed rim. Of fine fabric, it is treated on the outside with a slip and is painted on the outside in black with converging groups of lines between horizontal bands.
10. Small *handi* of red ware with splayed out mouth and carinated body. Of fine fabric, it is treated on the outside with a slip and is painted on the outside with groups of oblique lines as potter's mark. It also bears a graffiti mark of a ladder.
11. *Handi* of chocolate ware with splayed out mouth, carinated body and tubular spout. Of fine fabric, it is treated with a slip on the outside.
12. Rim-fragment of a vase of red ware with outcurved featureless rim and narrow neck. Of fine fabric, it is treated with a slip and is painted in black on the outside with a rim-band and a trellis pattern below a pair of horizontal bands.
13. Rim-fragment of a vase of red ware with almost horizontally splayed out slightly thickened rim. Of fine fabric, it is treated on the inside and outside with a slip and is painted in black on the inside with a festoon design below rim-band.
14. Rim-fragment of a vase of red ware with outcurved featureless rim and oblique shoulder. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a rim-band, a horizontal band below and a vertical line with sideways small horizontal strokes.
15. Rim-fragment of a vase of red ware with an out-turned beaded rim and narrow neck. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a rim-band and a horizontal band on the neck.
16. Rim-fragment of a vase of red ware with an externally bevelled outcurved rim and convex shoulder. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a rim-band and criss-cross design.
17. Rim-fragment of a vase of red ware with oval rim and oblique shoulder. Of fine fabric, it is treated on the outside with a rim-band and an indeterminate design below a horizontal band.
18. Rim-fragment of a vase of red ware with beaked outcurved rim and oblique shoulder. Of fine fabric, it is treated on the outside with a slip and is painted in black on the inside with a rim-band and on the outside with a rim-band and cross-hatched design and a

crinkled line below a horizontal band.

19. Rim-fragment of a vase of red ware with outcurved featureless rim. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a crinkled line below a horizontal band.

Fig. 72

1. *Chambu* of red ware with a splayed out ledged square rim, squat globular body, high narrow neck and tubular spout. Of fine fabric, it is treated with a slip and is painted in black on the outside with two horizontal bands at the junction of the neck and the shoulder, two crinkled vertical lines below, two horizontal crinkled lines between horizontal bands, one below the other and oblique thin lines between horizontal bands.
2. *Chambu* of red ware similar in shape as 1 above. Of fine fabric, it is treated on the outside with a slip and is painted in black on the inside with a rim-band and on the outside with a rim-band, a horizontal band below, two horizontal bands at the junction of the neck and the shoulder, standing deer with wavy horns, a wavy line above a horizontal band, and one band each, one below the other, of cross-hatched design and oblique lines between horizontal bands.
3. *Loti* of red ware with splayed out mouth, narrow neck and squat bulbous body. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a rim-band and groups of lines between horizontal bands.
4. *Loti* of red ware with outcurved featureless rim, narrow neck and squat bulbous body. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with oblique lines between horizontal bands and a horizontal band below.
5. *Loti* of red ware with splayed out mouth, narrow neck and squat globular body. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a rim-band, two bands below, intersecting and oblique pairs of lines and cross-hatched triangles between horizontal bands and a horizontal band below. Burial 8.
6. *Handi* of red ware with splayed out mouth, carinated body and tubular spout. Of fine fabric, it is treated on the outside with a slip and is painted on the outside with a slip and is painted on the outside with a rim-band, a horizontal band at the neck, oblique lines above a horizontal band and a thin line below.
7. *Loti* of red ware with almost horizontally splayed out rim, narrow high neck and squat globular body. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a horizontal thin rim-band, horizontal band below rim and on the neck and converging groups of lines between horizontal bands.
8. Miniature *loti* of red ware with high concave-sided narrow neck, out-turned featureless rim and carinated body. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a rim band, a horizontal band below and chequer pattern between horizontal bands. Such miniature *lotis* were obtained from the clusters of pots from the elliptical religious structures of structural phase E which were connected

with child welfare rituals.

9. *Loti* of red ware with splayed out mouth and carinated body. Of fine fabric, it is treated on the outside with a slip and is painted in black on the inside with two short strokes on the rim like a festoon and on the outside with a rim-band and oblique lines between horizontal bands.
10. *Loti* of red ware with outcurved square rim and squat globular body. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a rim-band and oblique lines between horizontal bands.
11. Rimless *chambu* with bottle-neck and bulbous body. Of fine fabric, it is treated with a slip and is painted with a series of horizontal bands on the neck, oblique lines above a horizontal band and solid rectangles between pairs of horizontal bands.

Fig. 73

1. *Handi* of red ware with funnel-shaped mouth, carinated body and tubular spout. Of fine fabric, it is treated on the outside and partly on the inside with a slip and is painted in black on the outside and inside with a rim-band and on the outside with two horizontal bands, oblique strokes rising from the upper of the two bands and a potter's mark of heron.
2. *Handi* similar to 1 above but with a bluntly carinated body. It is painted in black with a rim-band from inside and outside, and on the outside a horizontal band at the junction of the neck and the shoulder, two crinkled lines reaching the base of the tubular spout one band each around the mouth and the base of the spout and loops surmounted by oblique strokes above the upper of the two horizontal bands. On the outside, below the spout, there is a graffiti mark consisting of vertical and horizontal lines and a crinkled line.
3. *Handi* of red ware similar to 2 above and painted in black with designs also similar to those on 2 above, the only difference being that the surmounting strokes being inclined towards right. It bears on the shoulder a potter's mark of two horizontal lines.
4. *Loti* of red ware with outcurved featureless rim narrow high neck and squat carinated body. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with a rim-band, oblique lines between horizontal bands and a potter's mark of a wavy line like that of a snake.
5. *Loti* of red ware similar in shape and painted designs to 4 above. It bears on the shoulder a potter's mark of a plant motif.
6. *Chambu* of red ware with high narrow neck splayed out rounded rim and squat globular body. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside and inside with a rim-band, a horizontal band at the junction of the neck and the shoulder, close-spaced crinkled lines forming a chain pattern on the shoulder, a register of solid diamonds and rectangles between horizontal bands below.
7. *Loti* of red ware with globular body. Of fine fabric, it is treated on the outside with a

slip and is painted in black on the outside with vertical lines between horizontal bands and a potter's mark of four solid dots.

8. *Lota* of red ware with high narrow neck, outcurved rim and globular body. Of fine fabric it is treated on the outside with a slip and is painted in black on the outside and inside with a rim-band and on the outside with vertical lines between pairs of horizontal bands and a potter's mark of four solid dots, two of them being smaller in size than the other two.
9. *Lota* of red ware with high narrow neck, outcurved slightly rounded rim and squat globular body. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside and inside with a rim-band, a horizontal band on the neck and vertical lines between horizontal bands below.
10. *Lota* of red ware with high narrow neck, beaked rim and globular body. Of fine fabric, it is treated with a slip on the outside and is painted in black on the inside and outside with a rim-band, a horizontal band on the neck below, chequer pattern with rectangles between horizontal bands and a horizontal band below.
11. Miniature *handi* of red ware with funnel-shaped mouth, bluntly carinated body and tubular spout. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside and inside with a rim-band, a horizontal band at the junction of the neck and shoulder and oblique stroke above the upper of the two horizontal bands.
12. *Handi* of chocolate ware with out-turned slightly beaded rim and globular body. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside and inside with palm leaf motif and a crinkled line between horizontal bands and a pair of horizontal bands below.

The following potter's marks occurring on the outside of pots of Jorwe Ware are illustrated in figs. 74-77.

Fig. 74

1. One solid dot.
2. Two solid dots, one above the other.
3. Two solid dots by the side of each other.
4. Three solid dots one, bigger, above and two, smaller, below.
5. One solid dot and one oblique line.
6. Three solid dots, one on top of two.
7. Three solid dots, two on top of one, but little away from the latter.
8. Three close-spaced solid dots, two above one.
9. Four solid dots.
10. Five solid dots and solid semi-circles.
11. Solid dot and four lines shooting from it obliquely downwards.
12. Solid dot and four lines shooting above from it.

13. Solid oval with six lines shooting upwards.
14. Solid dot and two lines shooting towards right.
15. Two solid dots side by side and three lines shooting upwards from each.
16. Two solid dots side by side and four lines shooting upwards from each.
17. One solid dot and two solid dots above, three lines shooting upwards from each of the latter.
18. Two lines with a solid dot at the end of each.
19. Double-hooked horizontal line.
20. One oblique line.
21. Three horizontal lines.
22. Four horizontal lines.
23. Three horizontal lines.
24. Two horizontal lines.
25. Four oblique lines.
26. A single horizontal line with a solid dot at one of the ends.
27. A dumb-bell motif.

Fig. 75

28. A trichula.
29. A trichula and a solid dot.
30. One hooked line.
31. Two hooked lines one above the other, the hook being downwards.
32. Two hooked lines one within the other, the hook being upwards.
33. A plough motif.
34. One horizontal line with one vertical line at each end.
35. One horizontal line with a pair of vertical lines at each end.
36. One horizontal line with oblique lines shooting upwards.
37. Plant motif.
38. A crinkled line.
39. Two crinkled lines meeting at one end in a knot.
40. Two close-spaced crinkled lines forming a chain pattern.
41. One vertical line with a circle at the lower end.
42. Two wavy lines meeting at one end.
43. Two wavy lines meeting at one end and extending further in a circle and a knot.
44. Incomplete hill motif.
45. Semi-circle.
46. Empty oval.
47. Circle and one line shooting to the right.
48. Hill motif.
49. Hill motif intersected by an oblique stroke.

- 50. Intersecting lines within an empty oval.
- 51. Sun motif.

Fig. 76

- 52. Double-hill motif.
- 53. Double-hill motif, the hills being a little away from each other.
- 54. Two groups of double-hill motif, one in each group facing upwards and downwards.
- 55. Close-spaced double-hill motif.
- 56. Cross formed by wavy lines.
- 57. Eight-pointed star.
- 58. One line intersected by another.
- 59. Two pairs of intersecting lines.
- 60. Three lines intersecting three lines.
- 61. Four lines intersecting four lines.
- 62. Opposed triangles.
- 63. Opposed triangles.
- 64. Two intersecting lines intersected by a horizontal line.
- 65. Ladder with a solid dot at each end.
- 66. Ladder with seven rings.
- 67. Ladder with eight rings.
- 68. Ladder with three rungs.
- 69. Pipal — leaf.
- 70. Indeterminate. But when viewed from a side the mark looks like a man holding a plough-like object in each hand.
- 71. Human motif placed horizontally.
- 72. A horizontal line joined with a forked line at the end.

The selected potter's marks painted on the inside of pottery are illustrated.

Fig. 77

- 73. Two solid dots, one above the other.
- 74. Two solid dots, one beside the other.
- 75. Four solid dots.
- 76. Six solid dots.
- 77. One solid dot and two lines.
- 78. Solid oval and four lines.
- 79. Solid dot and curved lines.
- 80. Hand and open palm.
- 81. One line.
- 82. Two lines.

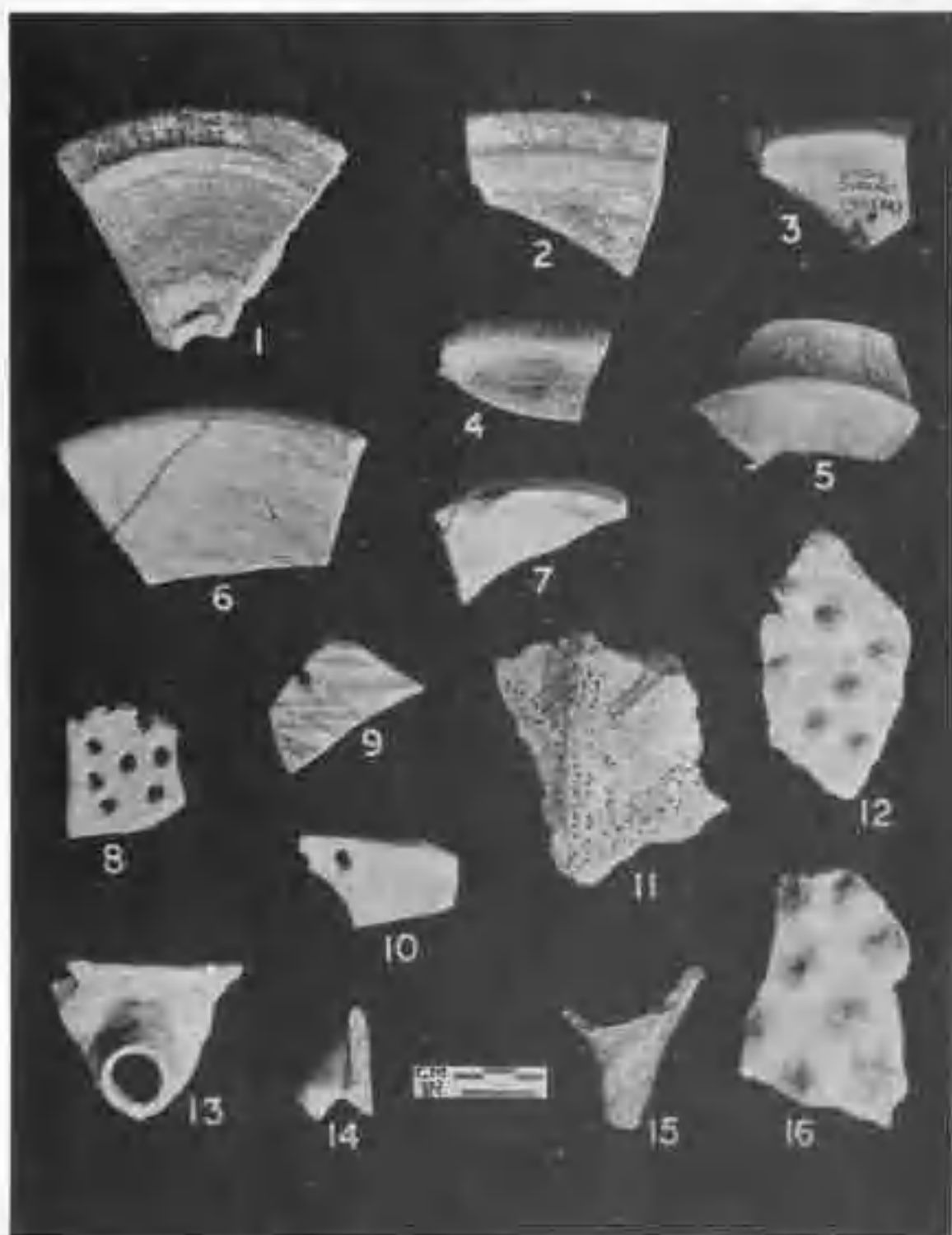


PLATE XCVI Deep Red Ware with waxy touch, perforated ware, glaucous ware, knobbed ware.

83. Three lines.
84. Four lines.
85. Dumb-bell motif.
86. Hook.
87. Cross.
88. Vertical line intersected near each end by a pair of horizontal strokes.
89. Two vertical lines intersected by two lines.
90. Three lines intersected by four lines.
91. Hill intersected by an oblique line or a bow and arrow motif.
92. Solid dot and an oval.
93. Bow and arrow motif.
94. Two wavy lines.
95. One crinkled line.
96. Two crinkled lines meeting at the end and three pointed strokes shooting upwards from the end.
97. An oblique line and short lines shooting downwards from it.
98. Two wavy lines meeting at one end in a knot.
99. One oblique line and downwards shooting oblique strokes from it.
100. Two crinkled lines meeting at both the ends.
101. Squatting human, notched arrowhead above and a bird below on his right, perhaps a heron (?).
102. Plant.

(ii) Deep Red Ware With Waxy Touch

This ware is represented by only three examples. They are distinct from the Jorwe Ware in having a deep red slip with waxy touch and medium fabric. One of them is a shallow dish with a hole in the centre followed by a deep circular groove suggesting that it was meant to be used as some device (fig. 78, 17; pl. XCVI, 9). It is painted in black with a rim band and groups of vertical strokes on the intumed ledged rim. The second is a fragment of a dish with oblique sides and internally collared ledged rim. It is painted in black with a rimband and horizontal concentric bands and group of vertical strokes on the rim on the inside (fig. 78, 18; pl. XCVI, 2). The third is a fragment of a bowl with a nail-headed rim. It is painted in black on the inside with a group of vertical strokes on the rim, a horizontal band, a dot and a vertical line (fig. 78, 19; pl. XCVI, 6).

(iii) Reddish Painted Ware

Only a solitary example of this ware is present. It has, however, been treated separately in view of the fact that it entirely differs from the Jorwe Ware. It is a fragment of a dish of lustrous chocolate ware with internally ledged rim. Of fine fabric, it is treated both internally

and externally with a thin slip and is painted in white pigment on the inside with pointed strokes on the rim (fig. 78, 16; pl. XCVI, 4). Analogues occur at Rangpur⁴² and Surkotada⁴³.

(ix) *Knobbed Ware*

Of this ware only a few fragments are present in the collection. They are of red ware, without slip and possess on the outer surface prominent pointed knobs (pl. XCVI, 12 and 16).

(v) *Perforated Ware*

A few of the potsherds of the Jorwe Ware are with purposely made perforations (fig. 78, 14 and 20; pl. XCVI, 8-10).

(vi) *Miscellaneous Ware*

In this category is included only one fragment of a leg of a footed vase of chocolate ware (fig. 78, 15; pl. XCVI, 15).

The pottery of categories (ii) and (iii), although represented by stray examples, appears to indicate contacts with the Jorwe people of Daimabad with the contemporaries from elsewhere. The illustrated examples are described:

Fig. 78, pl. XCVI

1. Incurved bowl of red ware. Of fine fabric, it is treated on the inside and outside with a slip and is painted in black on the outside with horizontal lines within loops between horizontal bands.
2. Bowl with ear handle of red ware.
3. Bowl of red ware with outcurved pointed rim and convex profile. Of fine fabric, it is treated with a slip internally and externally and is painted in black on the inside and outside with a rim-band and on the outside with converging groups of lines between horizontal bands.
4. Concave-sided carinated bowl with a short tubular spout. Of fine fabric, it is treated on the outside and inside with a rim-band and a band around the hole of the spout and on the outside with a rim band, horizontal bands and a band around the mouth of the tubular spout.

42. S.B. Rao, 'Excavation at Rangpur and other Explorations in Gujarat', *Ancient India*, 18 and 19, (1962 and 1963), fig. 43, 102 and 102a which have been identified as lamps.

43. J.P. Joshi, 'Fresh light on the Archaeology of Kutch', in (ed.) S.B. Deo, *Archaeological Congress and Seminar Papers*, (Nagpur, 1972), pp. 24-35, pl. XIA, top.

5. Dish of red ware with outcurved sharpened rim and carinated body. Of fine fabric, it is treated on the inside and outside with a slip.
6. Concave-sided carinated bowl of red ware with short tubular spout. Of fine fabric, it is treated on the inside and outside with a slip and is painted on the inside with a rim-band and a fine and on the outside with a rim-band, oblique lines between horizontal bands and a band around the base of the spout. There also occur a few solid dots which perhaps appear to have been caused due to spilling of the paint.
7. Concave-sided carinated bowl of red ware. Of fine fabric, it is treated on the inside and outside with a slip and is painted in black on the outside with a rim-band, horizontal band below and a hill motif below.
8. Fragment of a stand of red ware. Of fine fabric, it is treated on the inside and outside with a slip and is painted in black, on the outside with a band at the base.
9. Fragment of a short tubular spout of red ware.
10. Concave-sided bluntly carinated bowl of red ware with a short tubular spout. Of fine fabric, it is treated on the outside and inside with a slip and is painted in black on the outside with a rim-band.
11. Bowl of reddish ware with splayed sides and internally oval-collared rim. Of fine fabric, it is treated on the inside and outside with a slip and is painted on the outside with a thin rim-band.
12. Fragment of a stem of stand of orange ware. Of fine fabric, it is treated on the outside with a slip and is painted in black on the outside with oblique lines.
13. Fragment of a perforated vase of red ware.
14. Fragment of a perforated vase of red ware.
15. Leg of a footed vase of chocolate ware.
16. Dish of lustrous chocolate ware with internally ledged rim. Of fine fabric, it is treated on the inside and outside with a slip and is painted in white pigment on the inside of the rim with pointed short strokes.
17. Dish of deep red ware with waxy touch with a purposely made central hole and a deep groove around and internally ledged rim. Of fine fabric, it is treated on the inside and outside with a slip and is painted in black on the inside with a rim and short strokes below and on the outside with a rim-band.
18. Dish of deep red ware with waxy touch with internally ledged collared rim. Of fine fabric, it is treated on the inside and outside with a slip and is painted in black on the inside with a rim-band and short strokes and concentric bands below and on the outside with a rim-band.
19. Bowl of deep red ware with waxy touch with a nail-headed rim. Of fine fabric, it is treated on the inside and outside with a slip and is painted in black on the inside with short strokes, a concentric thick band, an oblique line and a solid dot.
20. Fragment of a perforated vase of red ware.

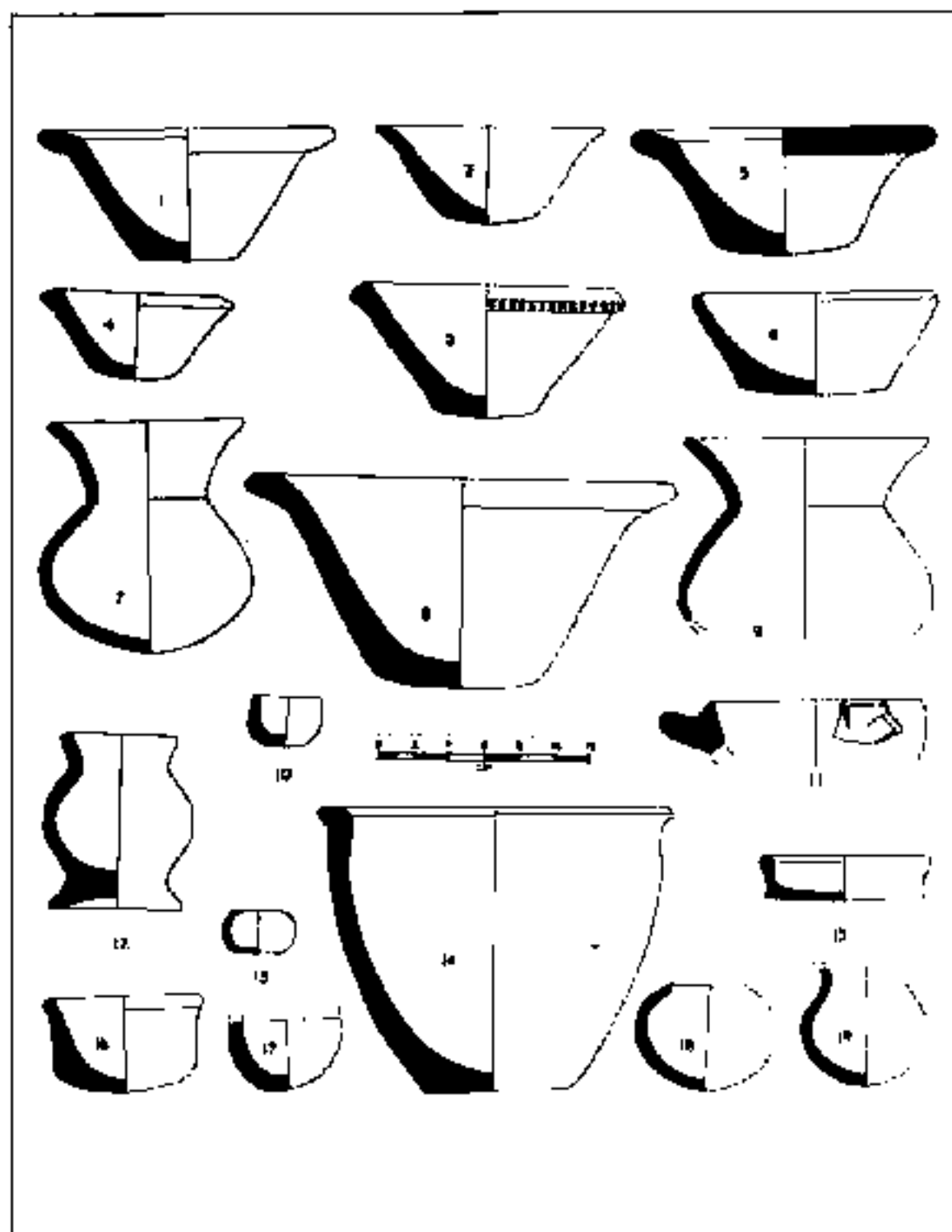


Fig. 79. Burmishel Grey Ware, Phase V.

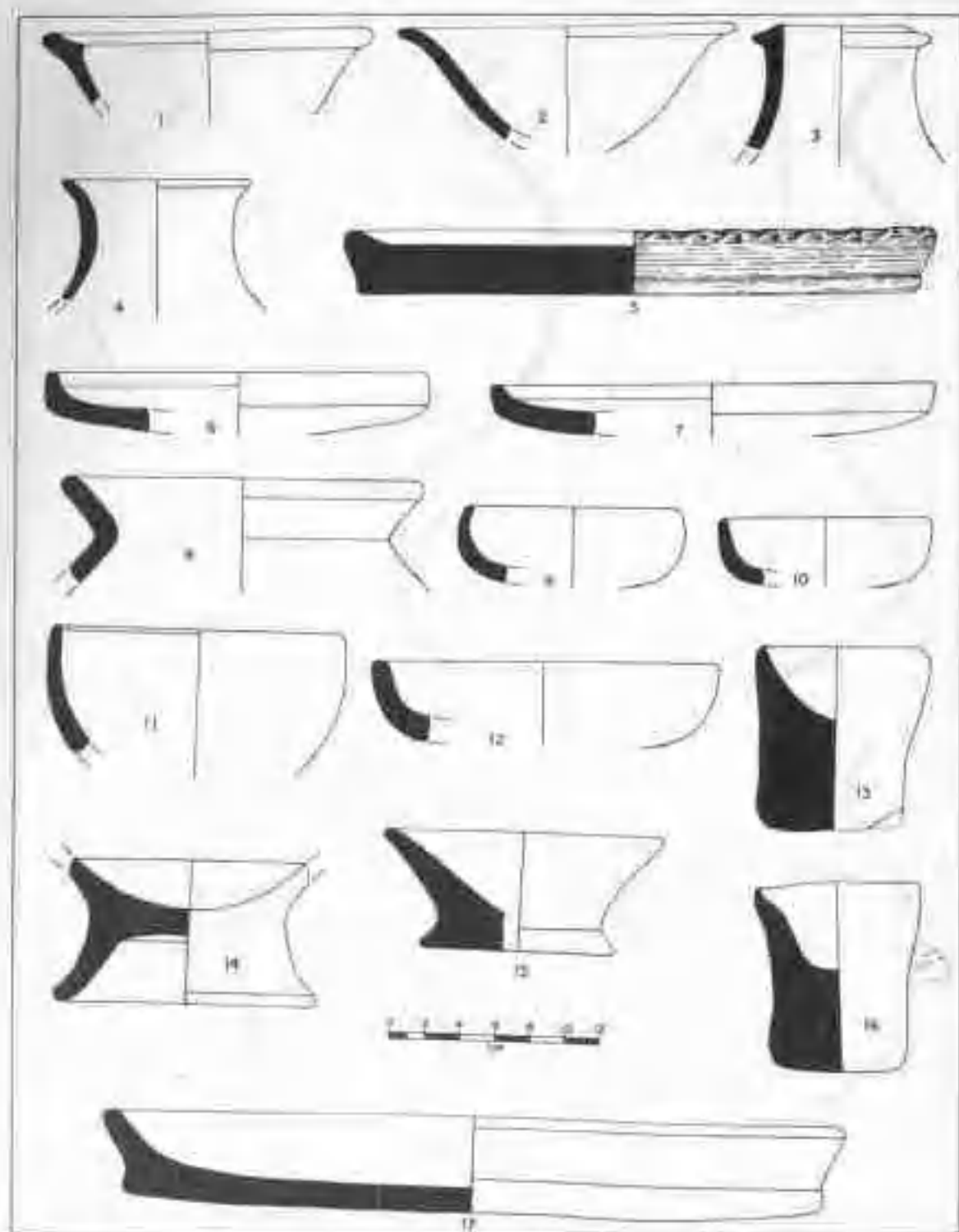


Fig. 80. 1-12, 14 and 17, Burnished Gray Ware; 13, 15 and 16, Handmade Red Ware, Phase V.

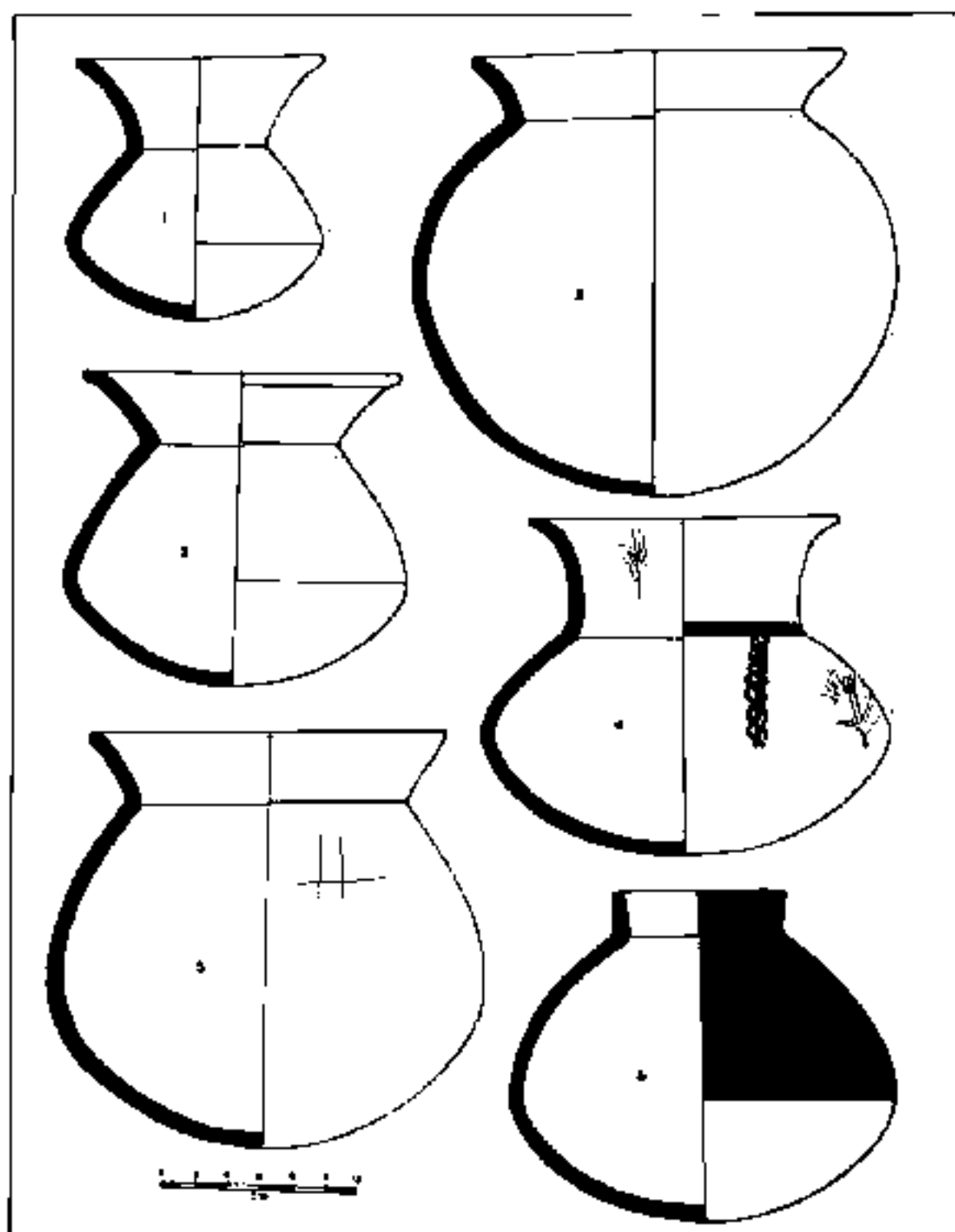


Fig. 61. Dural Uruk: 2 and 3, Dital 44; overlap between Phase IV and Phase V: 1 and 5, Dural 66; 4, Dural 125 and 6, Dural 42. Phase V

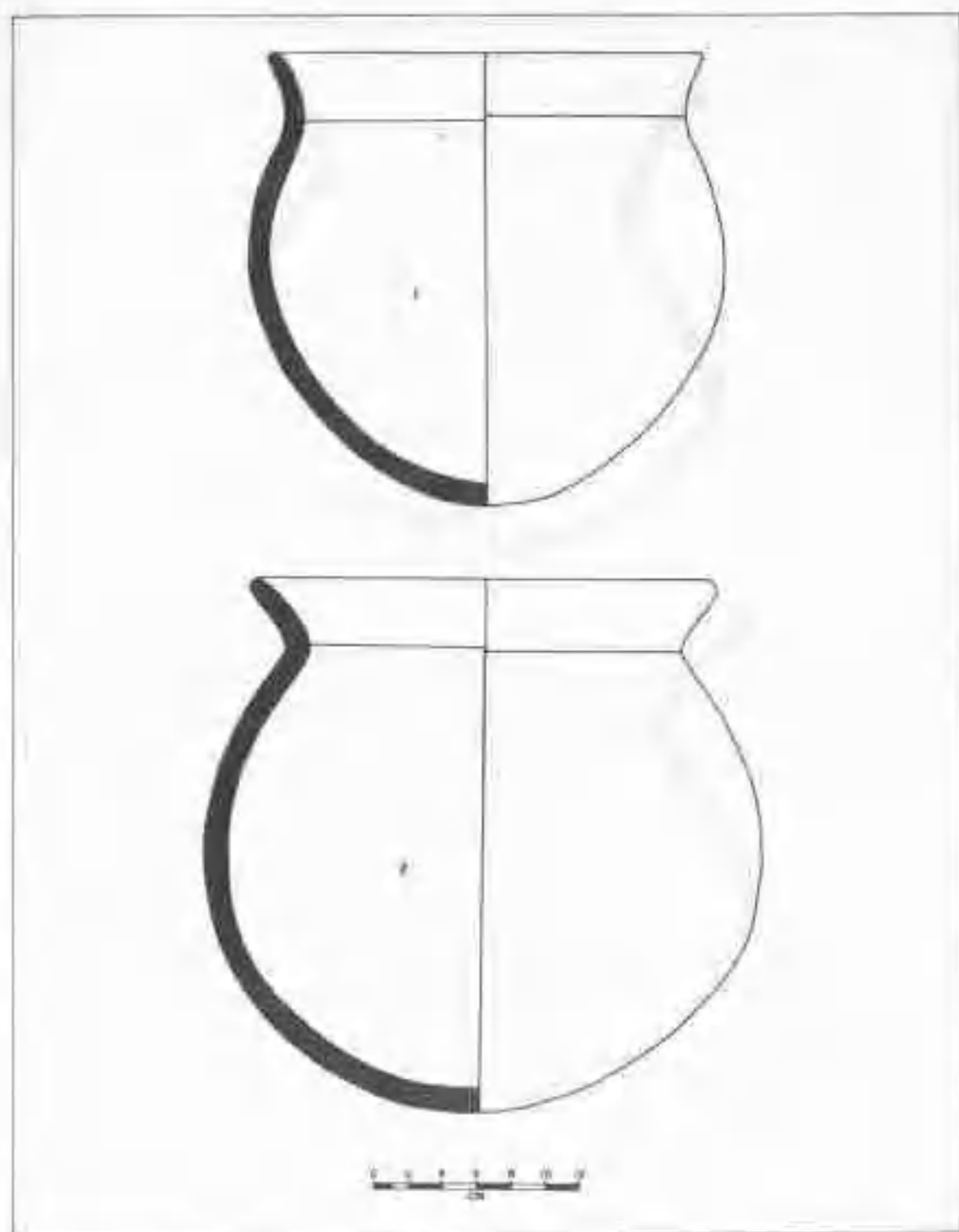


Fig. 32. Burial Urn (Burial 51). Phase V.

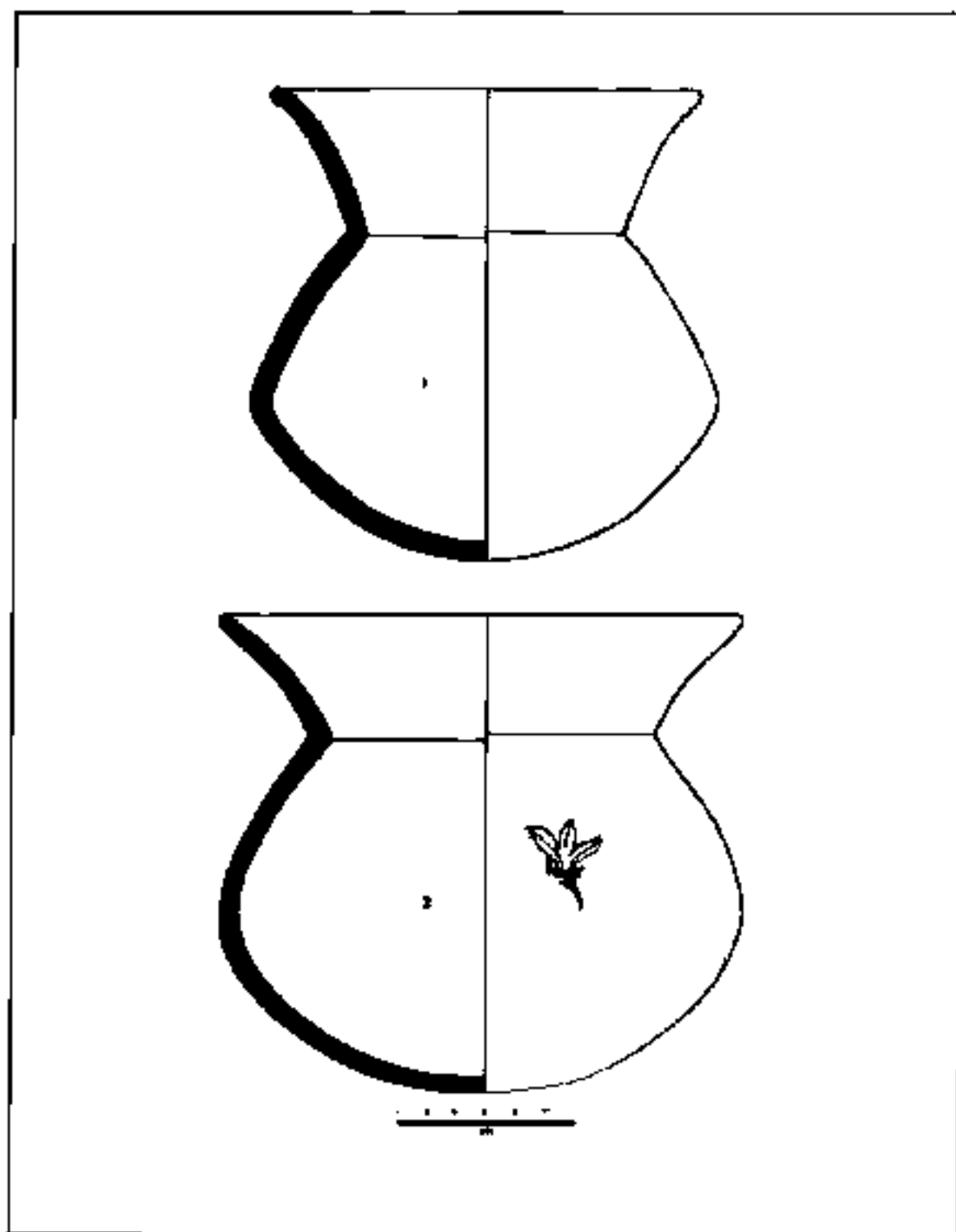


Fig. 88. Durbat Urop : Durbat 59. Plate V.

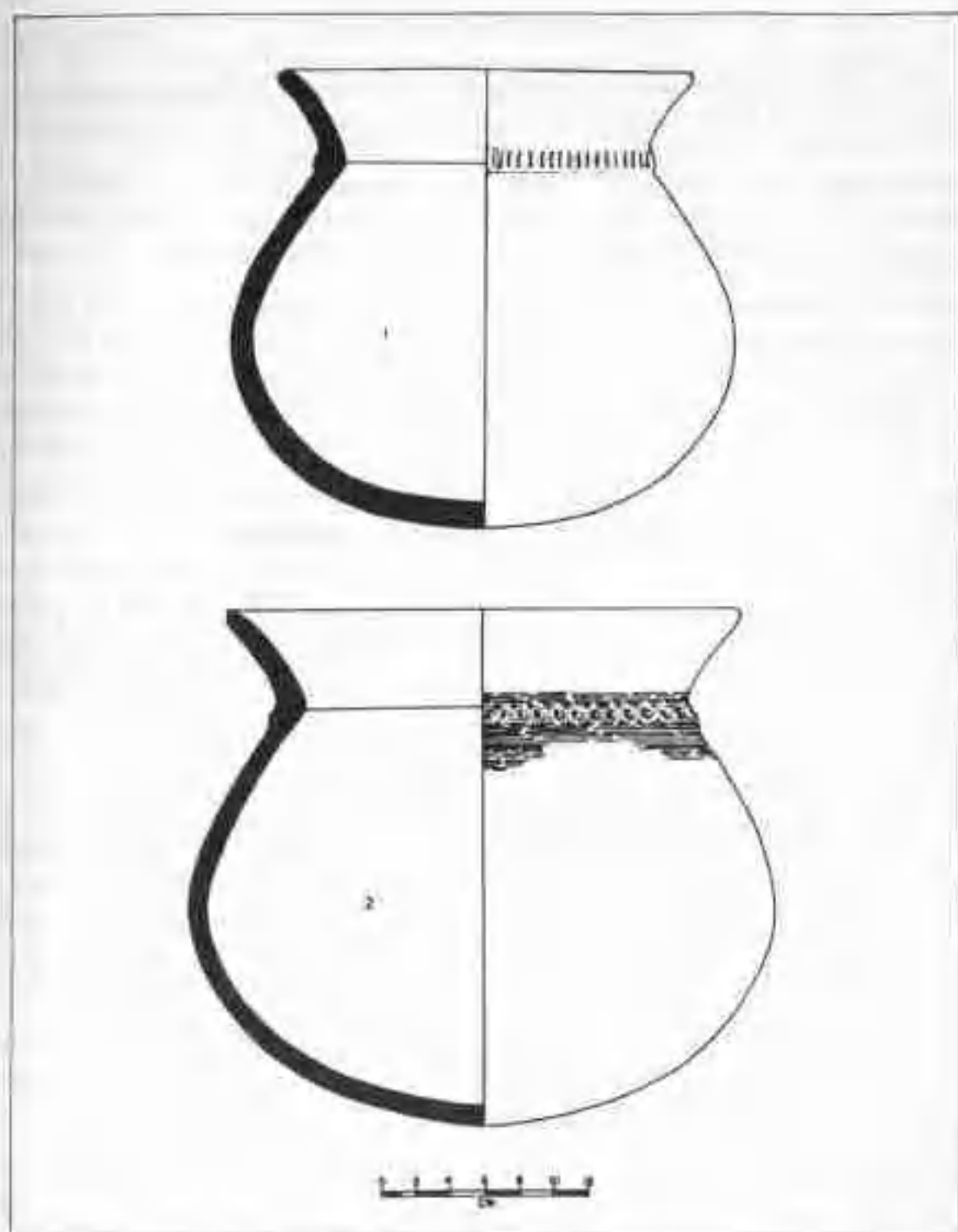


Fig. 88. Burial Urns: Burial 37, Phase V.

(vii) *Burnished Grey Ware*

This ware is finer than the burnished grey ware of the preceding phases. In fabric it is not so gritty as that of Phase IV. Even the bigger vases in this ware are of medium fabric. The surface is well dressed with slip and burnished, the burnishing having given a gloss much brighter than that occurring on this class of ware of the preceding phases. It is, however, under-fired so that the core is ivory black-to-black. The surface colours include grey, blotchy grey, brown, red, black, pink and chocolate. The ware is present in four varieties: (1) plain, (2) decorated, (3) lids and (4) lamps.

(1) In the plain variety are chiefly included (1) vase with flared out mouth and bulbous or carinated body (figs. 80, 8; 81, 1 and 2; 82 and 83), (2) *kwadi* with narrow flat base convex splayed body and outcurved sharpened rim (fig. 79, 14); (3) deep bowl with flatish base, splayed sides and splayed out slightly thickened rim (fig. 79, 8); (4) deep bowl with splayed outsides and out-turned oval-shaped rim (fig. 79, 1 and 3); (5) bowl with convex base splayed out sides and outcurved sharpened-rim (fig. 79, 2); (6) bowl with flatish base, convex sides and externally bevelled rim (fig. 79, 6); (7) bowl with convex base, splayed sides and externally bevelled rim (fig. 79, 4); (8) spherical bowl with sharpened lip (fig. 79, 18); (9) stud-handled bowl with convex sides (fig. 79, 11); (10) bowl with convex carinated base, almost vertical sides and rounded rim (fig. 79, 16); (11) miniature incurved bowl (fig. 79, 13); (12) miniature U-shaped bowl (fig. 79, 10); (13) dish with carinated base and rounded rim (fig. 79, 15); (14) *lofi* with globular body and splayed out mouth (fig. 79, 12 and 19); (15) *lofi* with pedestal base, globular body and almost vertical neck (fig. 79, 12); (16) vase with ring-stand (fig. 80, 14); (17) vase with narrow high neck and outcurved rim; (18) incurved bowl; (19) platter with slightly raised vertical edge (fig. 80, 17); (20) vase with concave narrow neck and externally bevelled rim (fig. 80, 4) (21) plate (fig. 20, 6 and 7) (22) dough-plate (fig. 80, 5); (23) vase with high narrow neck and externally ledged bevelled rim (fig. 80, 5); (24) bowl with convex body (fig. 80, 9-12) and (25) vase with globular body and vertical narrow neck (fig. 81, 6). The types 1 and 3-7 occurred in association with burials, as burial urns, as well as the residences. The type 14 is a new type. The type 5 had occurred before as a cover of the burial urn of burial 57 of the overlap phase between Phase IV and Phase V. The small-sized burial-urns (fig. 81, 1 and 3) are of all-black variety. Some of the pots used in burials are painted with a rim-band in ochre red colour. The type 25 is a burial urn painted in deep red colour on the outside. Mention should also be made of a burial urn with almost vertical high neck, outcurved rim and square globular body of burial 44 from overlap phase between Phase IV and Phase V (fig. 81, 4). It is painted in black colour on the outside with a horizontal band at the junction of the neck and the shoulder and three close-spaced wavy lines hanging below. It also bears a graffiti of tree motif on the outside on the shoulder and on the inside on the rim. The most interesting graffiti mark on the burial urn of burial 69 is that of a flower on the outside on the shoulder (fig. 83, 2).

In the second variety the decorations are incised and applied. The former include punctured marks, chevrons and vertical lines and the latter bands in applique decorated with mostly

finger-tip impressions and occasionally punctured marks. The types represented are (1) bowl with flat base, tapering sides and externally bevelled rim (fig. 79, 5); (2) dough-plate with slightly raised edge (fig. 80, 3); (3) *kundi* with slightly convex and tapering sides; (4) channel-spouted vase and (5) vase with flaring rim and bulbous body used both in the house and in the burial as burial urns (fig. 84).

The lids (pls. XCVII and XCVIII) are of various types including (1) saucer-type; (2) biconvex bun-shaped and (3) concavo-convex. The knobs are flat-topped, tapering, conical, single or also double pinnacle-umbrella (pl. XCVII, 5), conical with and without finger-tip depressions, and with raised vertical wall having finger tip impressions on either side (pl. XCVII, 2). On one of the surfaces of some of the bun-type lids there are two, three and four finger-tip depressions. Two examples among the lids are engraved with graffiti marks (pl. XCVII, 3 and 7). The pinnacle-umbrella knob is painted in ochre red colour.

The lamps (pl. LXXXVIII, 1, 4-8) are with or without stand and oval, circular, square and rectangular on plan. A variety with a handle (pl. LXXXVIII, 8) and a miniature pointed oval type (pl. LXXXVIII, 7) are also present. The oval type is similar to that of Phase IV. The example with handle has concave sides and flat base. Interesting is the incense burner-on-stand (pl. XCIX) with four curved horns, one each at each corner, and square opening. Its horns, ledge of stand and edge of square opening are painted in ochre red colour whereas the convex four sides are painted alternately in red and white pigments with vertical lines. The horns at the corners resemble those of a bull in shape.

The selected types are illustrated in figs. 79-84.

Fig. 79

1. Deep bowl of burnished grey ware with splayed sides and almost horizontally splayed oval-shaped rim. Of medium fabric, it is treated both internally and externally with a slip and burnished.
2. Deep bowl of burnished grey ware with splayed sides and outcurved sharpened rim. Of medium fabric, it is treated on the inside and outside with a slip and burnished.
3. Deep bowl of burnished grey ware with slightly convex vase, splayed sides and outcurved oval-shaped rim. Of medium fabric, it is treated with a slip from inside and outside and is painted in ochre red colour on the outside with a rim band.
4. Deep small bowl of burnished grey ware with a slightly convex base, splayedout sides and externally bevelled rim. Of medium fabric, it is treated on the outside and inside with a slip and burnished.
5. Deep bowl of burnished grey ware with a convex base, splayedout sides and externally bevelled rim decorated with oval-shaped incised designs on applied band. Of medium fabric, it is treated externally and internally with a slip and burnished.
6. Bowl of burnished grey ware with splayedout sides and externally bevelled rim. Of medium fabric, it is treated externally and internally with a slip and burnished.
7. *Lota* of burnished grey ware with splayedout mouth and globular body. Of medium fab-

ric, it is treated on the outside with a slip and burnished.

8. Deep bowl of burnished grey ware with slightly convex base, splayed-out sides and oval-shaped rim. Of medium fabric, it is treated both internally and externally with a slip and burnished.

9. Vase of burnished grey ware with splayed-out mouth and globular body. Of medium fabric, it is treated on the outside with a slip and burnished.

10. Miniature bowl of burnished grey ware.

11. Bowl of burnished pink ware with a stud-handle. Of medium fabric, it is treated with a slip and burnished.

12. *Lota*-on-stand of light red ware with globular body and vertical neck. Of medium fabric, it is treated on the outside with a slip and burnished.

13. Miniature bowl.

14. *Kunda* of burnished grey ware with flat base, oval-shaped body and slightly outcurved thickened and internally bevelled rim. Of medium fabric, it is treated on the inside and outside with a slip and burnished.

15. Miniature shallow bowl.

16. Miniature bowl.

17. Globular base of a miniature *loti*.

18. Miniature *loti* of grey ware with globular body.

19. Rimless miniature *loti* of burnished black ware with globular body.

Fig. 80

1. Bowl of burnished black ware with splayed out internally ledged rim. Of medium fabric, it is treated on the inside and outside with a slip and burnished.

2. Lid of deep saucer type of burnished grey ware with high outcurved sides. Of medium fabric, it is treated on the inside and outside with a slip.

3. Neck-fragment of a vase of burnished grey ware with high narrow neck and externally ledged rim. Of medium fabric, it is treated with a slip both internally and externally.

4. Neck-fragment of a vase of burnished grey ware with high narrow neck and outcurved featureless rim. Of medium fabric, it is treated from inside and outside with a slip and burnished.

5. Dough-plate of burnished black ware with slightly raised vertical sides decorated with finger-tip impressions. Of medium fabric, it is treated with a slip both from inside and outside and burnished.

6. Plate of burnished black ware with tapering almost vertical sides. Of medium fabric, it is treated with a slip from inside and outside and burnished.

7. Plate of burnished brown ware almost similar to 6 above.

8. Rim-fragment of a vase of burnished grey ware with splayed out mouth. Of coarse fabric, it is treated on the outside and inside with a slip and burnished.

9. Shallow small bowl of burnished grey ware with slightly convex sides. Of medium fabric,

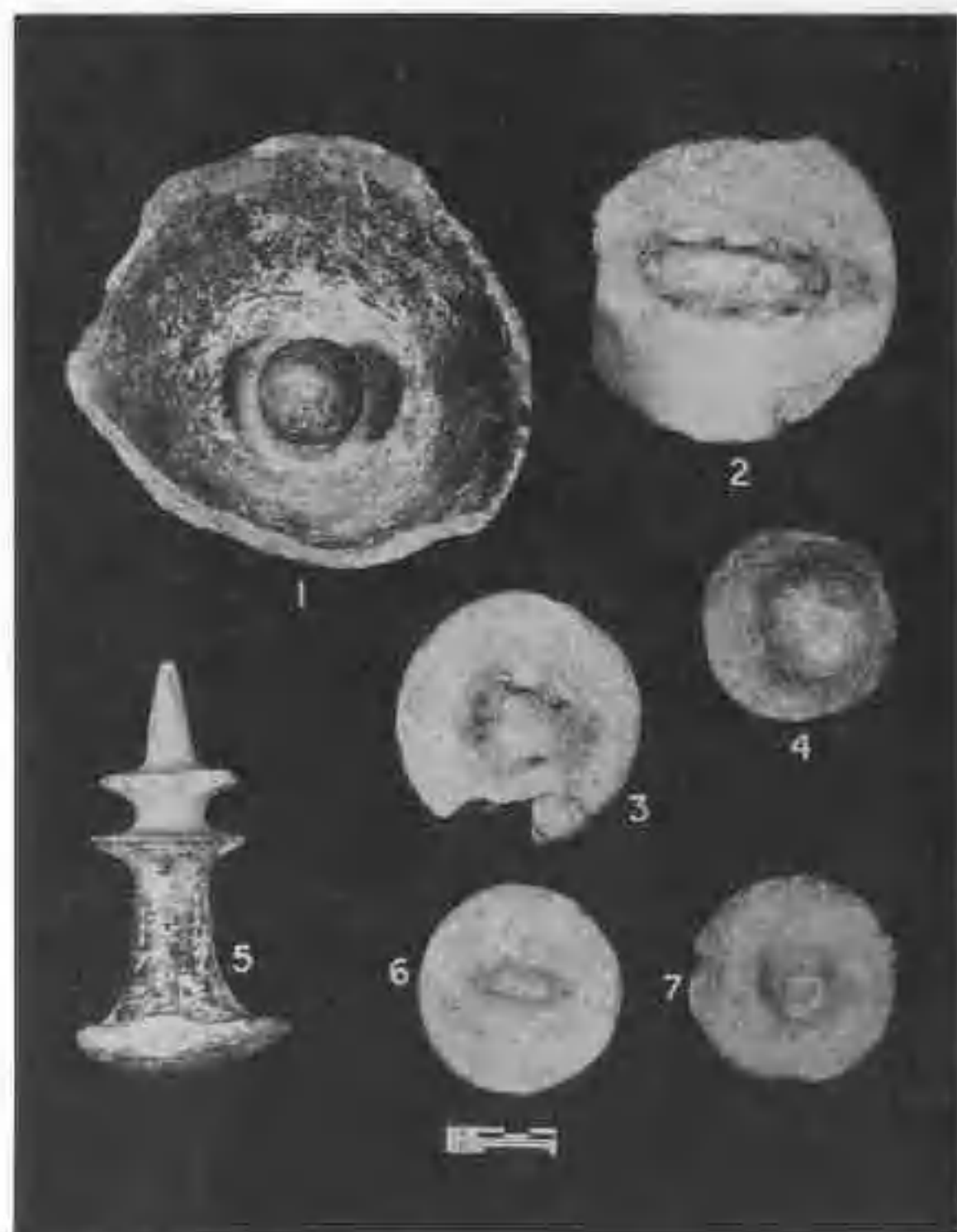


PLATE XCVII Lids, Burnished Gray Ware, Phase V

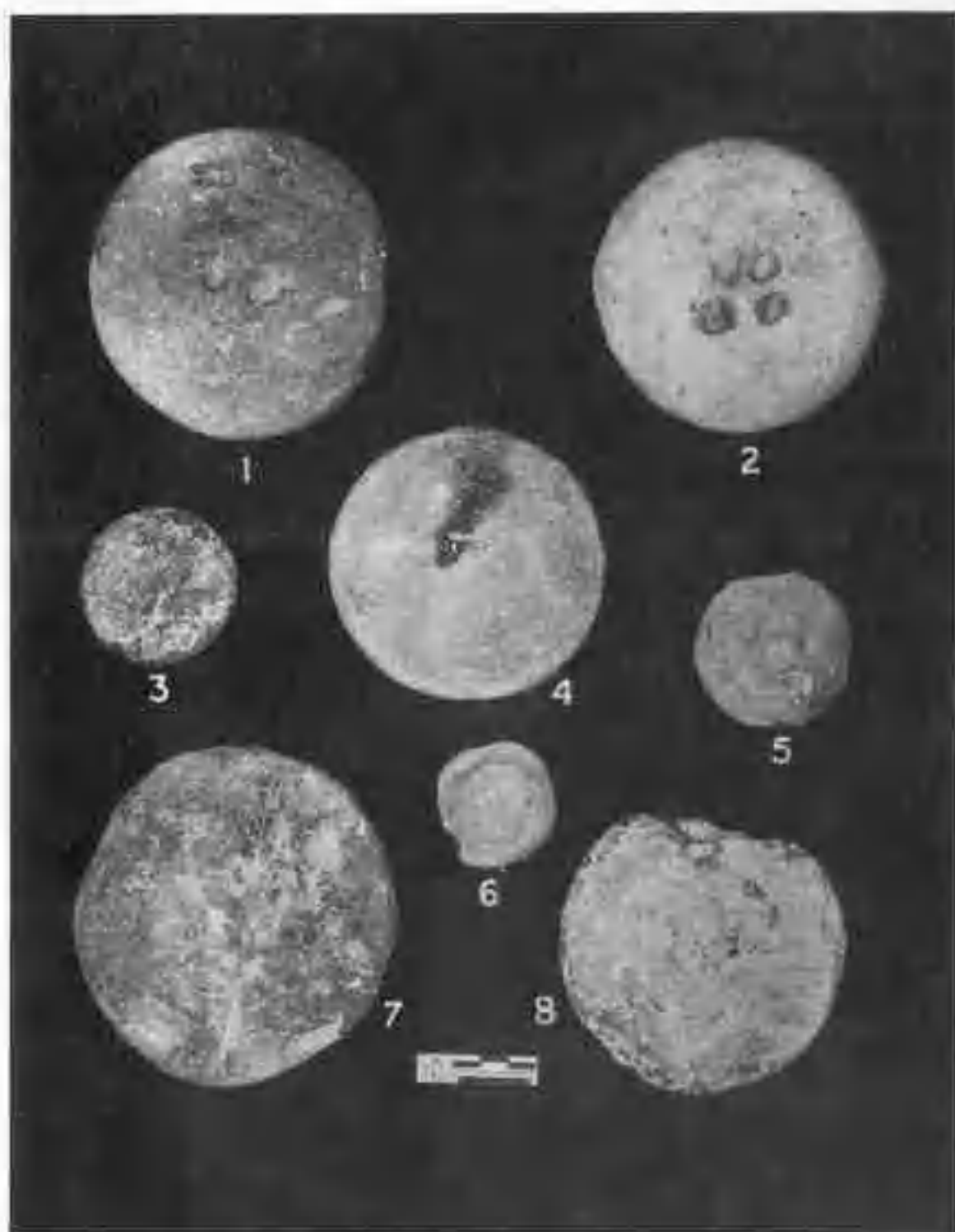


PLATE XVIII Lids, Burnished Grey Ware, Phase V.



PLATE XCIX. Incense burner, Burnished Grey Ware, Phase V.

it is treated with a slip from inside and outside.

10. Similar to 9 above.

11. Deep bowl of burnished grey ware with convex sides. Of medium fabric, it is treated internally and externally with a slip and burnished.

12. Shallow bowl of burnished pink ware similar to 9 and 10 above.

13. Shallow cup of handmade red ware with high pedestal base and tapering sides. Of medium fabric, it is bereft of any slip or wash.

14. Vase with ring-stand of burnished pink ware. Of coarse fabric, it is treated on the outside and inside with a slip and burnished.

15. Bowl of handmade red ware with a hole in the centre of the bottom and splayed sides. Of medium fabric, it is bereft of any slip or wash.

16. Shallow offering cup of handmade red ware with high pedestal base and tapering sides. Of medium fabric, it is bereft of any slip or wash.

17. Platter of burnished pink ware with flatish base and slightly out-turned convex sides. Of coarse fabric, it is treated on the outside and inside with a slip and burnished.

Fig. 81

1. Small burial urn of burnished black ware with splayed out mouth and slightly carinated body. Of medium fabric, it is treated on the inside and outside with a slip and burnished. Burial 66, Phase V.

2. Burial urn of burnished blotchy pinkish black ware with splayed out mouth and globular body. Of medium fabric, it is treated on the outside and inside with a slip and burnished. Burial 44. Overlap between Phase IV and Phase V.

3. Burial urn of burnished blotchy blackish grey ware with splayed out mouth and slightly carinated base. Of medium fabric, it is treated on the outside and inside with a slip and burnished. Burial 66, Phase V.

4. Burial urn of burnished blotchy black ware with high almost vertical neck, out curved featureless rim and carinated body. Of medium fabric, it is treated on the outside and inside with a slip and is painted in black on the outside with a horizontal band at the junction of the rim and the shoulder and three close-spaced vertical wavy lines. It also bears on the inside of the neck and on the shoulder on the outside graffiti of tree motif. Burial 44. Overlap between Phase IV and Phase V.

5. Burial urn of burnished grey ware with splayed out mouth and globular body. Of medium fabric, it is treated on the outside and inside with a slip and burnished. It bears on the outside on the shoulder a graffiti consisting of a pair of vertical lines intersected by a horizontal line. Burial 25, Phase V.

6. Small burial urn of burnished grey ware with vertical neck and squat globular body. Of medium fabric, it is treated on the outside and inside with a slip and burnished and is painted in deep red colour on the outside upto the blunt carination. Burial 42, Phase V.



PLATE 2 Close view of jar in situ near Kūn 1, showing decorations on the southern side and part of southern side, Thick Coarse Ware, Phase V.



PLATE CI Close view of decorations on part of southern side of jar in situ beside Rtn 1, Thick Coarse Ware, Phase V.



PLATE III Close view of decorations on the eastern side of the jar in situ beside Kīm 1, thick Coarse Ware Phase V.



PLATE CIII Jar of Thick Coarse Ware, found near Kilo 1 with decorations on three sides, after reconstruction, Thick Coarse Ware, Phase V.



PLATE CIV - Decorated vase of thick coarse ware from Kiln 1.



PLATE CV. Figural schematization in griffiti in the Loewe Ware, 1 and in patting on the Malwa Ware, 2.

Fig. 82

1. Burial urn of burnished reddish ware with out-turned featureless rim and globular body. Of coarse fabric, it is treated on the outside and inside with a slip and burnished. Burial 51. Phase V.
2. Burial urn of burnished reddish grey ware with splayed out mouth and bulber body. Of coarse fabric, it is treated on the inside and outside with a slip and burnished. Burial 51. Phase V.

Fig. 83

1. Burial urn of burnished black ware with high splayed out rim and carinated body. Of coarse fabric, it is treated on the outside and inside with a slip and burnished. Burial 69. Phase V.
2. Burial urn of burnished blotchy black ware with high splayed out rim and globular body. Of coarse fabric, it is treated both internally and externally with a slip and burnished and bears on the shoulder a graffiti of flower motif. Burial 69. Phase V.

Fig. 84

1. Burial urn of burnished pinkish grey ware with splayed out mouth and globular body. Of coarse fabric, it is treated with a slip on the inside and outside with a slip and burnished and is decorated on the outside with incised vertical strokes at the junction of neck and shoulder. Burial 37. Phase V.
2. Burial urn of burnished grey ware with splayed out mouth and globular body. Of coarse fabric, it is treated on the outside and inside with a slip and burnished and is decorated on the outside with oval-shaped incised designs on a band in applique at the junction of neck and shoulder. Burial 37. Phase V.

(viii) Thick Coarse Ware

In Phase V this class of pottery is comparatively better made and fired. It is of coarse fabric, but treated with either a thin slip or wash in the nature of sloash which has given the ware a better appearance. The surface colours of the ware are red, light brown, pink, drab and their shades. Apart from large storage vases, medium sized and miniature pots also find place in this ware. The ware is decorated with incised and applique designs. While the incised decorations consist of oblique and vertical lines, chevrons and criss-cross pattern, the decorations in applique are varied and of great interest and include, besides simple finger-tip depressions and loops incised with deep incisions, concentric arches, pointed oval-shaped dots and human and animal figures (pls. C-CIV). An important type present in this ware is the large storage jar found by the side of the potter's Kiln 1 (pls. C-CIII). It is oval-shaped, with

button base, out-turned rim and profusely decorated on the outside with designs in applique. Another type which was recovered from the kiln is with button base, squat globular body and splayed out rim (pl. CIV). It is also decorated on the outside with applied designs. The other types include (1) *kunda* with almost vertical sides and concave rim top; (2) concave-sided bowl with flattish base; (3) vase with outcurved rim and globular body; (4) jar with externally bevelled and out-curved rim; (5) vase with a perforation at the centre of the bottom; (6) vase with convex sides and narrow mouth; (7) vase with internally sharpened rim and almost vertical sides; (8) vase with outcurved flat rim and incised globular body; (9) vase with short tubular spout; (10) vase with splayed out mouth and incised globular body and (11) miniature U-shaped bowl. A fragment of a representation of a lizard in applique with punctured marks also deserves mention (pl. XCVI, 11).

The selected examples are illustrated.

Pls. C – CIII.

1. A large jar of thick coarse handmade ware with button base, oval-shaped body and applique bands pecked all over. At the junction of the neck and the shoulder is a horizontal band in applique decorated with fingertip impressions. On the body are three sets of concentric arches of applique bands incised with nail decoration. In the triangular space on three sides between the arches and the neck are represented different animals and a human figure. When the pot was *in situ* the decorations in the triangles facing east, south and west were as follows. The decorations in the triangle facing east comprised a bull in running position with long horns, a prominent hump and raised tail and a lizard at its back side. To the right of the latter, in the upper side, is some creature. In the triangle which faced south or the wall of the kiln the decorations included a bull also in running position, with a high hump, raised tail and two long horns. Immediately above the bull is a monkey and below a lizard. To the back side of the bull is a scorpion and to the right of the latter a monkey. In front of the head of the bull is a figure of man with flat body and the hands hanging away from the body. The impressions of fingers of both the hands and of the left leg are very clearly seen. To the right of the male figure is a curious flying figure of man with stretched hands and a curved lower portion pointed at the end like that of a fish, perhaps a representation of flying *Gandharva* (?). In the third triangular portion, facing west, are decorated two lizards and a dog. All the applique decorations are incised with nail pattern.

Pl. CIV.

1. A vase of thick coarse pink ware with button base, squat bulbous body and outcurved rim. It is decorated on the outside in applique with groups of oblique bands on the neck, each group consisting of seven bands, a horizontal band at the junction of the neck and the shoulder, three groups of concentric arches, each group comprising four concentric arches, on the shoulder and a group of eleven pointed oval-shaped dots resembling fish motif on the



Fig. 35. Graffiti, Jarwe Ware. Phase V.

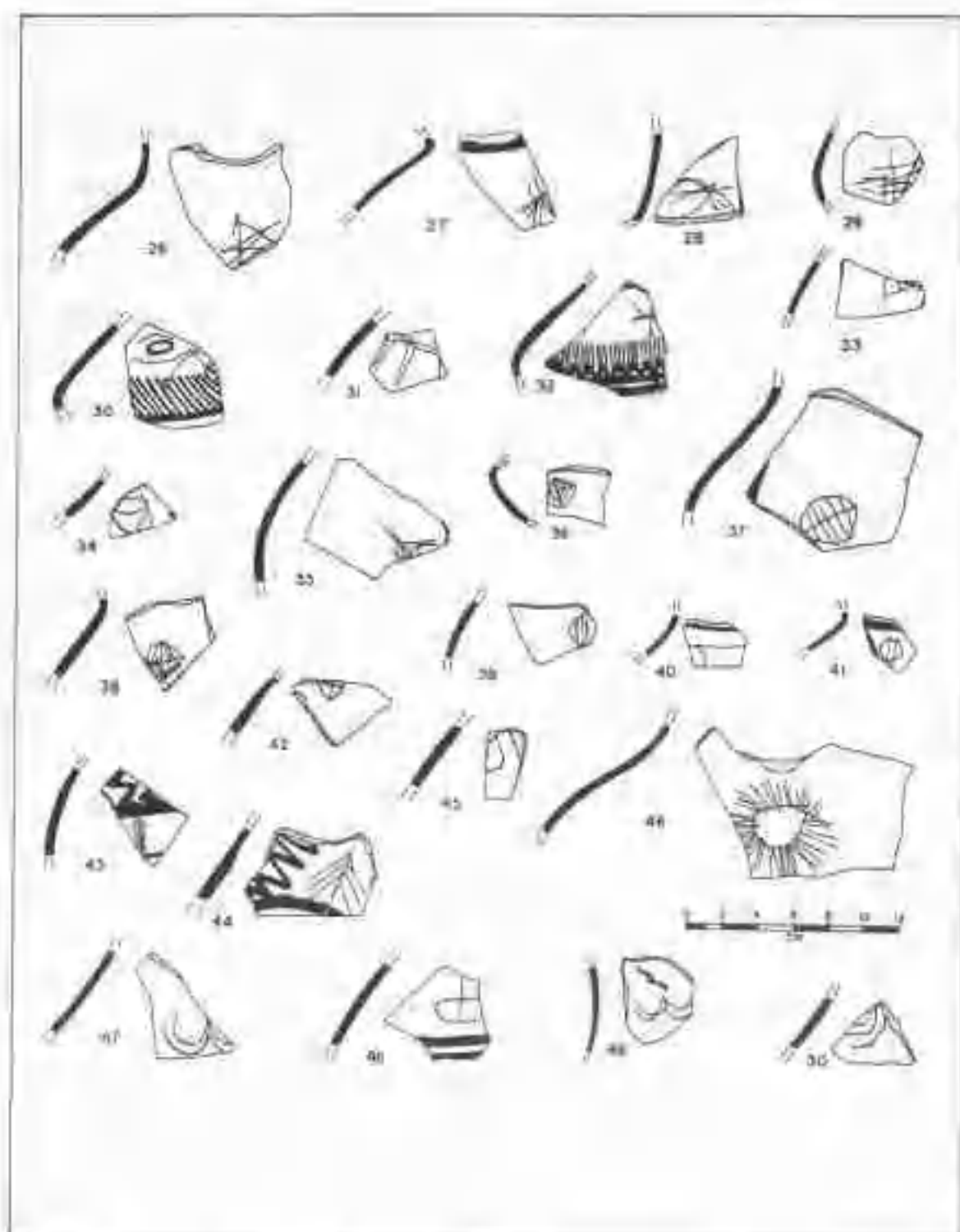


Fig. 86. Graffiti, Jorvis Ware, Phase V

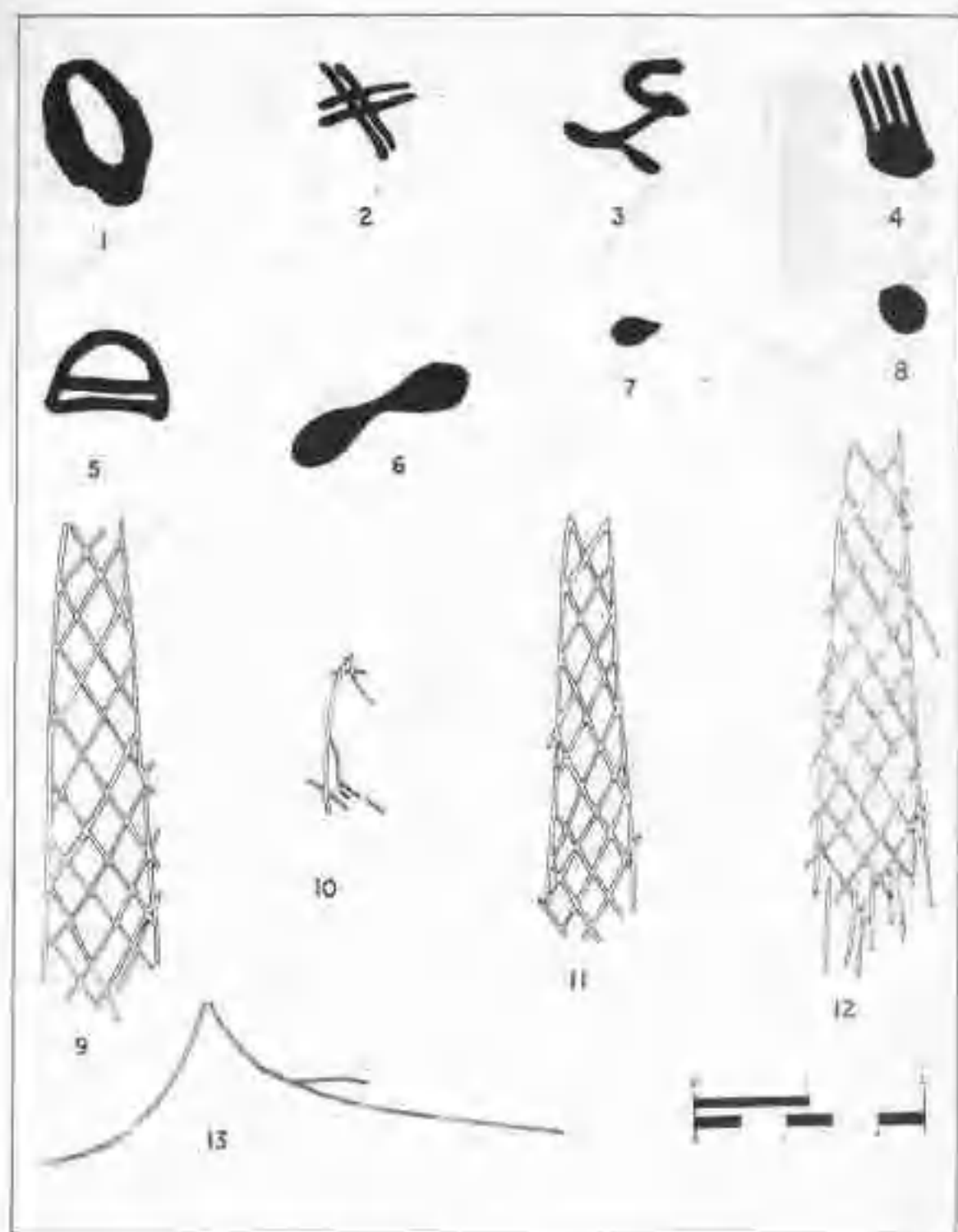


Fig. 87. Potter's marks and graffiti on Jorwe Ware from Kiln I, Phase V.

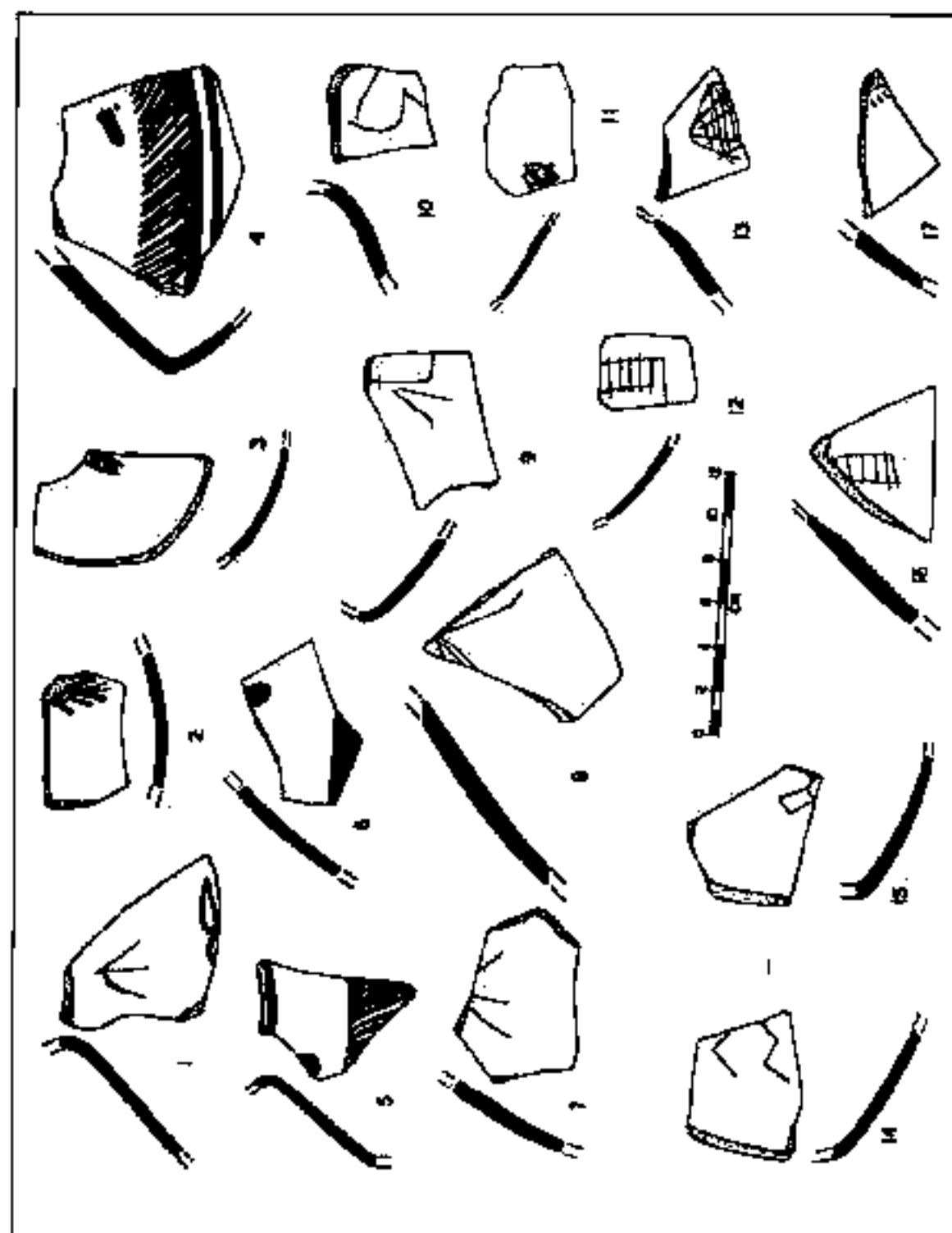


Fig. 86. Potter's marks and graffiti on Jarwe Ware collected from second floor of house 56, Phase V.

shoulder in a space between two of the groups of concentric arches. All the designs are decorated with finger-tip impressions.

(ix) *Handmade Red Ware*

This is a distinct class of thick pottery made of laminations of coarse clay mixed with vegetable material as temper. It is red in colour and fired under oxidizing conditions of the kiln. Pottery of this class was found associated with lenticular structures. Made of this ware were large three or four-footed vases which were found in badly crushed condition in the clusters. The other pots in this ware included a high-pedestalled shallow bowl (fig. 80, 13 and 16), a bowl with a hole in the centre of the flat bottom and splayed sides (fig. 80, 15), besides plates, of which no example could be preserved. It is interesting to note that the high pedestalled shallow bowl has parallels at Channudaro which Mackay, by showing analogy to examples from Sumer, has interpreted as libation vessels.⁴⁴ The occurrence of such vessels at Damabad in religious context is significant.

(x) *Unbaked Ware*

Unbaked or sun-baked pots with high pedestal base and high vertical or convex sides were found in house 5 (pls. XXXIX – XLI), outside of house 1 (pl. LXXII) and on the patches of floors of damaged houses of structural phase C. Lime was found stored in two of such pots in house 3. In this house half-a-dozen such pots were found. The high pedestal of the vases was embedded in the floor of the houses.

(xi) *Graffiti*

In Phase V graffiti principally occurred on the Jorwe Ware and only occasionally on the burnished grey ware. The marks were engraved on the pots before firing. This has been proved by the graffiti marks on the pots recovered from Kiln 1 (fig. 87).⁴⁵ The marks occur on the inside as well as outside of pots. It was also observed that graffiti marks were not confined only to the pots in burials. They are also found on the pots of domestic use. Among the potsherds collected from the surface of the second floor level of house 38, the merchant's house, there are examples bearing different graffiti marks (fig. 88), besides the so-called potter's marks.

The graffiti marks on the burnished grey ware included a vertical line; a *trishula*; drooping three lines; curved lines; plant motif; two vertical lines on the inside and outside of rim; nine vertical lines in a horizontal row and ladder pattern outside and inside of pot. All these marks also occur on the Jorwe Ware and as such they are not illustrated. The most interesting graffiti mark is, however, that of a flower engraved on the burial urn of burnished grey ware of burial 69 (fig. 83, 2). The following graffiti marks on the Jorwe Ware are illustrated.

44. E.J.H. Mackay, *Channudaro. Excavations 1935-36* (New Delhi, 1976) (Reprint), Type AT, Pls. XXIX, 5-11 and XXXIX, 16.

45. Sankar, *op. cit.* (1981), pl. XIIb.

figs 85-86

1. Two horizontal lines, one vertical line and two oblique short lines to the left of the latter. On the outside of the shoulder-fragment of red ware.
2. Vertical lines with the end of each turned to the opposite directions. On the outside of fragment of red ware.
3. Three vertical lines. On the outside of shoulder fragment of red ware.
4. Four vertical lines, the first with its lower end turned to the left. On the outside of a fragment of red ware.
5. Four vertical lines. On the outside of a fragment of a carinated bowl of red ware.
6. Five vertical lines. On the outside of a fragment of red ware.
7. Fourteen vertical lines in a horizontal row. On the inside of a fragment of red ware.
8. Stylized human figure. On the shoulder — fragment of red ware.
9. Stylized human figure. On the shoulder — fragment of red ware.
10. One vertical line and two lines shooting in opposite directions. On the outside of a fragment of red ware.
11. A crinkled line. On the outside of a fragment of red ware.
12. Two crinkled lines. On the outside of a fragment of red ware.
13. A cross. On the outside of a fragment of red ware.
14. A cross, the horizontally intersecting line being twice drawn. On the inside of a fragment of red ware.
15. Two horizontal lines and a shoot rising obliquely from the lower of the two. On the shoulder — fragment of red ware.
16. Five vertical lines intersected by horizontal lines. On the outside of a shoulder-fragment of red ware.
17. Two vertical lines, from each one shoots one horizontal line in opposite direction, that on the left has three short strokes inclined downwards. On the outside of a fragment of a vase of red ware.
18. A horizontal line and two curved lines opposite each other below. On the outside of a fragment of red ware.
19. Broom tied to a stick in horizontal position and a ladder down below. On the outside of a shoulder fragment of red ware.
20. Ladder pattern. On the inside of a fragment of red ware.
21. Ladder pattern. On the outside of a fragment of red ware.
22. Two horizontal lines meeting a human — like figure and intersecting lines. On the outside of a fragment of red ware.
23. Plant motif.
24. Ladder pattern. On the outside of a concave-sided carinated bowl of red ware.
25. Forked line. On the outside of a shoulder-fragment of red ware.
26. Stylized human motif and intersecting lines with a horizontal line on the top of each. On the shoulder-fragment of a vase red ware.
27. Stylized human motif. On the inside of a shoulder-fragment of red ware.
28. Indeterminate. On the outside of a fragment of red ware.

29. Indeterminate. On the outside of a fragment of red ware.
 30. Indeterminate and a potter's mark of empty oval. On the outside of a shoulder-fragment of red ware.
 31. Indeterminate. On the outside of a fragment of red ware.
 32. Indeterminate. On the outside of a shoulder-fragment of red ware.
 33. Indeterminate. On the outside of a fragment of red ware.
 34. Circle (?) divided into segments. On the outside of fragment of red ware.
 35. Diamond within diamond, intersecting lines inside and off shoots to the ends of intersecting lines outside the diamonds. On the outside of a fragment of red ware.
 36. Diamond inside diamond, a triangle inside the inner diamond and a cross within. On the outside of a fragment of red ware.
 37. An oval with an horizontal axis line intersected by five vertical lines. On the outside of a shoulder - fragment of red ware.
 38. A pentagon intersected in the inside by a vertical and horizontal line and another pentagon on the inside. On the outside of a fragment of red ware.
 39. A harp motif. On the outside of a fragment of red ware.
 40. Incomplete. On the outside of a fragment of red ware.
 41. A pentagon intersected by two vertical parallel lines. On the outside of a shoulder-fragment of red ware.
 42. Perhaps a pentagon with a cross inside. On the outside of a fragment of red ware.
 43. Drooping plant motif. On the outside of a fragment of red ware.
 44. Similar to above. On the outside of a fragment of red ware.
 45. Incomplete. On the outside of a fragment of red ware.
 46. Sun motif. On the outside of a shoulder-fragment of red ware.
 47. Buttocks. On the outside of a fragment of red ware.
 48. A penis and a vertical line. On the outside of a fragment of red ware.
 49. Buttocks and a snake motif as a potter's mark above. On the inside of a fragment of red ware.
 50. Incomplete. On the outside of a fragment of red ware.
- The potter's marks and graffiti occurring on the outside of pottery from Kiln I are illustrated.

Fig. 87

1. Potter's mark. Empty oval.
2. Potter's mark. Pair of intersecting lines.
3. Potter's mark. Non-descript.
4. Potter's mark. Solid dot and four shoots rising upwards.
5. Potter's Mark. Bow motif but with a double parallel line.
6. Potter's mark. Dumb-bell motif.
7. Potter's mark. Pointed solid oval-shaped dot.

8. Potter's mark. Solid dot.
9. Graffiti. Trellis pattern within two unparallel vertical lines.
10. Graffiti. Stylized human figure.
11. Graffiti. Similar to 9 above.
12. Graffiti. Similar to 9 and 11 above, but at the lower end are vertical lines.
13. Graffiti. Two curved lines going in the opposite directions, the one on the left with a fork.

The potsherds bearing potter's mark and graffiti collected from the second floor of house 38, the merchant's house, are illustrated.

Fig. 88

1. A graffiti of tripod and a double-hill motif as potter's mark. On the shoulder-fragment of a vase of red ware.
2. Lines like rays as a potter's mark. On the inside of a fragment of a vase of red ware.
3. Indeterminate potter's mark. On the inside of a fragment of a vase of red ware.
4. Solid oval and three lines shooting from it as a potter's mark. On the outside of vase of red ware.
5. Potter's mark. Solid dot. Incomplete. On the outside of a shoulder-fragment of a vase of red ware.
6. Potter's mark. Solid dot. Incomplete.
7. Graffiti. Three lines like that of a tripod.
8. Graffiti. Incomplete. On the shoulder-fragment of a vase of red ware.
9. Graffiti. One central vertical line and one line each going away from the former and with a turn in opposite directions, the right side one with a horizontal stroke at the upper end. On the outside of a fragment of red ware.
10. Graffiti. One crinkled line and an oblique line. On the shoulder-fragment of a vase of red ware.
11. Graffiti. Oval-shaped mark, a rectangle and intersecting lines. On the outside of a fragment of red ware.
12. Graffiti. Ladder. On the outside of a vase of red ware.
13. Graffiti. Incomplete. Perhaps a cross-hatched pentagon. On the shoulder-fragment of a vase of red ware.
14. Graffiti. Incomplete. Crinkled lines.
15. Graffiti. Incomplete. On the inside of a vase of red ware.
16. Graffiti. On the shoulder-fragment of a vase of red ware.
17. Graffiti. Plant. Plant motif. On the outside of a fragment of a vase of red ware.

9. OTHER FINDS

A. The Stone Tool Industries

The Stone Tool Industries from Daimabad have been divided into two major groups: (1) what is popularly known as "Microlithic Industry" or "Blade Industry", made on silicious rock material and termed here "Chalcolithic Blade Industry", and (2) the so-called polished stone tools of mainly basalt called here "Ground Stone Tool Industry".

(1) *The Chalcolithic Blade Industry.*

1. *Introductory*

The statistical analysis of the collection of four thousand eightyseven artifacts from different phases of Daimabad have brought out a fact that it is characterized by highly evolved blade industries in that the flake element is present in so negligible a percentage as not to be taken into account (Tables 4-7).

The raw material used is silicious rock-material and included chalcedony, agate, chert, jasper and very occasionally carnelian, quartz and fine-grained red basalt. This appears to have been mainly procured locally from the veins in rock basalt and the river bed, the only exception to this being that from the Jorwe Phase in which the material from river bed was absent. This is an interesting aspect of the blade industry of this Phase for which there is no satisfactory explanation at least for the present. In all the industries chalcedony ranked highest, other material occurring in a very small percentage (Table 5).

The presence of large percentage of pieces or debitage in all the assemblages indicated that the tools were manufactured in the settlement itself. This was documented in house 3 in which finished and unfinished artifacts and pieces of raw material occurred around a flat stone. (p. 134; pl. XII; fig. 16).

The study of the collections showed that blade was the most prominent tool type and it was converted into desired type of tool by secondary working. The blades with use-marks have not been made a separate category. They have been included in the category of simple blades without showing such marks for the simple reason that it would be improper to say that only because the latter are bereft of use-marks they would not have been put to use. The use-marks occurring on the margins of blades were perhaps the result of rigorous use of the blades. The broken blades are usually not taken into account while undertaking the study of microlithic industries. But the piece of blade, hafted in a rib bone, found in the levels of the Jorwe Phase, certainly indicates that broken pieces of blades were also put to use (fig. 96; pl. CXI).¹ This example also showed that the blade to be used as a tool in a haft need not be secondarily worked. For, the specimen in the rib bone does not show any kind of secondary working. Further, just because their margins do not show use-marks does not necessarily preclude the simple blades and their fragments from being called tools. The discovery of the bone tool-hafts in clusters 5 and 8 from the elliptical structure (pp.163-165)

1. S.A. Sali, "The First Evidence of a Hafted Blade Found at Daimabad, District Ahmednagar, Maharashtra, *Current Science*, Vol. 46, No. 23, December, 5, 1977, p. 818.

TABLE 3

Percentage analysis of the raw material used in the Chalcolithic Blade Industry

Raw Material Phase	Chalcedony	Jasper	Agate	Chert	Quartz	Fine-grained Basalt	Carnelian	Total
<i>Savliya Culture I</i>	78 91.6	9 3.6	2 2.4	1 1.2	— —	1 1.2	— —	85 100
<i>Late Harappan Culture II</i>	225 90.3	6 2.5	— —	13 6	— —	1 0.4	2 0.8	249 100
<i>Daimabad Culture III</i>	393 93.6	5 1.2	6 1.4	10 2.4	6 1.4	— —	— —	420 100
<i>Overlap</i>	133 97	2 1.5	— —	— —	2 1.5	— —	— —	137 100
<i>Malwa Culture IV</i>	365 92.4	16 4	7 1.8	1 0.3	3 0.7	1 0.3	2 0.3	395 100
<i>Overlap</i> 98.2	150 0.6	1 —	— 0.6	1 0.6	1 —	— —	— 100	153
<i>Jorwe Culture V</i>	2266 85.9	175 6.6	135 3	40 1.51	15 0.5	12 0.4	5 0.1	2648 100
<i>Total</i>	—	—	—	—	—	—	—	4087

represents an evidence of the types of razors that were being used by setting the blades.

Among the worked blades the most prolific was the penknife variety. In majority of the examples the tool has been prepared by minimum working at the lower end which is curved or oblique, produced by steep retouch.

The retouch was vertical or abrupt, oblique and minute. The vertical retouch was used for blunting or backing as well as for producing dentitions in the serrated blades and also for truncation. Oblique retouch has been used in truncation and producing scraper edge at the lower end of the blade, besides sharpening the margins, and occasionally in the case of blunting. For sharpening the margin quite a number of blades were minutely retouched.

Except for a few examples of Lavalloisium core which do not seem to belong to the chalcolithic period, being collected from the river bed perhaps as raw material, there is a total absence of flake-core. Flakes are, however, present in the collection but they appear to have been originated from the trimming of the core nodules. The core nodules occurring in the assemblages are with crested-ridge and these together with the fluted cores form an important type. They were utilized for the mass production of blades. Present in the assemblage were also blades with crested-ridge. The fluted cores bear either single or double platform and they are cylindrical and ovaloid in shape. Quite a number of them were flaked until they were almost completely exhausted. The presence of rejuvenated flakes indicated that the cores were rejuvenated from time to time.

Compared to the pen knife variety the backed, notched and serrated types were much less. An interesting aspect about the serrated blades occurring in the Late Harappan and the Jorwe levels was that the lower end of them was truncated by oblique retouch as in the case of end scraper on blade. In the serrated type in Phase II are also included examples in which the serrated edge is along the curved side (fig. 89, 5 and 7). The notch in the margin of the blades was produced deliberately as is indicated by the presence of retouch along its margin.

The crescentic variety of blade occurred occasionally and compared to other types, points and borers were found only in small number. The presence of a few burins on blades from the Jorwe levels is noteworthy. In fact as Table 7 would show the Jorwe levels have yielded maximum varieties of tools. The industry of the Jorwe Phase when compared with those of the earlier phases displayed highly advanced traits and a marked culmination in the chalcolithic blade technology. The blades produced are parallel-sided, long and thin, their being even paper-thin specimens. The points in this industry are also of varied types such as simple, backed, on a serrated blade, crescentic, notched and tanged. The two types of drills from this phase also deserve attention.

Among the geometric tools the trapezes and lunates occur but surprisingly enough not a single triangle has been found in any of the collections. Its absence at Daimabad is difficult to explain at this stage. Whether the chalcolithic residents of Daimabad needed no such a type of tool or its absence was merely fortuitous depending upon the area excavated, is not possible to explain at the present.

Except for the Late Harappan Phase, notched arrowheads were found in all the assemblages but not all of them belonged to the period of the respective phase, most of them being

Table 4

Daimabad 1976-79
Percentage Analysis of Major Categories of Artifacts in the Chalcolithic Blade Industry

Types Phase		Simple Blades	Worked Blades	Broken Blades	Blade with Crested Ridge	Flake Blade	Rejuvenation Flakes	Scraper on Flake	Flakes	Lavalloise Core	Core Nodules	Fluted Cores	Notched Arrowhead	Tanged Arrowhead	Burin	Drills	Lumps	Pieces	Total
V	Jorwe Culture	537 20.28	316 11.93	948 35.80	62 2.35		10 0.38		0.15		13 0.49	102 3.85	1 0.03	1 0.03	3 0.12	11 0.42	50 1.89	590 22.28	2648 100
	Overlap	17 11.1	21 13.7	38 24.9	2 1.3		1 0.7		2 1.3	2 1.3		11 7.2					11 7.2	48 31.3	153 100
IV	Malwa Cul- ture	69 17.5	35 8.9	93 23.5	7 1.7	1 0.2			13 3.2		3 0.8	13 3.3	2 0.5			1 0.2	23 5.9	135 34.3	395 100
	Overlap	12 8.8	9 6.5	25 15.3					1 0.7		1 0.7	7 5.1					15 11	67 48.9	137 100
III	Daimabad Culture	39 9.2	26 6.2	72 17.1	9 2.2		6 1.4	1 0.4			5 1.2	14 3.3	1 0.4				15 3.5	232 55.2	420 100
	Overlap	22 8.8	39 15.6	37 14.8	1 0.4	1 0.4	2 0.8		21 8.5	1 0.4		14 5.7					19 7.7	92 36.9	249 100
II	Late Hara- ppa Culture																		
	Overlap	12 14.1	13 15.2	17 20	1 1.2	3 3.5	1 1.2				1 1.2	2 2.4	3 3.5		1 1.2		5 3.5	28 33.1	85 100
Total																			4087

(Figures in italics represent percentage)

Table 5

Daimabad 1976-79

Percentage Analysis of Simple, Worked and Broken Blades in the Chalcolithic Blade Industry

Phase \ Types	Simple	Worked	Broken	Total
V Jorwe Culture	587 <i>29.7</i>	319 <i>17.7</i>	948 <i>52.6</i>	1803 <i>100</i>
Overlap	17 <i>22.4</i>	21 <i>27.6</i>	38 <i>50</i>	76 <i>100</i>
IV Malwa Culture	70 <i>35</i>	35 <i>17.5</i>	98 <i>47.5</i>	198 <i>100</i>
Overlap	12 <i>26</i>	9 <i>19.7</i>	25 <i>54.3</i>	46 <i>100</i>
III Daimabad Culture	39 <i>28.9</i>	24 <i>17.7</i>	72 <i>53.4</i>	135 <i>100</i>
II Late Harappa Culture	22 <i>22</i>	39 <i>39</i>	39 <i>39</i>	100 <i>100</i>
I Savalda Culture	12 <i>28.6</i>	13 <i>30.9</i>	17 <i>40.5</i>	42 <i>100</i>
Total				2400

(Figures in italics represent percentage)

Table 6

Daimabad 1976-79
Percentage Analysis of Simple Blades and Blade Tools in the Chalcolithic Blade Industry

Types Phase	Simple	Retrofitted	Penknife	Serrated	Truncated	Notched	Backed	Tanged	Lamates	Trapeze	Borer	Burins	Endscraper	Points	Total
V Jorwe Culture	537 62.7	120 14	51 5.9	32 3.7	26 3	22 2.6	15 1.8	4 0.5	25 2.9	9 1.1	—	5 0.4	1 0.1	11 1.3	856 100
Overlap	17 44.7	12 31.5	2 5.3	2 5.3	—	—	2 15.3	—	1 2.6	—	—	—	—	2 5.3	38 100
IV Malwa Culture	70 67.3	11 10.9	9 8.7	5 4.8	—	1 0.9	1 0.9	—	3 2.9	—	—	—	—	4 3.8	104 100
Overlap	12 57.2	5 23.9	2 9.5	1 4.7	—	—	—	—	—	—	—	—	—	1 4.7	21 100
III Daimabad Culture	39 61.9	8 11.3	9 12.7	1 1.5	—	2 3.2	4 6.4	—	1 1.5	—	—	—	—	1 1.5	63 100
II Late Harappa Culture	22 36	7 11.5	9 14.8	9 14.8	—	1 1.6	4 6.6	—	6 9.8	1 1.6	—	—	—	2 3.3	61 100
I Savaldia Culture	12 48	4 16	2 8	—	—	—	2 8	1 4	1 4	1 4	1 4	—	—	1 4	25 100
Total															1168

(Figures in italics represent percentage)

Table 7

Daimabad 1976-79

Typological Break-up of Artifacts in the Chalolithic Blade Industry

Types Phases		BLADES AND BLADE TOOLS																				
		Retouched				Penknife			Serrated				Truncated			Notched				Broken		
		Simple	Retouched	Retouched Truncated		Backed	Tanged	Penknife	Penknife on Truncated Tanged Penknife	Serrated	Serrated Notched	Serrated Truncated Notched	Double Notched Serrated Truncated	Serrated Truncated	Truncated	Truncated Retouched Notched	Truncated Backed Notched	Truncated Notched	Notched		Notched Retouched	Double Truncated Notched
V Jorwe Culture	537	112	8	15	4	49	1	1	25	1	1	1	4	23	1	1	1	19	2	1	62	947
Overlap	17	12	—	2	—	2	—	—	2	—	—	—	—	—	—	—	—	—	—	—	2	38
IV Malwa Culture	70	11	—	1	—	9	—	—	5	—	—	—	—	—	—	—	—	1	—	—	7	93
Overlap	12	5	—	—	—	2	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	25
III Daimabad Culture	39	8	—	4	—	9	—	—	1	—	—	—	—	—	—	—	—	2	—	—	9	72
II Late Harappa culture	22	7	—	4	—	9	—	—	9	—	—	—	—	—	—	—	—	1	—	—	1	37
I Savalda Culture	12	4	—	2	1	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	17
Total	709	159	8	28	5	82	1	1	43	1	1	1	4	23	1	1	1	23	2	1	82	1229

Table 7 continued

					OTHER ARTIFACTS																			
Lunate	Trapeze	Boyer	Burin	End Scraper	Points				Arrow Heads	Drills		Flakes and Flake Tools			Cores			Lamps	Pieces	Total				
					Simple	Backed	On a Serrated Blade	Crescentic	Notched	Tanged	Notched	Tanged	Cylindrical	Conical	Scraper on Flake	Rejuvenation Flake	Flake Blade				Flakes	Core Nodules	Lavalloise Core	Fluted Core
25	9	-	3	1	7	1	1	1	1	-	1	1	6	5	1	10	-	4	13	-	102	50	590	2648
3	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	2	-	2	11	11	48	153
5	-	-	-	-	3	-	-	1	-	-	2	-	-	1	-	-	1	13	3	-	13	29	135	395
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	7	15	67	137
1	-	-	-	-	-	1	-	-	-	-	1	-	-	-	1	6	-	-	5	-	14	15	232	420
6	1	-	-	-	2	-	-	-	-	-	-	-	-	-	-	2	1	21	-	1	14	19	92	249
1	1	1	1	-	1	-	-	-	-	-	3	-	-	-	-	1	3	-	1	-	2	3	28	85
39	11	1	4	1	13	4	1	2	1	1	7	1	6	6	2	20	5	41	23	3	163	136	1192	4087

glossy and slightly rolled suggesting that they were collected by the residents from the river bed and hence derived. The one coming from the Savalda levels is of great interest since representation of similar type also occurs in the painting on the Savalda Ware (fig. 25, 1 pl. LX-XIII, 1).

(a) Phase I: The Savalda Culture

As compared to the other collections that from the levels of the Savalda Culture is a small one, being comprised of only eighty-five artifacts. Out of these, thirty-one are pieces and lumps and in the remaining are included one burin, blades and tools made on blades. (Table 4).

A study of lumps, flakes and pieces bearing cortex suggested that the raw material used for preparing the tools was chiefly quarried from the basalt beds, their being only about half a dozen pieces which seemed to have been obtained from the river bed as is suggested by their rolled and glossy surface. The raw material used for preparing the tools included chalcedony, agate, jasper, chert and fine-grained red basalt. In these, the chalcedony is the highest, covering 92.7%. Jasper, agate, chert and basalt were used in only 3, 2, 1 and 1 specimens respectively.

In the category of blades (excluding broken) and blade-tools are included simple, penknife, retouched, backed, tanged and with crested-ridge types. The simple blades do not show any secondary working or even use-marks, and they were thus primary flakes. In these were included interesting specimens with a thick but narrow striking platform at the bulber end (fig. 89, 1; pl. CVI, 1). Their sides are not parallel. Such blades seem to have been detached from a core, triangular in shape and tapering towards the platform (fig. 89, 19; pl. CVI, 19). These blades are thin. The flutings of the blades removed from such cores are shallow and not parallel-sided. The blades and the cores of the type described were not found in any other assemblage. There are, however parallel-sided blades and tools made on such blades also in the collection. Such blades were detached from cylindrical cores although this type of core does not find place in the present assemblage. The prepared core-nodule has a crested-ridge on either side, is ovaloid in cross-section and wedge-shaped. Its striking platform is very uneven.

The retouch is bold in the case of backing (fig. 89, 4; pl. CVI, 4) and there are also examples of minute retouching, in one example this being from the underside. Steep retouching was resorted to for blunting the margin in backed-blades, for achieving a point in penknife blades, for preparing an arc of lunate, and for shaping unparallel sides of the trapeze.

There is only a solitary example of a crested-ridged blade (unillustrated).

The Length-Breadth-Thickness ratio of the tools made on blades has come to 29.3: 6.00: 2.00 mm. The arc of the lunate is damaged (fig. 89, 11; pl. CVI, 11). The point on blade (fig. 89, 9; pl. CVI, 9) has been achieved by intersection of vertically retouched left margin with the converging opposite margin at the lower end. The projecting sharp awl-point in the middle of the lower end of the blade has been produced by working on either side (fig. 89, 10).

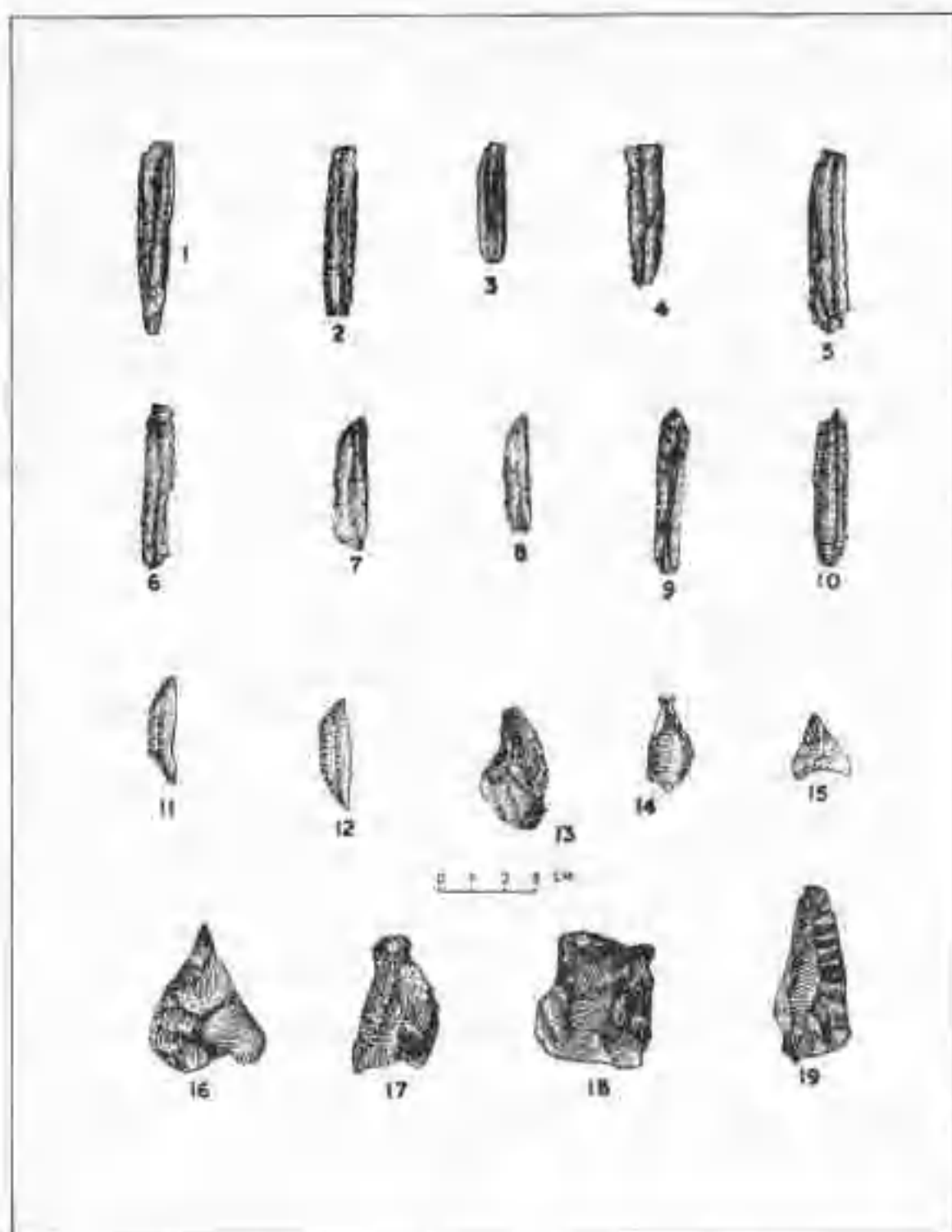


Fig. 89. Chalcolithic Blade Industry, Phase I.

Of the three examples of notched arrowhead (fig. 89, 15–17; pl. CVI, 15–17), only two are finished and one unfinished. One of the finished specimens has a broad V-shaped notch made by obliquely removing spalls from opposite sides of the notch both from the under as well as upper sides. The removal of spalls from the upper side has caused a dent at their junction which is shallow on the upper side and comparatively deeper on the underside. The pointed tip of the arrowhead has a chisel-end obtained by obliquely removing a spall from the left as in the burin. This specimen has come from Room B of House 11 (fig. 89, 15; pl. CVI, 16). The other finished specimen from the trench JZ 64 gives some idea about the method of preparation of such arrowheads. It is (fig. 89, 16; pl. CVI, 17) heart-shaped with a sharp pointed lower end and a thick left side. The surface of the striking platform bears original cortex. By the side of this platform is a concavity. This concave portion could have been converted into a V-shaped notch by obliquely removing spalls from opposite sides. This specimen can be described as heart-shaped when the concave side is placed at the base and as trapezoidal when the bulber end is taken as a base. In the latter case the lower of the parallel sides makes a sharp point by intersection with the thick non-parallel side. In this case it can therefore, be said that for the purpose of preparing notched variety of arrowheads a trapezoidal flake with one of its corners having a sharp point was selected. The unfinished example (fig. 89, 17; pl. CVI, 15) of arrowhead bears a wide V-shaped notch at the base, made by detaching spalls from opposite directions from the under side. It has a thick left margin but the lower end opposite the notched base is with a sharp tongue-like tip instead of pointed. This can even be a finished specimen and as such classed as a sub-type. The bulber portion of this specimen bears a bulber scar at one of the ends of the notch and in this case also, it seems, the flake or the blank was originally trapezoidal in shape.

The micro-burin is an interesting specimen (fig. 89 14; pl. CVI, 14). A fine burin edge has been achieved by obliquely removing burin spalls from either side of the thick end of a small flake. This specimen has not been prepared out of the detached portion of a lunate or a trapezoid but because of its tiny size it has been termed a microburin.

The core-rejuvenation flake (fig. 89, 13; pl. CVI, 13) has conical end with flutings which suggests that it was snapped from the conical portion of the conical fluted core.

Of the two examples of pen-knife blade, the blunting of one of the margins of one (fig. 89, 7; pl. CVI, 6) has been done so crudely as to result in the formation of serrated margin and although because of the serrations this specimen looks like a serrated blade, it can only be classed as pen-knife blade because of the obliquely blunted lower end forming a point by intersection with the opposite side as in a pen-knife blade. The other specimen (fig. 89, 8; pl. CVI, 7) has a gently curving pointed lower end achieved by steep retouch.

The tanged blade (fig. 89, 6; pl. CVI, 8) has a tang opposite the bulber end which has been abruptly retouched as in a truncated blade. About half portion of the right margin has been vertically flaked for achieving a tang.

The three flake-blades have come from the river bed as is indicated by their rolled nature and glossy surface and as such they do not belong to the Savadla levels. They were probably picked up from the gravel bed along with lumps of raw material by the inhabitants and

brought in the settlement.

The illustrated specimens are described below:—

Fig. 89; pl. CVI, 1–19

1. Simple blade; chalcedony. Thick butt and narrow striking platform at the bulbar end. Sides are unparallel; tapering towards the striking platform. The under side shows a hinge-fracture. The margins do not show use marks (130/1977-78). pl. CVI, 1.
2. Retouched blade; chalcedony. Parallel-sided blade with truncated bulbar end and obliquely retouched left margin. The right side margin shows nibbled obverse retouch and a shallow notch at the lower end produced by oblique retouch (137/1977-78). pl. CVI, 2.
3. Retouched blade; chalcedony. Parallel-sided blade showing obverse retouch on the right side margin and on the left margin steep retouch at the lower end. The bulbar end is partly snapped (CZ61 15/1975-76). pl. CVI, 3.
4. Backed blade; chert. Both the ends are broken, perhaps accidentally. One of the margins is abruptly retouched and the other shows nibbled retouch (CZ61 (15)/1975-76). pl. CVI, 4.
5. Backed blade; chalcedony. With prepared striking platform and a prominent bulb of percussion. Left margin is vertically retouched, resulting into the formation of serrations all along the edge. The blade may hence also be included in the category of serrated blade. Right margin shows distinct use-marks. Lower end is broken (133 a/1977-78, house 14). pl. CVI, 5.
6. Tanged blade; chalcedony. With a worked striking platform and prominent bulb of percussion. The lower end is truncated by steep retouch. One of the margins is partly vertically retouched and partly shaped to form a tang on the truncated side. The other margin shows use-marks (136 a/1977-78). pl. CVI, 8.
7. Pen knife blade; chalcedony. Made on a parallel-sided blade. The bulbar end is broken. The left margin is fully steeply retouched. The steep-retouching has caused serrations as in a saw and hence it may also be classed as serrated blade. The lower end of the serrated margin makes a point with the intersection of the opposite margin which shows minute retouch on the underside (136b/1977-78). pl. CVI, 6.
8. Pen knife blade; chalcedony. Made on a parallel-sided blade. The bulbar end is missing. Left margin partly steeply retouched to converge at the lower end in a point formed by intersection of the opposite margin which shows nibbled retouch as well as use-marks (CZ61 (15)/1975-76). pl. CVI, 7.
9. Point. Chalcedony. Made on a blade with a narrow bulbar end. A medial point achieved by vertically retouching on either side of the lower end. The right side margin also shows minute retouch from the underside (132/1977-78). pl. CVI, 9.
10. Borer, chalcedony. A parallel-sided blade with obliquely retouched left margin and a shallow notch on the right margin showing use-marks. A medial prominently projecting sharp borer point has been made at the lower end (opposite of the bulbar end) by vertically trimming on its either side as well as by working on both its faces (133b/1977-78; house 14). pl. CVI, 10.

11. Lunate; chalcedony. They are prepared by steep retouching, that at one end making a blunt angle. The opposite margin is sharp and shows use-marks (CZ61 (15)/1973-76), pl. CVI, 12.
12. Trapezee; chalcedony. Made on a parallel-sided blade by steep retouch on the non-parallel sides. Both the parallel sides are left without retouch (133c/1977-78; house 14), pl. CVI, 12.
13. Rejuvenation flake; chalcedony. With fluttings. Conical in shape suggesting snapping of the conical end of the core to rejuvenate the platform (151/1977-78), pl. CVI, 13.
14. Burin; chalcedony. On a tiny flake. The chisel end of the burin made by vertically removing spalls from its either side (135/1977-78; courtyard of houses 11 and 12) pl. CVI, 14.
15. Notched arrowhead; chalcedony. Triangular in shape, made on a flake. A broad V-shaped notch made by removing spalls from opposite directions on the broad side. The sharp chisel-ended point opposite the notch is formed by intersection of the worked left side with the mapped opposite side (98/1977-78), pl. CVI, 15.
16. Notched arrowhead, chalcedony. Made on a flake with flaring sides and narrow bulber end trimmed to form a sharp tongue-like tip. The opposite end is a broad 'V' produced by removing spalls from opposite sides to form a notch. The left margin is thick and with original cortex (134a/1977-78), pl. CVI, 16.
17. Notched arrowhead (unfinished); chalcedony. A trapezoidal flake with a sharp medial chisel-ended point formed by intersection of a thick vertically trimmed margin with the opposite margin. The side opposite to the point has an unworked concavity (134b/1977-78), pl. CVI, 17.
18. Core nodule; chalcedony. With a crude single striking platform at one end, the other end being chisel-ended showing trimming. The periphery is marked by shallow flaking leaving a couple of patches of original cortex. A crested-guiding-ridge has been prepared at each of the the corners by alternate trimming (138 a/1977-78), pl. CVI, 18.
19. Fluted core; chalcedony. With a narrow striking platform and splayed lower end. Back side retains a patch of original cortex. The fluttings are non-parallel (138b/1977-78), pl. CVI, 19.

(h) Phase II: The Late Harappa Culture

The assemblage of microliths from the levels of the Late Harappa culture is interesting from various points of view. The collection of two hundred forty-nine microliths consisted of cores, simple blades and tools made on blades, lumps and pieces (Table 4). The lumps for the manufacture of tools seemed to have been collected from the river bed as well as from the basalt beds. The raw material included chalcedony, chert, jasper, carnelian and fine-grained green basalt. The use of chalcedony was the highest covering 90.3% and interestingly enough the chert remained second, covering 6.0%.

The Harappan tradition of production of long ribbon-flake blades was represented by one longest and broadest (56 mm long and 8 mm broad) specimen of chert (fig. 90, 8; pl. CVI, 27). The average Length/Breadth/Thickness ratio of the blade tools was 30.7:5.7:1.9 mm. This showed that the blades, as compared to those of the preceding phase, are longer but in

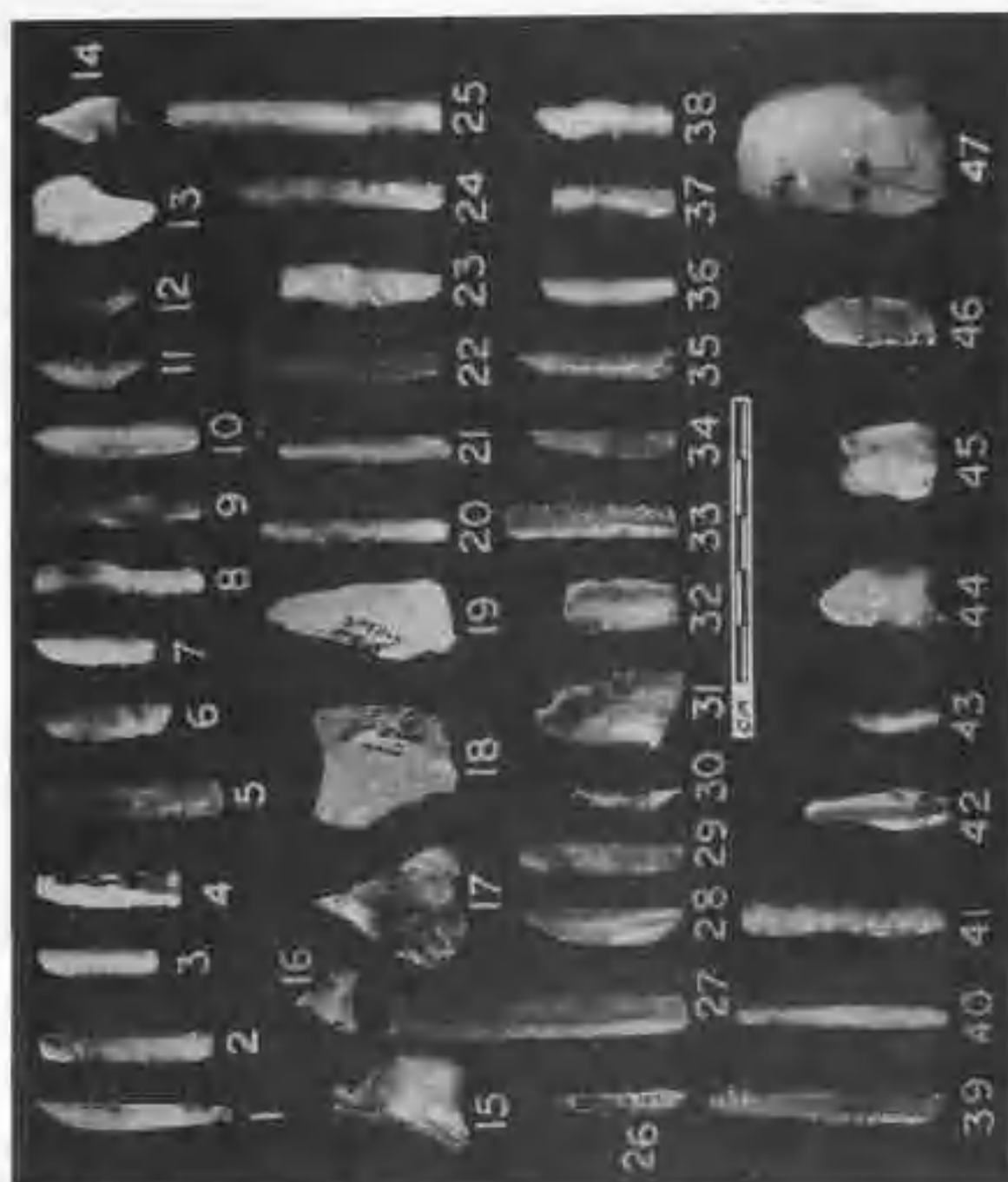


PLATE CVI Chalcolithic blade industry, 1-19 Phase I, 20/32 Phase II and 35-47 Phase III.

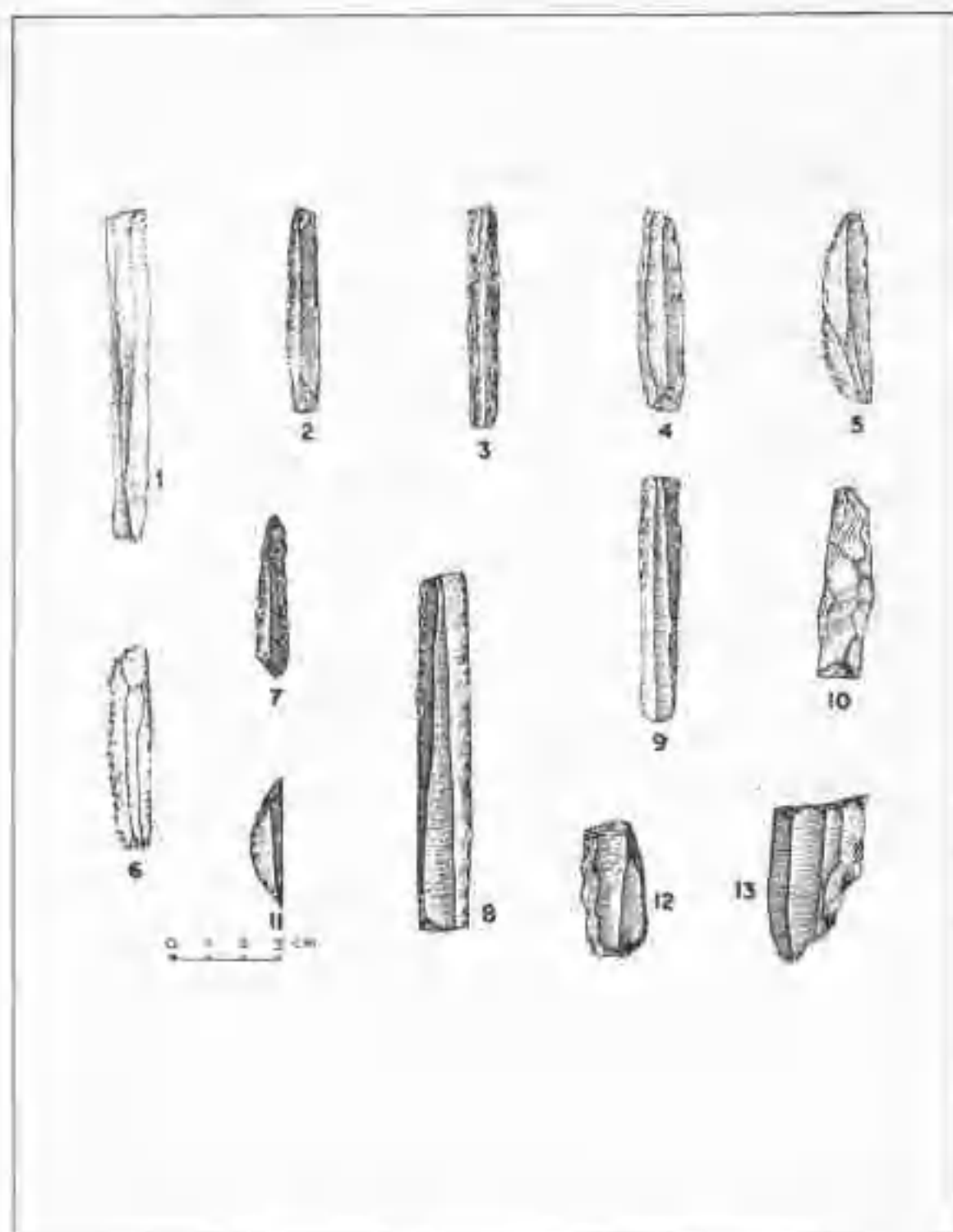


Fig. 10. Chalcolithic Blade Industry, Phase II.

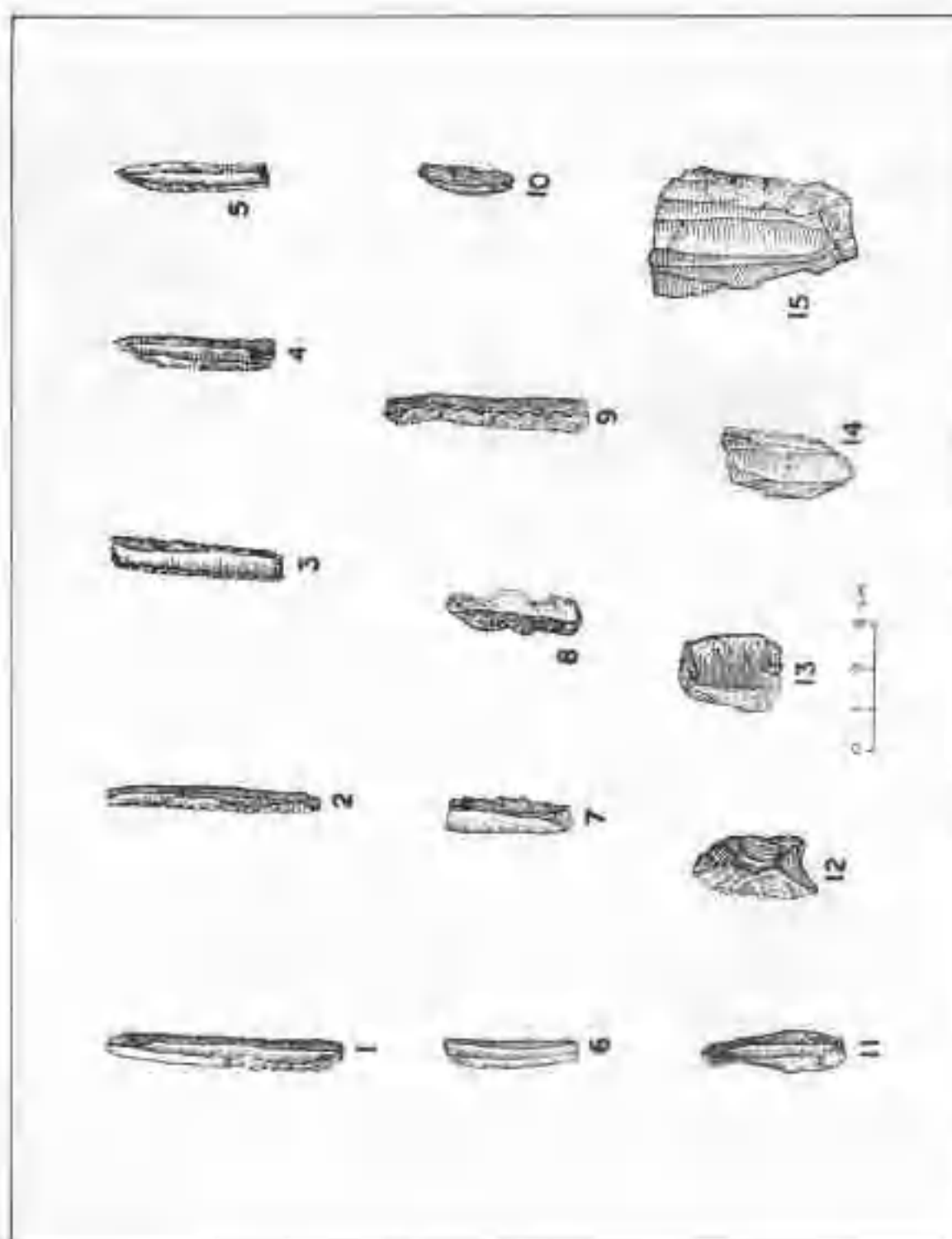


Fig. 31. Chalcolithic Metal Industry, Phase III.

breadth shorter by 0.3 mm and in thickness thinner by 0.1 mm.

The assemblage as a whole is in itself interesting in that it is marked by the occurrence of a fairly large percentage of serrated blades covering as much as 14.8% of the finished tools made on blades. Another marked feature of this industry is the high percentage of pen-knife blades also covering 14.8% of the finished tools on blades. These two types of blades have covered more than 25% of the total finished blade tools. The retouched variety comes next, covering 11.5%. The lunates cover 9.8%. The backed blades are represented by 6.6% of the total finished blade tools.

The trapeze (unillustrated) is represented by only one specimen. Its one of the sides has been broken. Among the finished blade tools the notched variety, represented by only one specimen, is interesting in that its both the margins possess a notch at the lower end.

Among the retouched blades is one interesting example having both the margins fully retouched. Thin patches of brownish substance occurs on the left side margin whereas the right side margin shows a gloss resulted from constant use (fig. 90, 3; pl. CVI, 24).

It appears that the longest chert blade in the assemblage was originally much longer and the specimen present in the collection is only an extant portion of it. This is indicated by its retouched ends. The secondary working at the hubler end is an oblique retouch as in the end-scraper on blade. At the lower end the retouch is almost vertical.

The pen knife blades (fig. 90, 6; pl. CVI, 29) show minimum working in that they have been vertically retouched only on the lower part of one of the margins and in none of the examples the margin has been fully backed. The backing to achieve the shape of a penknife is either in a curve or oblique to intersect with the opposite margin to form a point, dull in the case of curved backing and sharp in oblique backing.

It is interesting to note that one of the backed blades (fig. 90, 4 pl. CVI, 22) and a penknife blade (fig. 90, 5; pl. CVI, 28), both of chert, have come from the extant occupational deposit of Late Harappan Phase resting upon the black soil in Sector II very close to the find spot of the cache of bronzes.

The serrations of the serrated blades have been produced by steep retouch or notchings (fig. 90, 7 and 8; pl. CVI, 26 and 27).

Fifty percent of lunates have been made on thin blades, the thickness not exceeding 1 mm. The arc of two of the specimens has been only partly worked leaving the central portion unworked. In other specimens the arc has been fully worked by vertical retouch. (fig. 90, 11; pl. CVI, 30).

The point on blade has been achieved by obliquely snapping its lower end on either side (unillustrated). The blade used for this purpose is thin and had it been thicker the medial point would have been chisel-ended as in a burin.

The collection contains a fairly large percentage of flakes, 8.5% of the total. They are rectangular, oval, triangular and sub-triangular in shape, but none shows secondary working or use marks. The presence of the Levallois-type core appears to have been collected from the river bed along with lumps of raw-material and as such it is not contemporary with the Harappan Phase.

The fluted cores are mostly with single platform. Most of them are fully exhausted and as such elongated oval in shape. The length of the fluted cores present in the collection is much shorter than that of the blades, the average length of the blades being 30.7 mm and that of the fluted cores 23 mm. The longest blade in the collection is 56 mm long whereas the longest core is only 36 mm long. This anomaly may be due to the fact that the fluted cores were subjected to rejuvenation from time to time as is indicated by the occurrence of a rejuvenated flake.

The selected specimens are described below:

Fig. 90; pl. CVI, 20-32

1. Simple blade; chalcedony. One of the margins shows use-marks. The bulb on the underside is quite prominent. The lower end is truncated by oblique retouch (769a/1975-76). pl. CVI, 25.
2. Retouched blade; chalcedony. Both the margins are fully retouched obliquely. The lower end is truncated by oblique retouch. The bulb of percussion at the platform is prominent (125/1977-78). pl. CVI, 21.
3. Retouched blade; chalcedony. Blade with a prominent bulb of percussion and a hinge fracture. Lower end is truncated by oblique retouch. Both the margins obliquely retouched. An important aspect about this specimen is that the left margin is covered with thin patches of some brown substance whereas the right margin shows glossy surface as in a used blade (124/1977-78, house 19). pl. CVI, 24.
4. Backed blade, chert. A parallel-sided blade with prominent bulb of percussion. Left margin fully vertically retouched, right margin shows use-marks (36/1976-77). pl. CVI, 22.
5. Pen knife blade; chert. One of the margins almost fully vertically retouched. The blunting has produced a few serrations along the margin. The lower end has been given a gentle curve. The opposite margin is minutely retouched (30/1976-77). pl. CVI, 28.
6. Pen knife blade; chalcedony. Made on a blade with a prominent bulb and a hinge fracture. The left margin has been obliquely retouched. The lower end is with a gentle curve produced by vertical retouch. The opposite edge is minutely retouched (126/1977-78). pl. CVI, 29.
7. Serrated blade; chalcedony. A thin blade with sides converging in a point at the lower end. Serrations produced by steep notching on both the margins, those on the right margin being produced from the upper surface and those on the left from the lower surface. (769/1975-76). pl. CVI, 26.
8. Serrated blade, chert. Parallel-sided blade with a bulb of percussion on the under side and vertically truncated lower end. Right margin has been fully retouched to form serrations and the left margin shows nibbled retouch and use-marks. This is longest and broadest specimen in the collection (134/1978-79). pl. CVI, 27.
9. Notched blade; chalcedony. Parallel-sided blade with a bulb of percussion at the striking platform and vertically truncated lower end at which both the margins are slightly constricted as in a notch due to retouching on one of the margins. The retouch is continued from the notch throughout its length whereas on the other margin the retouch is restricted to the notch

only (127/1977-78), pl. CVI, 20.

10. Blade with crested-ridge; chalcedony. Bulb of percussion on the underside. The lower end is broken. Right side margin is fully retouched obversely (135/1978-79), pl. CVI, 23.

11. Lunate; chalcedony. Arc fully vertically retouched to give the specimen a crescentic form and to produce sharp point at both the ends. The margin opposite the arc does not show use-marks (140/1976-77), pl. CVI, 30.

12. Conical fluted core chalcedony. Oval-shaped in cross section, with a well-prepared striking platform and a crudely made crested-ridge at one² of the sides (129/1977-78), pl. CVI, 31.

13. Fully exhausted fluted core; chalcedony. Lenticular in cross section and a crested-ridge along one of the sides (128/1977-78), pl. CVI, 32.

(c) Phase III: The Darmabad Culture

A total of 420 specimens belonged to this phase. The material used in the preparation of tools is chalcedony, chert, agate, quartz and jasper. It appears to have been collected chiefly from the rock beds, that obtained from the river bed is only in negligible percentage. Chalcedony is the dominant material, forming 93.5% which is followed by chert but covering only 2.4%. The use of quartz was recorded in this industry for the first time. It formed 1.4% equal to that of agate. Jasper was represented by only 1.2% (Table 3).

The collection comprised blades and tools made on blades, cores, rejuvenation flakes, end-scaper, notched arrowhead and lumps and pieces. The highest percentage (58.7%), among these was that of debitage (Table 4). The fluted cores are of cylindrical and conical variety. In some of the cylindrical cores the lower end is obliquely snapped. The striking platform in both the varieties is well prepared. These cores of cylindrical type possess a crested-guiding-ridge in one corner. The flutings in both the cylindrical and conical varieties are well marked and parallel-sided. The average length of fluted cores is 27 mm whereas that of the simple blades comes to 30.1 mm and that of blade tools 29.6 mm. None of the cores in the assemblage exceeds 40 mm in length. This may be due to the rejuvenation of cores from time to time. The fluted cores found thus suggested that they were extant specimens. Yet none of the prepared core nodules was also of that much of length being 26 mm and the longest of the specimens 34 mm. There is, however, one blade with crested-ridge the length of which measured 56 mm. This would also mean that not all the fluted cores were originally of greater length and that in length they varied in relation to the available core nodule selected for manufacturing blades. It needs also to be mentioned that usually lumps of chalcedony are available in small size, bigger specimens being only rarely found.

The average thickness of the blades and blade tools has come to 2 mm and L/B ratio of simple blades to 30.1 : 5 mm and that of tools made on blades 29.6 : 5.2 mm. The L/B ratio of the pen knife blades has come to 28 : 5 mm that of retouched blades 35 : 3 mm, of crested-ridged blades 33 : 7 mm and of backed blades 28 : 5 mm. In these thus, the longest blades are of retouched variety, followed by those with crested-ridge and the shortest are

pen-knife and backed varieties. In breadth the crested-ridged specimens are the broadest with 7 mm on an average whereas the breadth of simple blades measured 5 mm. But the average breadth of the pen knife, backed and retouched variety is only 5 mm. Therefore, it may be assumed that while converting the primary blades into tools by retouching a portion between 1 and 2 mm on an average along the margins was removed.

Among the finished tools, barring a couple of specimens, for example, and end-scrapers on flake and a notched arrowhead, all the tools are made on blades and may be classed as blade tools. In these are included penknife blades, retouched blades, backed blades, a serrated blade (broken), a notched blade, a hune and a backed point.

The retouch is vertical and oblique and bold and minute. The vertical retouch has been used in the backing of the point, backed blades and also in the shaping of the lower end of the pen-knife blade. The oblique retouch is also to be found in the pen-knife as well as in the retouched blades. The serrated blade, of which there is only one example, and that too broken, has been made by vertical retouch. The serrations in this specimen are sharp but the dentitions are not so deep as those occurring in the specimens of Harappan Phase. The notches in the notched blades are fairly deep and broad and show use-marks. The delicate retouch is found specially in longer blades of which one margin has been worked with such a type of retouch.

The end-scraper has been made on an exhausted thin piece of fluted core instead of a flake. An absence of flakes in the collection is also noteworthy.

The notched arrowhead has a working point at the bulber end and a deep U-shaped notch made by removing a flake from the opposite end. In shape and even in the technique of manufacture this specimen differs from those found in the Savalda levels in that those from the latter are V-shaped and the deep V-shaped notch has been prepared by removing spalls from opposite sides, in one example both from the under and the upper sides. Besides, notched arrowheads of the Savalda Phase have been made on trapezoidal flakes. The specimen from Daimabad Phase has been made on a thick blade with a crested ridge and the bulber end has been worked into the point.

The backed point is represented by only one specimen and its tip is broken. Its both the margins, a little away from the bulber end, have been steeply retouched.

The selected specimens are described below.

Fig. 91; pl. CVI, 33-47

1. Simple blade; chalcedony. Parallel-sided blade with a bulb of percussions at one end, the other end being broken. Use-marks occur all along the right margin. Small notch at the lower broken end appears to be accidental (140/1977-78), pl. CVI, 39.
2. Retouched blade; chalcedony. Parallel-sided blade with both the ends truncated. One of the margins is retouched from the upperside and the other from the underside (139/1977-78), pl. CVI, 40.

3. Backed blade; chalcedony. Parallel-sided blade with a bulb of percussion at the lower end. The left side margin is vertically retouched (139a/1977-78). pl. CVI, 33.
4. Pen-knife blade; chalcedony. Made on a parallel-sided blade. Vertically retouched at the bulber end to produce a pointed end by intersection with the opposite sharp margin which shows use-marks (139b/1977-78). pl. CVI, 34.
5. Penknife blade; chalcedony. Made on parallel-sided blade. Vertically retouched at the lower end to produce sharp point by intersection with the opposite margin (147/1977-78). pl. CVI, 35.
6. Penknife blade, chalcedony. A parallel-sided blade converted into a penknife blade by vertical retouch. The opposite end is truncated by oblique retouch (143/1977-78). pl. CVI, 36.
7. Serrated blade; chalcedony. A parallel-sided blade with a bulb of percussion and the lower end broken. Serrations produced by vertical retouch on the right-side margin (144/1977-78). pl. CVI, 37.
8. Notched blade; chalcedony. Made on parallel-sided blade with a bulb of percussion on the underside. Lower end is broken. Deep notches are present on the left margin (146/1977-78). pl. CVI, 38.
9. Blade with a crested-ridge; chalcedony. Both the ends are broken. Little retouch on the underside shows use marks (139c/1977-78). pl. CVI, 41.
10. Lunate; chalcedony. On a thin blade, with the ends broken. Arc made by oblique and vertical retouch. Opposite margin does not show any secondary working or use-marks (142/1977-78). pl. CVI, 43.
11. Backed point; chalcedony. Made on parallel-sided blade, with a bulb of percussion on the underside. Both the margins vertically retouched. Tip broken (142a/1977-78). pl. CVI, 42.
12. Notched arrowhead; chalcedony. Made on a thick flake with a high medial crested-ridge on the upperside and a sharp point at the bulber end. A deep U-shaped notch has been produced by removing a flake at the opposite end. A few flakes have been removed from the bulber end to flatten excessive elevation (100/1977-78). pl. CVI, 44.
13. End scaper; chalcedony. Made on a fully exhausted core by retouching the lower end both from underside and upperside (141/1977-78). pl. CVI, 45.
14. Conical fluted core; chalcedony. With a striking platform opposite of the conical end (145/1977-78). pl. CVI, 46.
15. Fluted core; chalcedony. With a double striking platform. Small patch of original cortex exists on the periphery (747/1975-76). pl. CVI, 47.

(d) Overlap Between The Daimabad And The Malwa Cultures

The assemblage of microliths of the overlap phase between Daimabad and Malwa Cultures is represented by 137 specimens. The material used is chalcedony, jasper and quartz collected in the form of nodules both from the river bed and the trap formations. The use of chalcedony is the highest, 97%, the rest being covered by jasper and quartz. The assemblage consisted of

blades and tools made on blades, fluted cores, a core nodule, flakes, lumps and pieces. The pieces covered a maximum of 48.8%. The broken blades constitute 18.3%, the lumps 11%, simple blades 8.8% and the tools made on blades 6.5%. The fluted cores are 5.1% and only one specimen each of a core nodule and a flake find place in the assemblage (Table 4).

Among the complete specimens of blades 57.2% is covered by simple blades and the rest by worked blades. The percentage of broken blades in the entire assemblage of blade element is as high as 54.3%, that of complete simple blades 26% and of worked blades 19.7%. Among the worked blades are included retouched blades, penknife blades and one each a tanged point and a serrated blade.

The retouch is vertical, oblique and bold and minute. The vertical retouch has been used for giving a curve at the lower end of the penknife blade and also to form a medial point of the tanged point as well as to produce serrations in the serrated blade. Oblique retouch has been used in the retouching of the margins of blades as well as producing the tanged point. Minute retouch is found on the margins of majority of the retouched blades.

The L/B/T ratio of the entire assemblage of simple blades and tools made on blades has come to 33:5:1.7 mm, whereas the L/B ratio of the simple blades was 34:6 mm, that of the tools made on blades 31:5 mm, in retouched blades it was 33: 5 mm and with regard to the penknife blades 27:5.5 mm. The length and breadth of solitary specimen of point measured 28 mm and 5 mm and that of the serrated blade 31 mm and 3 mm respectively. The average breadth of the worked blades does not exceed 5.5 mm although the most common is 5 mm. On the other hand the average breadth of simple blade has come to 6 mm. In this case, therefore, the tools have lost from one-half mm to 1 mm marginal portion in the process of conversion into the tool form. The average length of the fluted cores measured only 21.5 mm. The longest among these was 26 mm and shortest 16 mm. None of these thus is equal to average length of the blades.

The fluted cores are roughly cylindrical in shape and with mostly single striking platform. They are oval in cross-section. Most of them are with a crested-ridge along one of their longer sides. The back side is marked by skimming flake scars and is flatish whereas the front side is convex and with flutings. The end opposite that of the platform is wedge-shaped formed by snapping it obliquely. A solitary core nodule is a fine specimen, cylindrical in shape, with a crested-ridge along the longer side, a flat striking platform produced by trimming and trimmed all along the cylindrical body leaving a few patches of original cortex (unillustrated).

A tanged point (fig. 93, 5; pl. CVIII, 5) has been made by producing a medial thick point at the bulbous end by vertically trimming the margins to converge into the point. The tang on the opposite side has been produced by reducing the margins by both vertical and oblique retouch. One of the penknife blades (fig. 93, 3; pl. CVIII, 4) has a fairly curved lower end made by vertical retouch as a result of which a dull point has been produced. In the other specimen of this type, of which a portion has been broken, vertical retouch has produced a sharp point by intersection with the opposite margin.

The serrated blade has fine serrations along one of the margins produced by vertical retouch whereas those on the other margin are irregular. The retouched blades on the whole

have parallel sides and, barring a few specimens, majority are triangular in cross section.

The selected specimens are described below.

Fig. 93: pl. CVIII, 1-5

1. Simple blade; chalcedony. A parallel-sided blade with a prominent bulb of percussion and a hinge-fracture. Both the margins show use-marks (122/1977-78). pl. CVIII, 1.
2. Retouched blade; chalcedony. Blade with a prominent bulb of percussion. One of the margins is retouched from the upper side and the other from the under side (123/1977-78). pl. CVIII, 2.
3. Pen knife blade; chalcedony. A parallel-sided blade with a prominent bulb of percussion. The lower end has been obliquely vertically retouched to form a penknife blade (121/1977-78). pl. CVIII, 4.
4. Serrated blade; chalcedony. Parallel-sided blade. Both the ends have been truncated by oblique retouch. Steep retouch has produced small dentitions (122a/1977-78). pl. CVIII, 3.
5. Tanged point, chalcedony. The bulber end has been retouched to converge the margins into a point. At the opposite end a tang has been produced by deeply retouching one of the margins. The margin on one side is broken obliquely (120/1977-78). pl. CVIII, 5.

(c) Phase IV : The Malwa Culture

Numerically the collection of microliths from Malwa Phase is little less than that from the Daimabad Phase but so far as the variety of tools is concerned that from the former is comparatively richer. The collection of 395 specimens included, besides lumps and pieces, simple blades, broken blades, tools made on blades, blades with crested-ridge, a notched arrowhead, a flake-blade, flakes, fluted cores and core nodules.

The material used for preparing tools included chalcedony, jasper, agate, carnelian, chert, red basalt and quartz. The chalcedony, as in the previous phases occurs in largest percentage and covers 92.4%. The remaining is covered by the rest. The material has been obtained from the basalt beds as well as from the river-bed. An important aspect of the material revealed from the study of lumps indicated that more than sixty percent of it has been obtained from the river bed. These lumps are patinated and possess a glossy surface.

The core nodules (fig. 92, 22 and 23) are fully prepared, with a single striking platform and a crested-ridge either on both the sides or on one side only. The back side of the core nodules shows skinning flake scars. The crested-ridge has been prepared by alternate flaking. The core nodules are of cylindrical as well as sub-triangular type with ovaloid cross-section.

The fluted cores (fig. 92, 24 and 25) are cylindrical in shape and ovaloid in cross-section. There are also examples of fully exhausted cores. The cores are either with one or double platform. Most of the cores possess a crested-ridge either in the centre or on one side especially on the back side. The average length of the core has come to 28 mm. They, how-

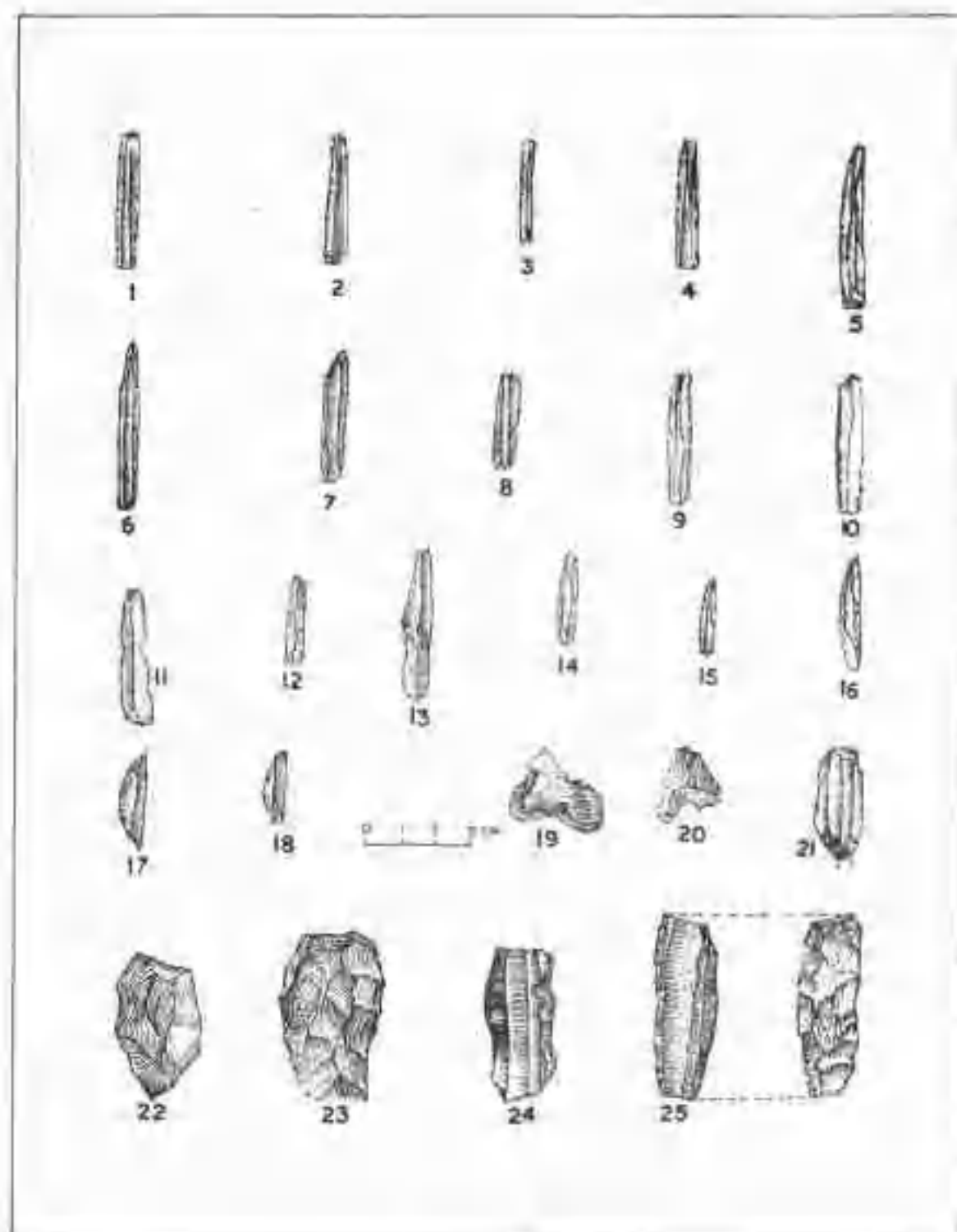


Fig. 92. Chakrolithic Blade Industry, Phase IV.

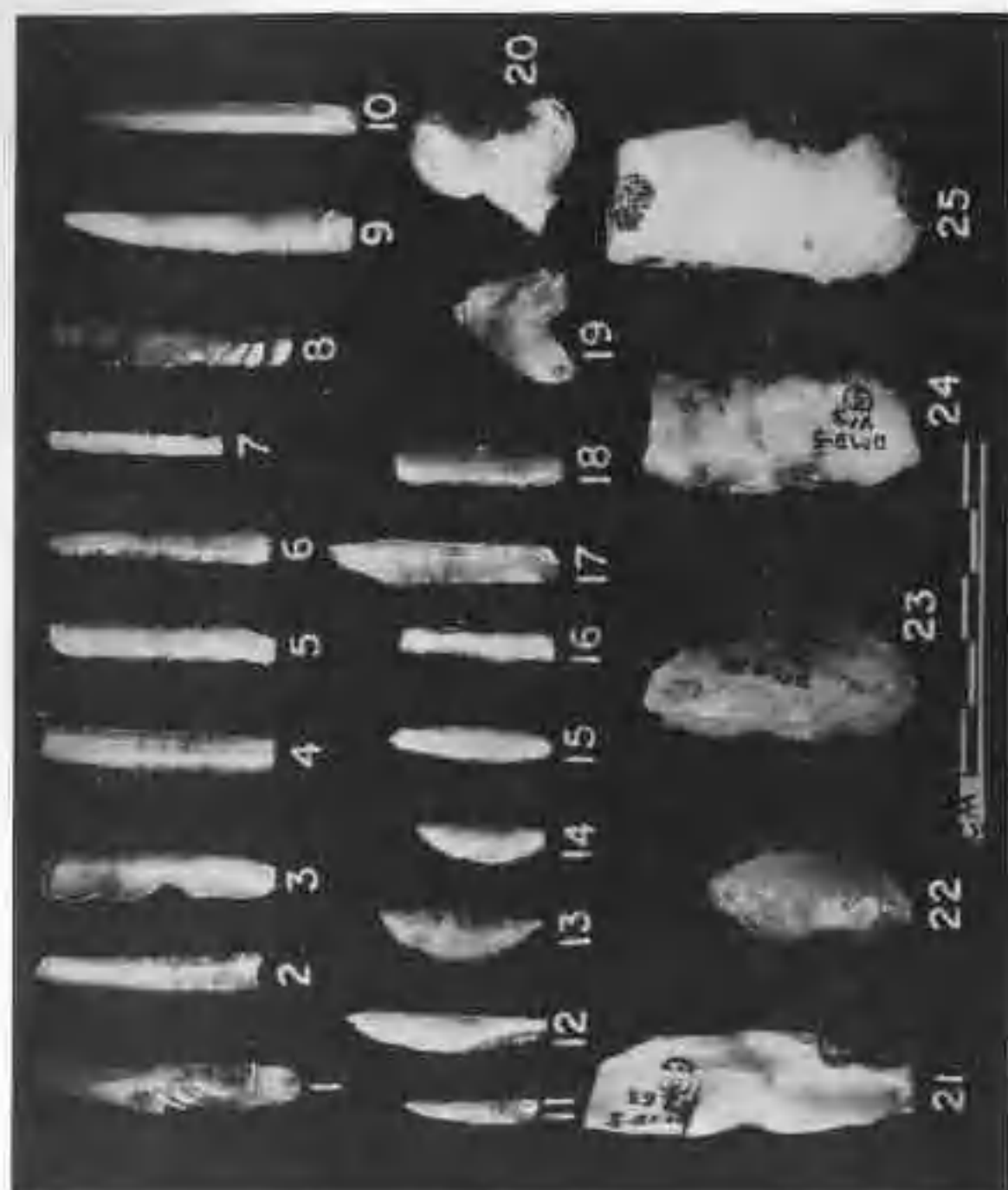


PLATE CVD Chalcolithic blade industry, Phase IV.

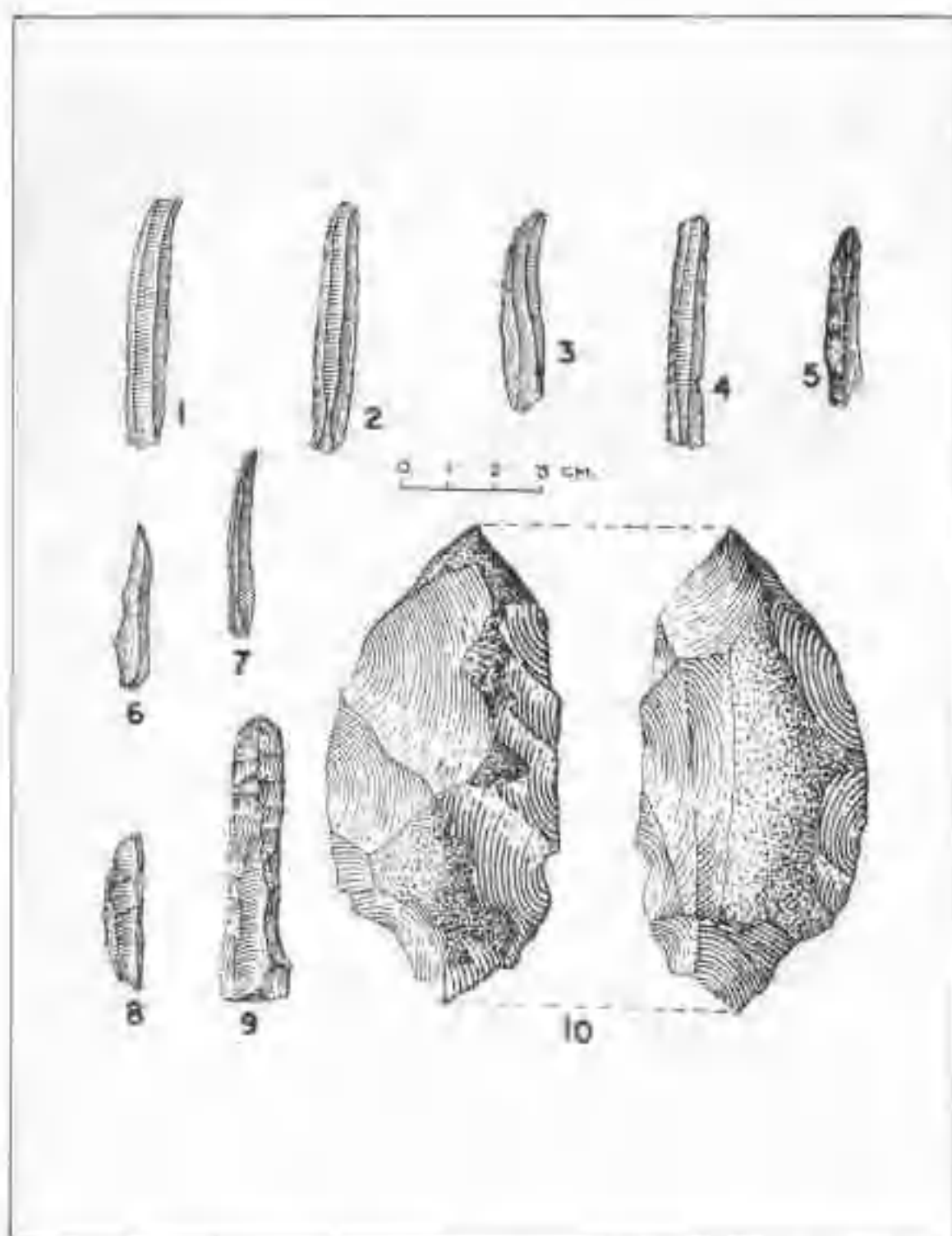


Fig. 98. Chulcolandia Blade Industry. 1-5, overlap phase between Phase III and Phase IV; 6-10, overlap phase between Phase IV and Phase V.



PLATE CVIII Chalcolithic Blade Industry, 1-5 overlap between Phase III and Phase IV and 6-10 overlap between Phase IV and Phase V.

ever, vary in length from 15 mm to 50 mm. The average length of the core compared to blades and blade-tools is much less. This may be due to the snapping of the ends of cores from time to time in the process of their rejuvenation, although no example of core rejuvenation flake has been recorded from this phase. There is one core (fig. 92, 21; pl. CVII, 22) with a purposely made medial point, the tip of which is broken. The medial point in this example is unique in that it is formed by the converging four ridges from four corners, one of them being an extension of the crested-ridge running throughout the length of the specimen. It appears to be a drill.

Examples of both minute and bold retouch are met with in this assemblage. The blunting or backing is oblique as well as vertical, the latter occurring in lunates, a point, a pen-knife and a crescentic blade and serrated blades in which the serrations have been produced by bold vertical notchings. Quite a number of blades show deliberate truncation by retouch.

In the penknife blades generally the lower end is oblique or curved, but there is one specimen (fig. 92, 8; pl. CVII, 18) with almost straight end produced by vertical-retouch. This is the only specimen of pen knife variety with truncated end in the entire assemblage of blades from the excavation at Daimabad.

The backed point (fig. 92, 15; pl. CVII, 11) is made on a blade. Half portion of its one of the margins has been vertically retouched in a curved form to form a sharp point by intersection with the opposite margin. The crescentic point is made on a thin parallel-sided blade (fig. 92, 16; pl. CVII, 12). A sharp point at one side of the lower end of this specimen has been produced by oblique retouching. The margin opposite that of the obliquely retouched lower end has been minutely retouched near the point. Another variety of point on blade has a sharp medial point at one end produced by oblique retouch on either side.

The notched blade, of which only one example has been found, has a notch in the centre of the margin. This margin also shows minute retouch (fig. 92, 16).

The notched variety of arrowheads technologically do not differ from the specimen of Phase III (fig. 92, 19 and 20).

The simple variety of blade ranks highest, covering 17.5% of the total assemblage. The tools made on blades cover 8.9% whereas the broken blades cover 23.3% (Table 4).

In the blade element the simple blades cover 35%, worked blades 17.5% and broken blades 47.5% (Table 5). In the simple and worked blades (excluding broken blades) the simple blades cover 67.3% and the rest is covered by worked blades or tools made on blades. In the latter category the retouched blades rank the highest, 10.9%, followed by penknife blades, 8.7%. The serrated blades cover as much as 4.8%.

The L/B ratio of simple blades come to 32.4 : 6.3 mm. This is more than that occurring in the preceding Daimabad Phase. Likewise the L/B ratio of penknife blades which in the Malwa Culture comes to 34 : 5.6 mm as against 28 : 5 mm in the preceding phase, also shows an increase. The ratio of retouched blades in the Daimabad Phase was 35 : 5 mm and that of crested-ridged blade 33 : 7 mm. As against this, types in the Malwa levels have shown the ratio 30 : 5.5 mm and 31 : 4 mm respectively. In these there is thus a decrease.

The average thickness of the blades and the tools made on blade in this phase is 2 mm.

The selected specimens are described below.

Fig. 92; pl. CVII

1. Retouched blade; chalcedony. One of the ends truncated by vertical retouch. Part of one of the margins obliquely retouched. The opposite margins show use-marks (Y'1 (5)). pl. CVII, 4.
2. Retouched blade; chalcedony. Partly retouched on the underside of one of the margins. Both the ends broken (BZ'3 (5)). pl. CVII, 5.
3. Retouched blade; chalcedony. Narrow thick blade with full retouch on one of the margins (X'5 (7)). pl. CVII, 7.
4. Retouched blade; chalcedony. A parallel-sided blade with both the ends broken. One of the margins shows both inverse and obverse retouch (Z'3 (5)). pl. CVII, 2.
5. Penknife blade; chalcedony. Made on a blade with a prominent bulb of percussion. The left side margin is retouched in a gentle curve to form a dull point by intersection with the opposite margin (Y'3 (7)). pl. CVII, 9.
6. Penknife blade; chert. Made on a blade with a prominent bulb of percussion. On the underside the lower end has been given a curve by retouch. The opposite margin shows inverse retouch (BZ'4 (5)). pl. CVII, 10.
7. Penknife blade; chalcedony. Made on a parallel-sided blade with a bulb of percussion on the underside. The lower end has been retouched obliquely to form a broad point by intersection with the opposite margin which has been both inversely and obversely retouched (Z'3 (8)). pl. CVII, 17.
8. Penknife blade; chalcedony. Made on a parallel-sided blade with a bulb of percussion on the underside and a laterally truncated lower end. The left side margin has been obliquely retouched and the right side shows use-marks (Y'3 (4)). pl. CVII, 13.
9. Serrated blade; chalcedony. A blade with a bulb of percussion. Serrations have been produced by vertical retouch on the left margin. The vertical retouch has been continued towards the lower end for truncating it. (Y'1 (5)). pl. CVII, 5.
10. Serrated blade; chalcedony. A blade with a bulb of percussion on the underside, the lower end being broken. Serrations have been produced by vertical retouch on the left margin (Y'2 (3)). pl. CVII, 8.
11. Notched blade; chalcedony. A parallel-sided blade with a bulb of percussion and a hinge-fracture. A deep notch is on the left margin (FZ63 (9)). pl. CVII, 3.
12. Blade with a crested-ridge; chalcedony. A parallel sided blade with a high crested-ridged on the upper side. Both the ends broken (CZ 61 (8)). pl. CVII, 16.
13. Point; chalcedony. A blade with a prominent bulb of percussion on the underside. A sharp point on the right of the lower end has been produced by obliquely snapping it. There is a tiny dent in the right margin which also shows use-marks (BQZ'4, house 32). pl. CVII, 1.
14. Point; chalcedony. A sharp projecting medial point made by obliquely snapping either side of the lower end of a blade with a fully backed left margin. The bulber end has been rem-

oved by secondary working. (Z'3 (4)). pl. CVII, 15.

15. Point; chalcedony. A backed variety of point on a blade produced by curved backing on the half of the left margin (594/1975-76). pl. CVII, 11.

16. Point; chalcedony. A crescentic variety of point on blade. The left margin has been fully retouched to give a roughly crescentic form. The opposite margin shows use marks (Z'4 (8)). pl. CVII, 12.

17. Lunate; chalcedony. Arc fully vertically retouched to give a crescentic form and both the ends pointed. The side opposite of arc does not show any working or use mark (X'5 (8)). pl. CVII, 13.

18. Lunate; chalcedony. Made on a blade, vertical retouch has been done on one of the sides to give a form of a crescent. One of the ends is broken. The opposite side does not show secondary work or use marks (Z'2 (8)). pl. CVII, 14.

19. Notched arrowhead; chalcedony. Although on a trapezoidal flake with a bulb of percussion on the underside and a sharp projecting point on the right, a natural concavity in the middle of the left margin and the sharp point opposite of it would class it as a variety of notched arrowhead (GZ 63 (9)). pl. CVII, 20.

20. Notched arrowhead; chalcedony. On a flake with splayed sides. A roughly U-shaped notch produced by removing spalls in the middle of the right side margin. On the opposite of it is a tongue-like tip (Y'1 (5)). pl. CVII, 19.

21. Drill; chalcedony. Made on a fluted core with a rounded upper platform to set in a drill-head. At the lower end has been produced a medial point. The tip of the drill is broken (FZ 63 (9)). pl. CVII, 22.

22. Core nodule; chalcedony. With a single platform, it has three sides produced by skimmed flaking. A crested-ridge has been prepared at two of the three corners (BZ'3, house 33). pl. CVII, 23.

23. Core nodule; chalcedony. Almost cylindrical in shape and with double striking platform, one of them fully prepared and the other retaining a patch of original cortex. A crested-ridge has been prepared by alternate flaking on each side (X'3 (4)). pl. CVII, 25.

24. Fluted core; chalcedony. Cylindrical in shape and with a prepared striking platform at each end. The periphery retains patches of original cortex. The specimen does not possess crested-ridge (Y'3 (5)). pl. CVII, 24.

25. Fluted core; chalcedony. A fully exhausted core with a skimmed back side and a crested-ridge along one of the corners. The front side is marked by flutings (FZ 63 (9)). pl. CVII, 21.

(f) *Overlap Between The Malwa And The Jorwe Cultures*

The collection of microliths of the overlap phase between Malwa and Jorwe cultures is numerically small, consisting of only 153 specimens. In these the pieces or waste flakes constitute 31.3% of the total assemblage. In the rest the broken blades cover 24.9%. These are followed by tools made on blades which come to 13.7%, the simple blades forming 11.1%.

An interesting aspect of the lumps, pieces and other artifacts bearing patches of original cortex is that none of them shows any sign which would suggest that the raw material was obtained from the river bed. This would mean that rock beds were chiefly exploited for obtaining the raw material. Whether this had to be resorted to because of the non-availability of the raw material in the river bed due to environmental changes such as that concealing of the gravel/pebble bed in the river by finer sediments such as silt and clays or there were some other reasons is not properly understood.

In the blades the broken pieces cover half of the assemblage, the worked blades 27.6% and the simple blades 22.4% (Table 5).

The L/B ratio of simple blades has come to 30.1 : 6 mm and that of tools made on blade 23.8 : 4.2, the reduction in the process of converting simple blades into tools being much greater than that observed in any of the preceding assemblages. The average length of fluted cores was 26.4 mm. The average thickness of the blades and tools made on blades has come to 1.8 mm.

The retouch is oblique and vertical. The oblique retouch was used in the fashioning of penknife, backed and serrated blades and also in the backed point and the arc of the lunate. The serrations of the serrated examples lie obliquely.

The rejuvenation flake (fig. 9.9; pl. CVIII, 6) bears, on a part of the upperside, a crested-ridge. A few broken blades with crested ridge also find place in the assemblage. The selected specimens are described below.

Fig. 93; pl. CVIII, 36-10

6. Point; chalcedony. A blade with a prominent bulb of percussion on the underside. A sharp point has been made by oblique retouch on the right side of the blade (Y'1 (2)), pl. CVIII, 7.
7. Point; chalcedony. Made on a parallel-sided blade with a bulb of percussion. Point produced by obliquely snapping the left side of the lower end (BZ'S (4)), pl. CVIII, 8.
8. Lunate; chalcedony. Arc fully vertically retouched. The side opposite of arc shows use-marks (Y'2 (2)), pl. CVIII, 8.
9. Rejuvenation flake, chalcedony. With a crested-ridge on the upperside. The underside is a primary flake scar. The flake has been resulted from snapping one end of the core representing a platform to rejuvenate the core (BZ'S (4)), pl. CVIII, 9.
10. Core; chalcedony. A Lavallosian core, lenticular in shape. The upper surface is marked by centrally directed flake scars. The underside also shows flaking along the periphery. Both the surfaces have retained patches of original cortex (BZ'1 (4)), pl. CVIII, 10.

(g) Phase V : Jorve Culture

Richest was the collection of the Jorve Phase, consisting of two thousand six hundred fortyeight artifacts. The industry was marked by a variety of tool forms quite a number of

which did not occur in the earlier phases (Table 7). Further, an interesting aspect of the raw material used is that the lumps for manufacturing tools seemed to have been obtained from rock beds and no inclination was seen towards collecting the lumps from the river beds, the feature which was first noticed in the preceding overlap phase. The material used in the manufacturing of the tools is chalcedony, jasper, agate, chert, quartz, fine-grained basalt and carnelian. The chalcedony forms highest percentage, 85.9%, whereas jasper is represented by 6.6% and agate 5%, the others covering the rest (Table 3).

This industry displays a culmination of the chalcolithic blade tool tradition as is evident from the delicately prepared tools including those made on paper-thin blades (less than 0.5 mm thick). The occurrence of finished as well as unfinished tools and pieces around the flat stone or an anvil found in house 3 (p. 134) indicated that the tools were made in some of the houses, if not all.

The highest percentage of broken blades, 35.8%, in this assemblage needs explanation. It appears, in the first instance, that just because they are broken, they were not made use of. But this does not seem to be so; because, one of such a broken piece of a blade was found *in situ* hafted in a fragment of a rib-bone² (fig. 96; pl. CXI). This is a sure indication that broken blades were hafted and used to form a composite tool. The finds of two ribs of *Bos indicus* (fig. 120; pl. CLVI) with their sides ground for exposing the porous cavity and giving them the shape of a razor need also to be mentioned in this context. Although the blade found associated with these ribs was not actually found hafted in any one of them the idea of setting the blade in the razor-shaped bone-hafts has been conveyed by placing the blade below one of the hafts.

Significant in this context is also the presence of a vast quantity of simple blades which comes to 20.28% of the total in the assemblage. It needs to be mentioned that the piece of the blade found hafted in the rib-bone and the blade found below the razor-shaped haft belonged to the simple variety of blades. It would thus appear that this variety of blade was also in prolific use as tools.

Compared to the simple blades the tools made on blades formed a meager percentage of 11.93%. Yet they are important because, quite a number of types of tools in them have occurred for the first time. It is no surprise that blades with crested-ridge in the blade-group cover so high the percentage as 2.35%, for, the fluted cores occurring in this collection also show crested-ridge prepared either on one of the sides or at the centre of the back side. Even in the fully exhausted cores the crested-ridge is present. While the function of this ridge on the fluted cores seemed to be connected with the production of blades, that occurring on the drill-heads (fig. 95, 44-46, 49-51 and 53 and 54) was perhaps meant for accelerating the cutting process while drilling by means of its sharp wavy edge.

The drills from this phase is an interesting form of tool. Drills have also been reported

2. Sali, op. cit., (1977).

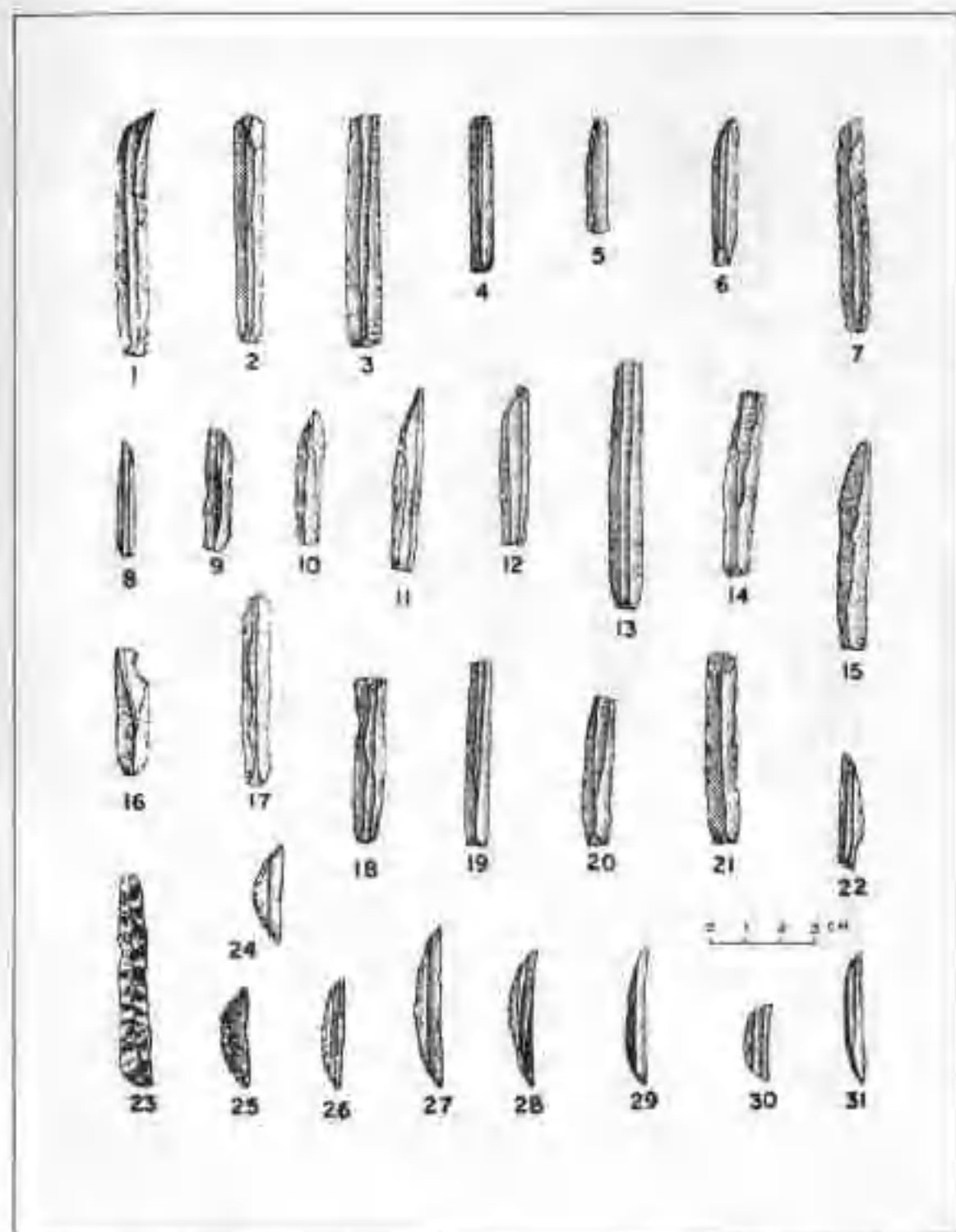


Fig. 94. Chalcolithic Blade Industry, Phase V.

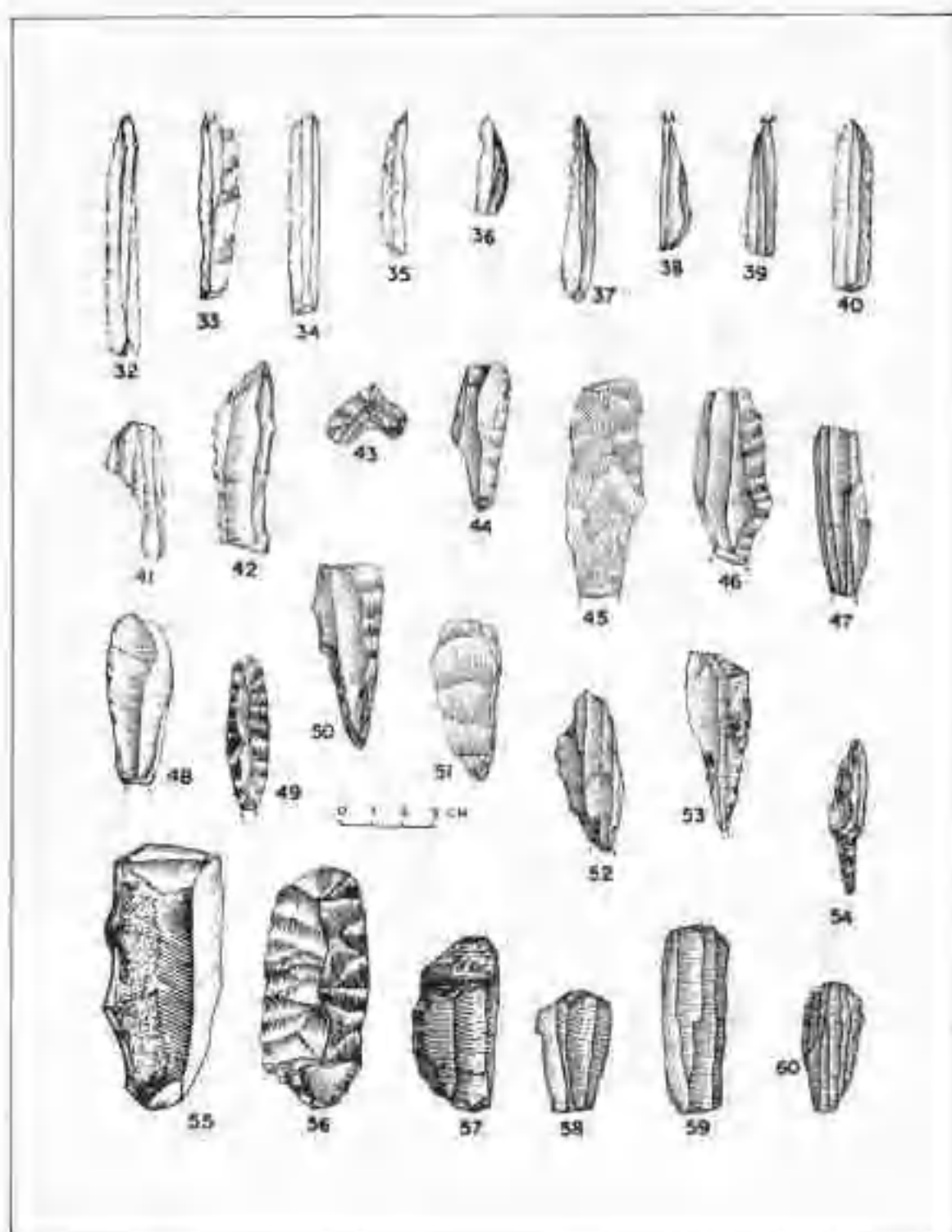


Fig. 95. Chalcolithic Blade Industry. Phase V.



Fig. 96. Blade hafted in rib-bone. Phase V.

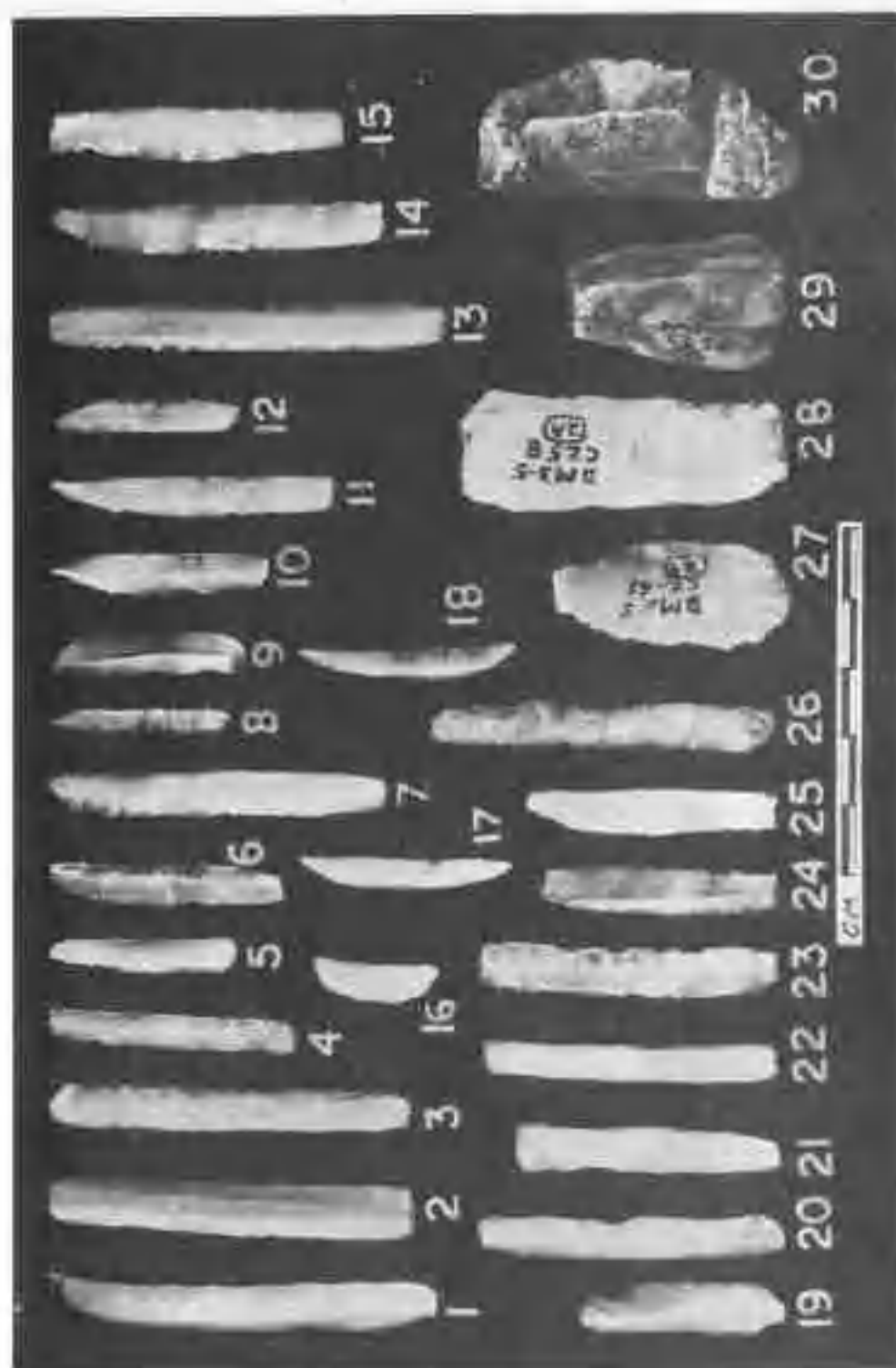


PLATE CX. Chalcolithic blade industry, Phase V.

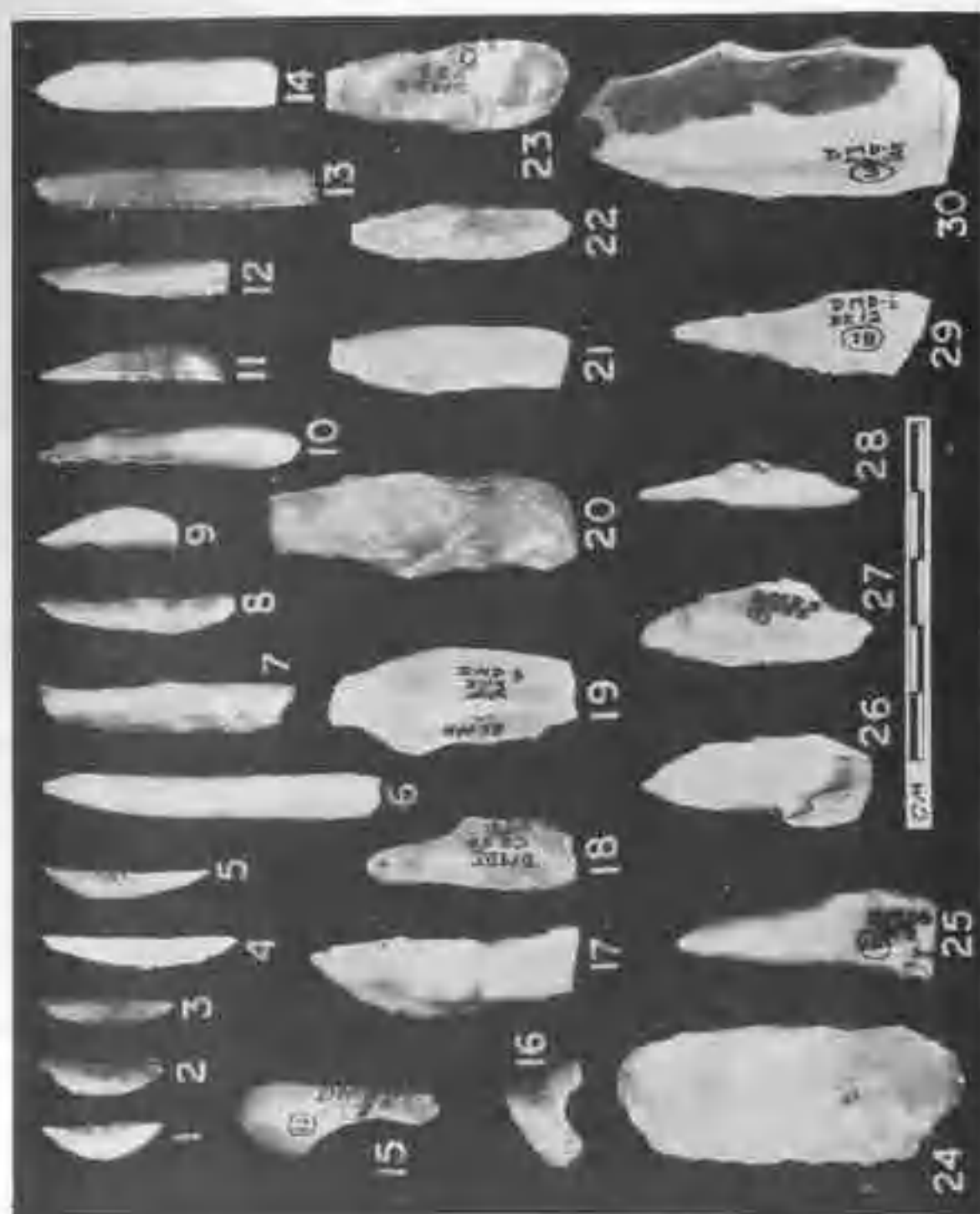


PLATE CX. Chalcolithic blade industry, Phase V.

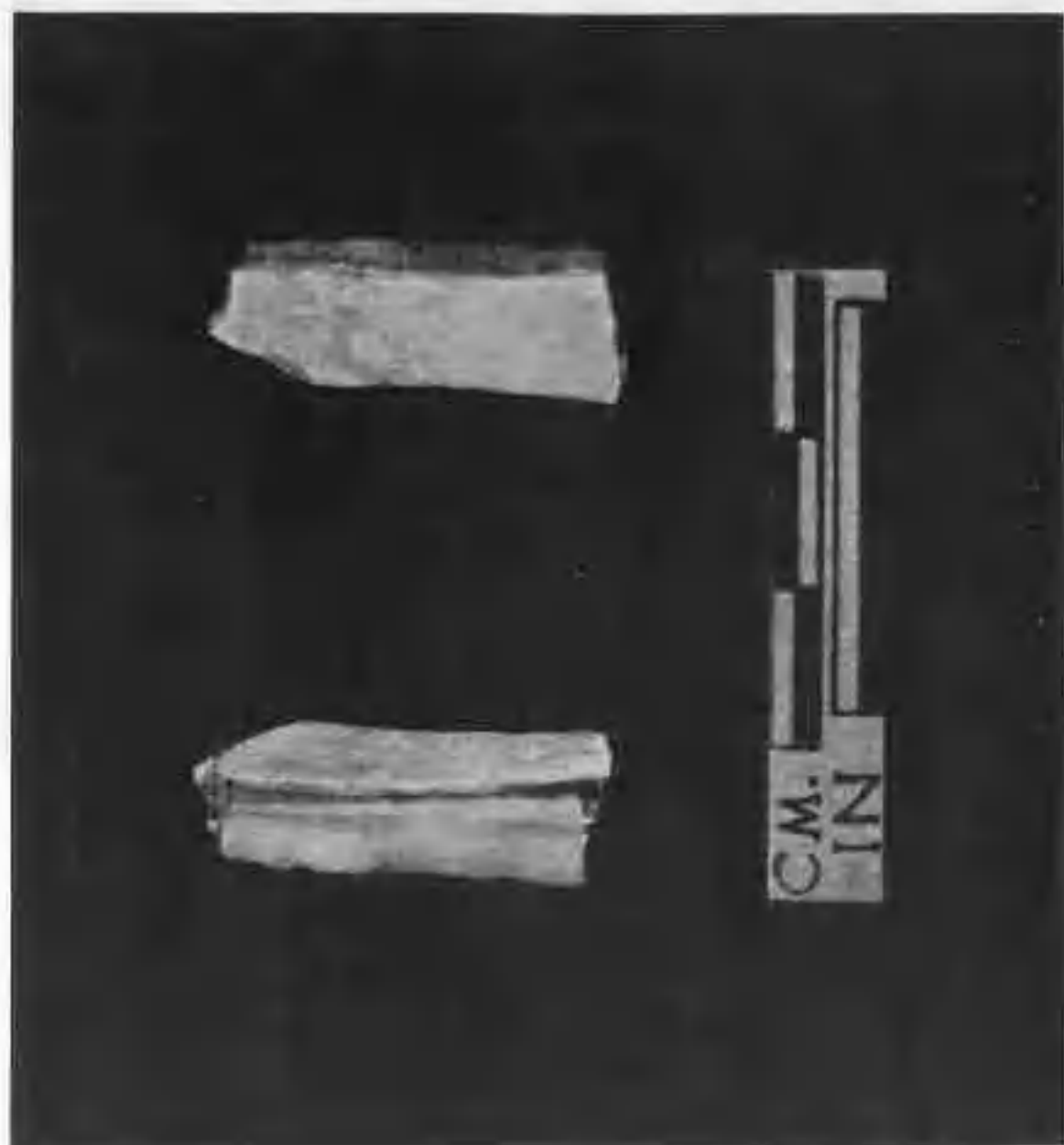


PLATE CXXI Blade hafted to bone, Phase V.

from Chanhudaro,³ Sharhi-i-Sokhta,⁴ Inamgaon⁵ and Mehrgarh.⁶ At all these sites only one type of drill is found whereas at Daimabad occur a variety of types. These types form 0.4% of the total assemblage.

The fluted cores are cylindrical, conical and elliptical and with a crested-ridge either on the side or back side. The cores have been elaborately made by skimmed flaking. In the conical variety the striking platform is single but in the cylindrical and elliptical examples there are two platforms.

The dressing of the core nodules shows interesting features. There is an example in which because of the faulty nature of the lump it was abandoned. It appears, a few of the fluted cores were also abandoned because of the faulty joints.

The solitary example of a notched arrowhead (fig. 95, 43) is marked by glossy surface and rolling and as such does not seem to belong to this phase. It might even belong to either the Mesolithic or the Upper Palaeolithic times.

The most negligible percentage in the assemblage is that of flakes which comes to only 0.15%. This is also significant because none of the tools in this assemblage has been made on flake. Even scrapers which are usually made on flakes have been made in this assemblage on blades (fig. 95, 40; pl. CX, 14).

The tools made on blades in this industry, are of varied types (Tables 4-7) and in this it has no parallel in any of the collections from Daimabad. Among these, the retouched blades rank highest forming 14% and the penknife blades 5.9%. The percentage of serrated blades is also equally high being 3.7%. An important feature of this type is that it included interesting sub-types such as serrated notched, serrated truncated and serrated truncated notched. Next in importance is the type of truncated blades. In this variety there are sub-types such as truncated retouched notched, truncated backed notched and truncated notched. The serrated and truncated blades also occurred at Nevasa⁷ but not in so many varieties. Apart from the above, there is a variety of notched blade. The notches in the examples of this type are not accidental as is suggested by the occurrence of retouch along the edge of the notch. Yet another noteworthy type among the finished tools is that of backed blades. The important feature of this type is that the blades are fully backed, a feature which is almost absent in the earlier phases. Equally interesting are the burins which form 0.4%. The solitary specimen of end-scraper is made on a considerably thick and broad blade. The ranged variety has been represented by 0.3%. The points are crescentic, notched and backed, besides those of ordinary type. The

3. Ernest Mackay, "Bead Making in ancient Sind", *Journal of the American Oriental Society*, Vol. 57, 1937, pp. 1-15.

4. Marcello Piperno, "Micro-drilling at Sharhi-i-Sokhta: the making and use of the lithic drill-heads" in (ed.) Norman Hammond, *South Asian Archaeology*, Duckworth, 1975, pp. 119-129.

5. Z.D. Ansari, "Lithic Drill-heads from Inamgaon" *Bulletin of the Deccan College Research Institute*, Vol. XXXVIII, Nos. 1-4 (1978-79), pp. 10-12.

6. Jean-François Jarrige, "Excavations at Mehrgarh: Their Significance for understanding the Background of the Harappan Civilization", in (ed.) Gregory L. Possehl, *Harappan Civilization*, 1982, pp. 79-84, pl. 6, 13.

7. Sankalia, Deo, Ansari and Eshwari, op. cit. (1960), fig. 65, 19-30, 36-39 and fig. 69, a-c and 1.

lunates are found in different sizes. The geometric form, namely the trapeze, represented by 1.1%, shows a few distinct features which were not observed before. A few of them exceeded 30 mm in length and barring a couple of examples, this variety of tool has shown retouching only on the non-parallel sides. In particularly long specimens the point at either end is pronounced and sharp.

A study of the Length/Breadth ratio of blades and tools made on blades in relation to that of the prepared core nodule and the fluted cores revealed interesting information. The average length of core nodule in the assemblage is 47 mm, being the longest in any of the chalcolithic assemblages at Daimabad but, in contrast to this, the average length of the fluted cores in the assemblage has come only 29 mm, apparently because the cores had to be rejuvenated from time to time. This has been attested to by the occurrence of rejuvenation flakes in the collection. A specimen as long as 57 mm in the fluted cores and half-a-dozen examples of core nodules with 50 mm and more in length also indicated preference for production of longer blades. This is substantiated by the ratio of 31.6 : 5.4 mm of the simple blades. It is interesting to note that the L/B ratio of the tools made on blades has also come to 31.5 mm. The study of ratio of individual types provided important information. The penknife blades have given a ratio of 28.9 : 5.3 mm and this is the lowest in the blade tools, the highest being in the truncated blades, 35.5 : 5.7 mm. The high figures among the serrated blades and notched blades, 33.9 : 6 mm and 33.6 mm respectively, are noteworthy. The ratios of tanged blades 32.2 : 5.7 mm, of retouched blades 32.9 : 5.5 mm, backed blades 30.8 : 5.2 mm, blades with created ridge 31.7 : 5.8 and points 32.5 : 5.3 mm, seem to be not much away from the ratio of simple blades. The ratio of lunates, 23.2 : 4.4 mm, and trapeze, 26.8 : 4.3 mm, are on the higher side than those for these types in the earlier phases. Special mention should be made of the average length of the drills which has come to 35.8 mm.

Interesting in the collection are eleven drills. They can be grouped into two major categories on the basis of the shape of working head, viz. (1) Cylindrical and (2) Conical. To the former belong six specimens and to the latter five. All of them are made on chalcedony. On an average the length of the drills measured 35.8 mm. The longest of them was 46 mm and the shortest 31 mm. Of the first category five are made on exhausted fluted cores (fig. 95, 44-48; pl. CX, 18-21 and 23) and one on a rod (fig. 95, 44-48; pl. CX, 22). Those made on fluted cores are elliptical in section with a narrow working-part, the tip of which in almost all the specimens is broken.

The top end of these specimens is flattened and is either chisel-ended or squarish, the latter type being only in one example. The chisel ended butt was produced for fixing the tool properly in a wooden rod. In all the examples one of the surfaces is marked by flutings and the other by skimmed flaking. In one example (fig. 95, 44; pl. CX, 18) the working head is almost complete. It is located on one of the sides of the end of the piece, pentagonal in section, three of the facets being the result of flutings and the remaining located on either side of the crested-ridge. The tip of the head, made pointed by secondary working, is sharp. Under the magnifying glass the facets show signs of use. The length of the working head of this specimen measured roughly 1 cm.

The rod-like specimen is marked by skimmed flaking all over and is with a crested-ridge on either side, it is lenticular in cross-section and with a narrowing working end (fig. 95, 49; pl. CX, 22).

Of the five specimens of the second category, one is made on a thick long blade-like flake (fig. 95, 54; pl. CX, 28), one on a fragment of a core (fig. 95, 53; pl. CX, 29) and the rest on exhausted fluted cores (fig. 95, 50–52; pl. CX, 25–27). One of the last-named shows extensive skim-flaking and a crested-ridge on either side which appears to have been prepared to facilitate easy cutting while drilling. The upper end of it is almost wedge-shaped whereas its pointed tip measured not more than 1 mm in diameter (fig. 95, 50; pl. CX, 25). The second has a sharp keel along one side, the other side being rounded by flutings. The working head is pointed, the point being achieved by shallow flaking. The upper end has a tang to fix it in the socket. The third specimen is lenticular in section. Its upper surface is marked by flutings and the under surface by skimmed flaking. The top of the upper end is either snapped or broken. A sharp working point has been formed by intersection of the vertically backed lower end of the left margin with the right side margin. The tip of the working head is quite sharp. The sharp pointed working head, about 10 mm in length, of the drill on blade-like flake was prepared by abrupt retouch. The upper end has been narrowed to facilitate hafting (fig. 95, 54; pl. CX, 28). The specimen on the fragment of a core is squarish in section and has a crested-ridge along one of the corners. The working head is sharp and almost chisel-ended.

Mackay has suggested use of the drills for drilling holes in beads.⁸ The drills from Shahr-i-sokhta were probably used for preparing alabaster and steatite seals.⁹ The micro-drills from Mehrgarh were found in association with stone beads.¹⁰ In most of the cylindrical type of drill from Daimabad the diameter of the working head exceeded 4 mm. Such drills were probably used for drilling holes in wood. Drills of conical type were used for drilling holes of comparatively much smaller dimensions. The study of holes bored in the beads of Phase V revealed that holes with hour-glass section could have been bored with a pointed type (below, pp. 526–527).

To recapitulate, the blade industry of the Jorwe Phase is marked by longer tools and this feature distinguishes it from those of earlier chalcolithic phases at Daimabad. It is also marked by the presence of varieties of truncated, serrated and notched blades and drills of two types which have not been recorded from the levels of the preceding phases. The occurrence of paper thin blades in this assemblage deserves special mention. This feature no doubt indicates high proficiency in the knapping of the blade tools.

The illustrated specimens are described below.

Figs. 94 and 95; pls. CIX and CX

1. Simple blade; chalcedony. A parallel sided blade with a bulb of percussion on the under-

8. Earnest Mackay, *op. cit.* (1937).

9. Marcello Piperno, *op. cit.* (1973).

10. Jean-François Jarrige, *op. cit.* (1982), p. 85.

side and a hinge fracture. None of the sides shows any secondary working or use-marks (4/1975-77). pl. CIX, 1.

2. Simple blade; chert. A parallel-sided blade. Both the ends are truncated by vertical retouch and none of the sides shows any secondary working or use-marks (house 38, fourth floor). pl. CIX, 3.

3. Simple blade; chalcedony. A parallel-sided blade without use-marks (from below a haft of ribbone from cluster 6 in the elliptical structural complex). (659/1975-76). pl. CIX, 2.

4. Retouched blade; chalcedony. A parallel-sided blade with both the ends truncated. Right side margin is inversely fully retouched (AZ'1 (2)). pl. CIX, 4.

5. Backed blade; chalcedony. A parallel-sided blade with a bulb of percussion on the underside. The right side margin is fully backed by vertical retouch which extended across the lower end. Left margin is inversely fully retouched (DZ'3). pl. CIX, 5.

6. Backed blade; chalcedony. A fully backed blade produced by almost vertical retouch along the left margin which takes a little curve at the lower end as in a penknife blade. The right margin shows use-marks (AZ'2 (2)). pl. CIX, 6.

7. Backed blade; chalcedony. A parallel-sided blade of which the right margin has been backed partly by vertical retouch which extends across the bulber end. The lower end is either snapped purposely or broken. The left side margin shows use-marks. (EZ 55 (1)). pl. CIX, 8.

8. Penknife blade; chalcedony. Made on a thin blade with a prominent bulb of percussion on the underside. The lower end has been vertically retouched along the right margin in a sharp point. (DZ. 59 (3)). pl. CIX, 8.

9. Penknife blade; chalcedony. A parallel-sided blade with a hinge fracture at the lower end has given a curve by vertical retouch. (CZ 57 (4)). pl. CIX, 9.

10. Penknife blade; chalcedony. Made on a parallel-sided blade. The lower end of the left margin has been abruptly retouched as a result of which a sharp point has been formed at the lower end by the intersection of opposite margin (EZ'2 (2)). pl. CIX, 10.

11. Penknife blade; chalcedony. A parallel-sided blade. The lower end of the left margin has been vertically retouched giving it a curve to meet in a dull point by intersection with the opposite margin. (CZ 57 (2)). pl. CIX, 11.

12. Penknife blade; chalcedony. The lower end has been vertically retouched to give a curve. At the upper end a tang has been formed by vertical retouch (CZ 57 (4)). pl. CIX, 25.

13. Serrated blade; chalcedony. A parallel-sided blade with a prominent bulb of percussion on the underside. The left margin has been fully retouched to produce serrations. The opposite margin shows use-marks. The lower end has been deliberately truncated by oblique retouch (EZ 57 (2A)). pl. CIX, 13.

14. Serrated blade; chalcedony. A blade with a bulb of percussion on the underside. Denticulations have been produced by abrupt retouch along the right side margin. The left margin has a deliberately made notch near its lower end. Both the ends are truncated (DZ'2 (18)). pl. CIX, 15.

15. Serrated blade; chalcedony. This is an unusual type of serrated blade. The left margin of it has been given a curve by vertical retouch to produce a curved edge. The opposite margin

- shows nibbled retouch near the bulbar end (690/1975-76). pl. CIX, 14.
16. Notched blade; chalcedony. A deliberate notch made on the right margin of the parallel-sided blade by vertical retouch at its lower end. (AZ'3 (1). pl. CIX, 19.
17. Notched blade; chalcedony. A parallel-sided blade with a deliberately made notch on the partly retouched right margin. The left margin also bears two notches made by inverse retouch. The lower end has been inversely worked (FZ 63 (5)). pl. CIX, 20.
18. Notched blade; chalcedony. A parallel-sided blade with notches on the right margin produced by retouch. The lower end is truncated by retouch (DZ 59 (3)). pl. CIX, 21.
19. Truncated blade; chalcedony. A parallel-sided blade with truncated lower end produced by oblique retouch. The left margin shows use-marks (DZ 58 (2)). pl. CIX, 22.
20. Truncated blade; chalcedony. A parallel-sided blade with a truncated bulbar end made by oblique retouch and serrations produced on the left margin by abrupt retouch (CZ 57 (4)). pl. CIX, 24.
21. Truncated blade; chalcedony. A parallel-sided blade with a truncated lower end produced by oblique retouch and a notch on the right margin created by secondary working (DZ 59 (3)). pl. CIX, 23.
22. Tanged blade; chalcedony. A thin parallel-sided blade with a tang produced at the bulbar end by oblique retouch on the right margin and a deliberately made tiny notch in the centre of the lower end. Both the margins show use-marks (EZ 57 (1)). pl. CIX, 12.
23. Blade with crested-ridge; chalcedony. An almost parallel-sided blade with a high medial crested-ridge on the upper side and a bulb of percussion on the underside. The lower end is marked by a patch of original cortex (CZ 60, house 3). pl. CIX, 26.
24. Lunate; chalcedony. Made on a blade by abruptly retouching the arc to give a crescentic shape and to produce point on either end. (EZ 57 (4)). pl. CX, 1.
25. Lunate; chalcedony. Made on a blade. The arc has been produced by a combination of oblique and vertical retouch. The point on either side is dull (BZ'2 (2)). pl. CX, 2.
26. Lunate; chalcedony. Made on a parallel-sided blade. A roughly crescentic shape has been given by steep retouching. The point on either side in this example is dull (DZ'2 (2)). pl. CX, 3.
27. Lunate; chalcedony. Made on a thin blade. The crescentic shape has been achieved by vertically retouching the ends of the arc, leaving the central portion of the margin without secondary working (53/1978-79). pl. CX, 4.
28. Lunate; chalcedony. Made on a blade. An asymmetric arc and a sharp point at one end produced by vertical retouch (788/1975-76). pl. CX, 5.
29. Trapezee; chalcedony. Made on a blade by abruptly retouching the non-parallel sides and one of the parallel sides. The non-parallel sides almost merge with one of the parallel sides and as such it roughly gives a form of crescent or lunate (555/1975-76). pl. CX, 18.
30. Trapeze; chalcedony. Made on a blade by abruptly retouching only the non-parallel sides. The point at either end is very dull (BZ'2 (2)). pl. CX, 17.
31. Trapeze; chalcedony. Made on a blade by steeply retouching the non-parallel sides to produce sharp points at either end (AZ 3 (3)). pl. CIX, 16.

32. Point; chalcedony. A medial point at the lower end of the blade produced by steep retouching to converge the margins into a point. The bulber end has been obliquely retouched from the upperside (EZ'2 (1)). pl. CX, 6.
33. Point; chalcedony. A tip of the point on the left made by obliquely retouching the lower end is broken. The left margin shows use-marks (DZ'3 (1)). pl. CX, 7.
34. Point; chalcedony. A sharp point on the left made by obliquely retouching the lower end. The left margin shows use-marks (DZ'3 (1)). pl. CX, 13.
35. Point; chalcedony. This is a crescentic variety of point with a tang. The left margin has been fully vertically retouched in a crescentic form to achieve a sharp point at the lower end by intersection with the right margin (DZ 59 (3)). pl. CX, 8.
36. Point; chalcedony. Made on a blade by vertically retouching the right side margin to form a sharp point by intersection with the left margin which possesses a notch at the lower end (CZ 58 (4)). pl. CX, 9.
37. Point; chalcedony. A thin blade with a sharp medial point at the lower end produced by vertical retouch on either side. The left margin bears purposely made notches by steep retouching (DZ 58 (4)). pl. CX, 10.
38. Burin; chalcedony. *Bec-de-flute* variety of dihedral type with a chisel-edge produced by removing spall from opposite sides at the lower end. The left margin shows use-marks (AZ'3 (3)). pl. CX, 11.
39. Burin; chalcedony. A burin on truncation. The chisel-edge of the specimen has been produced by removing spalls from opposite sides (CZ 56 (2)). pl. CX, 12.
40. End-scraper; chalcedony. Made on a thick parallel-sided blade. The lower end has been obliquely retouched to form a round scraping edge and the upper end vertically retouched along both the margins to produce a tang (DZ 58 (5)). pl. CX, 14.
41. Rejuvenation flake; chalcedony. With a hulk of percussion on the underside. The lower end is conical with flutings (AZ'3 (30)). pl. CX, 15.
42. Tanged arrowhead; chalcedony. An exquisite specimen of a tanged variety of arrowhead made on a broad, thick and a curved bluish flake by producing a fairly long tang by almost steep retouch and a lanceolate type sharp and pointed tip made by oblique and abrupt retouch. The tanged end is either purposely snapped or broken (BZ'2 (1)). pl. CX, 17.
43. Notched arrowhead; carnelian. Made on a flake. It has a deep U-shaped broad notch and a sharp point with a keel on the upper side. Although recovered from the levels of the Jorwe Culture, the specimen does not belong to the Jorwe Phase as is apparent from its rolled condition, thick patina, and glossy surface suggesting that it has come from the river bed (CZ 59 (2A)). pl. CX, 16.
44. Drill; chalcedony. A complete drill made on an exhausted fluted core with a crested-ridge. It has about a centimeter long drill-head pentagonal in cross-section and with a pointed tip. The facets of the tip when seen under magnifying glass show smoothened surface. The upper end has been made chisel-ended by secondary working to facilitate proper hafting (536' 1975-76). pl. CX, 18.
45. Drill; chalcedony. Made on an exhausted fluted core with a chisel-end. The tip shows

- secondary work in the form of steep retouch. This specimen too appears to be complete. (105/house 65). pl. CX, 20.
46. Drill; chalcedony. Almost similar to the above but with a broken drill-head (DZ'2, house 58). pl. CX, 19.
47. Drill; chalcedony. Made on a fully exhausted fluted core with an ovaloid upper end. The tip of the drill head is broken. (CZ 53 (1)). pl. CX, 21.
48. Drill; chalcedony. Made on an exhausted fluted core with an ovaloid upper end. The tip of the drill-head is broken (CZ'3 (3)). pl. CX, 23.
49. Drill; chalcedony. A fine specimen on an extensively flaked rod, lenticular in cross-section and with convex upper end. The drill-head is broken (house 58). pl. CX, 22.
50. Drill; chalcedony. Made on a fully exhausted fluted core. A fine drill point with a crested-ridge on either side and lenticular in cross-section has been produced by minute skin flaking. The top of the flat upper end of the drill has been either snapped or broken. (104/house 65). pl. CX, 25.
51. Drill; chalcedony. Made on an exhausted fluted core by steeply retouching the left side to produce a sharp drilling point by intersection with the right side margin. The top of the upper end, ovaloid in section, is either deliberately snapped or broken (546/1975-76). pl. CX, 26.
52. Drill; chalcedony. Made on an exhausted fluted core. A sharp drill point has been made at the lower end by secondary chipping all around. The upper end has a tang almost circular in cross-section (787/1975-76). pl. CX, 27.
53. Drill; chalcedony. Made on a fragment of fluted core with a crested-ridge along one of the corners. The specimen is squarish in cross-section and has a wedge-shaped sharp tip of drill-head (house 58). pl. CX, 29.
54. Drill; chalcedony. Made on a thick blade. About a centimeter long drill-head with a sharp tip has been produced by vertical retouch. The upper end with a bulb of percussion is narrow and triangular in cross-section (DZ/CZ 58 (4)). pl. CX, 28.
55. Core nodule; chalcedony. Triangular in shape and wedge-shaped in cross-section. It has a single platform marked by flutings. One of the longer sides shows flutings and the opposite side a crested-ridge prepared by alternate flaking. One of the surfaces bears a large patch of original cortex (AZ'2 (5)). pl. CX, 30.
56. Core nodule; chalcedony. Elongated oval in shape and plano-convex in cross-section. This core nodule is fully skin-flaked all over leaving a small patch of original cortex on one of the faces. Each of the two corners have a finely made crested-ridge throughout the length. The platform at each end, although trimmed, is not flat (DZ'1 (1)). pl. CX, 24.
57. Fluted core; jasper. Cylindrical in shape. This is a partly broken specimen. It does not have a properly made crested-ridge (DZ 57 (3)). pl. CIX, 30.
58. Fluted core; jasper. A conical variety with double platform and without a crested-ridge (CZ 58 (3)). pl. CIX, 29.
59. Fluted core; agate. With a double striking platform and a crested-ridge, this specimen is ovaloid in cross-section. It comes from a hearth and the cracks seen developed in this specimen were perhaps due to heat (718/1975-76). pl. CIX, 28.

60. Fluted core; chalcedony. A fully exhausted fluted core, elongated oval in shape, lenticular in cross-section and with a crested-ridge along one of the sides. It bears a patch of original cortex on the back side surface (754/1975-76), pl. CIX, 27.

(ii) The Ground Stone Tool Industry

This tool industry has been differentiated from the Chalcolithic Blade Industry in view of the fact that the tools in this industry have been smoothened by grinding. Except one which is made on coarse-grained diorite, the tools are made on dolerite. The material diorite is foreign to the region and the specimen seems to have come from Archean terrain of South India. About 2 km. north of the site is seen exposed a dolerite dyke and perhaps this may be the source of raw material for preparing ground stone tools of dolerite. In the collection are included two heavily patinated specimens, one each an axe type belonging to the Malwa Phase (fig. 97, 5; pl. CXIII, 7) and an adze type recovered from the Jorwe Phase (fig. 98, 6; pl. CXIII, 9). In the former only a small portion along the convex edge is ground whereas in the latter both the back and the front sides are ground to make them smooth, while the convex edge, one of the margins and the butt end have been chipped to remove the patinated cover. Both the specimens are naturally triangular in shape and advantage of the natural shape seems to have been taken to serve as tools by minimal working.

Eleven specimens were recovered from excavations and one was collected from surface. Of the stratified examples, two have come from the Malwa levels, one from overlap phase between phases IV and V, and the rest from the Jorwe levels. One of the two specimens from Phase IV is a fine axe of green diorite (fig. 91, 1; pl. CXII, 2) and the other a fragment of axe type (fig. 97, 3; pl. CXIII, 7). The specimen from the overlap phase is of axe type with battered and blunt working edge (fig. 97, 2; pl. CXII, 1). The eight specimens from Phase V can be divided into four categories: (i) axe type, (ii) adze type, (iii) celts and (iv) unclassified (fig. 98, 8, 9, 12; pls. CXII, 5, CXIII, 8, 11). The axe type is small in size and has a battered blunt edge and lenticular section. One of the examples of the adze type is small in size but with a sharp straight cutting edge produced by grinding both the faces (fig. 98, 7, pl. CXIII, 10). Both the adzes are with trapezoidal cross-section and with pointed butt. The celts are of elongated form and one of them (fig. 97, 5; pl. CXII, 3) is the longest specimen in the entire collection, being 19 cm in length. The other celt is biconvex in section and has a thick square butt end. In the unclassified specimens are included two tools with wedge-shaped section and one fragment with a point formed by intersection of an oblique edge with the straight edge both produced by grinding. One of the former is small in size and highly finished and the other is massive and the edge along one of the margins shows flake scars. It is not possible at this stage to understand the function of all these three specimens and hence they have been categorized as unclassified.¹³ The specimen collected from the surface

13. When the smaller of the two specimens with wedge-shaped section and the fragmentary piece were shown to Shri K.V. Soundara Rajan he opined that the former could have served as a potter's tool, its thick margin used for burnishing and the edged portion for pairing, and the latter may be a fragment of a tool either trapezoid or semi-circular in shape.

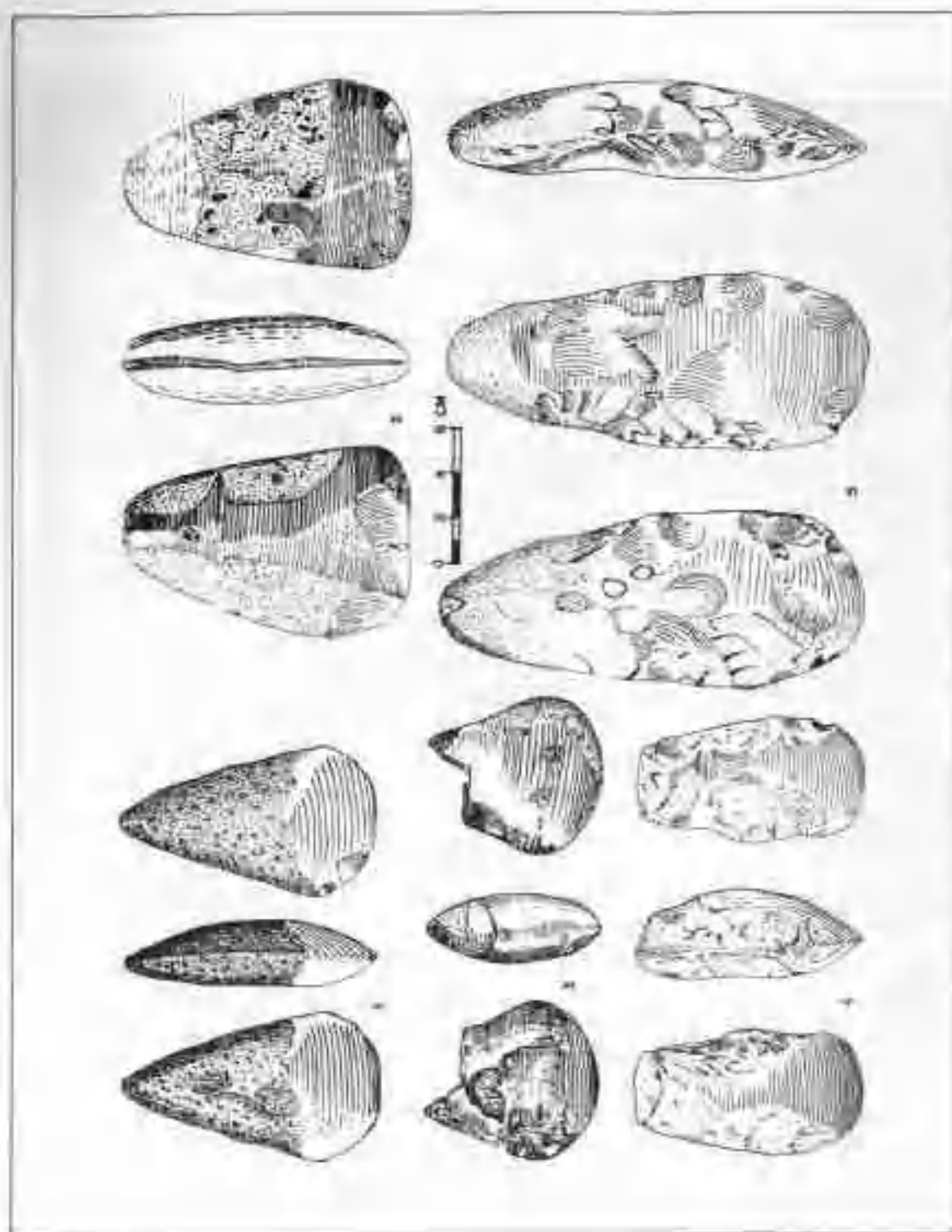


Fig. 97. Ground-Stone Tools: 1, 2, Phase IV; 3, overlap between Phase IV and Phase V; 4, 5, Phase V.

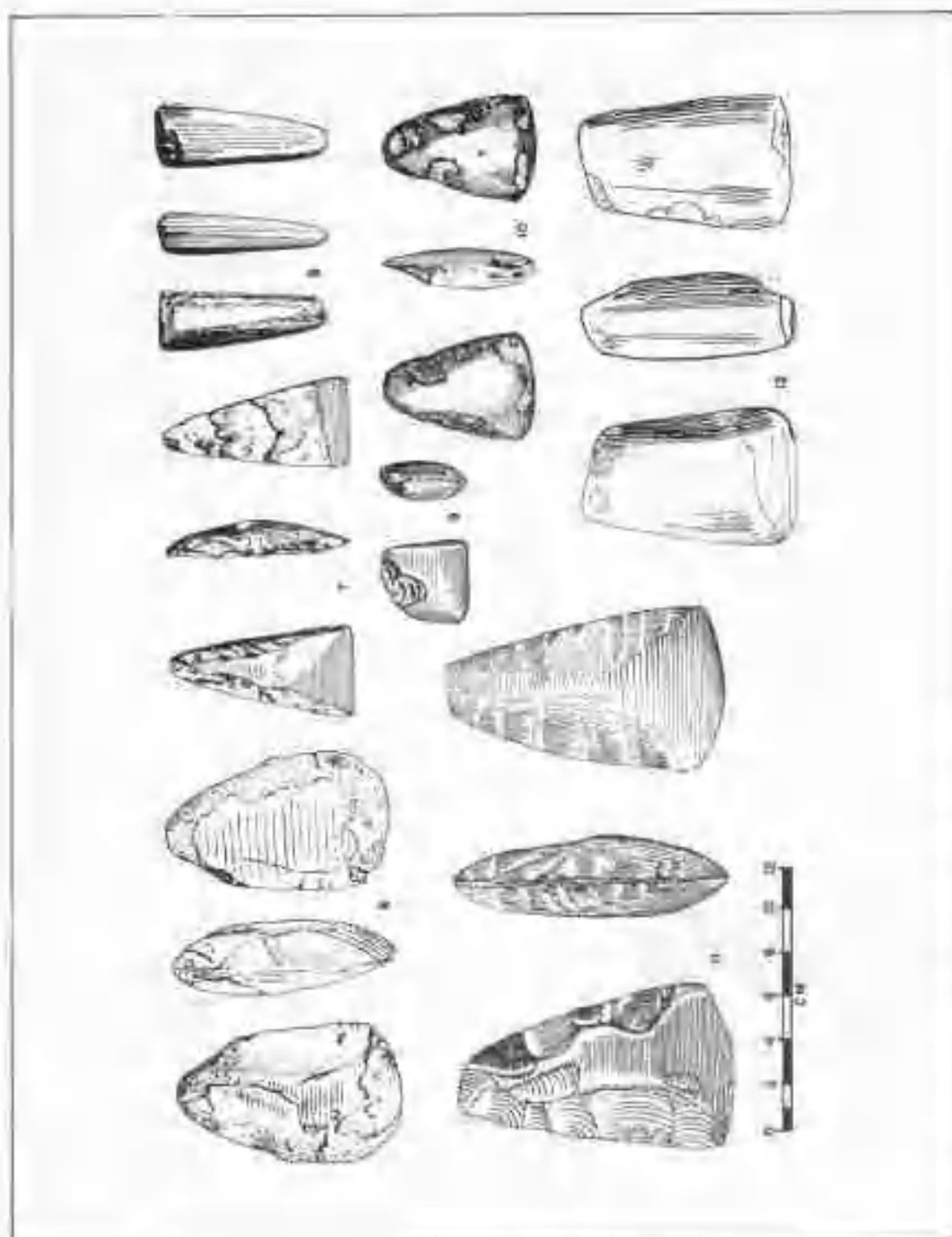


FIG. 10. Ground Stone Tools . 6-10 and 12, Pham V, 11, surface.



PLATE CXII. Ground stone tools.

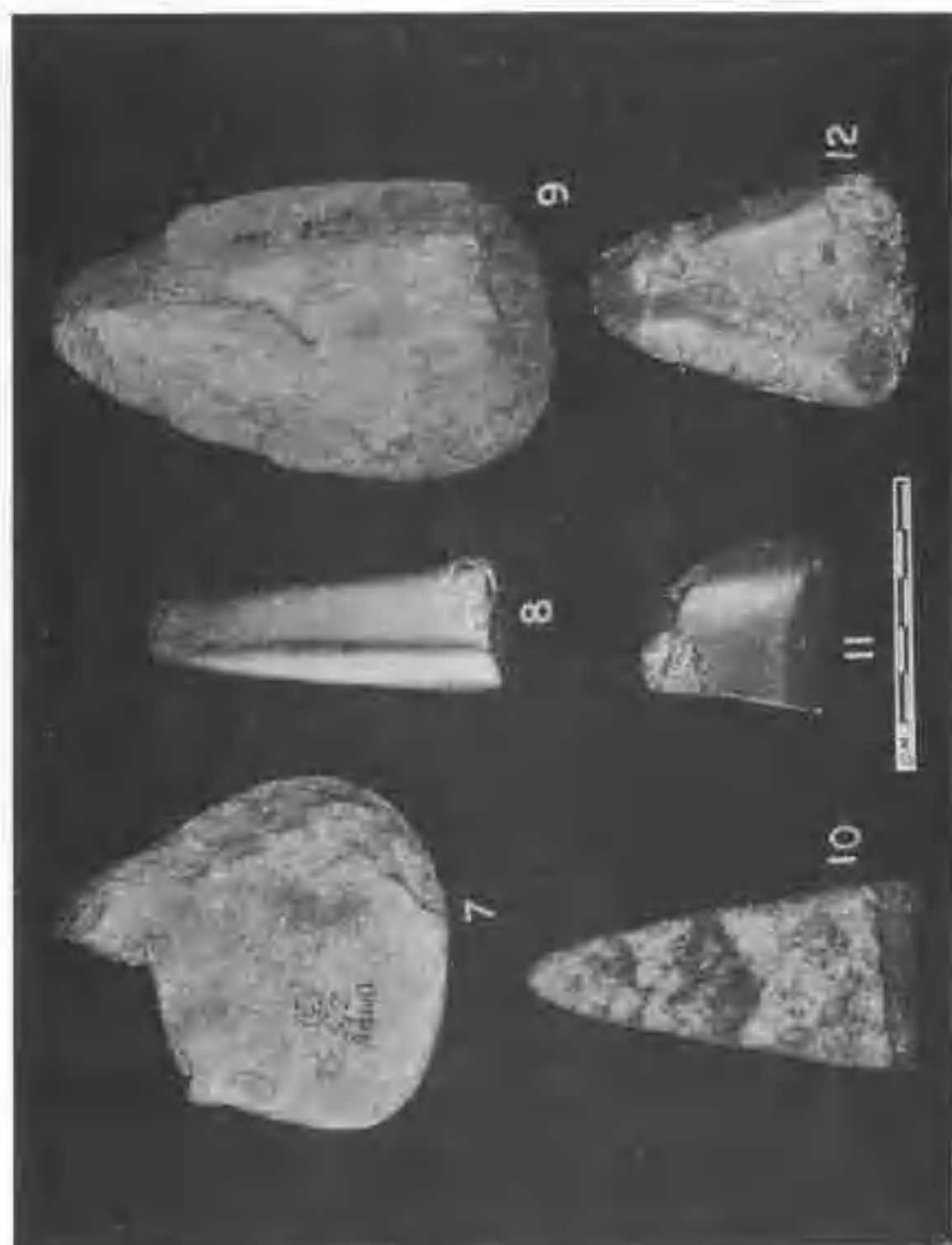


PLATE CXIII Ground stone tools.

is an axe type with biconvex section and broad square butt end.

The illustrated specimens are described below:

Figs. 97 and 98: pls. CXII and CXIII

1. Coarse-grained diorite, green. Axe with pointed butt, polished lower convex end and pecked upper butt end. Length 14.6 cm, breadth 5.8 cm, thickness 3.2 cm. From Phase IV (40/1977-78). pl. CXII, 2.
2. Dolerite, black. Axe with battered blunt edge and square butt end lenticular in cross-section. Length 12.7 cm, breadth 7.5 cm, thickness 3.7 cm. From overlap phase between Phases IV and V (32/1977-78). pl. CXII, 1.
3. Basalt, brown. Heavily patinated naturally shaped axe type with broken butt end. Its convex lower end shows little grinding. From phase IV (36/1977-78). pl. CXIII, 7.
4. Dolerite, black. Celt. With biconvex cross-section, sharp convex working edge produced by alternate flaking and thick square butt-end, biconvex in cross-section. From Phase V (108/1976-77). pl. CXII, 4.
5. Dolerite, slate grey patination. Celt, biggest specimen in the collection with rounded sharp working edge produced by grinding both the surfaces. Plano-convex in cross-section and with thick pointed butt-end. Length 19 cm, breadth 7.5 cm, thickness 4.4 cm. From Phase V (92/1978-79). pl. CXII, 3.
6. Dolerite, reddish brown. Adze on naturally shaped highly patinated stone, trapezoidal in cross-section. The patinated cover from the butt end, one of the margins and the lower end is flaked off. Length 10 cm, breadth 6.1 cm, thickness 3.5 cm. From Phase V (104/1976-77). pl. CXIII, 9.
7. Dolerite, black. Adze with trapezoidal cross-section, pointed butt end, trimmed margins, and straight sharp working end produced by grinding both the surfaces obliquely. Length 8.2 cm, breadth 3.2 cm, thickness 1.7 cm. From Phase V (99/1976-77). pl. CXIII, 10.
8. Dolerite, black. Unclassified. Highly finished specimen with wedge-shaped section. Length 7.5 cm, breadth 2.5 cm, thickness 1.6 cm. From Phase V (5/1978-79). pl. CXIII, 9.
9. Dolerite, black. Unclassified. Fragment of a highly finished tool with a point formed by intersection of an oblique edge with straight edge, both produced by grinding. From Phase V, pl. CXIII, 11.
10. Dolerite, black. Axe with battered blunt convex working end, lenticular in section and broad thick butt end marked by a flake scar on one of the surfaces. Length 6.5 cm, breadth 4.5 cm, thickness 2 cm. From Phase V (619/1975-76). pl. CXIII, 12.
11. Dolerite, black. Axe with biconvex section, polished convex sharp edge produced by obliquely grinding both the surfaces, trimmed margins and square butt-end. Length 12 cm, breadth 6.2 cm, thickness 3.8 cm. Surface (121/1976-77). pl. CXII, 6.
12. Dolerite, grey. Unclassified. With wedge shaped section. The edge along the longer side shows flake scars. Length 9 cm, breadth 5.2 cm, thickness 3.6 cm. From Phase V (2/

1978-79). pl. CXII, 5.

B. The Hafted Blade¹²

In the collection of blade tools from Phase V is included a unique specimen of a blade-hafted in a bone handle (fig. 96; pl. CXII). It has come from layer 2 of trench C2 58 in Sector 1 (518/1975-76).

The blade piece hafted in the spongy cavity of the flat bone is 24 mm long and 6 mm broad. Both its distal and bulbar ends have been snapped. It is parallel-sided and triangular in section with a medial ridge on the upper side. Its back is not retouched. The edge which remains projected above 2 mm outside the bone along its length (hereafter called the working edge) is marked by a couple of tiny indentations and except these there are no signs of retouch or secondary work or use-marks on the working edge.

The bone piece in which the above described blade fragment lies is 25 cm long and 7 mm broad. Its underside is flat and the upper oblique. The high medial ridge of the blade touches the edge of the oblique upperside and thus the blade is prevented from getting further inside upto the other end of the cavity so that the other side of the bone-handle is not cut by the opposite edge of the blade from inside the cavity. The shape of the bone suggested that it is a piece of a rib-bone.

The blade remained in its original place because of the compact earth which had covered the specimen. No trace of original sticking matter was found.

It is very well known that no definite evidence showing as to how the stone blades were used had hitherto been found in India. Yet on the basis of the evidence from Europe, Africa and West Asia, it was generally believed that in this country also the blades and blade tools were used by hafting in a wooden or bone-handle. The parallel-sided fragment of a blade found inside the piece of a bone-handle in the upper levels of the Jorwe Culture at Daimabad, however, provides for the first time in India, a direct evidence of hafting of blade in bone-handle.

C. Stone Objects

Stone objects were recovered from the levels of all Phases. The four hundred eighty-eight objects can be divided into the following groups:

(i)	Maceheads or Ringstones	3
(ii)	Hammers	7
(iii)	Saddle Querns	29
(iv)	Mullers	181
(v)	Peatles	2

12. Sali *Op cit.* 1977, p. 818.

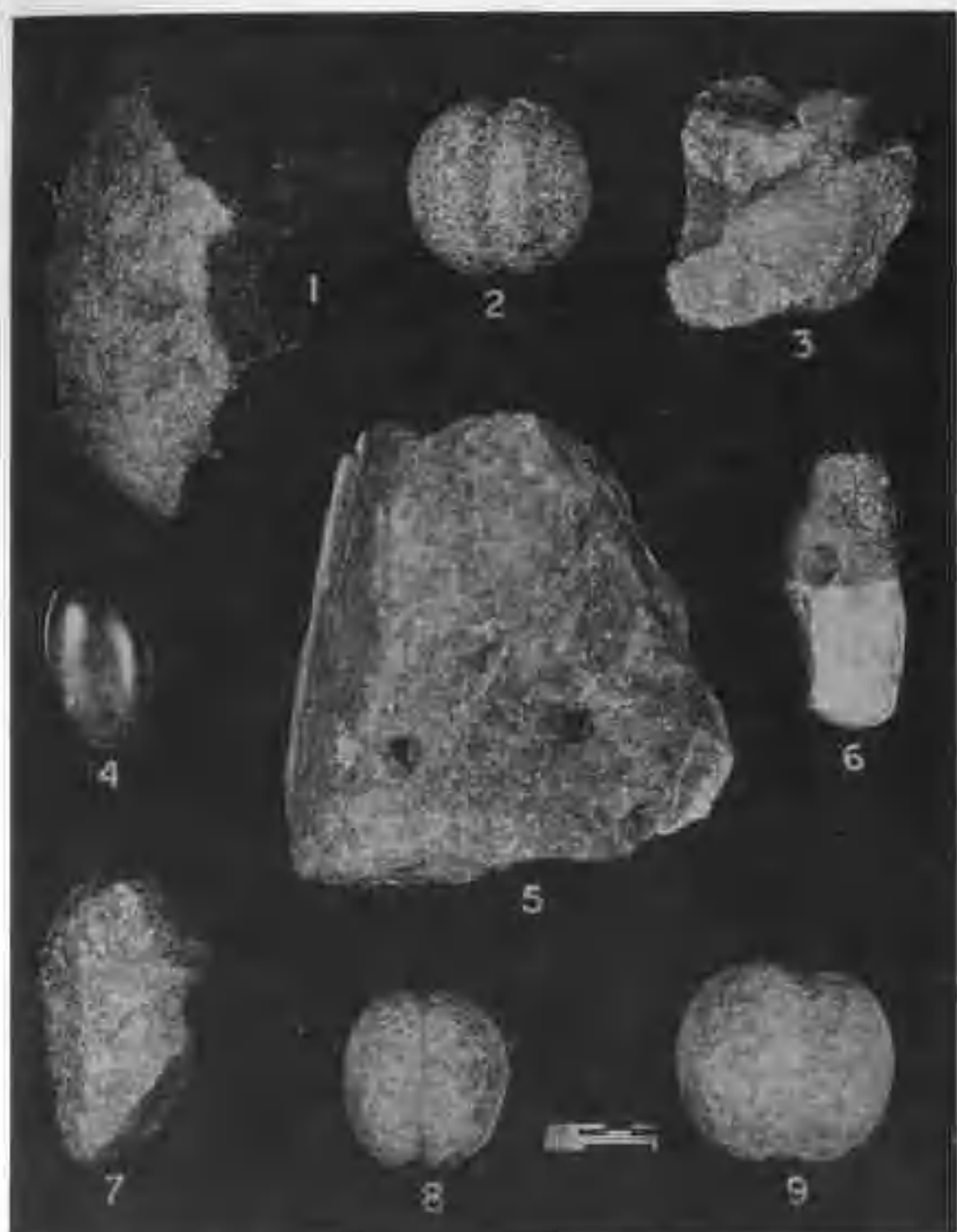


PLATE CXIV Stone objects: 1, 3 and 7 maceheads; 2, 8 and 9, hammers with groove; 4 and 6 pestles and 5 stone with blind holes.



PLATE CXV. Suddhagumra: 1, Phase II; 2, Phase I; 3, Phase IV; 4, Phase III and 5, Phase V.

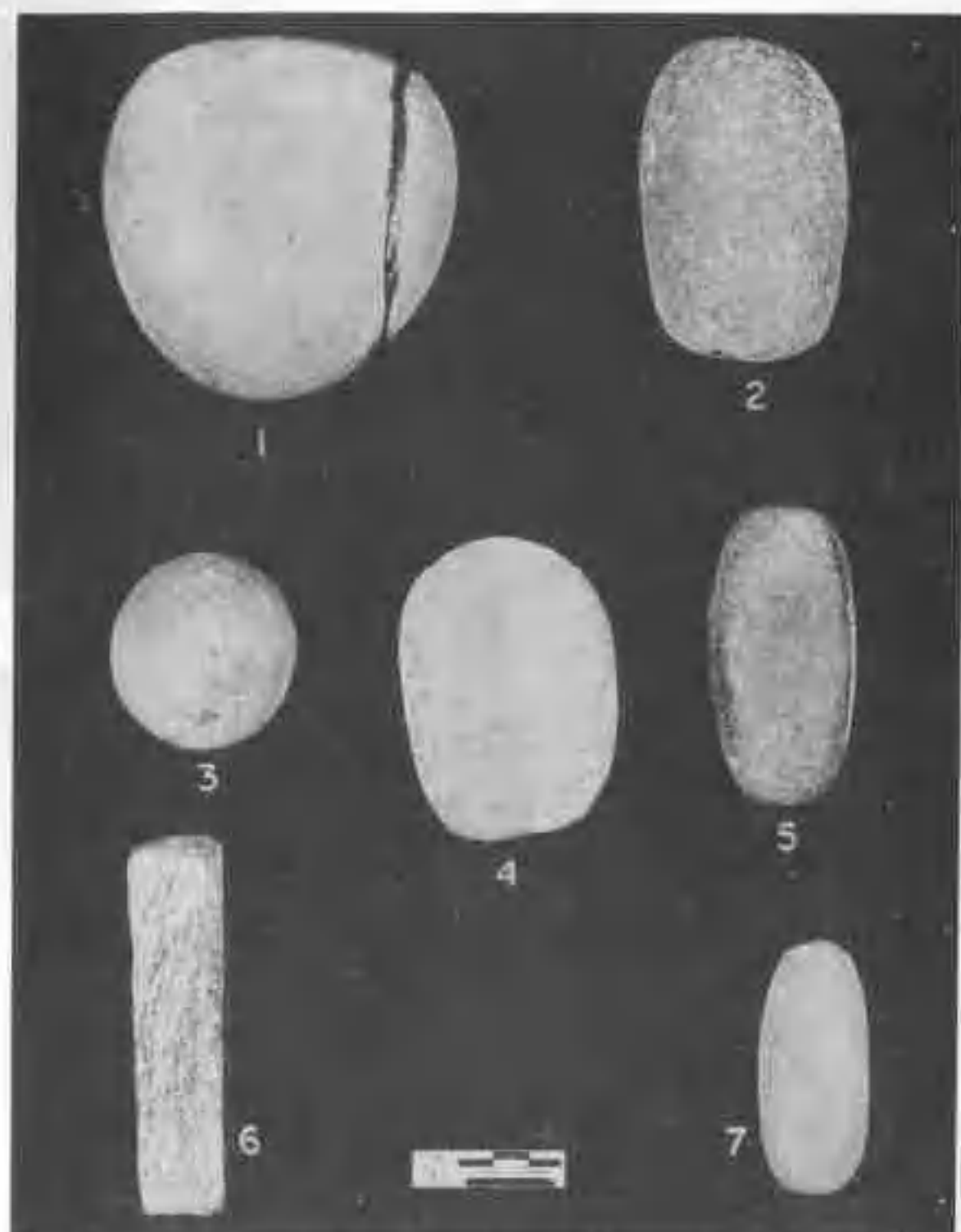


PLATE CXVI. Stone objects, 1 and 3 cushion stones, 2, 4, 5 and 7 hammers on pebbles and (6) hammer on pebbles.



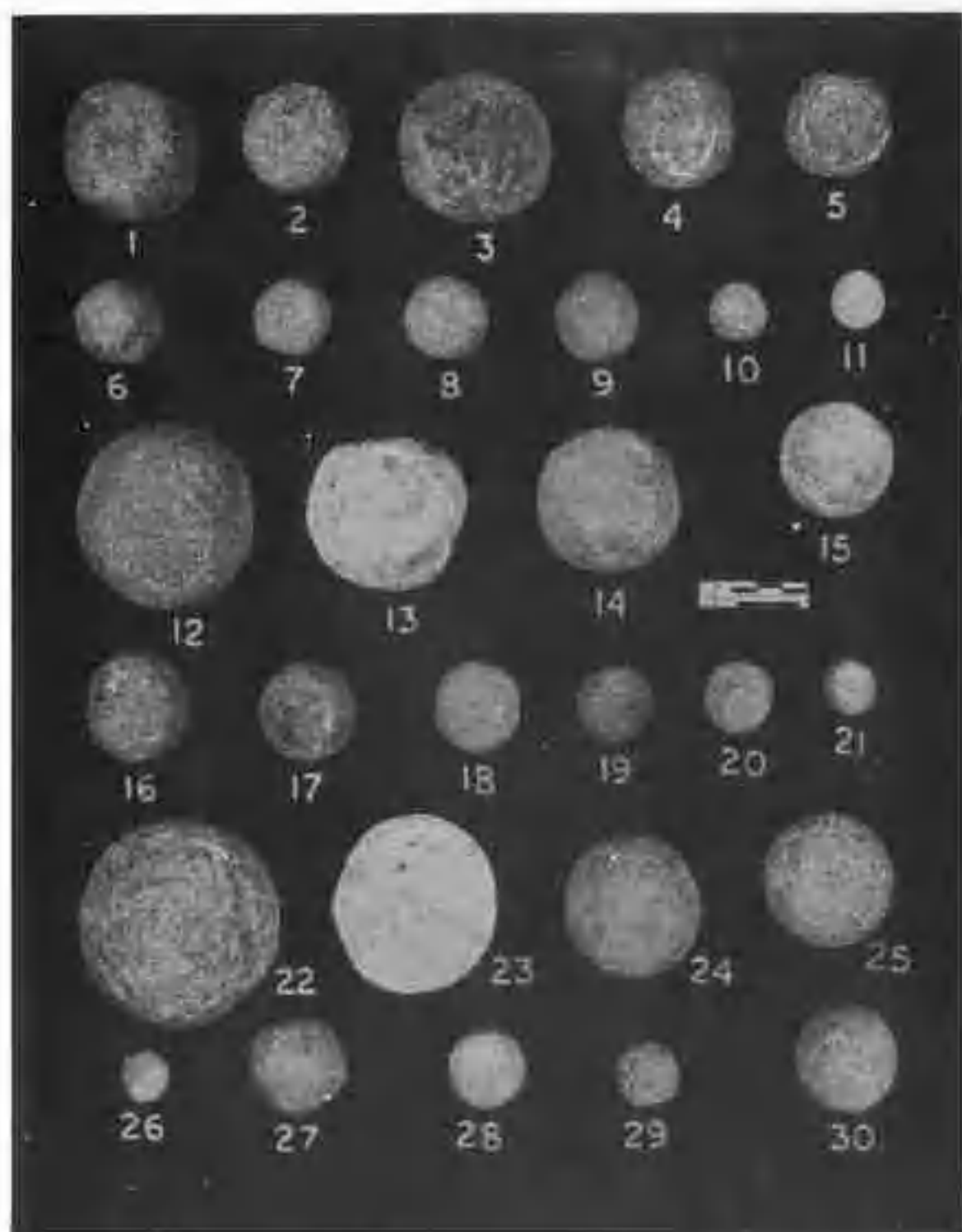


PLATE CXVII. Stone balls; 1, Phase I; 2, Phase II; 3-11 Phase III; 12-21 Phase IV and 22-30 Phase V.



PLATE CXVIII Stone ball with blind holes, Phase V.



PLATE CXIX Stone with groove, Phase V.

(vi)	Sharpeners	1
(vii)	Cushion stones	2
(viii)	Balls	157
(ix)	Ball with Blind Holes	1
(x)	Stone with blind holes	1
(xi)	Grooved stone	1
(xii)	Polishers	3

Barring one of the pebble hammers from Phase V and a few sling balls, which are made on chalcedony, all the specimens are of basalt of different varieties, including purple basalt, fine-grained black basalt and fine-grained red basalt.

(i) *Maceheads or Ringstones* (pl. CXIV, 1, 3 and 7).

Only three fragments of this type are included in the collection. One each of these has come from Phase I, Phase III and Phase V and each one has an hour-glass section caused due to boring from both the sides. The one from Phase I (pl. CXIV, 1) is a fragment of a heavy and large-sized ring stone. Its both the sides uniformly slope towards the outer periphery. The fragment from Phase III (pl. CXIV, 7) is of a smaller macehead. One of its surfaces is flat and smooth and the other uneven. It is damaged along the periphery. The fragment from Phase V is very irregular in shape (pl. CXIV, 3).

(ii) *Hammers* (pl. CXIV, 2, 8 and 9 and CXVI, 2, 4, 5 and 7)

These are of two types: (i) with a groove and (ii) on pebble. Of the first type one specimen each has come from Phase I, Phase II and Phase III. These have been purposely fashioned by dressing the stone into roughly oval or circular shape and a groove has been deliberately produced in the centre to haft the handle. Those from Phase I (pl. CXIV, 9) and Phase II (pl. CXIV, 8) are made on purple basalt and appear a little fragile than the one from Phase III (pl. CXIV, 2) which is made of fine-grained black basalt.

Of the second type (pl. CXVI, 2, 4, 5 and 7) there are four specimens, one each from Phase II and Phase III and two from Phase V. These are elongated oval-shaped pebbles with pecked marks at either end apparently resulted from hammering. One of the two from Phase V is on the water-worn pebble of jasper and the rest of black basalt.

(iii) *Saddle Querns* (pl. CXV)

Most of the saddle querns were found in fragments. None of the seven specimens from Phase I is complete whereas the solitary specimen of Phase II is complete (pl. CXV, 1). The illustrated example of the latter was recovered from house 17, the merchant's house, and that of the former (pl. CXV, 2) from house 15, the priest's house. Of the six examples from Phase III, only two are complete (pl. CXV, 4). The one saddle-quern from Phase IV

is complete (pl. CXV, 3). In the fourteen specimens of Phase V only one may be said to be almost complete (pl. CXV, 5). These are of two types: (i) with ovaloid depression and (ii) flat. The depression in the second type was caused due to grinding for a long period.

(iv) Mullers or Grinders

A total of one hundred eighty one mullers were recovered from the excavations. This number excludes broken pieces which were discarded. Phase I yielded four; Phase II six; Phase III twenty six, overlap phase between phase III and Phase IV one; Phase IV fiftytwo; overlap phase between Phase IV and Phase V eleven and Phase V seventy nine. From their shape they are divisible into the following groups:

- (1) Rectangular
- (2) Oblong
- (3) Square
- (4) Discoidal
- (5) Oval
- (6) Circular
- (7) Barrel
- (8) Cylindrical

They are made out of river-worn pebbles and rock-pieces. It was observed that the present shapes of these grinders were the result of their constant use. Further it was not possible to make clear cut distinction between the two shapes since one shape merged with the other. For example, the rectangular type with rounded corners may even be classed as oval-shaped and the square, because of the rounded corners, as discoidal. In such a situation any attempt to specify exact number of each type should have been unrealistic and hence avoided. However, the shapes present in each Phase and their important features have been discussed in the following pages.

All the four specimens from Phase I are oval in shape. One of these is a ovaloid pebble and two are plano-convex in section, the flat portion being the result of use. The fourth specimen is a fragment of a barrel-shaped muller recovered from house 15.

In the six mullers of Phase II are included discoidal and oval shapes. In three of the oval-shaped specimens both the surfaces are flat due to use.

The shapes present in the mullers of Phase III are rectangular, discoidal, circular, oval and barrel.

The solitary muller from overlap phase between Phase III and Phase IV is discoidal.

The mullers of Phase IV include all the shapes listed above, except cylindrical. The rectangular specimens are flat on both the faces and sides and give rectangular cross-section. In this variety there are also examples with plano-convex section in which only one surface is flat and the other convex. In the oblong specimens one side is narrower than the other. The square examples are either plano-convex or rectangular in cross-section. The discoidal speci-

mens are not exactly flat on both the surfaces. They are sloping or obliquely flat. The oval-shaped mullers are chiefly made on river-worn pebbles and as such each one differs in shape from the other. The circular grinding stones show a patch of use-marks. One among the barrel-shaped specimens is a fine example of this type. It was recovered from the stone-cutter's house (pl. XIX).

The oval shaped mullers in overlap phase between Phase IV and Phase V are on river worn pebbles and flattish rock slabs, the latter being plano-convex in cross-section and the former oval. The muller of whitish chalcedony material in this collection is almost barrel-shaped.

The rectangular shaped mullers in Phase V are large-sized. They are made on rock blocks. The oblong mullers are made mostly on river-worn pebbles. There is no specimen in this Phase which can be classed as square in shape. But there are shapes between square and rectangular, square and discoidal. There is, however, a perfectly discoidal shape both in thick and thin varieties, the former almost squarish in cross-section and the latter lenticular. The oval shapes include a number of varieties such as on water-worn pebble with oval-to-circular in section, on rock slabs with plano-convex section and those oval in section. The barrel-shaped muller in this collection is covered with pecked marks all over. It does not show signs of use. There is one end-fragment of a muller of cylindrical type in this assemblage. It closely resembles the modern type.

(v) *Pestles* (pl. CXIV 4 and 6)

Of the two examples of pestles, one was recovered from the levels of Phase IV and the other Phase V. The one from the former is on a river-worn pebble of black trap. Its one end has become flat owing to use, the other showing gloss due to handling. The pestle from Phase V (pl. CXIV, 4) was made on two varieties of basalt fused together, black basalt and finegrained red basalt (Hydrothermally Altered Amygdaloidal Basalt).

(vi) *Sharpeners* (pl. CXVI, 6)

Only one specimen of this type finds place in the collection. It has come from the overlap phase between Phase IV and Phase V. An interesting aspect of it is that it is a rectangular slab of sandstone, a material foreign to the region. On one of its surfaces marks of sharpening are clearly visible.

(vii) *Cushion Stones* (pl. CXVI, 1 and 3).

These are interesting objects. One of them belonged to Late Harappan Phase (pl. CXVI, 3). It is a squat circular river-worn pebble of trap. In the centre of one of its surfaces is a small circular depression 7 mm wide, caused due to friction of a pointed object in the course of rotation. The other cushion stone (pl. CXVI, 1) is also made on a water worn pebble but

in this case the pebble is of fine-grained red basalt. It is sub-triangular or heart-shaped and oval in cross-section. Its broad side has been made purposely flat by grinding. In the centre of one of its surfaces is a circular depression, 3.3 cm in diameter, resulted from the rotation of some object. On the backside surface a corresponding portion has become smooth. The object was found in Cluster 5 in the elliptical religious structure.

(viii) *Balls* (pl. CXVII).

These have been found in the levels of all the phases. Except a few which have been made on whitish chalcedony and black basalt, all have been made of purple basalt. Those of black basalt and chalcedony have been given round shape by grinding whereas the examples of purple basalt show pecked marks all over. Of the total two hundred fiftyseven balls, Phase I and Phase II yielded one each; overlap phase between Phase III and Phase IV one; phase IV fiftytwo; overlap phase between Phase IV and Phase V thirtythree and Phase V one hundred fifty-one. The smallest of these measured 5.6 cm in circumference and the biggest 24 cm. It appears that those having upto 11 cm circumference were probably used for playing as marbles and those with greater circumference as sling balls in war-fare.

(ix) *Ball With Blind Holes* (pl. CXVIII)

One of the stone balls bears two blind holes, one opposite of the other, caused due to rotation of a device with points.

(x) *Stone With Blind Holes* (pl. CXIV)

Close to the fire-pit of Rectangular Fire Altar of Phase IV (p. 114) one squarish fragment of a stone of basalt covered with ash and black soot and with one side flat and the other uneven, was found. On its flat surface are three blind holes of one cm diameter. It is not unlikely they were resulted by friction from the rotation of wooden sticks used to produce fire for kindling the sacred fire of the Rectangular Fire Altar.

(xi) *Stone With Groove* (pl. CXIX)

On one of the patches of a floor of a damaged house of structural phase C was found lying, among the group of a few stones, one fragment of a stone with a groove. It appears from the broken side of the grooved surface that the groove represents half part of a circular hole bored in the stone. The smooth surface of the groove suggests that the drilling of the hole was done by a sharp pointed device.

(xii) *Polishers* (pl. CXX)

These are three interesting objects, all of fine-grained black basalt and recovered from the

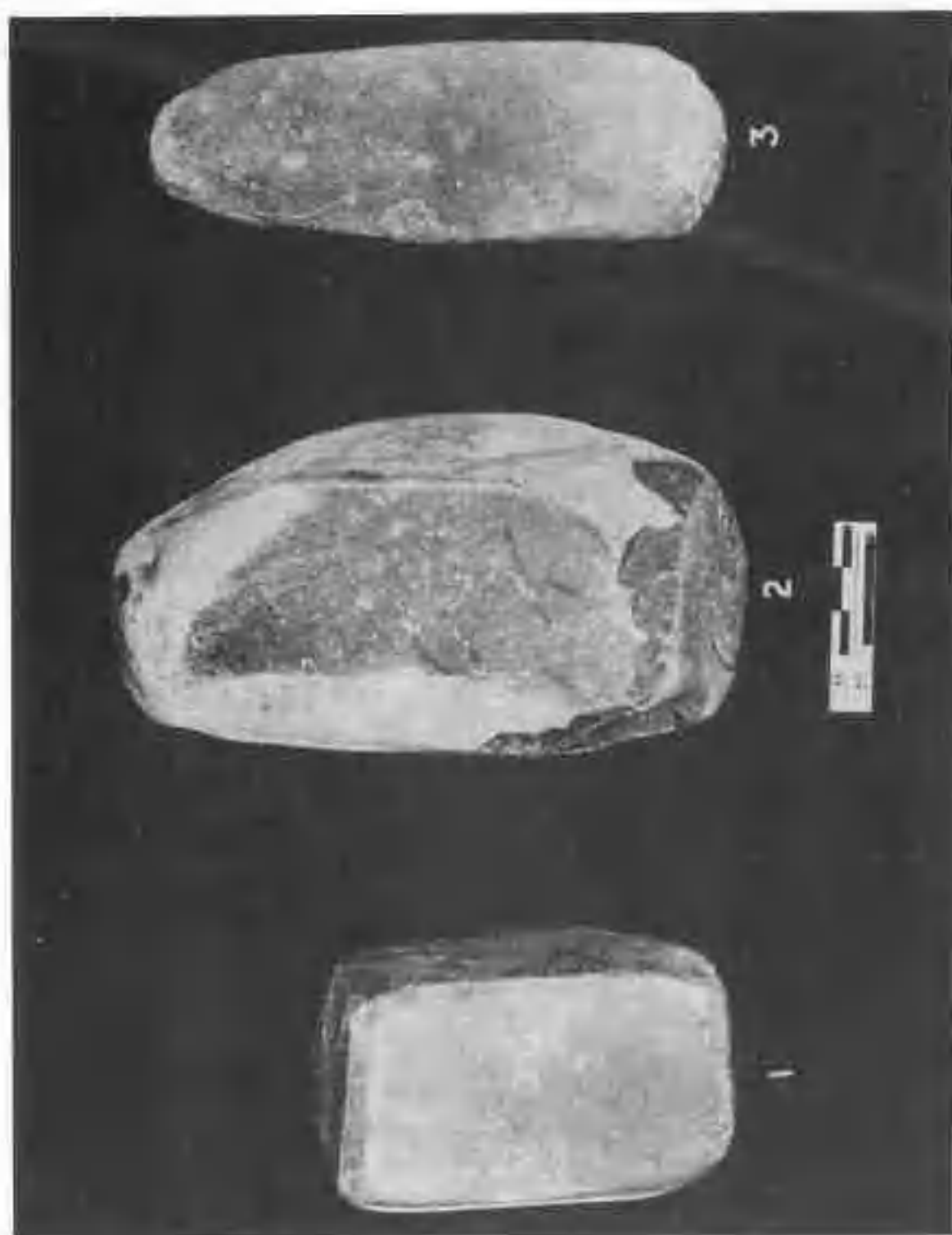


PLATE CXX. Stone polisherz, Phase IV



PLATE CXXI. Polished semi-precious stones; 1, Phase IV and 2-4 Phase V.

levels of Malwa Culture. Of these, one is a squarish block smooth all over and with a couple of tiny flake scars. The second is a rectangular block with two of its sides and one of the ends smooth, resulted from grinding. The third specimen is elongated oval-shaped and with a rectangular cross-section. Both its faces and sides are smooth, caused due to grinding. One of its ends is battered and the other shows patina.

(xiii) *Polished Semi-precious Stones (pl. CXXI)*

Among the stone objects are included four small polished stones, one from Phase IV and three from Phase V. The one from the former is of red jasper, almost cylindrical in shape and bears pecked patches over the highly polished surface. All the three from the latter are of agate and highly polished. It is possible that except the one which is with pecked marks and which might have been used as a hammer in delicate works, they were used for burnishing or polishing.

D. Stone Sculptures

Of great interest from the excavations are two stone-sculptures, one each of agate and basalt from the Savalda and the Malwa Phases respectively. The object of agate from the Savalda levels is an ithyphallus (fig. 99, pls. CXXII A and CXXII B) found lying in one of the circular fire-pits inside house 15, identified as the house of priest. The fire-pit from which it was obtained measured 1.6 m in diameter. The occurrence of this phallus-shaped object in the inside of the fire-pit or the altar filled with ash, a few postherds and a small stone, indicated that it was an object of veneration. Due to its contact with smoky fire and ash in the fire-pit a patch of a crust of black soot is adhered to its surface.

The object, made of agate, is 8.4 cm long. The sculptor has achieved a grand success in fashioning smooth realistic fleshy parts of an erect phallus in this small object. It is divisible into two parts; (i) the pedestal and (ii) the phallus. The pedestal is broken, leaving only little traces of it. The traces indicated that it was meant for fixing in a circular hollow of some object which served as a *peetha*, so that the phallus stood erect. The phallus or rather ithyphallus is bulbous at the base with 1.6 cm maximum diameter, and tapers gradually towards the grooved constriction with 1.3 cm diameter. The most realistic modelling is, however, of the glans penis, 1.3 cm long and equally thick, in which not only the details of the concave base and the side projections have been carved out but also the apex has been quite prominently depicted. It should be mentioned that nowhere else in the Indian sub-continent so naturalistic the representation of ithyphallus has been hitherto recorded in so early a period. Besides representing the earliest evidence of sculptural art in the Deccan, it also suggested that the Savaldans were phallus worshippers. It may be recalled that the Harappans were also phallus worshippers. Still, artistically the ithyphallus of their contemporaries in the Deccan—the Savaldans—is far superior and more realistic than the simple phalli of the Harappans, notwithstanding the fact that the sculptural art of the latter was no doubt of high artistic order. The object being an image of a realistic erect penis symbolising generative

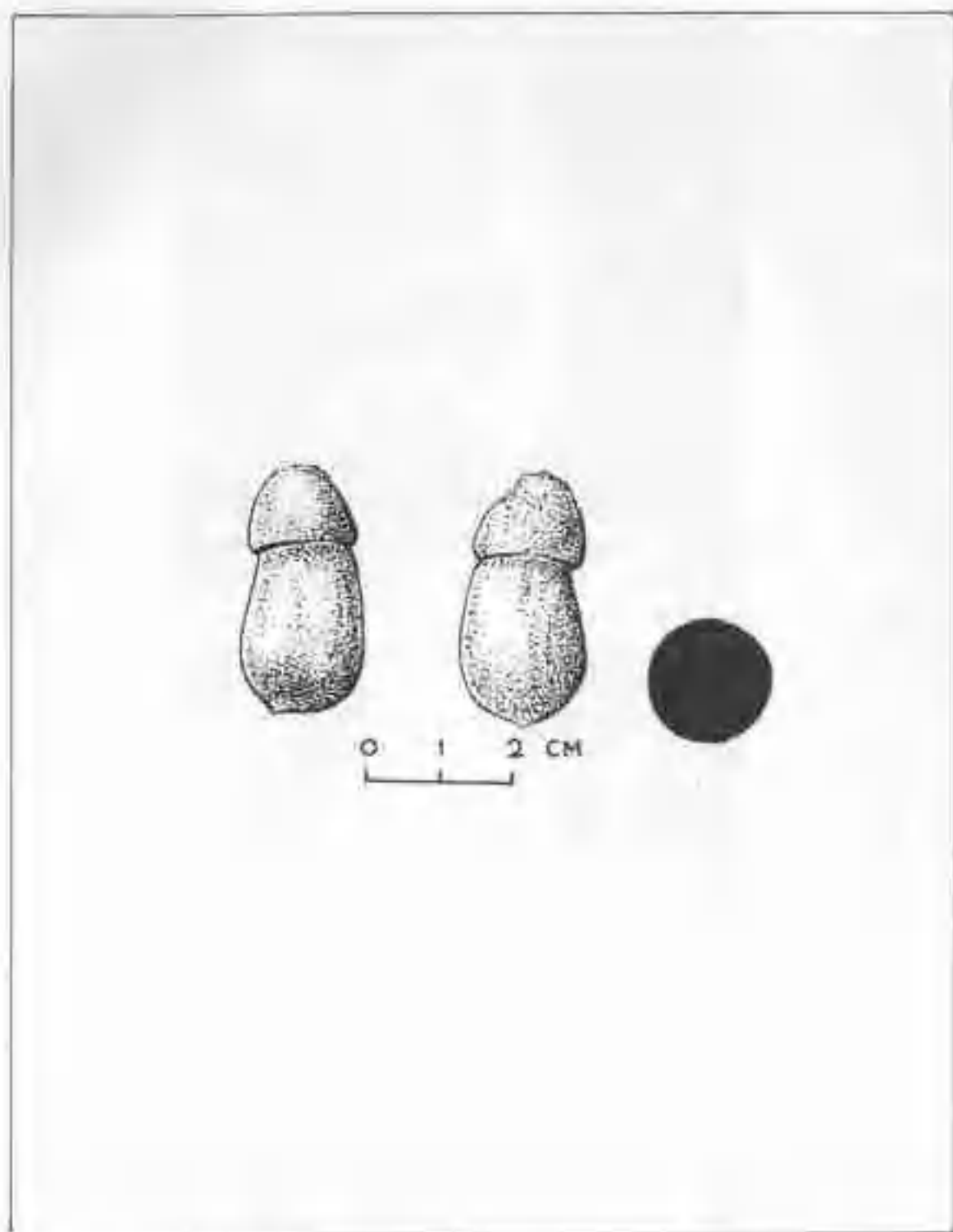


Fig. 59. *Itzyphallus otagata*. Phase I.



PLATE CXXIIA Lithypitallus of agate, front view, Phase I.



PLATE CXXIIB Lithypitallus of agate, back view, Phase I.



PLATE CXXIII *Sculpture head of Siva, Phase IV.*

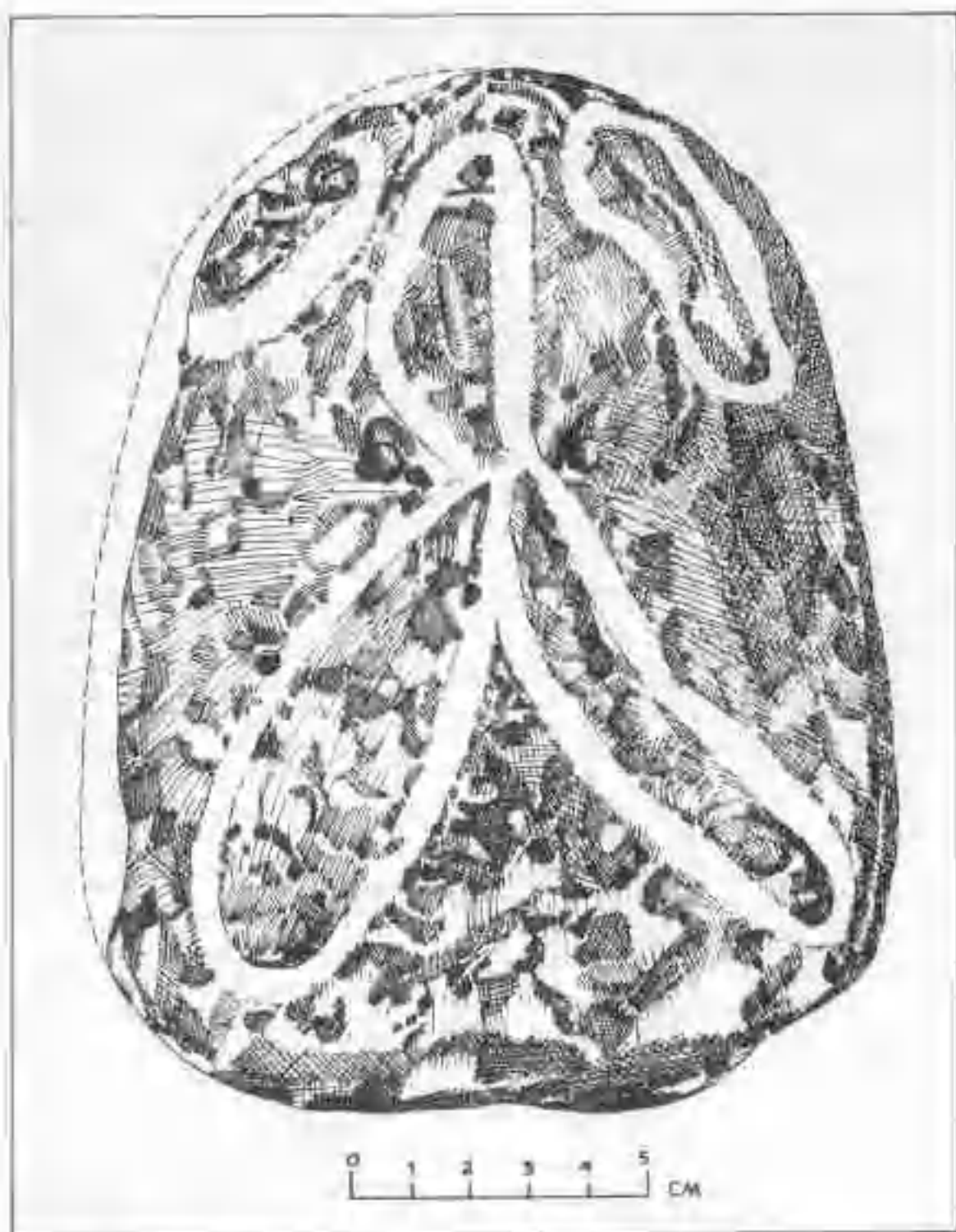


Fig. 100. Sculpture head of Siva, Phase IV.

power in nature or fecundating principle, it is possible to understand religious ideas of derived from the circular shape of the pedestal meant to be fixed into a circular hollow of the *peetha*. In these thus appeared to lie the belief in the principle of creativity and the desire for abundance of offspring as well as agricultural produce, multiplication and saving of the livestock and fulfilment of worldly needs.

The sculpture head (fig. 100; pl. CXXIII) of basalt of the Malwa Phase was recovered from trench X/3 in Sector II. It was not possible to ascertain its association. The head is carved on a trifaceted stone, 17.3 cm high, of vesicular purple basalt with a flattish base gradually tapering towards the rounded top. Two of its faces have been utilized to carve the facial features, the third, which served the backside of the head, and the base, being left unworked. The rolled nature of the stone suggested that it was collected from the bed of the river Pravara. The stone being of vesicular variety of trap, is marked by natural pits all over.

An ingenuity of the sculptor is suggested by the selection of the naturally shaped appropriate stone to convert it into a sculpture without labouring to dress for achieving the desired shape. Two of the three facets of the stone meet each other in a broad rounded ridge. It was utilized to depict the central elevation of the face, the nose and the mouth. On either side of this prominence, on the upper side, is engraved a goggle-eye, that on the right side being damaged due to flaking of the stone. The nose has been depicted by a sub-triangular carving between the eyes and a nostril on its either side by a pit at its bottom. Immediately from the bottom of the nose, between the nostrils, run the moustaches, that on the left being a little curved. The slight elevation below the moustaches, representing the mouth and the chin, gradually recedes towards the base of the stone which is roughly triangular in plan and 13.7 x 12.3 cm in size. The lines engraved to show the facial features — the eyes, the nose and the moustaches — are quite broad varying in breadth from 4 to 9 mm and in depth from 3 to 5 mm.

An interesting aspect of this sculpture head is that it is oval in outline. It is very well known that rolled oval-shaped pebbles are worshipped as *Siva*. As said before, the stone selected for engraving the facial features is rolled and seems to have been collected from the river bed. It should be noted that almost similar oval-shaped stone with facial features excluding moustaches, carved in relief, called *ekamukha linga* stone and ascribed to the 4th century A.D. has been reported from Central India.¹ The sculpture-head from Daimabad may likewise be described as *ekamukha linga*. It needs also to be mentioned that it was found hardly about fifteen meters to the east of the religious complex. Besides the one in applique on potsherd (p. 591-92; fig. 106, 1; pl. CXXXVII, 2), this is another example of iconographic form of *Siva* from the Malwa levels at Daimabad.

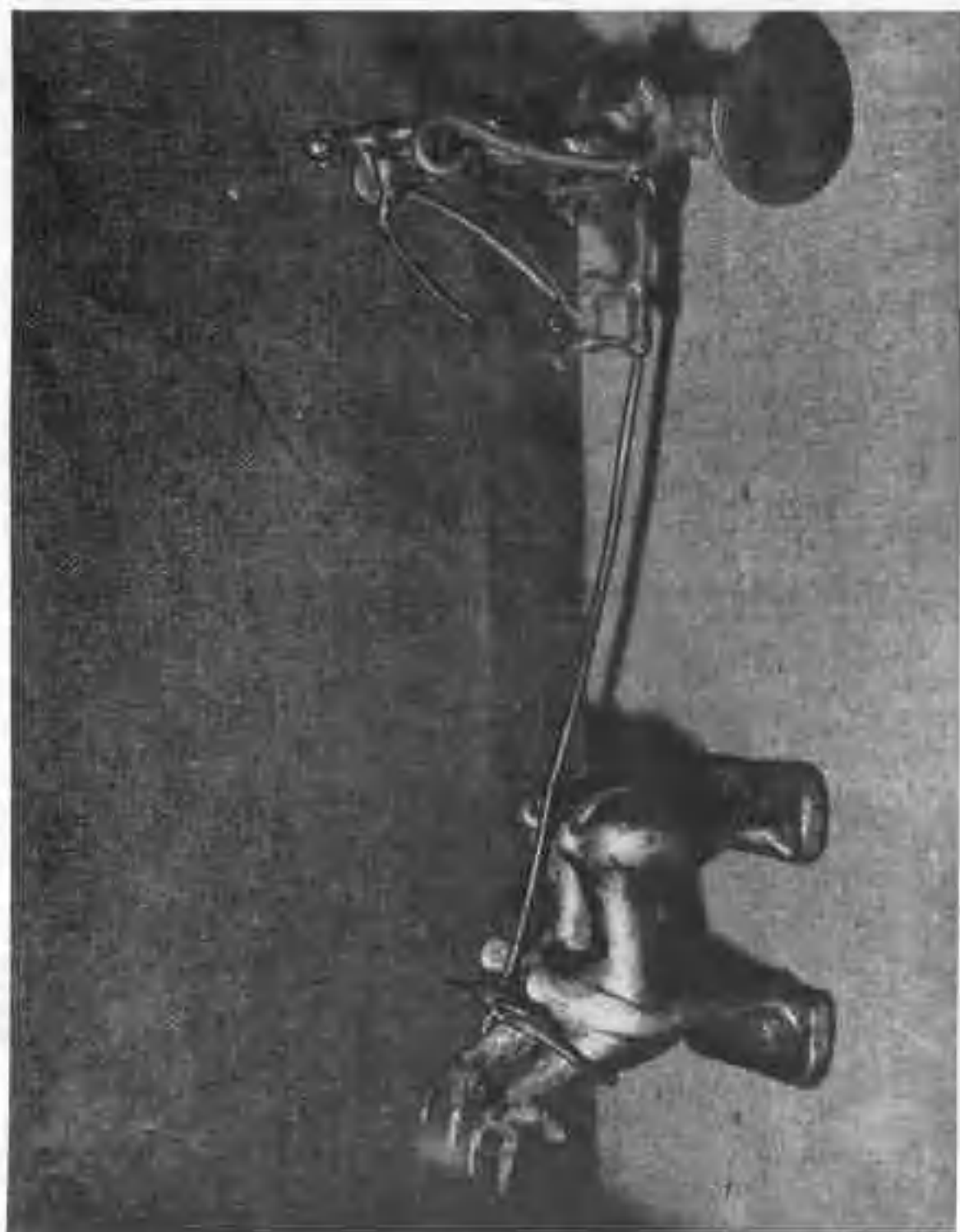


PLATE CXXXIV The chaatol yoked to a pair bull and driven by a tim. Side view.

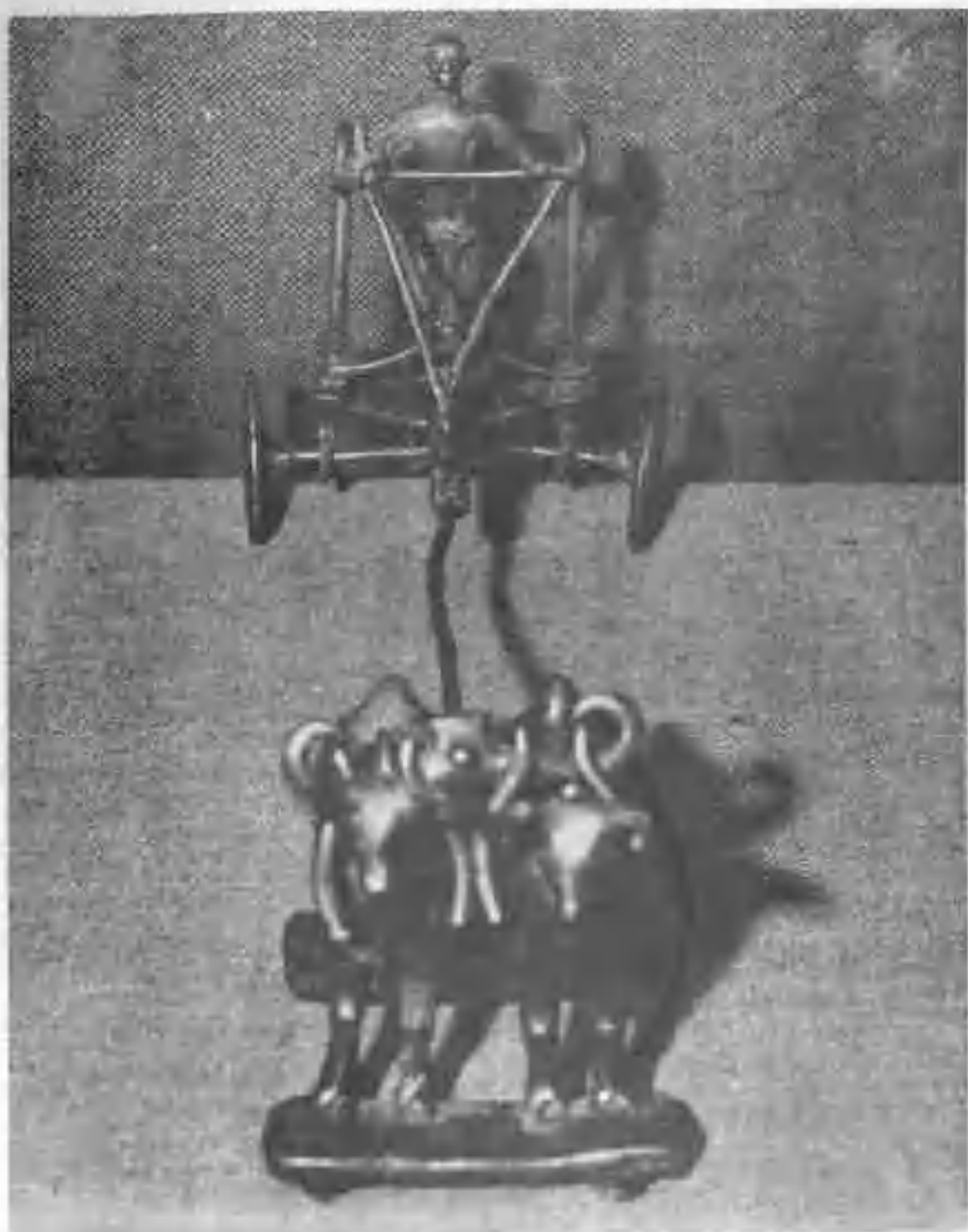


PLATE CXXV The chariot yoked to a pair of bull and driven by a man. Front view.

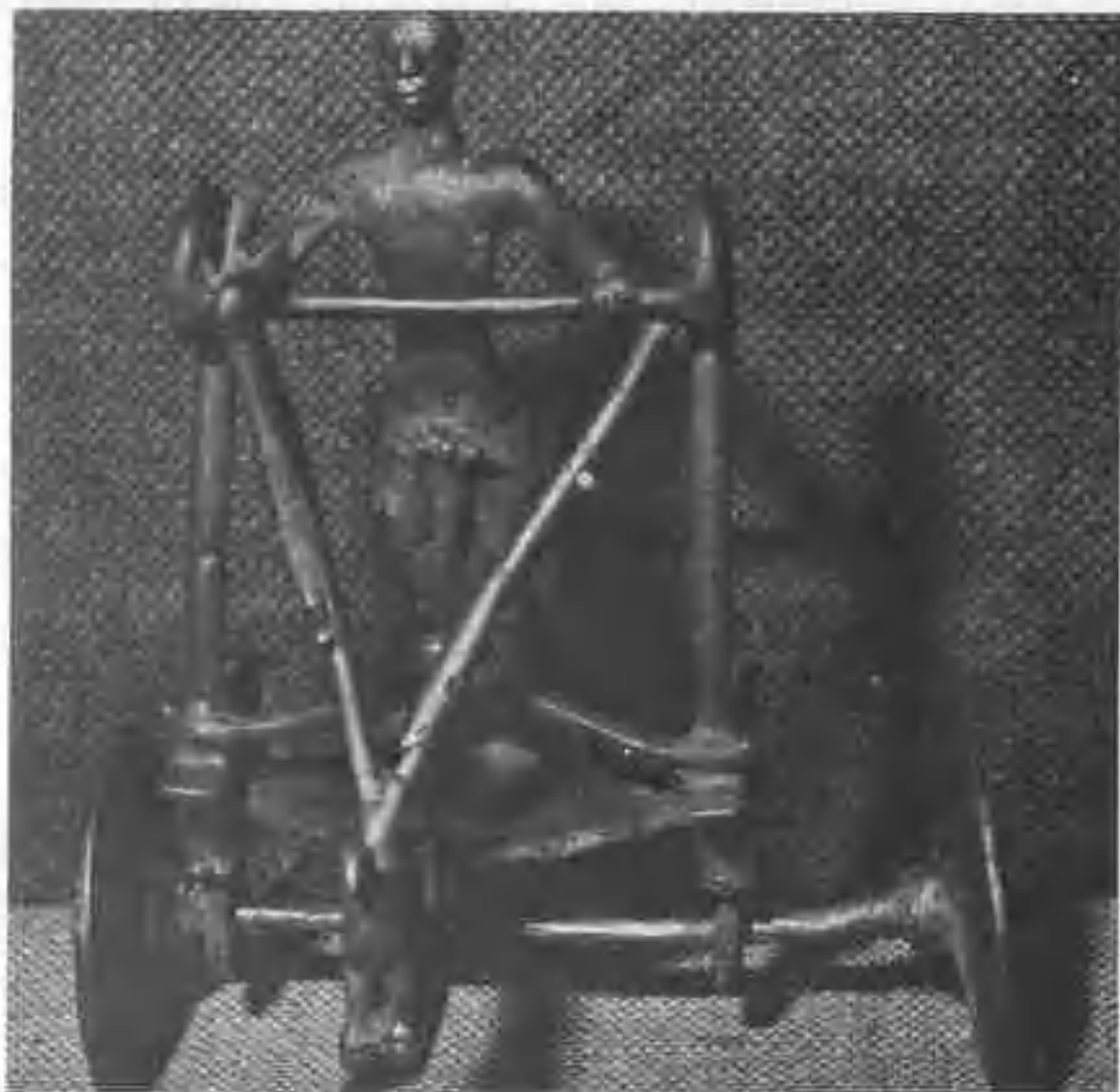


PLATE CXXVI Close up of the front of the chariot and the man driving the chariot.

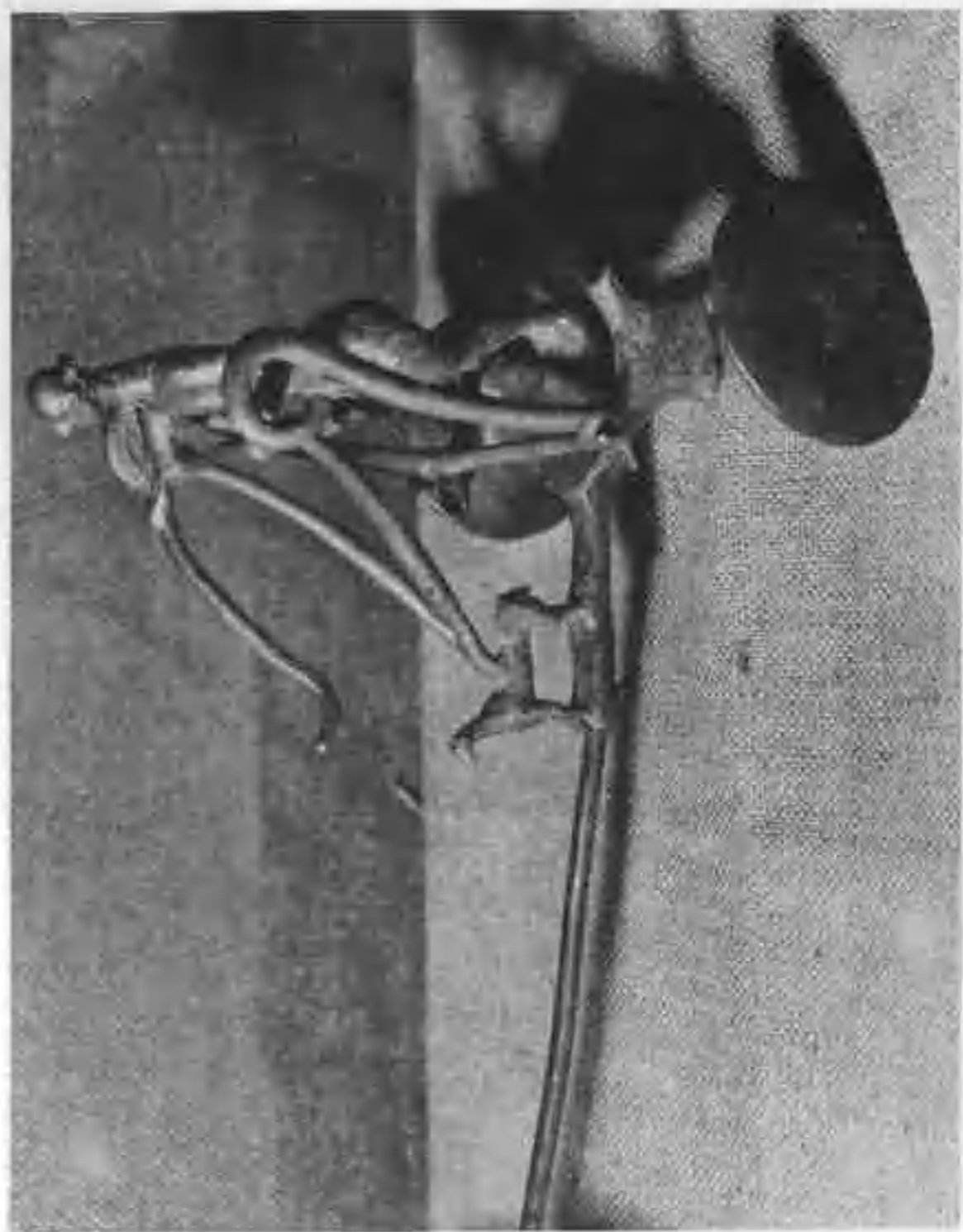


PLATE CXXV/II Close up of the side of the chariot, the man driving the chariot and the dog on the central pole.



PLATE CXXVIII. Elephant.



PLATE XXXIX Rhinoceros.



PLATE CXXX - Buffalo

I. The Bronzes

The circumstances in which the famous "Daimabad Bronzes" were found¹⁴ and how attempts were made to understand their probable cultural horizon have been explained before (pp. 59–61). In all likelihood they appear to belong to Phase II of Daimabad.

It is, however, necessary to mention that since the bronzes were not found under close observations they caused considerable controversy and different views have been expressed about their antiquity.¹⁵ The analytical data provided by the Chief Archaeological Chemist, Dehra Dun (Appendix V) indicated that the finds are low tin bronze.¹⁶ All the four bronzes are solid and have been cast. The most important aspect of them is that they are typically Indian. Further they display several Harappan features. The bronzes are described below.

(i) *The Chariot (pl. CXXIV–CXXVII)*

This is the most remarkable piece in the hoard comprising a chariot, a pair of bull and a man standing in the chariot. The chariot is open with solid wheels, each with a projecting hub on the inner side in which is fixed the axle. The axle is slightly bent in the middle. It is pierced through the ring loops of the frame of the chariot and moves along with the wheels which, it should be mentioned, is a distinguishing feature of the Harappan vehicles.¹⁷ Over the axle rests the body of the chariot. The front guard is composed of two vertical curved bars with out-turned upper ends joined with a horizontal bar on the upper side and an angular bar on the lower side. The frame of the guard is also strengthened by two oblique bars, the upper ends of which are attached to each end of the horizontal upper bar of the guard and the lower ends soldered together in a dog standing on the central pole in front of the guard, perhaps denoting that tight rein has been kept on the dog. It may be recalled that dog is associated with *Bhadravata*. The platform on which the guard stands is truncated oval in shape. On either side of this platform is a side guard of the shape of a bird similar to those of toy-carts from Mohenjodaro.¹⁸

Over the platform stands, in a commanding pose, a man driving the chariot, 16 centimeters high, with his left hand holding the upper horizontal bar of the guard and the right a long stick curved at both the ends and bearing a decoration consisting of vertical rows of squares with a tiny pillet inside each square. The man is necked and his penis is surmounted by four hoods of a cobra. It is well known that serpent is a tutelary deity. Besides, serpent

14. The bronzes were found by Shri. Chhaby Laxman Bhai and the matter was reported to the police by Shri Lal Hussien Patel of village Ladgaon. Shri S.R. Rao, who was then Superintending Archaeologist, Archaeological Survey of India, South Western Circle, Aurangabad obtained them for the Survey from the District Authorities since the objects had come from a Centrally protected ancient site.

15. For a review of this controversy and discussion see M.K. Dhavlikar, "Daimabad Bronzes", in (ed.) Gregory L. Possehl, *Harappan Civilization*, (New Delhi, 1982) pp. 361–66.

16. The elemental composition of elephant and rhino samples obtained through atomic absorption spectrophotometry by the Physical Research Laboratory, Ahmedabad, is detailed in Appendix VI.

17. E.J.H. Mackay, "Note on the bull-relief found at Ur", *The Antiquaries Journal*, 9, 1929, pp. 26–29.

18. Vats, op. cit., 1940, p. 302, pl. CXX, 3 and 7.

worship is especially resorted for prosperity and offsprings. Serpent is supposed to confer fertility on barren women! His hips appear scolopygous perhaps because his knees are bent. The chest and the belly are little elongated. His upper chin and the lower lip are protruding. He has a short nose, wide open eyes and curve eye brows above which occur two concentric curves over the forehead. The hair is curly, parted in the middle and gathered behind the neck in an elongated roll.

From the centre of the platform protrudes a broad bar at the other end of which stands the dog. From below the four feet of the dog rises a circular pole. Its further end is inserted in the centre of the yoke to which have been vertically attached curved bars for the necks of the bulls to accommodate. The shape of the yoke closely resembles that of the horned head-dress of the figure on the famous *Pashupati* seal from Mohenjodaro. Both the curved ends of the yoke are grooved.

The pair of bulls is detachable from the yoke. They stand on two separate metal strips, one each for the front and the hind legs. The horns of these bulls are curved forward, the feature to be commonly seen in the bulls of Sind¹⁹ but absent in those of Maharashtra. The hump of the bulls is massive and has covering which extends over the sides of forelegs and then merges with them. The mouth and the hind part of the bull resemble more those of a horse. This kind of bull-horse combination is seen in the unicorn so commonly depicted on the Harappan seals.

It needs to be mentioned that this chariot differs in its construction from that of the one engraved on the terracotta cylinder seal recovered from house 38 of the Jorwe Phase (fig. 108; pl. CXL1; pp. 598-602).

(ii) *The Elephant* (pl. CXXVIII)

This is the largest among the three animals. It stands on a platform, 27 cm long and 14 cm broad and with four ring-loops below to hold the wheels which are now missing. The elephant has a long trunk curved at the lower end. It has a curved sloping back. A short tail is almost hidden in the rump.

(iii) *The Rhinoceros* (pl. CXXIX)

The rhino stands on two horizontal strips over two sets of wheels and not on a platform as in the case of the elephant. The axles pass through the ring-loops below the horizontal strips and at their either end is attached a solid wheel with a hub on the inner side. The wheels move along with the axle. The skin folds over the body of the animal look like a saddle. The open mouth is elongated and has a short horn.

19. B.C. Sinha, *Serpent Worship in Ancient India*, *Worship in India Series*, No. 2, (New Delhi 1979), p. xiii.

20. Mackay, *op. cit.* 1945, pp. 156-57.

(w) *The Buffalo (pl. CXXX)*

This is a water buffalo standing on a platform which is broken near the right foreleg. The axles pass through the holes in the vertical bars attached to the platform and at their either end is attached a solid wheel with a hub on the inside. The axles rotate along with the wheels.

The sculptor has shown a superb skill in the production of the bronzes in as naturalistic the form as possible. All of them appear to be the sacred belongings, the objects in worship, and it seems more likely that the Harappans had brought them with them as they moved southwards. The Harappans seem to have to desert Daimabad in a hurry for the reasons not yet clear. Otherwise these cult objects would not have been left by them there.

The provision of wheels to all the bronzes suggests that they were taken out in procession on occasions. It is interesting to note that seals from Mohenjodaro have depicted animals in file, on one being rhino, elephant and buffalo.²¹ The four-hooded cobra head covering the penis of the naked man, the presence of the dog on the central pole with the tight reins attached to the front guard, the close similarity in the shape of the yoke and that of the head-dress of the figure on the famous *Pashupati* seal from Mohenjodaro as well as the presence in the hoard of such animals as an elephant, a rhino and a buffalo, all being depicted on the above-mentioned *Pashupati* seal would tempt one to identify the human figure standing in the chariot as *Pashupati Siva*, the Lord of Beasts.

F. Terracotta Objects

Thirtyone terracotta objects were recovered from stratified levels and one was picked up from surface in a rain-gully. None has come from Phase I. Phase II has yielded two specimens; Phase III one; Phase IV five and Phase V twentythree (Table 8).^{*}

The finds can be divided into the following eleven categories: (1) cult-image (2) animal figurine; (3) gamesman; (4) skin-scrubber; (5) cake; (6) dabber; (7) toy-wheel; (8) ball (marble); (9) reel; (10) pulley and (11) miscellaneous. The terracotta cylinder seal, the terracotta seals bearing Indus Script and the terracotta stamp seal have been dealt with separately (pp. 504-508).

All the objects are handmade. The figurine of the mothergoddess from the floor of a badly damaged house (fig. 101, 4; pl. CXXXII, 4) and the reel (fig. 103, 21; pl. CXXXV, 8) possess burnished surface whereas the bull (fig. 102, 8; pl. CXXXIII, 2) from Phase III is comparatively better finished than the other similar representations. Likewise the cult images on a plaque (fig. 101, 5 and 6; pls. CXXXI A-C) are well-finished and well-fired. The other objects by and large are crudely fashioned. The specimens have come from houses, ritualistic structures such as those connected with welfare of women and sacrificial altars and cultural debris.

21. Mackay, *op. cit.*, 1938, pl. XC, 13b.

^{*}For Table 8 please see page 369.

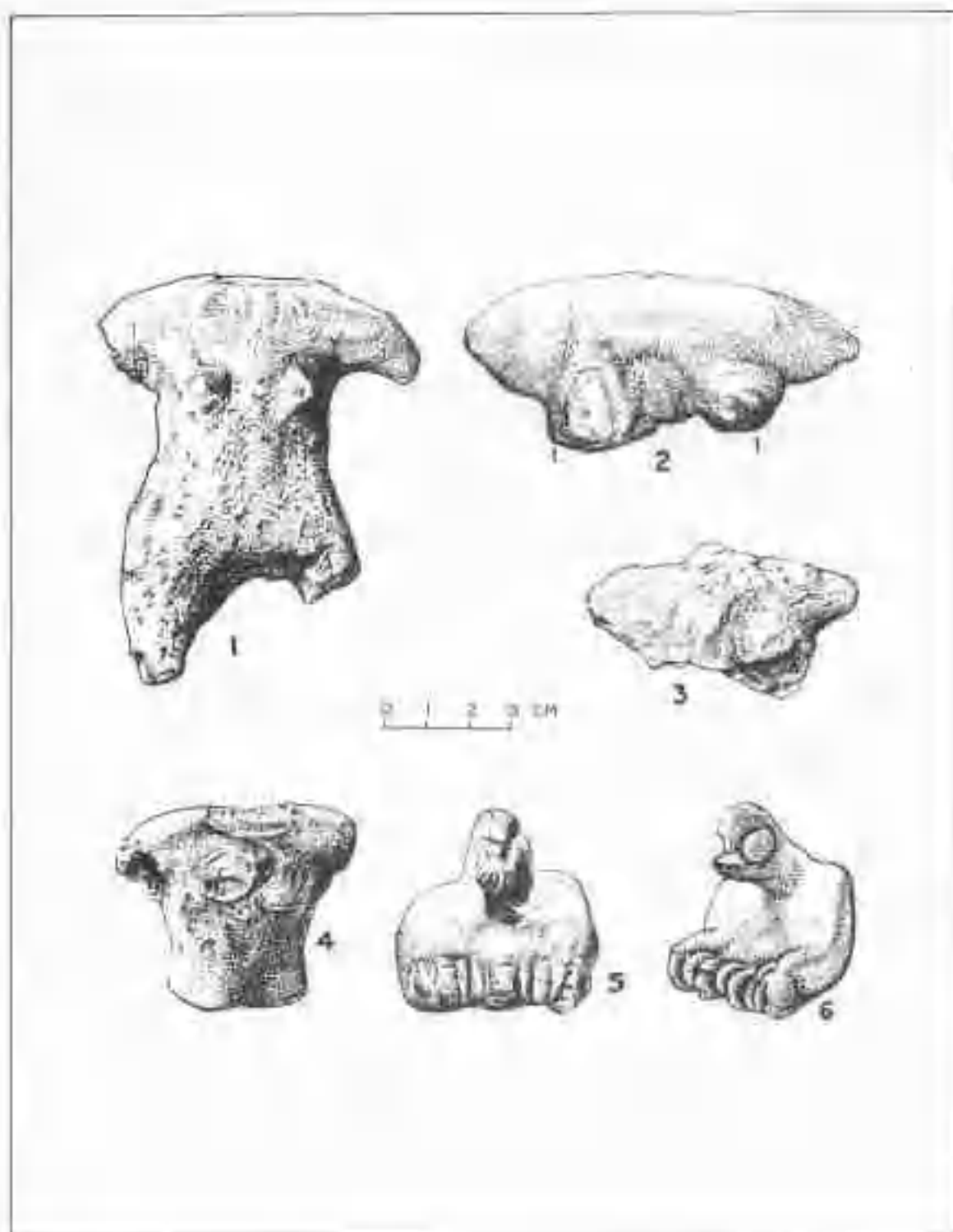


Fig. 101. Terracotta figurines, Phase V.



PLATE CXXXI A Terracotta plaque showing details of the sage, Phase V.



PLATE CXXXI B Terracotta plaque showing details of consorts of the sage, Phase V



PLATE CXXXI C Back side of the consorts on terracotta plaque, Phase V. See p.



PLATE CXXXII Terracotta multibeygged pieces, Phase V.

(i) Cult Images (Fig. 101; pls. CXXXI A-CXXXI C and CXXXII)

In the category of cult images from Phase V special mention should be made of a group representation of four human figures showing one male and three female opposite each other moulded on a platform and coated with red ochre colour (fig. 101, 5 and 6; pls. CXXXI A – CXXXI C) which was recovered from the fifth floor of house 38² (p. 147). The importance of this figurine lies in the fact that it represents the first evidence of ancestral worship and from sociological point of view it tells us prevalence of polygamy during the times of the Jorwe culture. The custom of veil among the ladies has also been depicted in this example. The other cult images (fig. 101, 1 – 4; pl. CXXXII) are representations of mother-goddess. Two of these (fig. 101, 1 and 3; pl. CXXXII, 1 and 2) have come from pit 207. One each among the rest has come from house 45 (a circular house) (fig. 101, 2; pl. CXXXII, 3) and a disturbed floor of a damaged house (fig. 101, 4; pl. CXXXII, 4). In three of the specimens heads are missing but their presence is marked by an almost circular scar in the centre of the shoulders. Of the two specimens from Pit 207, one is represented by the bust whereas in the other, the left leg, right arm and head are missing. Both show fine cracks developed in the course of firing, but the latter possesses a large number of them on the back side. This side is ochre red in colour and with a few small black blotches suggesting that it was placed in the fire-pit on the back while it was in wet condition. The back of the bust is slightly concave which suggests that it was placed over a potsherd when it was offered in the fire-pit. It appears, therefore, that the images were prepared near the fire-pit and offered then and there only. It seems, both of them, were placed in the fire-pit immediately after they were fashioned out of fine clay. In the clay of one grass was also mixed. One has turned light reddish brown and the other pinkish buff in colour due to firing. The bust has two short conical drooping arms and the head is represented only by a low elevation. The two breasts are indicated by slight circular elevations. The other specimen, with its head missing, has two prominent but small pointed breasts, a constricted waist and roundish little stretched feet with conical end. The arms are short curved cones. The third specimen, recovered from house 45, is a bust, without head, both the arms broken and two full breasts, one of which is damaged. The fourth example, also with its head missing, has burnished grey surface. Its arms and breasts are missing, the latter leaving its circular impression. This and that from house 43 mentioned above are made of fine compact clay. The waist of the former, as in the one from Pit 207, is constricted. The portion below the belly is missing. The evidence on the whole suggested that Pit 207 was connected with the rituals relating to the welfare of women (see p. 138) and as such the two specimens recovered from it seem to be connected with these rituals. The other two specimens, coming from the residential quarters, may also be designated as mother-goddesses although there is no direct evidence to associate them with any kind of ritual.

22. S.A. Sali "A Unique Terracotta figurine from the Jorwe levels of Daimabad" *Purastatna*, No. 11 (Delhi, 1979-80), pp. 127-128.

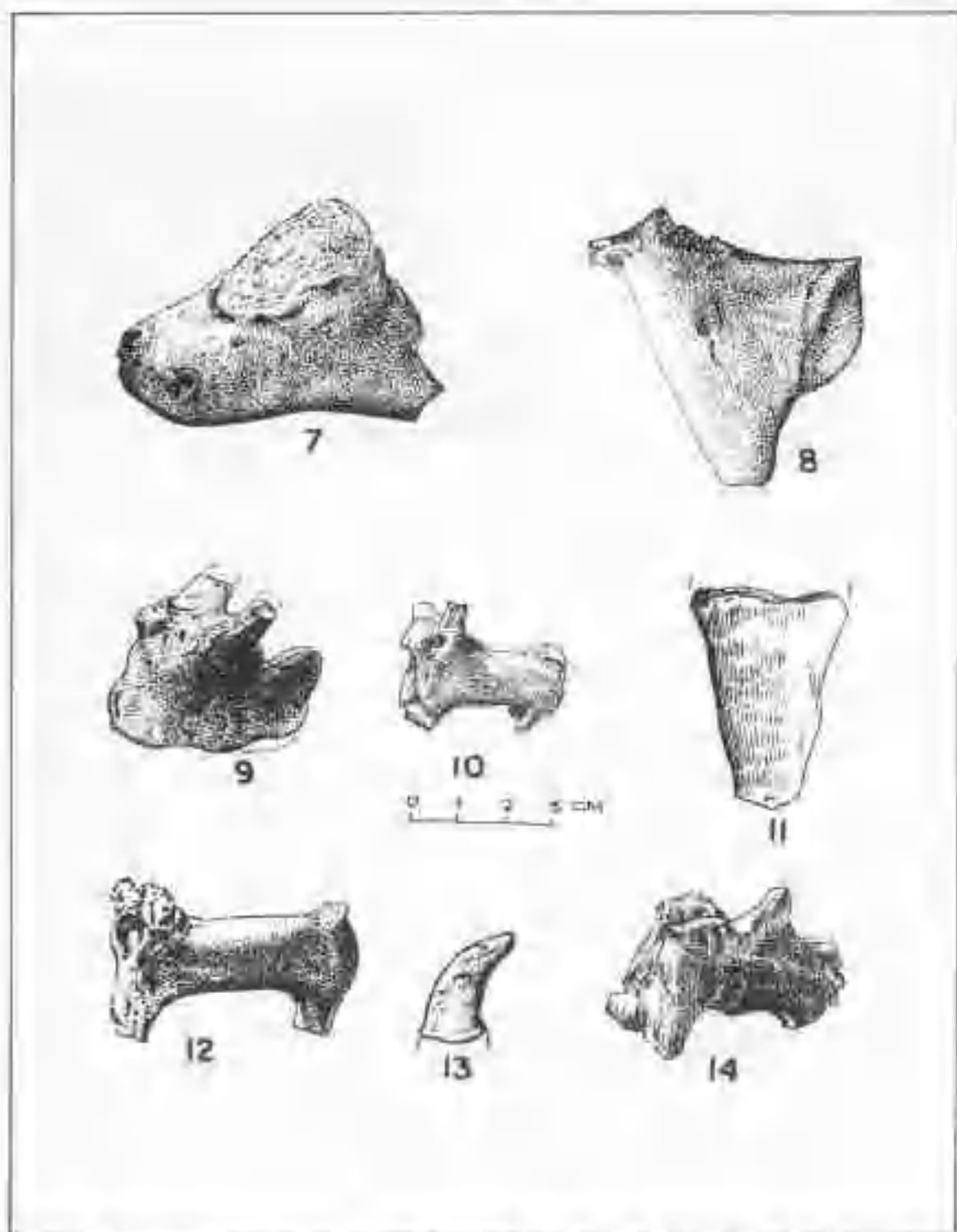


Fig. 102. Terracotta animal figurines: 13, Phase II; 8, Phase III; 11, Phase IV; 7, 9, 12, and 14, Phase V and 10, Surface.



PLATE CXXXIII Terracotta animal figurines, 3, Phase II, 2 Phase III, 6, Phase IV, 1, 5, 7 and 8, Phase V and 4, Surface.

All these four mother-goddesses are stylistically very well comparable with those from Nevasa²³ and Inamgaon.²⁴

(ii) Animal Figurines

Of the six stratified animal figurines, one is of a rhinoceros while the rest of bull. The one from the levels of Late Harappa Culture (fig. 102, 13; pl. CXXXIII, 5) is represented by only a horn which is ill-fired and black in colour. The others have been considerably damaged and that they are bull figurines can be identified from their hump, in a couple of examples it being missing leaving only its scars. The specimen (fig. 102, 8; pl. CXXXIII, 2) from Phase III is made of fine clay, but has not been fired well as is apparent from the ivory black core. Its surface is, however, brick-red in colour. Of the remaining three bull figurines, belonging to the Jorwe Culture, two are of identical style, having elongated body. One of these (fig. 102, 14; pl. CXXXIII, 8) is made of fine clay and is black in colour. Only the front portion of it, including the hump and the broken mouth and horns, has been survived. The other specimen (fig. 102, 12; pl. CXXXIII, 7), with elongated body, a short tail, almost straight vertical horns and conjoined legs slightly bifurcated at the end, had its mouth in applique which is lost leaving an ovaloid depression there. These two bull figurines, with elongated body and conjoined legs, have a stylistic parallel from Phase IC at Ramapuram, district Kurnool,

Andhra Pradesh.²⁵ The third specimen (fig. 102, 9; pl. CXXXIII, 3) differs in style from the above mentioned two examples in that it is in sitting posture, is grey in colour, with a pronounced split mouth, vertical horns which are partly broken and a prominent hump. Stylistically it closely resembles the one from Inamgaon²⁶ and that from Jokha.²⁷ The surface find (fig. 102, 10; pl. CXXX, 4) of a bull is an excellent representation and perhaps the best among those obtained from Daimabad so far. It displays a well-rounded form of body with a pointed mouth, forward-going horns which are partly broken, short, prominent tail and conjoined legs separated at the hoofs. The hump which was in applique is missing leaving the scar at its place. Made of fine clay, it is pinkish in colour. Being a surface find, it is not possible to assign it to any particular phase. However, an identical example was recovered from the site in the 1958-59 season.²⁸ Apart from the bulls, the collection includes a head of a rhinoceros (fig. 102, 1; pl. CXXXIII, 1), from Phase V. It is light chocolate in colour and made of clay mixed with fine sand. It has broad mouth and two prominent nostrils, one each on either side. There, however, exists no snout in the extant specimen.

23. H.D. Sankalia, *The Prehistory and Protohistory of India and Pakistan*, (Poona, 1974), p. 493; fig. 189 g.

24. *Op. cit.*, fig. 188; also, *Indian Archaeology 1968-69 - A Review*, (New Delhi, 1971), pl. XXI A 3.

25. *Indian Archaeology 1980-81 - A Review* (1985), p. 7; pl. IV B.

26. H.D. Sankalia, *op. cit.*, 1974, p. 488; fig. 188.

27. R.N. Melita, S.N. Chowdhary, K.T.M. Hegde and D.R. Shah, *Excavations at Jokha*, Maharaja Sayajirao University Archaeology Series No. 11, (Baroda 1971), fig. 22/8.

28. *Indian Archaeology 1958-59 - A Review*, (New Delhi, 1959), fig. 7, p. 16.

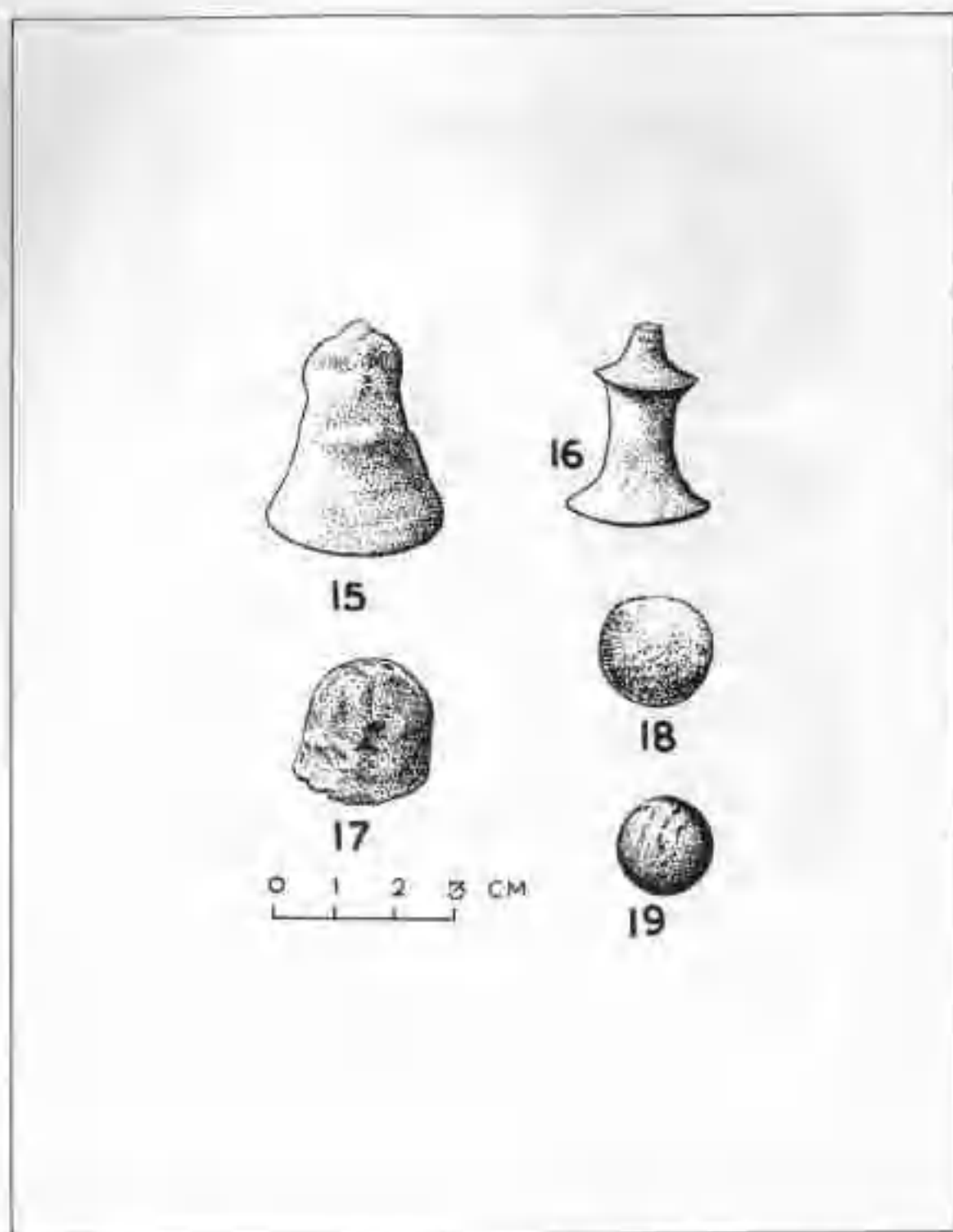


Fig. 105. Terracotta gamsamen and balls: 18, Phase IV; 15-17 and 19, Phase V.

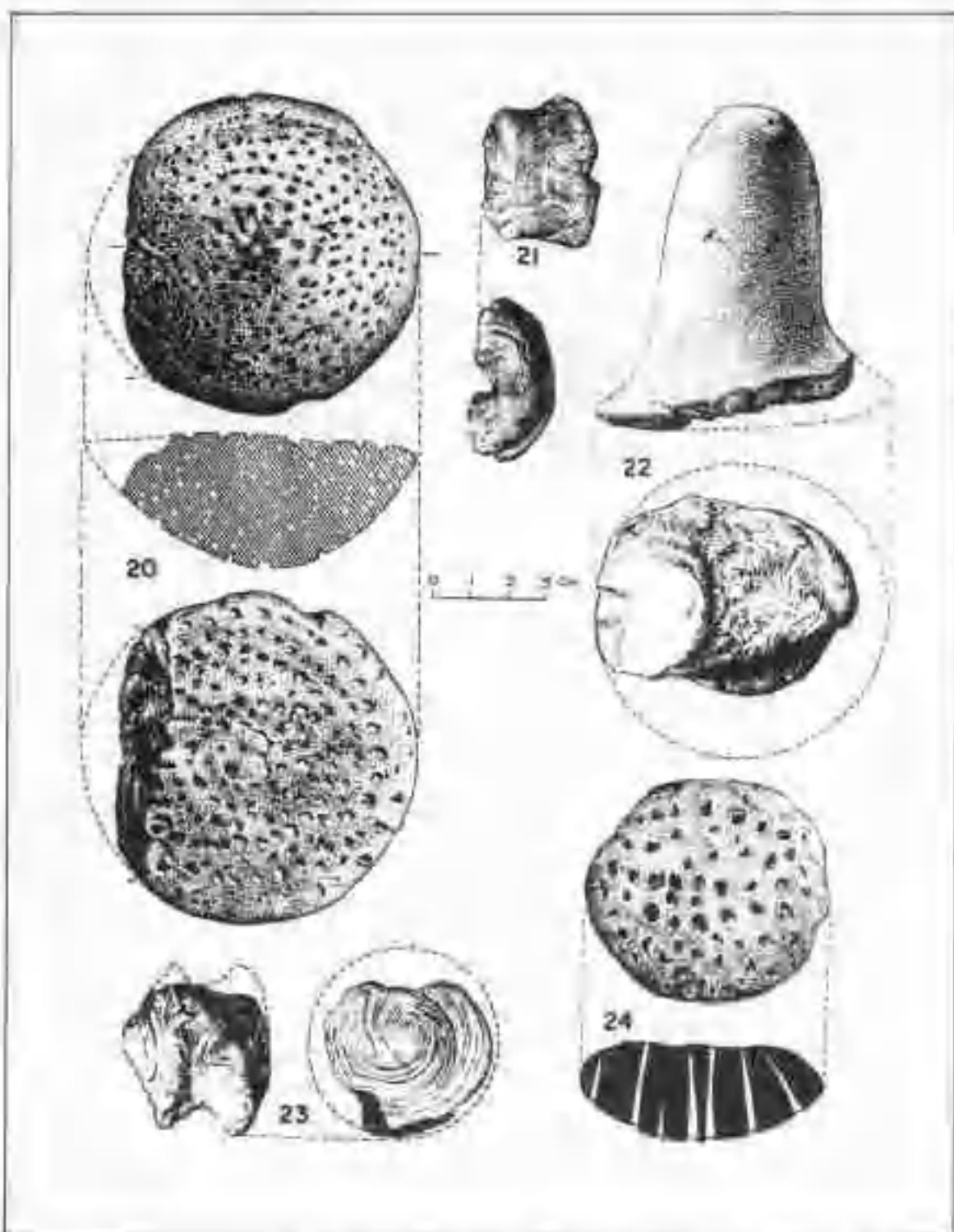


Fig. 104. Terracotta items: scribbles, dalmes, reel and paddy or measurement - 20, Phase IX; 21-24, Phase V.

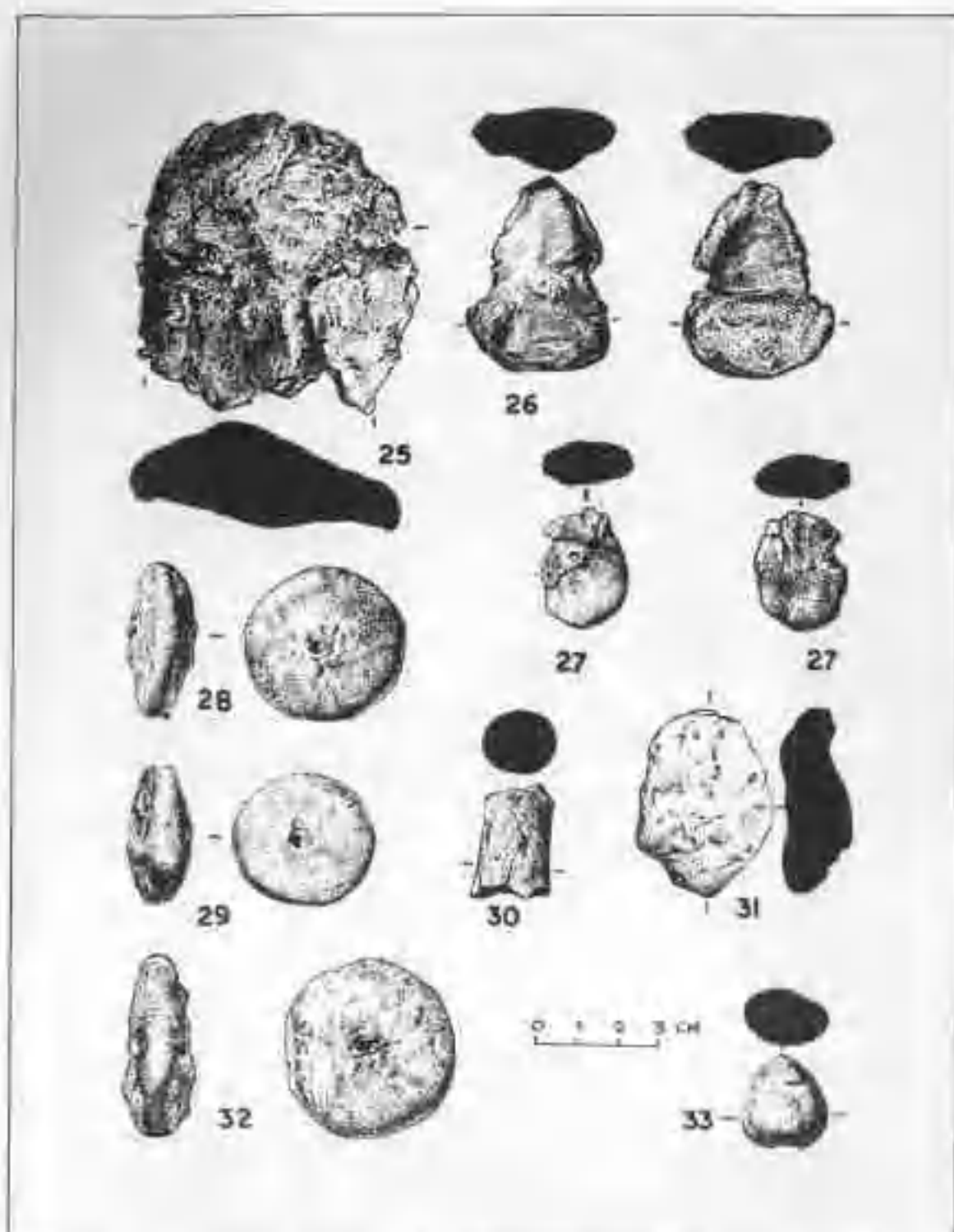


Fig. 105. Terracotta cakes, toy wheels and a cylindrical piece: 31, Phase II; 27, Phase IV; 25, 26, 28-30, 32 and 33, Phase V.

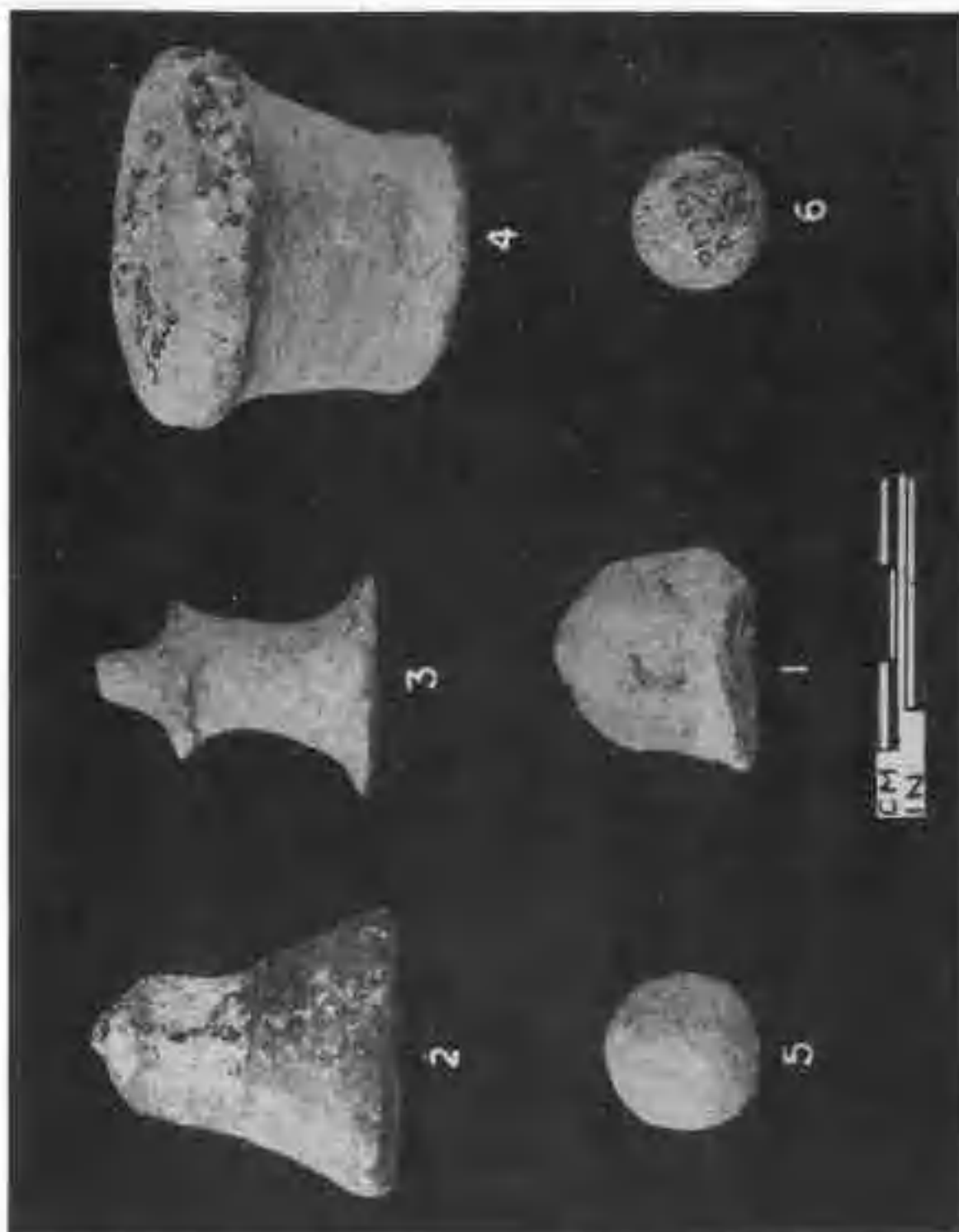


PLATE CXXXIV Terracotta earthenware, 1, 2 and 6, all Phase V; Terracotta sealing, 3, Phase II and terracotta balls (archaic), 4 Phase IV and 5, Phase V.

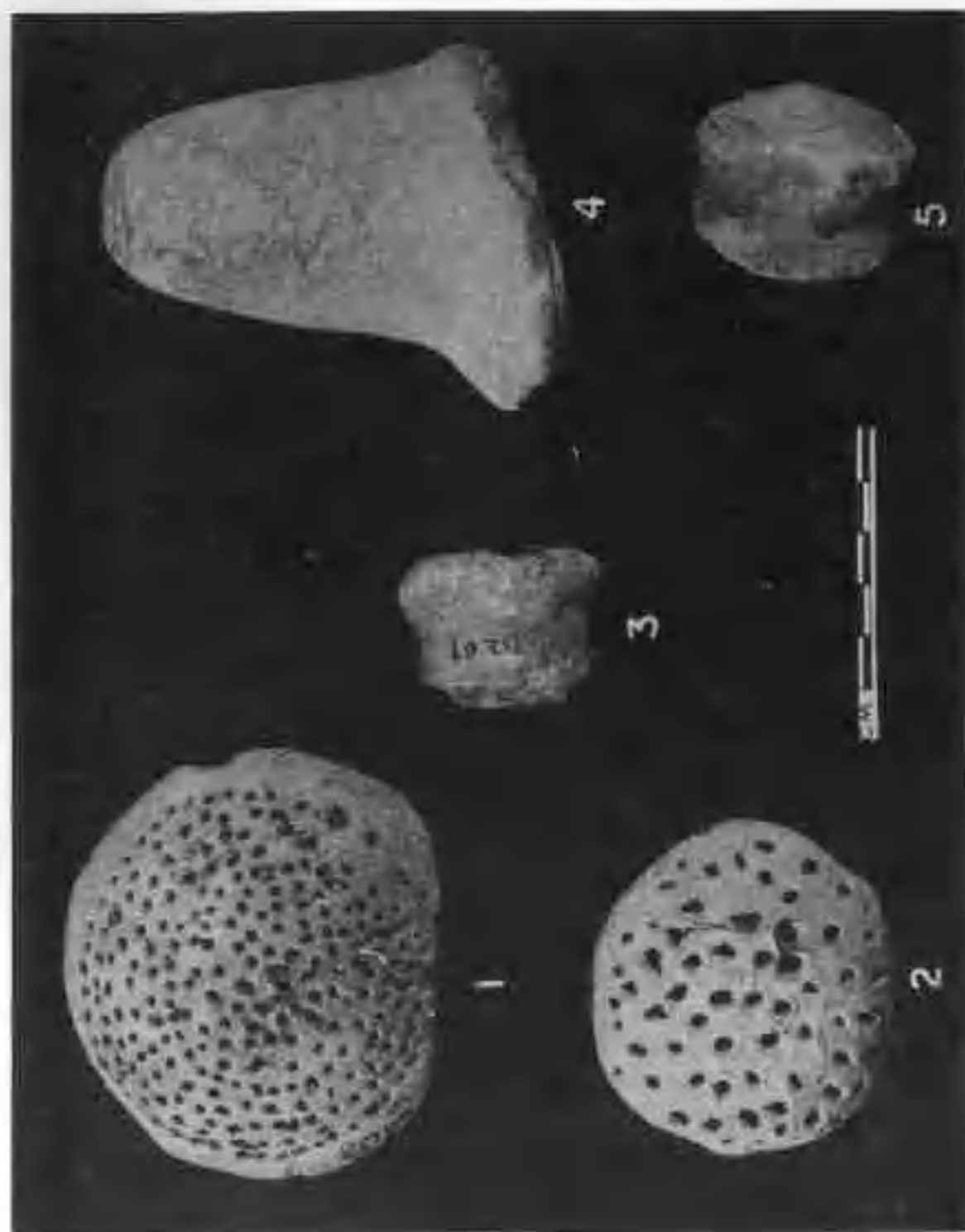


PLATE CXXXV. Terracotta skin scrubbers, 1 and 2; reel, 3; dabber, 4 and pulley or ear-pendant, 5.

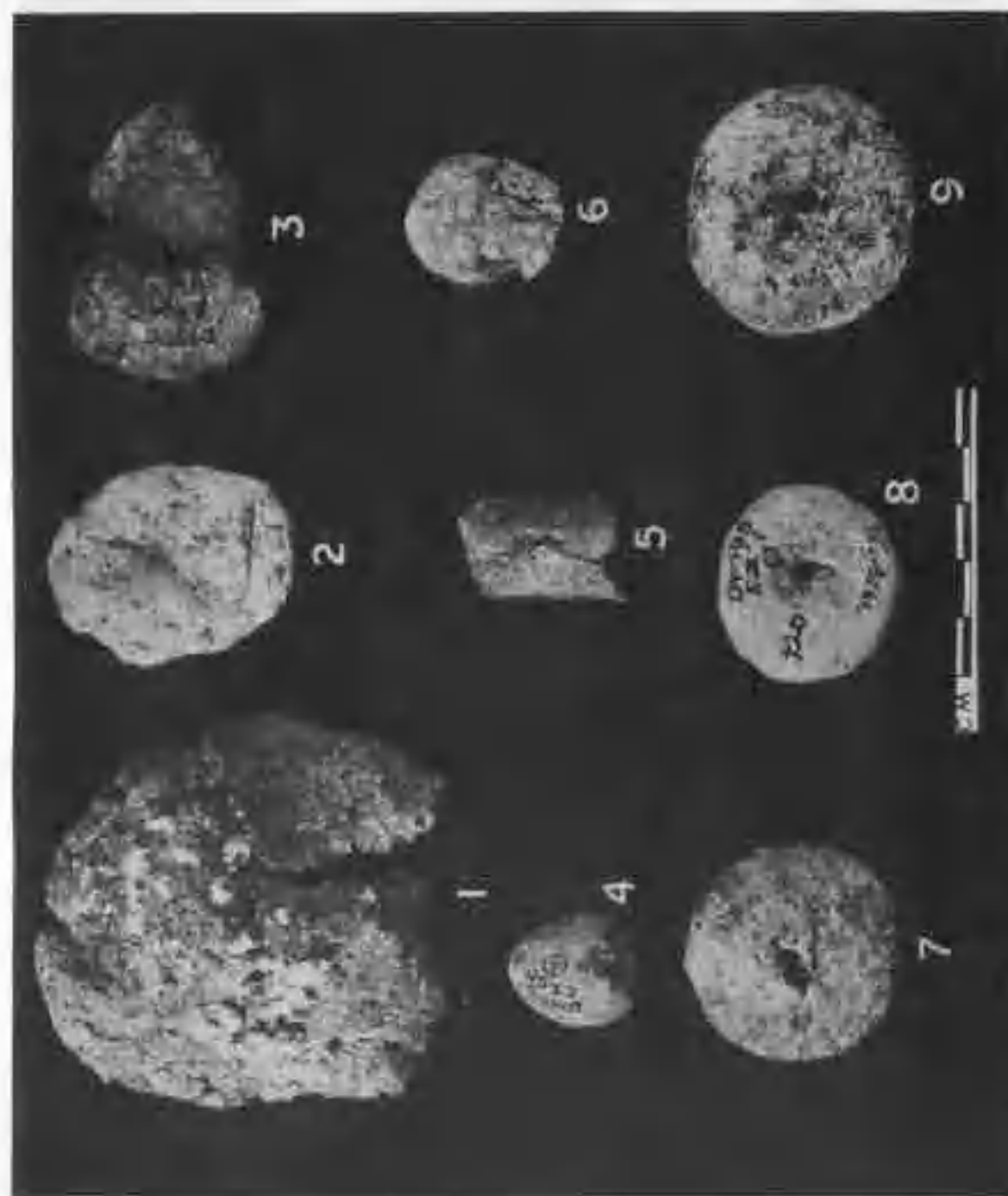


PLATE CXXXVI Terracotta cakes, 1-4 and 6; cylindrical piece, 5 and wheels, 7-9.

(iii) *Gamesmen* (fig. 103, 15-17; pl. CXXXIV, 1, 2 and 3)

All the gamesmen belonged to Phase V. One of these (fig. 103, 16; pl. CXXXIV, 2) has a flat base, concave sides, a ledged top surmounted by a conical projection like a pinnacle in the centre. A near parallel of this comes from Lothal.²⁹ The second (fig. 103, 15; pl. CXXXIV, 1) which comes from Pit 207 is of blackish grey colour. It is with burnished surface, has a flat base and slightly concave tapering sides with a convex top surmounted by an oval shaped elevation. This too has a parallel from Lothal.³⁰ The third (fig. 103, 17; pl. CXXXIV, 3) gamesman, recovered from house 39 (a circular hut), is red in colour, with a patch of bright red slip, survived over the slightly concave base, and a domical body.

(iv) *Skin scrubbers*

The two skin scrubbers are no less interesting. One of them has come from Malwa levels (fig. 104, 20; pl. CXXXV, 2) and the other from Jorwe (fig. 104, 24; pl. CXXXV, 1). The one from the former is buff in colour and circular in shape. It has slightly concave base, convex upperside and obliquely pierced perforations. Made of fine clay, bereft of coarse material, its under surface shows marks of scrubbing especially along the periphery. The second specimen, also of fine clay, is blotchy pink in colour, circular in shape, with a flat base and slightly conical domed upperside. It is punctured with pointed object on both the surfaces. Perforated and punctured skin scrubbers have been reported from the Jorwe levels at Nevasa.³¹

(v) *Cakes*

Of the five cakes, the one from (fig. 105, 31; pl. CXXXVI, 2) Phase II is oval-shaped and considerably worn-out. One of the two specimens from the levels of Malwa Culture which is oval-shaped, has been obtained from the fire-pit of sacrificial Ring Altar (fig. 105, 27; pl. CXXXVI, 6). The other specimen is triangular (fig. 105, 26; pl. CXXXVI, 3) in shape and pressed with finger in the middle. The oval-shaped terracotta cake (fig. 105, 25; pl. CXXXVI, 1) from Pit 207 of Jorwe Phase is fragmentary. It is plano-convex in section, grey at the base and blackish on the top and has developed cracks due to firing. The other specimen from this Phase (fig. 105, 33; pl. CXXXVI, 4) is small, heart shaped and blotchy brick red in colour.

(vi) *Dabber*

The massive dabber (fig. 104, 22, pl. CXXXV, 4) with its flat base broken, has tapering

29. S.R. Rao, *Lothal and the Indus Civilization*, (Bombay, 1973), pl. XXXIV, (third in the first vertical row from the top).

30. Rao, *op. cit.*, pl. XXXIV (second from the second horizontal line).

31. Sankalia, *et al.*, *op. cit.* (1960), pp. 375-77, 1 and 2.

sides and domical top.

(iii) *Toy-Wheels*

All the three wheels (fig. 105, 28, 29 and 32; and pl. CXXXVI, 5-7) belong to Phase V. They are crudely made and indifferently fired as a result of which they possess blotchy surface.

(iv) *Balls*

One ball (marble) each comes from the Malwa (fig. 103, 18; pl. CXXXIV, 4) and the Jorwe (fig. 103, 19; pl. CXXXIV, 6) levels. The specimen from the Malwa levels is made of fine clay, burnt brick red but has not been properly finished. On the other hand that from the Jorwe Phase is comparatively light in weight, perfectly globular and is painted in white and red colours. It may be recalled that painted balls (marbles) have been reported from Mohenjodaro³² and Chanhudaro.³³

(v) *Reel*

The fragment of a reel of grey colour (fig. 104, 21; pl. CXXXV, 3) comes from the Jorwe levels. It has been treated with a slip and burnished. It is made of fine clay and its core is ivory black.

(x) *Pully or Ear-Pendant*

The pully (fig. 104, 23; pl. CXXXV, 5) although considerably damaged, is an interesting specimen. Of fine fabric, it is blotchy pink in colour and has been prepared on a wheel as is indicated by the striation marks. Its side ends are conical to have a grip. In the centre of the circumference is a deep groove to accommodate the string.

(xi) *Miscellaneous*

Among the two objects included in 'miscellaneous' category, one is (fig. 102, 11; pl. CXXXIII, 5) a pointed piece, either a horn or a leg of an animal, brick-red in colour. It belonged to the Malwa Culture. The other is a cylindrical piece (fig. 103, 30; pl. CXXXVI, 5), black in colour which has come from Phase V.

The illustrated specimens are described below.

32. Mackay, *op. cit.* (1938), Vol. G, pl. CXX, 21 and 37.

33. E.J. H. Mackay, *Chanhudaro Excavation* (1976, reprint), pl. LXI, 1-7.

Figs. 101–105, pls. CXXXIA–CXXXIC and CXXXII–CXXXVI

1. A mothergoddess with its head missing. The two stumpy conical arms stretching from the shoulder have a little curve downwards, the right one being damaged. The belly is constricted widening down below at the hips. The breasts are small, round, but pointed and prominent. The legs are straddled (71/1978–79, Pit 207, Phase V). pl. CXXXII, 1.
2. Fragment of a mothergoddess with its head missing. The arms, stretched from the shoulder and bending downwards, are broken. One of the full breasts is damaged, (116/1978–79, house 43, Phase V). pl. CXXXII, 3.
3. A fragment of a mothergoddess with stumpy conical arms stretched from the shoulders. The head is represented by a low elevation over the shoulders. The breasts are circular and low flat elevations. The back is flat. (114/1978–79, Pit 207, Phase V). pl. CXXXII, 2.
4. A fragment of a mothergoddess with its head missing and the arms, stretched from shoulder, are broken. The belly is constricted. The two round breasts are damaged. (751/1975–76, from the damaged floor of a house ascribed to structural phase C, Phase V). pl. CXXXII, 4.
- 5 and 6. A unique terracotta with a rectangular or oval-shaped base or platform, 5 x 3.5 cm, and convex under side. On the upper surface of the platform, on one of the longer sides, is moulded, in high relief, a head. On the opposite side are moulded in relief, three heads of female figures in a row. The ears of all these female and the male figures are represented by pellets in applique. The specimen is covered with a coat of red ochre colour. (88/1978–79 from the surface of fifth floor of house 38, Phase V). pls. CXXXIA – CXXXIC.
8. Fragment of a front portion of a bull with its mouth damaged and hump missing. Both the legs are conjoined together. (127/1976–77, Phase III). pl. CXXXIII, 2.
9. A bull in sitting posture with prominent hump, protruding slit mouth and partly damaged horns. Little portion at the back side is also damaged. (94/1976–77, overlap phase between Phase IV and Phase V). pl. CXXXIII, 3.
10. Bull with round body, pointed mouth, damaged horns, short, prominent tail and conjoined legs split at the hoofs. (109/1977–78, Surface). pl. CXXXIII, 4.
11. Fragment of a horn or leg of an animal. (146/1976–77, Phase IV). pl. CXXXIII, 6.
12. A bull with elongated body, straight horns, partly damaged. The hump and the mouth in applique are missing. Legs are conjoined but split at the hoofs. (762/1975–76, Phase V). pl. CXXXIII, 7.
13. Fragment of a horn of a bull (96/1978–79, Phase II). pl. CXXXIII, 5.
14. Fragment of a front portion of a bull with probably an elongated body, damaged mouth and horns. The conical hump is prominently shown. The front legs are broken (29/1977–78, Phase V). pl. CXXXIII, 8.
15. Gamesman with slightly concave base, tapering sides and domed top surmounted by an oval-shaped elevation. (73/1978–79, Phase V). pl. CXXXIV, 1.
16. Gamesman with flat base, concave sides and ledged top surmounted by a pinnacle. (16/1978–79, Phase V). pl. CXXXIV, 2.

17. A dome-shaped gamesman with a concave base. (119/1978-79, Phase V). pl. CXXXIV, 5.
18. A ball (marble) with surface rubbed due to use. (34/1978-79, Phase IV). pl. CXXXIV, 4.
19. A ball (marble) painted in red and white colours. (10/1978-79, Phase V). pl. CXXXIV, 6.
20. A roughly circular skin-scrubber slightly concave at the base and convex on the upper side. It has been pierced through all over the surface. The holes are ovaloid, elliptical, rectangular in shape, apparently the result of use of a reed and careless piercing. The margin around the base is smooth due to rubbing. (144/1976-77, Phase IV). pl. CXXXV, 2.
21. Fragment of a reel, treated with a slip and burnished on the outside. (Phase V). pl. CXXXV, 3.
22. Potter's dabber with a damaged dabbing-end and with massive conical handle. (11/1978-79, Phase V). pl. CXXXV, 4.
23. A severely damaged pulley or ear-pendant. (108/1978-79, Phase V). pl. CXXXV, 5.
24. A skin-scrubber with almost a flat base and domical upper side. Both the sides are marked by blind holes. The underside is worn out evidently due to rubbing. (102/1978-79, Phase V). pl. CXXXVI, 1.
25. A fragment of an oval-shaped cake recovered from Pit 207. (72/1978-79, Phase V). pl. CXXXVI, 1.
26. A triangular terracotta cake, pressed with thumb when in green hard state. (24/1977-78, Phase IV). pl. CXXXVI, 3.
27. An oval-shaped small cake recovered from the fire pit of the sacrificial Ring Altar (48/1978-79, Phase IV). pl. CXXXVI, 6.
28. A wheel with bi-convex section and a hole little away from the centre. The circumference is rubbed due to use. (759/1975-76, Phase V). pl. CXXXVI, 9.
29. A wheel, biconvex in cross section and with a hole little away from the centre. The periphery is slightly rubbed. (120/1978-79, Phase V). pl. CXXXVI, 8.
30. A cylindrical fragment. (74/1978-79, Phase V).
31. An oval-shaped very much worn out cake of fine fabric. (110/1978-79, Phase II). pl. CXXXVI, 2.
32. A wheel, roughly plane-convex in section, with a hole in the centre and a flattened small portion on the periphery. The periphery is rubbed due to use. (147/1976-77, Phase V). pl. CXXXVI, 7.

G. Human Figurines In Applique On Pottery

From the stratified deposits three potsherds of thick coarse ware with human figures in applique were collected. Being of utmost importance for understanding the development of religious cults they are treated separately. A human figure in applique also occurred on the large vase kept by the side of the potter's Kiln I, but it has not been dealt with here. One

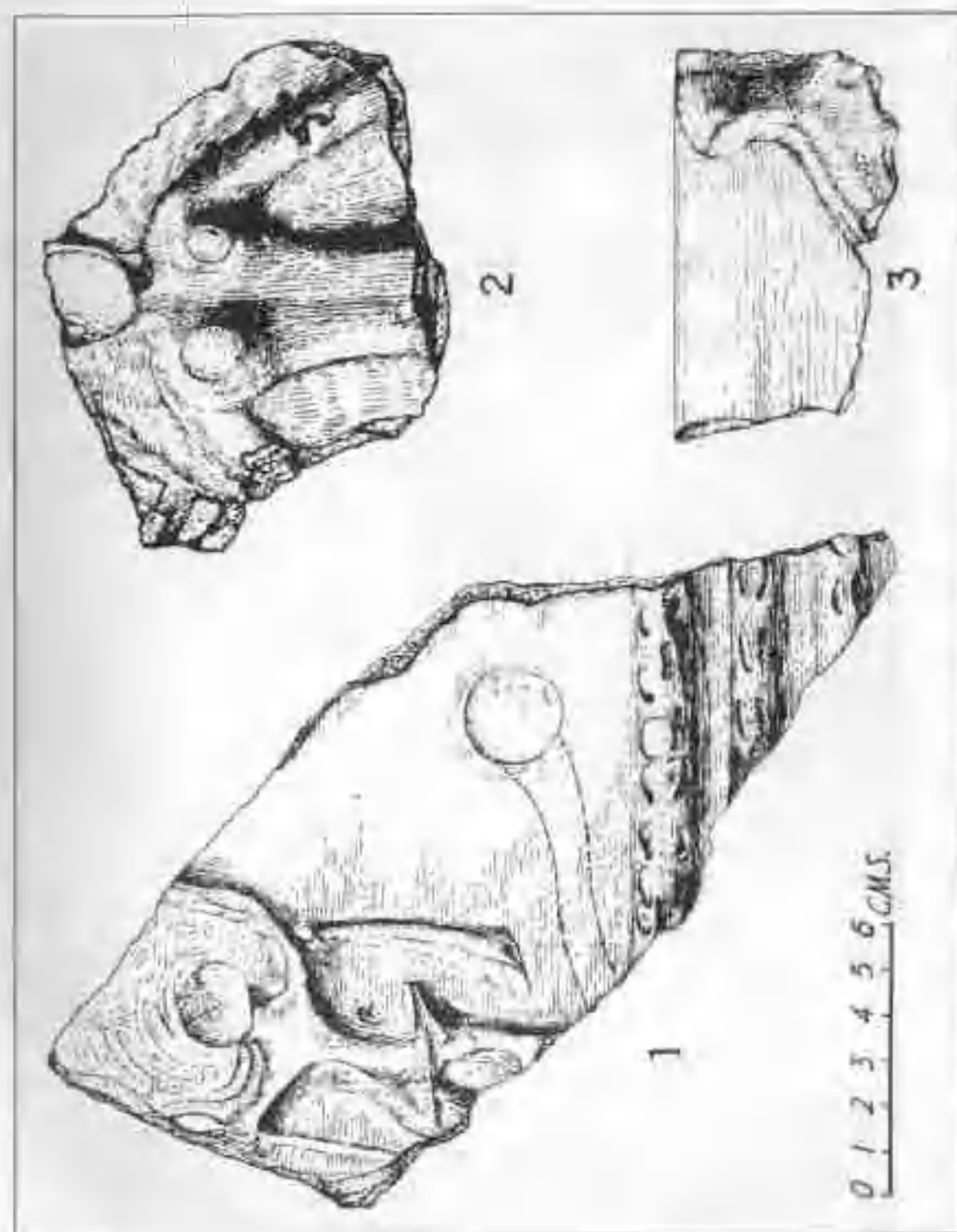


Fig. 100. Human figures in applique on pottery: 1, 5, Phase III, 4; Phase IV and V, Phase V.



PLATE CXXXVII. Human figurines in applique on pottery. 1, Phase III/2; Phase II and 3, Phase V.

each of the three belonged to the Daimabad, the Malwa and the Jorwe Cultures. Each one differed from the other in treatment and subject matter.

The earliest specimen, that from the levels of the Daimabad Culture (fig. 106, 3; pl. CXXXVII, 1), is a fragment of a vase of pink Thick Coarse Ware with a bevelled rim-top. On the inside of its vertical wall is a human figure, perhaps of a male, survived by the head, protruding mouth, tall slender neck and a small portion of shoulders and chest. The figurine being on the inside of a vase reminds one a votive tank.

The example from the Malwa levels is a fragment of a vase of chocolate brown Thick Coarse Ware. An interesting aspect of this find is that it was recovered from one of the several pot-rests located between the Apsidal Sacrificial Temple and the Ring Altar (see p. 166) in the religious and residential complex. On its outside is a decoration in applique of bands with incised nail pattern and a damaged male figure as well as an impression of an attendant figure by its side (fig. 106, 1; pl. CXXXVII, 2). The head, now missing, was applied in the deep oval-shaped cavity carved into the surface. Around the head is a distinct halo produced by applying thin paste of clay. The neck is survived above the shoulders. Both the hands are stretched. In the right hand is shown holding an arrow and in the left a bow, the lower end of which is of the shape of the head of a snake with incised eye. The body is slim, narrowing from the chest. A sword with a pointed hilt is depicted on the waist. The extant legs are suggestive of dignified stance of the figure. Only the impression of the attendant figure is survived. In this example also there exists a halo around the head produced by applying thin paste of clay. The halo around the head of both the figures undoubtedly indicates that they represented divine figurines. The snake-head-shaped end of the bow would make the figure that of *Siva*. Whether the figure on the left was that of a female deity cannot be made out from the impression.

The third specimen, belonging to the Jorwe Culture and found in house 64, is a fragment of a reddish purple vase of Thick Coarse Ware (fig. 106, 2; pl. CXXXVII, 3). On its outside is a female figure, apparently a mothergoddess, which differs from those of terracotta. Unlike the latter this figure was with a head which has been broken leaving its triangular scar. Over the shoulders rests a short neck. The two damaged arms, round in form, hang away from the body. One of the two round but low breasts is damaged. The body is slim. The portion below the navel is missing.

The fragment of the vertical wall of a vase with a figurine of a male applied on its inner side belonging to the Daimabad Phase, in all probability, appears to be of a votive tank and as such suggests a high antiquity for such offerings in Maharashtra. Votive tanks have been found at a large number of sites in this country in the historical levels but none from the Chalcolithic. It was believed that votive tanks were introduced in India by the Parthians in about 1st — 2nd century A.D.³⁴

The depiction in applique of the figure of *Siva* holding bow and arrow and with a sword reminds one of the bow of *Siva* in *Ramayana* and *Siva* of *Kirtarjunceraya* in *Mahabha-*

34. V.S. Agrawal, 'Terracotta Figurines of Alichchhatra, District Bareilly, U.P.', *Ancient India*, No. 4, 1948, p. 125.



PLATE CXXXVIII Incised earthenware object, Phase II.

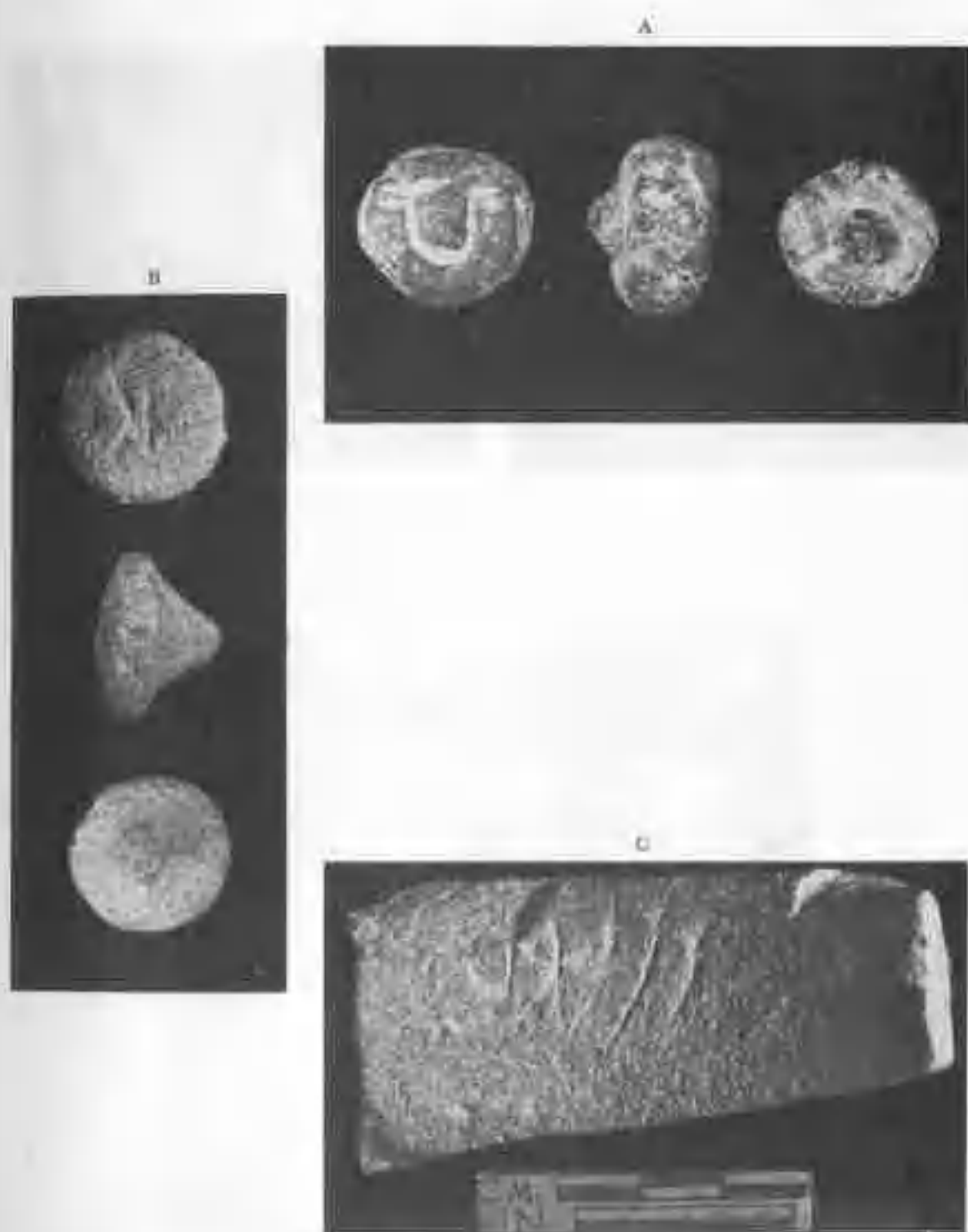


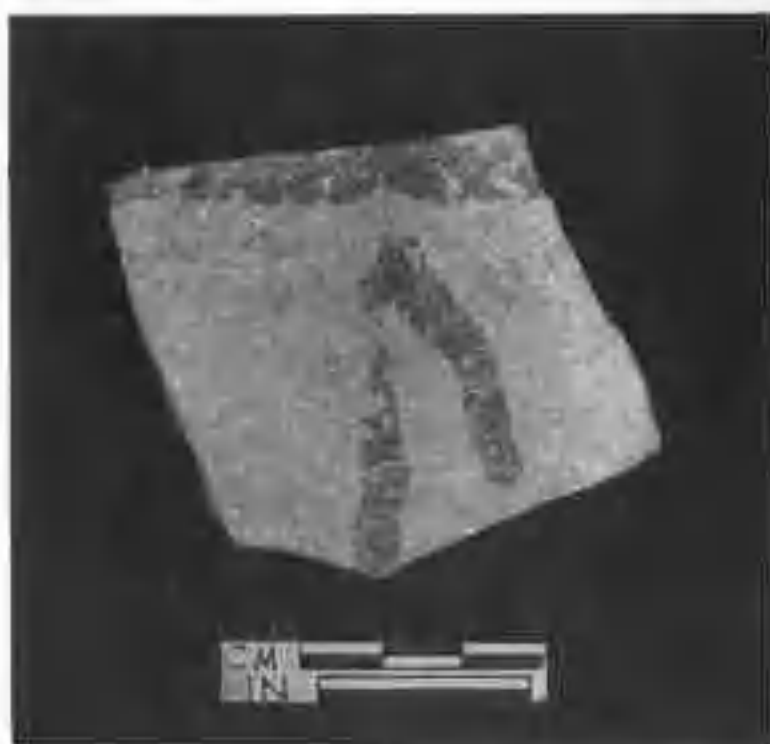
PLATE CXXXIX. A-C. Terracotta seals and potsherd, with Indus script. Phase II.



D



E



F

PL CXXXIX D-F. Potsherds bearing Indus script; D and E engraved, F painted; Phase II.



Fig. 197. Terracotta stamp seal, Phase II.

rita. Being collected from the debris inside one of the pot-rests, between the Apśidal Sacrificial Temple and the Ring Altar, it seems that it was an extant part of a vase containing offerings placed there.

The mother goddess in applique differs from the headless mothergoddesses mentioned above, in being with a head, although it is now missing. It also differs stylistically from the latter in having long arms hanging away from the body and closely parallels with a female figure on a storage jar from Navdatoli³⁵ which the excavators consider to be connected with fertility. The religious idea connected with the example from Daimabad may be different from that attached with the headless terracotta mothergoddess. It appears, in all likelihood, a representation of an auspicious deity believed to be capable of bringing prosperity.

H. Incised Cult Object

This is a crescent — shaped object made of potsherd (fig. 30, 15; pl. CXXXVIII). It was found in layer 9 of the trench ZD 62 in Sector IV and thus belonged to the Late Harappan Phase. The potsherd is of thick reddish ware of fine fabric, without slip or wash and shows striation marks on both the surfaces. Its edges have been ground to achieve the crescent shape. On the concave side of the potsherd is engraved a scene of a tiger attacking a buffalo from behind. The forceful attack of the tiger and the panic of the buffalo have been excellently depicted. On the convex back side of this sherd is a horizontal row of six lozenges with hatched upper half of each shape and the open space below between the two lozenges. The number of hatched lines is generally five and occasionally four.

It should be noted that the tiger generally attacks a buffalo from behind and the depiction is thus remarkable. The deliberate shaping and the engravings would suggest that it was a cult object for seeking protection of the buffaloes from tigers in the jungle.

(J) Terracotta seals and potsherds with Indus Script

The Harappan levels at Daimabad yielded two terracotta seals and four potsherds bearing Indus signs. The signs on three of the potsherds are engraved and on one painted. Besides, one potsherd of Daimabad Ware from Phase III was also found bearing Indus signs engraved on its surface (fig. 38, 24; pl. CXL). All these are described below.

(I) The terracotta seals

One each of the terracotta seals was found in house 16 and house 17. That from the former is made of fine clay and is blackish in colour (pl. CXXXIX A). It is roughly circular in shape and with a short knob at the back. On its front face is engraved a distinct Harappan sign similar to sign 342.³⁶

35. Sankalia, op. cit., 1974, fig. 149a, p. 442.

36. Iravataham Mahadevan, *The Indus Script: Texts Concordance and Tables*, Memoir of the Archaeological Survey of India, No. 77, (New Delhi, 1977), p. 36.

The second seal (pl. CXXXIX B) is made of a little coarse clay and is brownish red in colour. It has a knob on its back side and a little convex front side. On the convex front are engraved two letters one similar to sign 86³⁷ and the other sign 287.³⁸

(ii) *The Inscribed and Painted Potsherds*

The first of the potsherds bearing engraved Indus signs was found in the trench FZ 64 in layer 14. It is a rim-fragment of a vase of red ware with oval collared rim (pl. CXXXIX C). On the inside of the rim are engraved three Harappan signs, from right to left, three oblique lines similar to sign 102³⁹, a man-like sign similar to sign 1⁴⁰ and a pot sign similar to sign 28⁴¹ or sign 342.⁴² The upper portion of the last sign is missing because of the flaking off the portion of the potsherd there.

It is difficult to make out the signs on the second potsherd which is of red ware, of fine fabric and without a slip (pl. CXXXIX D). It was recovered from layer 2 (corresponding to layer 13) of JZ 63. One of the signs appears to resemble sign 176.⁴³

The third potsherd is circular in shape, of red ware and of fine fabric. It was collected from layer 9 of ZD62. On each side of it an Indus sign similar to sign 157⁴⁴ has been engraved (pl. CXXXIX E).

The fourth potsherd is of red ware and of fine fabric. It was recovered from layer 13 of FZ 63. It is (pl. CXXXIX F) painted in black on the outside with a horizontal band and below an Indus sign similar to sign 125.⁴⁵

The potsherd bearing engraved Indus signs from Phase III is a fragment of a vase of pink Dausabād Ware with narrow mouth and without rim (fig. 38, 24; pl. CXL). It has lost its slip. On its shoulder are engraved five or six signs resembling the Indus script (see also pp. 264 and 281).

J. *Terracotta Stamp Seal*

This is a unique piece of terracotta stamp seal (fig. 107; pl. CXXXIV, 3) which was recovered from the levels of Phase II from layer 18 of the cutting Z69–Z70 to AZ69–AZ70. It is light brick red in colour and massive. The seal is 3.5 cm high and has a circular flat top with 3 cm diameter, tapering sides and a convex base with 4 cm diameter, in the centre of which is a well-modelled figure in low relief of a strongly built animal in running posture resembling representation of a humpless bull of terracotta from Mohenjodaro.

37. *Ibid.*

38. *Op. cit.*, p. 34.

39. *Op. cit.*, p. 32.

40. *Ibid.*

41. *Op. cit.*, p. 34.

42. *Op. cit.*, p. 35.

43. *Op. cit.*, p. 32.

44. *Op. cit.*, p. 33.

45. *Ibid.*



Fig. 108. Laminated Clay Figurine (Daimabad, Phase V).



PLATE CXL Potsherds bearing engraved Indus script, Phase III.



PLATE CXLII Terracotta cylinder seal, Phase V.

K. Terracotta Cylinder Seal

One terracotta cylinder seal (fig. 108; pl. CXLI) was found on the surface of the fourth floor of house 38, the merchant's house (p. 147). It is made of fine clay and is brownish buff in colour. Due to imperfect firing its core has turned dark grey in colour. Although typologically it may be classed as cylinder seal, the convexity of the central portion, on which is engraved the scene in intagli, has given a roughly barrel form. One of its ends is broken obliquely. The maximum extant length of the seal is 5.9 cm. Its diameter at the unbroken end is 2.2 cm and in the centre of the scene 2.9 cm. The scene, bordered by a deep groove below and above, varies in height from 2.1 cm to 2.5 cm. The unbroken side below the scene is slightly concave and has two short streaks of groove on the periphery of its end. There is no trace of a hole in the centre of the unbroken end.

The scene shows a horse-driven cart or chariot. The chariot has a squarish frame made of four vertical members at four corners and horizontal bars attached in the middle of their height. Only one wheel is seen. It seems to be solid. This chariot differs in details from the chariot in the cache of bronzes (pp. 477-479) ascribed to Phase II. From the top of the front right side member of the frame of the chariot lies what looks like an attachment on the back of the horse driving the chariot. The horse seems to be of small stroller like that of a *Bhimthadi* breed.⁴⁶ This horse was one of the favourite animals of the Jorwe Culture is also attested to by a representation of horse in painting on the Jorwe Ware.⁴⁷ Besides, bones of horse have been recovered from the excavation.⁴⁸ In front of the horse is shown some plant and in front of the plant is an animal, perhaps a short-horned deer with its head turned towards its back. The deer is followed by an animal with a long neck, evidently a camel, in walking position as is apparent from the raised right side legs, the front one being the most artistically engraved. Representation of camel in black painting on one of the sherds of the Jorwe Ware is another evidence which leaves no doubt that the people of the Jorwe Culture at Daimabad were acquainted with domestic species of animal.⁴⁹ In front of the camel, between it and the back side of the frame of the chariot or cart, occur two representations marked by oblique wavy lines looking like snakes and a small dumbel-shaped incision.

Cylinder seals have been reported from Mohenjodaro⁵⁰ and Kalibangan.⁵¹ Apart from these, a cylinder seal was found from the surface at Maski which was ascribed to the Chalcolithic levels.⁵² Another cylinder seal, now in the collection of the Nagpur Museum and believed to be

46. The ponies of the Bhima valley, known as *Bhimthadi* ponies, are very famous.

47. *Indian Archaeology 1958-59 - A Review*, p. 16, fig. 7.

48. *Indian Archaeology 1975-76 - A Review*, p. 34.

49. Interesting is also the information from Dr. Satish Deshmukh of the Marathwada University, Aurangabad (per. com) that till the last century the village Jambgaon, situated on the right bank of a stream known as Deo Nadi, a southern tributary of the river Pravara, some 3 km south of the well-known site of Jorwe, was famous for the camel market. At present Jambgaon is a deserted village. I am thankful to Dr. Deshmukh for this information.

50. Mackay, op. cit. (1958), Vol. I, pp. 323, 344-45; Vol. II, pls. LXXXIV, 78; LXXXIX, 376 and XCVI, 488.

51. B.K. Thapar, "Kalibangan: A Harappan Metropolis beyond the Indus Valley," in (ed.) Gregory L. Possehl, *Ancient Cities of the Indus*, (New Delhi, 1979), pp. 196-202 pl. XXIII.

52. B.K. Thapar, "Maski 1954: A Chalcolithic site of the Southern Deccan", *Ancient India*, 13, 1957, pl. XVII B, p. 1959, p. 101, pl. XXIV, 4.

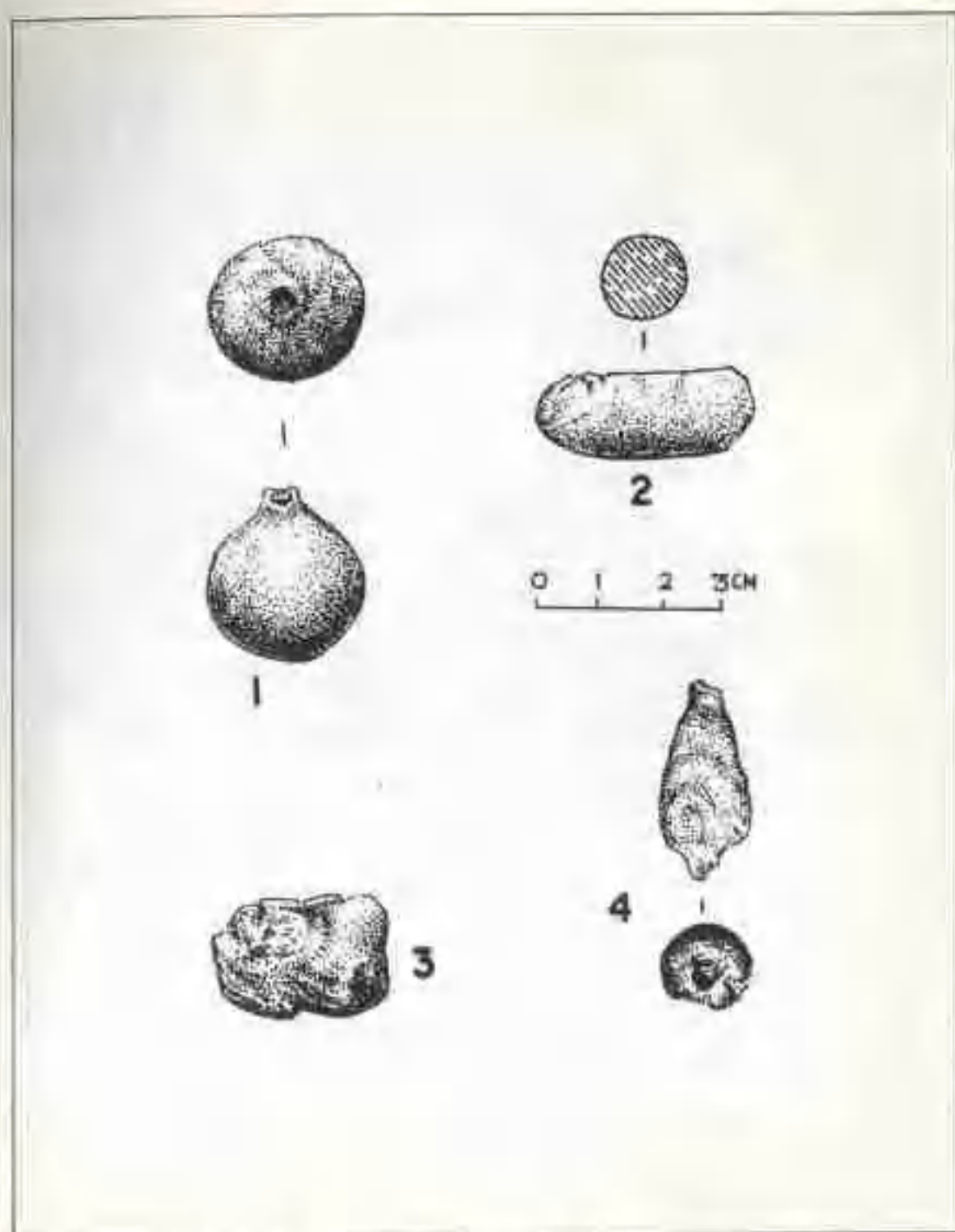


Fig. 109. Sumbakelil clay objects: 2 and 4, Phase II; 3, Phase IV, and 1, Phase V.

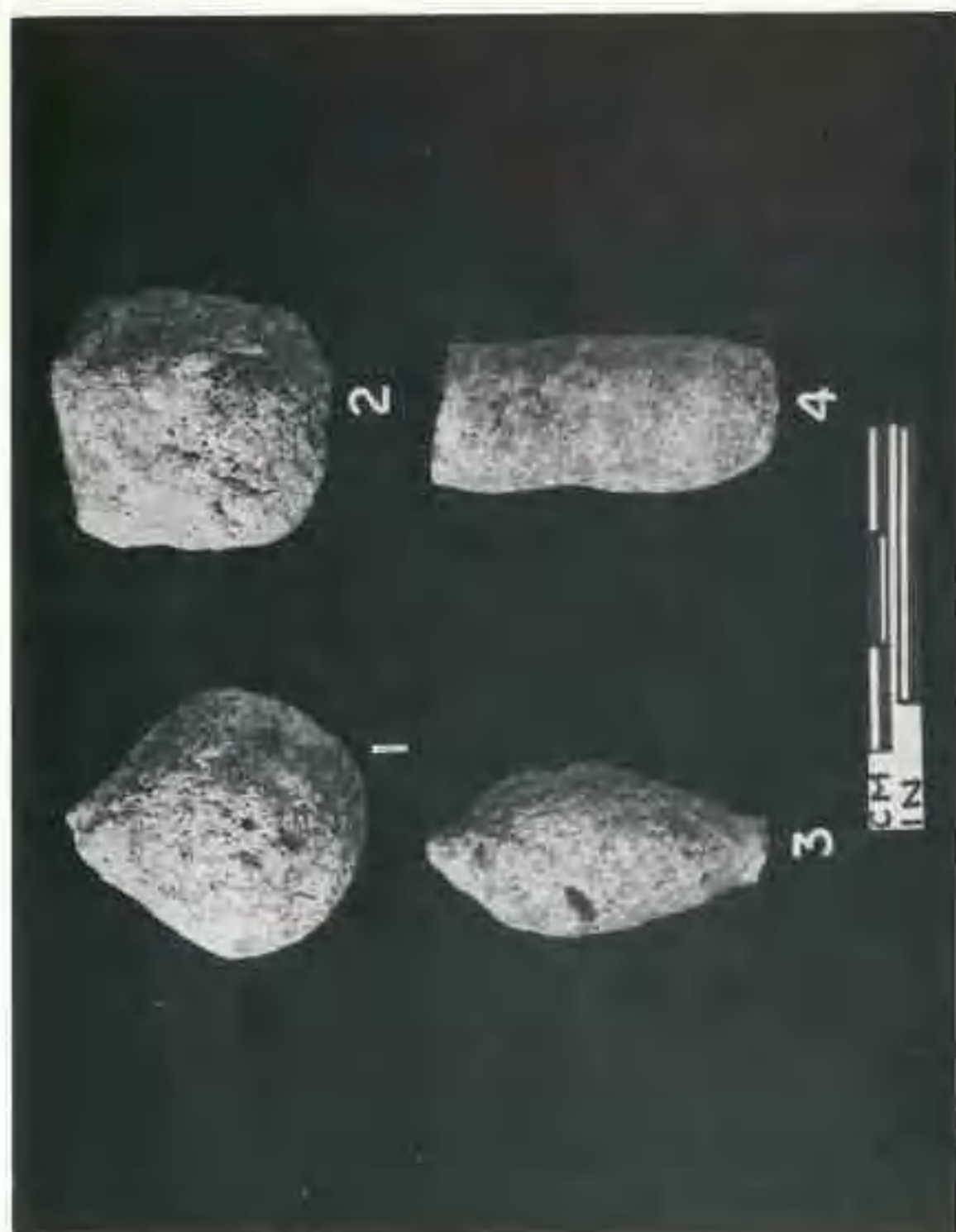


PLATE CNLH Baked-clay objects 1, Phase V; 2, Phase IV; 3 and 4 Phase II.

from somewhere in Central India, although its provenance is not known, is said to represent contacts with Babylonia.⁵³ Cylinder seals of Indian style have also been reported from Susa and Tell Asmar⁵⁴ as well as from Ur.⁵⁵

Of the three cylinder seals from Mohenjodaro, two depict animal and plant representations.⁵⁶ The cylinder seal from Kalibangan depicts a scene connected with religious function and includes representation of plant.⁵⁷ The Maski seal shows a scene of an elephant driven by a man with radiating head-dress and protruding mouth.⁵⁸ The Nagpur Museum seal is of foreign origin (West Asia) and does not show any animal or plant representation.⁵⁹ Interestingly enough cylinder seals of Indian style from Ur⁶⁰ and Tell Asmar⁶¹ also show representations of animals and plants. As described above, the cylinder seal from Daimabad depicts animals and plants and in addition a cart or a chariot driven by a horse, the whole representing perhaps an insignia or a trademark.

1. Sunbaked Clay Objects

Five objects of sunbaked clay were recovered from the stratified deposits. Of these, two each have come from Phase II (fig. 109, 2 and 4; pl. CXLII, 3 and 4) and Phase V (fig. 109, 1; pl. CXLII, 1) and one from Phase IV (fig. 109, 3; pl. CXLII, 2). Those from Phase II included one each a cylindrical fragment and a cone. The conical tip and the knob of the latter are broken. The solitary specimen from the Malwa Phase is a short cylindrical nodule which was found placed by the side of vertical stone stump in the Apsidal Sacrificial Temple (see p. 111) perhaps as an offering. It is made of white fine clay. The two clay objects found in the jar by the side of potter's kiln are balls with a short tapering cone. Whether they are excretions of some burrowing animals is being examined.

The illustrated specimens are described below.

Fig. 109; pl. CXLII

1. Ball of clay with a tapering cone. From the decorated vase of a thick coarse ware by the side of the potter's kiln 1, (106/1978-79, Phase V). pl. CXLII, 1.
2. A fragment of cylindrical piece of unbaked clay. (111/1978-79, Phase II). pl. CXLII, 2.
3. A cylindrical nodule of unbaked clay with flattened ends, found by the side of a stone stump at the apse of the Apsidal Sacrificial Temple (103/1978-79, Phase IV). pl. CXLII, 3.

53. B.B.Lal, "Protohistoric Investigations", *Ancient India*, 9, 1953, p.101, pl. XXIV, 4.

54. Mackay, *op. cit.* (1938).

55. C.J. Gadd, "Seals of Ancient Indian style found at Ur", in (ed.) Gregory L. Possehl, *Ancient Cities of the Indus*, (New Delhi) 1979, pp. 115-122; pl. VI, 6 and 7. Mackay, *op. cit.* (1938). Vol. II, pl. LXXXIX, 376 and pl. XCVI, 486.

57. Thapar, *op. cit.* (1979). 58. Thapar, *op. cit.* (1937).

59. Lal, *op. cit.* (1955). 60. Gadd, *op. cit.* (1979).

61. Mackay, *op. cit.* (1938).

4. A carrot-shaped cone of unburnt clay with its pointed tip and the knob partly broken. (83/1977-78, house 20, Phase II). pl. CXLII, 3.

M. Copper Objects

The excavations yielded thirty specimens of copper which included humps as well as slag pieces. The phase-wise distribution was : Phase I two; Phase II three; Phase III two; overlap between Phase III and Phase IV one; Phase IV six; overlap between Phase IV and Phase V three and Phase V thirteen. They can be grouped into five categories, viz. (i) Ornamental objects, (ii) Tools and weapons, (iii) Religious objects and (iv) Miscellaneous objects (Table 9).

Most of the specimens were found in a highly corroded state. Specially the two bangles from Phase I were in so advanced a stage that the encrustation in one of them crumbled very fast so much so that within a short period of a couple of years only a thin wire of one of them was survived. The extant wire also, being beyond the scope of chemical treatment, is likely to be completely corroded leaving behind only the powder of encrustation. The other bangle was also heavily encrusted and was broken into pieces as a result of further corrosion. Only those specimens which could withstand chemical treatment were subjected to it and the rest had to be left without cleaning.

(i) Ornamental Objects

In this group are included bangles (fig. 110, 1-7; pl. CXLIII). Bangles of two materials, viz. copper and shell (below, pp.650-654), were obtained from the excavations. Of the fifteen specimens of copper, including fragments, two have come from Phase I, one of which, as said before, was survived in the form of a fragment of a thin wire, while the other (fig. 110, 1; pl. CXLIII, 1) was broken into pieces due to corrosion. One among the two specimens from the Malwa Phase is a fragment. All the three examples from the overlap phase between Phase IV and Phase V are complete. Of the eight specimens from Phase V, four are complete and the rest fragments. Except one, which is complete and plano-convex in section (fig. 110, 7; pl. CXLIII, 7), all are round in section.

In the complete specimens the ends of one from Phase I touched each other and, excepting one each from Phase IV and Phase V, in which case it is not possible to determine the position of the ends, in one case from the former they seemed to touch each other. In one of the latter type the ends are a little thicker and turned over by hammering while in the other they have been made smooth. The advantage in keeping the over-riding ends appears to be that when the individual is grown up the same bangles could be used by widening its diameter. The diameter of copper bangles from the Savalda levels was 3.5 cm. The two from the Malwa Phase were 3 cm and 6 cm each in diameter. The three specimens from the overlap phase between Phase IV and Phase V have a diameter of 3.5 cm, 6 cm and 6.5 cm each. The measurable diameter in six of the eight specimens from Phase V varied from 3.5 cm

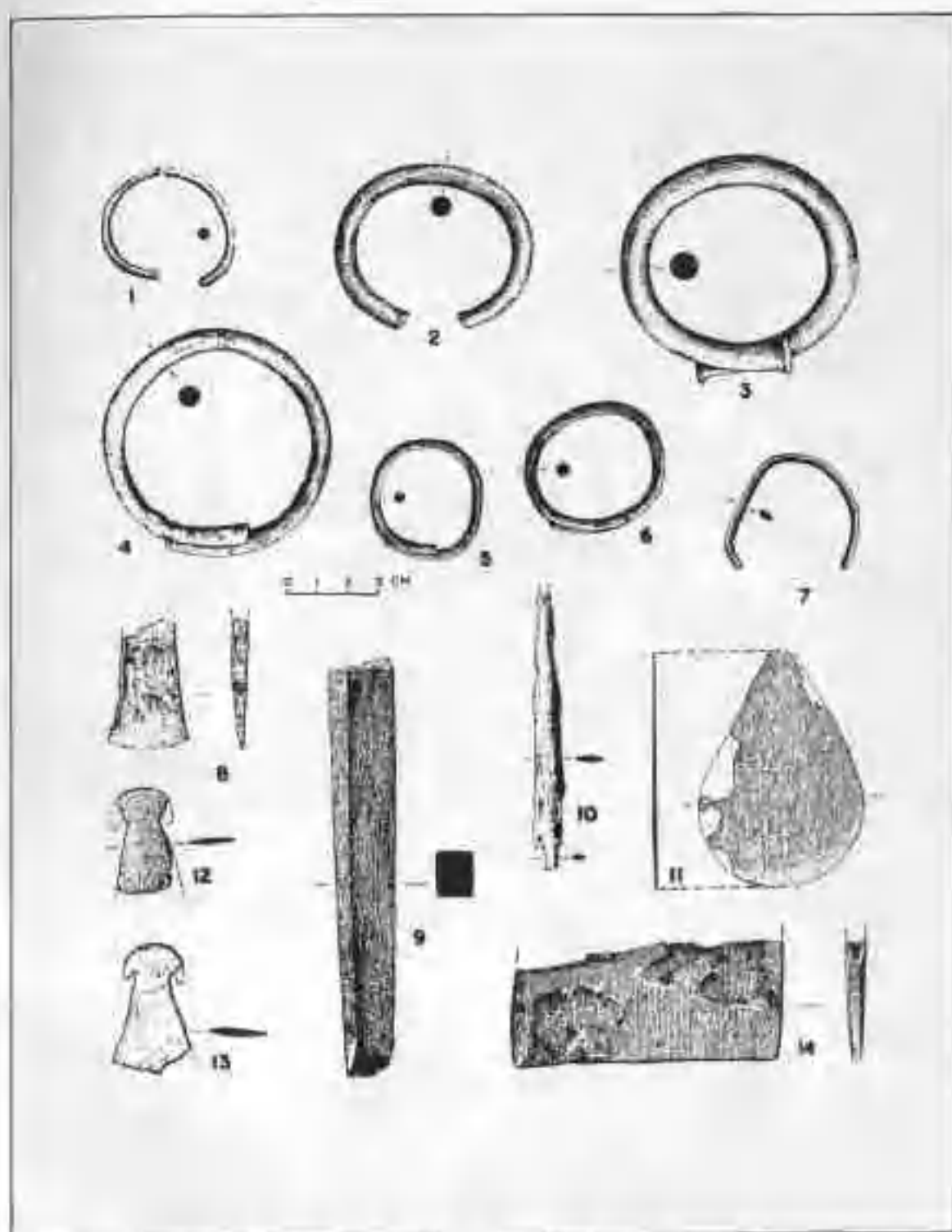


Fig. 110. Copper objects: 1, Phase I; 2, Phase II; 3-11, 14, Phase IV; 8-10, overlap phase between Phase IV and Phase V; 6, 7, 12 and 13, Phase V.

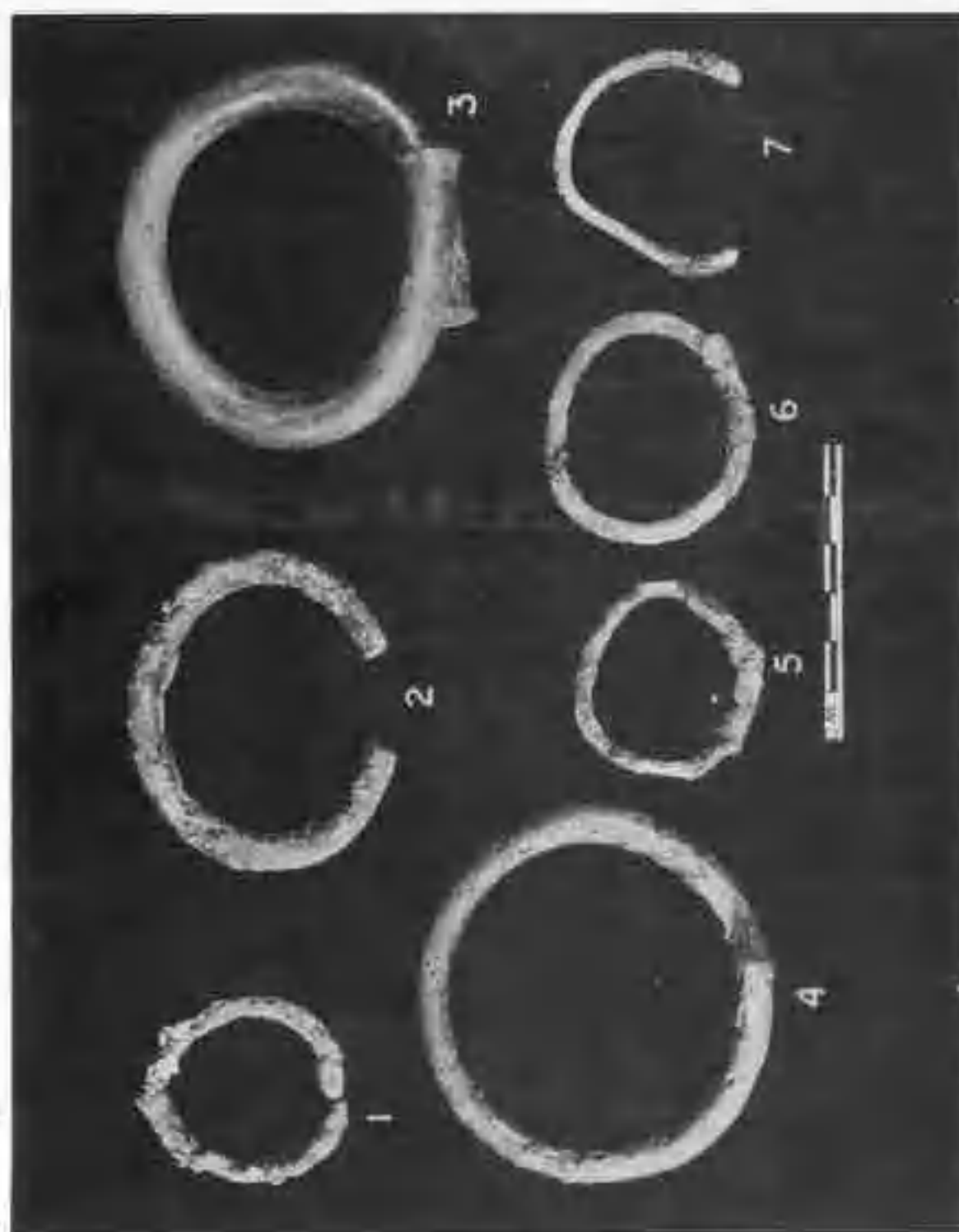


PLATE CXI.iii Copper bangles, 1, Phase I; 2, Phase IV; 3-5, overlap phase between Phase IV and Phase V; and 6 and 7 Phase V.



PLATE CXLIV Copper objects, 8 and 9 mothergoddesses, Phase V; 10 fragment of copper/bronze with, Phase II; 11, silver, Phase IV; 12, flat sheet, Phase IV; 13, razor, Phase IV and 14, spearhead, Phase V.

to 4.5 cm. Their thickness varied from 2.5 mm to 11.5 mm. One specimen each from among these were recovered from the Cluster 1 and the Cluster 6 in the elliptical religious structure of structural phase E (p. 164). Both belonged to children as was evident from 3.5 cm and 4.5 cm diameter respectively. The well-preserved two specimens, both from the overlap phase between Phase IV and Phase V (fig. 110, 3 and 4; pl. CXLIII, 3 and 4), show that they were made out of round bars with smoothened or highly finished surface. The surface of turned over ends is also smooth and circular in outline which point to the high skill of the coppersmiths of this overlap phase. The specimens with bigger diameter of 6.5 cm were made of thick bars and for grown up ladies while for those meant to be used by children thin bar or thick wire was used.

(ii) Tools and Weapons

In this category are included one fragment of the lower end of a celt from Phase II (fig. 110, 8; pl. CXLIV, 10) and a chisel, a spearhead and a heart-shaped razor from Phase IV. The chisel (fig. 110, 9; pl. CXLIV, 11), 14 cm long and 13.5 mm thick, has been hammered out of a rectangular solid rod of copper. Its head, bearing a few hammer-blow marks, is broken, perhaps in the course of hammering. The working edge is convex, bevelled and sharp. Comparable examples are to be found from Nevasa,⁶¹ Chandoli,⁶² Pikhilal,⁶³ Navdatoli⁶⁴ and Mohenjodaro.⁶⁵ The tanged spearhead (fig. 110, 10; pl. CXLIV, 14) when found had a leaf-shaped blade with its tip broken, a mid-rib and a short tang, rectangular in cross-section.⁶⁶ Typologically it resembles those from Chandoli and Mohenjodaro.⁶⁷ The heart-shaped razor (fig. 110, 11; pl. CXLIV, 13) which was recovered from the hearth in the coppersmith's workshop, has a sharp edge produced along the lower broad convex end by hammering.

(iii) Religious Objects

These are two mother goddesses belonging to Phase V. They are made of copper sheets and are heavily corroded. One of them (fig. 110, 12; pl. CXLIV, 2) was found in burial 72, a double-urn child burial, in house 62, and the other (fig. 110, 13; pl. CXLIV, 1) in layer (2) of the trench ZD60 in Sector IV. Both are with a fan-shaped head. The body of the former is slightly wide, whereas that of the latter is flanged as in mothergoddesses of terracotta from Nevasa.⁶⁸ The fan-shaped head resembles in shape the headgear of the mothergoddesses from Mohenjodaro⁶⁹ and Harappa.⁷⁰ The mothergoddesses in metal of the Chalcolithic period from Daimabad are unique having no parallels in the Indian sub-continent.

1. Sankalia, Deo, Ansari and Ehrhardt, op. cit. (1960), fig. 185, 7 and 186, 5.

2. Deo and Ansari, op. cit. (1965), figs. 57, 5, 6 and 59; 2, 3; p. 115.

3. F. R. Allchin, *Pikhilal Excavations*, 1960, pl. 55, 5 and pl. 36, b; 10; p. 107.

4. H. D. Sankalia, B. Subba Rao and S. B. Deo, *Excavations at Mehargarh and Navdatoli: 1952-53*, figs. 108, 34, 10 and 12; also Sankalia, Deo and Ansari, op. cit. (1971), fig. 21, 2, 3.

5. Mackay, op. cit. (1937), pls. CXXI, 7 and CXXIV, 7.

62. In the course of chemical cleaning this specimen was damaged.

63. Deo and Ansari, op. cit. (1965), fig. 57, 9 and fig. 58.

64. Mackay, op. cit. (1937), pl. CXVIII, 9.

65. Sankalia, op. cit. (1974), fig. 189g, 4.

66. Marshall, op. cit. (1931), pl. XCIV 14, pl. XCV, 7, 13 and 27.

67. Vats, op. cit. (1940), pl. LXXVII, 39-42, 44 and 56.

Table 9

Daimabad 1976-79

Phase-wise Distribution of Copper Objects

Phase	I	II	III	Overlap	IV	Overlap	V	Total
Objects				Between III and IV		Between IV and V		
Bangles	2	—	—	—	2	3	8	15
Chisel	—	—	—	—	1	—	—	1
Celt (Fragment)	—	1	—	—	—	—	—	1
Spearhead with tang	—	—	—	—	1	—	—	1
Mothergoddess	—	—	—	—	—	—	2	2
Rectangular Piece	—	—	—	—	—	—	1	1
Trapezoidal Piece	—	—	1	—	1	—	—	2
Heart-shaped razor	—	—	—	—	1	—	—	1
Wire	—	—	—	1	—	—	1	2
Lump	—	1	—	—	—	—	1	2
Slag	—	1	1	—	—	—	—	2
Total	2	3	2	1	6	3	13	30

(iii) *Miscellaneous Objects*

In these are included flat rectangular and trapezoidal (fig. 110, 14; pl. CXLIV, 12) pieces of sheets, a wire, tiny lumps and slag. The rectangular flat sheet has come from Phase V, one trapezoidal piece each from Phase IV and Phase V, one piece each of wire from overlap phase between Phase III and Phase IV and Phase V and one lump each of slag from Phase II and Phase V. Both the pieces of slag have been sent for chemical analysis.

The following examples are illustrated.

Fig. 110; pls. CXLIII and CXLIV.

1. Bangle of round section. From Phase I (84/1977-78), pl. CXLIII, 1.
2. Bangle of round section with unconnected ends. From Phase IV, (1/1977-78), pl. CXLIII, 2.
3. Bangle made of thick bar of a round section with overlapping turned-over ends. From overlap phase between Phase IV and Phase V, (110/1977-78), pl. CXLIII, 3.
4. Bangle of a round section with overlapping slightly thicker ends. From overlap phase between Phase IV and Phase V, (44/1978-79), pl. CXLIII, 4.
5. Bangle of a round section with over-riding ends. From overlap phase between Phase IV and Phase V, (46/1978-79), pl. CXLIII, 5.
6. Bangle of a round section with overlapping ends. From Phase V, (120/1976-77), pl. CXLIII, 6.
7. Bangle of a plano-convex section with unconnected ends. From Phase V, (578/1973-76), pl. CXLIII, 7.
8. Fragment of the lower end of a celt. From Phase II, (128/1976-77), pl. CXLIV, 10.
9. A chisel made on rectangular rod with bevelled convex working edge. From Phase IV, (46/1978-79), pl. CXLIV, 11.
10. A spearhead with a mid-rib and a tang. From Phase IV, (37/1977-78), pl. CXLIV, 14.
11. Heart-shaped cutting tool or razor with sharp edge along the lower broad convex end. From Phase IV, (51/1977-78), pl. CXLIV, 13.
12. Mothergoddess with a fan-shaped head and slightly wide body. From burial 72 in house 62 of Phase V, (116/1978-79), pl. CXLIV, 9.
13. Mothergoddess with a fan-shaped head and flanged body. From Phase V, (107/1978-79), pl. CXLIV, 8.
14. Trapezoidal flat sheet of rectangular section. From Phase IV, (43/1978-79), pl. CXLIV, 12.

N. Beads

1. INTRODUCTORY

The excavations have yielded seven hundred fifty-four beads, including sixteen pendants

Table 10

Daimabad, 1976-79

Phase-wise Distribution of Beads Classified According to Material

Material Phase	Steatite	Carnelian	Coral	Shell	Ternucolla	Unbaked Clay	Chalcedony	Onyx	Agate	Hyacinth crystal	Altered Amalgam	Jasper	Paste	Opal	Gold	Falconite	Ivory	Black Basalt	Total
V Jorwe Culture	47	28	100	11	8	10	2	5	3	3	2	1	1	—	1	1	—	1	223
Overlap	—	—	—	4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4
IV Malwa Culture	327	32	1	5	4	—	—	—	—	—	—	1	1	—	—	1	—	—	371
Overlap	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
III Daimabad Culture	—	116	5	8	—	—	1	—	1	1	—	—	2	—	—	—	—	—	134
II Late Harappa Culture	—	4	—	5	2	—	3	—	—	—	—	—	—	—	2	—	1	—	17
I Savalda Culture	1	1	—	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	4
Total	375 50	182 24.1	106 14.1	34 4.5	15 2	10 1.4	6 0.9	5 0.7	4 0.5	4 0.5	2 0.2	2 0.2	2 0.2	2 0.2	3 0.3	2 0.2	1 0.1	1 0.1	754 100

(Figures in italics represent percentage)

Table 11

Daimabad 1976-79

*Phase-wise Distribution of Beads Classified
According to Shape*

Phase \ Shapes		I	II	III	Q	IV	0	V	Total
Spherical		—	—	—	—	4	—	110	114 15.2
Oblate		—	—	—	—	—	—	5	5 0.4
Barrel	Long Circular	—	3	13	—	26	—	32	74 9.8
	Standard Circular	—	2	85	—	—	—	1	88 11.8
	Short Circular	—	1	—	—	24	—	6	31 4.1
Truncated Bicone Cylinder	Short Circular	—	2	1	—	1	1	2	7 0.9
	Standard Circular	—	—	3	—	2	1	7	13 1.7
	Long Circular	1	—	—	—	1	—	2	4 0.5
	Short Circular	1	2	—	—	97	1	2	103 13.7
	Standard Circular	—	2	20	1	1	—	9	33 4.5

	Plate Shapes	I	II	III	Q	IV	Q	V	Total
Dise	Truncated cone square	—	—	2	—	—	—	—	$\frac{2}{0.2}$
	Double Chamfered with one side Concave	1	—	—	—	—	—	—	$\frac{1}{0.1}$
	Cylinder	—	—	2	—	203	—	—	$\frac{205}{27.5}$
	Cone with Concave Sides	—	—	1	—	—	—	—	$\frac{1}{0.1}$
	Barrel	—	—	3	—	—	—	—	$\frac{3}{0.4}$
	Oblate	—	—	—	—	—	—	1	$\frac{1}{0.1}$
	"Wheel" type	1	—	—	—	7	—	12	$\frac{41}{5.3}$
	Biconvex Circular	—	—	—	—	1	—	2	$\frac{3}{0.4}$
	Standard Oval	—	—	2	—	—	—	—	$\frac{2}{0.2}$
	Segmented (Triple)	—	—	—	—	1	—	—	$\frac{1}{0.1}$
	Ellipsoid	—	—	—	—	—	—	1	$\frac{1}{0.1}$
	Long Elliptical	—	—	—	—	—	—	1	$\frac{1}{0.1}$

<i>Phase</i> Shapes		<i>I</i>	<i>II</i>	<i>III</i>	<i>Q</i>	<i>IV</i>		<i>V</i>	<i>Total</i>
Arcuate		—	—	—	—	—	—	1	1 0.1
Pendant		—	5	1	—	3	—	7	16 2.2
Cave Shell		—	—	—	—	—	1	2	3 0.4
Unfinished	Polygonal	—	—	—	—	—	—	1	1 0.1
	Long Truncated Bicone Circular	—	—	1	—	—	—	—	1 0.1
	Long Barrel	—	—	—	—	—	—	1	1 0.1
Total		4	17	194	1	1.371	4	223	754

(Figures in *italics* represent percentage)

and three unfinished specimens. Besides, eleven beads were collected from surface.⁶⁸ The stratified specimens were recovered from the houses, burials and cultural debris. The presence of unfinished specimens indicates that beads were manufactured locally. The phase-wise distribution was as follows : Phase I four; Phase II seventeen; Phase III one hundred thirty-four; overlap phase between Phase III and Phase IV one; Phase IV three hundred seventy-one; overlap phase between Phase IV and Phase V four and Phase V two hundred twenty three (Table 10).

The material used for manufacturing beads is varied and includes, besides semi-precious silicious rock-material such as carnelian, agate, chalcedony, jasper, onyx and opal, such simple stones as black basalt and Hydrothermally Altered Amygdaloidal Basalt (also called fine-grained basalt), in well as gold, steatite, coral, paste, faience, shell, terrapotta and unbaked clay. Gold, steatite, coral and sea shell are not locally available. The beads of gold have come from Phase II and Phase V. The nearest known source of gold is the gold mines in southern Deccan. It is, however, not unlikely that placer gold was obtained for this purpose. Steatite is available in the southern Deccan as well as in the region of Gujarat whereas sea shell, estuarine shell and coral were probably obtained from the coastal region of Saurashtra. Onyx, a more valuable material than carnelian, was probably obtained from the Rajpipala area. The other materials are locally available. Carnelian is found in the form of nodules in the gravel bed of the river Pravara as well as veins in the basalt beds. Besides, this material can also be artificially prepared by heating agate and chalcedony nodules, which are available in plenty in the river bed, in the sun and baking them in fire or crowding in pots, as is done even now a days by the agate traders of Cambay. While all these possibilities cannot be ruled out, examination of the specimens seems to suggest that those beads showing banded structure from particularly Phase V, were probably the conversions of banded agate. The colours of this material included orange, red, yellowish and their different shades. Some of the specimens show only faint shades of these colours. Whether artificial carnelian was made locally or was obtained from the region of Rajpipala in Gujarat is difficult to say with certainty. Nodules of jasper and occasionally of opal are also found in the river bed. The basalt and its varieties are easily available locally. Faience and paste might have been prepared by the local lapidaries.

The beads of steatite are maximum in number, being three hundred seventy-five. While Phase I has yielded only one specimen, from the Phase IV were recovered three hundred twenty-seven specimens and Phase V forty-seven. The prominent type in this material was the cylinder disc of which two-hundred three examples have come from the burial 75. The next type in importance was short truncated bicone of which ninety-seven specimens were found. The "Wafer" or "Wheel" type disc variety has been represented by thirty three specimens out of which one has come from Phase I and thirty-two from Phase V. The fourth type in the steatite head is barrel circular in which short barrel variety has been represented by twenty-nine specimens and long barrel by three. The seven of the disc beads from Phase IV are 1 mm thick and vary in external diameter from 2 to 3 mm. The steatite beads from the child

68. The surface finds have been excluded from the percentage analysis.

burial (75) of Phase IV markedly differ techno-typologically from the wheel-type of Phase I and Phase V in that they appear to have been manufactured by using the method as explained by Hedge and others.⁶⁹ The wheel-type shows cut-marks on both the faces which suggested that such beads were cut up into segments out of a shaped steatite rod by means of a saw.⁷⁰ All the beads of steatite are white in colour and quite hard which features are the result of complete dehydration of the steatite by heating at 900 to 1000° in a kiln.⁷¹

Next in order is carnelian of which one hundred eighty-two specimens were found. This material was used in all the phases at Daimabad. Phase I yielded only one specimen whereas Phase II four. Maximum number of beads, one hundred sixteen, have come from Phase III from two hoards. From the overlap phase between Phase III and Phase IV only one specimen was obtained. Thirty-two specimens were recovered from Phase IV and twenty-eight from Phase V in which is also included one unfinished specimen (fig. 113, 1; pl. CL, 1; see also Table 10). The most common type in this material was barrel, the total number of beads of which were one hundred forty-one, among them fifty-four being long barrel and eighty-seven standard barrel. The standard cylinder comes next being represented by twenty specimens. The spherical type is represented by five specimens. There are only two examples of pendant in this material, both from Phase V. Apart from these, there is one specimen each of long elliptical, oblate disc and the unfinished long polygonal types.

Beads of coral were found only in Phases III, IV and V. In the total of one hundred six specimens five have come from Phase III, one from Phase IV and the rest from Phase V which are all spherical and were collected from the patch of a floor of a damaged house of structural phase C in Sector I. The solitary specimen from Phase IV is short cylinder disc. Those from Phase III include three of standard cylindrical and one each of long barrel and barrel disc types. The spherical specimens from Phase V are small.

The kinds of shell used for preparing beads included conch-shell, estuarine shell of *Olivus* sp.; cowrie shell and fresh water shell. Important aspects of this material are that it has been used in all the phases and largest number of shapes have been represented in it (Table 11). Of the thirty-four specimens of shell only one has come from Phase I, five were recovered from the levels of Phase II, eight from Phase III, five from Phase IV, four from overlap phase between Phase IV and Phase V and eleven from Phase V. Three belong to cowrie shell, nine of estuarine shell, one of fresh water shell and twenty-one of conch shell. The varieties of shell beads are tabulated in Table 11. The presence of specimens of shells of coastal origin in all the phases indicates that throughout the Chalcolithic period the inhabitants of Daimabad maintained trade relations with their contemporaries in the region of Saurashtra sea coast. The examples particularly from Phase II are important, for, in the five specimens recovered, four are pendants. The surface of one has been very much worn out and it appears, it was used for more than one generations (fig. 112, 13, pl. CXIV, 18). Interesting in the conch shell specimens is a finely sawn piece (fig. 118, 1; pl. CLIII, 1) found in the courtyard of house 12

69. K.T.M. Hegde, R.V. Karanth and S.P. Sychanthawong, "On the composition and Technology of Harappan Micro-beads, in (ed.) Gregory L. Possehl, op. cit. (1982), pp. 239-245.

70. Earnest Mackay, "Bead Making in Ancient India", *Journal of the American Oriental Society*, Vol. 57, 1937, p. 12.

71. Hegde, Karanth and Sychanthawong, op. cit. (1982).

of Phase I. The clean sawn surface and an oval-shaped hole resulted from the removal of a piece clearly showed that beads were manufactured locally out of sea-shell. Further, the find of an unfinished bead (fig. 115, 17; pl. CLJ, 31) of shell found in house 57 of Phase V also points to the same conclusion. Important among the shell beads from the overlap phase between Phase IV and Phase V are two beads of cylindrical circular type which bear shallow pittings in two rows along their circumference meant for inlay work.

The beads of terracotta were found in all the phases, except in Phase III. They have occurred in small number, being only fifteen. Of these, one specimen comes from Phase I whereas Phase II has yielded two specimens, Phase IV four and Phase V eight. The most common type in this was spherical, represented by four specimens. Of the three biconvex circular specimens, one belonged to Phase IV and two to Phase V. The long barrel circular type was represented by only two specimens, both from Phase II. One each of cylindrical type was recovered from Phase I and Phase V and of truncated bicone from Phase IV and Phase V. A solitary pendant (damaged) in this material was obtained from phase IV (fig. 114, 15; pl. CXLVIII, 7). An interesting specimen in the terracotta is arecanut type which has come from the upper levels of the Jorwe Culture (fig. 117; 48, pl. CLII, 31). The ten beads of sunbaked clay occurred in two types, truncated bicone and spherical, all in Phase V.

The banded variety of agate was represented by four specimens, out of which one was recovered from Phase III and three from Phase V. All these belonged to long barrel circular type.

Onyx accounted for five specimens, all from Phase V and of long barrel circular type (fig. 115, 19 and 21-24; pl. CE, 7, 12, 15, 19 and 23).

The milky variety of chalcedony has been represented by six beads, three of which were recovered from Phase II, one from Phase III and two from Phase V. They occurred in cylindrical circular, barrel circular, truncated bicone and oblate types. A cylindrical circular type from Phase II bears on its circumference ten shallow pittings as in the shell beads of the overlap phase between Phase IV and Phase V mentioned above, made for inlay work, most probably in gold.

The use of Hydrothermally Altered Amygdaloidal Basalt in red and green colours, a simple or non-precious rock-material, which has been represented in two phases, III and V, by four specimens in all, one from the former and three from the latter, and the black basalt, of which only one specimen from the Jorwe levels has been found, is interesting. It seems more likely that beads of such non-precious or simple rock material were used by poor people rather than the elite.

Gold accounted for three and jasper, paste, opal, faience two beads each. The types in gold were short truncated bicone, standard barrel circular and long barrel circular, the first two, of small size, being from Phase II (fig. 112, 12 and 14; pl. CXLV, 12 and 13) and the last, a tiny specimen, from Phase V (fig. 116, 38; 38; pl. CL, 24). Those in jasper were truncated bicone and barrel circular; in paste only cylindrical circular; in opal truncated cone disc square and in faience segmented cylindrical and barrel circular. Both the beads of opal have come from Phase V whereas one each of paste was recovered from Phase IV and

Phase V. All the beads of opal were found in the hoard from Phase III. The segmented cylindrical bead of faience which comes from Phase IV has three segments. The barrel-shaped bead of this material was recovered from Phase V.

The single specimen of a boat-shaped pendant of ivory was obtained from the Late Harappan levels (fig. 112, 9; pl. CXLV, 14).

The analysis of the shapes has indicated that maximum number of beads belonged to barrel, cylinder and biconvex types. This was perhaps because these shapes were easy to make. They were, therefore, used by common man, being perhaps cheaper than the ones which required more skill in their making. These latter were probably used by the selected.

Positive evidence suggesting that beads were manufactured locally has come from Phases I, III and V. There is no evidence in this regard from the Harappan levels. Yet, it cannot be said that beads were not made locally during this phase. The terracotta beads seem to have been made locally. So far as the Phase IV is concerned the beads of steatite recovered from the burial were perhaps made at Daimabad out of steatite paste. The two unfinished specimens from Phase V, one each from house 57 and house 64, have enabled us to identify the houses of beadmakers, although no raw material or waste as also beadmaking equipment were found. The unfinished bead of red basalt of Phase III was recovered from the cultural debris and yet it is evident from it that beads were locally manufactured even during this phase. Although the occurrence of beads of unbaked clay in various levels in Sector I including that from house 4 is no less interesting it is not possible to say that these levels belonged to bead-making workshops. Making of such simple beads out of clay and baking them in a simple hearth may have been a handiwork of either ladies or children in the family and not a specialised job to be dealt with by professional lapidaries.

The examination of the holes drilled in the beads showed that in majority of the cases they were bored from two ends. This is indicated by two types of features: (1) diameter of the hole at one end differed from that at the other end and (2) the holes do not run straight; they are either a little curved or they make an angle at a point where the holes bored from two sides meet. There are, however, examples in which the diameter at both the ends is uniform. In Phase I the steatite bead of 4 mm diameter has $\frac{1}{2}$ mm wide hole. The hole on one side of the shell bead measured $3\frac{1}{2}$ mm in diameter and that on the other side 4 mm. The bead of carnelian has a 2 mm wide hole at one end whereas at the other end it is $2\frac{1}{2}$ mm. In the boat-shaped pendant of ivory from Phase II the hole has been bored horizontally in the centre. A close examination of both the ends of this hole showed that it has been bored from both ends. This has been indicated by the ripple marks or the tiny flake scars resulted in the course of boring the hole from each end. The hole in the carnelian bead (long barrel circular) is uniform bearing $3\frac{1}{2}$ mm in diameter. The holes in the beads of this phase vary from $1\frac{1}{2}$ mm to $3\frac{1}{2}$ mm in diameter. In Phase III the diameter of the holes bored varied from 1 to $3\frac{1}{2}$ mm. In the disc beads of opal and shell the hole has been bored from one side only with a drill having a pointed tip of 1 mm diameter gradually thickening upwards. This has been indicated by 1 mm diameter of the hole at one end and a 2 mm wide step in the hole at the other end. In the beads of Phase IV the holes varied in diameter from 1 mm to $3\frac{1}{2}$ mm. In one

of the specimens of carnelian, short truncated bicone, it was observed that the hole has been bored from both the ends but it is not uniform throughout. That bored at one end is 2 mm in diameter whereas that on the other end 2½ mm. But at the point where these two meet the hole is less than 1 mm. It therefore appears that the hole was bored from both the ends by using pointed drills with the point of different diameters and besides, the tip of each was less than 1 mm in diameter. In the overlap phase between Malwa and Jorwe phases the diameter of holes varied from 1½ mm to 2 mm. In Phase V the smallest hole was ½ mm in diameter in the small spherical beads of coral whereas the largest was 7½ mm in one of the wafer-beads of steatite. Examination of the cylinder bead of black basalt showed that the hole at one end measured 3 mm whereas that at the other end measured at its mouth as much as 6 mm decreasing inside to 3½ mm. The unfinished long polygonal bead of carnelian has a hole 2½ mm in diameter throughout which suggests that apart from there being pointed drills broadening upwards, there were also pointed drills having uniform thickness and cylinder shape. The hole in the carnelian pendants has been bored from both the sides and as a result it has achieved an hour-glass section. The study of the holes in the beads has thus revealed that hole of 7½ mm in a steatite wafer-bead was an exception or a rare example whereas the most common ranged between 1 mm and 3½ mm.

Further it was also observed that not all the holes bored were circular in shape, there being slightly ovaloid holes in the examples from all the phases. It has been suggested, on the basis of experimental studies, that the holes with excellent circular outline were the result of use of bow-drill and the ovaloid by the use of hand drilling.⁷² It is difficult at this stage to say as to whether any of the drills of stone found in the excavation could have been used for drilling holes in the beads, although the use of stone micro-drills with suitable sharp drill heads might have been used for boring holes in the beads by the lapidaries of Daimabad.

(a) Phase I

Only four beads were found in the levels of Phase I, one each of shell, steatite, carnelian and terracotta. Those of shell and steatite were found in Room C of house 11, while the one of carnelian has come from the courtyard of house 12 and that of terracotta from the courtyard of house 11. Each of these belonged to a distinct type, that of the shell is double chamfered disc with one side concave, the steatite bead is disc-shaped or "wheel" type or "wafer" whereas the carnelian bead is short truncated bicone circular and the terracotta long cylindrical circular.

A noteworthy feature of the bead of shell (fig. 111, 1; pl. CXLV, 1) is that it was made out of a conch shell and has a lustrous smooth worn out surface all over, apparently the result of the use of the bead for a long time, may be even by more than one generations. The colour of the bead has turned a little brownish perhaps because of aging. One of its surfaces is flat

72. A. John Gwynnett and Leonard Goulet, "An Ancient Repair on Cycladic Statuette Analysed Using Scanning Electron Microscopy," *Journal of Field Archaeology*, Vol. 10, No. 3, 1983, pp. 378-384.

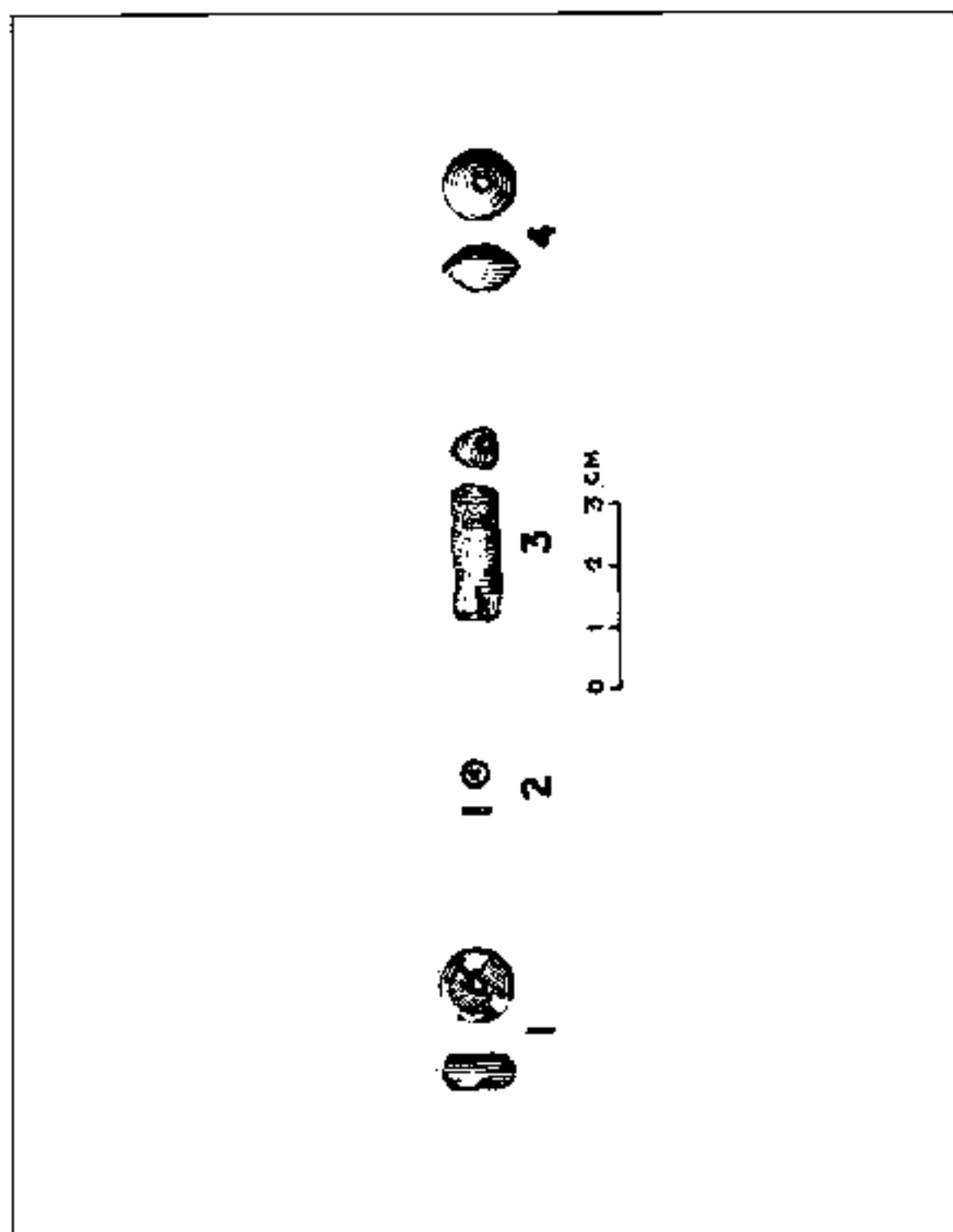


Fig. 111. Neolith, Itanum 1.

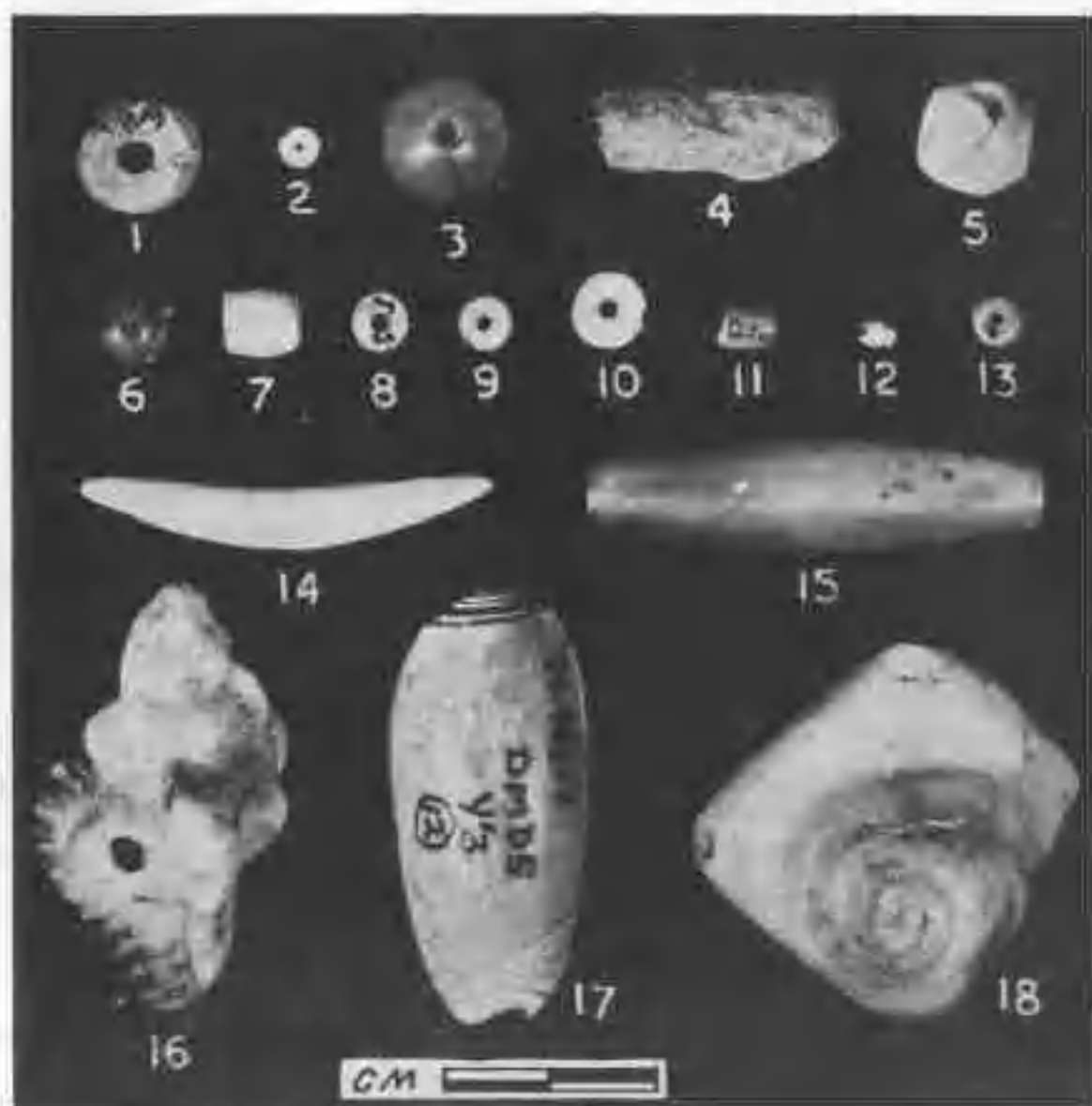


PLATE CKLV Beads: 1-4 Phase I and 5-18 Phase II.

and other with a little depression. The hole in the centre was drilled from both the sides. That drilled from the concave surface is oblique but meets that from the other side. The two depressions on the edge of each side of the bead appear to be the natural depressions or defects in the shell itself although a couple of them are in the shape of an eye.

The presence of steatite bead (fig. 111, 2; pl. CXLV, 2) in this phase is equally interesting. Close examination of both the surfaces under magnifying glass showed distinct cut-marks of saw.

The specimen of carnelian is light red in colour and finely ground and polished. Its hole has been pierced from one side only (fig. 111, 4; pl. CXLV, 3).

The bead of terracotta is fragmentary. It is made out of fine clay which has been turned light brownish red due to firing. Its surface is very much weathered (fig. 111, 3; pl. CXLV, 4).

The occurrence of shell and steatite beads is quite interesting in view of the fact that none of these materials is available in the region of Maharashtra and as such their presence clearly shows trade contacts of the Savaldans of Daimabad with the contemporaries outside the region. The source of shell is the Saurashtra sea coast of Gujarat and that of steatite the southern Deccan as well as Gujarat. Carnelian is available in the Deccan Trap formations.

During the times of this phase beads appear to have been manufactured locally at Daimabad itself. This has been suggested by the find, from the courtyard of house 12, of a piece of conch shell with a finely sawn surface and an ovaloid hole resulted from the removal of piece of the same shape apparently for preparing a bead out of it (fig. 118, 1; pl. CLIII, 1).

The beads are illustrated.

Fig. III; CXLV, 1-4

1. Shell: Double chamfered disc with one side concave. Room C of house 11, Phase I (47/1977-78), pl. CXLV, 1.
2. Steatite: Disc. Room C of house 11, Phase I (47A/1977-78), pl. CXLV, 2.
3. Terracotta: Long cylindrical circular. Courtyard of house 11, Phase I (54/1977-78), pl. CXLV, 4.
4. Carnelian: Short truncated bicone circular. Courtyard of house 12, Phase I, (135/1976-77), pl. CXLV, 3.

(b) Phase II

From the levels of Phase II seventeen beads were recovered. Of these, five were of shell, four of carnelian, three of chalcedony, two each of gold and terracotta and one of ivory (Table 10). Beads of this phase display superb skill of the craftsman and the taste for fine quality ornaments of the Harappans.

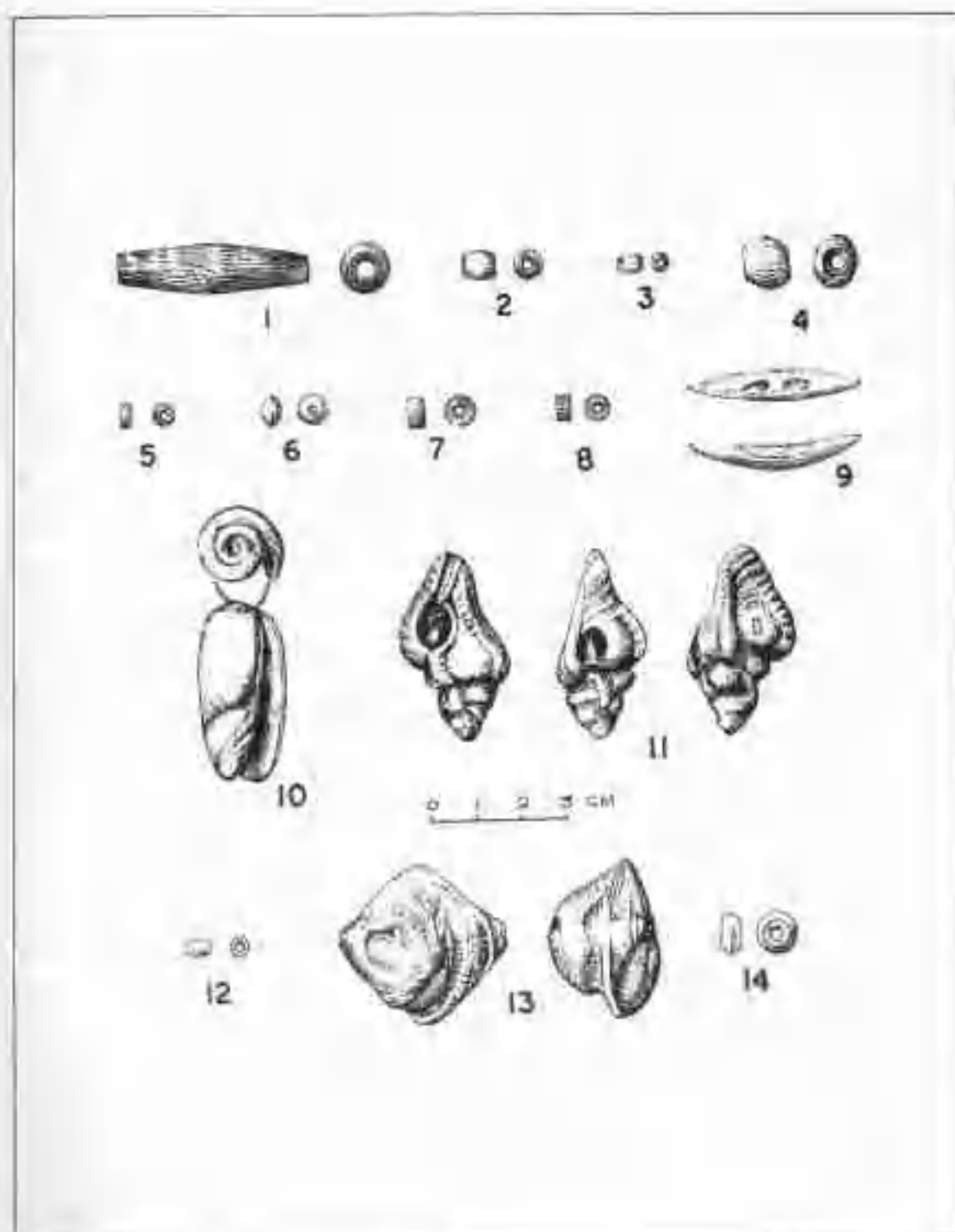


Fig. 117. Shell, Phase II. (Scale of 12 and 14— $\frac{2}{1}$)

The example of ivory deserves special mention as it is a unique boat-shaped pendant (fig. 112, 9; pl. CXLV, 14). It has been very well ground and smoothed. The horizontal hole in the middle of the flat concave upper surface has been so skilfully drilled obliquely from two sides, as the direction of shallow skinning flake scars in the depressions at either end suggest, that when hung the pendant remains in a perfectly horizontal position. The U-shaped skinning flake scars indicated that the hole was bored in this artifact by a chisel-ended tool rather than a drill. It is interesting to note that the depression at either end of the hole is eye-shaped. While in use these two "eyes" would have cast their look at the face of the wearer. This feature of the specimen also suggests that it might have been used even as a charm. It is very well known that Harappans were engaged in sea trade and that they were quite familiar with boats. It is, therefore, no wonder that the shape of a boat was given to the bead. It is not unlikely that the wearer of this pendant might have been intimately connected with a boat. A near parallel to this can be cited from Mohenjodaro⁷³ which is of faience and has been described as terminal of a necklace. It is crescent-shaped, has two vertical holes, instead of a horizontal one as in the specimen from Daimabad, and is rectangular in plan from the top as against lenticular of the latter.

In the shell beads is an interesting specimen of a pendant of sea shell, (fig. 112, 13; pl. CXLV, 18) which is physically worn out. Its physical condition clearly indicated that it was used over and over again for more than one generations. The third pendant in the collection is of estuarine shell of *Ostrea* sp. (fig. 112, 19; pl. CXLV, 17). From among the shell beads of Phase II of Daimabad, the one (fig. 112, 4; pl. CXLV, 5), standard truncated bicone circular, can very well be compared with an identical type from Mohenjodaro⁷⁴ which occurred there very frequently.⁷⁵ Apart from the above mentioned beads of sea shell, there is also one specimen of a pendant of fresh water shell of *Gasterepod* sp. (unillustrated).

Next in importance in this phase were the beads of carnelian which have been represented by four specimens. Among these, two are of exceptional interest. One of these the short truncated bicone circular (fig. 112, 6; pl. CXLV, 6), is an exquisite example of a stud as is indicated by the remnants of copper accretion still adhering to one of its sides. The small size of it indicated that it could have been used as either a nose or an ear ornament. The bead has a hole meant apparently for fitting the wire or tube attached to the copper-stud by soldering. Gold studs have been reported from Mohenjodaro⁷⁶ but not of copper and yet the analogy is worth noting. The biggest among the carnelian beads in the assemblage is a long barrel circular specimen (fig. 112, 1; pl. CXLV, 15) measuring 41 mm in length. The colour of the material used is deep red with a shade of yellow. It may be recalled that long barrel circular and long barrel-cylinder circular beads of exceptionally long length have occurred

73. Marshall, op. cit. (1923, reprint), Vol. III, pl. CXLVII, 22.

74. Mackay, op. cit. (1937), Vol. II, pl. CXXXVI, 10.

75. Mackay, op. cit., Vol. I, (1938), p. 497.

76. Sir John Marshall, *Mohenjodaro and the Indus Civilization*, Vol. II, (1923, reprint) p. 521.

at Harappa,⁷⁷ Mohenjodaro,⁷⁸ Chanhudaro⁷⁹ and Lothal.⁸⁰ Although the bead from Daimabad cannot be compared in length with those from the Harappan sites, there are also examples from Harappa, Mohenjodaro and Lothal which are about 45 mm in length being thus only 4 mm short. It needs also to be mentioned that so far such beads have not been reported from any known post-Harappan Chalcolithic levels. Among the other carnelian beads one is standard truncated bicone circular and the other short truncated bicone circular, none of which possesses any special feature worth noting.

Of the three beads of chalcedony, the one, short cylindrical circular (fig. 112, 8, pl. CXLV), with ten shallow pittings along its circumference is interesting. There is no identical example from any other chalcolithic site in the Deccan and Central India. However, at Harappa itself one globular oblate bead of white faience with shallow pittings at one end had occurred on Mound F, Great Granary Area.⁸¹ In this case the purpose of shallow pittings has not been recorded. It seems likely that the pittings were filled with metal, perhaps gold, for decorative purpose. Among the other two beads of chalcedony one is short barrel circular (fig. 112, 5; pl. CXLV, 9) and the other short cylindrical circular (fig. 112, 7; pl. CXLV, 10).

The affluence of this community is attested to by the find of two small gold beads, one each short truncated bicone circular (fig. 112, 14; pl. CXLV, 13) and standard barrel circular (fig. 112, 12; pl. CXLV, 12). The former is a unique specimen in which the gold leaf covers a terracotta mould leaving the area around the hole open. An artistic aspect of this specimen is that the gold leaf was cut to the required size and was fixed over the surface of the terracotta bead firmly by hammering the edges of the gold leaf by a very light tool. The second specimen is smaller than the former in size and is comparable with similar specimens from Mohenjodaro.⁸²

The two terracotta beads are no less interesting. Both are long barrel circular and made of fine clay, burnt brownish red in colour. One of these (fig. 112, 3; pl. CXLV, 11) bears part of a finger impression suggesting that they were hand-modelled.

The illustrated beads are described below

Fig. 112; pl. CXLV, 5-13.

- | | | |
|----------------|---|--|
| 1. Carnelian | : | Long barrel circular, (107/1977-78), pl. CXLV, 15. |
| 2. Carnelian | : | Standard barrel circular, house 19, (67/1977-78), pl. CXLV, 7. |
| 3. Terracotta | : | Long barrel circular, (56/1977-78), pl. CXLV, 11. |
| 4. Conch-shell | : | Standard truncated bicone circular, (79/1978-79), pl. CXLV, 5. |
| 5. Chalcedony | : | Short barrel circular, (69/1977-78), pl. CXLV, 9. |
| 6. Carnelian | : | Short truncated bicone circular, (43/1977-78), pl. CXLV, 6. |

77. Vats, *op. cit.*, Vol. II, pl. CXXXI, fig. 1, d and fig. 2, a and b.

78. Marshall, *op. cit.*, Vol. III (1975, reprint), pl. CXIV, 24-32.

79. Mackay, *op. cit.*, (1975, reprint), Vol. II, pl. CXXXVII, 47. Also by the same author *Chanhudaro Excavation*, (1976, reprint), pl. LXXXI, 29-34.

80. Rao, *op. cit.* (1975), fig. 26, 1.

81. Vats, *op. cit.*, Vol. I (1940), p. 436; *op. cit.*, Vol. II, pl. CXXVIII, 47.

82. Marshall, *op. cit.*, Vol. III, (1931), pl. CLI, b, 1.

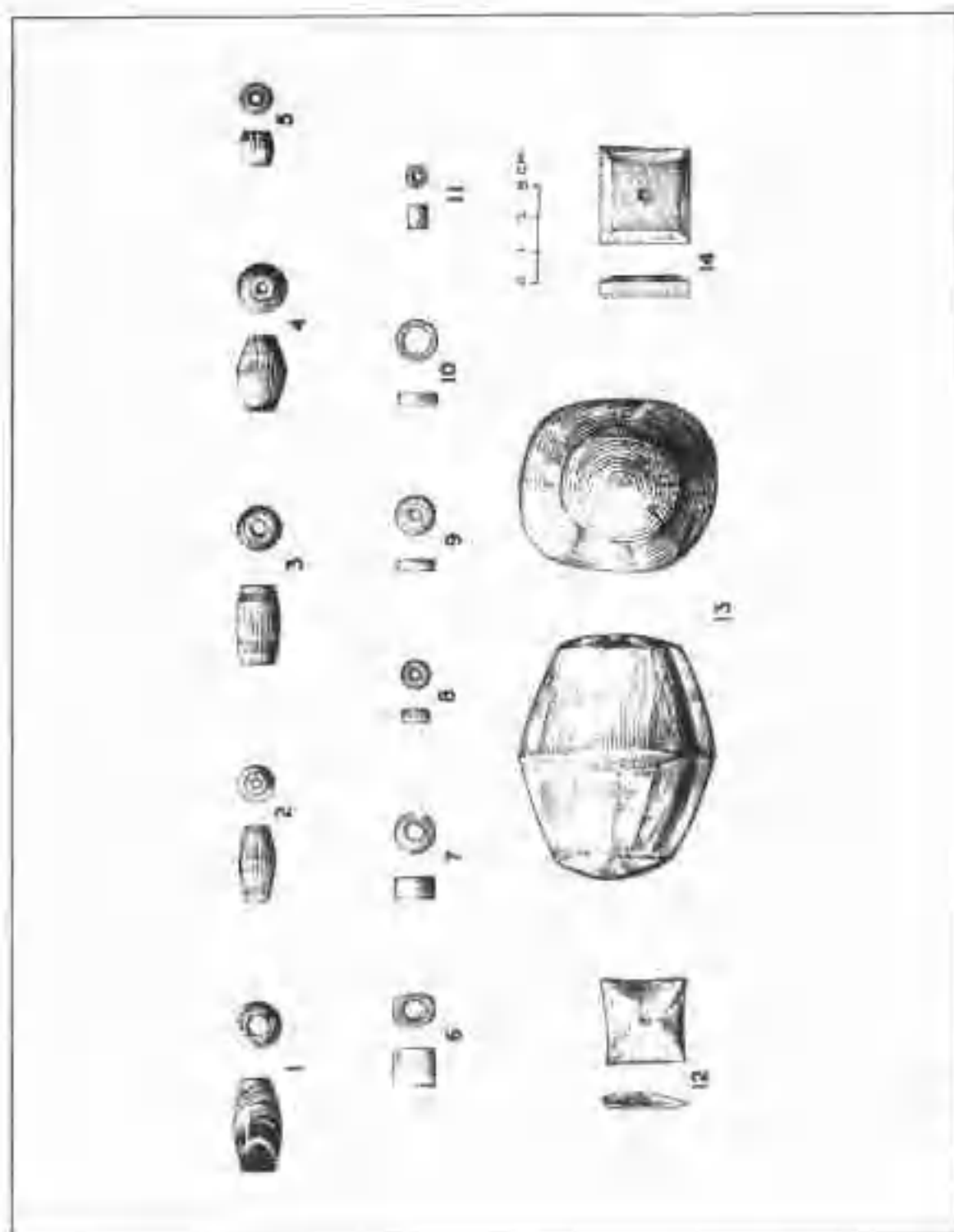


Fig. 133. Beads. Phase III.

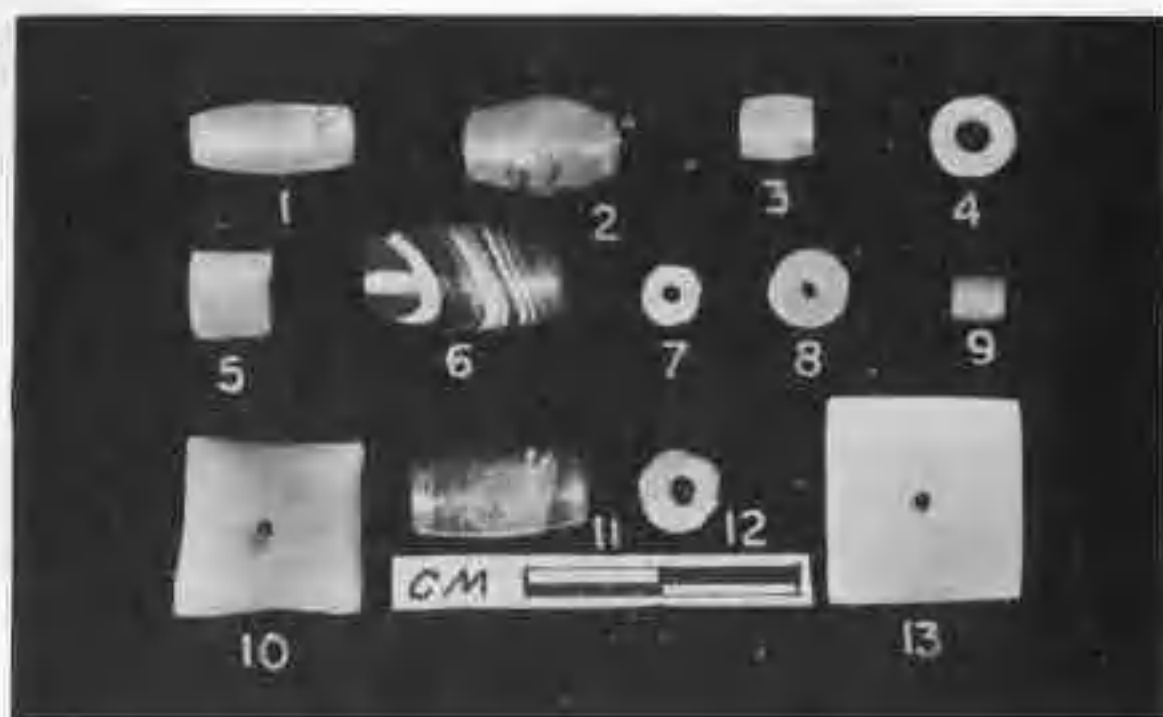


PLATE CXLVI. Beads (Plate III).



PLATE CXLVII. Unfinished bead of red basalt, Plate II.

- | | | | |
|-----|---------------------------|---|--|
| 7. | Chalcedony | : | Short cylindrical circular, (70/1977-78), pl. CXLV, 10. |
| 8. | Chalcedony | : | Short cylindrical circular with pittings, (112/1978-79), pl. CXLV, |
| 9. | Ivory | : | Boat-shaped pendant, (97/1978-79), pl. CXLV, 14. |
| 10. | Shell (<i>Olivu</i> sp.) | : | Pendant, house 17, pl. CXLV, 17. (106/1977-78), |
| 11. | Sea shell | : | Pendant, (695/1975-76), pl. CXLV, 16. |
| 12. | Gold | : | Standard barrel circular, (107A/1976-77), pl. CXLV, 12. |
| 13. | Conch-shell | : | Lozenge-shaped pendant, (89/1977-78), pl. CXLV, 18. |
| 14. | Gold | : | Short-truncated bicone circular (107/1976-77), pl. CXLV, 13. |

(c) Phase III

The assemblage of beads of Phase III, differed from that of the preceding phase in some respects. Firstly, the collection as a whole was marked by mostly the simple varieties as against the sophisticated ones of Phase II. Secondly, carnelian was the most dominant material in the preparation (86.6%) of beads in this phase, the shell acquiring a second place (6.0)%. Thirdly, coral, opal, agate and Fine-grained Red Basalt made their appearance as raw material for the first time. The coral has been represented by 3.8%, opal 1.5%, and agate, chalcedony and red basalt 0.7%, each.

One hundred thirtyfour beads, including one unfinished, belonged to this phase. Among these one hundred seventeen have come as a single hoard placed in one bowl and eleven in another bowl both of burnished grey ware. These bowls were found in the course of clearance of the partly excavated trench HZ 64, about 30 centimeters north of what Rao has called a copper smelting 'furnace'.⁸³ The bigger of the hoards contained new shapes as well as the specimens of coral and opal.

The new types were truncated cone disc square (fig. 113, 14; pl. CXLVI, 13) in opal, long truncated bicone circular in red basalt (fig. 113; pl. CXLVII) represented by only one specimen, barrel disc (fig. 113, 10; pl. CXLVI, 8) in coral and cone disc with concave sides (fig. 113, 12; pl. CXLVI, 10), cylinder disc (fig. 113, 11; pl. CXLVI, 4), standard oval (fig. 113, 6; pl. CXLVI, 5) and barrel disc (fig. 113, 8; pl. CXLVI, 7) all in shell.

In the hoard of one hundred seventeen beads one hundred four are of carnelian, seven of shell, four of coral and two of opal. Among the beads of carnelian eighty-two are standard barrel circular, fifteen standard truncated bicone circular and seven long barrel circular. The colours of carnelian in this hoard included deep red, orange, and their shades. In the beads of shell two each are barrel disc, standard oval and cylinder disc and one of cone-disc with concave sides. One of the four coral beads is barrel disc and three are standard cylinder circular. Both the specimens of opal are truncated cone disc square, one of these being smaller and thinner than the other.

The second hoard of eleven beads was represented by four each of long barrel circular and standard truncated bicone varieties and three of standard barrel circular type, all being

83. Rao, *op. cit.*, (1978)

of carnelian.

The carnelian bead from burial 33 is standard truncated bicone (fig. 113, 4; pl. CXLVI, 2). One specimen of coral (fig. 113, 3; pl. CXLVI, 9) and that of agate (fig. 113, 1; pl. CXLVI, 6) are long barrel circular and the solitary specimen of chalcedony is short cylindrical circular (fig. 113, 7; pl. CXLVI, 6). The unfinished example of fine-grained red basalt is long truncated bicone circular (fig. 113, 13; pl. CXLVII).

The illustrated beads are described below

Fig. 113; pls. CXLVI and CXLVII

1. Agate : Long barrel circular, Phase III. (63/1977-78). pl. CXLVI, 6.
2. Carnelian : Long barrel circular, Phase III. (90/1976-77).
3. Coral : Long barrel circular, Phase III. (117/1976-77). pl. CXLVI,
4. Carnelian : Standard truncated bicone circular, burial 33, Phase III. (42/1977-78). pl. CXLVI, 2.
5. Carnelian : Standard barrel circular, Phase III (90/1976-77).
6. Shell : Standard oval, Phase III. (90/1976-77). pl. CXLVI, 5.
7. Chalcedony: Short cylindrical circular, Phase III. (63/1977-78). pl. CXLVI.
8. Shell : Barrel disc, Phase III. (90/1976-77). pl. CXLVI, 7
9. Coral : Standard cylinder circular, Phase III. (90/1976-77).
10. Coral : Barrel disc, Phase III. (90/1976-77). pl. CXLVI, 8.
11. Shell : Cylinder disc, Phase III. (90/1976-77). pl. CXLVI, 4.
12. Shell : Cone disc with concave sides, Phase III. (90/1976-77). pl. CXLVI, 10
13. Red basalt: Long truncated bicone circular (unfinished), Phase III. (87/1977-78) pl. CXLVII.
14. Opal : Truncated cone disc square, Phase III. (90/1976-77). pl. CXLVI, 13.

(d) Overlap Between Phase III and Phase IV

Only one specimen of carnelian was found in the levels of this overlap phase. The material is of a poor quality of carnelian. The bead is standard truncated bicone circular and showed no special features and hence is not illustrated.

(e) Phase IV

The collection of beads from the levels of Phase IV is richer than any of the Phases at Daimabad. A total of three hundred seventyone beads were recovered from this phase. The material used is steatite, carnelian, shell, terracotta, coral, paste and faience, the last two-named occurring for the first time in this phase. The new types that have emerged for the first time are spherical in carnelian (fig. 114, 5; pl. CXLVIII, 6), segmented circular in

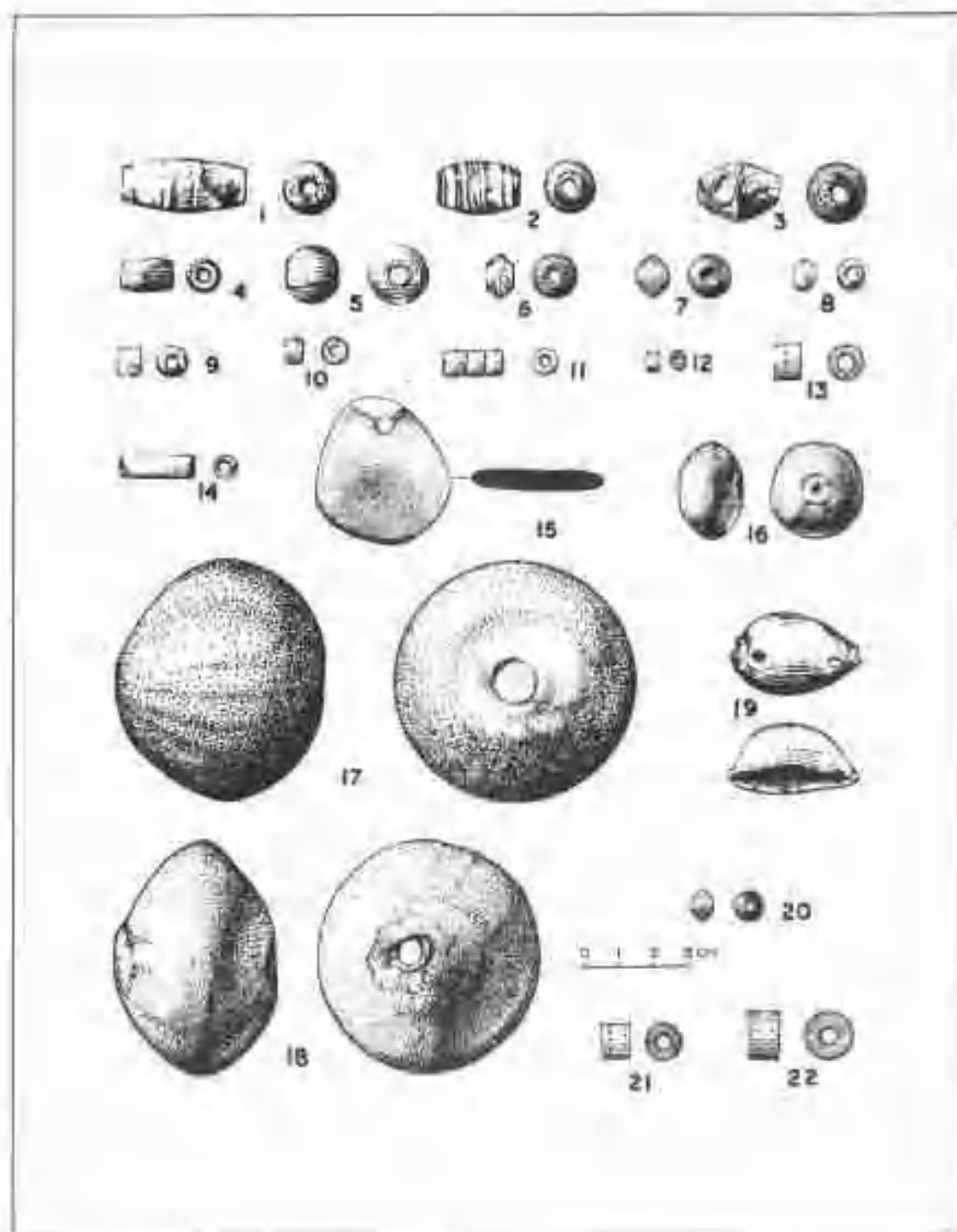


Fig. 114. Beads: 1-13, Phase IV; 19-22, overlap phase between Phase IV and Phase V.



PLATE CXLVIII Beads : 1-6, Phase IV and 17-21, overlap phase between Phase IV and Phase V.



PLATE CXLIX Terracotta beads, Phase IV.

faience (fig. 114, 12; pl. CXLVIII, 16), tubular in paste (fig. 114, 14; pl. CXLVIII, 15) and spherical (fig. 114, 17; pl. CXLIX, 22), biconvex circular (fig. 114, 18; pl. CXLIX, 21), short truncated bicone (fig. 114, 16; pl. CXLVIII, 8) and oval pendant (fig. 114, 15; pl. CXLVIII, 7) in terracotta. Apart from these there is a shell bead, standard cylindrical circular possessing pittings (fig. 114, 13; pl. CXLVIII, 12) very similar to that in Phase II, the only difference in the pittings between these two being that in the present specimen the number of pittings is eleven as against ten on that from the latter, the one extra pitting in the former occurring adjoining another.

The largest number of beads, three hundred twentyseven, are of steatite, carnelian ranking second with thirtytwo examples. The beads of shell, coral, paste and faience were represented by only one specimen each.

Maximum number of beads have come from the burials. Burial 75 has yielded two hundred seventyseven, burial 20 seventytwo and burial 24 one. Houses 32, 33 and 50 yielded one bead each, the remaining coming from the debris of this phase from various trenches. Those from burial 75 included two hundred fiftyfive of steatite and twentytwo of carnelian. All seventytwo beads from burial 20 are of steatite. It is noteworthy that none of the steatite beads from this phase can be classed as disc-shaped or "wheel" or "wafer" type. The types included in this material are cylinder disc, short truncated bicone and short barrel circular. It is not unlikely that the steatite beads in the present collection might have been made locally, the raw material being imported from outside either from southern Deccan, Central India or Gujarat. The most common type in carnelian is long barrel circular, the other types being spherical and short truncated bicone, in the beads of shell are also included pendants and one standard truncated type. The example of coral is short cylinder disc (unillustrated).

The illustrated beads are described below.

Fig. 114; pls. CXLVIII and CXLIX.

- | | | |
|--------------|---|---|
| 1. Carnelian | : | Long barrel circular, Phase IV. (303/1976-77). pl. CXLVIII, 3. |
| 2. Carnelian | : | Long barrel circular, Phase IV. (42/1978-79). pl. CXLVIII, 5. |
| 3. Shell | : | Standard truncated bicone circular, Phase IV. (38/1977-78). pl. CXLVIII, 10. |
| 4. Carnelian | : | Long barrel circular, Phase IV. (35/1978-79). pl. CXLVIII, 4. |
| 5. Carnelian | : | Spherical. Burial 75, Phase IV. (101/1978-79). pl. CXLVIII, 6. |
| 6. Carnelian | : | Short truncated bicone circular, Phase IV. (58/1977-78). pl. CXLVIII, 2. |
| 7. Carnelian | : | Short truncated bicone circular, Phase IV. (102/1976-77). pl. CXLVIII, 1. |
| 8. Steatite | : | Short truncated bicone circular, Burial 25, Phase IV. (101/1978-79). pl. CXLVIII, 11. |
| 9. Shell | : | Standard truncated bicone circular, Phase IV. (673/1975-76). |

- | | | |
|----------------|---|---|
| | | pl. CXLVIII, 9. |
| 10. Steatite | : | Short barrel circular, Burial 20, Phase IV. (142/1976-77).
Pl. CXLVIII, 12. |
| 11. Faience | : | Segmented cylinder circular, Phase IV. (35/1978-79). pl.
CXLVIII, 16. |
| 12. Steatite | : | Cylinder disc. Burial 75, Phase IV. (101/1978-79). pl. CXLVIII,
13. |
| 13. Shell | : | Standard cylindrical circular, Phase IV. house 33. (82/1978/79).
pl. CXLVIII, 8. |
| 14. Paste | : | Long cylindrical circular, Phase IV. (113/1978-79). pl. CXLVIII,
7. |
| 15. Terracotta | : | Oval pendant, Phase IV. house 32. (62/1978-79). pl. CXLVIII, 7. |
| 16. Terracotta | : | Short truncated bicone circular, Phase IV. (81/1978-79). pl.
CXLVIII, 14. |
| 17. Terracotta | : | Spherical, Phase IV. (999/1978-79). pl. CXLIX, 22. |
| 18. Terracotta | : | Biconvex circular. Phase IV. (22/1977-78). pl. CXLIX, 21. |

(f) *Overlap Between Phase IV And Phase V*

Four beads were recovered from this overlap phase. All the four are of shell, one of cowrie shell with two holes and the rest of conch shell. In the shell beads one each is short truncated bicone circular, standard cylindrical circular and short cylindrical circular, the last two examples bearing pittings in two rows (fig. 114, 21 and 22; pl. CXLVIII, 18 and 19), instead of one unlike those from Late Harappan and Malwa levels, apparently for inlay work. The number of pittings in each row varies from that in other, being 11 and 13 in one example and 16 and 17 in the other.

The illustrated beads are described below;

Fig. 114, 19-22; pl. CXLVIII, 17-20

- | | | |
|-----------|---|---|
| 19. Shell | : | Cowrie shell with two holes (32/1978-79). pl. CXLVIII, 20 |
| 20. Shell | : | Short truncated bicone circular. (38/1978-79). pl. CXLVIII, 17. |
| 21. Shell | : | Standard cylindrical, circular (48/1977-78). pl. CXLVIII, 19. |
| 22. Shell | : | Short cylindrical circular. (33/1977-78). pl. CXLVIII, 18. |

(g) *Phase V*

This phase has yielded two hundred twentythree beads including two unfinished examples. In this phase maximum variety of raw material was found used (Table 11). Beads of onyx, jasper, black basalt and unbaked clay have appeared for the first time. Maximum num-

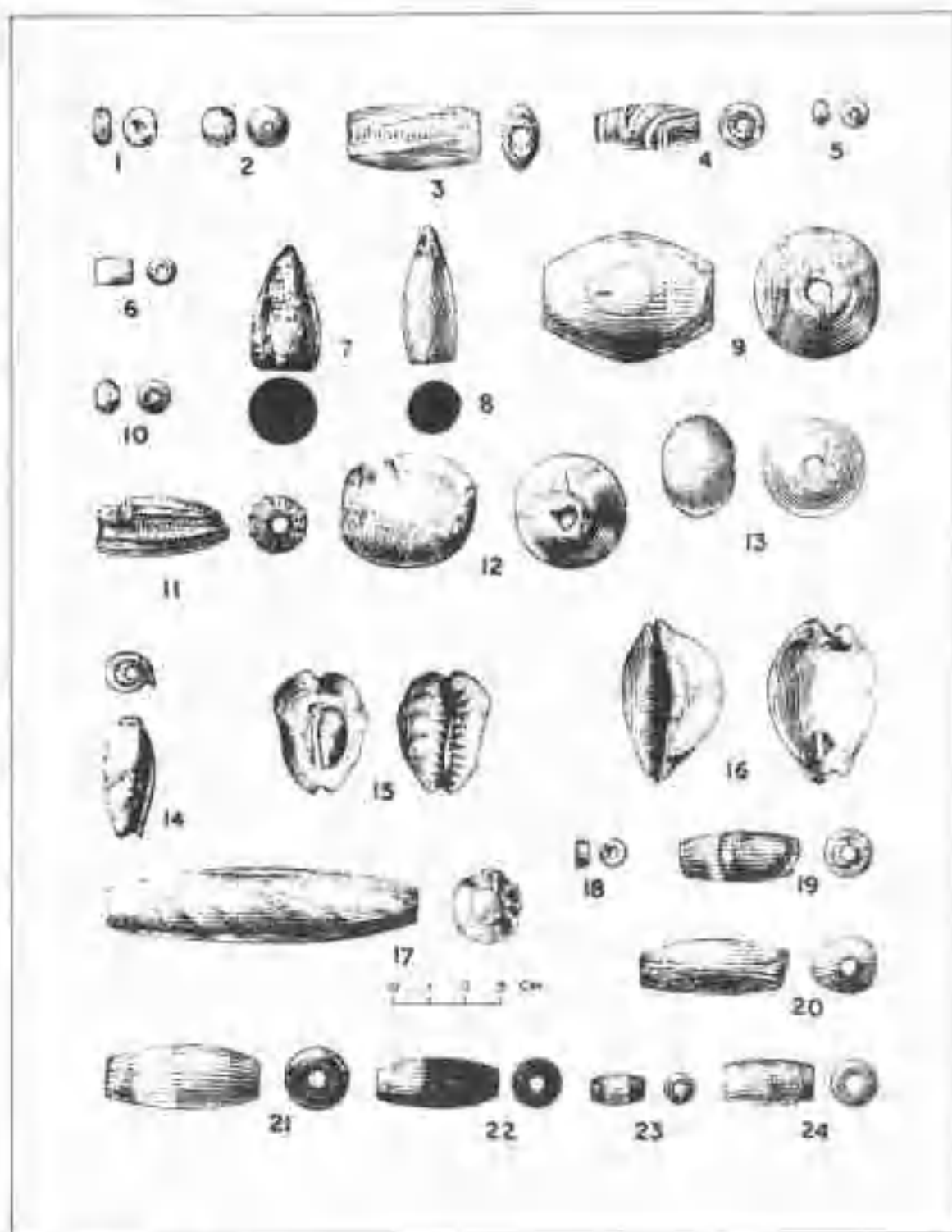


Fig. 115. Beads. Phase V.

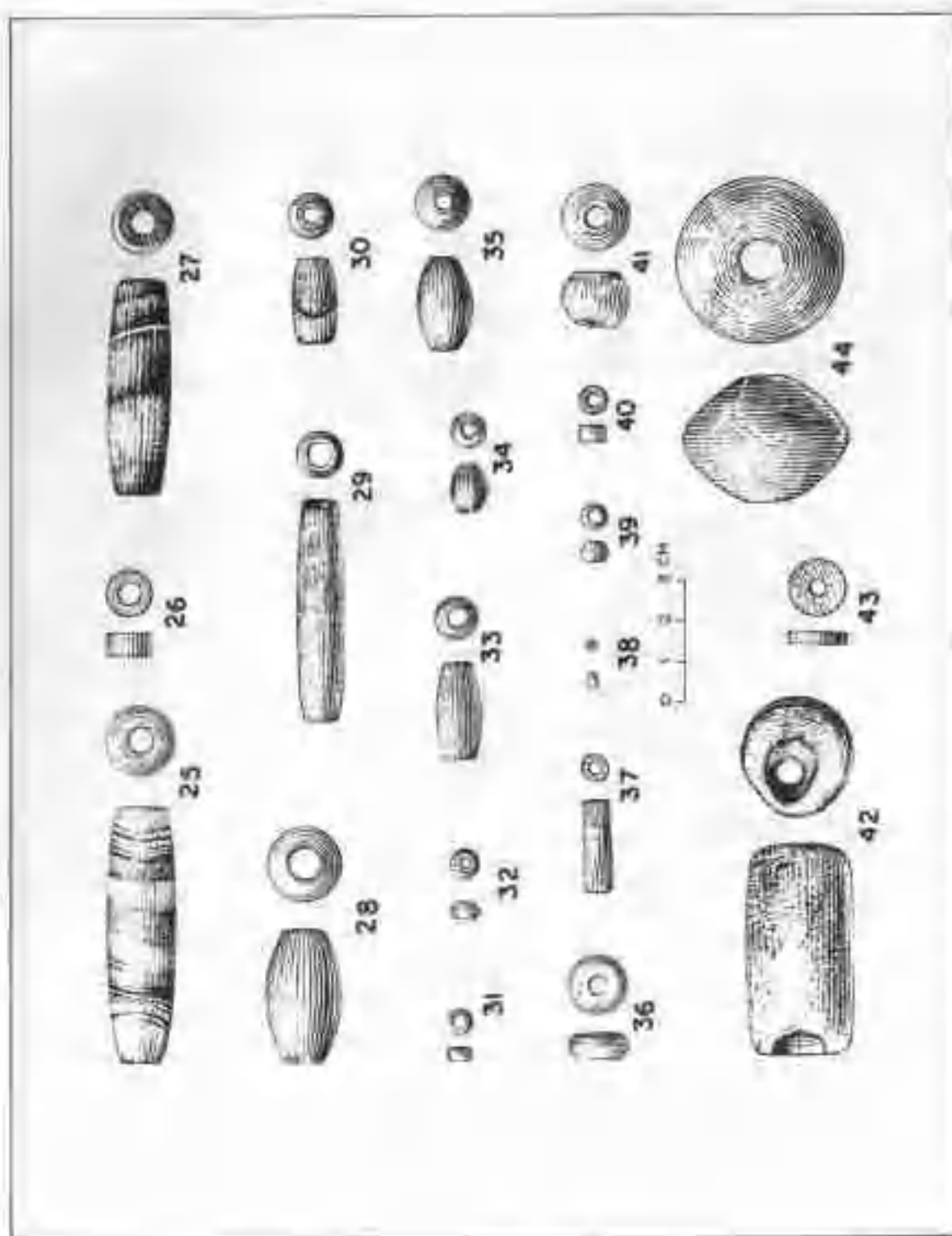


Fig. 146. Beads, Phase V (Scale of 10 = 1 cm.)

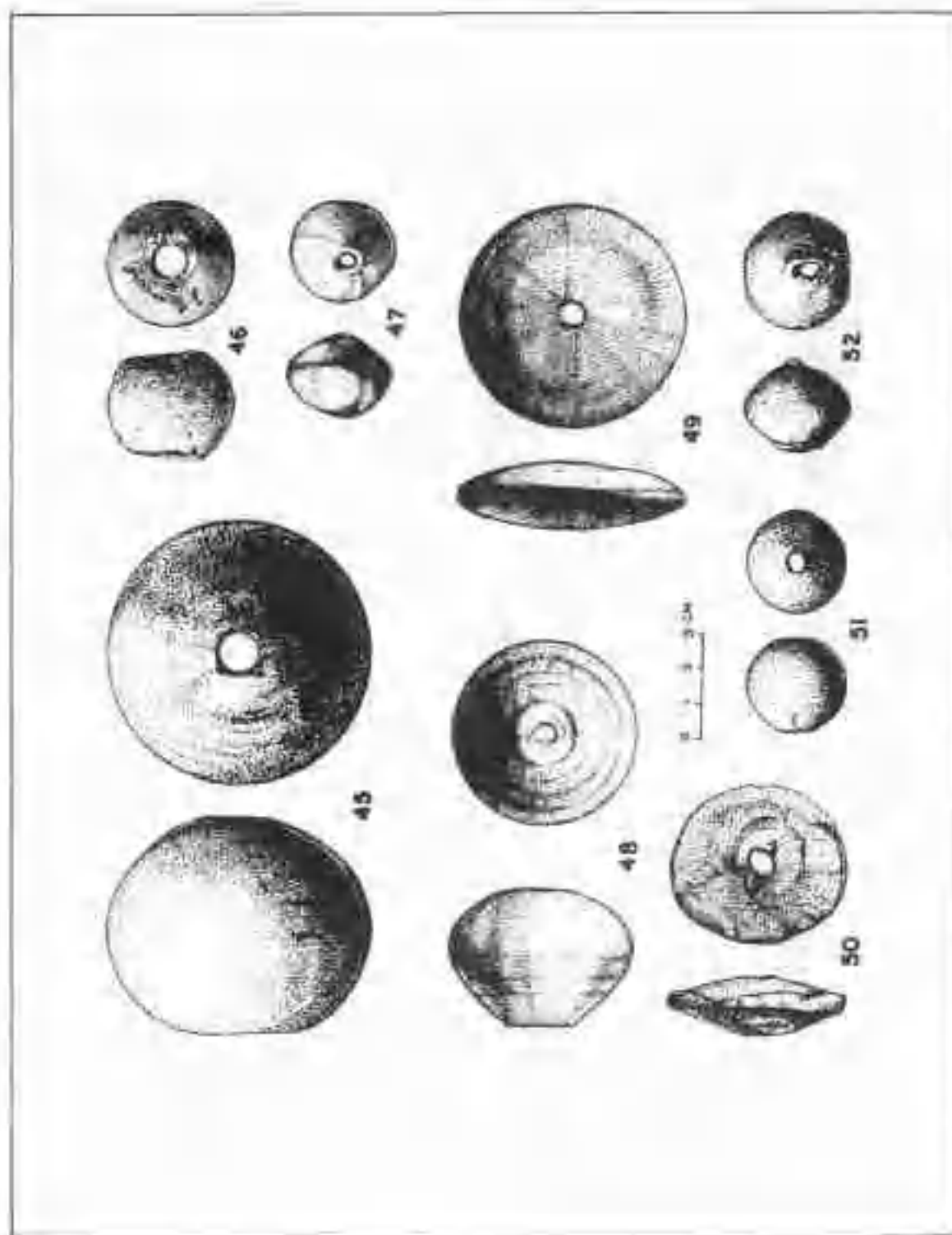


Fig. 117. Dada, 45-50, 51-52, sand-baked clay. Phase V.



PLATE CL. Beads: Phase V.



PLATE III Bricks (Phase V)



PLATE CLII Terracotta beads: Phase V.



PLATE CLX Gold piece.

ber of beads, one hundred (44.8%) are of coral whereas steatite ranked second with forty-seven (21.0%) examples. There are twenty-eight (12.6%) specimens of carnelian, eleven (4.9%) of shell, ten (4.5%) of unbaked clay, eight (3.9%) of terracotta, five (2.3%) of onyx, three each of fine grained basalt and agate, two each of chalcedony and jasper and one each of gold, paste, faience and black basalt. As has been explained before, beads were manufactured locally during this phase. Bead-maker's houses were located in Sector II.

The types which occurred for the first time were elliptical (fig. 115, 3; pl. CL, 3), oblate disc (fig. 115, 1, pl. CL, 1) and conical pendant (fig. 115, 7 and 8; pl. CL, 9 and 10) in carnelian; spherical (fig. 166, 39; pl. CL, 20) in coral; long barrel (fig. 116, 33; pl. CL, 18) and standard truncated bicone (fig. 116, 44; pl. CL, 17) in jasper; ellipsoid (fig. 115, 12; pl. CL, 49) and long barrel (unfinished) (fig. 115, 17; pl. CL, 11) in shell; short truncated bicone (fig. 116, 41; pl. CL, 22) and oblate (fig. 116, 36; pl. CL, 21) in chalcedony; short cylindrical (fig. 116, 26; pl. CL, 32), standard cylindrical (fig. 115, 18; pl. CL, 45) and long barrel (fig. 116, 34; pl. CL, 48) in steatite and arecanut (fig. 117, 48; pl. CL, 1) in terracotta. The occurrence of arecanut type in the Jorwe levels is of great significance, for this type has occurred in abundance in the Satavahan levels in Maharashtra at Nasik,⁸⁴ Prakash⁸⁵ and Kolhapur.⁸⁶ It needs to be mentioned here that a few terracotta arecanut shaped beads were also found in the upper layer at Harappā,⁸⁷ but they have been ascribed to the Gupta period taking into account the identical beads found in Hyderabad district in the mound surrounding some megalithic tombs. The examples from Daimabad, however, belong to the chalcolithic Jorwe Phase.

Besides the new types mentioned before, there also occurred "wheel" or "water" and short barrel types in the steatite. All the beads of coral are spherical. In addition to the new types mentioned above, there are also long barrel, short barrel, standard truncated bicone, short truncated bicone and spherical in carnelian. In the specimens of shell are included those of cowrie shell and *Oliva* sp. of estuarine origin. The biconvex circular, spherical and standard truncated were the other types in terracotta. The bead of gold is long barrel circular (fig. 116, 38; pl. CL, 24). The only type in agate is long barrel circular. Of the black basalt, there is only one example, long cylindrical circular (fig. 116, 42; pl. CL, 29). The Hydrothermally Altered Amygdaloidal Basalt has been represented in two colours, red and green and the type found is long barrel circular. All the five specimens of onyx are long barrel circular (fig. 115, 19, 21-24; pl. CL, 7, 12, 15, 19 and 23). In unbaked clay occur spherical and truncated bicone (fig. 117, 51 and 52; pl. CL, 28 and 46) the analogues of which are also to be found in terracotta.

The illustrated beads are described below.

Figs. 115, 116 and 117; pls. CL, CL, and CLH.

84. Sankalia and Dev, *op. cit.* (1956), fig. 47, Nos. 4, 5 and 12.

85. Thapar, *op. cit.* (1967), fig. 38, 37-39 and pl. XXIII, 32-39.

86. H.D. Sankalia and M.G. Dekshi, *Excavations at Brahmapuri (Kolhapur)* 1945-46, fig. 34, 31 and 32.

87. Vats, *op. cit.* (1940), Vol. pp. 407-408; Vol. II, pls. CXXXIV, v, n, and CXXXIV, v, g, and CXXX, 58.

1. Carnelian : Oblate disc. (82/1977-78). pl. CL, 1.
2. Carnelian : Spherical. (23/1977-78). pl. CL, 2.
3. Carnelian : Long elliptical. (1/1978-79). pl. CL, 3.
4. Carnelian : Long barrel circular. (21/1978-79) pl. CL, 4.
5. Carnelian : Short truncated bicone circular. (712/1975-76). pl. CL, 5.
6. Carnelian : Long barrel circular. Burial 43. (33/1978-79). pl. CL, 6.
7. Carnelian : Conical pendant. (31/1978-79). pl. CL, 9.
8. Carnelian : Conical pendant. House 58. (129/1978-79). pl. CL, 10.
9. Carnelian : Standard truncated bicone circular. House 43. (128/-79). pl. CL, 8.
10. Shell : Oblate (36/1978-79). pl. CL, 41.
11. Carnelian : Polygonal (unfinished). House 64. (27/1978-79). pl. CL, 11.
12. Shell : Ellipsoid. (111/1976-77). pl. CLI, 49.
13. Shell : Oblate. (85/1978-79). pl. CLI, 37.
14. Shell : Pendant. Ura bucin 9. (33/1978-79). pl. CLI 50.
(*Olin* sp.)
15. Shell : Cowri shell with a hole. (63/1978-79). pl. CLI, 39.
16. Shell : Cowri shell with holes. (579/1975-76). pl. CLI, 38.
17. Shell : Long barrel circular (unfinished). House 57. (137/1978-79). pl. CLI, 31.
18. Steatite : Standard cylindrical circular (118/1976-77). pl. CLI, 45.
19. Onyx : Long barrel circular. (4/1977-78). pl. CL, 12.
20. Steatite : Long barrel oval. (653/1975-76). pl. CLI, 47.
21. Onyx : Long barrel circular. Burial 7. (668/1975-76). pl. CL, 7.
22. Onyx : Long barrel circular. (564/1975-76). pl. CL, 19.
23. Onyx : Long barrel circular. (764/1975-76). pl. CL, 15.
24. Onyx : Long barrel circular. (15/1977-78). pl. CL, 23.
25. Banded agate : Long barrel circular. pl. CL, 16 (5/1977-78).
26. Steatite : Short cylindrical circular. Burial 13. (758/1975-76). pl. CL, 32.
27. Banded agate : Long barrel circular. Burial 11. (672/1975-76). pl. CL, 15.
28. Hydrothermally : Long barrel circular (24/1978-79). pl. CL, 26.
Altered Amyg
daloidal Basalt
29. Hydrothermally : Long barrel circular. (654/1975-76). pl. CL, 27.
Altered Amyg
daloidal Basalt
30. Banded agate : Long barrel circular. House 1. (676/1975-76). pl. CL, 14.
31. Steatite : Short barrel circular. pl. CLI, 42. (139/1976-77).
32. Steatite : Short barrel circular. Burial 43. (33/1978-79). pl. CLI, 44.
33. Jasper : Long barrel circular. pl. CL, 18. (564 A/1975-76).

34. Steatite : Long barrel circular. (14/1978-79). pl. CLJ, 48.
35. Hydrothermally Altered Amygdaloidal Basalt : Long barrel circular. House 28 (58/1978-79). pl. CL, 25.
36. Chalcedony : Oblate. (89/1978-79). pl. CL, 21.
37. Paste : Long barrel circular. (18A/1978-79). pl. CLJ, 33.
38. Gold : Long barrel circular. (130/1976-77). pl. CL, 24.
39. Coral : Spherical. (118/1976-77). pl. CL, 20.
40. Faience : Short barrel circular. (18/1978-79). pl. CLJ, 43.
41. Chalcedony : Short truncated bicone circular.
42. Black Basalt : Long cylindrical circular. (109/1976-77). pl. CLJ, 29.
43. Steatite : Disc. (113/1976-77). pl. CLJ, 34.
44. Jasper : Standard truncated bicone circular. (90/1978-79). pl. CL, 17.
45. Terracotta : Spherical. (115/1976-77). pl. CLJ, 52.
46. Terracotta : Spherical (13/1976-77). pl. CLJ, 30.
47. Terracotta : Standard truncated bicone circular. House 34. (132/1978-79) pl. CLJ, 56.
48. Terracotta : Arcuate. (807/1975-76). pl. CLJ, 51.
49. Terracotta : Biconvex circular. (5/1978-79). pl. CLJ, 10.
50. Terracotta : Biconvex circular. (54/1978-79). pl. CLJ, 35.
51. Sunbaked clay : Spherical. (645/1975-76). pl. CLJ, 40.
52. Sunbaked clay : Standard truncated bicone circular. (645 A/1975-76). pl. CLJ, 28.

O. Shell Objects

The excavations have yielded thirteen objects of shell including one sawn piece of conch shell and the rest bangles in which one is a complete specimen and the rest fragments, all of conch shell. Two pieces of shell bangles were also collected from surface.

To the Phase I belonged the sawn conch shell piece. Three specimens of bangles, including one complete have come from Phase II; Phase III and the overlap phase between Phase III and Phase IV yielded one example each. From Phase IV have come two and from Phase V five. All the specimens are in good state of preservation. Most of them possess yellowish tinge, apparently as a result of aging.

The sawn piece of conch shell from Phase I bears an ovaloid hole caused due to the removal of a piece (fig. 118, 1; pl. CLIII, 1). This was found in the courtyard of house 12. Interestingly enough one thick bead made of conch shell was also recovered from Room C of the adjoining house 11 (fig. 111, 1; pl. CXIV, 1). The piece under description has been sawn out of a conch shell by a sharp instrument and the smooth sawn surface without any ripple evident to the eye, suggests that the cutting instrument was with a sharp edge. This piece and the presence of shell bead are the sure indications that conch shell beads were manufactured at the site during the Phase I times. Further, this evidence also points out that the Savadhans of Daimabad had trade contacts with the contemporaries of the Saurashtra sea

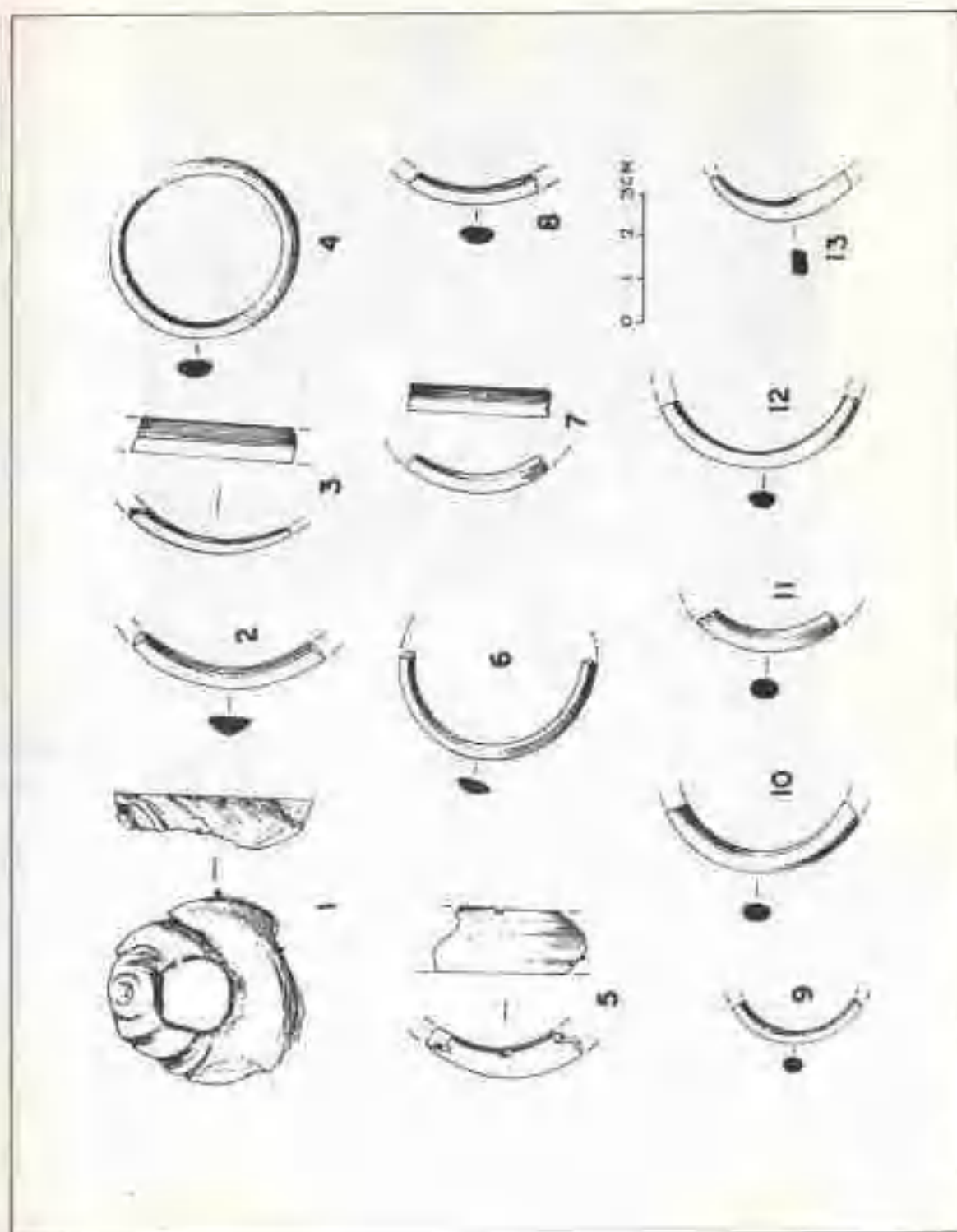


Fig. 11b. Shell objects: 1, Phase I; 2-4, Phase II; 5, Phase III; 6, overlap phase between Phase III and Phase IV; 7, 8, Phase IV; 9-13, Phase V.

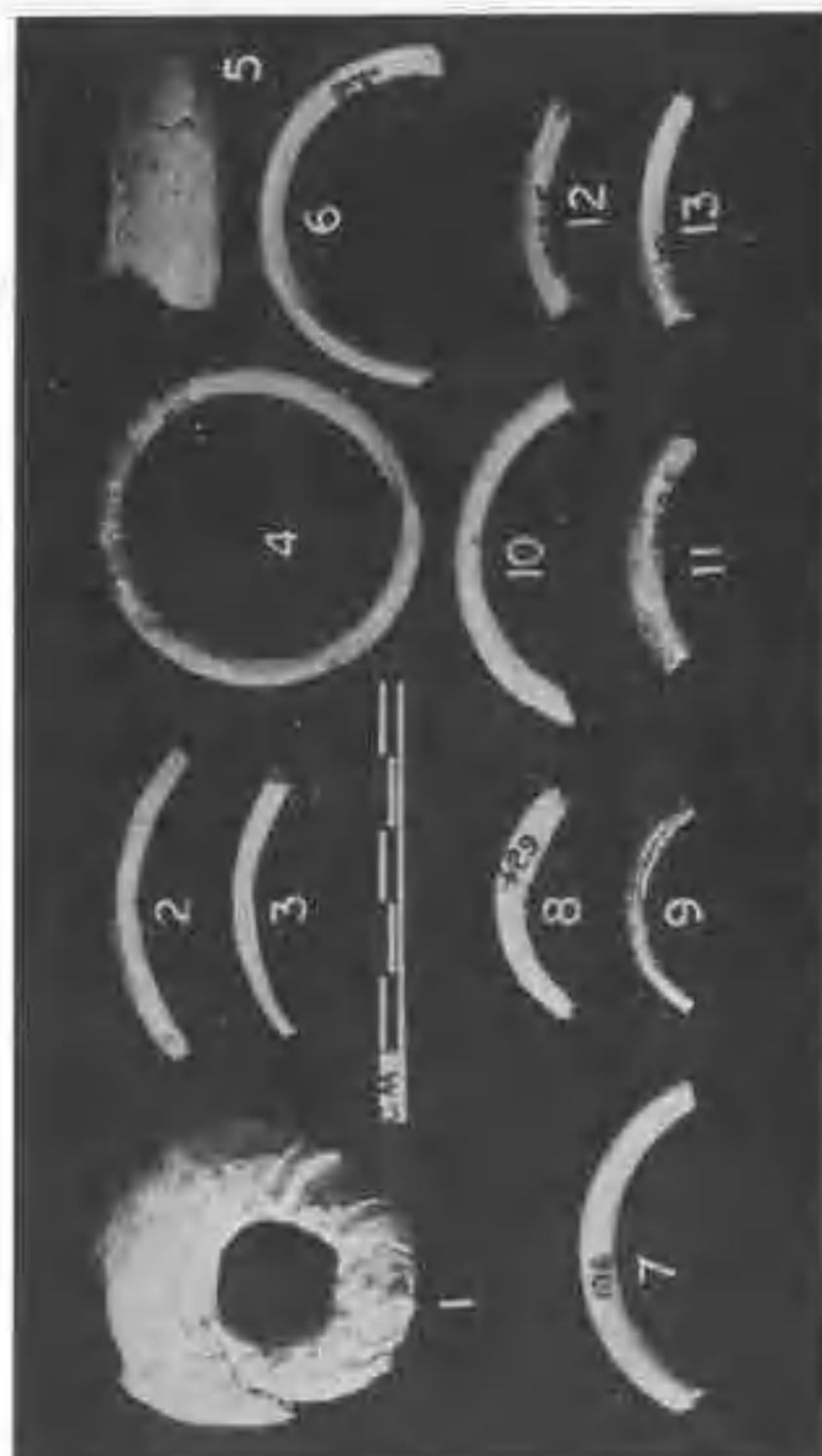


PLATE CLIII. Shell objects : 1, Phase I; 2-4, Phase II; 5, Phase III; 6, overlap phase between Phase III and Phase IV; 7, 8, and 11, Phase IV and 9-11, Phase V.

coast where such shells are available.

The diameter of the shell bangles varied from 3.1 cm. to 5.6 cm. Of the three specimens from Phase II, the complete one has come from house 17 from which was also recovered one terracotta seal bearing Indus script. This specimen with oval section has turned yellowish in colour and is 5.5 cm in diameter suggesting that it was meant for a child of 3 or 4 years age (fig. 118, 4; pl. CLIII, 4). The other two examples from the same Phase are still more interesting (fig. 118, 2 and 3; pl. CLIII, 2 and 3). Both have a keel and on the surface of one of them (fig. 118, 2; pl. CLIII, 2) are adhering light reddish remnants of some unidentifiable material perhaps some kind of resin used as adhesive to fix the sheet of precious metal like gold as covering. This specimen is of 5.6 cm diameter and the other of 5.5 cm. Both are highly finished. It is interesting to note that shell bangles with a keel have also been reported from Harappa⁸⁸ and Mohenjodaro.⁸⁹ The solitary specimen from Phase III is marked by pittings as a result of weathering. It is 4 cm in diameter, is thick and broad (fig. 118, 5; pl. CLIII, 5). The single specimen from the overlap phase between Phase III and Phase IV has a blunt mid-ridge on the upper surface. It is 4 cm in diameter (fig. 118, 6; pl. CLIII, 6). Of the two specimens of Phase IV, one is with a prominent ridge in the middle of the upper surface and is 8.5 cm in diameter (fig. 118, 7; pl. CLIII, 3). From among the five examples from Phase V, one is with 3.1 cm diameter meant for a child of not more than one year age (fig. 118, 9; pl. CLIII, 9). Significantly enough it has come from house 35, a structure adjacent to the Apsidal Temple (see also p. 138). A slightly bigger specimen with 3.5 cm diameter, also meant for a child is squarish in section (fig. 118, 13; pl. CLIII, 8). There are two specimens with 4.5 cm diameter (fig. 118, 10 and 12; pl. CLIII, 7 and 10) and oval in section. The specimen with 5 cm diameter and oval in section is covered with patches of chocolate coloured unidentifiable substance (fig. 118, 11; pl. CLIII, 11) similar to that on the one from Phase II described above.

The illustrated examples are described below:

Fig. 118; pl. CLIII.

1. The sawn piece of conch shell bearing an ovaloid hole. Phase I, (Courtyard of house 12; GZ 64, (15) pl. CLIII, 1).
2. Fragment of a keeled bangle with triangular section. Bears remnants of light reddish patches of indeterminate material. Phase II. (90/1977-78). pl. CLIII, 2.
3. Fragment of a keeled bangle with triangular section. Phase II (88/1977-78). pl. CLIII, 3.
4. Bangle with oval section. House 17 of Phase II. (101/1977-78). pl. VI, 4.
5. Fragment of a bangle with oval section. Phase III. (72/1977-78). pl. CLIII, 5.
6. Fragment of a bangle with a blunt mid-ridge. Overlap phase between Phase III and Phase

88. Vats, op. cit., (1940), Vol. II, Pl. LXXXVIII, No. 23.

89. Mackay, op. cit. (1937), Vol. II, Pl. CXL, 47 and Vol. I, p. 537.

IV. (46/1977-78). pl. CLIII, 6.

7. Fragment of a keeled bangle with triangular section, Phase IV. (26/1977-78). pl. CLIII, 13.
8. Fragment of a bangle with oval section, Phase IV. (11/1977-78). pl. CLIII, 12.
9. Fragment of a bangle with semi-circular section, House 35 of Phase V. (127/1978-79). pl. CLIII, 9.
10. Fragment of a bangle with oval section, Phase V. (80/1975-76). pl. CLIII, 7.
11. Fragment of a bangle with oval section. Bears patches of unidentifiable chocolate coloured material, Phase V. (710/1975-76). pl. CLIII, 11.
12. Fragment of a bangle with oval section, Phase V. (703/1975-76). pl. CLIII, 10.
13. Fragment of a bangle with square section, Phase V. (634/1975-76). pl. CLIII, 8.

B. Bone Objects

Fiftyeight bone objects were recovered from the excavation and three points were collected from surface. The stratified objects recovered from different phases were five specimens from Phase I; three from Phase II; twelve from Phase III; seventeen from Phase IV and twentyone from Phase V.

The objects are divisible into four categories, viz. (i) tools, (ii) tool-hafts, (iii) worked bones and (iv) blank. Among these, the tools form the major bulk, being fiftythree in number; tool-hafts two; worked bones two and blank one. The phase-wise distribution of different types of objects is shown in Table 12. It should be mentioned that no other Chalcolithic site in the Deccan has so far yielded so varied the types of bone objects as at Daimabad.

Various parts of animal bones were used for preparing bone objects. Those which could be identified⁹⁰ were limb bones, rib bones, metacarpal, metapodial, metatarsal, third phalanx, tusk, teeth, horn cores, antlers and ulna and belonged to *Bos indicus*, four horned antelope (*Tetracerus quadricornis*), crocodile, chital (*Axix-axix*), domestic goat (*capra*), cattle/buffalo (*Bos/Bubalus*), sheep/goat (*Ovis/Capra*) and elephant.

The objects were fashioned in the desired shape by splitting, flaking, notching, charring and grinding. The tip of quite a number of specimens show a high polish; otherwise, the remaining surface of the tools is either deliberately smoothened by grinding or the smoothness seems to be the result of handling. An interesting aspect of some of the pointed tools is that in their preparation advantage of natural shape of the bone was taken, thereby avoiding labour in the making of such types of tools. For example, a thick pointed tool was made on the ulna of *Bos* which has a natural point and thick epiphyse to serve as a handle. The pointed horn cores of sheep/goat, chital and antelope have likewise been used in the making of pointed tools. The teeth of crocodile were converted into chisels. Majority of the points and awls have been made from limb bones. The pointed tip in these specimens has been

90. The identification (per. com.) has been very kindly done by Dr. G.L. Badam of the Deccan College Research Institute, Pune for which I am grateful to him. A detailed report on the identification of animal bones recovered from the excavations is awaited.



Fig. 119. Bone objects: 1-4, 7, Phase I; 5, 8, 11, Phase II; 9, 10, 22, 23, Phase III; 3, 12, 13, 18, 17, 19-21, 27, Phase IV; 14, 16, 15, 24-26, Phase V.

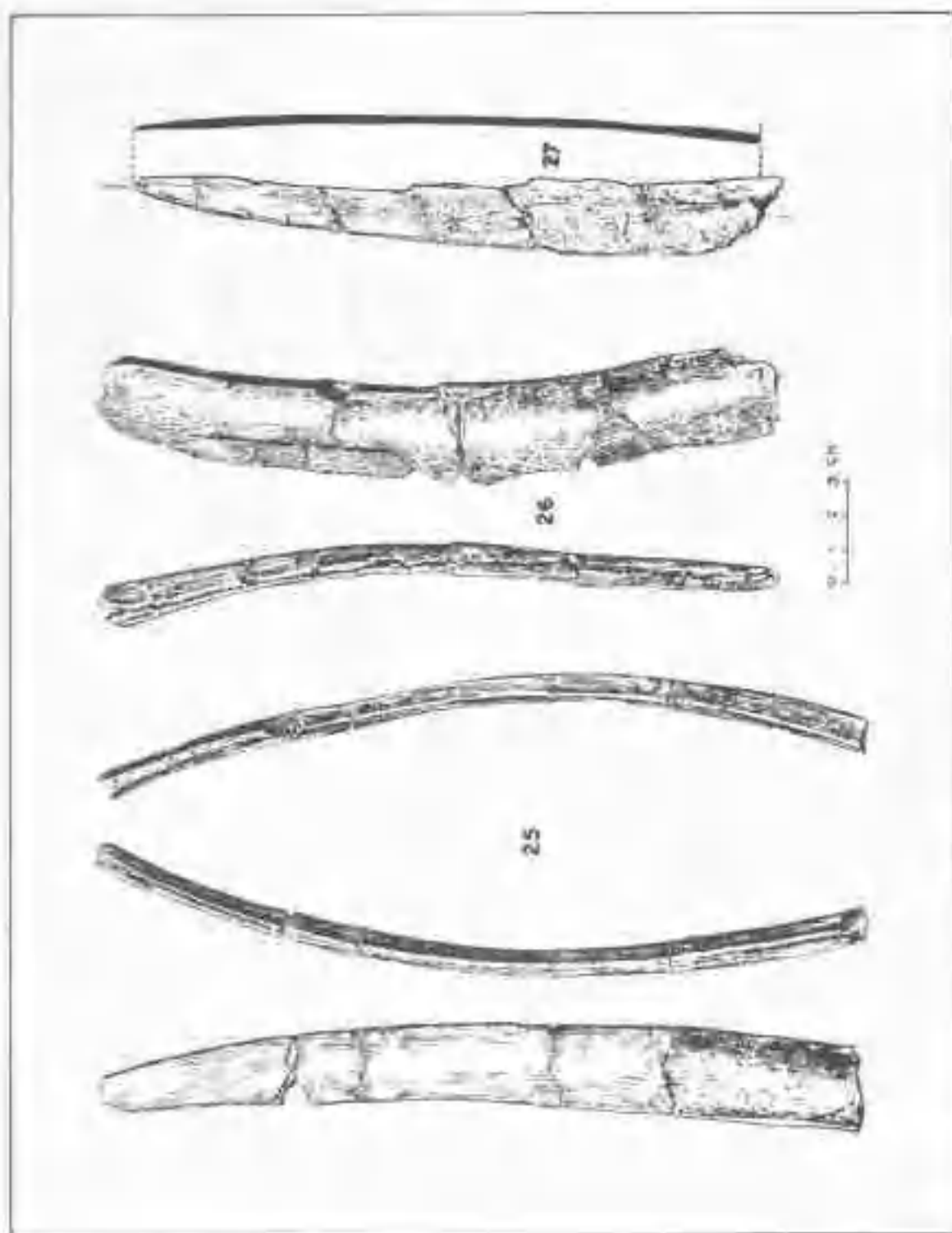


Fig. 110. Bone objects = 25, 26, antelopes, Phase V; 27, antelope, Phase V.



PLATE CLIV Bone objects 1

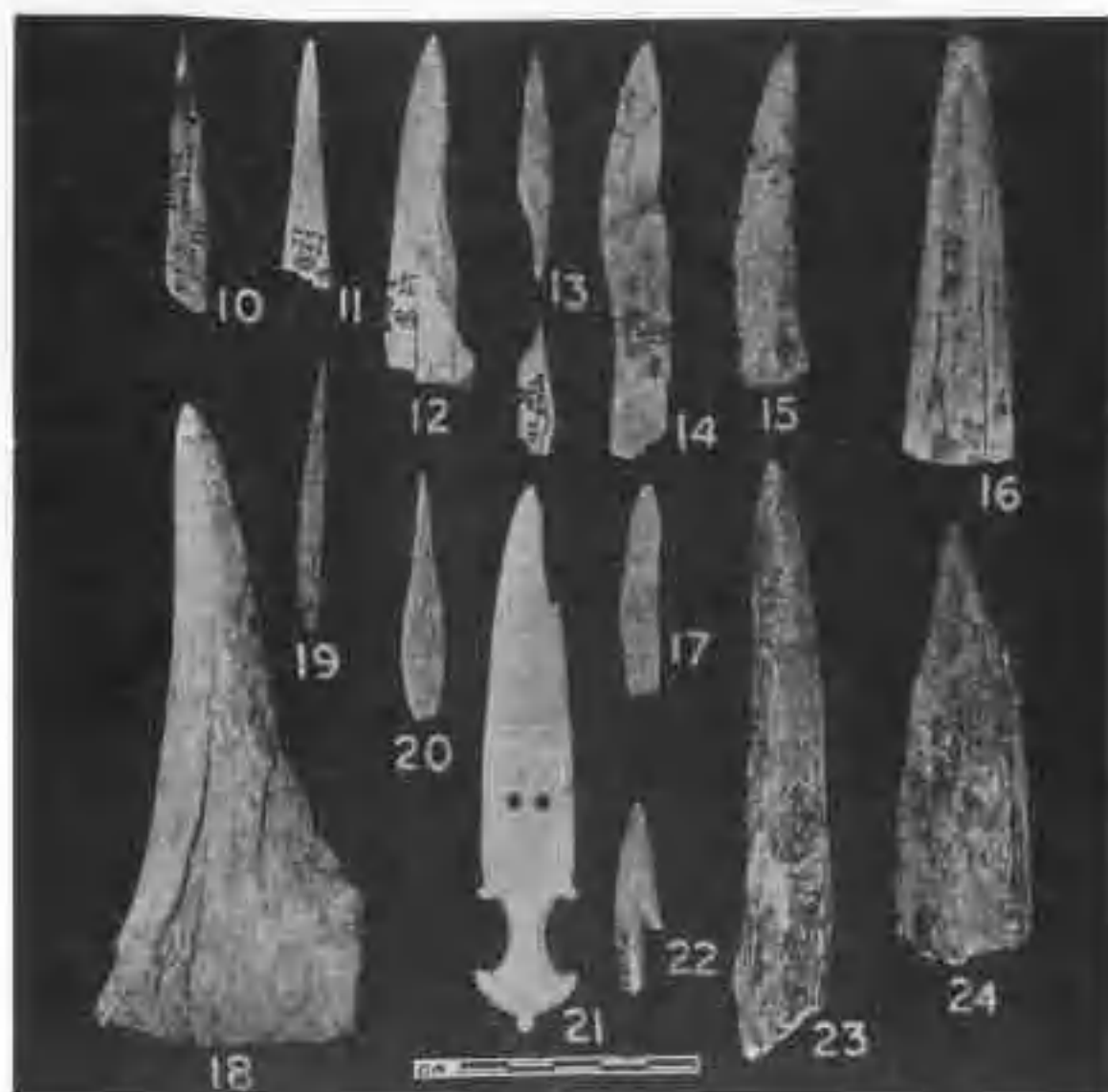


PLATE CLV Bone objects.



PLATE CLVI Bone halves, Phase V.

produced by flaking and charring and finally grinding. The tip of quite a number of specimens was broken.

A comparative study of the piece of a rib (fig. 119, 7; pl. CLIV, 3) of *Bos* recovered from close to the tanged arrowhead (fig. 119, 2; pl. CLIV, 2) in house 15 of Phase I has given an idea about the use of similar kind of rib in the preparation of a tanged arrowhead. In this example a little marginal flaking has produced a leaf-shaped point and a long tang. Ribs of *Bos indicus* were also used in Phase V in the preparation of tool-hafts (fig. 120, 25 and 26; pl. CLVI, 26 and 27) which were recovered from Clusters 5 and 6 from the religious elliptical structure of the structural phase E (pp. 202-3). A rib bone of a large mammal was used in the preparation of the miniature dagger (fig. 119, 8; pl. CLV, 21) which was found in the 1974-75 season⁹¹ only about 2 m away from the findspot of the bronzes in the course of clearance of the excavated debris and hence considered associated with the cache. The solitary example of engraver (fig. 119, 21; pl. CLIV, 9) has been made on a limb bone and its chisel-ended point prepared by grinding. The spatula (fig. 120, 27; pl. CLIV, 1) is an interesting tool made on a limb bone with a highly polished broad end. It was recovered from the Rectangular Sacrificial Altar (house 56, p. 114). The bodkin (fig. 119, 18; pl. CLIV, 7) was made by obliquely snapping and grinding the metacarpal of sheep/goat. What has been termed as worked bone (fig. 119, 22; pl. CLIV, 6) is a piece of elephant tusk, trapezoidal in section and with a rounded end produced by rough flaking.

Interesting among the five specimens from Phase I are one each a harpoon and a tanged and a notched arrowhead. The harpoon (fig. 119, 1; pl. CLV, 25) is survived by the end-fragment and is with a sharp and polished pointed end. The tanged arrowhead (fig. 119, 2; pl. CLIV, 2) is unique in being made on a broad rib of *Bos* by working along the margin. The notched arrowhead (fig. 119, 3; pl. CLIV, 4) with a fine sharp point and smooth surface has also been represented in paintings on the Savalga Ware. In the remaining is included a fragment of a rib bone of *Bos* mentioned above and a fragmentary point made on a limb bone with a broad but short tip and polished upper surface (fig. 119, 4; pl. CLV, 11). The occurrence of finished tanged arrowhead and a blank by its side in house 15 suggested that bone tools were made by the occupant of the house.

Only three specimens belonged to Phase II. One of them is a miniature dagger (fig. 119, 8; pl. CLV, 21) which, as mentioned above, has come from surface close to the findspot of the cache of bronzes and appears to be ceremonial dagger. The second specimen is a point (fig. 119, 11; pl. CLV, 12) made on a metapodial of some large mammal and with a polished sharp tip of point. Its sides have been broken. The third one is a splinter (fig. 119, 6; pl. CLIV, 3) of a limb bone flaked along the tip, the sides and at the butt end. It appears to represent an unfinished tool.

To the Phase III belonged twelve specimens including eleven points and one worked fragment of elephant tusk. Among the points four are small fragments. All the points are made of limb bones. Of the illustrated examples, one (fig. 119, 9; pl. CLV, 13) has a fine

91. *Indian Archaeology 1974-75* — A Review, (1979), p. 31, pl. XXV D.

sharp point and a long tang made by obliquely snapping the sides. The second is a massive example (fig. 119, 23; pl. CLV, 24) made by charring and grinding. The point in this specimen is triangular in section. In massiveness and typologically this specimen closely resembles a bone point from the Upper Neolithic, Site 1, at Pikiha² which, as the excavator thinks, was a part of a shuttle. The specimen from Daimahad, however, cannot be considered as such in view of the fact that the lower portion of it is too rough to be used as a shuttle. The third specimen (fig. 119, 10; pl. CLV, 17) with a sharp point is broken on one side.

A variety of tools come from Phase IV. In the total seventeen specimens eight are points, six awls, and one each a spatula, an engraver and a bodkin. Three of the points and four of the awls are fragmentary. The points are made on horn cores of *Tetracerus quadricornis* (fig. 119, 12; pl. CLV, 16) and *capra* (fig. 119, 20; pl. CLV, 15) as also on limb bone (fig. 119, 15; pl. CLV, 20) and ulna (fig. 119, 5; pl. CLV, 18) of *Bos indicus* the broad base of the epiphyse of the last-named of which has been ground to make it straight and flat in order to facilitate easy grip. The spatula (fig. 120, 27; pl. CLIV, 1) made on a limb bone has a highly polished tongue-like broad tip. The engraver, (fig. 119, 21, pl. CLIV, 9) also made on limb bone, has a fine, sharp chisel end made by grinding and a conical tang produced by obliquely snapping the butt end. The bodkin (fig. 119, 18; pl. CLIV, 7) prepared on the metacarpal of *avis/capra* has a highly polished pointed lower end obviously resulted from use.

Maximum number of bone artifacts, twenty one, have come from Phase V. They included twelve points (eight fragments), three awls (two fragments) and two each a chisel, an engraver and tool hafts. The points are made on antler of *Axis axis* (fig. 119, 18; pl. CLV, 23) and on limb bones. The complete specimen of awl (fig. 119, 16; pl. CLV, 10) made on limb bone has a sharp projecting medial point produced by charring and grinding all around. One of them (fig. 119, 24; pl. CLIV, 8) is made on the tooth of crocodile. Unique among the bone artifacts from Phase V are the two tool-hafts made out of long ribs of *Bos indicus* (fig. 120, 25 and 26; pl. CLVI, 26, 27). Of these two, one (fig. 120, 26; pl. CLVI, 26) was found in a highly crushed condition and its upper end is missing. The lower end and both the margins towards half of the upper end have been ground as a result of which the porous cavity is exposed and the specimen has achieved the shape of a razor. The other specimen (fig. 120, 25; pl. CLVI, 27) although in fragments is much better preserved than the one described above. The lower end and the margins near it have been ground to expose the porous cavity and except this there are no marks of secondary working on the specimen. Both the specimens provide evidence of the hafts that were used by the people of the Jorwe Culture for hafting blades and blade tools. The hafted blade in the fragment of rib bone found in the levels of this Phase is yet another evidence in this regard.

The illustrated specimens are described below

92. F.B. Allchin, *Piklha Excavation*, (1960), p. 112; pl. 57 a.

Table 12

Phase-wise Typological Distribution of Bone Objects

<i>Types/Phases</i>	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>V</i>	<i>Total</i>
Point	1 (fragment)	1	11 (4 frags.)	8 (3 frags.)	12 (8 frags.)	33
Awl	—	—	—	6 (4 frags.)	3 (2 frags.)	9
Harpoon	1 (frag.)	—	—	—	—	1
Arrowhead	—	—	—	—	—	—
Tanged	1	—	—	—	—	1
Notched	1	—	—	—	—	1
Chisel	—	—	—	—	2 (frags.)	2
Spatula	—	—	—	1	—	1
Engraver	—	—	—	1	2 1 (unfinished) (1 frag.)	3
Bodkin	—	—	—	1	—	1
Dagger	—	1	—	—	—	1
Tool Hafts	—	—	—	—	2	2
Worked bone	—	1	1	—	—	2
Blank	1	—	—	—	—	1
Total	5	3	12	17	21	58

Figs. 119 and 120; pl. CLIV, CLV and CLVI

1. Harpoon. Lower fragment, with a finely polished lower end and a barb. Phase I. (64/1977-78; Room B of house 11). pl. CLV, 25.
2. Tanged arrowhead. Made on a rib bone of *Bos* with a long tang and a leaf-shaped point produced by marginal trimming. Phase I. (89/1976-77; house 15). pl. CLIV, 2.
3. Notched arrowhead. With a sharp point and polished surface. Phase I. (99/1977-78; courtyard of houses 11 and 12). pl. CLIV, 4.
4. Point. Fragment of a point made on limb bone with a sharp but broad point and polished upper surface. Phase I. (45/1977-78). pl. CLV, 11.
5. Point. Made on a massive ulna of *Bos indicus* with a sharp thick point and a flattened base of the broad epiphysae by grinding. Phase IV. (25/1977-78). pl. CLV, 18.
6. Worked bone. A splinter of limb bone, with flake scars at the lower pointed end, on the margins and at the butt end. Phase II. (74/1977-78). pl. CLIV, 3.
7. Blank. A fragment of a rib of *Bos* found by the side of the tanged arrowhead. Phase I. (88/1976-1977; from house 15). pl. CLIV, 5.
8. Dagger. A miniature dagger made of rib bone of a large mammal with a concave-sided hilt having a fan-shaped upper end surmounted by a small U-shaped pinnacle-like top. On either side of the lower end of the hilt is a ledge. Lower down are two circular holes on the blade and a pair of horizontal incised lines. A small portion of the right side margin at the lower end is missing. The tip at the lower end is sharp and pointed. Ascribed to Phase II on circumstantial ground. (51/1974-75; from surface about 2 m north of the find spot of the cache of bronzes). pl. CLV, 21.
9. Point. Made on a limb bone, with a sharp point and a long tang prepared by obliquely snapping the margins. Phase III. (62/1977-78). pl. CLV, 13.
10. Point. Made on a limb bone and with a projecting sharp point. Right margin broken. Phase III. (771/1975-76). pl. CLV, 17.
11. Point. A damaged point on the metapodial of some large animal with a sharp point. Phase II. (79/1976-77). pl. CLV, 12.
12. Point. A thick point made on the horn core of four-horned antelope (*Tetragerus quadricornis*) with a polished end. Phase IV. (125/1976-77). pl. CLV, 16.
13. Bodkin. Made on a metacarpal of sheep/goat (*ovis/capra*). A thick point has been produced by obliquely snapping one of the ends which shows a high polish due to use. Phase IV. (118/1977-78). pl. CLIV, 7.
14. Point. Made on a limb bone with a medial sharp point produced by grinding the margins. Phase V. house 39. (122/1978-79). pl. CLV, 22.
15. Point. Made on a limb bone with finely shaped oval body and a slightly damaged medial point by grinding. Phase IV. (86/1977-78). pl. CLV, 20.
16. Awl. Made on a limb bone. A fine medial sharp point produced at the lower end by charring and grinding all around. Phase V. house 39. (121/1978-79). pl. CLV, 10.
17. Point. Made on a limb bone. With a broad but sharp point at the lower end produced

- by grinding the margins. Phase IV. (50/1978-79). pl. CLV, 14.
18. Point. A massive point made on the antler of *chital* (*Axé axis*). The pointed ends possess lustrous surface apparently due to use. Phase V. (126/1978-79). pl. CLV, 23.
19. Awl. Made on a limb bone and with elongated oval-shaped body and a fine projecting sharp point produced by grinding all around. Phase IV. (111/1977-78). pl. CLV, 19.
20. Point. A massive point made on a horn core with a blunt thick point. Phase IV. (125/1978-79; from the sacrificial Ring Altar). pl. CLV, 15.
21. Engraver. Made on a limb bone. The closed edge at the lower end has been produced by grinding and a tang at the butt-end made by obliquely snapping the margins. Phase IV. (112/1977-78). pl. CLIV, 9.
22. Worked bone. Fragment of an elephant tusk, trapezoidal in cross-section and with a roughly flaked convex end. Phase III. (73/1977-78). pl. CLIV, 6.
23. Point. A massive point made on a thick limb bone. The lower end has been charred and ground to produce a thick and medial point, triangular in section. Phase III. (118/1977-78). pl. CLV, 24.
24. Chisel. Made on the tooth of crocodile. Phase V. (660/1975-76). pl. CLIV, 8.
25. Tool haft. Made on a rib of *Bos indicus*. The lower end has been ground along both the margins. Phase V. (669/1975-76). pl. CLVI, 27.
26. Tool haft. Made on a long rib of *Bos indicus*. The lower end has been rounded and the margins near it have been ground. As a result the spongy inner side is exposed and the haft obtained the shape of a modern razor. Phase V. (662/1975-76). pl. CLVI, 26.
27. Spatula. Made on a long piece of limb bone. The lower end is ground and polished and has a broad tongue-like tip. Phase IV. (100/1978-79; from the Rectangular Sacrificial Altar, house 56). pl. CLIV, 1.

Q. Pottery Objects.

Objects of this class, made out of potshards, have been treated separately. All the Phases have yielded pottery objects. A total of five hundred seventysix of them were recovered. Of these, Phase I yielded three; Phase II thirteen, Phase III sixtyseven; Phase IV fortythree and Phase V four hundred fifty. Majority of them are, however, fragments. They can be grouped into the following categories:

- | | |
|--------|-------------------------|
| (i) | Combs |
| (ii) | Toy wheels |
| (iii) | Pendant |
| (iv) | Pierced Discs |
| (v) | Partially Pierced Discs |
| (vi) | Unpierced Discs |
| (vii) | Sharpeners or bones |
| (viii) | Miscellaneous |

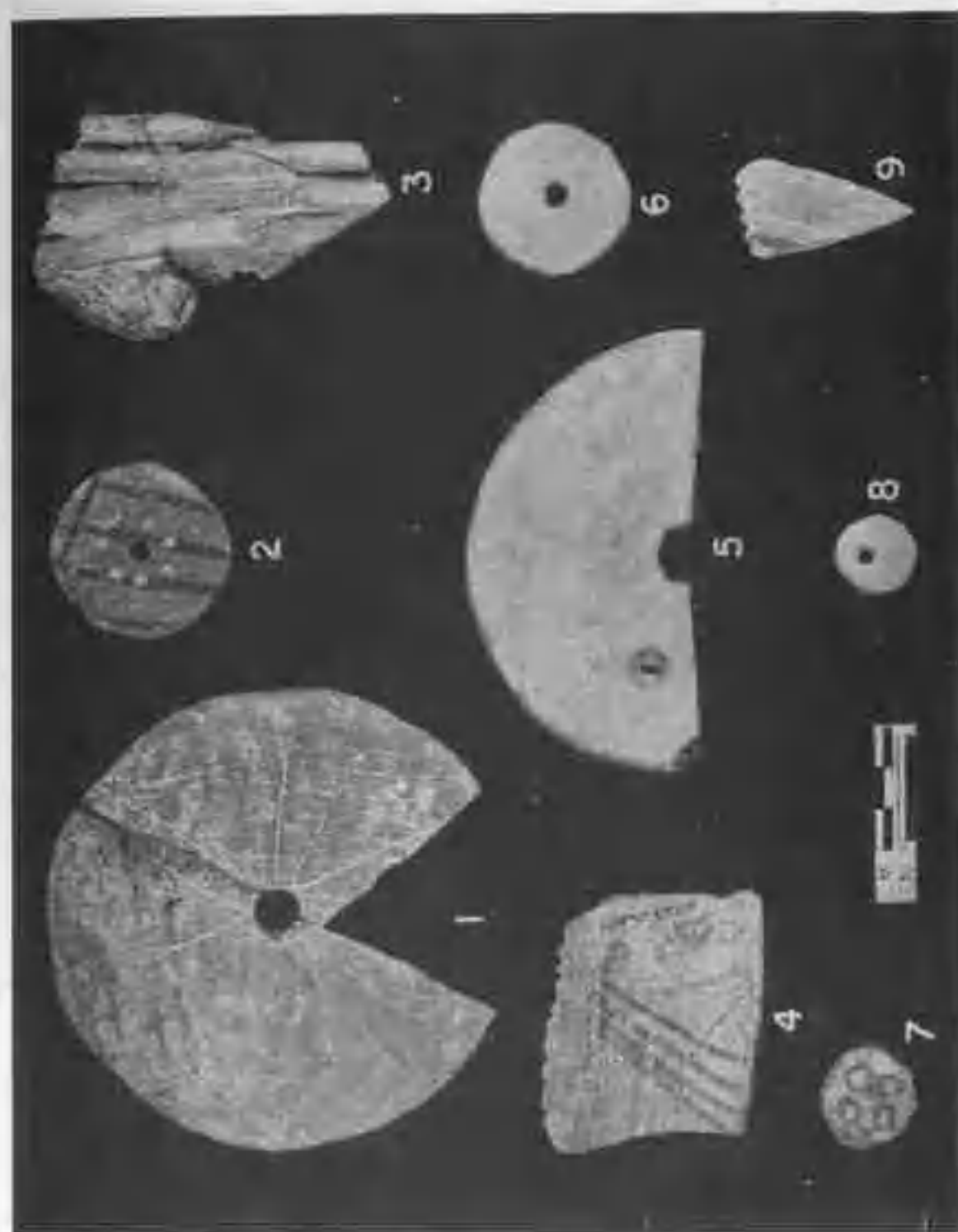


PLATE CLVII Pottery objects.

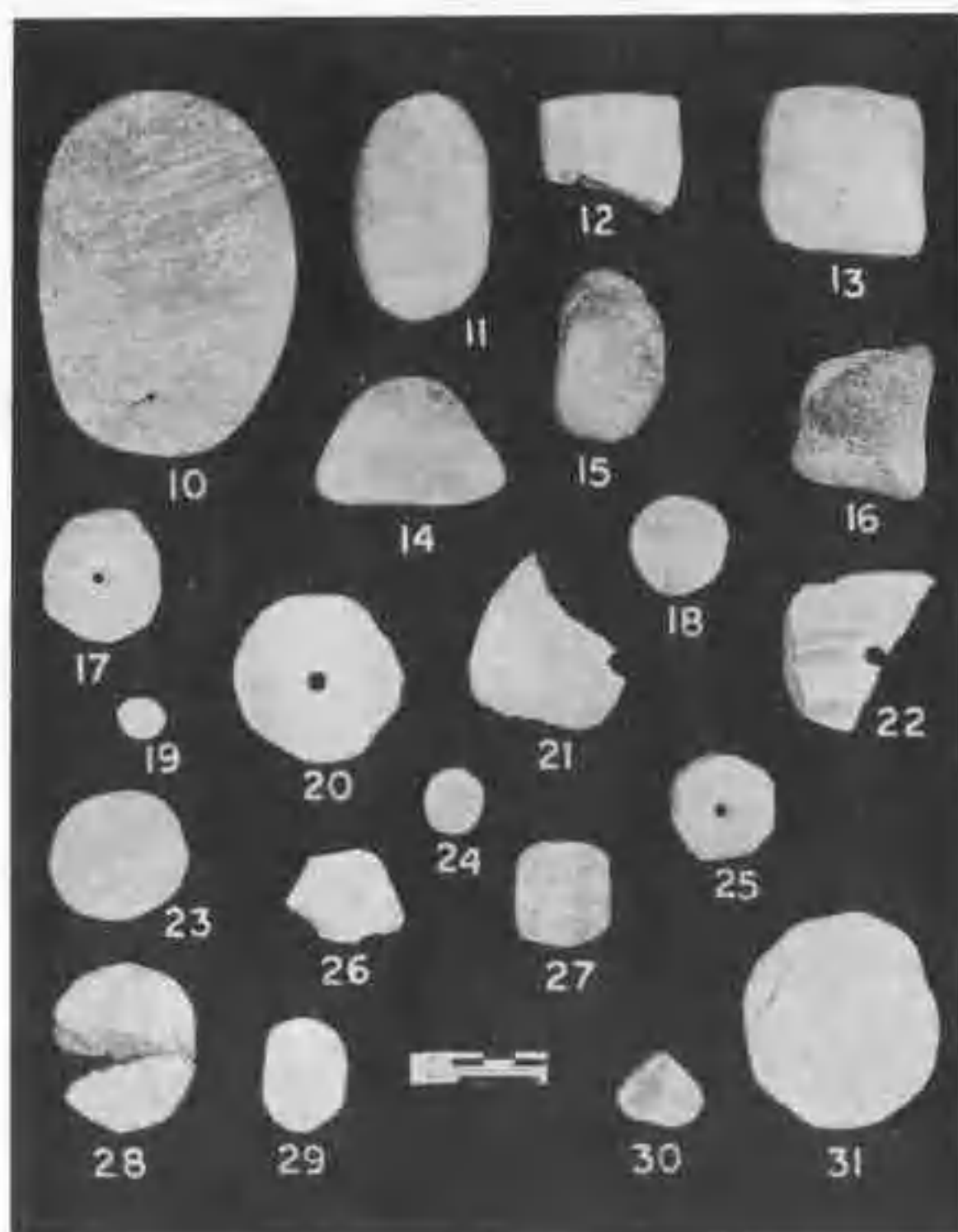


PLATE CLVIII Pottery objects.

(i) *Combs (pl. CLVII, 4 and 9)*

Only two examples of this class and both from Phase V, are present in the assemblage. These are interesting objects made on potsherds of the Jorwe Ware with teeth carved out along one edge. One of the examples is made on a fragment of a concave-sided varnated bowl (pl. CLVII, 4) and the other is a small fragment (pl. CLVII, 9). Pottery combs were obtained from Daimabad in the 1958-59 season. They were also found in the chalcolithic levels at Rahad.²³

(ii) *Toy wheels (pl. CLVII, 1, 2, 5 and 6)*

There are a large number of pierced pottery discs which could have been used as either toy wheels or spindle whorls. But in this category have been included only four examples, all from Phase V, which on surer grounds can be classed as toy wheels. Most interesting among these is a large toy wheel (pl. CLVII, 1) recovered from the second floor level of house 38, with a number of spokes engraved on one side, the outer side, and two blind holes bored on the inner side apparently to fix bars in them in order to eradicate wobbling of the wheels. This arrangement is also to be found in two other specimens. One of these has seven blind holes around the central hole (pl. CLVII, 2). The other specimen is half-portion with only one blind hole surviving. The central hole in this example is squarish rather than circular (pl. CLVII, 5). The fourth specimen (pl. CLVII, 6) has four spokes engraved on one of the sides, the outer side. The arrangement to provide a contrivance to eradicate wobbling is an important factor in these toy wheels since it increases the speed of the vehicle. The above described toy wheels indicate that spoked wheels were in use during the Jorwe times and they were provided contrivances to eradicate wobbling, a mechanism which helped increase the speed of a vehicle.

(iii) *Pendant (pl. CLVII, 8)*

This is an interesting object made out of a potsherd of Malwa Ware and recovered from Phase IV. It is ovaloid in shape and near its narrow side is pierced a circular hole. It has been classed as pendant taking into account its shape and the position of the hole.

(iv) *Pierced Discs (pl. CLVII, 17, 2-22 and 25)*

Except Phase I, these have been obtained from all the phases. These are circular in shape but there are also examples in which the shape varies between oval and circular. In most of the examples the hole in the centre has been drilled from both the sides and the hole is circular in shape. There are however, examples in which the holes were bored from one side and they are ovaloid in shape. In the former case bow-drilling appears to have been resorted to

23. *Indian Archaeology 1956-57 - A Review*, pl. XXI B.

and in the latter hand-drilling. In diameter the holes varied between 3 and 13 mm. It was difficult to make out as to whether these were used as spindle whorls or toy wheels although in quite a number of them the latter possibility appears to be more plausible.

(v) *Partially Pierced Discs*

These occurred in the levels of Phase III, Phase IV and Phase V (pls. CLVII, 7 and CLVIII, 23 and 24). The hole in these examples was pierced from both the sides. Whether this was done simultaneously or in two stages cannot be said with certainty. In one disc four holes have been partially pierced on each surface (pl. CLVII, 7).

(vi) *Unpierced Discs* (pl. CLVIII, 18, 19, 24 and 31).

These are present in large number and in all the Phases. In some examples the edge is ground and in several others it is unfinished.

(vii) *Sharpeners or hones* (pl. CLVIII, 10-16 and 27-30).

In this class are included a vast majority of the specimens. They were recovered from the levels of all the phases. They are oval, triangular and squarish in shape, their edges being made smooth by grinding. Similar objects were found at practically all the excavated chalcolithic sites in the Deccan, viz. Prakash,⁹⁴ Bahal,⁹⁵ Nevsa,⁹⁶ Chandoli,⁹⁷ Tekkalakota,⁹⁸ Hallur.⁹⁹ Their use is uncertain. But after studying such objects from Inamgaon it has been suggested that they are the tools of a potter, to be used especially when the vessels are thrown on the potter's wheel to even out or smooth the surfaces, inner or outer, and to a lesser extent as a shaping and scraping tool.¹⁰⁰

(viii) *Miscellaneous* (pl. CLVII, 3).

In this category is included one fragment of pottery of thick coarse ware with prominent corrugations. It is difficult to make out the object of which it is a fragment.

R. Weights And Measures

These are unique objects made of stone and pottery.

A total of five specimens which have been considered as weights on the basis of their

94. Thapar, *op. cit.* (1967), p. 119 and pl. XXVI C, 18 and 19.

95. Information from Shri M.N. Deshpande.

96. Sankalia, Deo, Ansari and Ebrardt, *op. cit.* (1960), pp. 381-83, fig. 125, 1-3.

97. Deo, *op. cit.* (1963), p. 121.

98. Nagasaja Rao and Malhotra, *op. cit.* (1963), *op. cit.* (1965), p. 83.

99. Nagasaja Rao, *op. cit.* (1971), pp. 99-100, pl. XIII A.

100. G.G. Mujumdar, 'A Multi-purpose Tool of the Deccan Chalcolithic Potter', *Bulletin of the Deccan College Research Institute*, Vol. XXXIV, 1-4 (Pune, 1974), pp. 103-113.

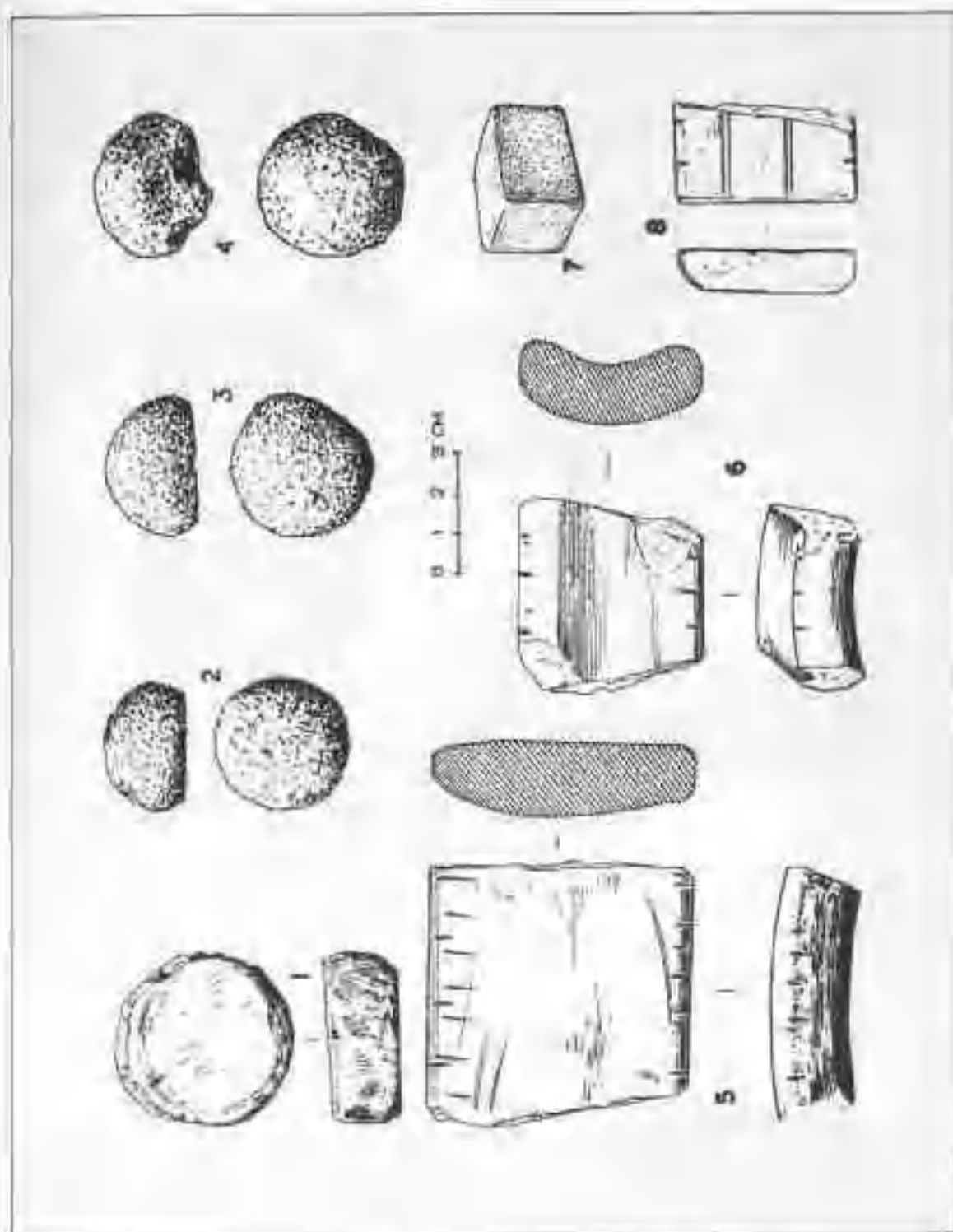


Fig. 121. Weights and Measures

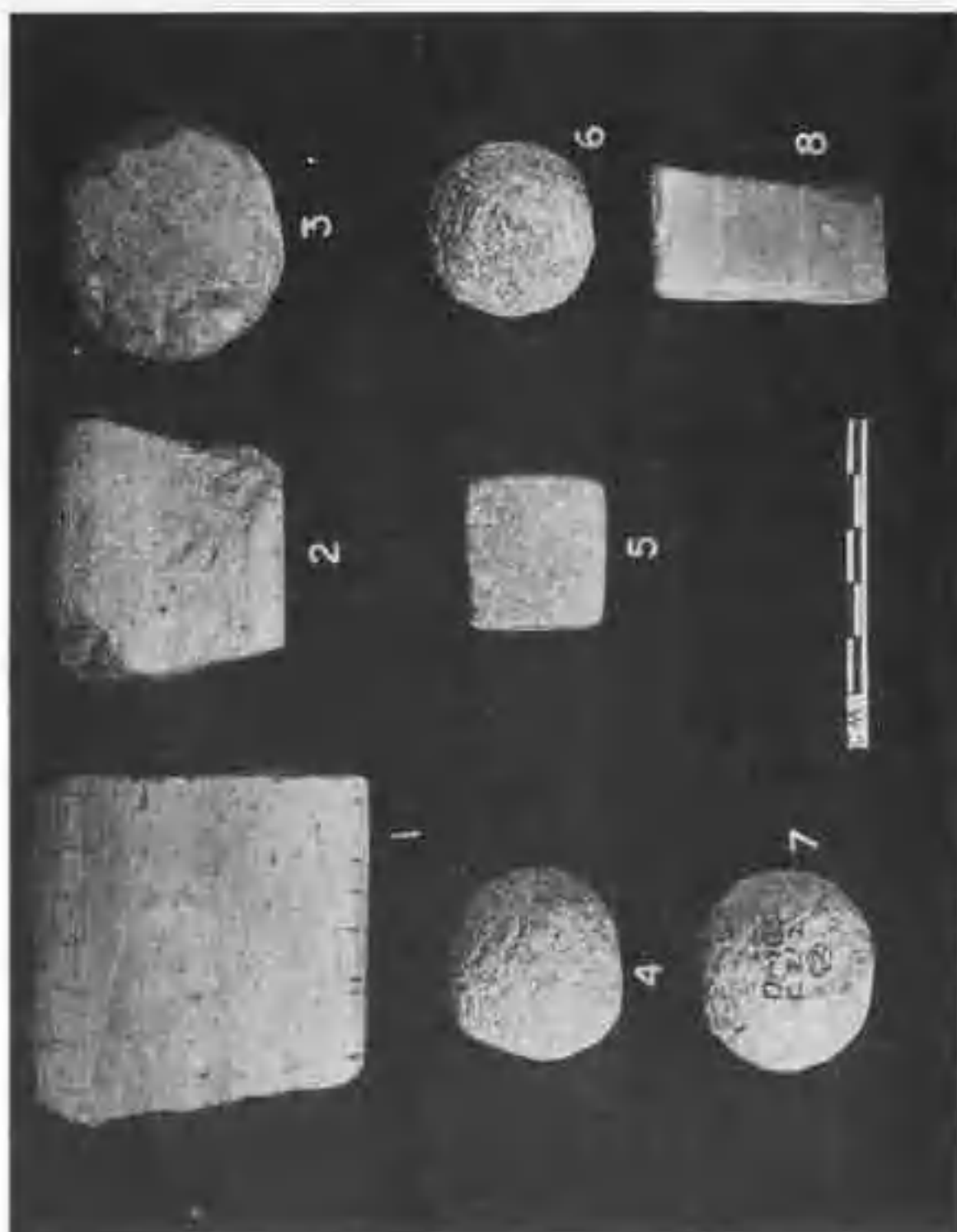


PLATE Clix. Weights and Measures: 8, Phase II; 1 and 2 Phase III; 3, Phase IV, and 4, 7, Phase V.

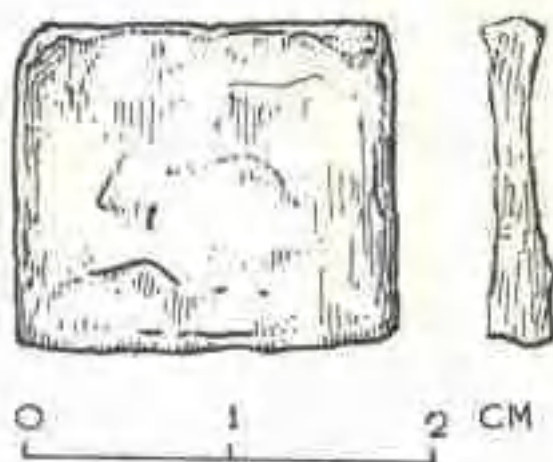


Fig. 123. Gold piece (scale 2/1)



shape belonged to the Malwa and the Jorwe Phases, the one from the former is a purposely shaped disc of thick pottery (fig. 121, 1; pl. CLIX, 3) and all the four from the latter of stone. Those of stone are of two types, one is a cube (fig. 121, 7; pl. CLIX, 5) and the remaining three are plano-convex (fig. 121, 2-4; pl. CLIX, 4, 6 and 7), all made of purple basalt. The cube reminds one the weights of the Harappa Culture.

Measuring instruments are represented by three specimens, one from Phase II (fig. 121, 8; pl. CLIX, 8) and two from Phase III (fig. 121, 5 and 6; pl. CLIX, 1 and 2). That from the former is the earliest example of its kind so far obtained in the Deccan. It is of very fine fabric, comparatively much finer than that of the Harappan Red Ware, and its surfaces have been treated with a thin coat of brick red slip. It was originally a long piece of which only a fragment of one of the square ends has been found. The specimen is elliptical in cross section. The square end has been made flat by grinding. The sides have been slightly flattened and on each side there is a straight horizontal groove. At the end there is a groove across the breadth. While the under surface is devoid of any other marking, the flat upper surface is divided into three parallel segments by two shallow horizontal grooves which lie at a distance of 15 mm from each other. One of the sides bears two graduations at a distance of 10 mm. On the opposite side only one graduation has been survived. Interestingly enough this latter and the first of the two mentioned above also lie at a distance of 10 mm from the square end of the scale. In contrast to the straight measuring scale of Phase II the scales from Phase III are fragments of specially made rings of pottery. One of them (fig. 121, 5; pl. CLIX, 1) is buff in colour, elliptical in cross section with a slight curve on the inner side and the convex outer side. Of fine fabric, its core shows ivory black band in the middle. Its lower side has been ground to make it flat. Graduations occur along both, the upper and the lower, periphery in two sets. The graduations in one set on the upperside lie 15 mm apart from each other and in the other 9 mm. The graduations on the lower side are in two sets, one of which varied from 11 to 12 mm and the other from 16 to 18 mm. The other specimen is of pink colour with concave outer side and slightly thickened rounded edges. Of medium fabric, its core is ivory black in colour in the middle. On both its edges occur incised graduation marks. Those on the lower edge are at a distance of 8 mm, 15 mm and 15 mm. There is thus, no uniformity in the divisions.

The selected examples are described below.

Fig. 121; pl. CLIX

1. Weight; pottery. A circular disc of thick pink ware, Phase IV, 51/1978-79, pl. CLIX, 3.
2. Weight; purple basalt. Plano-convex in shape with a concave under side, Phase V, 4/1978-79, pl. CLIX, 6.
3. Weight; purple basalt. Almost similar to 3 above, Phase V, (CZ'3 (3) 1978-79, pl. CLIX, 4.
4. Weight; purple basalt, Almost similar to the 3 and 4 above with the difference that the

- underside seems damaged. Phase V. (GZ¹² (2) 1978-79). pl. CLIX, 7.
5. Fragment of a measuring ring of buffish pink ware with a concave outer side and rounded edges on which are incised graduation marks. Phase III. (96/1977-78). pl. CLIX, 2.
 6. A fragment of a measuring ring of buff ware with slightly concavo-convex section and rubbed edges. It bears incised graduation marks on both sides. Phase III. (97/1977-78). pl. CLIX, 1.
 7. Weight; cube of purple basalt. Shaped by grinding. Phase V. (21/1977-78). pl. CLIX, 5.
 8. A fragment of a highly finished measuring scale with square end, parallel sides and elliptical cross-section. It bears on one of the sides two graduation marks and on the other, one, all incised. Phase II. (105/1977-78). pl. CLIX, 8.

S. Gold Piece

In the course of cleaning the area between the pegs L 40 and L 48 lying between the tomb or *samadhī* of Gaibi Baba or Gahinimath and the temple of Maruti, one rectangular piece of gold with hammered surfaces and raised edges was collected (fig. 122; pl. CLX). It is 1.7 cm long and 1.5 cm broad.

10. CONTRIBUTIONS AND CONCLUSIONS

To recapitulate the evidence, When viewed in the light of the situation of archaeological research in Maharashtra prevailing prior to the excavations described in the foregoing pages, it would become amply clear that the excavations have, for the first time, made it clear in a stratified context that in this region, prior to the Malwa Culture, flourished three more Chalcolithic cultures, viz., the Daimabad, the (Late) Harappan and the Savalda. This evidence has pushed backwards the span of the Protohistoric period of the region by more than five hundred years and thus narrowed to some extent the cultural gap between the last phase, Phase III C₂ of the Mesolithic revealed in the excavation conducted by this author at Patne in the central Tapi basin on the one hand, and the Savalda Culture of the Chalcolithic on the other.

The most striking feature of the available evidence is that, except for a short duration between Phase II and Phase III, the site remained occupied throughout during the period from around the last quarter of the third millennium B.C. to the end of the second millennium B.C. (without MASCA — correction) and cultural deterioration was not to be seen in any of the levels. Even the floods during the Jorwe Phase appear to have brought about changes in the settlement pattern but not the cultural deterioration as such. Further, except the Jorwe Culture, in which various sources seem to have contributed towards its formation, all the cultures appear to have arrived and settled at Daimabad in their fully developed form and, except Savalda Culture, about which there is no information, each one ousted its predecessor. These facts would suggest that there was favourable environment in Maharashtra for the Chalcolithic Cultures to flourish during the period under study and that there were probably disturbing situations outside Maharashtra resulting into the movement of cultures which seem to have taken place roughly every after two centuries or so, if the calculations be any guide. In the light of the above it is doubtful if the suggested climatic fluctuations (Appendix I) could be held good for Daimabad or for that matter for Maharashtra. It appears more likely that the climate during the Chalcolithic period was not different from that of today.

Besides being advanced agriculturists with a knowledge of double cropping, winter (*Kharif*) and summer (*Rabi*), the authors of these cultures were engaged in various arts, crafts and merchandise and maintained long distance contacts. The society of each culture was well-organised, bound by specific norms, as is indicated by the use of a distinct class of painted pottery characteristic of each culture, and governed by a head with the assistance from administrators, noblemen and priests. Religion played an important role in the life of the people. Except the Savalda Culture of which no evidence of disposal of the dead was found in the excavated area, the people of all the cultures buried their dead in the area of habitation, of the Jorwe Culture also having a separate burial site away from the habitation site.

The authors of the Savalda Culture were the first known settled agricultural village

1. *Indian Archaeology 1972-73 - A Review*, pp. 21-23.

community to select and occupy the site at Daimabad and to exploit the moisture – retaining clay-rich black cotton soil of the region for cultivation. They lived in primitive type of tri-lateral mudwall houses of various dimensions and of one or more rooms, the floors of which were occasionally decorated with shells. The two-room and three-room houses with a common main entrance and a hearth in each room may suggest allotment of separate room to married members of the joint family.

The Savalda Culture was contemporaneous with the Harappa Culture of the Mature Phase in northwest India and Gujarat and both these cultures maintained contacts with each other. The descendants of the highly advanced Harappans migrated into the upper Godavari basin, through the central Tapi basin, towards the beginning of the second millennium B.C. and succeeded the phallus – worshipping and culturally as well as technologically comparatively much backward settlers of the Savalda Culture.

The overall pattern of the Harappa Culture as represented at Daimabad is that of a Late or Degenerate form. The exposed house complex appeared to belong to the merchants and craftsmen. The people were not in as prosperous the conditions as those obtained in Gujarat and the Indus Valley during the Mature Phase of their culture. Yet, they had kept alive most of the traditions of their ancestors such as production of fine, sturdy pottery, including the bichrome ware, the use of mudbricks in the ratio of 4:2:1, the art of writing and the use of fine quality ornaments including those of gold. The bronzes were their sacred belongings, the objects in their worship, which they had brought with them at Daimabad.

The city life once enjoyed in their homeland would not have been felt at Daimabad. Yet the town of considerable size, occupying over 20 hectares of land, with a temple of *Pashupati* and mudwall and occasionally mud-brick houses with probably flat roof, big and small, Daimabad may have been a capital of the Harappans of the region of the Godavari basin in Maharashtra.

Among the important contributions of the (late) Harappans to the Deccan mention should be made of fast wheel, rectilinear houses with perhaps flat roof, mud-brick structures, advanced metal technology, standardization of weights and measures and urbanism.

After a gap of about half-a-century or so the Daimabad Culture came on the scene. This was recognized as a distinct Chalcolithic culture for the first time at Daimabad and much remains to be known, including its genesis, about it. It should, however, be mentioned that this culture, it seems, was contemporaneous with the Ahar Culture of Madhya Pradesh as is apparent from its stratigraphic position below the Malwa Culture revealed in the excavations at Kayatha² and Dangwaila³.

It is believed that the Malwa Culture of Central India had spread in the Deccan. But this culture at Daimabad, showed some important differences. In the black-on-red pottery of Madhya Pradesh the carinated *handi* with funnel-shaped mouth and tubular spout is absent. There is also a total absence of double-urn type child burials in that region. The absence of these two important features is difficult to explain at this stage. In fact, the evidence of

2. M.K. Dhavalikar and Z.D. Anari, *Excavations at Kayatha*, (Pune, 1975).

3. M.D. Khare, op. cit., (1982).

different types of burials in the Malwa Phase at Daimabad is the first of its kind so far obtained in the region hitherto known to have been occupied by this culture.

Unique was the religious and residential complex of the Malwa Culture. It is an unequivocal evidence of elaborately developed and systematized institution of sacrifice. The provision of a channel on the platform and in front of house 31 for the ablution water to run into soak-pits is suggestive of the sanctity and the cleanliness that was maintained within the complex and also while performing the rituals. For performing the sacrifices in so vast a sacrificial site, with different types of altars, therefore, an array of priests well-trained in the sacrificial liturgy would have been required. All these would ultimately tend one to assume the existence of specialized priestly classes and hereditary priesthood. It is also logical to believe that the priestly classes were now in the full hold of the sacrificial rituals and thus the religion. They gained wealth through the offerings made by the people. Their affluence can be judged from the specious *Wada* the headpriest possessed in the religious complex. As religious heads they must have been enjoying a high status in the society and consequently exerting considerable influence not only on the common people but also the nobility, the officials of the administrative system as well as the ruler or the chieftain of the settlement.

Priestly classes would not have developed in isolation and with it also must have grown the various artisan classes. It is not possible, however, to infer that there existed a social stratification based on the crafts or occupations during the Malwa Phase although it is quite likely that with the growing specialization in the arts and crafts they had also become hereditary as in the case of priesthood. Occupation of the merchant's house by succeeding generations may also suggest so.

The exposed religious complex has helped identification of the religion of the Malwans. It has been very well documented that the religious life of the people of the *Vedic* period was marked by the performance of sacrifices and that the sacrificial rituals involved construction of sacrificial altars. The evidence of sacrificial altars in the religious complex leaves no doubt that the authors of the Malwa Culture at Daimabad were followers of *Vedic* religion.

It is not as yet certain that the authors of the *Savalda*, the Late Harappia and the Daimabad Cultures followed *Vedic* religion. Until, however, it is proved so, it may be said that the authors of the Malwa Culture were the first people following *Vedic* religion to settle in *Dakshinapadesha* around 1600 B.C. This also reminds one of the story of sage *Agastya* who crossed the *Vindhya*. A legend current in the region is that the sage *Agastya* established his *ashrama* or hermitage at Akola on the river Pravara, about 55 km upstream of the famous site of *Jorwe*. It is not unlikely, this legend may be a real remnant of a historical fact.

The sacrificial altars as also the spouted pots and the representations of *Siva* in applique on pottery and in stone seem to mark a stage in the development of post-*Vedic* *Samam* and *Sakti* cult. The figural schematization in the case of the spouted pots appears to represent the concept of fertility.⁴ This concept is based on the idea of union of the *Linga* and the *Yoni* or of Father and Mother. It seems also likely that the stone-stump in the fire altar at the apse

4. It is well-known that the sage *Agastya* was known as *Kumbhayanil*.

of the Apsidal Sacrificial Temple and the clay-stump inside the fire altar of the Heart-shaped Fire Altar in house 32 convey the same idea. Image worship is clearly evident in the stone image of Sma. The decorations in applique on a jar of thick coarse ware of a flower and a crescent motif seem to have religious significance.

Quite a number of culture-traits of the Malwa Culture continued in the Jorwe Culture. To name the salient ones:

1. the pottery types such as the carinated *handi* with tubular spout and the concave-sided carinated bowl which became the fossil-types of the Jorwe Ware;
2. the so-called potter's marks;
3. the graffiti marks;
4. the double-urn child burials;
5. the use of burial urns of the burnished grey ware;
6. the apsidal form of sacrificial temple;
7. the circular floor decorations of potsherds and
8. the type of *chullahi*.

From the above mentioned features, common to both the cultures, it was felt for some time that the Jorwe Culture was developed out of the Malwa Culture. But further analysis of the evidence showed that it was not a whole truth and it appears that, on the whole, the former belonged to a well-organized and well-disciplined community who had nurtured civic sense of high order and had an administrative, political, social, economical and religious set up required to maintain it.

The period of the Jorwe Culture at Daimabad was marked by important events. There was an expansion of the settlement from 20 hectares to about 50 hectares. The population in so vast an area would not have been less than 10000 souls and with so much population, there should be no difference of opinion in calling the settlement a town. In this town the orientation of the houses was changed from the east-west of the earlier phase to the northwest-southeast. Even the butcher's hut and the potter's kiln were in the alignment of other houses. This could not have happened without town-planning and which ultimately could not have been possible without an authority or a leader or a head either religious or social or political.

The construction of the embankment of lime along the vulnerable sides of the settlement for protecting it from the floods of the river Pravara and that of the fortification wall are equally important in the present context. Both these constructions involved mobilization of man power either voluntary or paid (in kind) or forced. The fortification with bastions does not but represent a military defence system and here the presence of a leader or an authority or ruler for safeguarding against external aggression cannot be ruled out. The finds of terracotta gamesmen further substantiate the belief that the idea of administrative and military systems were in much advanced a stage during the Jorwe times at Daimabad. Even in the use of stone weights one is inclined to see a hand of someone determining specifications. The cylinder seal is an unequivocal evidence of long distance trade. The State usually have

control over weights and measures as well as trade within and outside. The evidence thus indicates presence of an authority imposing regulations in social, economic and political life.

It may be recalled that fast-wheel for producing pottery was first introduced at Daimabad by the Harappans in Phase II. In the Jorwe Phase it may be said to have been 'reintroduced'. But then, it appears, the fast-wheel was not the monopoly of a potter. It moved fast with the vehicles such as bullock-carts and chariots as well. These vehicles crossed the forested plains of the Pravara and the Godavari basins and traversed far beyond in the North and the South in connection with trade and commerce. That the transport system during the Jorwe Phase was swift is also attested to by the representations of camel and horse on pottery and cylinder seal. The bullock-carts, horse-drawn chariots and carts and camel and horse, besides being the indicators of modes of travel of the Jorwe people, they also represent vehicles of trade. The Jorwe Phase witnessed flourishing trade. The terracotta cylinder seal represents nothing but an insignia or trade-mark.

Technologically the spoked wheels show a development over the solid wheels in that the former help increase the speed of the vehicle. The wheel of the chariot on the cylinder seal appears to be of solid type. But the examples of pottery toy-wheels suggest that the Daimabad folk used also the spoked wheels for their carts. They were of advanced type. This has been indicated by a couple of blind holes on their inner side apparently for attaching subsidiary spokes with the hub so as to eradicate wobbling of the wheel. Wobbling of the wheel affects the speed of a vehicle and as such the contrivance provided to remove this defect speaks about the master mind of the inventor.

But, far more interesting is the evidence of the pottery kiln in which is manifest advanced scientific knowledge the Jorwe potter had attained in the pottery manufacturing craft.

In the Jorwe Phase religious rituals were developed into various elaborate forms. Those connected with the welfare of women and children have been represented by fire-pit of the *Arghyapatta* or *Yonipeetha* type, the mother goddesses of terracotta and copper and the elliptical structures with elaborately made strips of approach paths plastered with cowdung and containing clusters of pots and other objects as offerings. Plastering with cowdung appears very significant since it is connected with a religious structure. Whether this evidence also suggests that cow was being held in reverence during these times is difficult to say with certainty at this stage. The finds of bone-hafts of razor-shape and a blade below one of them may suggest that the elliptical structures were connected with, among others, the *Keshakartana* ceremony of boys. Significant is also the representation of a mothergoddess as an auspicious deity believed to be capable of bringing prosperity. The figural schematization occurring in painting on the Malwa Ware was replaced on the Jorwe Ware by a representation of buttocks in graffiti below the tubular spout. In this connection mention should also be made of an interesting evidence of union of a male and a female, painted in black colour on the inside of an incurved bowl of Jorwe Ware (fig. 71, 20) recovered from a burial in the 1958-59 season.² The representations thus differ, but, the basic idea of fertility remains the same.

2. *Indian Archaeology, 1958-59: A Review*, fig. 7, top left.

Deification of a sage and his three consorts shown unified with him and their posthumous worship indicate nothing but an ancestor worship. The evidence of offering flowers to the dead is unique. This has been represented by two examples: one in the form of graffiti of a flower on a burial urn of burial 69 (fig. 83, 2) and the other by the find of flowers of *Flavaria compositae* (pp. 192-195). The evidence obtained thus shows a marked departure from the elaborate sacrificial rituals of the Malwa Phase and appears to depict dominance of tantric rites. That magic rites were also performed has been suggested by the find of an incense burner with bull-horn-shaped spirals at each corner and painted in red ochre and white colour.

A number of finds from the Jorwe levels and some of the traits of this culture seem to owe their origin to the Harappa Culture. To cite some examples, the cubical weight, the terracotta gamesmen, the cylinder seal, the 'wafer' beads of steatite, the arecanut terracotta bead and the chalcedony drills have parallels in the Harappan material equipment. The use of fast-wheel for the production of pottery, the method of application of slip over the Jorwe Ware and the paintings of the fish-scale, the pipal leaf and the palm-leaf motifs suggest Harappan origin. The similarity between the pottery from Surkotada and Daimabad is worth noting. The offering cups are analogous to those from Chanhudaro. The idea of planning the settlement, the civic discipline discernible in the settlement pattern, the trade pattern and, most important of all, the establishment of a town appear to be the elements of the Harappa Culture. Even the circular huts of the Jorwe levels may owe their origin in the similar huts of the rural Harappans of Gujarat.⁶

Harappan traits have also been noticed at other sites of the Jorwe Culture. The double-pot from Jorwe is typologically similar to those from Amri and Rangpur.⁷ The copper celts from Jorwe also show similarities with those from Harappan sites. The barbed arrowhead from Inamgaon is unmistakably Harappan whereas the two spiral-headed copper pins from this site recall Harappan specimens.⁸

The Harappan elements thus seem to form the core of the Jorwe Culture. This would sound not only strange but also unbelievable. Firstly, because, as has been seen before, the Harappans had left Daimabad, and that too in a hurry, some four hundred years earlier. Secondly, personality of these Jorwe-Harappans is quite different. How and where did they get this form? It seems, as the evidence stands at present, the region of Maharashtra was the nuclear area of the Jorwe Culture. Does the concentration, therefore, indicates another wave of the successors (now remote) of the Harappans in this region?

The excavations at Daimabad have no doubt brought to light several unknown facets of the Chalcolithic cultures of Maharashtra but at the same time also posed many problems for the archaeologists to work on.

6. R.N. Mehta and K.N. Momin, 'Excavation at Kanewal'. In (ed.) R.K. Sharma, *Indian Archaeology - New Perspectives*, (Delhi, 1982), pp. 142-147.

7. S.B. Rao, 'Excavations at Rangpur and other Explorations in Gujarat', *Ancient India*, 18 and 19, 1962 and 1963, (1963), p. 72, pl. XXIX, G, H and E.

8. M.K. Dhavalikar, (per com.)

APPENDIX I

GEOARCHAEOLOGY OF DAIMABAD

By S.N.Rajaguru, Deccan College, Pune.

A. Introduction

Geoarchaeology helps elucidate the relationship between early man and his physical environment which includes static parameters like geology, structural landforms and the dynamic parameters like rivers, soils and climate. Recently attempts have been made to understand early farming cultures of Maharashtra against the background of Mid Holocene climatic changes. Cultural deterioration between 1000 B.C. and 700 B.C. at Inamgaon in District Pune, Maharashtra has been explained in terms of frequent draughts that occurred due to a relatively dry climate (with weak SW monsoons) during this period. It is against this background, geomorphic features like buried soil and flood gravels located in Late Harappan and Jorwe habitational debris (anthrosols) at Daimabad will be examined.

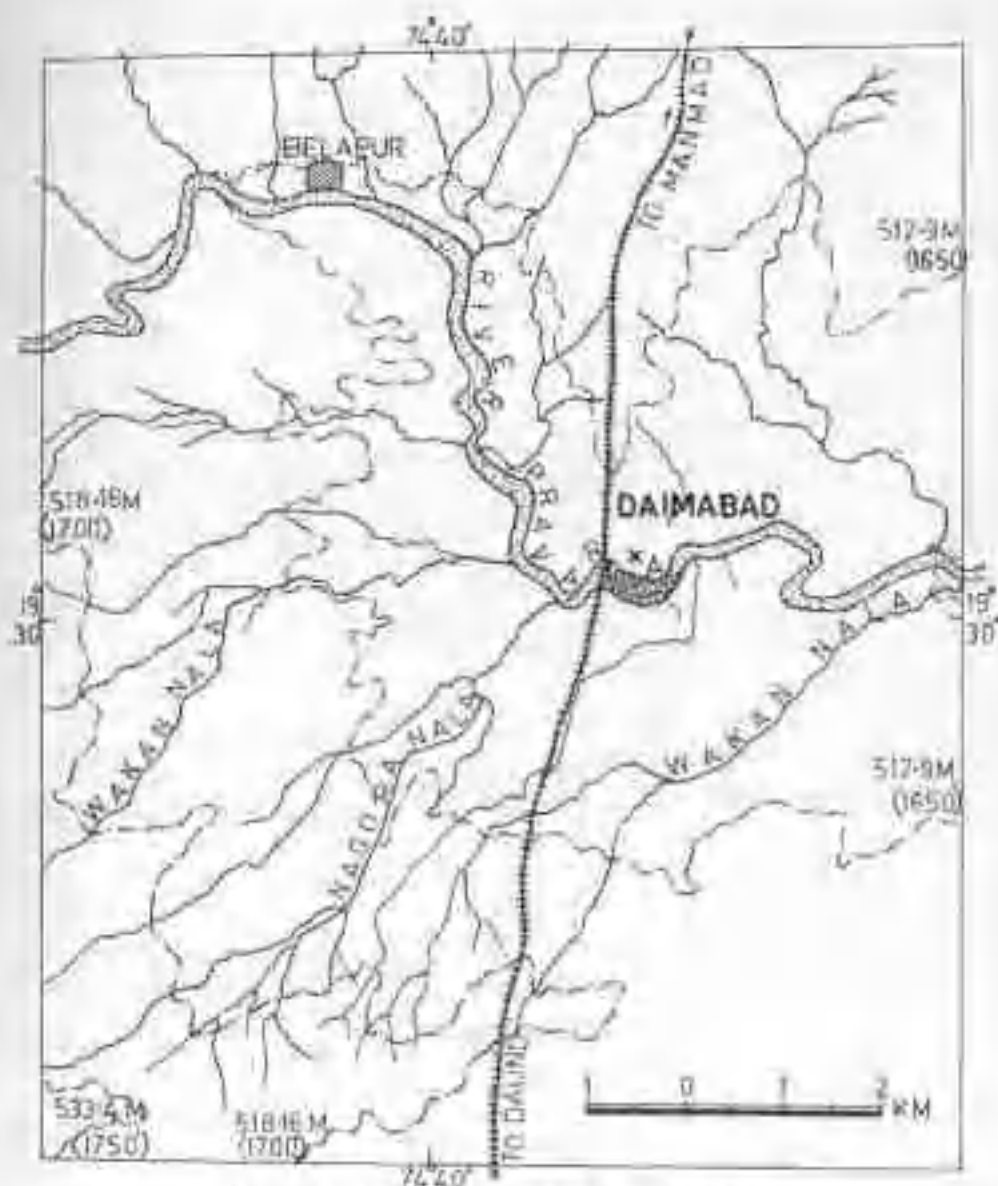
The Chalcolithic site of Daimabad is situated on a 10 m high alluvial flat surface developed in a concave meander loop of the Pravara, one of the major tributaries of the Godavari in Western Maharashtra. The surrounding terrain of the site consists of Late Quaternary alluvia and basaltic rocks of the Cretaceous-Eocene age. The Pravara has a broad gravelly channel and it takes a sharp northern turn near the habitational mound. It receives significant ephemeral streams from the south. These tributaries originate in a valley pediment (535 m high ASL) and have a gradient of 4 m per km (fig. 123). The present climate of the area is semi-arid monsoonic and the Pravara gets flooded only during July, August and September when the monsoons are active in this region. The habitational mound of Daimabad was submerged under high overbank flood waters of the Pravara in the year 1947, 1956 and 1969.

B. Palaeoenvironmental Significance of buried soil and flood gravels.

1. Buried soil

This soil occurs as a dark brown (10 YR 3/3 as per Munsell Soil Colour Chart) band with an average thickness of 10 cm in between the habitational debris of Late Harappan Phase and that of the Daimabad Phase. This band of uneven thickness (varying from 5 cm to 15 cm) was prominently observed in the cuttings, B8-C8-D8-B9-C9, X'5-X'5 to Z'3-Z'5 and Y1.

Soil samples of habitational as well as weathered layers were collected in trench Y'4 of Sector II and analysed by usual chemical and mineralogical methods in the Chemistry laboratory of the Deccan College, Pune. Results of these analyses are given below:



DAIMABAD AND SURROUNDING DRAINAGE



PLATE CLXI Section facing west of the cutting UMD 1 of 1958-59 season (stripped in 1978-79 season) showing river flood deposits sandwiched between layers 4 and 5.



PLATE CLXII Flood gravel deposited in pits scooped out in the habitation deposit.

Chemical and Mineralogical composition of habitation deposits and buried soil

Sample No.	Trench No.	Layer No.	Colour	pH	CaCO ₃ %	Organic Carbon	Mineral composition of fine sand fraction
1	Y*4	13	10 YR 5/3 Dark Brown	7.8	3.1	0.8	Weathered Plagioclase, Quartz, Chalcedony, opaques.
2	Y*4	12	10 YR 5/5 Greyish Brown	7.7	10	0.62	Plagioclase, Quartz, Chalcedony, Opaques and traces of pyroxene.
3	B8	Older alluvial silt	10 YR 6/4 Yellow Brown	8.3	18	0.3	Plagioclase, Quartz, Chalcedony, Opaques and traces of pyroxene.
4	B8	Virgin Black soil	10 YR 4/2 Dark Brown	7.8	1.2	0.84	Quartz, Chalcedony, Opaques and traces of plagioclase (weathered)

The analyses on p.584 clearly show that there is a considerable similarity in mineral and chemical composition of Virgin Black Soil developed over Yellowish Brown Silt of alluvial origin and the Dark Brown band capping Greyish Brown habitation debris of the Late Harappan Phase. Relative enrichment in organic carbon, decrease in calcium carbonate content, presence of weathered plagioclase and absence of pyroxene in dark brown layers convincingly suggest pedogenesis. Dark brown layers developed over Late Harappan debris and alluvial silt are weathered eluvial (A) horizons and represent buried soils of the Mid Holocene and Early Holocene periods respectively. Pedologically both the soils can be classed as pedocalic vertisols, characteristic of savannah vegetation with hot semi-arid climate.

Presence of weathered potsherds of Harappan red ware in the dark brown band supports the hypothesis of *in situ* pedogenesis of the Late Harappan debris around 1800 B.C.

Pedocalic brown soil over debris of the Late Harappan Phase, therefore, suggests that the site remained deserted for a period of hundred years or so at least, as the soil is moderately weathered or sub-mature. It is difficult to indicate the causative factor responsible for the desertification of the site. One however, gets some idea about the environmental change during Jorwe period, when one tries to understand the hydrological aspect of flood deposits sandwiched in the habitation debris of the Jorwe Phase.

2. Flood Gravels

Lenticular lenses of cross-bedded, loose, sandy pebbly (with pebble size varying from 1/2 cm to 4 cm) gravel were found to occur in various levels of the Jorwe Phase in Sector 1, in the southwestern part of the mound. The earliest evidence in this regard was noticed in the section facing west of the 1958-59 cutting DMD-3 (pl. CLXI). The floods left behind about 15 cm thick layer of gravel over a lime embankment which has been ascribed to structural phase C (see pp. 191-192, pl. XLVII). The flood gravels were also found to occur on the top of layer 3 of the cutting CZ52-FZ52 to CZ61-FZ61. This flood very badly damaged the structures of structural phase C in this cutting (see pp. 48-50). The habitation was again encroached upon by the flood as was evident by the lenticular patches of river sand and gravel in layer 2 of the above mentioned cutting. Its maximum lateral spread was observed for about 120 m in the cutting L-48 (see p. 59). Nearer the river the flood scooped out habitation deposit and deposited gravel in the pits so resulted (pl. CLXII). The dominant lithological components are compact and amygdaloidal basalt (tributary component), zeolites and chalcedony. The gravel is well rounded-to-subrounded, unimbricated, ungraded and moderately sorted. Presence of hundreds of small (less than 1 cm) gastropod shells and absence of cementing material indicate that the gravel has not undergone post-depositional pedo-diagenetic changes and the area was occupied almost immediately after the floods.

C. Discussion

In most of the earlier accounts of floods during Protohistoric and Early Historical periods

In Western India, it has been observed that the habitation sites were affected by the spread of low energy floods and the sites were covered by slack water deposits such as clay, silt and fine sand.¹ In the Northern Deccan, the streams like the Godavari, Pravara, Bhima and the Krishna, have entrenched courses in hard rocks and therefore have poor flood plains. Compared with rivers in the Gangetic Plain, these rivers are mainly autochthonous (with the main watershed in the Western Ghats) and have bridged to moderately sinuous courses. The streams in the northern Deccan are active only during the four months of summer monsoon and the maximum number of floods occur in July, August and early September. Floods last for a couple of days only. It has been observed that the Godavari and also the Pravara had a severe flood with a discharge of about 2 to 4 lakhs of cusecs and a maximum velocity of about 3 to 4 m per second.² This flood occurred in the first week of September, 1969 and damaged property heavily. The flood of 1969 has been found to be of rare occurrence, i.e. once in seventy five years. During this flood clay, silt and sand were found to be deposited in areas, 15 to 20 m high above the modern bed level of these streams. In the light of the above mentioned aspects of modern floods in Western Maharashtra in general and in the Godavari Valley in particular it is easy to explain floods of low energy type during the Protohistoric and Early Historic times in Western Maharashtra. These floods could have occurred as a result of heavy rains (precipitation of 50 to 100 mm per day for a period of 3 to 4 days without break) during the monsoon months. One however, fails to explain the deposition of pebble grade material at a height of about 15 m above the modern bed level of the Pravara at Daimabad in terms of modern flood analogy alone.

Normally, pebble grade material is moved and deposited only in the channel of the stream. Its deposition during the Jorwe times cannot be explained by hypothetical rise in the bed/channel level of the Pravara by 15 m as there is no geomorphological evidence of raised bed level of the Pravara in the area under study during the Mid Holocene. Ritter³ has tried to explain the deposition of cobble-to-pebble grade gravel in the floodplain of Sexton Creek in southern Illinois, U.S.A., in terms of flash floods of high intensity as a result of storm-rains. Some of the sedimentological characters of gravels are very similar to those observed at Daimabad. The overbank gravels in the floodplain of Sexton Creek are lenticular in shape (length varying from 18 to 60 m, width around 18 m and maximum thickness of about 0.5 m) and they are discontinuous and not connected with each other. It has been suggested that the gravel reached the floodplain at a height of about 8 to 10 m above the channel level not by rolling or sliding but as "particulate matter in momentary suspension" (p. 647). It has been pointed out that much of the increased discharge during the rising stage of the flood was probably due to rapidly increasing velocity. More or less similar flood condition was prevailing during the Jorwe times at Daimabad. These floods were of high intensity, probably like that

1. G.G. Mujumdar, S.N. Rajaguru and R.S. Pappu, "The recent Godavari flood (September, 1969) and its relevance to Prehistoric Archaeology", *Bulletin of the Deccan College Research Institute*, vol. XXIX, (1970), pp. 118-134.
2. *Ibid.*
3. D.F. Ritter, "Stratigraphic implications of coarse grained gravel deposited as overbank sediment, Southern Illinois", *Journal of Geology*, Vol. 53, (1975), pp. 645-650.

of 1969 flood in the Godavari and Pravara valleys, and short lived. Only such a flood condition would have allowed the transport of gravel on the floodplain surface. Most of the increased discharge during such high intensity flood was accommodated by rapid increase in width.

Owing to rapid drop in the flow velocity across the floodplain surface (in case of Daimabad, across the habitation debris), the gravel deposition resulted. The most important aspect of this case is that the gravel was deposited in a passive manner and therefore, the destruction of the habitation was comparatively moderate.

As no detailed mapping of geomorphological features around Daimabad has been completed and as there is inadequate data on hydrology of the area, it is not possible to interpret flood deposits of Daimabad precisely. It can only be suggested that the environment during the Mid Holocene times was not static. Both the buried soil and flood gravels indicate dynamic changes in physical environment. Such changes, particularly flood during Jorwe times may be in response to major environmental change such as climate. Palaeobotanical, archaeozoological and archaeological data collected at Inamgaon indirectly indicate climatic deterioration around 1000 B.C. Probably frequent floods of Daimabad might have occurred due to the same factor. Recent mineralogical and geomorphological studies of lake sediments of Didwana in District, Nagaur, Rajasthan have shown that the climate in the Thar was arid around 20,000 yrs. B.P., dry semi-arid between 20,000 and 12,000 years B.P., sub-humid between 7000–5000 yrs. B.P. and dry semi-arid after 5000 yrs. B.P.⁴ The synchrony of climatic change between the Thar desert and Western Maharashtra during the Terminal Pleistocene (C. 20,000 B.P. to C. 10,000 B.P.) has been established beyond doubt. The climate during this period was dry with weak southwesterly monsoon. It is therefore, highly likely that the same perhaps holds good for the Mid-Holocene during which the climatic fluctuations were as follows:⁵

- 5000 – 3700 Yrs. B.P. Relatively wet.
- 3700 – 3500 Yrs. B.P. Relatively dry.
- 3500 – 3000 Yrs. B.P. Relatively wet.
- 3000 – 2500 Yrs. B.P. distinctly dry, or arid.

The above climatic sequence may also have occurred in Maharashtra. It, therefore, can be suggested that the floods at Daimabad occurred during the relatively wet climatic phase (i.e. between 3500 – 3000 Yrs. B.P.). This climatic hypothesis needs to be tested in future in other parts of Western and Central India.

Acknowledgements

I thank Dr. S.A. Sali, Director of Daimabad Excavation for giving me an opportunity to study the geomorphic aspects of the site and Dr. B.C. Deotare of the Deccan College, Pune for the Chemical analyses of soil samples.

4. R.J. Wasson, S.N. Rajaguru, V.N. Misra, D.P. Agrawal, R.P. Thir, A.K. Singhi and Kameswari Rao, 'Geomorphology, late Quaternary stratigraphy and palaeoclimatology of the Thar dunefield,' *J. Geomorphology*, Suppl. 5d, 15, 1983, pp. 117–181.
5. R.V. Krishnamurthy, D.P. Agrawal, V. N. Misra and S.N. Rajaguru, 'Palaeoclimatic inferences from the behaviour of Radio Carbon dates of carbonates from sand dunes of Rajasthan,' *Proceedings of the Indian Academy of Sciences (Earth Planet Science)*, Vol. 90:2, (July, 1981), pp. 155–160.

APPENDIX II

ANCIENT PLANT ECONOMY AT DAIMABAD

Vishnu-Mitre, Aruna Sharma and Chanchala
Birbal Sahni Institute of Palaeobotany, Lucknow,

1. Introduction.

The site Daimabad (Lat. 19° 31' north; Long 70° 42' east) is located on the left bank of the Pravara river a tributary of the Godavari, 18 km southeast of Shrinampur in Ahmednagar district and six km south-east of Padhegaon. The occupational deposit upto 5 m thick and varying in thickness from place to place overlies black cotton soil below which is the yellow kankary silt dating from the Late Pleistocene Period. The present vegetation is of thorny scrub type much like that in the semi-arid belt.

A succession of five Chalcolithic cultures was recognised at Daimabad such as Phase-I — The Savalda Culture; Phase II — The late Harappan Culture; Phase III — The Daimabad Culture; Phase IV — The Malwa Culture and Phase V — The Jorwe Culture.

The plant economy for the Savalda, the Malwa and the Jorwe Cultures was first briefly reported in 1977 by Kajale to consist of Barley, Lentil and *Zizyphus jujuba* for the Savalda Culture; Wheat, Barley, *Pisum*, *Lathyrus*, *Dolichos*, Lentil and *Zizyphus* for the Malwa culture and in addition to these Rice, Ragi, *Paspalum*, *Sorghum*, *Vigna speciosa*, *Carthamus tinctorius*, *Linum unitatissimum* for the Jorwe Culture.

The present report on the plant economy of the site (fig. 124) is based on carbonised seeds and fruits and leaf impressions from the levels of the Savalda, the Malwa and the Jorwe Cultures (Table 22) given to the senior author for investigation and the charcoals sent separately for radiocarbon assay to Dr. G. Rajagopalan of the Radiocarbon Dating Laboratory at the Birbal Sahni Institute of Palaeobotany (pp. 206-211).

The authors are indebted to Dr. Sali for these fascinating materials.

2. Description of Plant Remains

The three kinds of plant remains comprising leaf impressions, seeds and fruits and charcoals are described each under a separate section. Not only they constitute three distinct entities, the convenience of their treatment and significance would also require that each category should be dealt with separately.

1. M.D. Kajale, "On the botanical findings from Excavations at Daimabad — A Chalcolithic site in Western Maharashtra", *Current Science*, 46, (28), 1977, pp. 818-819.



A. Leaf Impressions

(i) Grass Leaves (pl. CLXIII B)

These are exclusively found on the burnt clay lumps from the courtyard of House No. 15 in the Phase I (Sample 13 from Sector I, Trench J2/64) belonging to the Savaldi Culture.

These are in all three impressions of incomplete leaves measuring 3-4.8 x 1-2 cm. The fragmentary impressions reveal that they belonged to linear or lanceolate leaves. They are characterized by distinct midrib with distinct 8-9 or more veins on its either side and running parallel to it. The leaf blade has parallel undissected margins. The apex as observed in one specimen is acute and pointed. The exact length of these leaves would remain unknown.

The pattern of venation and shape of fragmentary impressions allow their reference to leaves of grasses. With the insufficient data on their morphology it is not possible to attempt their further identification and whether these fragmentary leaf impressions belonged to wild or cultivated grasses.

B. Carbonized Grains

(i) Barley (*Hordeum Vulgare* L.)

The carbonised grains (in all the samples) are elongated with rounded and slightly protruded apex and with tapering base due to the embryo. The maximum width is observed in the centre. A ventral groove runs throughout the entire length of the grain (pl. CLXIII C). The grains in sample Nos. 7 and 8 from the Malwa Culture measure 3.5-5.5 x 1.8-3.2 x 1-2 mm in size. They seem to be of small to large sizes. The smaller ones measure 3.5-3.7 x 1.8-1.9 x 1 mm and are 8-9%. The grains in sample No. 1 from the Jorwe Culture measure 4.2-5.5 x 2.3-3.0 x 2 mm. No small-sized grains, the like of which are found in the Malwa Culture, were found in the Jorwe Culture (Table 13).

The small-sized barley grains were earlier reported from Kalibangan where grains under 3.00 mm are 5%, and those between 3.50-3.75 mm are 9%.

(ii) Wheat (*Triticum* spp.)

There are 173 carbonized grains (Sample Nos. 5, 8, 9, 10 and 12) from Malwa Culture and 165 from Jorwe Culture (Sample Nos. 1, 4, 5). These grains are short, broad with a deep ventral groove, and the embryo not protruding as in Barley, are referred to *Triticum*. The detailed morphographic studies have revealed that these grains can be referred to the following three species:



PLATE CLXIII A carbonised grain of *Triticum spheerococcum* showing dorsal side.



PLATE CLXIII Grass leaf impression on burnt clay lump.



PLATE CLXIII Carbonised grains of *Hordeum vulgare*.



PLATE CLXIII Carbonised grains of *Triticum compactum*.

- a. Grains short and broad. Nearly 40 grains in the Malwa phase measure $3.2-4.6 \times 2.2-3.4 \times 1.5-2.6$ mm and 30 in Jorwe phase measure $3.3-4.6 \times 2.2-3.0 \times 2.0$ mm. They have notched apex, deep ventral groove and are humped dorsally (pl. CLXIII A). These on morphographic details are referred to *Triticum sphaerococcum* Perc. (Table 14).
- b. Grains elongated. Nearly 112 grains in the Malwa phase measure $3.5-5.5 \times 2.0-3.25 \times 1.25-2.0$ mm and 27 in Jorwe phase measure $4.0-5.0 \times 2.4-3.0 \times 1.7-2.0$ mm. These are rounded or have broad apex and deep ventral furrow and circular in cross section (pl. CLXIII, D). These are referred to *T. compactum* Host. (Table 15).
- c. Grains long, narrow towards both ends, 21 grains in Malwa phase measure $3.2-4.5 \times 1.7-2.3 \times 1.5$ mm and 58 in Jorwe phase measure $3.5-5.0 \times 1.6-3.0 \times 1.3-2.0$ mm. The ventral furrow is deeper in the centre and runs from end to end and the dorsal surface is smooth without a hump. These are referred to *Triticum aestivum* (Table 16).

There are 4 very small-sized grains measuring $3.0-3.1 \times 1.8-1.9 \times 1.25$ mm. in the Jorwe samples resembling seeds of *T. aestivum* in characters as described above.

Although the grains of all the three species are represented in both the Malwa and Jorwe Cultures, yet those of *T. compactum* predominate in both (Table 17). *T. aestivum* is comparatively much less in the Malwa Culture than in the Jorwe. The grains of *T. sphaerococcum* are slightly more in the Malwa Culture than in the Jorwe Culture.

(iii) Finger Millet (Ragi) (*Eleusine coracana* Gaertn.)

The 123 carbonised grains from the Malwa Culture (Sample Nos. 7, 8, 10, 11 and 12) and 29 from the Jorwe Culture (Sample Nos. 1 and 5) are sub-globose, broadly oblong, measure $1.0-1.4 \times 0.9-1.2$ mm in size. Rugose ornamentation is faintly visible in some (Table 18) (pl. CLXIV A). Embryo is situated dorsally with hilum as a scar on the ventral surface.

These characters are so distinctively similar to those of Ragi grain that these have been referred to *Eleusine coracana*. (Table 18).

These carbonised seeds of *Eleusine coracana* from Daimabad have been found to exhibit variability in their size and shape. We have distributed them in the following two categories.

Category-I — Seeds measure $1.1-1.4 \times 0.9-1.2$ mm, narrow to broadly oblong, ellipsoidal, flattened. Embryo ovate, situated dorsally, hilum situated ventrally. Slit like structure seen on the lateral sides. Rugose pattern seen in some seeds.

Category-II — Seeds measure $1.0-1.25$ mm in diameter, more or less globose, base and apex rounded. Embryo ovate, situated on the dorsal surface, hilum as a small scar on the ventral surface.

There are two possibilities as given below regarding the size and shape variability in the carbonised *Eleusine coracana* seeds.

(1) Due to carbonization the seeds shrink in size. Different shapes may be due to mutual pressure exerted on them while within the fruit.

(2) Variability existed in the seeds of *E. coracana* since the Chalcolithic times, the native

Table 13

Dimensions in mm. of unbroken Barley grains from Dainabad

<i>No. of grains</i>	<i>Length</i>	<i>Breadth</i>	<i>Thickness</i>	<i>L/B</i>	<i>L/T</i>	<i>B/L</i>	<i>B/T</i>	<i>T/L</i>	<i>T/B</i>
<i>Mahua Phase</i>									
2	5.5	3.6	2.0						
2	3.5	1.8	1.0						
3	4.3	2.7	2.0						
2	5.5	2.7	2.0						
1	3.5	2.0	2.0						
2	3.7	2.0	2.0						
2	5.5	2.8	2.0						
2	5.9	3.0	2.0						
1	5.3	2.8	2.0						
1	5.5	3.0	2.0						
4	4.8	2.8	2.0						
Total 22	Av 4.78	2.44	2.09	1.95	2.28	0.51	1.16	0.43	0.85
<i>Jorai Phase</i>									
1	4.6	2.4	2.0						
1	5.4	3.0	2.0						
1	5.0	2.4	2.0						
2	4.5	2.7	2.0						
1	4.5	2.6	2.0						
2	5.5	3.0	2.0						
1	4.5	2.8	2.0						
1	4.5	2.8	2.0						
1	5.0	2.8	2.0						
1	5.4	2.7	2.0						
1	4.8	3.0	2.0						
1	4.2	2.3	2.0						
2	4.5	2.8	2.0						
15	Av 4.82	2.6	2.0	1.85	2.41	0.53	1.3	0.41	0.76

Table 14

Dimensions in mm. of complete wheat grains from Daimabad

<i>No. of grains</i>	<i>Length</i>	<i>Breadth</i>	<i>Thickness</i>	<i>L/B</i>	<i>L/T</i>	<i>B/L</i>	<i>B/T</i>	<i>T/L</i>	<i>T/B</i>
<i>Malwa Phase</i>									
1	4.6	3.4	2.6						
1	3.6	2.3	1.5						
1	3.6	2.2	2.0						
2	3.5	2.3	2.0						
1	3.4	2.5	2.0						
1	3.7	2.5	1.5						
1	4.0	2.6	2.0						
1	3.5	2.4	1.5						
2	3.2	2.5	1.5						
11 Total	Av. 3.55	2.64	1.8	1.34	1.97	0.74	1.46	0.50	0.68
<i>Jorwe Phase</i>									
1	4.6	2.8	2.0						
2	3.3	2.4	2.0						
2	4.3	3.0	2.0						
2	3.3	2.4	2.0						
1	3.2	2.3	2.0						
1	4.2	2.2	2.0						
2	3.5	2.4	2.0						
1	4.0	2.8	2.0						
3	3.3	2.5	2.0						
1	3.9	3.0	2.0						
16	Av. 3.43	2.5	2.0	1.37	1.71	0.72	1.25	0.58	0.80

Table 15

Dimensions in mm. of complete wheat grains from Duimabad
(*Triticum compactum*)

Maha Phase										
1	5.0	3.2	1.5							
1	5.0	3.1	1.25							
2	5.0	3.0	1.5							
3	5.0	3.25	2.0							
3	5.2	3.25	2.0							
5	5.0	3.0	2.0							
2	4.5	2.5	1.0							
2	4.0	2.5	1.0							
1	5.5	3.25	2.0							
2	3.8	2.5	1.6							
1	3.5	2.0	1.5							
2	4.0	2.3	1.5							
2	3.5	2.5	1.6							
2	3.7	2.6	1.5							
2	3.7	2.6	1.5							
2	4.1	2.6	1.5							
2	3.7	2.5	1.5							
1	5.5	3.2	1.5							
1	5.5	3.0	2.0							
35	Av 4.44	2.75	1.60	1.61	2.77	0.61	1.71	0.36	0.58	
Total										
Jorwe Phase										
2	4.0	2.6	1.7							
2	4.0	2.4	1.7							
2	4.5	3.0	2.0							
2	4.0	2.8	2.0							
2	5.0	3.0	2.0							
2	4.8	3.0	2.0							
2	5.0	2.8	2.0							
14	Av 4.61	2.8	1.91	1.64	2.41	0.60	1.46	0.41	0.68	
Total										

Table 16

Dimensions in mm. of complete wheat grains from Daimabad Triticum aestivum (vulgare)

No. of grains	Length	Breadth	Thickness	L/B	L/T	B/L	B/T	T/L	T/B
<i>Malwa Phase</i>									
1	3.5	2.2	1.5						
1	4.0	2.3	1.5						
1	4.5	2.0	1.5						
1	3.8	2.0	1.5						
2	4.1	2.0	1.5						
2	3.6	2.0	1.5						
1	3.3	1.7	1.5						
1	3.3	1.8	1.5						
1	4.0	2.2	1.5						
2	4.2	2.1	1.5						
1	3.8	2.0	1.5						
1	3.8	2.2	1.5						
15 Total	Av 3.83	2.04	1.50	1.87	2.46	0.53	1.30	0.40	0.76
<i>Jorwe Phase</i>									
2	5.0	3.0	2.0						
2	5.0	3.1	2.0						
1	3.6	1.8	1.3						
1	3.6	2.0	1.5						
2	3.5	1.6	1.0						
2	3.7	1.8	1.5						
2	4.1	2.1	1.5						
1	4.0	2.4	2.0						
2	5.0	2.7	2.0						
2	4.8	2.3	2.0						
1	4.2	2.2	1.9						
1	4.3	2.1	1.9						
1	4.8	2.7	2.0						
2	4.7	2.8	2.0						
1	4.5	3.0	2.0						
23 Total	Av 4.37	2.8	1.76	1.56	2.48	0.64	1.59	0.40	0.62

Table 17

Number of wheat grains from Malwa and Jorwe Cultures

<i>Triticum</i> sps.	No. of grains in Malwa	No. of grains in Jorwe
<i>T. sphaerococcum</i>	40	30
<i>T. compactum</i>	112	97
<i>T. aestivum</i>	21	38

Table 18

Dimensions of Carbonized Eleusine coracana seeds from Daimabad

Sl. No.	<i>Eleusine</i> species	Sample No.	No. of Grains	Culture	Dimension mm		Percentages	
					Cat. I	Cat. II	Cat. I	Cat. II
1.	<i>Eleusine coracana</i>	7	1	Malwa	1.25 x 1.0	—	100	—
2.	<i>Eleusine coracana</i>	11	1	Malwa	1.25 x 1.0	—	100	—
3.	<i>Eleusine coracana</i>	8	4	Malwa	1.4 x 1.1	—	100	—
4.	<i>Eleusine coracana</i>	1	20	Jorwe	1.1 - 1.3	0.8 - 1.0	80	20
5.	<i>Eleusine coracana</i>	12	117	Malwa	1.1 - 1.3 x 0.9 - 1.2	1.0 - 1.25 x 1.0 - 1.2	47.97	52.33
6.	<i>Eleusine coracana</i>	5	4	Jorwe	1.1 x 1.0	—	100	—



PLATE CLXIV A Two carbonised grains
of *Eleusine coracana*
Ragi



PLATE CLXIV B Carbonised grains
of *Setaria italica*



PLATE CLXIV C Carbonised grains
of *Pennisetum glaucum*



PLATE CLXIV D Carbonised
grains of
Pennisetum
setaceum



PLATE CLXIV E Carbonised grains of
Lysichiton

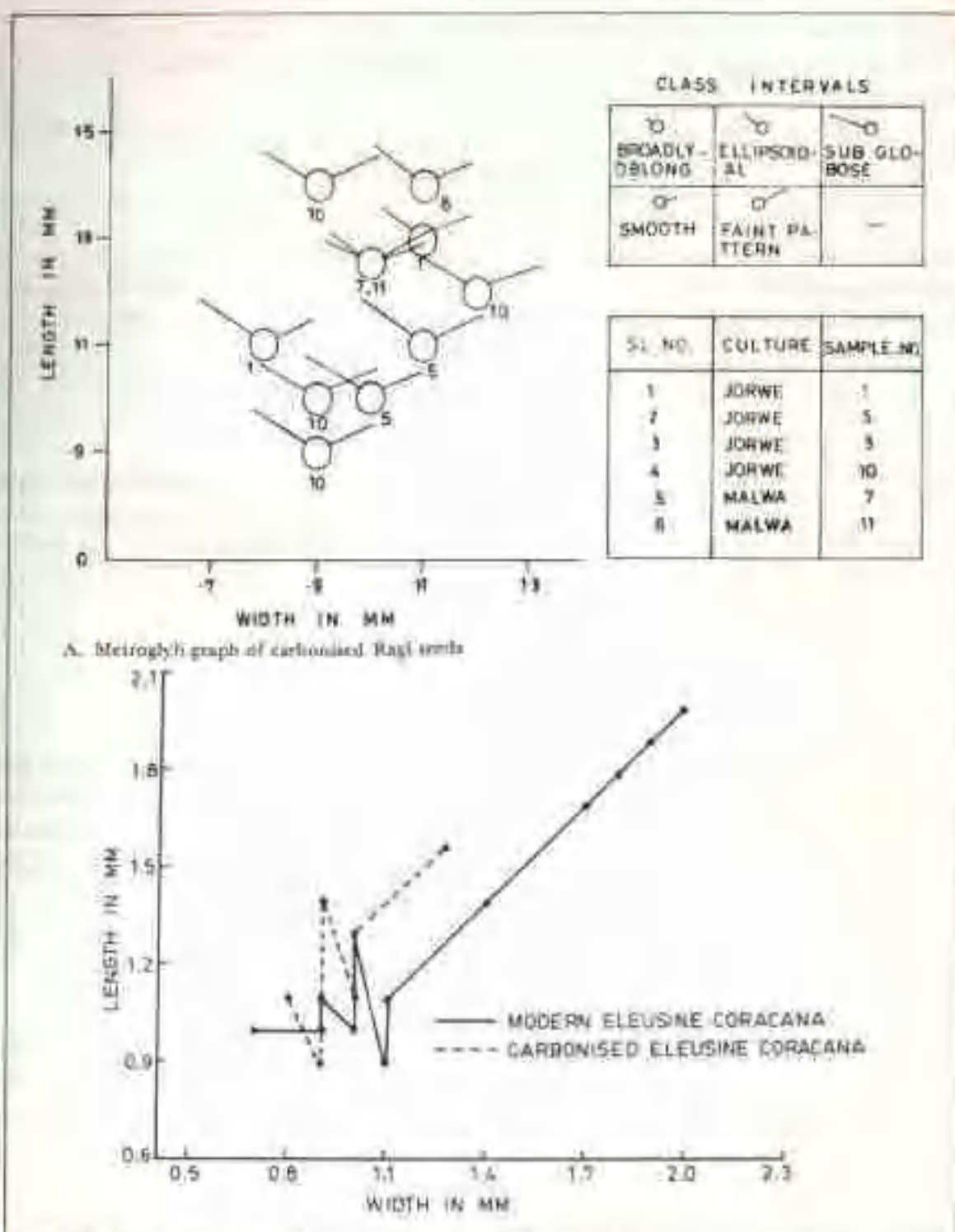


Fig. 125 B. Variability graph of the modern and carbonized Ragi seeds.

glyph graph shows the different categories of seeds of *E. corucana* (fig. 125 A) as is observed in modern seeds of *E. corucana*. The variability in the modern and carbonized seeds is shown in (fig. 125 B).

(iv) *Kodon* (*Paspalum scrobiculatum* L.)

One carbonised seed measuring 1 mm in diameter from Jorwe Culture (Sample No. 1) is more or less circular in shape. The embryo is situated dorsally and hilum is observed as a scar on the ventral surface. It compares with seeds of modern Kodon (Table 19).

(v) *Foxtail Millet* (*Setaria italica* (L.) Beauv. Agrost. Hook. f.)

Three carbonised seeds in sample No. 1 from Jorwe phase are ellipsoidal measuring 1.3 x 1.1 mm x 1.1 x 0.9 mm with rounded ends. The embryo is situated dorsally, hilum ventrally and with anatomising rugose pattern on the seed surface. These characters compare with seeds of *Setaria* spp. the larger one among them compares with *S. italica* (Table 19) and the smaller one with *S. viridis* (pl. CLXIV, B).

(vi) *Lentil* (*Lens esculenta* Moench.)

The lenticular-circular seeds measuring 2.6–3.3 mm in diameter (Table 20) with smooth and shining seed surface compare with seeds of *Lens esculenta*. The seeds of lentil are found in both the Malwa and Jorwe Cultures. There are 107 seeds in sample Nos. 6–12 in the Malwa phase and 80 in sample nos. 1, 4, 5 from the Jorwe phase. Most of these seeds are broken hence dimensions given in Table 20 are based upon the complete one (pl. CLXIV, E).

(vii) *Beans* (*Phaseolus/Vigna* species)

The carbonised beans have been recovered from both the Malwa and Jorwe Cultures. These vary in size and shape. Based on size, we have categorised them into small-sized (between 3–5 mm in length) beans. The shape and other characters are used to segregate them further for the purpose of identification.

Small-sized beans

The following types are recognized:

- a) Twenty two reniform elongated seeds measuring 3.6–4.2 X 2.0–2.8 mm with both

Table 19

Dimensions in mm. of carbonized seeds of *Setaria viridis*, *Setaria italica* and *Paspalum scrobiculatum*

Name	No. of grains	Length	Breadth	Diameter
<i>Setaria viridis</i>	1	1.1	0.9	
<i>Setaria italica</i>	1	1.3	1.1	
<i>Paspalum scrobiculatum</i>	1			1.0

Dimensions in mm. of Lentil from Daimabad

Table 20

Lens esculenta

Dimensions are taken at random and more particularly of the complete grains

No. of grains		Diameter in mm.
	2	3.0
M	1	3.1
A	2	3.2
L	1	3.3
W	2	3.2
A	1	3.3
Total	9	Av. 3.16 Range dia 3.00-3.3 mm.



PLATE CLXV A Carbonised grains of *Phaseolus vulgaris*.



PLATE CLXV B Carbonised large-seed beans.



PLATE CLXV C Carbonised grains of *Vigna sinensis*.



PLATE CLXV D An unidentified triangular seed.



PLATE CLXV E Carbonised grains of *Phaseolus lunatus*.



PLATE CLXV F Carbonised grains of *P. lathyroides*.

ends round in sample No. 11 from the Malwa Culture and only 2 seeds measuring $3.1 \times 1.8 \times 0.75$ mm with sample 1 from the Jorwe Culture seem to compare with the seeds of *Phaseolus vulgaris* (pl. CLXV, V).

b) Nineteen rhomboidal seeds measuring $3.8-3.9 \times 2.5-2.8 \times 0.75$ mm with one end narrower than the other in sample nos. 9 and 11 from the Malwa Culture seem to compare with the seeds of *Phaseolus lunatus*? (pl. CLXV, E).

c) Twelve rectangular seeds measuring $3.1-4.0 \times 2.4-3.2$ mm with truncate ends in sample No. 11 from the Malwa Culture compare with the seeds of *Phaseolus lathyroides* (pl. CLXV, F).

d) Eight oblong seeds measuring $4-4.5 \times 2.6-3.0$ mm with squarish ends are found in sample Nos. 8, 9, 11 from the Malwa Culture and compare with seeds of *Vigna mungo*.

e) Sixteen reniform, oblong, seeds measuring $3.8-4.0 \times 2.5-2.8$ mm ends smoothly round and with hilum a little below the apical region and protruding in sample Nos. 10, 11 from the Malwa Culture compare with seeds of *Vigna sinensis* (pl. CLXV, V).

f) One reniform, triangular, seed measuring 4.2×2.6 mm from the Jorwe Culture (Sample No. 1) remains unidentified (pl. CLXV, D).

g) One small oblong seed measuring 2.0×1.3 mm with rounded ends and with hilum situated at the centre from the Jorwe Culture (Sample No. 5) remains unidentified.

Large-sized beans

h) Three oblong seeds measuring $7.00-12.0 \times 3.25-3.75$ mm with one end broader than the other end with rough seed coat from the Malwa Culture (Sample No. 9) and seeds in sample No. 2 from the Jorwe Culture measuring $14-17 \times 7-10 \times 4.90-5.00$ mm remain unidentified (pl. CLXV, B).

Owing to insufficiency of modern comparative materials of all the species of *Phaseolus*, some grains from these cultures referred to this genus have been compared with species *Lunatus* and *Lathyroides* with their photographs published in literature².

These are not indigenous species and not adequately identified. We therefore refrain from giving any comments on them. These and also seeds of *Heteropanax* need re-examination for their correct identity.

(viii) Horse Gram [*Dolichos biflorus* L.]

Seventeen reniform seeds measuring $4.0-4.5 \times 2.4-2.5 \times 1.0$ mm with rounded ends in sample Nos. 7, 8, 9, 11 and 12 from the Malwa Culture and 24 measuring $3.8-4.1 \times 2.4-2.5$ mm in sample Nos. 1, 4 and 5 from the Jorwe Culture (Table 21) compare with seeds of horsegram.

2. Anonymous, *The Wealth of India: Raw Materials*, Vol. 8, New Delhi, pp. 5-10.

(iii) Horse Gram

(Dolichos biflorus L.)

Table 21

Dimensions in mm. of seeds of *Dolichos biflorus* from Daimabad at random of the complete grains

No. of grains		Length	Breadth	Thickness
M	2	4.3	2.6	1.0
A	1	4.5	2.6	1.0
L	1	4.0	2.6	1.0
W	1	4.0	2.4	1.0
A	2	4.2	2.6	1.0
Total	7	Av. 3.73	2.25	1.0 Range 4.0-4.5 x 2.4-2.6 x 1.0 mm
J	1	4.1	2.5	1.0
O	2	3.8	2.4	1.0
R	2	3.9	2.5	1.0
W				
E				
Total	5	Av. 3.9	1.96	1.0 Range 3.8-4.1 x 2.4-2.5 x 1.0 mm

(ix) *Peas* (*Pisum* species)

One hundred and eleven globose seeds measuring 2.5–3.7 mm in diameter are comparable with those of *Pisum sativum*. Such seeds have been met with in sample Nos. 1 and 4 from the Jorwe Culture only. Together with these in the same samples 67 dimpled and angled seeds with a linear hilum scar but smaller in size (2–2.9 mm in diam.) have also been found. These compare with those of *P. arvense*, the wild species. No seeds of this kind have been found from the samples in the Malwa Culture (pl. CLXIV C–D).

(x) *Grass Pea* (*Lathyrus sativus* L.)

Three squat-shaped seeds measuring 2.4–4.5x2.3–2.5x3.0 mm in sample Nos. 9 and 12 from the Malwa Culture and only one from the Jorwe Culture measuring 3x2.6x2.0 mm have been found.

(xi) *Ber* (*Zizyphus* species)

The remains of this are the globose and ellipsoidal nuts with distinct rugose pattern. Eleven seeds measuring 5.0–7.5 mm in sample Nos. 8 and 9 from the Malwa Culture and 41 in sample Nos. 1, 4 and 5 from the Jorwe Culture of similar dimensions have been found. On comparison with the nuts of *Zizyphus jujuba* and *nummularia* they seem to compare with both of them.

(xii) *Tarla* (*Heteropanax fragrans* Seem.)

Five spherical, flattened, seeds measuring 4.0–4.5 mm in diameter with notched apex and reticulate pattern with the basal region protruding are found in sample Nos. 9, 12. 60 similar seeds from the Malwa Culture measuring 3.75–5.0 mm in diameter have been found in sample Nos. 1 and 4 from the Jorwe Culture. They resemble the seeds of *Tarla* in all essential characters (pl. CLXVI, F).

(xiii) *Sugarilha Bela* (*Pavonia odorata* Willd.)

A single plano-convex seed measuring 1.0 x 0.9 mm with spinulate surface in sample No. 12 from the Malwa Culture compares with the seeds of *Pavonia* and resembles closely the seeds of *P. odorata*.



PLATE CLXVI A
Carbonised grains of *Chenopodium* sp.



PLATE CLXVI B
An unidentified kidney-shaped seed.



PLATE CLXVI C
An unidentified seed.



PLATE CLXVI D
Carbonised grains of *Rhyncosia* sp.



PLATE CLXVI E
An unidentified *Cordata* seed.



PLATE CLXVI F
Carbonised grains of *Heteropanax*.



PLATE CLXVI G
An unidentified triangular seed.



PLATE CLXVI H
An unidentified ovate hollow seed *Acaia* sp.

(xiv) *Dak Taranghanda (Rynchosia sp.)*

The seeds in this genus are broadly oblong with apex narrower than base and hilum broad and situated at the base. Three seeds of this kind measuring 3 x 2.7 x 1 mm have been found in sample No. 1 from the Jorwe Culture (pl. CXLVI D).

(xv) *Cheno/Ams*

The modern seeds are the small spherical flattened seeds with rugose ornamentation measuring 1-1.5 mm diameter, 25 in sample Nos. 7, 9, 10 and 11 from the Malwa Culture and only one in sample 4 from the Jorwe Culture compare with those of *Cheno/Ams* (pl. CXLVI A).

(xvi) *Unidentified Seeds*

It has not been possible to identify the following seeds segregated from sample from both the Cultures.

1. FROM MALWA CULTURE

- a) One, ovate, hollow, seed with smooth surface measuring 4.5 x 4.5 x 2 mm (Sample no. 5) (pl. CXLVI H).
- b) Two, kidney-shaped, seeds with one end broader than the other one measuring 2.25 x 1.25 x 0.5 mm and the other 2 x 1 x 0.5-1 mm (Sample Nos. 7 and 11) (pl. CXLVI B).
- c) Two, cordate, seeds with notched apex, with a groove running along the entire length, and measuring 2.15 x 2 mm at apex and 1 mm at the base (sample no. 9). (pl. CXLVI E).
- d) Two, globose and pitted, seeds, pits not too deep and measuring 1.5 mm in diameter (Sample No. 9).
- e) Two, triangular, seeds with one end broader than the other and measuring 2-2.2 x 1-2 mm (Sample NO. 12).
- f) Four, lanceolate, seeds broadest at the centre and gradually tapering towards the base and measuring 3.25 x 1.15 mm (Sample NO. 12) (pl. CXLVI C).
- g) Two broadly oblong, seeds with a groove running along the entire length and measuring 2 x 1.5-1.75 x 1-1.24 mm (Sample NO. 12).

2. FROM JORWE CULTURE

- a) One, triangular seed with one end broader measuring 3.7 x 3 mm (Sample No. 1) (pl. CXLVI G).
- b) Single bilobed seed with small pores with hilum at the basal end measuring 4 x 2.5 mm (Sample No. 1).

Sam. Sec- pile for	Trench	Layer	Phase	Age PRL BSIP	Assumed	Identity	Remarks
						<i>chos biflorus</i>	connected with child rituals. April- dal temple.
6.	II	BZ'5	House No. 30	Malwa Phase IV	3250 ± 110 (5340 ± 120) 1390 B.C. PRL 412	1600- 1400 B.C. <i>T. aphacrocoecum, Hordeum vulgare</i> <i>Zizyphus nummularia, Lens escul-</i> <i>enta.</i>	These houses (Nos. 30, 32 33) belong to religious complex of the Malwa Culture.
7.	II	BZ'4	House No. 32	-do-		<i>Hordeum vulgare, Eleusine coracana</i> <i>Lens esculenta, Dolichos biflorus,</i> <i>Chenop. Ams.</i>	
8.	II	BZ'4	House No. 33	-do-		<i>T. compactum, Hordeum vulgare,</i> <i>Zizyphus nummularia, Lens escu-</i> <i>lenta, Dolichos biflorus, Eleusine</i> <i>coracana V. Mungo.</i>	
9.	II	CZ'4	House No. 36	Malwa Phase IV		<i>T. compactum, T. aestivum V.</i> <i>aphacrocoecum, D. biflorus, Dol-</i> <i>ichos sps. Large sized beans.</i> <i>Z. nummularia Z. jujuba, Heliot-</i> <i>ropis, Lens esculenta, Cordia seed</i> <i>Lathyrus sativus, V. mungo, Chenop.</i> <i>Ams, Hordeum vulgare, P. Lunatus.</i>	Sacrificial altar contain- ing of mud- rings.

Sam-Seq-Trench pile top	Layer	Phase	Age PRL, HSP	Assumed	Identity	Remarks
10. II	BZ 3 House no. 87 Sacrificial Temple (5)	Malwa Phase IV			<i>T. compactum</i> , <i>H. vulgare</i> , <i>Leus</i> <i>Eleusine coracana</i> .	Apical tem- ple (Sacrifi- cial altar)
11. II	UZ 4 Sacrificial altar House No. 56	do.	1600 ± 1400 B.C.		<i>Leus vulgaria</i> , <i>Eleusine coracana</i> , <i>Chenopodium</i> , <i>Phaseolus vulgaris</i> , <i>P. lunatus</i> L. <i>Mungo</i> , <i>V. sinensis</i> , <i>Beauveria</i> , <i>P. Lathyrus</i> , <i>Dolichos</i> <i>biflorus</i> .	From the fire pit of the sacrifi- cial altar.
12. II	BZ 3 Heath in layer (6) sacrificial altar	do.	2000 ± 100 (3000 ± 110 1130 BC) BS 151		<i>T. compactum</i> , <i>Eleusine coracana</i> , <i>Leus vulgaria</i> , <i>Chenopodium</i> , <i>Portulaca</i> <i>quercus</i> , <i>H. vulgare</i> , <i>T. arvensis</i> , <i>Papaver</i> , <i>Adiantum</i> , <i>Zizyphus</i> , <i>Lathyrus sativus</i> , <i>P. biflorus</i>	Apical sac- rificial altar.
13. I	JZ 6 Courtyard of House No. 15	Savaldia Phase I	3450 ± 220 1540 BC PRL 429 3590 ± 90 (3695 ± 95) 1745 BC BS 176	2200. 3000	Leaf imprints of grass	Lump of clay with plant leaf impressions
14. II	Y 2 Potter's Kiln No. 1	Joint Culture Phase V	2950 ± 100 (3040 ± 100) 1000 B.C. 1000 BC BS 178	1400. 1000 B.C.		Lumps of the fuel used for kiln.

c) One, oblong, rounded (almost globose), seed with shallow pits all over the surface and 2 raised structures seen at one end measuring 2 mm in diameter (Sample No. 1).

d) Four, oblong, seeds with raised ridges all over the surface and with a beak-like protruded structure measuring 3.25 x 1.5 x 1.5 mm (Sample No. 5).

There are other seeds measuring 1 x .75 mm in the same sample which are more or less globose with six prominent ridges all over the surface with hilum on the protruded base and with depressed apical region.

C. Charcoals

There are only seven samples of charcoals from this archaeological site the provenance of which is given in Table 23. These range in age from Savalida to Jorwe cultures. The number and size of the charcoal pieces varied considerably in different samples. Suitably processable charcoals were selected from the samples. The blocks of these were prepared in paraffin wax. The sections, 8–15, thick, were cut in sliding microtome and mounted after suitable washing in Canada balsam. These were examined under the microscope and identified. Some small-sized charcoals or those with fragmentary nature were found to be poorly preserved, hence they could not be identified. Some were too small to bring out all the necessary anatomical characters for identification.

The identification of the charcoals was attempted with the help of literature³ and through comparison with reference slides available in the xylarium of the Birbal Sahni Institute of Palaeobotany, Lucknow. The identifications were confirmed at the Wood Anatomy Branch of the Forest Research Institute, Dehra Dun. Wherever possible, the identifications have been done upto specific level.

From the Table 23, it is apparent that charcoals of different types were found in same sample though some had charcoals of one kind only. In order to avoid needless repetition of description, charcoals from various depths and horizons and identified as of the same species are described under the same species. As the details of their archaeological provenance are already given in Table 23, only the sample no. with culture is mentioned in the description of charcoals.

The information on the use and ecology of the identified taxa from charcoals is derived from published literature.⁴ To avoid repetition on the reference to literature on modern use and ecology of taxa identified is not mentioned in the text.

3. K.A. Chawdhary and S.S. Ghosh, *Indian Woods*, Vol.1, Dehra Dun, 1958; Anonymous, *Indian Woods*, Vol.2, Dehra Dun, 1963; K. Ramesh Rao and S.K. Parkayastha, *Indian Woods*, Vol.3, Dehra Dun, 1972; C.R. Metcalf and L. Chalk, *Anatomy of the Dicotyledons*, Vols. 1–2, Oxford, 1952 and R.S. Pearson and H.P. Brown, *Commercial Timbers of India*, Vols. 1 and 2, Calcutta, 1932.

4. N.L. Bur, *Manual of Indian Forest Botany*, Oxford, 1958; H.G. Champion and S.K. Seth, *A Revised Survey of the Forest Types of India*, Delhi, 1968; T. Cooke, *Flora of the Presidency of Bombay*, Vols. 1–3, Calcutta, 1958; Anonymous, *The Wealth of India – Raw Materials*, Vols. 1–11, New Delhi, 1948 – 1976 and H. Gausson, et al *Notice de La Fenille Bombay, Travaux de la Section Scientifique et Technique, De L'Institut Français De Pondichery* Serie, No. 8, 1956, pp. 1–101.

Table 23

Archaeological provenience of the charcoal materials

Sl. No.	Sample No.	Depth	Sec tor	Trench Layer and H.No.	Locus	Phase and Age	Identity
1.	DMD/52/1977-78	0.30 m. II	DZ ¹³	2. House no. 38	CZ ¹² 2.00 m. x CZ ¹³ 5.00 m.	V Jorwe Culture 2970±100 Y.B.P.	a) <i>Acacia</i> sp. b) <i>Zizyphus mauri- fana</i> .
2.	DMD/46/1977-78	1.00 m. II	Y ¹²	Kiln No. 1	X ¹¹ x ... m. Y ¹¹ 4.50 m.	V Jorwe Culture 2950±100 Y.B.P.	a) <i>Pterocarpus marsupium</i> b) <i>Trema orientalis</i>
3.	DMD/50/1977-78	1.36 m. II	Y ¹³	7	Y ¹³ 4.35 m. YZ ¹ 4.30 m.	IV Malwa Culture 2990±100 Y.B.P.	a) <i>Acacia</i> sp. b) <i>Anogeissus lati- folia</i> c) <i>Caesia fistula</i> d) <i>Dalbergia lati- folia</i> .
4.	DMD/39/1977-78	2.10 m. II	Z ¹³	10	Y ¹³ 2.70 m., x Z ¹³ 4.20 m.	III Daimabad Culture 3130±90 Y.B.P.	a) <i>Acacia</i> sp. b) <i>Anogeissus lati- folia</i> .

Sl. Sample No.	Depth	Sec	Trench Layer & H.No.	Locus	Phase and Age	Identity
III						
5. DMD/45/1977-78	2.25 m. II	Z'3	Pit no. 45	Z'3 4.00 m. Z'2 5.00 m.	Daimabad Culture 3460±105 Y.B.P.	Not identified.
IV						
6. DMD/53/1978-79	2.30 m. IV	ZD 60		ZD 61 5.00 m. x ZE 61 1.20 m.	Late Harappan Culture 3390±100 Y.B.P.	a) <i>Borvelia serrata</i> b) Not identified c) Not identified
7. DMD/41/1977-78	4.10 m. I	GZ 63	H. No. 12	FZ 64 1.00 m. x GZ 15.40 m.	Savalda Culture 3590±90 Y.B.P.	<i>Acacia</i> sp.

Acacia sp.

PLATE CLXVII A
Transverse section of charcoal showing mostly solitary vessels and predominantly vascularized parenchyma (x 50).



PLATE CLXVII B
Tangential section of charcoal showing 1-5 seriate homogeneous rays (x 50).

Cassia fistula

PLATE CLXVII C
Transverse section of charcoal showing distribution of vessels and abundant parenchyma around them (x 50).



PLATE CLXVII D
Tangential section of charcoal showing homogeneous rays and crystals in the paratracheal strand (x 300).

(i) *Acacia* sp.
(pl. CLXVII A-B)

MATERIAL. — Sample Nos. DMD/52/1977-78 (Jorwe Culture); DMD/30/1977-78 (Malwa Culture); DMD/39/1977-78 (Daimahad Culture); DMD/41/1977-78 (Savalda culture).

DESCRIPTION: It is a *diffuse-porous* wood. *Growth-rings* are faintly preserved and delimited by a fine interrupted line of parenchyma as observed only in a few specimens. *Vessels* are small to medium-sized, mostly solitary but sometimes in short radial multiples of 2-3 (rarely upto 5), 7-15 per sq. mm; oval to roundish in shape with a maximum diameter of $207.9 \mu \times 299.4 \mu$; dark gummy deposits abundant. *Parenchyma* forming narrow to fairly broad sheath surrounding the vessels or vessel groups (vasicentric), sometimes with bilateral extensions (aliform), occasionally uniting the adjoining vessels (confluent); crystals also present. *Rays* mainly moderately broad, fairly closely spaced; 1 to 5 (mainly 3-4) cells wide, about 75μ in width, upto 438μ in height; ray tissue homogeneous. *Fibre* : thick-walled, non-septate.

Six species of *Acacia* are known from Maharashtra: all these are distributed in dry thorn forest; but for *A. intsia*, the other five species (*A. nilotica*, *A. latronum*, *A. leucophloea*, *A. pennata*, and *A. tundra*) occur in dry deciduous forest without teak; 3 species (*A. leucophloea*, *A. pennata* and *A. tundra*) in dry deciduous teak forest and only one species (*A. intsia*) in moist deciduous teak forest. The precipitation in these forest types ranges from under 600-4000 mm with dry period of 7-8 months and average temperature of the coldest month is around 20°C . Thermal amplitude is between $2-10^{\circ}\text{C}$.

Timber of *Acacia* being hard and durable, is extensively used for wheels besides fuel. Green pods, young shoots and leaves constitute excellent fodder. Gum exuded from the bark is also used.

(ii) AXLE - WOOD
(*Anogeissus latifolia* Wall.)
(pl. CLXX A-B)

Hind-Dhawra, dhura; Mar-Dhawda; Guj-Dhawdo; Tel.-Chirimano, Yellamaddi; Tam.-Vellay-nagi; Kan.-Dinduga; Mal.-Marukinchiram.

MATERIAL. — Sample nos. DMD/50/1977-78 (Malwa Culture); DMD/39/1977-78 (Daimahad Culture).

DESCRIPTION : It is a *diffuse-porous* wood. *Growth rings* are not seen due to the small size of the charcoals. *Vessels* are small to very small, majority solitary, also in short radial multiples of 2-3 (rarely 4 to 5); quite evenly distributed, 15-42 per sq. mm; appearing more or less round to oval with a max. diameter of $86.5 \mu \times 112 \mu$; vessel segments with truncate to abruptly tailed ends; perforation simple; intervacular pits are bordered; alternate, $6-7 \mu$ in

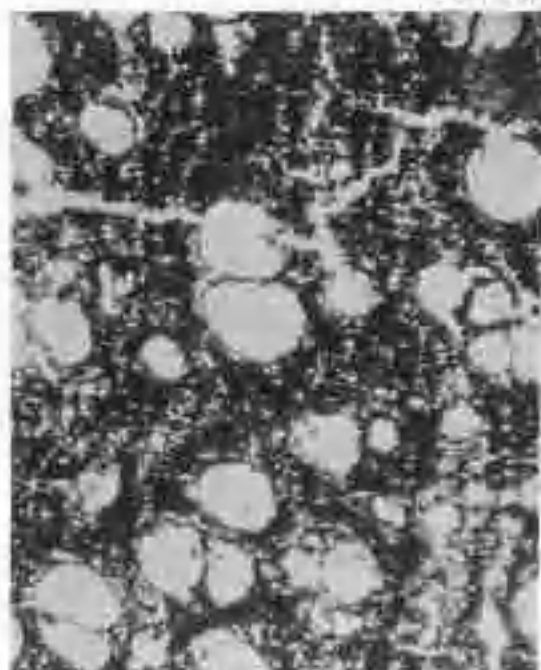
Pterocarpus marsupium

PLATE CLXVIII A
Transverse section of charcoal showing vessel distribution and mainly narrow wavy bands of parenchyma (x 50).



PLATE CLXVIII B
Tangential section of charcoal showing mainly uniseriate homogeneous rays arranged in distinct storys (x 300).

Dalbergia latifolia

PLATE CLXVIII C
Transverse section of charcoal showing vessel distribution, uniform to confluent parenchyma forming thin wavy bands and fine rays (x 50).



PLATE CLXVIII D
Tangential section of charcoal showing 1-3 seriate heterogeneous rays arranged in distinct storys (x 300).

Zizyphus mauritiana

PLATE CLXIX A

Transverse section of charcoal showing growth ring demarcated by fine line of parenchyma towards the top of the photograph; vessel distribution and vascentric, aliform to confluent parenchyma ($\times 50$).

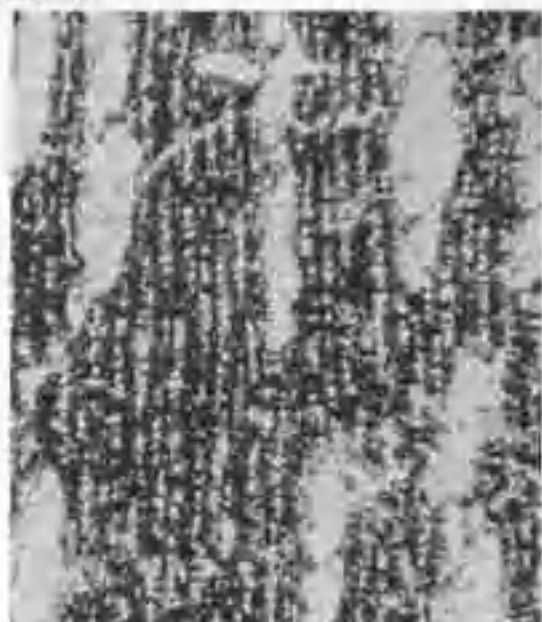


PLATE CLXIX B

Tangential section of charcoal showing closely spaced, 1-2-seriate heterogeneous rays ($\times 50$).

Trema orientalis

PLATE CLXIX C

Transverse section of charcoal showing growth ring towards the upper half of photograph demarcated by a fibrous mass containing fewer small vessels and scanty paratracheal parenchyma ($\times 50$).



PLATE CLXIX D

Tangential section of charcoal showing tall heterogeneous rays ($\times 300$).

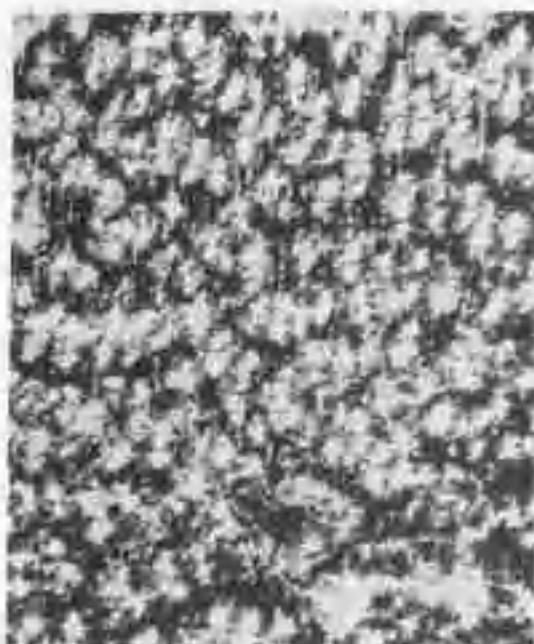
Anogeissus Latifolia

PLATE CLXX A

Transverse section of charcoal showing small vessels, excentric, aliform to cordiform parenchyma and linear rays (x 50).



PLATE CLXX B

Tangential section of charcoal showing mainly uniseriate heterogenous rays and gummy infiltration and crystals in the ray cells (x 300).

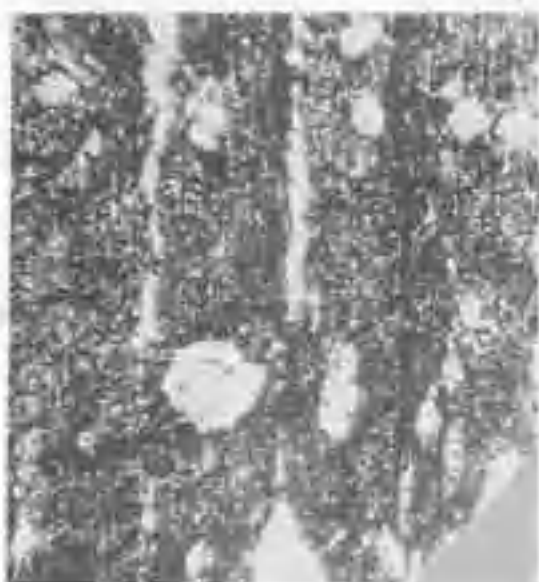
Borassia Sorata

PLATE CLXX C

Transverse section of charcoal showing small to large-sized, mostly solitary vessels and scanty paratracheal parenchyma (x 50).

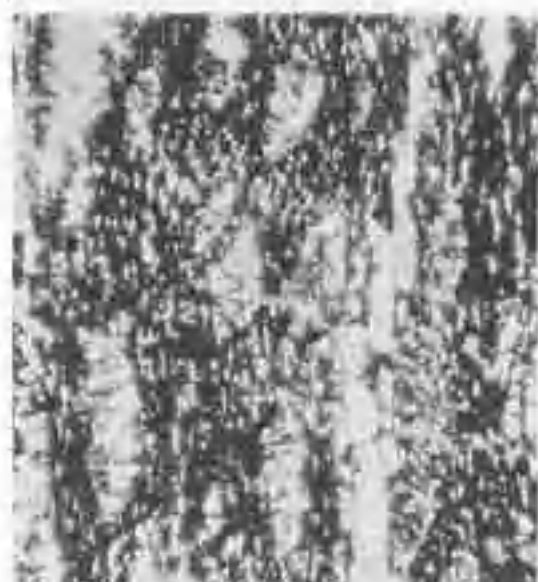


PLATE CLXX D

Tangential section of charcoal showing simple and fusiform rays, heterogeneous ray base and gum canals in fusiform rays (x 50).

diameter with lenticular aperture; deposits of reddish brown gum occasionally observed. *Parenchyma* fairly abundant, forming irregular sheath round the vessels or vessel groups (vasicentric) occasionally in the form of cyclets (aliform), generally extending sideways forming narrow, wavy, more or less continuous bands uniting the adjacent vessels. *Rays* fine numerous and closely spaced, 1-2 (mainly 1) cells wide, about 21-25 μ in width, upto 420 μ in height, ray tissue heterogeneous; yellowish gummy infiltration fairly abundant in the ray cells; crystals also seen frequently. *Fibre* oval to angular, more or less radially aligned, moderately thick-walled, frequently septate.

Anatomically the wood of *Anogeissus latifolia* Wall is very similar to that of *Anogeissus acuminata* Wall. However, small pores, more clearly defined, concentric bands of parenchyma and narrower rays differentiate it from *A. acuminata* Wall.²

Anogeissus latifolia Wall. occurs in Maharashtra on well drained alluvial to diluvial soils in the dry deciduous forest with or without teak and also in the moist deciduous teak forests where the precipitation ranges from 600-4000 mm with dry period of 7-8 months, average temperature of the coldest month is around 20° C and thermal amplitude 7-10° C.

A. latifolia Wall is famous Axlewood tree because its timber is used for cart axles, tool handles, agricultural implements also for making charcoals. Tannin and gum obtained are also used.

(iii) SALAI
(*Roxb. serrata* Roxb.)
(pl. CLXX C-D)

Beng., Hind., and Mar. — Salai; Sans. — Kunduru, Sallaki;
Tam. and Tel. — Parangisambani; Kan. — Madi

MATERIAL — Sample no. DMD/53/1978-79 (Late Harappan).

DESCRIPTION — It is a *diffuse-porous* wood. *Growth rings* are not seen as the area of the section is too small. *Vessels* are small to large sized, majority solitary, rarely in short radial multiples of 2-5, uniformly distributed, 5-16 per sq. mm., roundish to oval in outline with a maximum diam. of 245 μ x 296 μ , vessel segments with truncate to abruptly tailed ends, perforation simple; intervascular pits are bordered, alternate, 6-7 μ diam. with linear aperture; tyloses faintly seen. *Parenchyma* is mainly in the form of thin interrupted sheath round the vessels (sparse paratracheal). *Rays* are of two types, simple and fusiform, moderately broad, fairly closely spaced, 1-7 (mainly 3-5) cells wide, about 175 μ in width, upto 625 μ in height; ray tissue heterogeneous; gum canals seen in fusiform rays; crystals abundant in the ray cells. *Fibre* thin walled, radially aligned, frequently septate. *Gum canals* occasionally seen, horizontal in the fusiform rays.

3. Pearson and Brown, 1952, op.cit. p. 541.

Boswellia serrata Roxb. occurs in Maharashtra in dry deciduous forests with or without teak where the precipitation ranges from 600–1500 mm. with dry period of 7 months, rarely 6; average temperature of the coldest month is around 19–20°C and thermal amplitude 7–10°C.

Boswellia serrata Roxb. is chiefly used as incense. Timber of this tree is useful but of inferior quality.

(iv) *INDIAN LABURNUM*

(*Cassia fistula* Linn.)

(pl. CLXVII C–D)

Hind. — Amaltas, girimalah; Sans. — Savarnaka, rajataru; Beng. — Sundali, amulras; Mar. — Bahava; Guj. — Garmala; Tam. — Konnei; Tel. — Rela; Kan. — Kakke.

MATERIAL — Sample no. DMD/30/1977–78 (Malwa Culture).

DESCRIPTION — It is a *diffuse-porous* wood. *Growth rings* are faintly seen and delimited by a narrow line of terminal parenchyma. *Vessels* are small to moderately large sized, mainly solitary also in short radial multiples of 2–3, 5–13 per sq. mm., roundish to oval in outline with a maximum diam. of 136.4 μ \times 248 μ ; vessel segments with truncate to abruptly tailed ends; perforation simple; inter-vascular pits bordered, alternate, 6–7 μ in diam., vested. *Parenchyma* forming thick sheath round the vessels or vessel groups (vascentric), frequently with tangential extensions forming broad, irregular, concentric bands of parenchyma (confluent), fine line of terminal parenchyma faintly seen, a few cells also scattered in the fibrous zone (diffuse); crystals frequently seen in paratracheal strands. *Rays* are fine, closely spaced, 1–3 (mainly 2–3) cells wide, upto 50 μ in width and 438 μ in height; ray tissue homogeneous. Fibre thick-walled, septate in part.

Cassia fistula Linn. occurs in Maharashtra in dry deciduous forest without teak, also in thorn and moist deciduous teak forest where the precipitation ranges from under 600–5000 mm with dry period of 7–8 months; average temperature of the coldest month is around 20°C and thermal amplitude 7–10°C.

Timber of *Cassia fistula* Linn. is used for rice pounders, wheels, ploughs, shafts of carts and tool handles. Root bark and fruit pulp are of medicinal importance.

(v) *Indian Rosewood. HOMBAY BLACKWOOD*

(*Dalbergia latifolia* Roxb.)

(pl. CLXVIII C–D)

Hindi — Shisham, Beng. — Sitsal, Swetasal; Mar. — Shisham, Siswa; Sisra, Guj. —

Shisham, Kalamuk; Tel. — Cittegi, irugudu, jittegi; Tam. — Itti, Karundor Viral; Kan. — Bite, todagatti; Mal. — Itti, Colatitti Kar. — Itti; Uriya — Siswa.

MATERIAL — Sample no. DMD/30/1977-78 (Malwa Culture).

DESCRIPTION — It is a *diffuse-porous* wood. *Growth rings* are not seen due to the small size of the charcoal. *Vessels* are small to medium sized, mostly solitary but with occasional short radial multiples of 2-5, few to moderately numerous, roundish to oval in outline with maximum diam. of $115.38 \mu \times 153.84 \mu$; their cavities are filled in part with yellowish brown gummy deposits. *Parenchyma* is abundant, in the form of thin sheath round the vessel groups (vasicentric), also with bilateral extensions (aliform), frequently connecting adjoining vessels as thin, wavy or nearly straight tangential bands. *Rays* are fine, numerous and closely spaced, 1-3 (mainly 2) cells wide, upto 37.5μ in width, low generally 8-10 cells high, largest upto 16 cells and 195μ in height; ray tissue heterogeneous; distinct storied arrangement of rays. *Fibre* thick-walled, non-septate, *Ripple mark* present.

Even though anatomically *Dalbergia latifolia* Roxb. is very similar to *Dalbergia sissoo* Roxb. we have utilised the distinguishing criteria as mentioned by Chowdhury and Ghosh to identify this species.⁶

Dalbergia latifolia Roxb. occurs in moist deciduous teak forest where the precipitation ranges from 1800-4000 mm. with dry period of 7-8 months, average temp. of the coldest month is around 20°C and thermal amplitude 7.5°C . It thrives best on drained, deep, moist soil.

Its timber is of the finest quality and is used for wheels, handles, agricultural implements, combs etc. Leaves are used as fodder. Tannin from bark is used for dyeing. Leaves are of medicinal importance.

(vi) **BIJASAL**

(*Pterocarpus marazupium* Roxb.
pl. CLXVIII A-B)

Hindi — Bijasal, bija; Beng. — Pishal; Mar. — Dhorbenla, asau, bibla; Guj. — Biyo, hiradakhari; Tel. — yegi, peddigi; Tam. — Vengai; Kan. — Honne, bange; Oriya — Byasa; Mal. — Venga.

MATERIAL — DMD/46/1977-78 (Jorwe Culture).

DESCRIPTION — It is a *diffuse-porous* wood but slightly semi-ring-porous tendency seen in few specimens. *Vessels* are small to large sized, mostly solitary, also in short radial multiples of 2-3 (rarely upto 5) 2-12 per sq. mm., appearing more or less round to oval with maximum diam. of $274 \mu \times 313 \mu$. *Parenchyma* is abundant, forming thin sheath round the vessels or

6. K.A. Chowdhury and S.S. Ghosh, 'Plant Remains from Harappa, 1946', *Ancient India*, 7, 1951, pp. 3-19.

vessel groups (vasicentric), generally with tangential extensions uniting with those from other vessels to form narrow, concentric wavy but continuous bands; also scattered (diffuse). *Rays* are very fine, close, storied with the vessel segments, 1-2 (mainly 1) cells wide, upto 35 μ in width, generally 6-10 and upto 190 μ in height; ray tissue homogeneous. *Fibre* moderately thick-walled non-septate. *Ripple marks* present.

In Maharashtra it occurs on sandy soil, also on red loam with a certain amount of clay in the moist deciduous forests where the precipitation ranges from 1800-4000 mm. with dry period of 7-8 months; average temp. of the coldest month is around 20° C and thermal amplitude 7.5° C.

Timber of *Pterocarpus marsipium* Roxb. being hard and durable is used for building purposes, agricultural implements, drums and tool handles. Its flowers are used in the treatment of fever. Leaves are used as fodder. Gum Kino is of medicinal importance.

(vii) CHARCOAL TREE

(*Trema orientalis* Blume)

(pl. CLXIX C-D)

Hindi — Gio; Beng. — Chikan, jibon; Mar. — Gol, Kapashi, kargol, ratanbada; Guj.; Gol Tel. — Balamuru, Chakamaanu, Gaddanelli, Kaakaniushti; Tam. — Ambaralthi, Chenkolam; Kan. — Gorklu, koruhale; Mal. — Ama, melantotali, ratthi; Oriya — Kharkas, jivani.

MATERIAL — Sample no. DMD/46/1977-78 (Jorwe Culture).

DESCRIPTION — It is a *diffuse-porous* wood. *Growth rings* are faintly seen and delimited by a fibrous zone containing fewer small sized vessels. *Vessels* are moderately small to large sized, mainly solitary, rarely in short radial multiples of 2-3, 5-12 per sq. mm, appearing roundish to oval with maximum diam. of 256 μ x 445 μ ; vessel segments with truncate to abruptly tailed ends; perforation simple; intervascular pits bordered, alternate, 6-7 μ in diam. with lenticular aperture; tyloses faintly seen. *Parenchyma* is in the form of thin sheath and few cells round the vessels (scanty paratracheal). *Rays* are fine, fairly closely spaced, 1-4 (rarely 4) cells wide, upto 49.5 μ in width, tall, upto 864 μ in height; ray tissue heterogeneous. *Fibre* moderately thick-walled, septate in part.

Trema orientalis Blume occurs in Maharashtra in moist deciduous forest where the precipitation ranges from 600-5000 mm. with dry period of 7 months, temperature of the coldest month is below 20° C.

It is poor fuel wood though makes good gunpowder charcoal. Tannin from its bark is used for toughening and dyeing fishing lines made of other fibre. Fibre is used for making ropes, twine and a kind of coarse cloth. Fruit is sweet and edible. Leaves are used as fodder.

(viii) INDIAN Jujube

(*Zizyphus mauritiana* Lam.)
(pl. CLXIX A-B)

Hindī — Baer, Sam. — Ajapriya, badara, Karkandhu, kuvala, madhuraphala; Beng. — Koul, ber, boroi, Mar. — Bor, Bera; Guj. — Bor, bondi; Tel. — Reegu, gengaragegu, karakandharu; Tam. — Elandai, yelande, elladu; Kan. — Yalachi, elanji; Mal. — Elentha; Oriya — Barkoli, bobokoli, bodori.

MATERIAL.— Sample no. DMD/52/1977-78 (Jorwe Culture).

DESCRIPTION.— It is a *diffuse-porous* wood. *Growth rings* are faintly distinct and delimited by denser fibrous tissue and narrow lines of terminal parenchyma. *Vessels* are small to medium sized, solitary and in radial rows of 2-6 (mainly 2-3), uniform in distribution, numerous, appearing more or less round to oval, with a maximum diam. of 179 μ x 205 μ ; vessel segments with truncate to abruptly tailed ends; perforation simple; intervessel pits oval to orbicular, 7-8 μ in diam. with lenticular aperture. *Parenchyma* is fairly abundant, in the form of 1-2 cells thick sheath round the vessels or vessel groups (vasicentric), occasionally with bilateral extensions (aliform) and also connecting adjacent vessels in the form of thin wavy bands (confluent), a thin interrupted line of terminal parenchyma faintly seen. (Rays are very fine, close, 1-2 (rarely 2) cells wide, upto 17 cells in height, ray tissue heterogeneous; gummy infiltration abundant; crystals also seen. *Fibre* moderately thick-walled, radially aligned, non-septate.

Zizyphus mauritiana Lam. thrives on burnt grassy tracts and is found in dry thorn forest, dry deciduous forest without teak and moist deciduous where precipitation ranges from under 600-4000 mm. With dry period of 7-8 months, average temp. of the coldest month is around 20°C and thermal amplitude 7-10°C. It is frost-hardy and drought resistant.

Its wood being hard and durable is used for wells, axhandles, arrows and wheel parts, good for fuel and charcoal. Branches used as fodder. Tannin from bark is used.

5. CONCLUSIONS

The leaf impressions discovered in the burnt clay lumps from the Savaldi Culture have been found to be of grasses possibly adventitiously mixed with clay in keeping with the practice of mixing straw and chaff as a tampering material — a practice more or less commonly observed in protohistoric sites.

The samples from the Malwa Culture have revealed that the food economy consisted of barley (*Hordeum vulgare*), three kinds of wheat (*Triticum xphaerococcum*, *T. compactum* and *T. aestivum*), ragi (*Eleusine coracana*), lentil (*Lens esculenta*) three species of *Phaseolus*

(*Vulgaris*, *hirsutus* and *lathyroides*) and two species of *Vigna* (*mungo* and *sinnensis*) and *Zizyphus nummularia*. Besides these, seeds of *magadhabela* (*Pavonia odorata*), tarla (*Heteropanax fragrans*), *Lathyrus sativus* and *Dolichos biflorus* have been found. The food economy of the Malwa Culture as built up from materials given to us is very much similar to that described by Kajale⁷, but for *Pisum* which we could not find place in our samples. Finger-millet (*ragi*) and several types of beans, *Heteropanax* and *Pavonia* were not reported by Kajale⁸. In the materials examined by us we find that there are small-sized barley grains constituting 8-9% of the total barley grains, the grains of *compactum* wheat predominate the wheat grains but grains of the *aestivum* wheat are comparatively much less, and the seeds of *ragi* show considerable variability.

The food economy of the Jorwe Culture has been found to consist of barley (*Hordeum vulgare*) three kinds of wheat (as from Malwa Culture), *ragi*, *Paspalum scrobiculatum*, *Setaria italica*, lentil (*Lens esculenta*), *Lathyrus sativus*, *Pisum Sativum* and *Pisum arvense*, species of *Phaseolus* and *Vigna*, *Dolichos biflorus*, *Zizyphus nummularia*, *Heteropanax fragrans*, *Rhynchosia* sp. and of *Chenopodiaceae*/*Amaranthaceae*. The food economy reported for Jorwe Culture by Kajale⁹, is largely similar but for rice, *Sorghum*, *Carthamus* and *Linum usitatissimum* which have not been discovered by us in the materials sent to us. But we have discovered *Setaria italica*, *Heteropanax fragrans*, *Rhynchosia* sp. and *Phenopodiaceae*/*Amaranthaceae* which were not reported by Kajale¹⁰. An interesting feature observed among the food grains from Jorwe Culture is that small-sized barley has not been found and variability in the finger-millet has been found to be comparatively less than that observed in the Malwa Culture. The grains of *compactum* predominate over those of other species but those of *aestivum* are comparatively more than in the materials from the Malwa Culture. No plausible explanation for these alterations in the nature of grains as mentioned above suggests at the present.

From these food grains it is not possible to have an idea of the acreage on which they were grown during the Malwa and Jorwe Culture times. However, one can presume that wheat and barley were the major cereals along with Legumes upon which the Malwa and Jorwe Culture peoples at Daimabad had subsisted. However, this is in contrast to the present situation in district Ahmednagar where a substantial area (916,009 hectares) is under the cultivation of large and small millets with a very small area under wheat (50 hect.) and rice (10 hectares). And the legumes, species of *Dalichos* and *Phaseolus*, are cultivated on about 102 hectares. Interestingly barley and *ragi* are not cultivated at all in this district today as was done during the Chalcolithic times¹¹. No records have been found of *Pennisetum typhoides* and *Panicum* sp., the principal millets, which are cultivated here today. Species of *Phaseolus*, *Vigna*

7. Op. cit. (1977). Carbonized seeds and fruits were collected trenchwise and layerwise by using 'floatation technique' in collaboration with Dr. M.D. Kajale of the Deccan College, Pune during all the four seasons. His findings referred to in this Appendix and the Excavation Report are based on the material collected only in the 1976 and 1977 seasons and a full report on the material with him is still awaited. The material dealt with in this Appendix was a part of that collected in the 1979 season (S.A. Sali).

8. *Ibid.*

9. *Ibid.*

10. Op. cit. (1977).

11. See, however, pp. 17-19 (S.A. Sali).

and *Dolichus biflorus* are cultivated today along with *Cicer arietinum*. No record of the latter has been found in Chalcolithic times. *Carthamus tinctorius* is cultivated even today of which evidence has been found in the Jorwe Culture but linseed is not reported to be grown in the district as discovered from the Chalcolithic period¹².

The finds of *Pavonia odorata* and *Heteropanax fragrans* from the Chalcolithic culture are of special interest. The roots of sugandha bela (*Pavonia odorata*) are used in India in perfumery and the perfume 'Hina' is prepared from them. Further its roots are used as medicine for stomachache, inflammation and haemorrhage of intestine, even a tough fibre is obtained from this species which is whiter, softer and of fine texture and of good quality. It is not commercially exploited because of the short length of the ultimate fibre. This plant occurs in Konkan and other places in Maharashtra but not in district Ahmednagar in which Daimabad is located. The leaves of *Heteropanax fragrans* are used in Assam for feeding silkworms as a substitute for castor (*Ricinus communis*) leaves, and the wood is used for articles of turnery. *Heteropanax fragrans* is distributed in sub-Himalayan tract from Siwalik eastwards to Bihar, Bengal, and Assam and in Andaman Nicobar Islands¹³, but not in Maharashtra and South India anywhere. The discovery of these two in the Chalcolithic times at Daimabad shows that possibly the ancient inhabitants of Daimabad might have made similar use of both *Pavonia odorata* and *Heteropanax fragrans* as today. To gather the seeds, fruits and leaves and even wood of *Pavonia* and of *Heteropanax fragrans*, they had to go as far as Konkan in Maharashtra and to distantly located sub-himalayan tract. These two discoveries seem to throw light on their trade and cultural contacts within and outside Maharashtra. However, charcoals of timber of *Pavonia* and *Heteropanax fragrans* has not been found at this site.

Several other legumes, members of Chenopodiaceae/Amaranthaceae must have occurred in the vicinity of Daimabad as plants of the waste lands and alkaline, saline soils. Quite a few plant species of Chenopodiaceae and Amaranthaceae are used today as vegetable as pot herbs, and for medicinal purposes. Some of them as *Amaranthus spinosus* is used for dyeing purposes. They are also used as fodder. In particular context of this region, it may be mentioned that *Kuchia indica*, *Suaeda frutescens* and *Salvinia foetida* comprise favourite fodder for camels.

Interesting information concerning the exploitation of wild plant life by the ancient people at Daimabad has emerged from the study of charcoals from various cultural levels. It can be reasonably presumed that they had used the wild plants for the same purpose as is done today.

During the Savalda Culture the wood of *Acacia* was exploited. Its wood is hard and durable and presently used for wheels, its green pods and young shoots used for fodder and the gum from the bark is also used.

The Late Harappan peoples at this site exploited the Indian quality but this species is chiefly used today as incense. Two other charcoal specimens from this horizon could not be

12. See, Howarth, pp. 17-19 (S.A. Sali).

13. Anonymous, op. cit. (1959), p. 6.

identified.

During the Daimabad culture, besides the exploitation of *Acacia* sp., Dhawa, the axlewood tree (*Anogeissus latifolia*) was also exploited. The timber of the Axlewood tree as the name suggests is used for cart axles, tool handles and agricultural implements. It is also used for making charcoal. Tannin and gum derived from it are also used.

During the Malwa Culture both *Acacia* and Axlewood trees were continued to be exploited in addition to Amaltas, the Indian Laburnum Tree (*Cassia fistula*) and Shisham, the East Indian Rosewood Tree (*Dalbergia latifolia*). The timber of Amaltas is presently used for rice pounders, wheels, ploughs, shafts of carts and tool handles. Besides, root bark and fruit pulp are of medicinal importance. The East Indian Rosewood Tree is used for wheels, tool handles, agricultural implements, combs. The leaves are used as fodder and for medicinal purposes and tannin from bark is used for dyeing purposes.

The exploitation of *Acacia* continued as before during the Jorwe period. In addition to this the timber of bijasal (*Pterocarpus marsipium*) and the gin, the charcoal tree (*Treha orientalis*) and Indian jujube (*Zizyphus mauritiana*) were the other trees which were also used by the Jorwe people. Timber of *Pterocarpus marsipium* is used for building purposes, agricultural implements, drums and tool handles. Leaves are used as fodder and its flowers and gum kino are used medicinally. The charcoal tree as its name suggests yields good gunpowder charcoal and its fibre is used for making rope, twine and a kind of coarse cloth. Tannin from its bark is used for toughening and dyeing fishing lines. Leaves are used as fodder and the sweet fruits are eaten. Like the bijasal, the wood of Indian jujube is hard and durable and is used for axe-handles, arrows and wheel parts. Branches are used as fodder and the tannin from bark is also used.

It is not possible to mention particular uses of these trees during the various cultural periods. The fact that the protohistoric inhabitants of Daimabad had practiced agriculture many of their agricultural implements such as wheels, ploughs, plough-handles, carts, cart axles must have been derived from these timber trees. Their arrows and the coarse-textile were not only derived from some of them, even the tannins derived from bark of these trees must have been used for dyeing coarse cloth, even ropes and twines are derived from them. It may be difficult or perhaps more conjectural to attribute the other uses as mentioned to these people.

The study of tree exploitation from Savalda to Jorwe Culture reveals that during each cultural period distinct and different plant species were exploited though *Acacia* was exploited commonly by almost all the cultures except by the Late Harappans and *Anogeissus latifolia* by people of the Daimabad Culture and the Malwa Culture. This diversity in the plant species exploited by each culture is not easy to explain. People during each culture possibly had preferences for particular exploitable species.

It is most likely that quite a few of these species were available locally or in the immediate surroundings and some had to be brought from distant regions. The present day vegetation types in the region in which Daimabad is located appears to have undergone considerable degradation during the last about 4,000 years. The trees of *Zizyphus mauritiana*, *Cassia fistula* and *Acacia* were available in the Thorn Forest in the vicinity of the site itself.

The species of *Acacia*, *Zizyphus mauritiana*, *Cassia fistula*, *Anogeissus latifolia* and *Boswellia serrata* which occur today about 100 km south and west of the site in the dry deciduous forest were distantly located from Daimabad in protohistoric times. These two forest types occur under 800 mm annual precipitation though the thorn forest occurs below 600 mm. precipitation. Until the Malwa Culture was established at Daimabad, the only forests being exploited were the thorn forest and dry deciduous forests. The Malwa Culture people not only continued with the same but exploited *Dalbergia latifolia* a constituent of moist deciduous forest which thrives under much higher precipitation, 1800–2500 mm, and occurs today nearly 300 kms west of the site. The Jorwe people had exploited other constituents of the moist deciduous forest such as *Pterocarpus marsupium* and *Trema orientalis*. A majority of plant species exploited occurs today in the thorn forest and dry deciduous forest indicating that semi-arid climate had continued in the region since the Savalda Culture times. These forests occur even today in the immediate environs of Daimabad.

The fact that Jorwe people exploited exclusively the timber trees from the moist deciduous forest with average precipitation above 1800 mm. may be interpreted to indicate that during Jorwe times moist climate had prevailed in the vicinity of Daimabad. There is no supporting evidence to prove this except that the Jorwe people like other cultural people were adventurous and had discovered these new timber trees for their use. It is most likely that the Jorwe people had reached the site from the west of Daimabad and they were already used to timber trees from the moist forest, which had occurred in the west as at present.

The fascinating picture of ancient plant economy from Savalda to Jorwe Culture as reconstructed by us covers an approximate time span of 1200 years as assumed by Sali (personal communication). However, the radio-carbon dates done at Physical Research Laboratory at Ahmedabad and Birbal Sahni Institute of Palaeobotany Lucknow are unfortunately inconsistent.

We are extremely grateful to Dr. S.A. Sali for the very interesting material of plant remains from Daimabad given to us for investigation.

APPENDIX - III

CHEMICAL ANALYSIS OF HABITATIONAL DEPOSITS AND ANIMAL BONES FROM DAIMABAD

R. V. Joshi, B. C. Dentare and Anupama Kshirsagar, Deccan College, Pune.

A. Chemical Analysis of habitational deposits.

Chemical analysis of soils from habitational sites is of great importance for constructing the conditions under which the various deposits were laid down. Human occupation increases concentration of elements such as carbon, nitrogen and phosphorus. This alteration is cumulative and measurable by chemical analysis. Soil chemistry can also be fruitfully utilized in solving some problems in archaeological investigations in building up the sequence of human cultures or for confirming the conclusions already drawn by other methods of investigations.

The use of chemical analysis in archaeology is based on the fact that the human occupation at the site and several activities connected with habitation significantly increase the amount of some chemical elements in the resulting occupational deposits. This increase is due to the residue of these elements contained in plant food materials, human and animal excreta, urine, human burials and bones. This type of work is the first of its kind in India, although it was done in various parts of the world. At Daimabad the chemical analysis of several soil samples from different trenches at the habitational site was attempted to study the effect of human habitation due to accumulation of various chemical elements in the resulting soils. For comparison, the non-habitational soil samples, i.e. modern soil or black soil were also analysed, for the elements like phosphorus, nitrogen, carbon, calcium carbonate. Besides the chemical analysis, the usual soil characterisation like pH and electrical conductivity were also determined. Eighty-nine samples were collected from this site of which four are from cultivated field and virgin soil and the remaining eighty-five samples from habitational area. The analytical results are incorporated in tables 24, 25, 26 and 27. The soil from earthen pots was also analysed to see the variation in composition. The black soil surrounding the area of this site is derived from the Deccan Trap represented by varieties of Basalts.

1. pH

Here pH of the deposits from profile ranges from 7.5 to 8.6 which is slightly alkaline. The samples from horizontally exposed layer give pH value ranging from 8.0 to 9.25 indicating moderate alkalinity of the deposits. The basal black soil sample from a profile shows 7.9 pH and modern black soil gives 8.5 and 8.25 pH. It means the pH of habitational deposits is more or less similar to that of black soil of the region.

Table 24

Results of Chemical Analysis of the Deposits from Sections and Pits from Daimabad

S.No	Culture	Layer	pH	E.C.	CaCO ₃ %	O.C.%	N%	P%
1.	Jorwe	3	7.8	3.5	12.0	0.52	0.044	0.34
2.	Jorwe	3	7.8	4.0	13.0	0.50	0.047	0.35
3.	Jorwe	3	7.9	4.0	12.0	0.67	0.046	0.36
4.	Malwa	8	7.7	5.0	5.0	0.73	0.048	0.31
5.	Malwa	8	7.8	6.0	5.0	0.77	0.042	0.31
6.	Malwa	8	7.9	5.5	7.0	0.65	0.047	0.31
7.	Daimabad	11	7.9	5.0	5.0	0.71	0.051	0.33
8.	Daimabad	11	7.9	5.0	4.0	0.71	0.050	0.33
9.	Daimabad	11	7.9	8.0	7.0	0.86	0.050	0.32
10.	Late Harappan	13	8.0	5.5	7.0	0.86	0.059	0.37
11.	Late Harappan	13	7.9	6.0	12.0	0.86	0.060	0.37
12.	Late Harappan	13	8.0	5.5	12.0	0.69	0.062	0.37
13.	Savaldi	16	7.9	4.5	4.0	1.07	0.069	0.37
14.	Savaldi	16	7.9	6.0	12.0	1.03	0.068	0.38
15.	Savaldi	16	7.8	4.5	12.0	1.13	0.070	0.38
16.	Jorwe, pit-3	3	7.6	0.32	10.0	0.86	0.060	0.40
17.	Jorwe, pit-21	5	7.7	5.2	12.0	0.58	0.050	0.32
18.	Jorwe, pit-21	5	7.9	4.0	12.0	0.54	0.051	0.30
19.	Malwa, pit-30	7	7.9	5.0	10.0	1.13	0.072	0.43
20.	Malwa, pit-30	7A	7.8	5.0	11.0	1.36	0.075	0.41
21.	Malwa, pit-30	7A	7.9	6.0	9.5	1.12	0.072	0.41
22.	Daimabad, pit-28	11/12	8.0	4.5	9.0	0.84	0.030	0.38
23.	Daimabad, pit-28	11/12	7.8	6.7	9.0	0.81	0.052	0.39
24.	Savaldi, pit-29	15	8.0	5.0	9.0	1.09	0.050	0.39
25.	Savaldi, pit-29	15	8.0	5.0	8.5	1.02	0.061	0.39
26.	Late Harappan	13	7.9	5.0	6.0	0.75	0.052	0.35

No. Culture	Layer	pH	W.C.	CO ₂ %	OC %	N %	P %
27. Late Harappan	13	7.8	5.0	7.0	0.73	0.038	0.36
28. Black soil, below Layer 16	17	7.9	3.0	2.5	0.29	0.025	0.06
29. Malwa, Horizontal	8	7.7	4.0	1.94	0.44	0.037	0.34
30. Malwa, Horizontal	8	7.7	5.0	3.66	0.57	0.044	0.27
31. Malwa, Horizontal	8	7.65	4.2	3.88	0.42	0.043	0.34
32. Malwa, Horizontal	8	7.65	5.0	3.88	0.39	0.043	0.28
33. Malwa, Horizontal	8	7.95	4.0	5.79	0.45	0.037	0.28
34. Daimabad, Horizontal	11	7.8	3.0	1.94	0.71	0.046	0.24
35. Daimabad, Horizontal	11	7.8	4.0	4.65	0.75	0.055	0.28
36. Daimabad Horizontal	11	7.8	4.0	6.79	0.62	0.034	0.30
37. Daimabad Horizontal	11	8.0	4.0	4.55	0.75	0.030	0.38
38. Black soil	13	7.7	4.5	4.2	0.073	0.046	0.05
39. Modern black soil, Lakh village		8.5	0.6	6.79	0.71	0.035	0.06
40. Modern black soil, below 9"		8.25	0.07	7.76	0.68	0.030	0.03

Table 25

Results of Chemical Analysis of the samples from Earthen Pots from Daimabad

S.no	Culture	Trench	Layer	pH	E.C.	CaCO ₃ %	O.C %	N%	P%
41.	Jorwe	CZ 56	3	8.3	0.8	16	0.50	0.048	0.46
42.	Jorwe	CZ 56	3	8.4	0.45	17	0.77	0.075	0.49
43.	Jorwe	CZ 56	4	8.3	0.5	15	0.69	0.070	0.50
44.	Jorwe	BZ 56	4	8.25	0.5	17.5	0.70	0.081	0.43
45.	Jorwe	BZ 56	4	8.3	0.45	14	0.58	0.070	0.38
46.	Jorwe	L 48	4	8.6	0.4	15	0.49	0.070	0.38
47.	Jorwe	L 48	4	8.35	1.0	13.5	0.34	0.057	0.40
48.	Daimabad	FZ 64	11	7.7	4.0	12	0.88	0.119	0.38
49.	Daimabad	FZ 64	12	7.8	3.5	9.5	0.81	0.070	0.42
50.	Daimabad	FZ 64	12	7.8	3.5	8.5	0.79	0.070	0.46
51.	Malwa	X' 4	7	7.7	8.5	8	0.65	0.051	0.27

Table 26

Results of Chemical Analysis of the Deposits from Horizontally Excavated Layers at Daimabad

Silo Culture	Trench	Layer	Depth	pH	E.C.	O.C. %	CaCO ₃ %	N %	P %
52. Jorwe (Sector II)	DZ'3	top 2	20 cm	8.15	0.35	0.68	13.44	0.060	0.028
53. Jorwe (Sector II)	DZ'3	top 2	20 cm	8.95	1.5	0.56	11.52	0.062	0.25
54. Jorwe (Sector II)	DZ'3	top 2	20 cm	8.35	0.22	0.77	9.6	0.070	0.31
55. Jorwe (Sector II)	DZ'3	top 2	20 cm	8.6	0.54	0.30	8.64	0.043	0.36
56. Jorwe (Sector II)	DZ'3	top 2	20 cm	8.85	0.0	0.41	10.56	0.054	0.25
57. Jorwe (Sector II)	BZ'3	top 2	20 cm	8.35	0.25	0.68	11.52	0.068	0.25
58. Jorwe (Sector II)	BZ'3	top 2	20 cm	8.3	0.18	0.49	8.64	0.070	0.33
59. Jorwe (Sector II)	BZ'3	top 2	20 cm	8.45	0.20	0.54	8.64	0.070	0.22
60. Jorwe (Sector II)	BZ'3	top 2	20 cm	8.6	0.30	0.55	10.56	0.076	0.14
61. Jorwe (Sector II)	BZ'3	top 2	20 cm	8.2	1.3	0.48	13.44	0.080	0.25
62. Jorwe (Sector II)	DZ'2	top 2	28 cm	8.5	2.5	0.58	14.4	0.078	0.34
63. Jorwe (Sector II)	DZ'2	top 2	28 cm	8.75	1.7	0.48	10.56	0.076	0.38
64. Jorwe (Sector II)	DZ'2	top 2	28 cm	8.4	0.52	0.75	15.32	0.085	0.39
65. Jorwe (Sector II)	DZ'2	top 2	28 cm	8.5	4.0	0.30	10.56	0.062	0.28
66. Jorwe (Sector II)	DZ'2	top 2	28 cm	9.15	1.0	0.70	18.24	0.086	0.31
67. Malwa (Sector II)	CZ'4	top 5	1.25 m	8.1	3.0	0.56	6.72	0.055	0.32
68. Malwa (Sector II)	CZ'4	top 5	1.23 m	8.0	9.0	0.65	7.68	0.068	0.39
69. Malwa (Sector II)	CZ'4	top 5	1.23 m	9.0	3.0	0.58	10.56	0.070	0.27
70. Malwa (Sector II)	CZ'4	top 5	1.23 m	8.1	6.2	0.41	5.76	0.040	0.23
71. Malwa (Sector IV)	ZD 60	top 5	1.29 m	9.2	1.0	0.56	8.64	0.045	0.41
72. Malwa (Sector IV)	ZD 60	top 5	1.25 m	8.6	4.0	0.44	7.68	0.062	0.36
73. Malwa (Sector IV)	ZD 60	top 5	1.25 m	8.5	4.0	0.77	8.64	0.082	0.50
74. Malwa (Sector IV)	ZD 60	top 5	1.25 m	8.8	3.0	0.54	8.64	0.045	0.41
75. Malwa (Sector IV)	ZD 60	top 5	1.25 m	8.8	3.1	0.69	9.60	0.074	0.44
76. Malwa (Sector IV)	ZD 60	top 5	1.30 m	8.8	2.8	0.53	9.60	0.082	0.46
77. Malwa (Sector IV)	ZD 60	top 5	1.30 m	9.25	1.0	0.43	8.64	0.066	0.36

S.No.	Culture	Trench	Layer	Depth	pH	E.C.	O.C. %	CaCO ₃ %	N %	P %
78.	Mahwa	ZD 60	top 5	1.30 m	8.45	3.8	0.81	5.60	0.076	0.41
79.	Mahwa	ZD 60	top 5	1.30 m	8.4	3.7	0.54	7.68	0.076	0.44
80.	Late Harappan	ZD 61	top 9	2.05 m	8.55	3.7	0.72	10.56	0.070	0.29
81.	Late Harappan	ZD 62	top 9	2.05 m	8.6	3.2	0.49	8.64	0.066	0.29
82.	Late Harappan	ZD 62	top 9	2.05 m	8.9	1.9	0.53	9.60	0.058	0.26
83.	Late Harappan	ZD 62	top 9	2.05 m	8.75	2.6	0.38	6.72	0.079	0.14
84.	Late Harappan	ZD 62	top 9	2.05 m	8.75	2.5	0.80	10.56	0.080	0.32
85.	Late Harappan	ZD 62	top 9	2.05 m	9.2	1.5	0.56	18.24	0.081	0.23
86.	Late Harappan	ZD 62	top 9	2.05 m	8.9	3.2	0.61	9.60	0.060	0.22
87.	Late Harappan	ZD 62	top 9	2.05 m	8.96	2.6	0.71	11.52	0.076	0.31
88.	Late Harappan	ZD 62	top 9	2.05 m	8.95	2.6	0.71	11.52	0.076	0.31
89.	Late Harappan	ZD 62	top 9	2.05 m	8.8	3.1	0.61	12.48	0.080	0.32

Table 27

Results of Particle-size Analysis of the Deposits from Daimabad

S.No.	Culture	Layer	Clay%	Silt %	Fine Sand %	Coarse Sand %
2	Jorwe	3	10.34	38.29	40.88	10.47
5	Malwa	8	12.70	36.30	39.77	11.24
8	Daimabad	11	12.52	54.28	25.10	8.10
11	Late Harappan	13	14.88	32.27	23.15	9.69
14	Savaldi	15	14.70	58.44	17.80	9.00
						Sandy silt
						Sandy silt
						Sandy silt
						Sandy silt
						Sandy silt

Table 28

Results of Chemical Analysis of Bones from Daimabad

No.	Culture	Layer	Trench	F%	P%	C, C%	N%	Ca%	CaCO ₃ %	Si O%	P ₂ O ₅ %	100F/ P ₂ O ₅
1	Jorwe	1	ZD62	0.052	9.75	0.635	0.067	39.14	27.44	nil	22.53	0.143
2	Jorwe	2	"	0.030	11.25	0.483	0.054	39.14	26.46	"	25.76	0.116
3	Jorwe	3	"	0.028	11.56	0.399	0.022	36.64	20.68	"	26.47	0.106
4	Jorwe	4	"	0.054	12.0	0.420	0.047	36.47	22.54	"	27.98	0.124
5	Malwa	5	"	0.051	11.88	0.420	0.045	38.65	27.44	"	27.20	0.137
6	Malwa	6	"	0.038	11.88	0.420	0.045	38.65	27.44	"	27.20	0.137
7	Malwa	7	"	0.046	12.25	0.472	0.054	36.64	20.58	"	28.05	0.164
8	Malwa	8	"	0.038	13.12	0.567	0.060	38.65	18.62	"	30.04	0.126
9	Late Harappan	9	"	0.038	11.75	0.465	0.051	36.47	23.52	"	26.91	0.141

(ii) Electrical Conductivity.

In the profile of habitation deposit electrical conductivity ranges from 3.0 to 8.5 millimhos/cm indicating slightly saline nature of almost all samples, except Jorwe pit-3 sample which is low (0.32 millimhos/cm.). As this sample is from the pit, possibly the salts might have got washed down.

In case of the sample from the earthen pot of Jorwe period, salt content is low while Daimabad and Malwa period samples give relatively high values. The samples from horizontally excavated layer 2 of Jorwe period show low conductivity whereas in the layers of Late Harappan and Malwa cultures it is considerably high. No definite trend has been observed.

(iii). Calcium Carbonate

It is high in Jorwe Culture ranging from 12 to 13%. In Malwa it is 5%. Then it goes on increasing with the depth. In Daimabad Culture no definite trend has been observed. Again in Late Harappan it increases from 7.0 to 12% and further remains constant in Savalda Culture. In the case of pit samples carbonate is high at first and then decreases with the depth. In the samples from earthen pots somewhat similar trend is observed.

(iv) Organic Carbon

As regards organic carbon in profile, it ranges from 0.504 to 1.134% and increases with depth right from Jorwe to Savalda. Pit samples contain slightly more carbon percentage. In the case of Malwa pit, it is high. Horizontally exposed layers 2, 5 and 9 give low-to-medium organic carbon ranging from 0.504 to 0.813%. In comparison with the basal black soil, organic carbon contents of habitation deposit of profile are 3 to 5 times more.

(v) Nitrogen

Nitrogen content increases downwards from the top of Jorwe to Savalda. Culturewise increase varies, but the overall range is 0.044 to 0.07%. Pit samples do not show any trend. In pit samples, nitrogen percentage is maximum at Malwa level. The same thing is observed in the case of organic carbon. In the horizontally exposed layers also nitrogen content falls within the above range.

In general, from the results it is observed that the nitrogen content in the deposit from profile is 2 to 4 times more than in the basal black non-occupational soil. The high nitrogen content perhaps indicates relatively intense human activity.

(vi) Phosphorus

The uppermost Jorwe culture gives phosphorus content from 0.34 to 0.36% which is rela-

tively higher than in the immediately underlying culture which is 0.316%. From Malwa to Savaldi it goes on increasing with the depth and hence with the age.

In the case of the pit sample obviously no definite trend has been observed. Throughout the profile maximum phosphorus content, i.e. 0.43% is observed in the pit sample from Malwa Culture. The same thing has been noticed in the case of organic carbon and nitrogen. Samples from the pots also contain very high phosphorus ranging from 0.27 to 0.5%. As regards the horizontally excavated layers, it varies from 0.14 to 0.39% in the layer 2 of Jorwe period, from 0.23 to 0.30% in layer 3 of Malwa period and from 0.14 to 0.38% in the layer 9 of the Late Harappan period. This means that the phosphorus content is higher in layer 3 of the Malwa period and range from 0.23 to 0.3%. These high phosphate contents are suggestive of a high density of population during the Malwa period. In layer 9 of the Late Harappan period only slight variations in the phosphorus content is observed, with one or two exceptions. Most of the samples are between 0.23 to 0.33%, thus indicating a lesser intensity of occupation than in Malwa period (Table 26). However, it is not possible to quantify actual population densities without comparisons with modern settlements with known values for human as well as animal populations.

In general, from the results it is clear that the phosphorus content in the samples from profile, pits, pots and horizontally excavated layers is three to nine times more as compared to the underlying virgin and modern soils in which it ranges from 0.059 to 0.068%.

Thus, the high values of organic carbon, nitrogen and phosphorus observed in Savaldi Culture are due to higher or increased human activities. The organic carbon and nitrogen, because of their possible losses through leaching and by oxidation, are of not much use as indicators of human activity. And as such the quantity of phosphorus is the only criterion for interpreting human occupancy as the phosphorus compound is the most stable in wide varieties of soil conditions.

In the profile decreasing human activity trend is noticed. Savaldi — Late Harappan — Daimabad — Malwa. After Malwa, during Jorwe period, again it is quite significant.

The highest values of organic carbon, nitrogen and phosphorus are observed in the pot samples of Malwa. The pit might have been filled with something which after decomposition added more phosphorus along with organic carbon and nitrogen.

Particle-size analysis (Table 27) shows dominance of silt and fine sand indicating sandy silt texture of the deposit.

B. Bone Analysis

The chemical composition of the buried bone gives some idea about the degree of fossilization and the relative age of the bone since changes with time. Therefore a few animal bone samples from one profile of the habitation trench were tried to study this hypothesis. The results are given in Table 28. Fluorine analysis of bone is often attempted for relative dating purposes. Bone obtained in excavation is a complex of organic and inorganic compounds. The fats disappear very rapidly while proteins at a very slow declining rate from organic

part of bone after its burial. These open spaces are filled with minerals like CaCO_3 , SiO_2 , etc. from soil solution. Hydroxyapatite, the inorganic part, is slowly converted to fluorapatite by diffusion of fluoride from ground water to the bone matrix. This slow, irreversible process provides tool for dating.

On the basis of the data obtained by chemical analysis of bone samples from Daimabad and several specimens from archaeological sites belonging to different cultural periods, it is observed that fluorine method has limited applied value for the bones of later archaeological periods. It can hardly be applied for distinguishing substages of the Chalcolithic period. However this method gives best results when there is large time difference in two lots of bones. Fluorine/Phosphate ratio is comparable in case of the chalcolithic sites of Inamgaon (0.125) and Daimabad (0.137). A higher value for the fossils from Pleistocene period at Inamgaon (5.0) is obtained. This ratio is below 0.5 in bones of the Chalcolithic sites from Maharashtra, Madhya Pradesh, Gujarat and Andhra Pradesh. Fluorine/Phosphate ratio ranges from 3.0 to 8.0 in the fossils from Pleistocene period from different regions of India.

(i) Fluorine

Fluorine content in the bones from Daimabad ranges from 0.028 to 0.051%. There is no appreciable increase in the fluorine from layer (1) to layer (9).

(ii) Phosphorus

The phosphorus content in the bone samples varies from 9.73% to 13.12% with no definite trend.

(iii) Organic Carbon and Nitrogen

0.33 to 0.63 and 0.022 to 0.067 respectively values are indicative of loss of organic matter from Chalcolithic period due to semi-arid climate. Recent bone contains 10% organic carbon and 4% Nitrogen approximately.

(iv) Calcium Carbonate

This varies from 18.62 to 27.44% with no definite trend. Recent bone contains approximately 10% of CaCO_3 . Silica is absent in these bones.

APPENDIX -IV

ANALYSIS OF DAIMABAD BRONZES IN %

By

Chief Archaeological Chemist, Dehra dun

The table on next page gives the composition of the bronzes as determined by chemical analysis of samples taken by drilling and washed with ether for removal of greasy matter before analysis. In the absence of instrumental analytical equipment for determining the percentage reported as traces, precise figures have not been recorded. From the amount of tin present in the large bull or buffalo and in the various component parts of the chariot it is clearly inferred that these images are made of a *low tin bronze*. A sample from the image of the charioteer itself was not drawn since the bronze was beautifully cast with fine detail on various parts and on account of the delicacy of the figure its various limbs were not as heavy as to justify drilling out of samples.

In case of the rhino 2 different samples have shown varying percentage of tin; viz. 0.85% and 6.51%. It would appear that the smelting of the alloy used for casting of the image has been imperfect and has not resulted in a homogeneous mix. The continuance of this inhomogeneity during casting however seems to be inexplicable unless some repair is supposed. In view of its association with the other low tin bronzes this image may also be considered more a low tin bronze than impure copper.

The heavy bronze elephant was too highly corroded and pitted to admit of a reproducible analysis of the upper segments of the surface. Deep drilling was not resorted to for obtaining samples. From a qualitative analysis of the sample drawn from the upper surface it was seen that its alloy is also a tin bronze.

It is pertinent to state that pure copper has a melting point of 1083°C. Furthermore it has a tendency to shrink on cooling which results in loss of fine details of the original mould. Addition of tin to copper depresses the melting point upto a limit. With 25% tin this melting point is down to about 800°. These images are by and large low tin bronze and would have required a melting temperature in between the two figures indicating a fairly developed furnace technology for attaining higher temperatures. The production of fine details of decoration on some of these images especially the chariot would therefore point to the high skill and technical knowledge of the makers of the images and the art of casting.

It has not been possible to conduct trace element analysis in respect of these samples in the absence of instrumental equipment. Trace element analyses like that for arsenic, nickel, cobalt, etc. are helpful in linking the source of ores to the images but again caution would appear necessary in making a judgement since both the source of the trace element and the smelting technique would affect the trace element in the final metallurgical product.

APPENDIX — IV

Analysis of Dairnabad Bronzes in %

By

Chief Archaeological Chemist, Dehra Dun

	<i>Rhino</i>			<i>Bull of Chariot</i>		<i>Chariot</i>
	<i>Sample</i>	<i>Sample</i>	<i>Buffalo</i>	<i>Hindlimbs</i>	<i>Abdomen</i>	<i>Wheel</i>
	<i>No. 1</i>	<i>No. 2</i>				<i>support</i>
Tin	0.85	6.51	4.43	5.36	4.58	5.03
Lead	nil	nil	nil	0.93	0.32	Traces
Copper	98.83	92.51	93.06	91.48	98.08	93.97
Iron	Traces	Traces	Traces	0.49	0.68	Traces
Nickel	Traces	nil	Traces	Traces	0.39	Absent
Total	99.68	99.02	99.49	98.26	99.05	99.00

* Minute amount not accurately estimable quantitatively by chemical analysis is recorded as traces

Appendix -V

PERCENTAGE ELEMENTAL COMPOSITION OF DAIMABAD ELEPHANT AND RHINO SAMPLES OBTAINED THROUGH ATOMIC ABSORPTION SPECTROPHOTO

BY
Physical Research Laboratory Ahmadabad.

Key : np: Not Present

Sam- ple	Site	Description	Sr	Ni	Fe	As	Pb
PRL 172-a	Daimabad	elephant base	np	0.2912	0.3584	0.9202	< .002
PRL 172-b	"	elephant body	np	0.2654	0.2526	0.6871	< .002
PRL 172-c	"	elephant base- body joint	np	0.4115	0.3782	0.8385	< .002
PRL 172-d	"	elephant base joint	np	0.3596	0.3128	0.8926	< .002
PRL 173-a	"	Rhino base	np	0.1195	0.6390	1.2324	< 0.0435
PRL 173-b	"	Rhino side	np	0.2127	0.8363	1.125	< 0.002
PRL 173-c	"	Rhino wheel	np	0.4447	0.8412	1.299	< .002

APPENDIX VI

PALAEODEMOGRAPHY OF PROTOHISTORIC DAIMABAD

By

Dr S.R. Walimbe

Deccan College Post Graduate and Research Institute, Pune 411 006.

1. Introduction

The archaeological site of Daimabad, lat. 19° 31' North and 74° 42' East, is situated on the left bank of the river Pravara, a tributary of Godavari, in Shrirampur taluk of Ahmednagar district of Maharashtra. This report is primarily an attempt to reveal the morphological and metric features, with palaeodemographic perspective, of the human skeletal remains recovered from three occupational levels, Late Harappan, Malwa and Jorwe, of Daimabad.

In South Asian palaeoanthropology descriptive and comparative analysis of skeletal series often include only the better preserved and complete adult crania. Moreover, the broader palaeodemographic perspective was lacking in these studies because of the small sample size and the fragmentary nature of the osteological findings. Numerous investigations of the skeletal biology of prehistoric Indian populations may be mentioned in support of this statement. Besides the barriers posed by the practical and theoretical limitations, the other and perhaps more important reason for non-adoption of demographic framework was the prime objective the investigators had to establish the racial origin and ethnic identity of the population. Since only complete adult crania provide relevant data in this endeavour the numerous immature and fragmentary skeletal specimens were never subjected to description and their great anthropological potential value was routinely overlooked or ignored.

For this study a palaeodemographic perspective has been adopted. Every piece of human bone, cranial or post-cranial, fragmentary or complete, mature or immature, is scrutinised and systematically and thoroughly studied.

2. Sample

Human skeletal remains recovered from 37 burials are made available for this study. Two of these burials, 58 and 59, are symbolic, in the sense that, they lack any human bone or have a few chips, and contain vertebrate faunal remains only. Many of the other burials are very poorly preserved and are represented by only a few osseous remains that survived during the process of exposure, excavation and transport to the laboratory.

Table 29 gives the archaeological details of the burials that are considered for this study. Besides the two symbolic burials, the remaining 33 represent the minimum number of 35 individuals. Burial 51, however, yielded remains of more than one individual though the second

Table 29

Detail of the human burials considered for the present report

Burial No.	Cultural Phase	Section	Trench	Layer	Burial Type	Age	Sex
7	Jorwe	I	CZ 69-10Z 69		Twin urn	1 to 1.5 years	Uncertain
8	Jorwe	I	CZ 69-10Z 69		Extended	4 to 5 years	Uncertain
18	Late Harappan	I	CZ 61		Extended	25 to 30 years	Male
37	Jorwe	II	BZ'4	1	Twin urn	1.5 years	Uncertain
38	Jorwe	II	BZ'3	1	Twin urn	Less than 6 months	Uncertain
39	Jorwe	II	BZ'4	1	Twin urn	Less than 6 months	Uncertain
42	Jorwe	II	BZ'3-BZ'4	1	Twin urn	Around 6 months	Uncertain
43	Jorwe	II	BZ'2	1	Twin urn	5 to 6 years	Uncertain
44	Malwa and Jorwe Overlap	II	AZ'3	3	Twin urn	2 to 3 years	Uncertain
45	Malwa and Jorwe Overlap	II	AZ'3	4	Twin urn	Less than 3 months	Uncertain
46	Jorwe	II	BZ'2	2	Twin urn	Around 8 years	Uncertain
47	Malwa and Jorwe Overlap	II	BZ'3	4	Twin urn	1 to 3 months	Uncertain
48	Jorwe	II	BZ'1	2	Twin urn	2.5 to 3 years	Uncertain
49	Jorwe	II	BZ'1	2	Twin urn	Less than 6 months	Uncertain
50	Malwa and Jorwe Overlap	II	BZ'3	4	Twin urn	Perinatal	Uncertain
51	Malwa and Jorwe Overlap	II	BZ'3	4	Twin urn	1 to 2 months	Uncertain
52	Jorwe	II	CZ'3	2	Twin urn	10 to 12 months	Uncertain
53	Jorwe	II	CZ'3	2	Extended	6.5 to 7.5 years	Uncertain
54	Jorwe	IV	ZD 62	1	Twin urn	8 to 10 years	Uncertain
56	Malwa	IV	ZD 61	3	Twin urn	Infant	Uncertain
58	Malwa and Jorwe Overlap	II	BZ'3	4	Single urn	Uncertain	Uncertain
59	Daimabad	IV	ZD 61	7	Single urn	Uncertain	Uncertain
60	Jorwe	I	Z 69	3	Twin urn	1 to 2 years	Uncertain

Burial No.	Cultural Phase	Sector	Trench	Layer	Burial Type	Age	Sex
61	Jorwe	I	Z69	5	Twin urn	3.5 to 4 years	Uncertain
62	Malwa	I	Z69/Z70 to AZ69/AZ70	12	Twin urn	1.5 to 2 years	Uncertain
64	Malwa	I	Z69/Z70 to AZ69/AZ70	14	Twin urn	3 to 4 years	Uncertain
65	Jorwe	II	CZ'2	1	Twin urn	Infant	Uncertain
66	Jorwe	II	CZ'2	1	Twin urn	8 to 10 months	Uncertain
67	Jorwe	II	CZ'2	1	Twin urn	Premature	Uncertain
68	Jorwe	II	DZ'4	1	Twin urn	6 to 8 months	Uncertain
69	Jorwe	II	DZ'4	1	Twin urn	Premature	Uncertain
70	Jorwe	II	DZ'4	1	Twin urn	Less than 1 year	Uncertain
71	Jorwe	II	DZ'4	1	Twin urn	Child	Uncertain
72	Jorwe	II	DZ'4	1	Twin urn	1 to 2 months	Uncertain
73	Jorwe	II	EZ'4	1	Twin urn	2 to 3 months	Uncertain
74	Jorwe	II	EZ'4	1	Twin urn	Foetus	Uncertain
75	Malwa	II	ZD 60	5	Twin urn	2 to 2.5 years	Uncertain

individual is represented by just a few fragments. It should be noted that the term individual is employed here in its paleontological sense and even a single tooth or few cranial or post-cranial fragments may also represent a particular individual.

Methods of the disposal of the dead at Daimabad conforms to the traditional patterns observed at other contemporary protohistoric sites of the Deccan Plateau. Usually the adult were buried in an extended position whereas the children were accommodated in twin-arms placed mouth-to-mouth in the grave pit. The adults and also the children were usually buried in a pit specially dug beneath the house floor or in the courtyard of the house.

3. Preservation

In general the state of preservation is rather poor. Very few specimens are complete and have all the parts preserved while most of the others have bones heavily weathered and eroded. Neurocranial elements are frequently preserved, though fragmentary, but the facial skeletons and the skull base is severely damaged in all the cases. In case of long bones the ends are often broken. Some bones have chalky texture while some have mineralized appearance. Local soil conditions primarily play an important role in such differential preservation. The post-mortem breakage, mostly breakage during the excavation process is severe in some of the cases. Preservatives were rightly used in the field to avoid further damage but its excessive use makes the laboratory cleaning difficult. Moreover it precludes detailed morphological observations. Non-human bones occur in abundant quantity in many burials. Some of the skeletons have traces of grass on the bones which suggest that the body might have been wrapped in grass while burying.

4. Methodology

For age estimation the criteria used are dental eruption sequence,¹ the progress of dental calcification,² lengths of long bones,³ and in case of adolescents and adult, long bone epiphyseal fusion,⁴ cranial suture closure,⁵ molar wear⁶ and metamorphosis of pubic symphysis.⁷

Standards used for dental eruption sequence are based on European populations. However, its use is justifiable as differences in timing of tooth eruption between European and Indian populations are not significant.⁸ In the absence of published standards for dental crown and root calcification among Indian populations the available European standards are employed in this study.

As far as possible age determination in case of infants is based on the dental evidences. However, in the absence of the dental data lengths of long bones are employed in age estimation. A crude, rough, estimate is made on the assumption that individuals of similar ages grow and develop at roughly similar rates. Growth in length of long bones is of course greatly influenced by both, genetic and environmental, factors. Still in the absence of any other data it remains the best thing to rely on. Long bones in such cases are compared with the long bones of individuals in the Huangao series whose age was determined dentally. As a last

resource, comparisons are made with the bone lengths of Arikara Indian infants.

Sex determination is possible in case of only one individual. Methods suggested by Keen¹ and Washburn² are followed for sex determination.

The diagnosis and interpretation of skeletal pathology is based on Brothwell,³ Ortner-Putschur^{1,2}, Steinbock³, and Zivanovic.^{1,4}

Standard methodology has been applied while taking measurements and computing indices. The majority of the measurements and indices are described by Martin-Saller.⁵ The angular measurements on mandible are described by Oettinger.^{1,6} Computation of cranial capacity are based on Lee-Pearson formulae and Sergi classification cited by Martin.⁷ Stature estimates are based on the formulae given by Trotter-Glessner^{1,8} and Athawale.^{1,9}

Two measures of crown size are made for each tooth, maximum mesiodistal diameter (MD) and maximum buccolingual diameter (BL) following the method described by Moorrees.²⁰ Crown dimensions are employed in calculating three dental indices, crown area (CA), crown index (CI) and crown module (CM) following Wolpoff.²¹ All the measurements are made with a Helios needle-point dial caliper calibrated to 0.05 mm. The scoring of dental units follows the standards outlined by Hanihara,²² Hanihara-Minamidate,²³ and Scott.²⁴ Description and interpretation of dental pathology follows Brothwell²⁵ and Glickman.²⁶

In addition to the literature mentioned several other text books and excavation reports are followed during the course of this study.

5. Description

The following is a comprehensive account for each burial giving preservation and skeletal inventory, morphology and metric features, pathology, age estimation and sex determination.

Burial No. 7

Excavation date : 15.2.76	Age: 1 to 1.5 years
Cultural phase: Jorwe	Sex: Uncertain
Sector: I	Cranium: Extremely fragmentary
Trench: CZ 69 — DZ 69	Mandible: Missing
Layer:	Dentition: Missing
Burial type: Twin-urn	Post-cranium: Fragmentary (incomplete)

Preservation and Skeletal Inventory: This burial contains osseous remains of a child. The cranial elements are extremely fragmentary but the post-cranial bones are rather in fairly good condition and many bones are complete. However, no jaw bones or dentition is preserved in this burial.

The cranium, as mentioned earlier, is in very fragmentary condition and owing to the small size and weathered appearance the bones are beyond reconstruction. The parts that could be identified with certainty include left parietal with almost complete midsagittal suture, part of right parietal, left and right squamous and petrosal portions of temporals, parts of

greater wing of right and left sphenoid, frontal portions preserving right and left orbital superior margins, a small piece of occipital with lambdoid suture and left malar bone. Facial skeleton is completely crushed and no parts are identifiable. Maxillae or mandible are just missing. The dentition appears to have lost postmortem. All the cranium is heavily coated with matrix and levicol preservative coating and any attempt to clean the bone results in fresh cuts.

The burial alongwith the urns was lifted in plaster jacket at the time of excavation and then transported to the office of the Archaeological Survey of India, Aurangabad. The two pots placed on the skull perhaps as burial offerings while burying, might have resulted in further damage to the skull.

No dentition or jaw elements are preserved.

The post-cranial bones are better preserved and all the parts represented. The thoracic skeleton is complete, though fragmentary. Attempt has not been made to lift them from the plaster cast because of likely damage.

The upper extremities are fully represented. The pectoral girdle has all its components but no morphometric studies are possible because of preservative coating. The right side limb bones, right humerus, ulna and radius, all are complete and undamaged. The left side however suffers post-mortem damage. Distal fragment and the proximal head of left humerus, proximal 2/3 of both left ulna and radius are present. All cuts are fresh and the loss is most likely during the excavation or its transportation. The wrist and hand skeleton is better preserved for the right side and is visible, the left side elements are embedded in matrix.

Pelvis is completely crushed and though all the elements are represented none is complete. Proximal half of left femur is present but the right side bone is missing. Both right and left tibia-fibula are missing, except a small proximal 1/3 segment of right fibula. Skeleton of the foot is entirely missing.

Description of Post-Cranial Bones: Though many bones are present a few are complete which allow the diaphyseal length measurement. The lengths are as follows:

Humerus	R	99.2 mm
Ulna	R	91.5 mm
Radius	R	88.4 mm.

Age Determination: The long bone length data provide base for age estimation. The long bone lengths of this specimen stand in the range of bone lengths of 1 to 1.5 years Arikara children, except the fibula which is slightly larger for this range. An approximate age at time of death on this basis may be suggested as between 1 to 1.5 years.

Sex Determination: Uncertain.

Burial No. 8

Excavation date: 15.2.76
 Cultural Phase: Jorwe
 Sector: I
 Trench CZ 69 — DZ 69
 Layer:
 Burial type: Extended

Age: 4 to 5 years
 Sex: Uncertain
 Cranium: Well preserved
 Mandible: Fragmentary
 Dentitions: 5 deciduous, 2 permanent
 Post-Cranium: Well preserved

Preservation and Skeletal Inventory: This burial contains rather well preserved cranial and post cranial elements of a child. Most of the cranial parts are represented and the long bones are complete. However, heavy application of fevicol preservative precludes any detailed morphological observation.

The neurocranial vault is in very good state of preservation and in spite of the preservative coating reconstruction of almost complete left half of vault is possible (pl. CLXXI). The right side elements are present too but the edges are either eroded or damaged. The facial skeleton, however, is heavily damaged and no part except a small maxillary piece and malar bones is present.

The frontal bone is almost complete over the left orbital region; only damaged portion is from the lateral orbital margin. The right orbital margin is broken but the bone, approx. 1 cm above it, is well preserved. The coronal suture is complete for the left side, from the right side only 3 cm sutural edge is preserved. The frontal eminence is prominent. The left sphenoid is present but cannot be articulated with the frontal. The temporal bone too is complete and both right and left petrosal and squamous portions are well preserved. The left parietal is damaged all over the mid-sagittal region. The squamous suture is undamaged throughout its course. The left lambdoidal suture is also visible, though not fully. The occipital is well preserved but too fragmentary and cannot be articulated with the other bones as some parts are missing.

The right side of the neurocranium is badly damaged post mortem and many parts are missing. The elements preserved include parietal and temporal mostly. The occipital right half is also present. The frontal and sphenoid bones of this side are either missing or heavily damaged. Most of the cranial base is missing as well as the facial skeleton.

The mandible is well preserved and nearly complete. The left half is almost complete except the slight damage to the inferior border of the ramus in the region of M_1 . The damage is obviously post-mortem. The Ld_1 , Ld_2 , and Ld_3 are in their respective positions, the permanent LM_1 is seen in the crypt. The left ascending ramus is complete and undamaged. Both condyle and coronoid are present. The right half is heavily damaged. The ascending ramus is missing. The horizontal ramus preserves the portion of distal end of RM_1 crypt through the region of Rd_1 . However, only the Rd_2 is in the crypt. The Rd_1 is missing and Rd_3 is recovered isolated. The RM_1 crown was in the crypt but extracted in the laboratory for morphometric study.



PLATE CLXXI First preserved child skull, Burial B.

Dentition preserved include the deciduous Ldm_2 , Ldm_1 , Ld_4 and Rdm_2 . The Rd_2 is present but isolated. The permanent first molars RM_1 and LM_1 are also present. No maxillary dentition is represented.

The post-cranium is well preserved but many bones have suffered post-mortem damage. Since the skeleton was lifted 'in situ' on plaster slab almost all thoracic skeleton is retained. However, the elements are heavily coated with preservative which appears to be necessary at the time of excavation. Any attempt to lift the individual ribs result in further damage to the region.

From the upper extremities following elements are present. For the left scapula only the vertebral border is preserved and the rest of the portion has been destroyed. The right side cannot be examined since the region is heavily covered with matrix and preservative. The left clavicle is missing but the right one is complete. Left humerus is almost complete except for the slight damage to the proximal end. The right humerus is represented by 2/3 proximal diaphysis with head. The damage to the distal end is obviously post-mortem. The right ulna is completely preserved but the radius is broken proximally. The left ulna and radius, both, have suffered extensive post-mortem breakage and are beyond reconstruction. The carpal, metacarpals and phalanges of the left side are all present but covered with matrix. The skeleton of the right hand is missing.

Pelvis is completely crushed. No pelvic bone is complete, though most of the right iliac blade is preserved. The right and left femora are extensively damaged whereas the lower segments are totally missing.

Description of Cranial Bones: The mandible is fairly complete. The metric observations on this bone are recorded below:

Symphysal height	23.9 mm
Thickness of corpus at dm_2 right	13.2 mm
Thickness of corpus at dm_2 left	13.1 mm
Depth of corpus at dm_2 right	20.8 mm
Depth of corpus at dm_2 left	21.0 mm
Height of ascending ramus, left	43.0 mm
Minimum breadth of ascending ramus, left	24.0 mm
Maximum breadth of ascending ramus, left	31.9 mm
Condyle-coronoid length, left	30.1 mm
Gonial angle, left	(145°)

Description of Dental Elements: The mandibular fragments and the teeth in situ are heavily coated with preservative and detailed morphological observations are not possible in many cases.

Deciduous second molars, Ldm_2 and Rdm_2 are both five cusped with Y type of groove pattern. The permanent first molars are six cusped with small but readily discernible entoconid. C-7, proestylid, paramolar or other unusual features are not seen on these teeth. The occlusal groove pattern is of Y style.

The crown dimensions are given in Table 30.

Table 30

Dental Crown Dimensions and Indices: Burial 8

		Crown MD	Diameters BL	Crown CA	Indices NI	CM
<i>Mandible</i>						
dc	R	6.6	5.7	57.6	86.4	6.2
	L	6.5	5.6	56.4	86.2	6.1
dm ₁	L	8.6	7.7	66.2	89.5	8.2
	R	9.8	8.3	81.3	84.7	9.1
dm ₂	L	9.8	8.3	81.3	84.7	9.1
	R	11.5	10.8	118.7	92.9	11.1
M ₁	R	11.2	10.8	121.0	96.4	11.0
	L					

Dental pathology: The deciduous teeth exhibit tartar accumulations and some degree of plaque formation. The heavy preservative coating precludes further observations.

Description of Post-Cranial Bones: Left humerus and right ulna are complete and allows the maximum diaphyseal measurement. The right clavicle is also almost complete. The lengths are recorded below:

Humerus	L	147.0 mm
Ulna	R	134.5 mm
Clavicle	R	(85.0 mm)

No unusual pathological lesions are seen on any of the bones. This statement should be considered in view of the heavy preservative coating all over the skeleton which prevents minute observations.

Age Determination: The deciduous second molars are in occlusion and show some degree of attrition. These teeth erupt at the age of 30 to 32 months suggesting an age at time of death over this range for this individual. The permanent first molars have definitely completed crown calcification, an event that generally occurs around 2.5 to 3.0 years. The degree of root development for these teeth cannot be observed.

The lengths of long bones suggests an age of 4 to 5 years at the time of death. The humeral length in INM 119 is 151.00 mm, whose age based on dental calcification sequence is 3 to 4 years. The ulnar length of INM 85 is 112.7 mm who is also aged at 3 to 4 years on the basis of dental data. The bone lengths of this individual are more than both the Imagaon individuals. The age suggested on this basis is around 4 to 5 years which coincides with the dental age estimate.

Sex Determination: Uncertain.

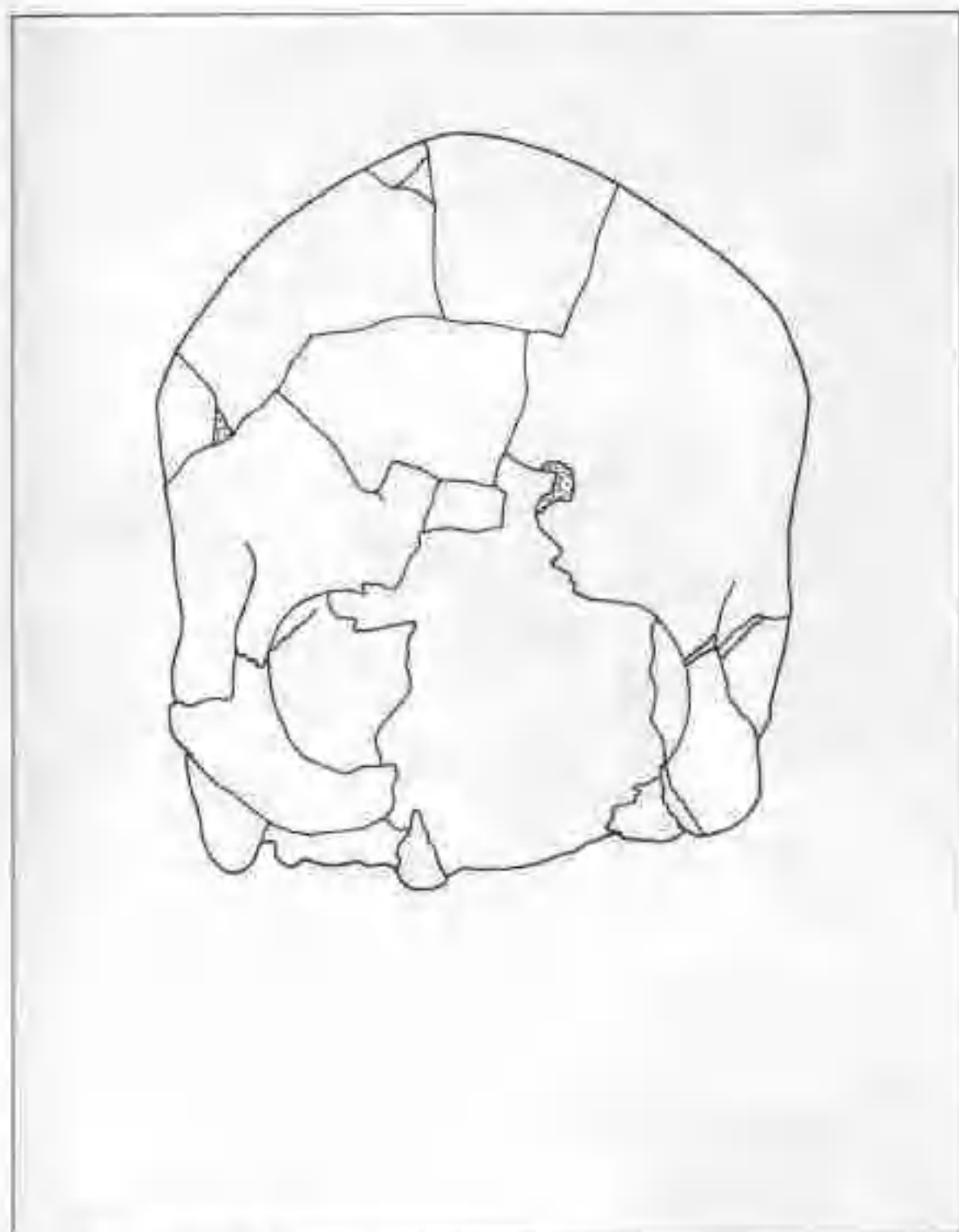


Fig. 126. *Nordia frontalis*, Burial. 1B.



PLATE CLXXII *Neema frontalis*, Burial 18.



PLATE CLXXXIII. Jaw bones, Burial 18.

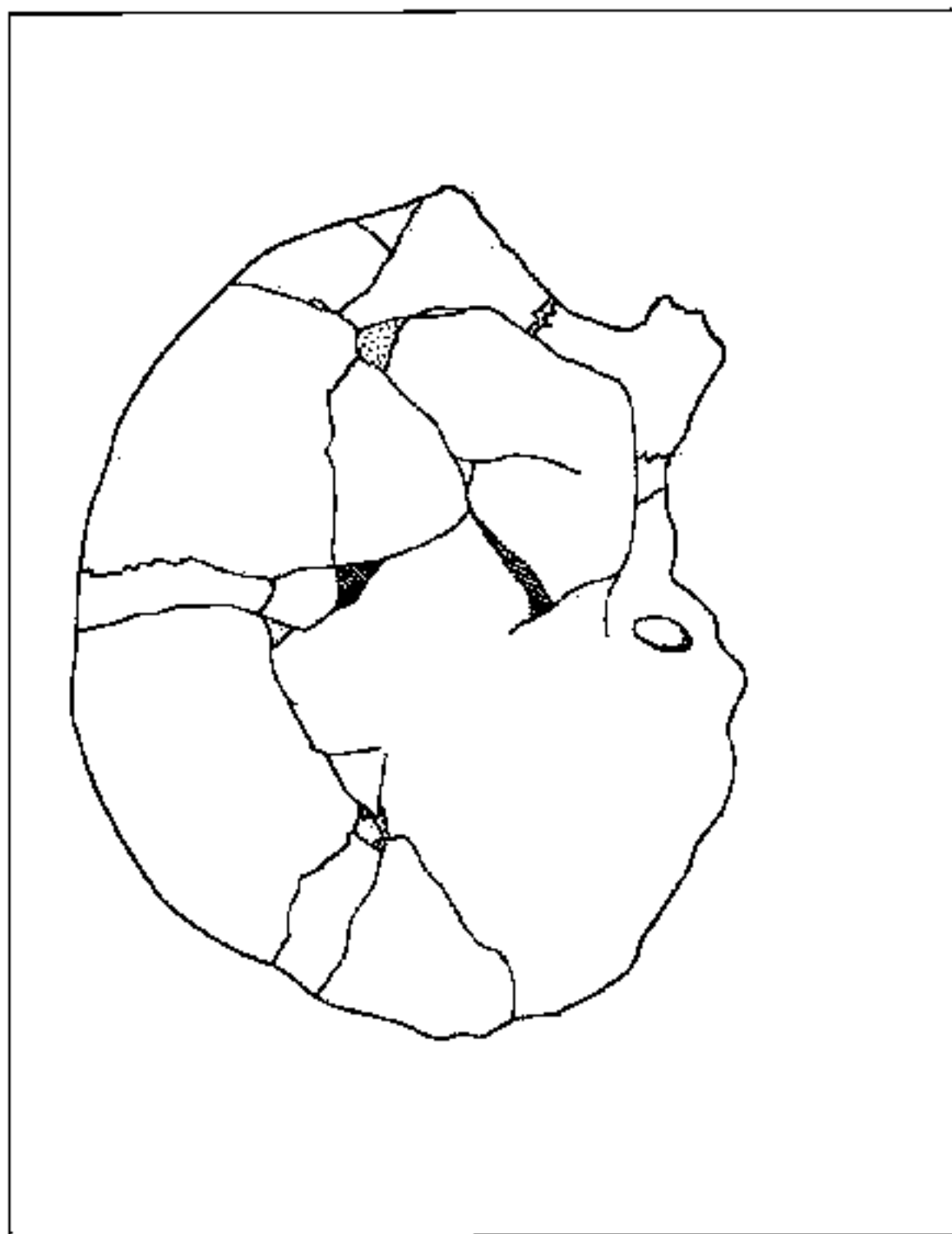


Fig. 127. *Nereis lateralis*, right, dorsal



PLATE CLXXIV - *Norma lateralis*, right, Burial A8.

Burial No. 18

Excavation date: 10.2.76	Age: 25 to 30 years
Cultural phase: Late Harappa	Sex: Male
Sector: I	Cranium: Well preserved
Trench: GZ 61	Mandible: Well preserved
Layer:	Dentition: 31 permanent
Burial type: Extended	Post-cranium: Well preserved

Preservation and Skeletal Inventory: This burial contains skeletal remains of an adult. All the elements are preserved in extremely good condition and detailed morphometric analysis is possible. This is the only adult specimen from this site and it is indeed fortunate that the bone remains are preserved in good condition.

The skull, though fragmentary, almost complete neurocranium could be reconstructed. The bones of the skull base and the facial region are slightly less well preserved and cannot be joined with the reconstructed vault. The general nature of preservation of the cranial parts is described below.

Norma frontalis (fig. 126; pl. CLXXII): Greatest damage has occurred to the bones of the facial region. The nasal bones are broken as well as the frontal, the region of glabella, is damaged. The glabella point can be located with some approximation. The superior and lateral margins of both the orbits are preserved, the right one is more complete than the left one. The right zygomatic process is complete while on the left side the temporal process of zygomatic is broken post-mortem. The cut is fresh but the piece is missing. The left malar is, however, completely preserved. The medial walls of the orbit, maxilla bone in this region, are broken. The internal structure of the orbital opening is more complete for the right orbit; however, for both the orbits the lacrimal and ethmoid are not preserved. The infra-orbital foramen of the right maxilla is present, the area on the left side is broken. The right and left maxilla are well preserved inferiorly and complete alveolar region is undamaged from end to end (pl. CLXXIII). The maxilla preserves a very healthy and superbly preserved dental arcade. The inferior border of the nasal aperture and about 1 cm of the lower lateral border of the right side is preserved. The vomer is partially preserved but the turbinates and the ethmoid are missing. These bones are possibly represented by numerous small sized fragments. The region of the intermaxillary suture is slightly damaged on the right side. The anterior 1/3 of the palate is preserved and the remainder bone is heavily damaged and cannot be articulated. The maxilla retains all the 16 teeth in place and in their proper anatomical position.

The mandible is described separately.

Norma lateralis (right): (fig. 127; pl. CLXXIV). No major damage is apparent in this view. A small piece of parietal bone just above the lambd or squamosal suture is missing. The temporal bone below this suture also exhibit a gap which is mainly because of the post-mortem deformation. The neurocranial bones were fragmentary and even after the reconstruction some of the cracks can be discerned. The zygomatic suture is complete. The sphenoid bone is

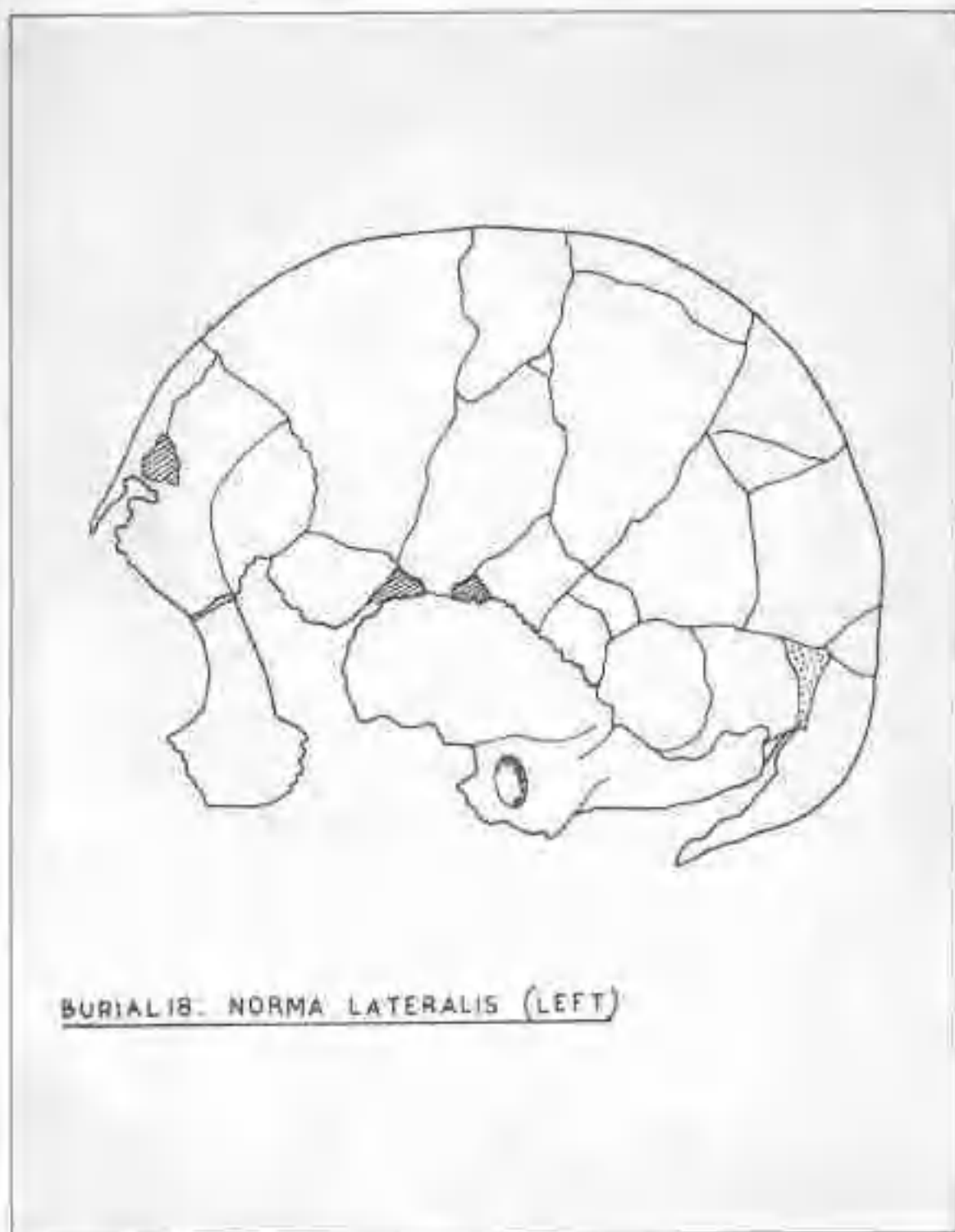


Fig. 128. Norma lateralis, left, Burial 1H.



PLATE CLXX V Norma lateralis, left, Burial 10.

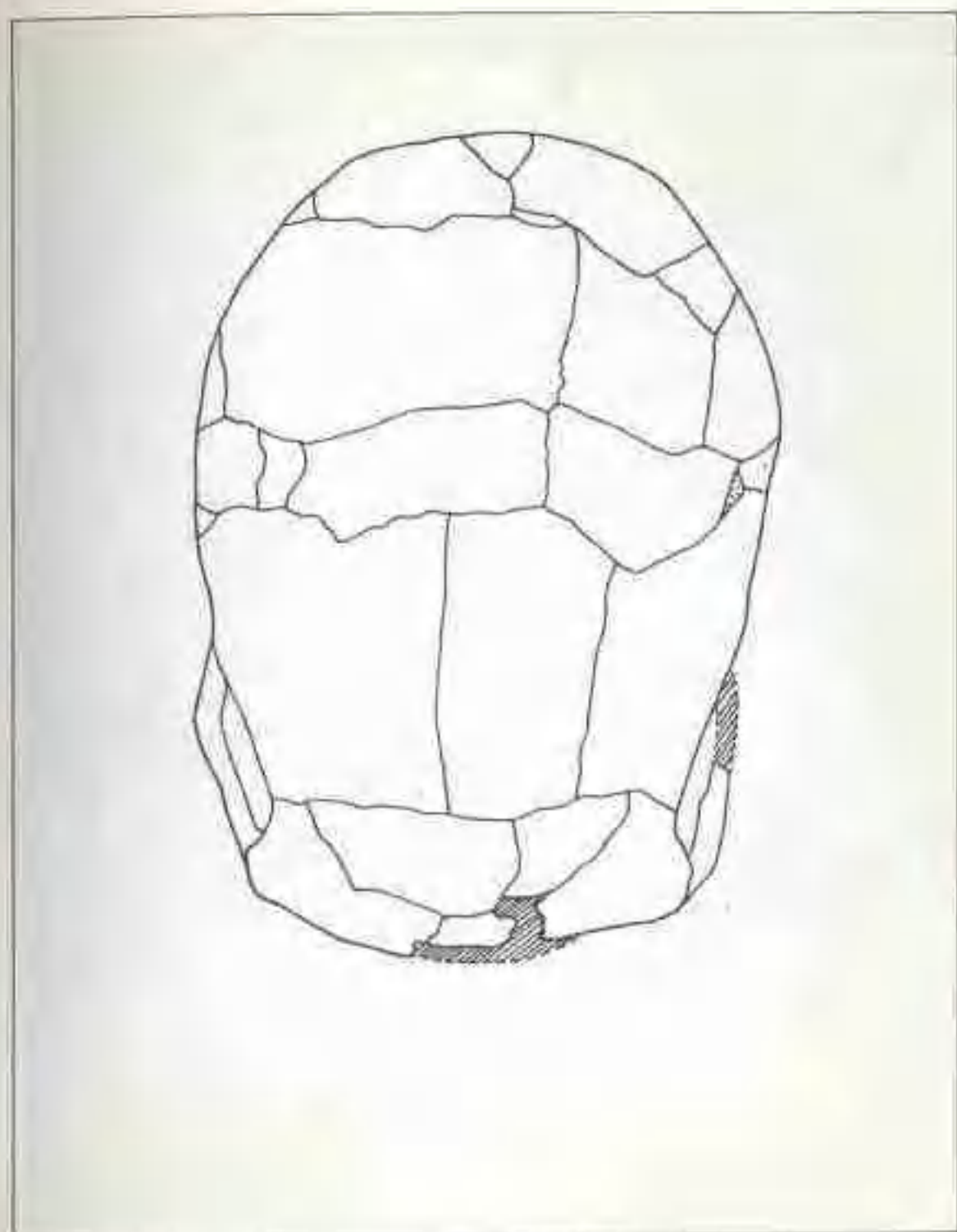
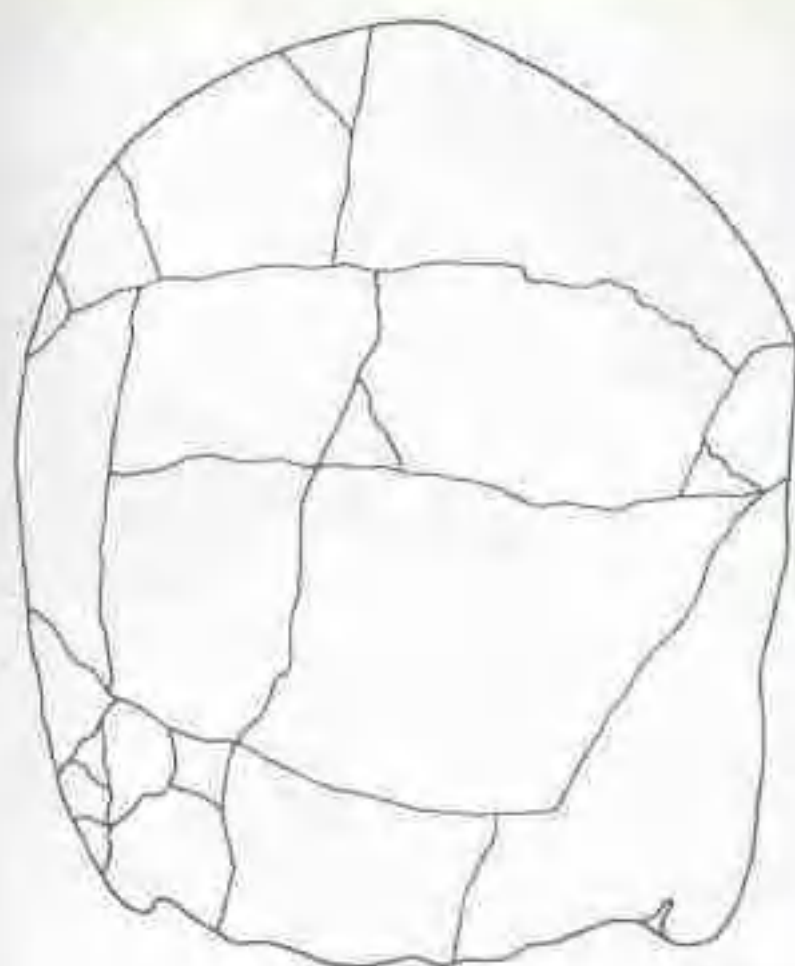


Fig. 129. Norma verticalis, Burial 18.

PLATE CLXXVI. *Nayna verticalis*, Burial 18.



BURIAL 18: NORMA OCCIPITALIS

Fig. 130. Norma occipitalis, Burial 18.

PLATE CLXXVII - *Nosua occipitalis*, Burial 18.



Fig. 131. Mandible, lateral view, Burial 18.

damaged distally and the other obviously damaged region is of the skull base. The nasal region is damaged too but the maxilla is complete and the mandible is also complete except the breakage of the coronoid process. The first molar, RM_1 , is broken post mortem and its roots are visible.

Norma lateralis (left): (fig. 128; pl. CLXXV). More damage has occurred in this view than the right lateral view. Though the temporal preserves almost all the squamosal suture, the area posterior to the mastoid process is damaged. The sphenoid is damaged heavily as is the zygomatic process of the temporal bone. The malar bone is complete but the arch is incomplete. The occipital is broken below the region of inferior nuchal lines and the left occipital condyle is broken.

Norma verticalis: (fig. 129; pl. CLXXVI). The vault is complete in this perspective though numerous longitudinal and vertical cracks are seen across the parietals.

Norma occipitalis: (fig. 130; pl. CLXXVII). The greatest breadth in this region is across the parietal bosses. The lambda region and more or less all the sagittal natural region is covered with matrix. Because of the hardness of this matrix no attempt is made to remove it which otherwise would have further damaged the region. The articulation is nearly perfect and no obvious deformities are evident in this view. Besides the damage to the foramen magnum, the occipital in the region inferior to the nuchal lines is greatly damaged on the left side, and, though fragments from this region are present, they cannot be articulated.

Norma basalis: Greatest damage is to the base of the skull. Both left and right pterygoid plates are broken, the region is more damaged on the left side. The sphenoid is present but too fragmentary and the palatine bones are totally missing. The anterior $4/5$ of the hard palate, maxillary portion is retained. The left zygomatic arch is incomplete. Mastoid process of the right side is well preserved and undamaged whereas the tip of the left mastoid is eroded which gives deceptive small appearance to the process. Both styloids are present but isolated. The region of the foramen magnum is severely damaged on the right and anterior side. The basion (ba) point is only approximately located and the related measurements should be considered with some limitation. The glenoid fossa of the right side is well preserved but this region on the left side is broken.

Mandible: (fig. 131; pl. CLXXIII). The mandible is recovered in three pieces. The first segment is of the complete right half and also the region of the left first incisor. The second half is from the region of LC to the region of LM_3 . These two pieces are joined together. The articulation is complete inferiorly. The LI_2 , its crown and the root is lost post mortem. The ramus is complete horizontally except the left genial region. The third piece is of the left ascending ramus, its superior half, which preserves both condyle and the coronoid processes. The right coronoid is broken. The bone retains $1/4$ teeth in their proper anatomical position. The LI_2 is lost post-mortem and also the RM_1 .

The post-cranial bones are also well preserved for this individual and many bones are complete. Post-mortem damage has occurred to the epiphyseal region of some of the bones and while measuring them utmost care is taken to reconstruct them accurately.

All that remain of the scapulae are the right and left glenoid fossae. The left coronoid

process is preserved partially. Both the right and left clavicles are complete and well preserved except the damage that has occurred to the acromial end of the left clavicle. The right humerus is complete and undamaged. The left humerus is damaged distally but fairly accurate estimate of the maximum length is possible. The right radius and ulna are complete too but their left counterparts are damaged heavily. The skeleton of the left hand is almost completely preserved including the carpal, metacarpal and the phalanges. The right carpal bones are present too, but the metacarpals and phalanges appear to have lost.

The pelvis is heavily crushed. The sacrum is represented by a piece which include the first three sacral vertebra. The left and right iliac blades are partially preserved and none is complete. However the region of the sciatic notch is well preserved for both the sides which facilitates the sex determination. The superior portion of the left ischium is present and the right ischium is nearly complete. The entire symphyseal surface on the left and right pubis are present. The right side long bones are better preserved than the bones of the left side. Right femur, tibia and fibula, all are complete. The left femur is damaged at both the ends. The left tibia and fibula are damaged distally but preserve the proximal ends. Both patellae are present. The right and left tarsal bones are all eroded heavily and damaged, perhaps post-mortem. The metatarsals are however well preserved, 3 of them are from the right side and 4 from the left side. The phalanges are missing altogether except a few, four in all, whose side is not determined.

The skeleton of the thoracic cage is extremely fragmentary especially for the thoracic region. The lumbar vertebrae are fairly well preserved. All the ribs are crushed and none is complete.

The body appears to have been wrapped in grass or with twigs of hemp-like fibrous plant at the time of burial. The traces of them are evident sticking to the skeleton.

Description of Cranial Bones: The skull in general is somewhat robust and the muscular markings are rather prominent.

Norma frontalis: the facial skeleton is missing and the parts preserved are not in articulation. So no statement can be made about the facial length. The supra-orbital ridges are very prominent and the glabellar region is moderately developed. The area is damaged in this region, however. The orbits appear oblong but medially no orbit is complete. Supra orbital notch is present on both the sides. The temporal line is very prominent. The upper orbital edges are rather blunt. The left and right malar bones are robust and both have a foramina nearly at 1 cm from the maxillary zygomatic suture. The anterior nasal spine is sharp. The maxilla exhibit a very prominent incisive foramen on the plate. The plate in general is larger.

Norma lateralis (right): As mentioned earlier the temporal line is prominently marked. The molars are robust and the posterior end of the zygomatic arch extends as a crest for some distance past the external auditory meatus. The mastoid process is large and the area just above it forms a torus like structure. The external occipital protuberance is well developed, this feature is more clearly seen in occipitalis perspective.

Norma lateralis (left): The continuation of the zygomatic process past the external

auditory meatus is more clear in this view. The mastoid is damaged but its robustness is comparable with that of the right mastoid. The parietal eminences are very prominent.

Norma verticalis: The skull is more or less comparable to the pear shape, suggested by Segi.²⁷

Norma occipitalis: No wormian bones are present. Both the nuchal lines, superior and inferior are strongly developed and a small mound like structure appears in this region in mid-sagittal plane.

Norma basalis: Because of the severe damage in this perspective not much can be said about the morphology. The mastoids are large and the glenoid fossa on the right side is rather deep.

Mandible: The mylohyoid groove is very prominent on the right side of the mandible. This region is missing for the left side. Mylohyoid line can also be traced for about 2 cm length. The gonial region is quite flaring and exhibits rugose pterygoid markings. The body is also considerably thick or robust. Single mental foramina are present on either side of the horizontal ramus. Symphysis and the body is rather high. The condyle is very strongly developed. The chin is squarish in shape. The mental eminence is medium.

The detailed craniometric observations are possible on the vault and the mandible. But owing to the damage to the facial and basal region the related measurements cannot be attempted. The measurements are recorded below.

Anthropometric data for Burial 18

Note: 1. Measurements are recorded in millimeters unless otherwise stated.

2. Estimated measurements are bracketed. As far as possible all the measurements are taken precisely. However, in some cases the values have to be estimated, either because the landmarks are not clear or damaged or being covered with matrix. Such readings are given in parenthesis and these values are to be considered with an error of ± 2 mm.

Sl. No.	Measurement	Reading
<i>Length Measurements on Neurocranium</i>		
1.	Maximum cranial length	194
2.	Glabella inion length	190
3.	Nasion inion length	(185)
4.	Glabella lambda length	192
5.	Basi nasal length (length of skull base)	(110)
6.	Length of foramen magnum	(59)
7.	Length of the inner cavity of skull	182

Sl. No.	Measurement	Reading
<i>Breadth Measurements on Neurocranium</i>		
8.	Maximum cranial breadth	133
9.	Minimum frontal breadth	89
10.	Maximum frontal breadth	113
11.	Bi-auricular breadth	108
12.	Greatest occipital breadth	95
13.	Bi-mastoid breadth	89
14.	Minimum breadth of skull	(81)
15.	Breadth of foramen magnum	(25)
<i>Height of Measurements on Neurocranium</i>		
16.	Basion bregma height	(145)
17.	Total height of skull	150
18.	Porion (auriculo) bregmatic height	135
19.	Calvarial height	110
20.	Porion (auriculo) vertex height	138
21.	Lambda calvarial height	(78)
22.	Frontal perpendicular height	25
23.	Parietal perpendicular height	34
24.	Occipital perpendicular height	(26)
<i>Circumference, Arc and Chord Measurements on Neurocranium</i>		
25.	Horizontal circumference of skull	533
26.	Longitudinal (mid-sagittal) arc	381
27.	Frontal arc	133
28.	Parietal arc	137
29.	Occipital arc	111
30.	Frontal chord	127
31.	Parietal chord	130
32.	Occipital chord	(99)
33.	Transverse arc	
<i>Breadth Measurements on Face</i>		
34.	Outer bi-orbital breadth (upper facial breadth)	99
35.	Inner bi-orbital breadth	90

Sl. No.	Measurement	Reading
36.	Biorbital breadth	90
37.	Bizygomatic breadth	121

Breadth of the upper jaw and length as well as height measurements on face are not attempted as the bones are fragmentary and not in articulation.

Measurement on orbit

38.	Orbital height, right	40
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Outer orbital breadth or inter orbital breadth cannot be measured. So also measurements of the nasal region are not possible.

Measurements on Upper Jaw and Palate

39.	Maxillo-alveolar length (palate-maxillary length or length of upper jaw)	53
40.	Maxillo-alveolar breadth (palato-maxillary breadth or breadth of maxilla)	63
41.	Internal palatal breadth	42
42.	External palatal arc	135
43.	Molar teeth row length, left	29
44.	Molar teeth row length, right	30
45.	Premolar teeth row length, left	12
46.	Premolar teeth row length, right	23
47.	(pr-us)	23

Palatal height and internal palatal length are not measured.

Measurements on Lower Jaw

48.	Bicondylar breadth	114
49.	Bigonial breadth	(96)
50.	Bimental breadth (anterior breadth)	52
51.	Length of lower jaw	79
52.	Chin height (symphyseal height)	39
53.	Condylar height (height of ramus)	62
54.	Condylar-symphyseal length	108 (cond-id) 127 (cond-go)
55.	Corpus length, right	93
56.	Molar teeth row length left	35
57.	Molar teeth row length, right	35

SLNo. Measurement	Reading
58. Premolar teeth row length, left	12
59. Premolar teeth row length, right	13
60. Ascending ramus maximum breadth, left	40
61. Ascending ramus minimum breadth, left	32
62. Condyle-coronoid length, left	39
63. Height of Corpus at M2 left	30
64. Height of corpus at M2, right	31
Dental crown measurements are given separately.	

Angles

65. Alveolar profile angle	70°
66. Metopic angle (profile of forehead)	67°
67. Calvarial base angle	(15°)
68. Bregma angle of Schwalbe	53°
69. Lambda angle of Schwalbe	79°
70. Mandibular angle, (gonial angle)	124°
71. Angle of cranial quadrilateral, l-b-a	109°
72. Angles of cranial quadrilateral, b-a-n	76°
73. Angles of cranial quadrilateral, n-b-l	97°
74. Angles of cranial quadrilateral, b-l-ba	78°
75. Chin angle	78°
76. Mento basid angle of mandible	68°
77. Antero basal angle of mandible	79°
78. Basid angle of mandible	11°
79. Postero basal angle of mandible	123°
80. Ramus angle of mandible	71°
81. Condyle coronoid angle of mandible	16°

Total profile angle (facial profile angle), Nasal profile angle, Lambda episthion angle, inclination of foramen magnum and angles of superior facial triangle are not measured.

Cranial Capacity: The skull is exceptionally long and the vault is high. The estimation of cranial capacity on the basis of the Lee's formula cited by Martin²³ give the value of 1609 cc. Pearson's formula, also cited by Martin²³, using the basion bregma height, give the cranial

capacity of 1519 cc. Using the auricular-bregma height and the Pearson formula the value is 1650 cc.

The mean value of cranial capacity thus may be taken as 1586 cc.

According to Sergi's classification cited by Martin^{3,9} the cranial capacity falls under mega-*locephalic*.

Indices: Burial 18

Sr. Index No.	Value	Range	Classification
1. Cranial index	66.56	Hyperdolicho cranial	Garson (1885)
2. Length-basion-bregma height or vertical index	74.74	Orthocranial	Martin-Saller (1957)
3. Breadth-basion-bregma height or transverse vertical index	109.02	Acrocranial	Martin-Saller (1957)
4. Auriculo vertical or length auriculo-bregmatic height index	69.59	Hypsicranial	Martin-Saller (1957)
5. Auriculo-transverse vertical or breadth-auriculo-bregmatic height index	101.50	—	—
6. Length-auriculo vertex height index	71.18	—	—
7. Breadth-auriculo vertex height index	105.76	—	—
8. Calvarial height breadth index	82.71	—	—
9. Houschild's circumference height index	27.20	—	—
10. Sagittal arc index	48.03	—	—
11. Transverse frontal index	78.76	—	—
12. Transverse fronto-breadth index or frontal index	66.91	Metriometopic	Martin-Saller (1957)
13. Sagittal frontal index	95.48	Chamaemetopic or flat	Martin-Saller (1957)
14. Sagittal parietal index	94.89	—	—
15. Sagittal occipital index	89.19	—	—
16. Foramen magnum index	64.10	Narrow	Martin-Saller (1957)
17. Skull modulus	157.33	—	—
18. Jugo-mandibular index	79.34	—	—
19. Zygofrontal index	73.55	—	—

20. Inter-orbital index	90.91	—	—
21. Maxillo-alveolar index	118.97	Brachyuranic	Turner
22. Mandibular index	69.30	Dolichostenomandibular	Lindgard-on-Sonesson
23. Transverse cranio-facial index	90.98	—	—

Note : Range-variation values are quoted after Singh Bhasin²¹.

Description of Dental Elements: The dentition of this individual is extremely well preserved. All the elements except the LI_2 and RM_1 are present and are in their respective anatomical positions. The morphological features are not easily distinguishable because of the attrition but the pathological observations are possible.

Because of attrition shovelling is not observable. However, both central and lateral incisors exhibit single medium lingual ridge (grade 1). The central incisors are in the straight alignment which can be classified as grade 3, or Dahlberg's C type. Marginal interruption grooves are absent. The canines are heavily worn out and reading of canine distal accessory ridge is not possible. All the maxillary molars from both the sides exhibit grade 4 of hypocone. Carabelli's trait is absent on these molars, no vertical ridges, pits, or any other manifestations are exhibited on mesiolingual cusp. Metacone, protocone or paramolar cusp is not observed on any of the molars.

The lower molars also do not exhibit any unusual features. The cusp number on LM_1 is five with possibly Y groove pattern. The occlusal surface is heavily worn out and the given reading is only a judgement. The R/LM_2 and R/LM_3 , however, have + 4 pattern. C-6, C-7, Protostylid, deflecting wrinkle or paramolar cusp is not seen on the mandibular molars.

In general, anatomically the dentition is rather dull and do not exhibit any anomalous traits.

Dental pathology: The pathology of the dentition is quite interesting.

Some degree of attrition is seen on all the teeth. Dentine patch is exposed on the incisors, which is of minimal nature, grade 4, on maxillary incisors and grade 3 on mandibular incisors where the dentine patch is very small. The attrition of upper and lower canines result in obliteration of cusp pattern and a small patch of dentine is exposed on RC . Both the upper first premolars and lower left first premolar, RPm_2 , LPm_2 and LPm_3 , have cusp pattern partially obliterated and the upper premolars exhibit small patches of dentine exposed. The first molars are heavily worn and dentine is exposed all over their occlusal surface. This may be attributable to category 5. The wear on $M2$'s is slightly less and the $M3$'s are least affected. Other interesting feature is that the attrition is heavy for the teeth on the right side, even the third

molars RM_3 and RM_2 also show moderate degree of attrition. On the other hand the left second and third molars, LM_2 , LM_3 and LM_2 , LM_3 show considerable less degree of attrition. This certainly reflects the mastication pattern of this individual.

Discrete cups of depression in the dentine are distinct on RM_1 , LM_1 and LM_2 . The deep pits on the upper molars are in the central part of the occlusal surface. These pits penetrate into dentine. This feature is definitely not attributable to wear but probably represent different stages of caries formation.

The circular pit on the mesio-lingual surface is not very deep. It is certainly an example of gross enamel hypoplasia. Such type of hypoplasia are generally because of the interruptions in the crown classification sequence. The exact cause remains to be known but possibly the nutritional deficiencies or disease associated with high fever are responsible. It may be noted in this regard that a small patch of hypoplasia, a linear one, is observed on both the central maxillary incisors. The possibility of congenital causative factors for such lesions cannot be ruled out.

The only other pathology evident in this specimen is the presence of tartar accumulations and calculus deposits on the cervical margin of many teeth. The RM_1 has the heaviest deposit, all other teeth are affected in different degrees.

The following table gives the dental crown dimensions for Burial 18.

Table 31 Dental Crown Dimensions and Indices: Burial 18

		Crown MD	Diameters BL	Crown CA	Indices CI	CM
<i>Maxilla</i>						
I^1	R	9.0	8.5	76.50	94.44	8.75
	L	9.2	8.6	79.12	95.48	8.90
I^2	R	7.9	8.0	63.20	101.27	7.95
	L	7.6	8.0	60.80	105.26	7.80
C	R	8.4	8.2	68.88	97.62	8.30
	L	8.2	8.5	69.70	103.66	8.35
Pm^3	R	7.6	9.5	72.20	125.00	8.55
	L	7.6	9.5	72.20	125.00	8.55
Pm^4	R	6.8	10.1	68.68	148.53	8.45
	L	6.9	10.2	70.38	147.83	8.55
M^1	R	11.4	11.8	134.52	105.51	11.00
	L	11.6	11.8	136.88	101.72	11.70
M^2	R	10.8	11.6	126.28	107.41	11.20
	L	11.1	11.7	129.87	105.41	11.40
M^3	R	9.9	11.0	108.90	111.11	10.45
	L	9.8	10.8	105.84	110.20	10.30

Mandible

I ₁	R	6.2	7.2	44.64	116.13	6.70
	L	6.3	7.1	44.73	112.70	6.70
I ₂	R	6.1	7.0	42.70	114.75	6.53
C	R	7.3	8.3	62.05	116.44	7.90
	L	7.5	8.6	64.50	114.67	8.05
Pm ₃	R	7.0	8.2	57.40	117.14	7.60
	L	7.1	8.2	58.22	113.49	7.65
Pm ₄	R	7.1	8.6	61.06	121.13	7.85
	L	7.2	8.7	62.64	120.83	7.95
M ₁	L	11.6	10.8	125.28	93.10	11.20
M ₂	R	11.3	10.0	113.00	88.50	10.65
	L	11.2	10.1	115.14	90.18	10.65
M ₃	R	11.3	10.4	117.52	92.04	10.85
	L	11.1	10.2	113.22	91.89	10.65
I.		7.6	9.5	72.20	125.00	8.55

Description of Post-cranial Bones: The coracoid process of the left scapula is fused and the glenoid cavity is complete. The partially preserved segment of the vertebral border exhibits rather a convex appearance and the scapular notch is medium. Both the clavicular epiphyses are fused indicating an adult status of this individual. All the long bones have fused epiphyses and in general give a robust appearance. The left humerus is damaged distally but the right one is complete. The distal end of right humerus has a medium sized septal aperture²². The deltoid tubercles are strongly marked and the supra-lateral condylar crests are well developed. Greater and lesser tubercles are well developed and the intertubercular groove is rather deep. The overall impression of these bones suggest a stouter and the sturdier person. The radial tuberosity on the right side bone is large and the distal end is robust. The right ulna is stout and the interosseous crest is well developed. The nutrient foramen is of medium size.

The innominate bones are rather damaged and only limited observations can be made. The symphyseal surfaces of pubic bones are preserved which exhibit smaller sub-pubic angle. Sub-pubic concavity is possibly absent. There is no ventral arc. The sciatic notch is narrow which denotes male of this individual. The sacro-iliac articulation is rather flat and the pre-auricular sulcus is absent. In general the preserved parts of the innominates give a robust appearance. The acetabulum is also very large. For the right femur both the lesser and greater trochanters are rugose and the inter trochanteric line is prominent. The linea aspera is very broad, the gluteal and spiral line very prominent. The femur as well as the tibia are very stron-

gly built. The popliteal line is well marked. The left tibia is damaged distally but the right one has well developed squatting facet. Fibular head has strong muscular markings.

The vertebrae, especially in the lumbar region are very strong. The sacrum is represented by the first three sacral vertebrae so no comment on the sacral curvature be made. The vertebrae preserved do not show any lesion of arthritic lipping.

The long bones and well preserved post-cranial elements are subjected to various metric observations. The measurements and the indices calculated are recorded below. The estimates are given in parenthesis. Unless otherwise stated the measurements are in millimeters.

Metric data on post-cranial bones: Burial 18

Vertebrae

	Vertebral No.	Vertical Ventral	Vertical Dorsal	Cranial transverse	Caudal transverse	Cranial sagittal	Caudal sagittal	Sagittal dia. of foramen	Trans. dia. of foramen
Region									
Cervical	5	13	13	22	21	15	15	14	22
	6	13	14	25	24	15	15	16	23
	7	15	16	27	28	15	15	16	24
Thoracic	1	18	18	27	28	15	15	20	20
	2	18	19	27	28	16	17	19	20
	10	23	26	30	33	30	31	18	20
	11	24	26	31	35	30	32	19	20
Lumbar	12	27	28	33	36	30	33	20	21
	1	27	28	35	38	31	31	22	23
	2	26	28	36	39	31	32	21	22
	3	25	28	39	45	35	31	20	22
	4	26	27	41	48	32	32	20	23
	5	28	25	46	49	33	32	22	21
Sacrum	Lumber index: 103.03								
	Maximum anterior breadth					91.0 mm			
	Maximum anterior height					(105.0 mm)			
	Sacral index					86.67			

No measurements are attempted on sternum or ribs.

Clavicle

Maximum length	R	162.0
	L	(162.0)
Mid-shaft diameter, antero-posterior	R	10.5
	L	10.4
Mid-shaft diameter, superior-inferior	R	12.2
	L	12.4
Mid-shaft circumference	R	40.0
	L	41.0
Minimum shaft circumference	R	13.0
	L	13.0
Sternal head diameter	R	26.0
	L	26.0
Acromial head diameter	R	24.5
	L	(24.0)
Conoid tubercle diameter	R	20.0
	L	19.0
Internal angle of curvature	R	157°
	L	155°
External angle of curvature	R	150°
	L	150°
Robustness index (length-mid-shaft)	R	24.69
	L	23.91
Clavicular-humereral index	R	47.98
	L	(48.80)

Scapula

Supra-spinous fossa length	R	50.0
	L	50.0
Coracoid process length	L	(48.0)
Coracoid process breadth	L	(17.0)
Glenoid fossa height	R	37.0
	L	36.5
Glenoid fossa breadth	R	30.0
	L	30.0
Glenoid fossa index	R	81.08
	L	82.19

Humerus

Maximum length,	R	338.0
	L	332.5
Bicondylar length, physiological length	R	336.0
	L	330.0
Head diameter, antero-posterior	R	40.0
	L	40.0
Head diameter, superior-inferior	R	43.0
	L	43.0
Bicondylar diameter	R	63.0
	L	(62.0)
Mid-shaft diameter, antero-posterior	R	24.0
	L	24.0
Mid-shaft diameter, lateral	R	22.0
	L	22.0
Minimum shaft circumference	R	60.0
	L	58.0
Condyle-diaphyseal angle	R	87°
Robusticity index	R	17.75
	L	17.47
Radio-humeral index	R	76.33
Ulnar-humeral index	R	78.99
Humero-femoral index	R	71.61

Radius

Maximum length	R	251.0
Axial length, physiological length	R	243.0
Head diameter, antero-posterior	R	24.0
Head diameter, lateral	R	23.0
Mid-shaft diameter, anterior-posterior	R	15.0
	L	12.5
Mid shaft diameter, lateral	R	15.5
	L	15.5
Minimum shaft circumference	R	39.0
Robusticity index	R	15.54

Ulna

Maximum length	R	267.0
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Axial length, physiological length	R	260.0
Olecranon diameter, anterior-posterior	R	23.0
Olecranon diameter, lateral	R	24.0
Mid-shaft diameter, anterior-posterior	R	14.0
Mid-shaft diameter, lateral	R	13.0
Minimum shaft circumference	R	38.0
Breadth of lower extremity	R	18.0
Olecranon height	R	24.0
Robusticity index	R	14.23

Carpal: Navicular

Length	R	(23.0)
	L	23.5
Breadth	R	16.0
	L	16.0
Breadth-length index	R	69.57
	L	68.09

Triangular

Length	R	(15.0)
	L	15.0
Breadth	L	13.5
	L	90.00

Hamate

Length	R	25.0
	L	24.5
Breadth	R	(15.5)
	L	16.0
Breadth-length index	R	(62.00)
	L	65.31

Lunate

Length	R	22.0
	L	22.5
Breadth	R	(16.0)
	L	16.0

Breadth-length index	R	(72.72)
	L	71.11

Hamate

Length	R	(23.0)
	L	(23.0)
Breadth	R	(16.0)
	L	(16.0)
Breadth-length index	R	(69.57)
	L	(69.57)

Pisiform, greater multangular (trapezium) and lesser multangular (trapezoid) are damaged and not measurable for either side.

Metacarpal

Metacarpal 1, maximum length	L	42.0
Metacarpal 2, maximum length	L	70.0
Metacarpal 3, maximum length	L	69.0
Metacarpal 4, maximum length	L	65.0
Metacarpal 5, maximum length	L	34.0

Measurements on phalanges are not attempted.

Innominate

Symphysal height		24.0
Sciatic notch breadth	R	40.0
	L	39.0

Femur

Maximum length	R	472.0
Bicondylar (oblique, physiological) length	R	460.0
Maximum trochanteric length	R	452.0
Physiological (oblique) trochanteric length	R	445.0
Head diameter, antero-posterior	R	45.0
Head diameter, superior-inferior	R	49.0
Bicondylar diameter	R	60.0
Sub-trochanteric diameter, antero-posterior	R	28.0
	L	29.0

Sub-trochanteric diameter, lateral	R	30.0
	L	30.0
Mid-shaft diameter, antero-posterior	R	27.0
	L	29.0
Mid-shaft diameter, lateral	R	25.0
	L	25.0
Mid-shaft circumference	R	80.0
	L	81.0
Platymetric index	R	93.33 Eurymeric
	L	96.66 Eurymeric
Pilastric index	R	108.00
	L	116.00
Robusticity Index	R	11.30

Tibia

Lateral condylo-Malleolar length	R	390.0
Medial condylo-Malleolar length	R	385.0
Spino-Malleolar length	R	392.0
Nutrient foramen diameter, antero-posterior	R	29.0
Nutrient foramen diameter, lateral	R	21.0
Mid-shaft diameter, antero-posterior	R	25.0
Mid-shaft diameter, lateral	R	19.0
Tuberal diameter, antero-posterior	R	45.0
Tuberal diameter, lateral	R	40.0
Minimum shaft circumference	R	70.0
Platycnemic index	R	72.41
		Eurycnemic
Robusticity index	R	17.95
Tibio-femoral Index	R	82.63

Fibula

Maximum length	R	381.0
Mid-shaft diameter, antero-posterior	R	16.0
Mid-shaft diameter, lateral	R	14.0
Minimum shaft circumference	R	38.0
Robusticity index	R	9.97

Patella

Height	R	40.0
	L	40.0
Breadth	R	(39.0)
	L	39.0
Thickness	R	19.0
	L	20.0
Height breadth index	R	97.50
	L	97.50

Tarsal: Talus

Height	R	40.0
Breadth	L	39.0

Calcaneus

Height	R	70.0
Breadth, Maximum	R	(40.0)

Cuboid

Length	R	35.0
Breadth	R	25.0

No other tarsal bone is measurable

Metatarsal

Metatarsal 1, maximum length	R	65.0
	L	66.0
Metatarsal 2, maximum length	R	71.0
	L	(70.0)
Metatarsal 3, maximum length	R	65.0
	L	65.0
Metatarsal 4, maximum length	L	(63.0)

No measurements are attempted on phalanges,

Stature Estimation

Trotter-Glesser²¹ Formula for stature estimation of White males is used for this individual.

Bones considered	Stature	Standard error
Femur (R) + Tibia (R)	174.18 ± 2.99	
Femur (R)	173.75 ± 3.27	
Fibula (R)	173.89 ± 3.29	
Tibia (R)	176.90 ± 3.37	
Humerus (R)	174.55 ± 4.03	
Humerus (L)	172.71 ± 4.05	
Radius (R)	173.89 ± 4.32	
Radius (L)	173.89 ± 4.32	
Ulna (R)	172.84 ± 4.32	
Average stature	174.09 cm	

Calculations based on Athiawale's²⁴ formula give the following results.

Bones considered	Stature	Standard error
Radius (R) + Ulna (R)	162.72 ± 3.62	
Radius (L)	162.91 ± 3.66	
Ulna (L)	162.28 ± 3.28	
Average Stature	162.64 cm	

Age Determination: This individual is definitely a full grown adult. Epiphyseal unions are complete for all the long bones indicating an age of more than 22 to 24 years. Epiphysis of the iliac crest is completely fused. The pubic symphysis gives development stage 5 or 6 as defined by Todd as cited by Stewart,²⁵ giving an age of 27 to 35 years. Approximate scoring of pubic metamorphosis on the basis of McKern-Stewart scale²⁶ is 12 to 13, suggesting an age of around 28 years.

The cranial suture closure observations should be considered with some limitations. The heavy preservative coating precludes the detailed ectocranial reading. The sagittal suture is almost completely obliterated ectocranially. The lambdoid suture appears to have completely closed or on the verge of completion. This generally occurs at the age of 30 years for White males.²⁷

Molar wear pattern suggests an age range of 25 to 35 years when compared with the

Brothwell's chart.²⁴ There is no ante-mortem tooth loss.

The best estimate be around 25 to 35 years at time of death, lower age is more possible.

Sex Determination: Sex of this individual is definitely male. The skeleton in general is very robustly built and the muscular markings are very prominent on all the bones. The pelvis and the skull exhibits many characteristic male features that are described above. Moreover the sciatic notch undoubtedly suggest maleness.

Burial No. 37

Excavation date: 20.1.1979	Age: 1.5 years
Cultural phase: Jorwe	Sex: Uncertain
Sector: II	Cranium: Fragmentary (incomplete)
Trench: BZ'4	Mandible: Fragmentary (incomplete)
Layer: I	Dentition: 2 deciduous, 1 permanent
Burial type: Twin-den	Post-cranium: Fragmentary (incomplete)

Preservation and Skeletal Inventory: Skeletal elements preserved in this burial include fragmentary cranial, mandibular and post-cranial elements of an infant. A few dental elements are also associated with this burial.

From the cranial bones right and left frontals are well preserved, the left orbital wall is better preserved than the right. The two fragments do not articulate along the metopic suture as the edges of these fragments are slightly weathered. Left greater wing of sphenoid and left temporal are also present but do not articulate accurately. The tympanic ring and the petrous portions are present from both the sides. A large piece of the left parietal has been reconstructed. Large and medium sized pieces of right parietal and occipital are also present. Occipital condylar parts, right and left, are present. The facial bones are badly damaged and the fragments present include maxillae, left zygomatic and other small sized fragments that could not be identified with certainty.

The left half of the mandible is well preserved, however, the right counterpart is totally missing. The preserved portion include the left corpus from symphysis thru the gonial region, the ascending ramus is missing. The LM₁ is seen in the crypt as the portion above the dental germ is slightly eroded. The Ldm₂ is also preserved in the crypt. The only tooth recovered isolated is the damaged crown of Ldm₁.

The post cranial skeleton is rather well preserved but all the bones are damaged post-mortem and many metaphyses are broken.

No bone of the pectoral girdle is present. The upper extremities are represented by left humeral shaft of the proximal region, the posterior border is heavily damaged; proximal

end with 2/3 of the diaphysis of right ulna; mid-shaft segment of left ulna, and fragments of both right and left radius.

The pelvis is represented only by a fragment of right ilium with the sciatic notch. No other bone of the pelvic region appear to be preserved. Right femur has both the metaphyses broken post-mortem, but the shaft is fairly well preserved. The left femoral shaft is present too, less well preserved than the right femur and has distal end undamaged. Mid-shaft segment of left tibia is present but the right side bone is missing. The two other fragments preserved are fibular shafts, but the side identification is not possible.

No long bone preserved with this burial is measurable.

Description of Dental Elements: The dental elements preserved in the mandibular crypt were heavily coated with matrix which was cleaned in the laboratory and the teeth were extracted for morphometric observations.

The Ldm_1 is four cusped with X groove pattern. The Dryopithecus cusp and groove pattern, Y-5, is observed on Ldm_2 as well as on the permanent LM_1 . The permanent tooth is incompletely calcified for crown development, the deciduous teeth have completely calcified crowns, more than half of the root development is observed for Ldm_1 , the Ldm_2 exhibits rather 1/3 root development.

The LM_1 is incompletely calcified, so not measured. The Ldm_1 is slightly damaged on the labial side and the measurement given below is an estimate.

Table 32

Dental Crown Dimensions and Indices: Burial 37

		Crown Diameter		Crown Indices	
		MD	BL	CA	CI
<i>Mandible</i>					CM
dm_1	L	7.7	(7.1)	54.7	92.2
dm_2	L	10.5	9.1	95.6	86.7

Age Determination: The maxillary molar though incompletely calcified appears to be in the final phases of crown calcification, an event that usually occurs between 2.5 to 3 years of age. The deciduous teeth are completely calcified for crown. The dm_1 is found isolated but must have been erupted at the time of death as exhibited by the crypt.

On the basis of these data an approximate age at time of death for this individual be around 1 year 6 months to 1 year 8 months.

Sex Determination:

Uncertain

Burial No. 38

Excavation date: 20.1.1979	Age: Less than 6 months
Cultural phase: Jorwe	Sex: Uncertain
Sector: II	Cranium: Fragmentary (incomplete)
Trench: BZ's	Mandible: Missing
Layer: I	Dentition: Missing
Burial type: Twin-urn	Post-Cranium: A few fragments

Preservation and Skeletal Inventory: This burial contains moderately well preserved cranial elements, but the post-cranial bones are extremely fragmentary and under represented and the gnathic and dental elements are totally missing.

The cranium is variably preserved, some bones of the neurocranial vault are in much better state of preservation while the other are fragmented and cannot be articulated. The facial skeleton is missing, except a very small piece from the left maxilla which retains the alveolar crypt for *Rhny* (?). The occipital has parts of all its components preserved. The basi-occipital, right and left condylar pieces and are rather complete. The left and right petrosal portions are present, the left one is better preserved than the right one. A small piece of frontal is present which includes the superior margin of the right orbit. Parts of the left and right parietals are present too but their exact location is difficult to assess. Numerous other small sized pieces of the neurocranium are present but none is identifiable with certainty.

Both upper and lower jaws are missing, except for the maxillary fragment mentioned above. Dentition is missing as well.

Post-cranials are in extremely fragmentary state of preservation and many parts are highly weathered. Identifiable pieces include left (?) femur mid-shaft, diaphyseal segment of left tibia which preserves the proximal end, and left humerus for which both the metaphyses are damaged.

Numerous rib and vertebral fragments are also preserved.

No one preserved exhibit any abnormal pathological lesions, and no additional information can be obtained from the preserved elements.

Age Determination: In this burial no dental elements are preserved and no long bone is completely preserved either. So any statement on age determination should be regarded as tentative.

The size of the long bone suggests small age of this individual. The average length of humerus for Inamgaon skeletal series is 73.03 mm for the age group 0 to 6 months and in this individual a very rough estimate of humeral length is 75.00 mm. Since this is the only clue available for age determination in this individual, an age of less than 6 months at time of death is suggested.

Sex Determination: Uncertain.

Burial No. 39.

Excavation date : 20.1.1979	Age: Less than 6 months
Cultural phase : Jorwe	Sex : Uncertain
Sector : II	Cranium: Fragmentary (incomplete)
Trench : BZ'4	Mandible: Missing
Layer : I	Dentition: Missing
Burial type: Twin-urn	Post-cranium: Fragmentary (incomplete)

Preservation and Skeletal Inventory: This burial preserves extremely fragmentary neurocranial pieces, rib and vertebral fragments. No gnathic, dental elements are preserved, neither long bones!

Several large and medium sized pieces of cranial bones are present. However, deterioration of cortical bone makes specific diagnosis impossible. Identifiable cranial bones include a portion of frontal with the left superior orbital margin, right petrous portion of the temporal, damaged right petrosal, fragments of the parietal (?) bones, basi-occipital and left malar bone. No jaw bones are preserved, neither the dentition.

Post-cranium is also equally fragmentary and in addition very few parts are represented. Surprisingly no long bones are associated with this burial. Besides the numerous rib fragments, neural arches, vertebral centra and metabones, right scapula is present which is almost complete with the glenoid and the acromion region but the entire vertebral border for this bone is missing.

Age Determination: In the absence of dental elements and long bones no positive statement can be made for the age at death. The size of the cranial bones of this individual and the overall appearance is comparable with the burial 38 which is aged below 6 months. Consequently 0 to 6 months seem to be the most appropriate age at death for this individual.

Sex Determination: Uncertain.

BURIAL NO. 42

Excavation date : 23.1.1979	Age: Around 6 months
Cultural phase: Jorwe	Sex: Uncertain
Sector: II	Cranium : Missing
Trench: BZ'3/BZ'4	Mandible : Missing
Layer: I	Dentition : Missing
Burial type: Twin-urn	Post-cranium: Fragmentary (incomplete)

Preservation and Skeletal Inventory: This individual is represented only by 3 long bone fragments. No cranial or dental elements are preserved.

The long bones preserved are one diaphyseal segment of humerus, side of which is unidentifiable and two femoral fragments. The right femur is almost complete though it is slightly damaged at the distal metaphysis. The other femoral fragment is from the left side, whose both ends are damaged heavily. No other human skeletal element is associated with this burial.

Description of Post-cranial Bones: Fortunately one long bone is complete and measurable in this burial, the right femur which measures 105.5 mm in diaphyseal length. No unusual pathological lesions are seen on any of these bones.

Age Determination: The femur of INM-122 is 109.5 mm whose age, on the basis of dental crown calcification, is 4.5 to 5 months. Mean and range values for the Arikara Indians of 0 to 6 months age group are 82.2 mm and , 62.5 mm to 106.0 mm, respectively, for femoral length²². For this individual the femoral length is 105.5 mm, so an estimate of age at time of death be around 5 to 6 months.

Sex Determination: Uncertain.

BURIAL NO. 45

Excavation date: 23.1.1979	Age: 5 to 6 years
Cultural phase: Jorwe	Sex: Uncertain
Section: I	Cranium: Extremely fragmentary
Trench: BZ'2	Mandible: Missing
Layer: 1	Dentition: Missing
Burial type: Twin-urn	Post-cranium: Fragmentary (incomplete)

Preservation and Skeletal Inventory: This burial contains extremely fragmentary and weathered cranial elements and fairly well preserved post-cranials of a child.

The cranial bones are primarily from the neurocranial vault. The petrous portions of both right and left side are preserved. The cranial fragments are heavily weathered and cannot be joined together or identified to element.

No mandibular or dental elements are preserved in this burial.

The post-cranial bones are moderately well preserved and some bones are complete. The distal half of right humerus and almost complete right radius are the identifiable bones from the upper extremities. Proximal end of the right radius is slightly damaged post-mortem but the bone is very much measurable. The pelvic girdle is represented by complete left ilium and a portion of sciatic notch from the right ilium. Proximal 1/3 of diaphysis of the right femur and mid-shaft segments of tibiae are present but side identification is possible for none of them. Numerous rib and vertebral fragments and phalanges are present as well.

Description of Post-cranial Bones: The diaphyseal segment of the right femur exhibits porous bone apposition but the portion is heavily weathered; still possibility of sub-periosteal hemorrhage cannot be ruled out.

The diaphyseal length of right radius is 121.0 mm.

Age Determination: Radial length in INM 198 is 123.0 mm whose age estimate at time of death is 5 to 6 years. The radius of this individual is having comparable diaphyseal length, so the same age group is suggested.

The iliac crest is unfused suggesting the pre-adolescent status of the individual.

Numerous phalanges are preserved in this burial which have the unfused proximal epiphyses. This lack of fusion suggests an age at death of around 5 to 6 years.

Sex Determination: Uncertain.

Burial No. 44

Excavation date: 16.1.1979	Age: 2 to 3 years
Cultural phase: Malwa/Jorwe (overlap)	Sex: Uncertain
Sector: II	Cranium: Extremely fragmentary
Trench: AZ'S	Mandible: Missing
Layer: 3	Dentition: Missing
Burial type: Twin-urn	Post-cranium: Extremely fragmentary

Preservation and Skeletal Inventory: This burial contains extremely fragmentary and weathered cranial and post-cranial elements of a child. No dental or jaw elements are associated with this burial.

The cranial fragments are all from the neurocranial vault; in all seven fragments are present, all small sized and weathered; none preserve any distinguishing anatomical feature. As a result all of them are unidentifiable, except complete left petrosal and a portion of right petrosal.

The post-cranials are also weathered and so damaged to a great extent during the excavation process. Three diaphyseal segments are present, one is proximal half of left ulna, second one is the proximal 2/3 of right (?) tibia and the third is unidentifiable, probably from fibula. Left iliac bone is present exhibiting portion of the sciatic notch.

Only one partially calcified molar M_7 is present. Apart from the partially calcification the crown is damaged distally and labially. The exact position of this tooth cannot be ascertained because of its partial preservation, neither its morphology clear clear nor it is measurable.

Age Determination: The age assessment of this individual should be flexible since no long bone is complete and dentition is not well represented.

The molar tooth that is associated with other bones preserved in this burial cannot be identified precisely. Definitely it is a permanent molar and the crown is incompletely calcified. The degree of calcification that is achieved and the relative size of long bones of this individual suggests it is first molar. This First molar teeth complete crown calcification around 2.5 to 3 years. The calcification stage and the long bone indicate age of around 2 years at time of death for this individual. The tooth suggests lower age, of 2 years, and the long bone size

indicate higher age, around 3 years. So very flexibly age group to which this individual is assigned is of 2 to 3 years at time of death.

Sex Determination: Uncertain.

Burial No. 45

Excavation date: 24.1.1979	Age: Less than 5 months
Cultural phase: Malwa and Jorwe (overlap)	Sex: Uncertain
Sector: II	Cranium: A few fragments
Trench: AZ'3	Mandible: Missing
Layer: 4	Dentition: Missing
Burial type: Twin-urn	Post-cranium: Fragmentary (incomplete)

Preservation and Skeletal Inventory: This individual is predominantly represented by post-cranial long bones, only a few cranial bones are preserved in this burial. No dentition is found to be associated with this burial.

Cranial elements are very few and those present are very heavily weathered and the size of the fragment is too small making individual identification almost impossible. Only fragments that are identified with certainty are the right frontal which preserves the superior and lateral orbital wall, left and right petrosal, basi-occipital elements and left parietal. No maxillary or mandibular fragments or dentition is preserved.

Post-cranial bones are well represented but the state of preservation is very poor. All the bones are heavily weathered, some show horizontal striations which could be a rodent activity. Besides the numerous rib and vertebral fragments, neural arches and phalanges, other preservation include the following. No element from the pectoral girdle appears to be present. The left humerus is complete. Both, proximal and distal ends are preserved for the right humerus but the middle segment is missing. The cuts are fresh. Proximal half of the right ulna is the only other element present from the upper extremity. The pelvic girdle is represented by right and left iliac blades, right one is complete. Both, right and left, femora are completely preserved. Proximal 2/3 of right tibia and proximal half of left tibia are present. The left fibula is complete and for the right fibula only mid-shaft is present and the ends are broken post-mortem.

Description of Post-cranial Bones: Many long bones are complete for this individual which are measured for maximum diaphyseal length. The data are given below:

Femur	L	76.5 mm
Femur	R	75.0 mm
Humerus	L	66.3 mm
Fibula	L	63.4 mm
Ilium	L	29.0 mm, height
Ilium	L	55.2 mm, breadth



PLATE CLXXVIII Prehistoric Archaeology, Bristol 45.



All post-cranial bones of this individual exhibit some unusual lesions. The femoral shafts and right ulna show horizontal striations across their anterior surface of proximal diaphyses and the right femur has a depression, about 2 mm x 2mm, on its posterior surface. This feature is more clear on ulna (pl. CLXXVIII). This could be attributed to a rodent activity or differential weathering or post-mortem erosion because of water logging, etc. However, the lesions seen on the distal segment or left humerus distal portion of right femur are very certainly pathological. The granular porous bone apposition exhibited by these bones is clearly explained as sub-periosteal lesion (pl. CLXXIX). However, looking at the young age of this individual it may be questioned whether the individual survived enough to allow the ossification of the lesion. This certainly needs further investigations. It may be noted here that two individuals where SPH lesions are evident are aged 2 to 3 months, same age-group to which this individual belongs.

Age Determination: The long bone lengths provide a rough clue to estimate age at time of death for this individual. The mean figures for femoral fibular and humeral lengths are 83.8 mm, 65.7 mm and 73.03 mm, respectively in the Juangaon skeletal series for 0 to 6 months age group. The range values are 70.6 mm to 109.3 mm for femur 62.1 mm to 68.0 mm for fibula and 63.5 mm to 91.5 mm for humerus. This individual has bones which fall in the low range of the quoted figures. When compared with the Arikara long bone lengths of 0 to 6 months age group, Burial 45 bones measure less than the means and stand low in the given class range.⁴⁰

The long bones of Burial 45 are comparable with the INM 129-A though little larger, whose age is estimated at 1 to 2 months. So best estimate for this individual be little more than this range, say around 3 months at time of death, or, rather less than 3 months.

Sex Determination: Uncertain.

Burial No. 46

Excavation date : 24.1.1979	Age: Around 3 years
Cultural phase: Jorwe	Sex: Uncertain
Sector: II	Cranium: Missing
Trench: B2'2	Mandible: Missing
Layer: 2	Dentition: 6 deciduous, 2 permanent
Burial type: Twin-urn	Post-cranium: Missing

Preservation and Skeletal Inventory: This individual is represented only by dental elements, cranial or post-cranial bones being altogether absent.

The dentition collected has all isolated, no jaw bone is recovered. All teeth are maxillary and include the following: deciduous: Rdi², Rdc, Rdm¹, Ldi¹, Ldc and Ldm¹. Two permanent germs are also present, central incisors, left and right, RI¹ and LI¹.

Description of Dental Elements: Morphological features on the dentition are clearly marked and easily observable.

No shovelling is observed on the deciduous central or lateral incisor. But the permanent incisors, both, exhibit grade 2 shovelling. The Rdm^1 and Ldm^1 show grade 2 of cusp development.

Odontometric data is presented in table 33.

Table : 33 Dental Crown Dimensions and Indices: Burial 46

		Crown Diameters		Crown Indices		
		MD	BL	CA	CI	CM
<i>Maxilla:</i>						
di^1	L	6.5	5.1	33.2	78.5	5.8
di^2	R	5.6	4.6	25.8	82.1	5.1
dc	R	6.9	6.1	42.1	88.4	6.5
	L	7.0	6.1	42.1	87.1	6.6
dm^1	R	7.4	8.9	65.9	120.3	8.2
	L	7.5	8.9	66.8	118.7	8.2

The permanent incisors are not measured because of incomplete calcification.

Age Determination: Since all teeth were isolated eruption sequence of teeth is not applicable for age estimation in this case. However, calcification progress offers enough clues to determine the age precisely.

All the deciduous teeth have completed their crown calcification. The central incisors complete crown calcification at 1.5 to 2.5 months, lateral incisors at 2.5 to 3.0 months, canines at 9 months, and $dm1$'s at 5.5 to 6.0 months. So on this basis age is more than 9 months.

Root development is complete for the central and lateral incisors and molars, this would mean that the age at death is more than 2.25 years. The canines also on the verge of completing root calcification, if they have not completed it. Generally root calcification is complete for deciduous canines at 3.25 years. So atleast age of 3 years is suggested on this basis.

The permanent incisors, central, start the process of crown calcification at 3 to 4 months and it is complete at 4.0 to 5.0 years. In this case though the full status is not achieved almost 3/4 of the calcification is attained. This coincide with the age estimated on the basis of canine root development progress.

So age around 3 years is suggested at time of death for this individual.

Sex Determination: Uncertain.

Burial No. 47

Excavation date:	Age: 1 to 3 months
Cultural phase: Malwa and Jorwe (overlap)	Sex: Uncertain
Sector: II	Cranium: a few fragments
Trench: BZ 3	Mandible: Missing
Layer: 4	Dentition: Missing
Burial type: Twin-urn	Post-cranium: Fragmentary (incomplete)

Preservation and Skeletal Inventory: This burial contains a few cranial elements and post-cranial bones some of which are complete. No dental or mandibular fragments preserved.

Cranial bones are altogether missing except 3 fragments from the neurocranial vault. All the three pieces are of medium size but lack any anatomical details, as a result, identification to element is impossible.

The post-cranial bones are rather better preserved and three bones are complete and measurable. The upper extremities are represented only by the proximal half of right ulna and distal 2/3 of right humerus. The lower extremities are better represented, both right and left femora and left tibia are present, all the three bones are complete. No other postcranial bone, even rib or vertebral fragments are associated with this burial.

Description of Post-cranial Bones: The diaphyseal lengths of the complete bones are as follows: right femur is 74.3 mm, left femur is 73.9 mm and left tibia is 67.4 mm.

Age Determination: In the absence of any dental elements age assessment has to be based on the long bone lengths. The femoral lengths are less than the bone lengths for Burial 45. When compared with the Inamgaon sample they fall below the mean values for 0 to 6 months age group. However the tibial length is more than the Inamgaon mean value but still in the range for 0 to 6 months.

Subsequently the best guess for the age at time of death for this individual be around 1 to 3 months.

Sex Determination: Uncertain.

Burial No. 48

Excavation date:	Age: 2.5 to 3.0 years
Cultural phase: Jorwe	Sex: Uncertain
Sector: II	Cranium: Fragmentary (incomplete)
Trench: BZ 1	Mandible: Fragmentary (incomplete)
Layer: 2	Dentition: 5 deciduous, 3 permanent
Burial type: Twin-urn	Post-cranium: Fragmentary (incomplete)

Preservation and Skeletal Inventory: This burial contains numerous cranial, post-cranial and dental elements of a child. Unfortunately most of the collection is damaged post-mortem

as suggested by the fresh cuts evident on the bones.

Cranial elements include the left frontal with the superior orbital margin, left temporal with the zygomatic process, left malar, part of the greater wing of sphenoid, petrous portions of the right and left temporals, basi-occipital and a small fragment of maxilla. Though numerous small fragments of the cranial vault are present they could not be reconstructed or identified to element because of their small size.

Mandibular fragment preserved is from the right corpus, from the symphysis to the gonial region. The ascending ramus is missing. The lower border of the ramus is almost complete except the slight post-mortem damage below the crypt of $Rd\bar{c}$. The first permanent molar, RM_1^- , was present in the crypt; it was extracted in the laboratory for morphometric observations.

Dentition preserved in this burial include deciduous as well as permanent teeth. All teeth are mandibular and include the following: Rdi_1^- , $Rd\bar{c}$, Rdm_1^- , Rdm_2^- which is slightly damaged on the mesial side, RM_1^- in the crypt, RM_2^- , Ldm_1^- , and LM_1^- .

Many long bones are present in this individual but almost all lack their metaphyses and in some cases severe damage has occurred even to the diaphysis. Identifiable post-cranial elements include the following. The left scapula is present with the glenoid and the acromion but the vertebral border is damaged. Both clavicles are present, right one has sternal 1/3 damaged, left clavicle has sternal half damaged. Right humerus has complete shaft but both the proximal and distal ends broken post-mortem, however, length estimation is possible. Left humeral mid-shaft segment is preserved. The left ilium is completely preserved but the right counterpart is missing. Both right and left femoral diaphyses are present. Right fibula is almost complete but the ends are broken.

Besides numerous other long bone splinters that are unidentifiable, rib and vertebral fragments, neural arches and phalanges are present.

Description of Dental Elements: This is one of the few specimens in this skeletal series where the dental elements are well preserved.

Both the lower first deciduous molars, Rdm_1^- and Ldm_1^- have five cusps indicating a very small hypoconulid formed by a groove bifurcating the hypoconulid, resulting in two smaller cuspules. The Rdm_2^- groove pattern is of Y type but the cusp number cannot be determined due to post-mortem damage to the mesial surface.

Both the permanent first molars, RM_1^- and LM_1^- have Y-5 occlusal feature and are without any extra cusp, C-6, C-7 or protostylid. The RM_2^- is incompletely calcified.

The crown dimensions are given in the table 34.

Table 34. Dental Crown Dimensions and Indices: Burial 48

	Crown Diameters		Crown Indices		
	MD	BL	CA	CI	CM
Mandible- di_1^- R	4.6	4.5	20.7	97.8	4.6

		Crown Diameter		Crown Indices		
		MD	BL	CA	CL	CM
<i>Mandible</i>						
d \overline{c}	R	5.5	5.4	29.7	98.2	5.5
dm $\overline{1}$	R	8.6	7.3	62.8	84.9	8.0
	L	8.5	7.2	61.2	84.7	7.9
dm $\overline{2}$	R	—	9.0	—	—	—
M $\overline{1}$	R	10.6	10.0	106.0	94.3	10.3
	L	10.8	9.9	106.9	91.7	10.4

Dental pathology: The Rdc has thin enamel on the labial surface of the tooth. A circular patch of about 1.5 mm in diameter of deficient enamel is present on this surface. This lesion may be interpreted as hypoplasia and be related to the developmental hypocalcification of the crown.

Description of Post-cranial Bones: The right humerus provide a rough estimate of length measurement. The length is 118.2 mm.

Age Determination: For Arikara children of 1.5 to 2.5 years age group the humeral length range is 121.0 to 138.0 mm and the mean is 129.5 mm⁴³ The humerus length in this individual is 118.2 mm, which is less than the lower limit of the range given, correspondingly the age estimate on this basis be less than 1.5 years.

However, the dental calcification sequences suggests higher age for this individual. All the deciduous teeth have complete crown calcification. The dm $\overline{1}$'s show complete root formation also, which occurs around 2.25 years. The Rdm $\overline{2}$ root is damaged but surely more than half of the root growth is evident. This completes at the age of 3 years or so, indicating an age of about 2 years or more for this individual.

The permanent first molars appear to have completed the calcification of crown, more than 2.5 years of age is suggested on this basis.

Considering all above estimates an average age of 2.5 to 3.0 years at time of death be guessed for this individual, the lower limit is more likely.

Sex Determination: Unlikely.

Burial No. 49

Excavation date: 2.5.1979	Age: 0 to 6 months
Cultural phase: Jorwe	Sex: Uncertain
Sector: II	Cranium: Fragmentary (incomplete)
Trench: BZ'1	Mandible: A small fragment
Layer: 2	Dentition: Missing
Burial type: Twin-urn	Post-cranium: Fragmentary (incomplete)

Preservation and Skeletal inventory: This burial contains fragmentary cranial and post-cranial elements of an infant.

Seven medium sized and four small sized cranial flat bones are present which are primarily from the bones of the neuro-cranial vault. Because of the small size of the fragments reconstruction is not possible. Right and left parietal bones are identifiable. The right half of the interparietal portion of the occipital is present, but the left half is missing. The condylar parts of the occipital are identifiable. The right and left temporals, petrous portions are present. A small fragment of the right mandibular corpus is present which include the area from the gonial region and the ascending ramus which is well preserved.

No dental remains are associated with this burial.

The post-cranial elements are also extremely fragmentary and yield little information. The pectoral girdle is represented by a right scapular fragment and right clavicle whose sternal end is broken. No bone of the upper extremity is preserved except the distal end of right humerus. The lower extremities are fairly well preserved. The left ilium is complete and the right ilium is also almost complete but for the damage that has occurred near its anterior end. The right femur is complete but the distal end is damaged post-mortem. Distal 2/3 of the left tibia and proximal 1/3 of the right tibia is present.

Also 8 rib fragments, 12 neural arch fragments and 4 phalanges are present in this burial.

Description of Post-Cranial Bones: The femur is complete and measurable, though its distal end is slightly damaged. The maximum diaphyseal length is 89.0 mm. The left iliac breadth is 42.4 mm and height is 36.5 mm.

No unusual pathological lesions are seen on any of the bones of this specimen.

Age Determination: The length of the femur is the only criteria on which age assessment may be based for this individual. The femur for Burial 49 is more in length than the means of femoral length of Inangaon and Arikara infants of the 0 to 6 months age group.² Similarly the iliac breadth is more than the corresponding mean for these two given populations.

As a result the best age estimate of time of death for this individual be between 0 to 6 months, more precisely around 3 to 4 months.

Sex Determination: Uncertain.

Burial No. 50

Excavation date: 20.4.1979

Cultural phase: Malwa and Jorwe (overlap)

Sector: II

Trench: BZ'3

Layer: 4

Burial type: Twin-urn

Age: Perinatal

Sex: Uncertain

Cranium: Fragmentary (incomplete)

Mandible: Fragmentary (incomplete)

Dentition: Missing

Post-cranium: Well preserved

Preservation and Skeletal Inventory: This burial contains rather well preserved post-cranial bones but very fragmentary and less represented cranial elements of an infant. No dental germs are preserved.

The cranial elements are mostly from the neurocranial vault, except one small maxillary fragment forming the lower margin of the right orbit and the left malar bone. The neurocranial fragments are of very small size and individual identification or reconstruction is impossible. The identifiable fragments include the right and left petrous portions of the temporal, right superior and lateral margin of the orbit and condylar portion of the occipital.

Mandibular fragments are two, each from the symphysis to the region of the dm_1 crypt, making the corpus complete from the Rdm_1 thru Ldm_1 complete. The lower margin is complete and undamaged. But the superior margin is weathered and damaged post-mortem exposing all the crypts, and as a result all germs are lost.

Dentition is not represented in this burial.

Post-cranial bones are much better preserved and many long bones are complete. The following elements are present.

For the pectoral girdle both right and left scapulae are present, the right one is more complete than the left. Spine and the glenoid region is present for both. Right clavicle complete but the left side bone is missing. Both right and left humeri are present and completely preserved. Right ulna and radius are also complete. The left side forelimb bones are present but lack some or the other extremity. The left radius has distal end with 2/3 of the shaft but the proximal end is missing, post-mortem breakage. The left ulna has only the proximal end with 1/3 of the diaphysis.

The pelvic girdle is represented by complete right ilium and damaged left ilium; ischia and pubes are missing. Both right and left femora are complete. Right and left fibular shafts are present but both tibiae are missing.

Also numerous rib and vertebral fragments, metabones and phalanges are present.

Description of Post-cranial Bones: The complete long bones are measured for their maximum diaphyseal lengths, the data are presented below:

Clavicle	R	39.0 mm
Humerus	R	63.5 mm
Humerus	L	61.9 mm
Ulna	R	59.8 mm
Radius	R	52.0 mm
Ilium	R	39.2 mm, breadth
Ilium	R	34.8 mm, length
Femur	R	73.5 mm
Femur	L	73.4 mm

No unusual pathological lesions are observed on any of the long bones preserved in this burial.

Age Determination: The long bone lengths provide enough data for age assessment, though it is less accurate than the dental calcification sequence.

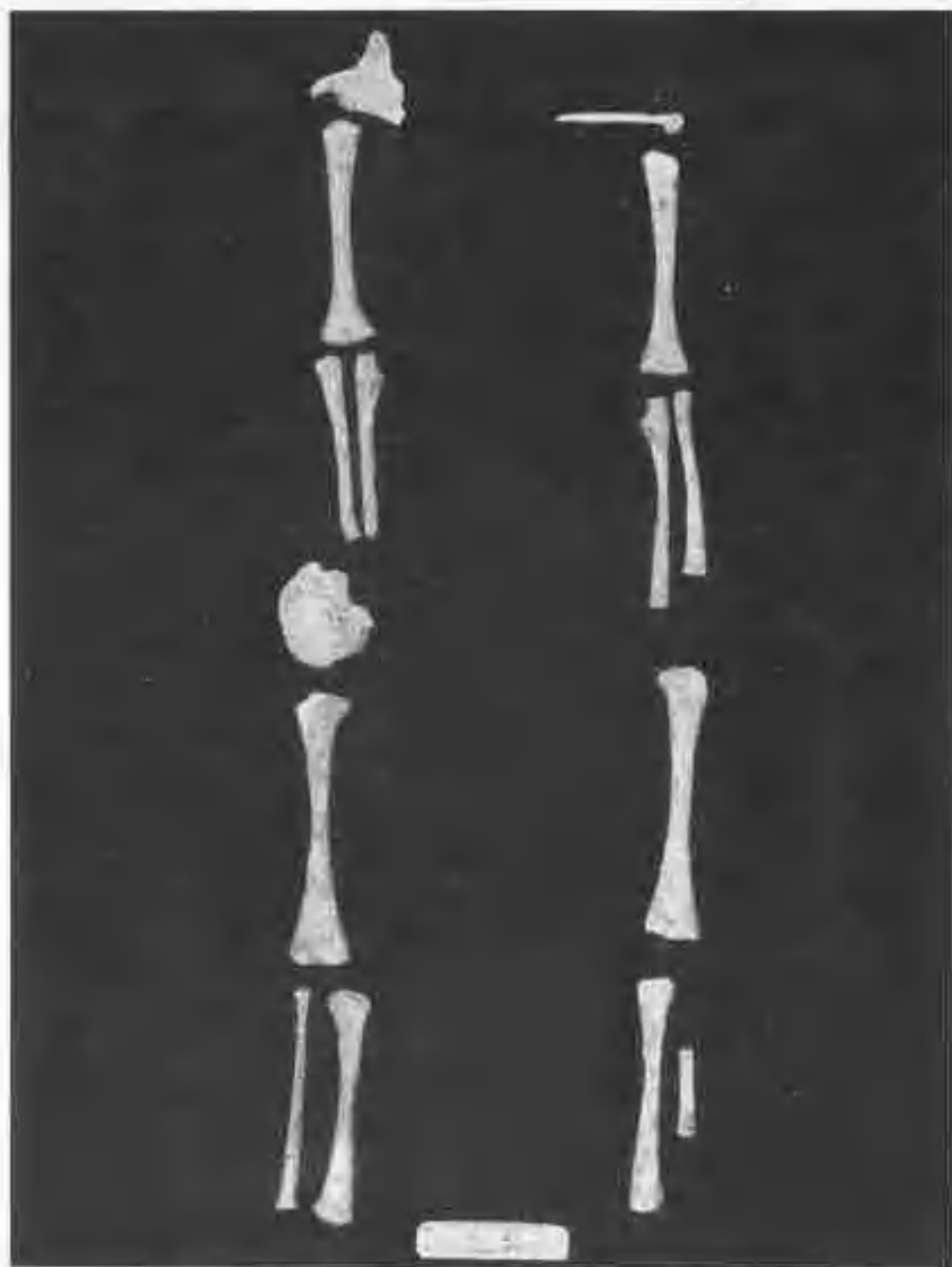


PLATE CLXXX Best preserved infant post-cranials, Burial 51.

Long bones for this individual measure less in lengths than Burial 45 and Burial 47.

When compared with the Arikara population these figures are less than the mean values for the 0 to 6 months age group but are well within the range. The Luamgaon long bone length mean values are also little higher than the values for this individual.

These figures are best comparable with the bone lengths of INM 129—A though that of later are slightly higher. The age estimate for the INM 129A is 1 to 2 months.

When compared with the charts of Arikara bone lengths of new born⁹ it is evident that the two sets of values are almost comparable and Darnabad figures are even less for some of the bones.

Dental data would have been the best to use in such case. On the basis of the available data it may only be estimated as the death was perinatal, either at the time of birth itself or shortly after that.

Sex Determination: Uncertain.

Burial No. 51

Excavation: 20.4.1979	Age: 1 to 2 months
Cultural phase: Malwa and Jorwe (overlap)	Sex: Uncertain
Sector: II	Cranium: Fragmentary (incomplete)
Trench: BZ'3	Mandible: Fragmentary (incomplete)
Layer: 4	Dentition: Missing
Burial type: Twin-urn	Post-cranium: Well preserved.

Preservation and Skeletal Inventory: This burial contains rather fragmentary cranial and well preserved post-cranial elements of an infant. No dental elements are associated with this burial.

Cranial bones preserved in this burial are primarily from the neurocranial vault. Most of the fragments are heavily coated with matrix and poorly preserved and cannot be reconstructed. The identifiable and most complete cranial parts include the occipital condylar parts, right and left squamous and petrous portions, orbital superior margins for both the sides, fragments of parietal and temporal. No facial bones are preserved.

Left mandibular corpus is preserved from symphysis to the gonial region, the ascending ramus is missing. The crypts for Ld_1 thru LM_1 are seen as the superior margin of the corpus is eroded. However, the dental germs are totally missing.

The post-cranials are in better state of preservation, as in Burial 50. Many long bones are complete and measurable (pl. GLXXX).

The elements preserved for the upper extremity include the following. The right scapula is more complete than the left and include spine and the glenoid region, but the vertebral border is damaged. Left scapula only has the spine and the glenoid region, and the entire infra-

spinous fossa is broken post-mortem. The left clavicle is complete but the right one is altogether missing. Right and left radii, humeri, and left ulna are completely preserved. The right ulna has proximal end and proximal $3/4$ of the shaft present, the distal end is broken post-mortem.

The pelvic fragments preserved are complete right ilium and damaged left ilium, the ischia and pubes are missing. Both femora are complete as are both tibiae and right fibula. Left fibula is also present, but the distal half is broken post-mortem.

Also numerous rib and vertebral fragments are present, also metabones and phalanges.

Description of Post-cranial Bones: The long bone measurements are recorded below:

Clavicle	L	40.5 mm
Humerus	R	66.8 mm
Humerus	L	65.9 mm
Ulna	L	61.2 mm
Radius	R	55.2 mm
Radius	L	55.4 mm
Ilium	R	33.5 mm, breadth
Ilium	R	30.0 mm, length
Femur	R	80.3 mm
Femur	L	79.9 mm
Tibia	R	67.6 mm
Tibia	L	67.5 mm
Fibula	R	65.4 mm.

No bone of this individual exhibit pathological lesions.

Age Determination: The long bone lengths of this individual are less than the mean values reported for Arikara and Inangaon 0 to 6 months old infants. However, these values are little more than the values of Burial 50 bone lengths. The best estimate for age at time of death be around 1 to 2 months for this individual.

Sex Determination: Uncertain.

Supplementary note: Proximal half of tibia has a second occurrence, probably from an individual of the same age. No other duplication of parts is observed in this burial. Hence probable representation of a second individual remains uncertain.

Ble N. 52

Excavation date: 2.6.1979

Cultural phase: Jorwe

Sector: II

Trench: CZ'9

Layer: 2

Burial type: Twin-urn

Age: 10 to 12 months

Sex: Uncertain

Cranium: Extremely fragmentary

Mandible: Missing

Dentition: 9 deciduous, 3 permanent

Post-cranium: Extremely fragmentary

Preservation and Skeletal Inventory: This burial contains extremely fragmentary and weathered cranial and post-cranial elements, almost all of them are unidentifiable with certainty. Nothing can be learnt from them either. However, surprisingly the burial preserves some of the maxillary dentition in fairly good condition.

The dentition preserved is all maxillary and include all the deciduous teeth except the Ldi^2 . Three maxillary permanent germs are also preserved Ll^1 , LM^1 and RM^1 . All the dentition is recovered isolated and no gnathic elements are preserved.

Description of Dental Elements: Morphological features on the dentition are well preserved. No shovelling is observed on the deciduous, central or lateral incisors. The permanent incisor, however, has distinct single medium lingual ridge. The incisors, both permanent and permanent, have serrate incisive edges. Morphology of the molar teeth is symmetrical; both R/Ldm^1 are in grade 2 of cusp development, whereas the R/Ldm^2 , are in grade 4-. On the second molars, R/Ldm^2 , Carabelli's trait is seen in the form of a small vertical groove. The permanent molars, R/LM^1 , have grade 2 Carabelli.

The dental crown dimensions are given in table 35.

Table 35

Dental Crown Dimensions and Indices: Burial 52:

		Crown Diameters		Crown Indices		
		MD	BL	CA	CI	CM
<i>Maxilla</i>						
di^1	R	7.1	5.2	36.9	73.2	6.2
	L	7.1	5.2	36.9	73.2	6.2
di^2	R	5.6	4.6	25.8	82.1	5.1
	L	5.6	4.6	25.8	82.1	5.1
dc	R	6.8	6.0	40.8	88.2	6.4
	L	6.9	6.0	41.4	87.0	6.3
dm^1	R	7.0	9.0	63.0	128.6	8.0
	L	7.1	9.0	63.9	126.7	8.1
dm^2	R	9.6	10.1	97.0	105.2	9.9
	L	9.5	10.1	96.0	106.3	9.8

The permanent teeth are not measured as the crown calcification is incomplete.

Age Determination: Crown calcification for deciduous teeth is complete, even for the canines and second molars, suggesting an age of more than 10 to 11 months. The development of root in the R/Ldi^1 's is not even half way, indicating an age around 1 year. The calcification of permanent molars cannot be judged, but it is definitely less than half.

These data suggest an age of 10 to 12 months at time of death for this individual.

Sex Determination: Uncertain.



PLATE CLXXXI Pseudopodiceps, Burial 53.

Burial No. 53

Excavation date: 2.6.1979	Age: 6.5 to 7.5 years
Cultural phase: Jorwe	Sex: Uncertain
Trench : CZ'3.	Cranium: Extremely fragmentary
Sector: II	Mandible: Fragmentary
Layer: 2	Dentition: 14 deciduous, 17 permanent
Burial type: Extended	Post-cranium: Well preserved

Preservation and Skeletal Inventory: This burial contains rather fragmentary neurocranial and well preserved post-cranial bones. The facial skeleton is damaged severely but the dentition is extremely well preserved and allows detailed morphometric studies.

The cranium is fragmentary and most of the preserved portion is from the neurocranial bones. The facial skeleton is completely lacking except for the malar bones and a few fragments of the jaw bones adhering to the teeth. The preserved neurocranial pieces include left and right parietals, completely preserved left temporal, squamous and petrosal part of right temporal, almost entire occipital but the portion of foramen magnum, left side of the greater wing of sphenoid and three very small fragments of the frontal bone. Most of the parts have eroded borders and so reconstruction is not possible.

Maxillary portion is completely damaged and no part is represented. Mandible is also almost entirely damaged and the only parts preserved include the left complete ascending ramus, right ascending ramus where condyle is undamaged but the coronoid is broken post-mortem. From the horizontal ramus only part preserved is the area of right di_1 and di_2 .

However dentition is almost completely represented which include both deciduous teeth and developing permanent germs. All teeth are found isolated. The preserved deciduous teeth include, maxillary: Rdi_1^1 , Rdc , Rdm_1^1 , Ldi_1^1 , Ldc , damaged Ldm_1^1 , and Ldm_2^2 , and mandibular: Rdi_1^1 , Rdi_2^2 , Rd_1^1 , Ldi_1^1 , Ldi_2^2 and Ld_1^1 . The permanent teeth include, maxillary: RI_1^1 , RC_1^1 , RPm_1^3 , RPm_2^4 , RM_1^1 , RM_2^2 , LI_1^1 , LC_1^1 , LPm_1^3 , LPm_2^4 and LM_1^1 ; and mandibular: RC_1^1 , RPm_3^5 , RM_1^1 , LC_1^1 , LPm_3^5 and LM_1^1 .

The post-cranial elements are rather well preserved but heavy application of preservatives at the time of excavation has resulted in hardening of the matrix. Without further breakage it is almost impossible to lift the individual bones, so observations are done *in situ*.

The upper extremities are less well preserved than the lower extremities. Especially bones of the right hand are destroyed because of the burial pot placed above it. The right humerus is represented only by a few fragments, and the distal halves of right radius and ulna are present. The skeleton of wrist, metabones and phalanges are all present but lifting from matrix is impossible. The left hand is fairly well preserved. The left humerus is almost complete but the head is damaged post-mortem. The left ulna has the portion of mid-shaft and both the ends are broken. The left radius is almost complete except the distal 1/3 diaphysis. The left fore-arm is twisted and as a result the radius and ulna are not located side by side but the radius mid-shaft is above the ulnar mid-shaft and the extremities side by side (pl. CLXXXI).

This only indicate twisting of the hand while burying of the dead body and no pathology is associated with it. Skeleton of the left hand too is fully represented, except for the wrist region where the bones are slightly eroded. The bones of the pectoral girdle are not visible and the right side appears to have been completely destroyed. The left clavicle is fragmentary whose sternal end is broken and the diaphysis is present in two pieces.

The pelvis is completely destroyed post-mortem. Only the right iliac fragment is fairly well preserved, though damaged anteriorly. The portion of sciatic notch and acetabulum are preserved. The left ilium is completely crushed. The iscial and pubes fragments are present for both the sides but no bone is complete. The right and left femora are damaged. Patella, right and left are missing. Both right and left tibia and fibula are present, the diaphyses are undamaged except the proximal end of left tibia. The feet below the ankles are not chopped off. Tarsals and metatarsals are all represented, though suffered from severe damage. The phalanges too are present but some of the elements are missing.

The thoracic cage is completely crushed and all the bones, ribs, sternum and vertebrae are fragmentary. Two vertebrae from the lumbar region provide an exception.

Description of Dental Elements: The dentition of this individual is well represented and the state of preservation is very good. Morphologically this dentition presents very interesting features. The progress of calcification of crown and root development is discussed while determining the age at death.

Morphology of the deciduous and permanent teeth is described below.

Deciduous teeth: Both the central incisors, Rdi^1 and Ldi^1 , exhibit grade 2 shovelling. The Rdm^1 has slightly worn occlusal surface but the grade of hypocone development appears to be 3, (3M2 type of Hanihara⁴⁴ and Hanihara-Minamidate⁴⁵). The Ldm^1 is also worn out and in addition the labial surface is chipped off. The hypocone development for this tooth may tentatively be classed as grade 3. The second molars, Rdm^2 and Ldm^2 , show grade 2 (5+B, Hanihara) of cusp development. Carabelli of grade 3 is also present on these two molars. The lower deciduous incisors and canines do not exhibit any significant morphological feature.

Permanent teeth: Like the deciduous incisors, the permanent incisors exhibit semi-shovel, grade 2. Marginal ridges are strongly marked. Median lingual ridges or marginal interruption grooves absent. Upper canines exhibit medial lingual ridge and the lower canines have distal accessory ridge. Hypocone development in the first maxillary molars is of grade 3-4⁴⁶ and for Rmc^2 grade 3 development is observed. Though the region of Carabelli is not clear a small vertical ridge is present, which may be taken as grade 1 Carabelli. No metaconule, protoconule or paracanal cusp is observed. Both mandibular molars have 6 cusps and Y type of groove pattern. The sixth cusp, entoconulid, is weakly developed but distinct. Metaconulid, protostylid, deflecting wrinkle or trigonid crest is not evident on the molars.

Dental pathology: Most of the deciduous teeth exhibit attrition of lesser or greater degree. The deciduous molars, upper, are worn out to a great extent and on the lingial distal edge dentine is exposed. There is no apparent loss of any deciduous teeth yet.

The other pathology that is evident in this dentition is the presence of calculus deposits, tartar accumulations on the crowns. The incisors, both upper and lower, and molars are mostly affected. The other deciduous teeth also show traces of such plaque formation and nearly all the primary teeth are affected. The permanent teeth are free from such deposits.

The dental crown dimensions are given in table 36.

Description of Post-Cranial Bones: Some of the long bones of this individual are complete and permit measurement of maximum length. The data are presented below. It may be noted that the lengths given below are full lengths of bones, including epiphyses. The estimates are given in parenthesis.

Femur	R	262 mm
Femur	L	264 mm
Fibula	R	208 mm
Fibula	L	(206 mm)
Tibia	R	213 mm
Tibia	L	(214 mm)
Humerus	L	178 mm

Because of the coating of preservative no pathological observations are possible. But no lesions are seen apparently.

Age Determination: The crown calcification sequence and the root development provide data for accurate age estimation.

Though the deciduous teeth are found isolated, they have completed crown calcification. The attrition on the molars suggest they were in occlusion at time of death. This would suggest an age of more than 4 years.

Root calcification for dm₂ is complete at 3 years and for the dc it is complete by 3.25 years. In this case both second molar and the canines have roots completely formed and for the incisors slight root resorption is evident. This indicate age of 5 years at time of death.

All the permanent teeth also show complete crown calcification, even the second molar and the second premolars (P₂4). This generally occurs at 7 to 8 years. So this age range may be suggested on this basis.

The permanent first molars generally erupt at 6.5 to 7 years of age. In this case since the teeth were isolated no statement can be made about the eruption stage. However, the presence of deciduous first incisors suggests age less than 7 years. The loss of deciduous central incisors is generally at 6 to 7 years. It might have been delayed by a few months in this case.

Considering all these facts together the best estimate be between 6.5 to 7.5 years

at time of death.

Sex Determination: Because of the young age of the individual sex determination is not possible for this individual. The long bones are gracile but this is definitely because of the young age. The iliac bone is preserved and the sciatic notch appears narrow, however. Though sex determination is not possible with certainty, maleness is suggested.

Table 36

Dental Crown Dimensions and Indices: Burial 33

		Crown Diameters		Crown indices		
		MD	BL	CA	CI	CM
<i>Maxilla</i>						
di ¹	R	6.5	5.8	36.54	92.06	6.05
	L	6.3	5.7	35.91	90.48	6.00
dc	R	4.9	4.4	21.56	89.80	4.65
	L	5.0	4.5	22.50	90.00	4.75
dm ¹	R	7.6	9.0	68.40	118.42	8.30
	L	7.7	—	—	—	—
dm ²	R	9.4	10.1	94.94	107.45	9.75
	L	9.4	10.2	95.88	108.51	9.80
I ¹	R	9.7	8.6	83.42	88.66	9.15
	L	9.7	8.6	83.42	88.66	9.15
C	R	8.8	9.5	89.60	107.95	9.15
	L	8.8	9.6	84.48	109.09	9.20
Pm ³	R	6.0	9.2	59.80	141.54	7.85
	L	6.5	9.5	60.45	143.08	7.90
Pm ⁴	R	7.1	9.5	67.45	133.80	8.30
	L	7.2	9.6	69.12	133.33	8.40
M ¹	R	9.4	10.5	98.70	111.70	9.95
	L	9.4	10.4	97.76	110.64	9.90
M ²	R	9.8	11.6	113.68	118.37	10.70
<i>Mandible</i>						
di ₁	R	4.3	4.2	18.06	97.67	4.25
	L	4.4	4.2	18.48	95.45	4.30
di ₂	R	5.1	4.5	22.95	88.24	4.80
	L	5.2	4.6	23.92	88.46	4.90
dc	R	5.5	5.4	29.70	98.18	5.45
	L	5.5	5.5	30.25	100.00	5.50
C	R	6.7	7.7	51.59	114.93	7.20

		Crown Diameters		Crown Indices		
		MD	BL	CA	CI	CM
Pm ₃	L	6.7	7.7	51.59	114.93	7.20
	R	6.8	7.7	52.36	113.24	7.25
	L	6.9	7.8	53.82	113.04	7.35
M ₁	R	11.0	10.6	116.60	96.36	10.80
	L	11.0	10.6	116.60	96.36	10.80

Burial No. 54

Excavation date: 26.5.1979	Age: 8 to 10 years
Cultural phase: Jarwe	Sex: Uncertain
Sector: IV	Cranium: Missing
Trench: ZD 62	Mandible: Missing
Layer: 1	Dentition: 3 permanent
Burial type: Twin-urn	Post-cranium: a few fragments

Preservation and Skeletal Inventory: The osteological remains preserved in this burial are very few. Four phalanges, distal epiphysis of femur (side ?) and 3 teeth are the only material present.

The teeth are identified as I₁¹, I₁² and M₁¹. The dentition was recovered isolated and no gnathal remains are associated with these. Root for the lateral incisor is broken post-mortem.

Description of Dental Elements: The teeth preserved are all complete in crown calcification and in the molar root development is also complete. In morphological features, the central incisor exhibit trace shovelling, grade 1. This trait is not observed for the lateral incisor. The molar show grade 4- (Dahlberg standard) and grade 2 (Lukacs standard) for hypocone size. Carabelli of grade 1, small vertical groove, is present on this tooth. Metacone, protocone or paramolar cusp is absent.

The dental metric data is presented in table 37.

Table 37 Dental Crown Dimensions and Indices; Burial 54.

		Crown Diameters		Crown Indices		
		MD	BL	CA	CI	CM
<i>Maxilla</i>						
I ₁ ¹	L	6.3	6.3	39.7	100.0	6.3
I ₁ ²	L	6.7	6.9	46.2	103.0	6.8
M ₁ ¹	L	11.4	11.2	127.7	98.2	11.3

Age Determination: The permanent central incisors complete crown calcification at 4.0 to 5.0 years and the lateral incisors also at the almost same age. This individual's incisor have achieved this development indicating age of more than 3 years. The permanent molars and the central incisors have almost completed root development also suggesting age of around 10 years. The lateral incisor, LM², root is damaged and its apex is broken. As a result its stage of development can be evaluated, but certainly considerable progress has been made. The lateral incisors complete root calcification at 10 to 11 years. Little less age, of 9 years may be estimated on this basis.

The best average of age at time of death be between 8 to 10 years.

Sex Determination: Uncertain.

Burial No. 56

Excavation date: 3.4.1979	Age: Infant
Cultural phase: Malwa	Sex: Uncertain
Sector: IV	Cranium: Extremely fragmentary
Trench: ZD 61	Mandible: Missing
Layer: 5	Dentition: Missing
Burial type: Twin-urn	Post-cranium: Missing

Preservation and Skeletal Inventory: This burial contains very poorly preserved and weathered cranial fragments of an infant. Post-cranial or dental elements are not represented in this burial.

In all 13 small sized pieces of the cranial vault are present, most of them are unidentifiable. The two frontal pieces preserving the superior margins of the left and right orbits, left petrosal and right condylar portion of the occipital are the only identifiable elements. No unusual pathological lesions are seen on any of these fragments.

No other observation can be made on these fragments.

Age Determination: No precise age assessment is possible in the absence of dental or long bone data. On the basis of the size and thickness of cranial fragments it may only be said that the individual was infant at time of death.

Sex Determination: Uncertain.

Burial No. 38

Excavation date:	Age: Uncertain
Cultural phase: Malwa and Jorwe	Sex: Uncertain
Sector: II (overlap)	Cranium: Missing
Trench: BZ ² 3	Mandible: Missing
Layer: 4	Dentition: Missing
Burial type: Single urn	Post-cranium: Missing

Preservation and Skeletal Inventory: This is rather an odd assortment of non-human bones, esp. of cattle. In all 4 large and 5 medium fragments are present. No human bone is evident in this collection.

Age Determination: Uncertain.

Sex Determination: Uncertain.

Burial No. 59

Excavation date: 2.6.1979	Age: Uncertain
Cultural phase: Daimabad	Sex: Uncertain
Sector: IV	Cranium: Missing
Trench: ZD 61	Mandible: Missing
Layer: 7	Dentition: Missing
Burial type: Single urn	Post-cranium: Missing

Preservation and Skeletal Inventory: This burial contains partially charred non-human bones, a mixed collection. Two medium sized and 7 small sized long bone splinters are present. No human bone is found to be associated with this burial.

Age Determination: Uncertain.

Sex Determination: Uncertain.

Burial No. 60

Excavation date: 1.6.1979	Age: 1 to 2 years
Cultural phase: Jorwe	Sex: Uncertain
Sector: I	Cranium: Extremely fragmentary
Trench: Z 69	Mandible: Missing
Layer: 5	Dentition: Missing
Burial type: Twin-urn	Post-cranium: Fragmentary (incomplete)

Preservation and Skeletal Inventory: This burial contains extremely fragmentary cranial and post-cranial elements of a child. No dental or gnathic elements are preserved.

Though numerous, ten, fragments of the neurocranial vault are present, all are weathered and very poorly preserved. As a result they are not identifiable with certainty, no reconstruction is possible. Only a small frontal piece with the superior margin of the left orbit can be identified.

Post-cranial bones are also poorly preserved. From the upper extremities present are the distal ends of right and left humeri, distal half of right radius, distal 2/3 of the left radius, proximal head and semi-lunar notch of left ulna. From the lower extremities ischial and pubes fragments are identifiable and also mid-shaft segment of femur (side ?) and distal end of left tibia. Numerous rib fragments are present as well as a few metabones and phalanges.

Age Determination: Precise age estimation is not possible for this individual. On the basis of the long bone size it may very roughly be suggested that this child may be of 1 to 2 years at time of death.

Sex Determination: Uncertain.

Burial No. 61

Excavation date: 1.6.1979	Age: 3.5 to 4 years
Cultural phase: Jarwa	Sex: Uncertain
Sector: I	Cranium: Extremely fragmentary
Trench: Z 69	Mandible: Missing
Layer: 5	Dentition: 6 deciduous, 5 permanent
Burial type: Twin-urn	Post-cranium: Extremely fragmentary

Preservation and Skeletal Inventory: This burial contains numerous cranial and post-cranial fragments and a few dental elements of a child.

Though numerous long bone splinters and cranial fragments are present, owing to their small size and weathered appearance, reconstruction is not possible, neither identification to element, except the proximal end and a portion of diaphysis, about 3 cm long, of left tibia.

Dentition is however present in this burial which include the following. Deciduous teeth are Rdm_1 , Rdm_2 , Ldl_1 , damaged crowns of Ldl_2 , Ldc and Ldm_1 . Permanent teeth are Rl_1 , Rm_1 and Rm_2 . No maxillary dentition is represented.

Description of Dental Elements: The deciduous first molars, R/Ldm_1 's show 5 cusps, and the Rdm_2 exhibit Y-5 pattern. The permanent, Rm_1 is also Y-5 in cusp number and groove pattern. Rm_2 is incompletely calcified. Protostylid, entoconulid or metaconulid are absent on any of the molars.

The dental crown dimensions of Burial 61 dentition are given in table 38.

Table 38.

Dental Crown Dimensions and Indices: Burial 61

		Crown Diameters		Crown Indices		
		MD	BL	CA	CI	CM
<i>Mandible</i>						
dl_1	L	4.4	4.3	18.9	97.7	4.4
dl_2	L	—	4.4	—	—	—

		Crown Diameters		Crown Indices		
		MD	BL	CA	CI	CM
dc	L	5.5	5.4	29.7	98.2	5.5
dm ₁	R	8.8	7.5	66.0	85.2	8.2
	L	8.8	7.5	66.0	85.2	8.2
dm ₂	R	10.6	9.2	97.5	86.8	9.9
I ₁	R	5.4	5.9	31.9	109.3	5.7
M ₁	R	10.8	10.4	112.3	96.3	10.6

Age Determination: Dental crown calcification sequence and the progress of root formation provide adequate data for age determination.

Crown calcification for all deciduous teeth is complete, indicating an age of more than 1 year. Root formation is also complete for all deciduous teeth, even for the *dc*. This suggests age of more than 3.25 years. The permanent molar is completely calcified for crown, age more than 3 years, and the permanent incisor appears to have on the verge of completing of crown calcification. The incisors, permanent, complete crown calcification usually at 4 to 5 years. The *M₂* germ is incompletely calcified.

Considering all the data an average age at time of death be estimated as around 3.5 to 4 years.

Sex Determination: Uncertain.

Burial No. 62

Excavation date: 1.6.1979	Age: 1.5 to 2.0 years
Cultural phase: Mahwa	Sex: Uncertain
Sector: I	Cranium: A few fragments
Trench: Z69/Z 70 to AZ 69/AZ 70	Mandible: Missing
Later: 12	Dentition: Missing
Burial type: Twin-urn	Post-cranium: Fragmentary

Preservation and Skeletal Inventory: This burial contains a few weathered fragments of cranium and fragmentary post-cranial elements of a child.

Cranial bones are highly weathered and size of the fragments are too small which do not possess any distinguishing anatomical marks. A occipital fragment with a portion of the lambdoid suture can only be identified with certainty.

No jaw elements or dentition are preserved in this burial.

The post-cranials are slightly better preserved but most of the bones suffer from post-mortem breakage resulting into a loss of one or the other metaphysis. No pectoral elements are preserved. Proximal 1/3 of the right humerus is present. Right radius is completely

preserved and is measurable. The right ulna has distal end and $3/4$ of the shaft but the proximal end is broken. The pelvis is fully represented, right and left ischia and pubes are present, all are complete except slight damage to the left ischium. Right ilium is complete and the anterior portion of the left ilium is present. The left ilium has suffered post-mortem damage. Proximal half of the right femur, proximal $1/3$ of the left femur and a distal end of tibia (side?) represent the lower extremities. A few vertebral fragments and rib fragments are present too.

Description of Post-cranial Bones: The right radius is the only complete bone preserved in this burial. The diaphyseal length of this bone is 91.5 mm. The right ilium is also complete, breadth measurement of this bone 59.4 mm. Length is not measured as the bone is slightly eroded in the region.

No bone of this specimen exhibit any pathological lesions.

Age Determination: The value of the radial length for Arikara 1.5 to 2.5 years children is 97.1 mm, the range being 84.0 to 104.0 mm⁸. Only one individual from this age range from the Inamgaon skeletal series has complete radius which measures 96.0 mm; the age estimate for this individual on the basis of crown calcification sequence is 2.0 to 2.5 years.

The Burial 62 radius is smaller than both the Arikara mean length as well as the Inamgaon individual. Hence the best estimate of age be between 1.5 to 2.5 years, younger age seems more appropriate.

The mean for iliac breadth for Arikara 0.5 to 1.5 years children is 55.8 mm, the range is 46.0 to 65.0 mm. Here in this specimen the iliac breadth is 59.4 mm, more than the Arikara mean, but suggests younger age less than 1.5 years.

Sex Determination: Uncertain.

Burial No. 64

Excavation date: 2.6.1979	Age: 3 to 4 years
Cultural Phase: Malwa	Sex: Uncertain
Sector: I	Cranium: Extremely fragmentary
Trench: Z 69/Z 70 to AZ 69/AZ 70	Mandible: Missing
Layer: I4	Dentition: 4 deciduous
Burial type: Twin-urn	Post-cranium: Fragmentary (incomplete)

Preservation and Skeletal Inventory: This burial contains numerous but extremely small sized and weathered fragments of the neurocranial vault almost all of them are unidentifiable. Only left and right petrous portions of the temporal are identified. No observation can be made on these fragments.

The mandible or maxilla are missing. However two teeth from each jaw are present which

include mandibular, Rdm_1 and Rdm_2 maxillary, Rdm_1^1 and Rdc . No permanent dentition is present.

The post-cranials are also weathered and damaged post-mortem. Only identifiable elements are proximal half of left ulna, proximal 1/3 and distal 1/3 of the left radius where the middle portion is missing, and a diaphyseal segment of femur (side?). Along with the rib fragments, left and right iliac pieces are also preserved.

Description of Dental Elements: In hypsacanth development the maxillary Rdm_2 show grade 1. The mandibular first molar, Rdm_1 has four cusps. Rdm_2 is six cusped with Y shaped groove pattern. The entoconulid, C-6, is present as a distinct cusp. Deflecting wrinkle or metaconulid is present. The Rdc has a distal accessory ridge.

The metric observation are recorded in table 39.

Table 39

Dental Crown Dimensions and Indices: Burial 64

		Crown Diameters		Crown Indices		
		MD	BL	CA	CI	CM
<i>Maxilla</i>						
dc	R	7.1	5.9	42.0	83.1	6.4
dm_1^1	R	8.0	9.1	72.8	113.8	8.6
<i>Mandible</i>						
dm_1	R	9.1	7.7	70.1	84.6	8.4
dm_2	R	10.2	8.3	84.7	81.4	9.3

Age Determination: The deciduous dentition preserved provide enough data for age assessment of 'less than X' type. However, in the absence of permanent dentition or any other clue upper age limit cannot be positively stated.

The Crown calcification for the teeth preserved is complete, also roots are completely formed. The dc, upper or lower, root formation is generally complete at 3.25 years, for dm_1 's the root is completely formed at 2.25 years and for dm_2 's at 3.0 years. The age suggested on this basis is more than 3 years.

On comparing the radial fragments with the radius of INM 85 the upper age limit may very crudely be determined as 'less than 4 years'.

Sex Determination: Uncertain.

Burial No. 65

Excavation date: 31.5.1979	Age: Infant
Cultural phase: Jorwe	Sex: Uncertain
Sector: II	Cranium: Missing
Trench: CZ'2	Mandible: Missing
Layer: 1	Dentition: Missing
Burial type: Twin-urn	Post-cranium: Extremely fragmentary

Preservation and Skeletal Inventory: This burial contains extremely fragmentary and weathered post-cranial elements of an infant. Their poor preservation makes them unidentifiable to element or carry any morphological observations. Only identifiable piece is the distal half of ulna for which side could not be determined. Nothing can be learned from this preserved material.

Age Determination: On the basis of the size of the bones, especially of ulnar fragment, only thing that can be said is, this individual was infant at time of death.

Sex Determination: Uncertain.

Burial No. 66

Excavation date: 31.5.1979	Age: 8 to 10 months
Cultural phase: Jorwe	Sex: Uncertain
Sector: II	Cranium: Well preserved
Trench: CZ'2	Mandible: Well preserved
Layer: 1	Dentition: 9 deciduous, 3 permanent
Burial type: Twin-urn	Post-cranium: Fragmentary

Preservation and Skeletal Inventory: This burial contains one of the best preserved infant skeleton. Cranial and dentition elements are well represented and the post-cranium, though fragmentary, many long bones are complete.

Facial skeleton is severely damaged but reconstruction in producing a nearly complete cranium was possible from numerous small fragments of neurocranium. Nearly complete cranial bones include the frontal whose left half is much better preserved than the right, left parietal, left temporal, most of the occipital, nearly half of the right parietal restoring almost all mid-sagittal suture, the right and left occipital condyles, left and right petronals, right and left malar and a few maxillary fragments. Other facial bones are damaged.

Mandible is also almost complete, though broken at three pieces. The first fragment is of the right ascending ramus to the region of Rdm_2 the teeth, Rdm_2 , and RM_1 , are in the crypt, unerupted. The second fragment is of left ascending ramus to the LM_1 crypt the germ is present being unerupted. The third fragment is from the Ldm_2 crypt thru symphysis thru Rdi_1 . The fourth segment is of the corpus of Rdi_2 and Rdm_1 . Ldm_1 is seen in the

third fragment. Lower border of the mandibular corpus is almost complete after reconstruction, except the region of Ldi_2 and mesial side of Ldc . Both right and left gonial angles are well preserved as are the condyles but the coronoid processes are broken.

Besides the dentition preserved in the crypts the following teeth are recovered isolated: Ldm_5 , Ldc , crown of Rdc and Rdm_1 . Maxillary dentition is poorly represented which include Rdm_1 and Rdm_2 , as well as the slightly damaged Rdi_1 . Permanent RM_1 is present too.

Preservation of the post-cranial elements is equally good, but post-mortem damage has occurred for most of the bones resulting into metaphyses breakage. Both right and left clavicles are present, but both ends are missing for either. Right humerus is completely preserved and measurable. Right ulna has proximal half of diaphyseal shaft and the right radius has distal half. Pelvis is totally missing. Right femur has complete head and 2/3 of the proximal shaft, the left counterpart has complete distal end and 2/3 of the distal shaft. Right tibia has complete diaphysis but the ends are broken post-mortem. Right fibula is complete whereas the left fibula has complete shaft with the ends broken. Many rib fragments, neural arches, metacarpals and phalanges are present.

Description of Dental Elements: Grade 1 shovelling is observed in Rdi_1 . The Rdm_1 are four cusped as is the Rdm_2 . The first incisor have Carabelli of grade 4. Both R/Ldm_1 have 5 cusps, the hypoconid is split into very small hypoconulid. The R/Ldm_2 are also 5 cusped with normal hypoconulid. No accessory cusp is observed on any of the molars. The permanent molars are incompletely calcified and morphological features are not clear.

The odontometric data for Burial 66 dentition is presented in table 40.

Table 40

Dental Crown Dimensions and Indices: Burial 66

		Crown Diameters		Crown Indices		
		MD	BL	CA	CI	CM
<i>Maxilla</i>						
di_1	R	6.6	—	—	—	—
dm_1	R	7.8	8.8	68.6	112.8	8.3
dm_2	R	9.3	9.9	92.1	106.3	9.6
<i>Mandible</i>						
dc	R	5.8	5.2	30.2	89.7	5.5
	L	5.7	5.1	29.1	89.3	5.4
dm_1	R	7.3	9.5	69.4	130.1	8.4
	L	7.3	9.3	69.4	130.1	8.4
dm_2	R	10.4	9.3	96.7	89.4	9.9
	L	10.6	9.2	97.3	86.8	9.9

The permanent teeth are not measured as the crown calcification is incomplete.

Description of Post-cranial Bones: The diaphyseal length of right humerus is 93.4 mm and the right fibula is 102.3 mm. The right femur is complete proximally and the left one is complete distally. An estimated length of the bone considering these two bones together is 121.0 mm.

No unusual pathological lesions are seen on the bones preserved in this burial.

Age Determination: On comparing the long bone lengths with the bone lengths of Arikara and Inangaun data an age of 8 to 10 months is suggested for this individual.

The crown calcification provide much precise and reliable age estimate.

The deciduous second molars, dm2's, complete crown calcification generally at 10 to 12 months. In this specimen the dm2's appear to have attained full degree of calcification. The permanent first molars start crown calcification at birth and in this calcification the crowns are partially calcified. Though the exact degree of calcification in this case cannot be determined approximately 1/4 to 1/3 calcification appear to have progressed. The deciduous incisor, Rd¹, was isolated and its root is slightly damaged. However, the preserved portion of the root strongly suggest that half of calcification is complete.

Considering all these data an average of 8 to 10 months at time of death seem most appropriate.

Sex Determination: Uncertain.

Burial No. 67

Excavation date: 31.5.1979	Age: Premature or still birth
Cultural phase: Jerwe	Sex: Uncertain
Sector: II	Cranium: A few fragments
Trench: CZ'2	Mandible: Missing
Layer: I	Dentition: Missing
Burial type: Twin-burn	Post-cranium: Well preserved,

Preservation and Skeletal Inventory: This burial contains fragmentary and not well represented cranial remains and rather well preserved post-cranials of a baby who died at the time of birth or immediately after it. No dental germs are found associated with this burial.

The cranial elements preserved are extremely small sized and mostly include elements of the neurocranial vault. All of them, in all ten, are unidentifiable except the left condylar portion of occipital and left petrous portion of the temporal. No gnathic or dental elements are present.

The post-cranials are very well preserved and many long bones are complete and undamaged. Beside the numerous rib fragments, neural arches, vertebral centra, metapones and phalanges the following post-cranials are present.

The pectoral girdle is represented by complete left clavicle, the right one is also complete except for the slight post-mortem damage that has occurred to the sternal end. No scapular

blades are preserved. The left humerus is complete and damaged and the right humerus head is slightly damaged but the bone is complete otherwise. Both right and left ulna are complete as is the right radius. The left radius has suffered slight damage to the proximal end but the bone is very much complete and an estimate of diaphyseal length is possible.

The right and left iliac fragments are present, the present, the left one is more complete; however, none of them is measurable. The lower extremities are less represented. Right femur is the only complete bone, the other elements preserved being only diaphyseal segments of right and left fibula.

Description of Post-cranial Bones: The post-cranial bones are undamaged and complete, provide rare data of bone lengths in the given age group. The diaphyseal lengths of the measurable bones are given below:

Clavicle	L	40.2 mm
Clavicle	R	(39.5 mm)
Humerus	R	62.5 mm
Humerus	L	61.5 mm
Ulna	R	58.2 mm
Ulna	L	58.2 mm
Radius	R	50.5 mm
Radius	L	(49.8 mm)
Femur	R	71.1 mm

No post-cranial or cranial bone of this individual exhibit abnormal pathology.

Age Determination: When the long bones of this individual are compared with the corresponding bone lengths of Arikara new borns it is observed that they compare well and even for some cases they are slightly less⁴⁵.

When compared with the Inangaon long bone data at 0 to 6 months age group they fall below the lower range, except for femur where the Burial 67 femur is 0.4 mm more than the lower limit for the said age range.

The best estimate in this case be death right at time of birth, i.e., still birth or immediately after it, or more likely a premature still birth.

Sex Determination: Uncertain.

Burial No. 68

Excavation date: 31.5.1979	Age: 6 to 8 months
Cultural phase: Jorwe	Sex: Uncertain
Sector: II	Cranium: Well preserved
Trench: DZ'4	Mandible: Fragmentary (incomplete)
Layer: I	Dentition: 6 deciduous, 3 permanent
Burial Type: Twin-urn	Post-cranium: Fragmentary (incomplete)

Preservation and Skeletal Inventory: This is one of the best preserved specimens in this skeletal series as far as the cranial bones are concerned. Some dental germs are present, the post-cranium is rather fragmentary but a few bones are complete.

The skull of this individual is represented by the well preserved right half and fragmentary left half of the cranium. Some of the facial bones are present too which include maxilla and both malar bones. The maxilla retains the lower border of the left orbit and alveolar crypts of Ldi^1 thru Ldm^1 , the right side element is missing. The frontal is well preserved on the right side as is the parietal. The left frontal has many parts missing, the damage is post-mortem. The right temporal and sphenoid are well preserved. Left side bones are either missing or have suffered severe post-mortem damage. The occipital bone is relatively complete, only part that is missing is the left lambdoid region. The basi-occipital, condylar portions are present.

The mandible is nearly complete from LM_1 region thru Rdm_1 region. The crypts are well preserved but not the germs. Only LM_1 and Ldm_2 are retained in the crypt. The alveolar bone on the anterior and posterior surface of the symphysis has broken away. The ascending rami are missing.

Besides the dental germs, LM_1 and Ldm_2 in the crypt isolated RM_1 , Rdm_2 , Rdm_3 and Ldm_3 are recovered. The maxillary teeth include Rdi^1 , Rdm^1 and RM^1 .

Post-cranials are relatively fragmentary, the cuts apparent on bones are fresh. From the upper extremities the right clavicle is complete but for the slight damage to the ends. The left clavicle has broken sacral end. For left humerus proximal 2/3 of the diaphyseal shaft is present but the head is broken. The right radius is complete whereas the left radius has only distal 2/3 preserved. Left ulna is missing and right ulnar head is the only portion preserved for that side. From the lower extremities, the pelvis is only represented by complete right ilium, no other bone is present for the girdle. Right femur has proximal head and 3/4 of shaft. Left femur has head and 2/3 of shaft. The right tibia is missing but the left tibia has head and 1/3 of proximal shaft. Right and left fibular shafts are present, both ends are broken post-mortem for either of them. A few rib fragments, neural arches and phalanges are present.

Description of Dental Elements: The dm_2 's and M_1 's as well as M^1 are incompletely calcified and the features on occlusal surface are not distinct. The Rdm^1 has no hypocone and show very small metacone. No shovelling is observed on Rdi^1 . The mandibular R/Ldm_3 's are four cusped, no accessory cusp is noted.

The measurable teeth for which calcification is complete are recorded below.

Table 41. Dental Crown Dimensions and Indices: Burial 68

		Crown Diameters		Crown Indices		
		MD	BL	CA	CI	CM
<i>Maxilla</i>						
di^1	R	6.2	5.1	31.6	82.3	5.7
dm^1	R	8.4	9.1	76.4	108.3	8.8

Mandible

dm ₁	R	8.4	8.6	72.2	102.4	8.5
	L	8.5	8.6	73.1	101.2	8.6

Description of Post-cranial Bones: Length of the right clavicle is 57.2 mm. The right radius is 77.3 mm. The right ilium is also completely preserved, the breadth of which is 49.1 mm.

No bone of this individual exhibit unusual pathology.

Age Determination: The radial length of this individual falls near the mean (75.5 mm) for radial lengths for Inangaon 0.5 to 1.5 infants.

The dm₁'s are completely calcified for crown development suggesting an age of more than 6 months. The dm₂ have not yet completed crown calcification but seem half progressed. This indicate an age of around 8 months. The root development in the deciduous incisor has begun, 1/3 development has been achieved, suggesting an age above 6 months.

The above data given an approximate age of 6 to 8 months at time of death for this individual.

Sex Determination: Uncertain.

Burial No. 69

Excavation date: 31.5.1979	Age: Premature
Cultural phase: Jorwe	Sex: Uncertain
Sector: II	Cranium: Missing
Trench: DZ'4	Mandible: Missing
Layer: 1	Dentition: Missing
Burial type: Twin-urn	Post-cranium: Fragmentary (incomplete)

Preservation and Skeletal Inventory: This burial contains fragments of post-cranial elements of a fetus. Cranial or dental elements are missing for this individual.

The left scapula is almost complete with well preserved glenoid and acromion region, the vertebral border is broken but the axillary border is complete. Proximal shafts of left humerus and ulna are the other elements of the upper extremities.

For the pelvic girdle the left ilium is completely preserved. Right femur is complete but the left one is missing. Right tibial head and 2 pieces of fibular shafts (side?) are the other preserved elements.

Also 3 rib fragments, 2 neural arches are preserved in this burial.

Description of Post-Cranial Bones: The right femur is 68.2 mm in diaphyseal length. The breadth for left ilium is 32.0 mm.

Age Determination: Age assessment is rather difficult in the absence of any dental data. The femur is less in length than the femoral length 74.5 mm given for Arikara new borns⁴⁹. Premature death or still birth may be suggested on this basis.

Sex Determination: Uncertain.

Burial No. 70

Excavation date: 31.5.1979	Age: Less than 1 year
Cultural phase: Jorwe	Sex: Uncertain
Sector: II	Cranium: A fragment
Trench: DZ'4	Mandible: Missing
Layer: 1	Dentition: Missing
Burial type: Twin-urn	Post-cranium: Fragmentary (incomplete)

Preservation and Skeletal Inventory: This burial contains very poorly preserved and represented post-cranial elements of an infant. No cranial bones, except left petrosal, are present neither dentition.

Post-cranial elements are also poorly preserved. In all 6 diaphyseal segments are present, one of them is of right femur, second of left femur, third of right (?) tibia and the remaining three are unidentifiable, perhaps of right and left humeri and ulna. Eight rib fragments and 4 vertebral fragments are all that is preserved in this burial.

No significant observations can be made on these bones.

Age Determination: For this individual neither dentition is present nor complete long bones. So any statement regarding age assessment should be flexible. On the basis of the size of the long bones only thing that may be said is that this individual was an infant at time of death.

Sex Determination: Uncertain.

Burial No. 71

Excavation date: 31.5.1979	Age: Child
Cultural phase: Jorwe	Sex: Uncertain
Sector: II	Cranium: Missing
Trench: DZ'4	Mandible: Missing
Layer: 1	Dentition: Missing
Burial type: twin-urn	Post-cranium: Two fragments

Preservation and Skeletal Inventory: Individual buried here is represented only by two diaphyseal fragments, a mid-shaft segment of tibia and a fibular fragment of 3 cm long, sides cannot be identified with certainty for either.

No observation or additional comment be made on this preservation.

Age Determination: On the basis of the bone size 'child' status may be given to this individual.

Sex Determination: Uncertain.

Burial No. 72

Excavation date: 31.5.1979	Age: 1 to 2 months
Cultural phase: jorwe	Sex: Uncertain
Sector: II	Cranium: A few fragments
Trench: DZ'4	Mandible: Fragmentary (incomplete)
Layer: I	Dentition: Missing
Burial type: Twin-urn	Post-cranium: Fragmentary (incomplete)

Preservation and Skeletal Inventory: This burial contains poorly preserved cranial and rather well preserved post-cranial elements of an infant. No dental elements are associated with this burial.

Eight small sized fragments of the bones of the neurocranial vault are present. Because of their small size and weathered nature almost all of them are unidentifiable. No fragment exhibits a sutural margin or any distinguishing anatomical landmark. Only the right and left petrosals are identifiable and the right and left condylar portion of the occipital.

Mandible is represented only by the right half of the corpus, from the symphysis to the gonial region. The ascending ramus is missing. The state of preservation for this bone is rather good, the lower margin is undamaged and the alveoli for all teeth are present, the dental germs are missing.

The post-cranials are better preserved but post-mortem fresh breaks make most of the bones incomplete. No pectoral elements are present. Distal 2/3 for the right humerus and distal 1/3 for the left humerus are preserved. No forelimb bones are present from either side. From the pelvic girdle the left ilium is complete but the right side bone and other pelvic bones are totally missing. The left femur is complete and undamaged. The right femur is also complete but for the slight damage that has occurred to the distal end. Right tibia has proximal 2/3 of the diaphyseal segment but both the ends are missing. The left side element is represented by two mid-shaft segments. Fibular fragments are present representing bones from both the sides. Other post-cranial bones include several rib and vertebral fragments.

Description of Post-cranial Bones: The right femur is slightly damaged at the distal end but its diaphyseal length may be estimated as 79.0 mm. The left femur is complete, the maximum length of which is 78.6 mm. The ilium is also completely preserved and it measures 33.3 mm in breadth and 29.5 in height.

No unusual pathology is observed on the bones preserved.

Age Determination: The femur of this individual stand close to the mean of femoral length of Arikara¹⁸ and Inangaon 0 to 6 months infants. The difference is of 3 to 4 mm.

The mandibular symphysis appears to have partially fused.

This data suggests an age at death between 1 to 2 months.

Sex Determination: Uncertain.

Burial No. 73

Excavation date: 31.5.1979	Age: 2 to 3 months
Cultural phase: Jorwe	Sex: Uncertain
Sector: II	Cranium: A few fragments
Trench: KZ/4	Mandible: Fragmentary (incomplete)
Layer: I	Dentition: Missing
Burial type: Twin-urn	Post-cranium: Fragmentary (incomplete)

Preservation and Skeletal Inventory: This burial contains fragmentary and less represented cranial and abundant but damaged post-cranials of an infant.

The cranial elements are few; in all 8 small and medium sized pieces of neurocranial vault are present. The frontal with the right superior orbital margin, left temporal-squamous portion, parietals, right and left petrous portions and left condylar part of occipital are identifiable elements.

Mandible is represented by a small fragment of the left corpus from the symphyseal face to the region of Ldm_1 . The crypts are preserved in good condition, the germs are missing.

The post-cranials are slightly better preserved; many breaks appear fresh. Though no bone is complete and undamaged, length estimates are possible for some of the bones. The following elements are preserved. Left humerus has proximal end and the distal half, the middle portion is missing. Right humerus is complete in length but proximal end is damaged heavily on the posterior side. Proximal half of right ulna and almost complete right radius is present. The left side bones are missing. The iliac piece of the right side is present, no other bone from the pelvis is evident. Both right and left femur are complete, both the bones are heavily eroded but the length measurement is possible with fair accuracy. Mid-shaft segment of tibia (side?) is present, the fibular elements are totally missing. About 9 rib and 8 vertebral fragments are preserved in this burial.

Description of Post-cranial Bones: The diaphyseal length estimates are given below:

Humerus	R	(73.0 mm)
Radius	R	58.3 mm
Femur	R	(82.5 mm)
Femur	L	(82.9 mm)

No other unusual features are observed on these bones.

Age Determination: Since no dental elements are preserved in this burial age assessment has to be based entirely on the long bone data.

When compared with the Imangaon or Arikara infants of the 0 to 6 months age group, the bone lengths of this individual are slightly more or near the mean in all the cases. This would mean that this individual was approximately 2 to 3 months old at time of death.

Sex Determination: Uncertain.

Burial No. 74

Excavation date: 31.5.1979	Age: Foetus or still birth
Cultural phase: Jorwe	Sex: Uncertain
Sector: II	Cranium: A few fragments
Trench: EZ*4	Mandible: Missing
Layer: 1	Dentition: Missing
Burial type: Twin-urn	Post-cranium: Fragmentary (incomplete)

Preservation and Skeletal Inventory: The individual present in this burial is very poorly represented. A few cranial and post-cranial elements are all that is present in this burial. No gnathic or dental elements are represented.

Cranial fragments present are three, small sized, one of them is of petrous portion of left temporal, the other two are from the neurocranial vault bones but identification to elements is not possible.

The post-cranial elements present include the following. Proximal end and about 3/4 of the shaft of right ulna, one radial (side?) diaphyseal segment and 3 mid-shaft segments of unidentified bones are present in this burial. Besides 14 rib fragments and 3 vertebral fragments are preserved.

No significant observation can be made on the elements preserved.

Age Determination: The ulna is damaged distally, but in the absence of any dental data or any other complete long bone on which age assessment may be based, an estimate, though very rough, of its diaphyseal length is made. The estimated length is 60.0 mm. In view of these limitations no precise age determination is possible. However, the individual appears to be a immature foetus or new born baby at time of death. The ulnar length at birth is 69.0 mm for Arikara population²¹. The ulna of Inamgaon specimen INM 63-a is 66.9 mm whose age on the basis of dental calcification is assessed as foetus to 2 months. The smallest ulna from Inamgaon is of INM 135 individual, 65.0 mm who is aged as less than 1.5 months on the basis of calcification sequence.

The best estimate for this individual be full term foetus or death immediately after birth, neonatal death.

Sex Determination: Uncertain.

Burial No. 75

Excavation date: 2.6.1979	Age: 2.0 to 2.5 years
Cultural phase: Malwa	Sex: Uncertain
Sector: II	Cranium: Extremely fragmentary
Trench: ZD 60	Mandible: Missing

Layer: 5
Burial type: Twin-urn

Dentition: 1 deciduous, 2 permanent
Post-cranium: A few fragments

Preservation and Skeletal Inventory: This burial contains 3 small sized neuro cranial fragments all of them are unidentifiable. A few long splinters of long bones are also preserved but no more diagnosis can be made.

Fortunately this burial preserves three dental elements, all of them are mandibular, two permanent, RM_1 and LM_1 , and one deciduous, Rdm_1 .

Description of Dental Elements: The permanent molars have not yet completed crown calcification but seem to be on the verge of completing it. The LM_1 and RM_1 are Y-6 in the cusp number and groove pattern. Interestingly both exhibit C-7, metaconulid of very small size but very distinct too. No paramolar tubercle or deflecting wrinkle or protosylid or other features are present. The deciduous Rdm_1 was five cusps with very small hypoconulid.

The dental crown dimensions are given in table 42.

Table 42. Dental Crown Dimensions and Indices: Burial 75

		Crown Diameters		Crown Indices		
		MD	BL	CA	CI	CM
<i>Mandible</i>						
dm_1	R	8.4	7.3	61.3	86.9	7.9
M_1	R	11.2	10.7	119.8	95.5	11.0
	L	11.2	10.8	120.9	96.4	11.0

Age Determination: The dentition enables to determine age of this individual very precisely.

The deciduous molar, Rdm_1 , in this individual is fully calcified for crown development and root is also fully formed. For dm_1 's root development is generally complete at 2.25 years, suggesting age at death as more than 2.25 years.

The first permanent molars begin crown calcification at birth and the process is complete at about 2.5 to 3.0 years. The molars of this individual are though not fully calcified certainly more than half of the process is achieved. The occlusal patterns are very clear. This would suggest an age of around 2 years, rather more than 2 years.

The best estimate be between 2 to 2.5 years at time of death.

Sex Determination: Uncertain.

6. Discussion and Conclusions

Table 43 gives the age, sex and cultural phase-wise distribution of the Daimabad human skeletal sample analysed. Except one, adult specimen which comes from the Late Harappan levels all others belong to the later cultural phases of Malwa, overlap between Malwa and Jorwe and Jorwe culture. The pre-adolescent sample consists of 34 individuals (97.15%) while the

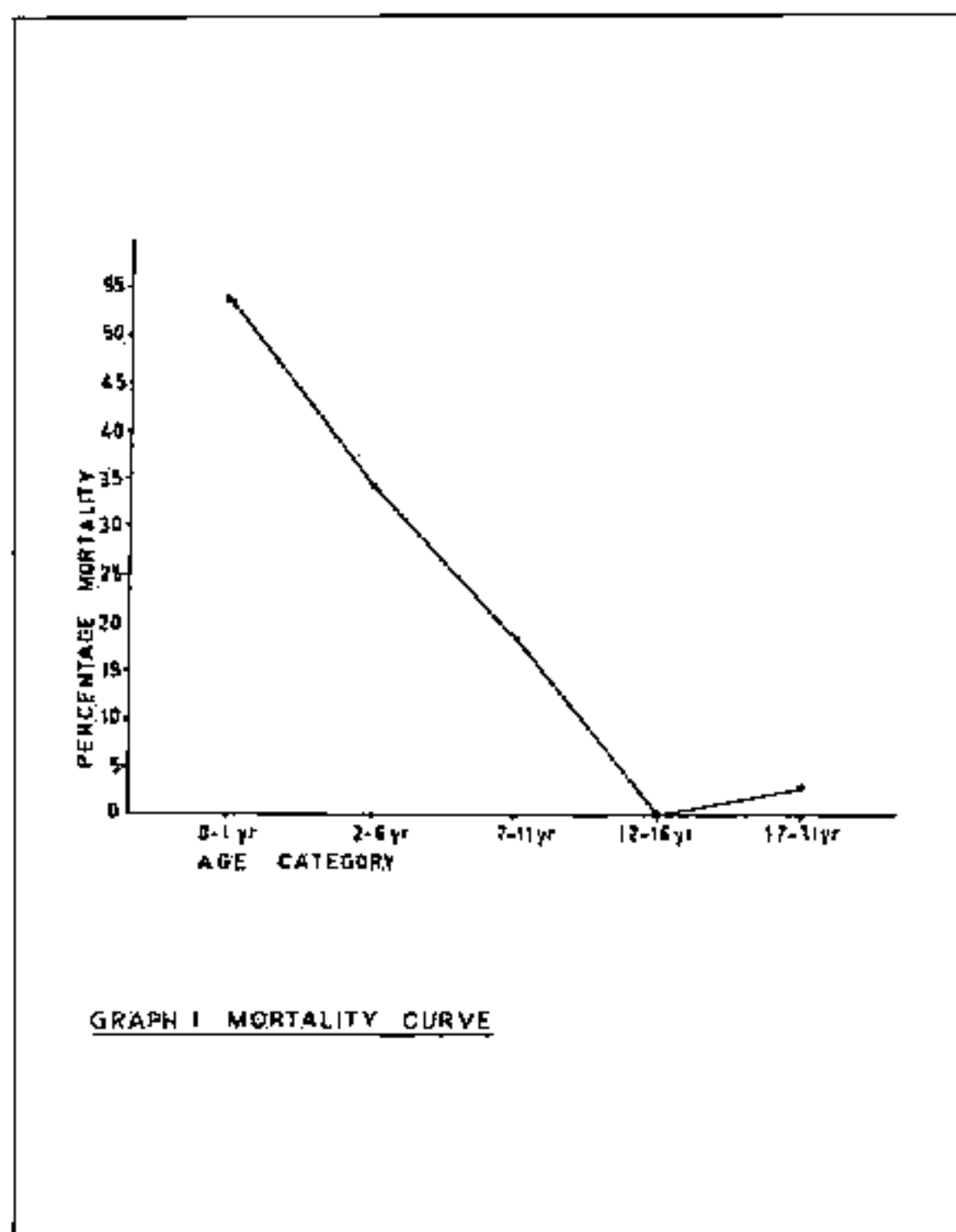


Fig. 152. Mortality curve.

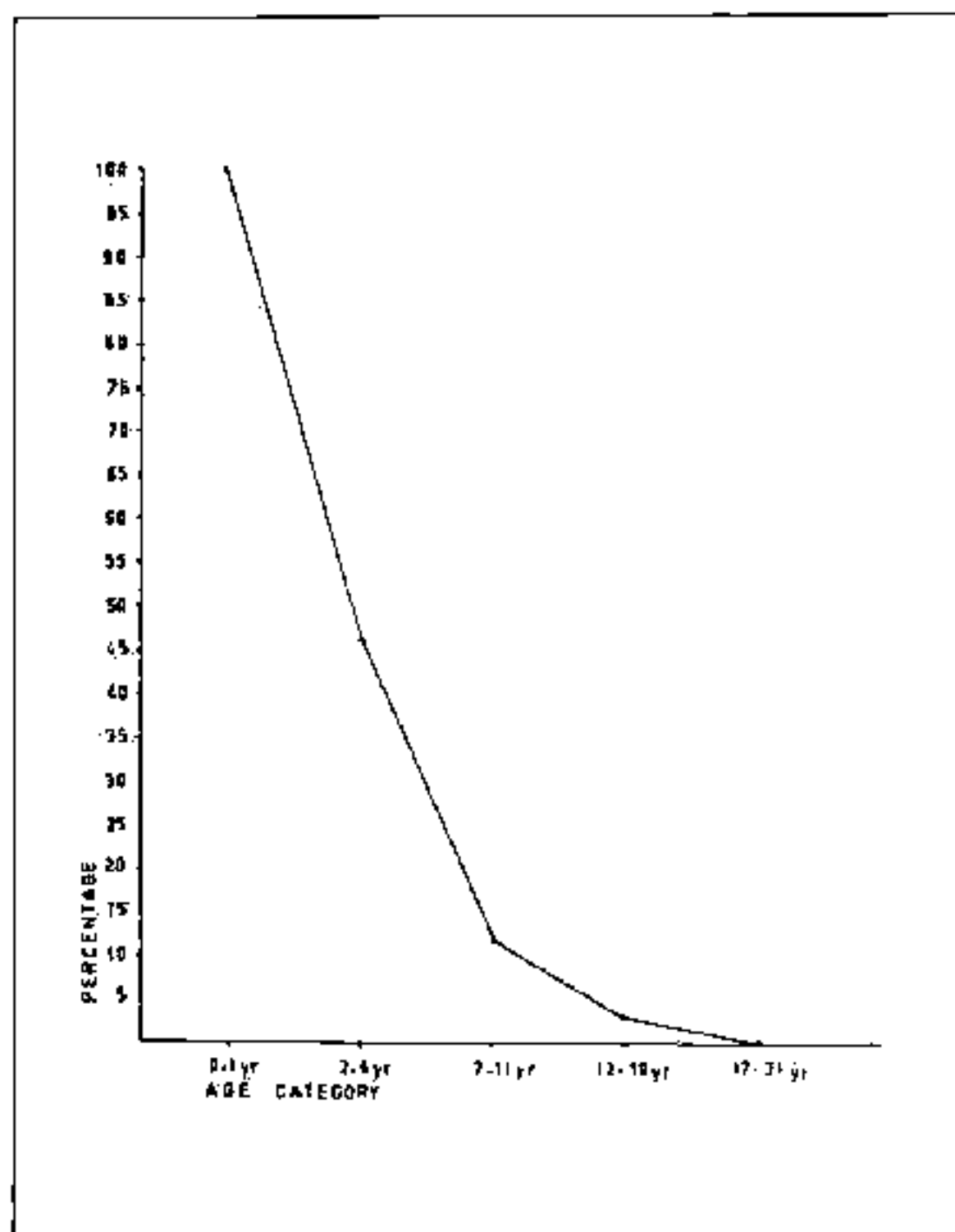


Fig. 135. Survivorship curve.

Notations used in graph 3 to 7: AD - ADITTANALUR

BB - BELLAN BANO PALASSA

BR - BRAHMAGIRI

BZ - BURZAHOM CH - CHANDOLI

DM - DAIMABAD

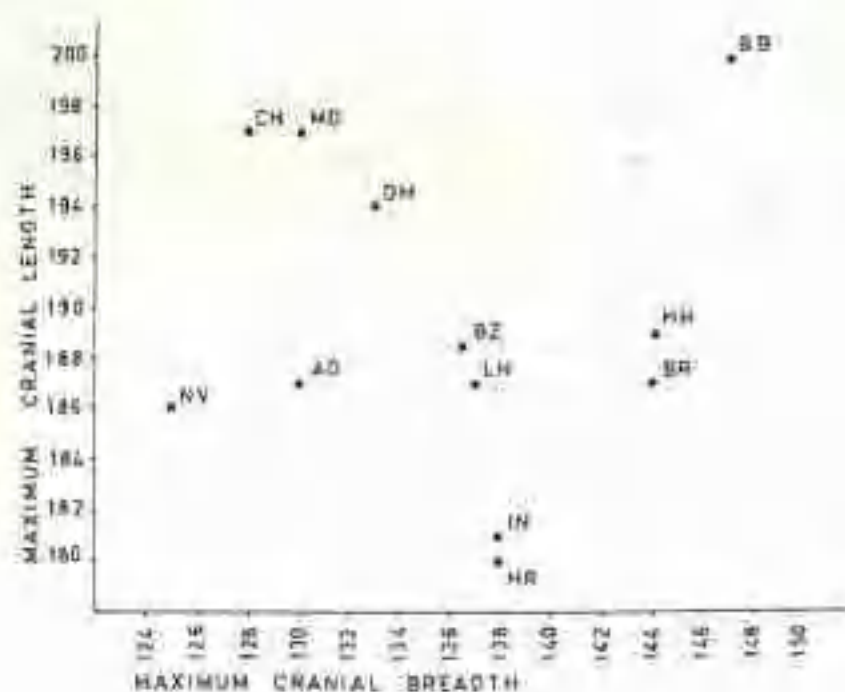
HH - HARAPPA H-ST II

HR - HARAPPA R-ST

IN - INAMBADH LN - LANGHNAJ

MD - MOHENJO-DARO

NV - NEVASA



GRAPH 3. COMPARATIVE CRANIAL INDICES

Fig. 134. Comparative cranial indices.

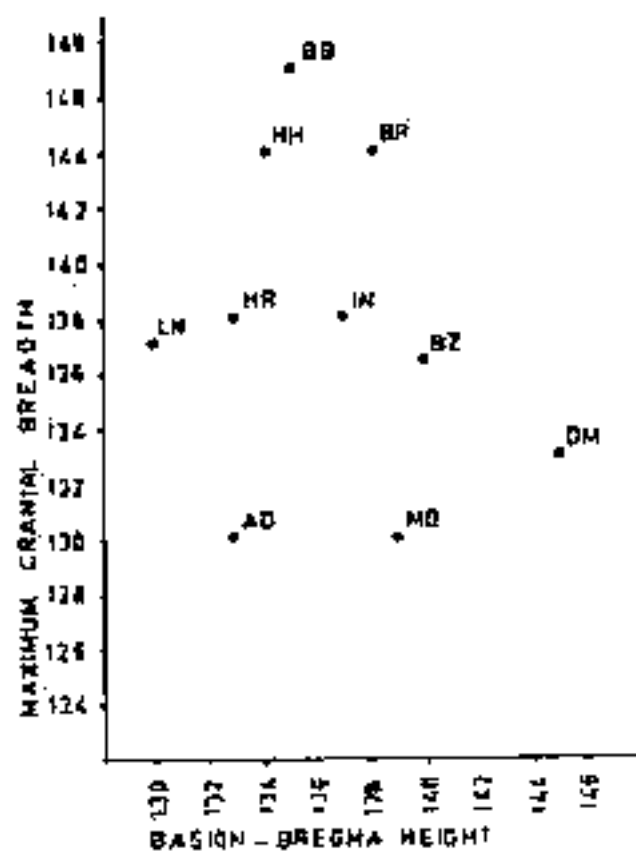


Fig. 455 Basion - bregma height - cranial length indices.

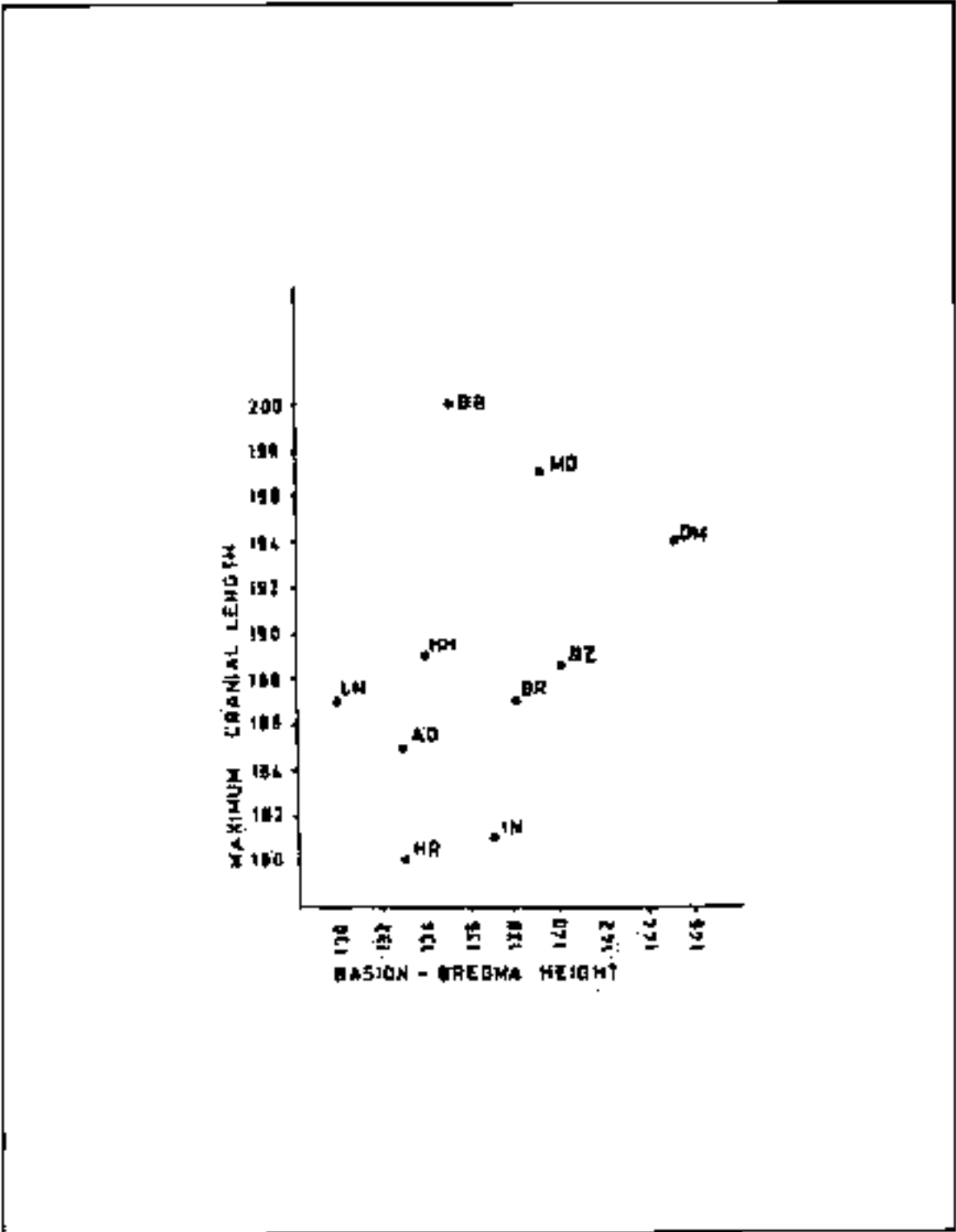


Fig. 156 Basion - Orebma height - cranial breadth indices

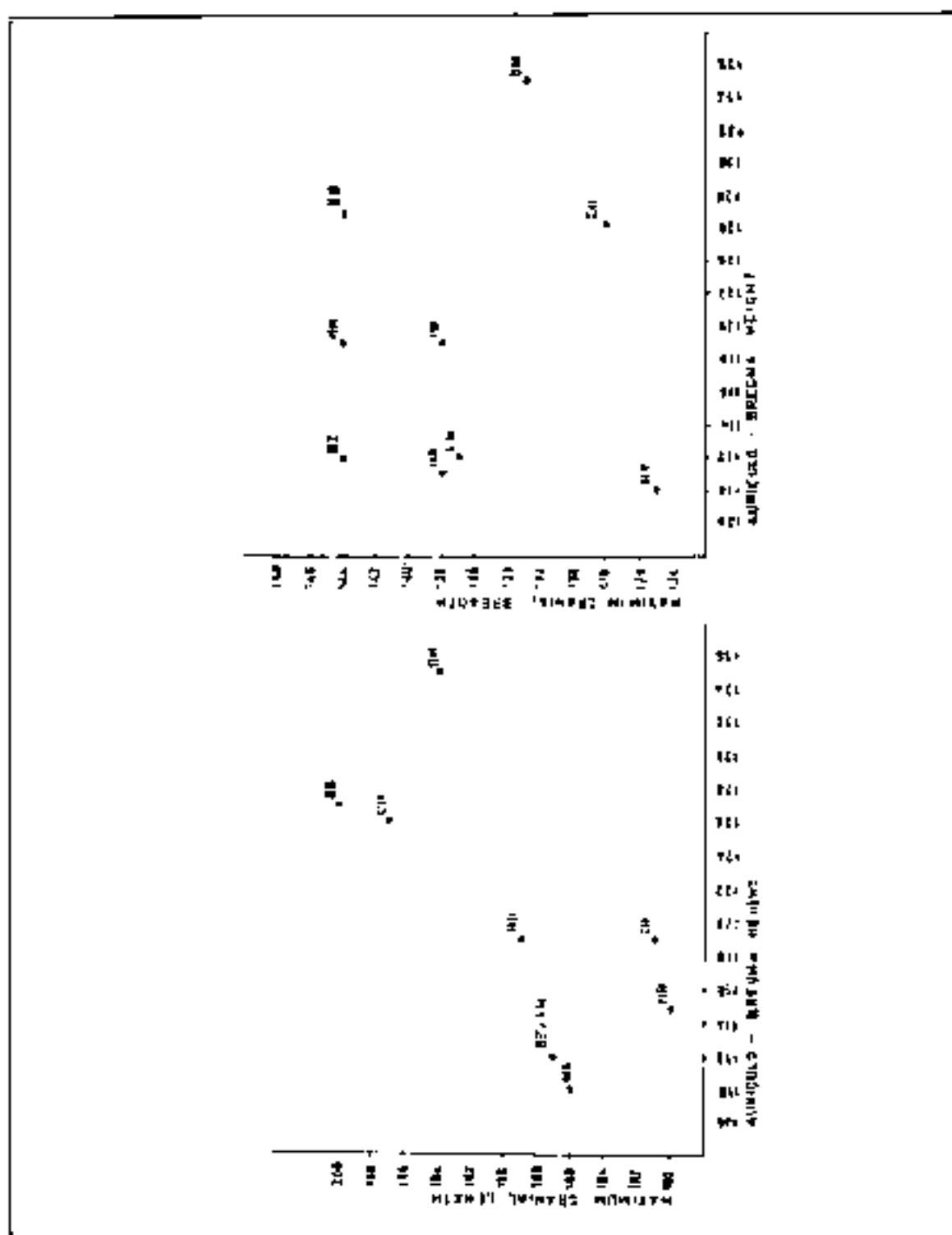


Fig. 137. *A. auriculata* - stem length (cm) vs. rainfall (mm). Fig. 138. *A. auriculata* - stem length (cm) vs. rainfall (mm).

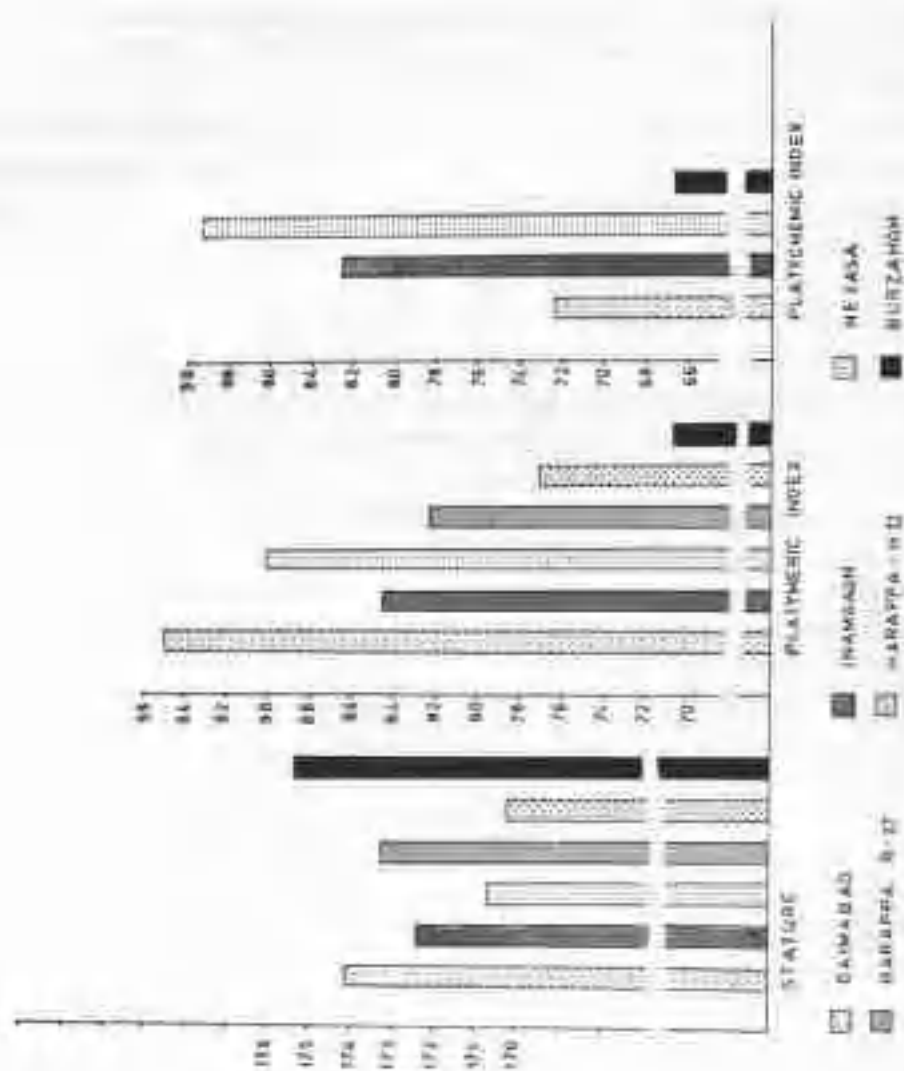


Fig. 139. Post - strata comparisons.

adult segment is represented by only one specimen (2.86%). The Jorwe culture is predominantly represented with 25 individuals (71.43%), overlap between Jorwe and Malwa by 5 individuals (14.29%), Malwa by 4 individuals (11.43%) and Late Harappa by one individual (2.86%). This distribution is clearly biased, in the sense, the preadolescent and the later cultural phases are over represented. The paucity of adolescent and adult individuals may best be attributable to exposure, disposal and possible cremation as alternatives to the practice of burial. Possibility of a burial in a cemetery outside the habitation area cannot be ruled out. The differential cultural-wise representation is primarily due to the more extensive excavations of later cultural phases.

Graphs 1 and 2 are the mortality and survivorship curves for the skeletal series studied. In general, these curves conform to the general mortality pattern, described on the basis of larger representative skeletal samples²². High infant mortality and low adult mortality are primarily due to sample bias. Comparisons on culture wise distribution cannot be attempted because of the small sample size. (*figs. 132 and 133*)

Only on the basis of one adult burial no conclusions can be drawn regarding the biological characteristics of the Daimabad population. Any statement about the racial affinities should be regarded as tentative. This adult burial has already been described in detail. The craniometric observations possible on this specimen are compared with some of the prehistoric male populations. Tables 44, 45 and *figs. 134 through 139* present the data. As far as the neurocranial dimensions are concerned the Daimabad adult stand apart from the two best preserved Inamgaon specimens of Jorwe phase, Nevasa specimen from Indo-Roman levels, crania from Harappa R-37 and Cemetery H (Stratum II), Burzahom, Adittanahur, Brahmagiri and Langhnaj. The values of cranial indices for Nevasa and Adittanahur are comparable with those for Daimabad individual but this specimen is much longer in head dimensions than Nevasa and Adittanahur specimens. The best comparable crania are from Chandoli and Mohenjodaro. The Daimabad skull vault is exceptionally high. This definitely cannot be attributable to postmortem deformation or error in reconstruction. The exact cause for this remains unknown at this stage; however, it is certainly in the modern range and may simply be individual variation. In basion-bregma height-length-breadth graphs the Daimabad and Mohenjodaro (ba-br height not known for Chandoli), and in auriculo-bregma height-length/breadth graphs the Daimabad and Chandoli (au-br height not known for Mohenjodaro) specimens exhibit fair amount of closeness. The Daimabad specimen is definitely taller than the Inamgaon, Nevasa and Harappa specimens, Burzahom being the tallest in the series (Table 45). The platymeric index, or Daimabad is largest in the series but fall in the range of Eurymeric.

The multivariate analysis and the comparisons based on dental data will give the best clues regarding the genetic affinities of this population. These investigations are currently in progress. At this stage it may only be said, with some reservations, that the Daimabad adult presents a mixture of Mediterranean and Protoaustraloid racial elements.

The osteometry of the new born is an important aspect of this study. Approximate long bone lengths for 0 to 6 months infants in this skeletal series are given in Table 46. This along with the Inamgaon skeletal data may give a clearer picture of the skeletal growth of long bones among infants. In South Asian populations no other study of similar nature have so far been undertaken.

Thorough macroscopic observations on skeletal and dental pathological lesions revealed some interesting results. Though the dental health is rather good among the infants as well as for the adult, some evidences of dental caries, gross enamel hypoplasia, tartar accumulations and calculus deposits are observed. The other skeletal lesion observed is the ossified supperiosteal haemorrhage, which represent a form of infantile scurvy. Weakness of blood capillary or arterial walls due to inadequate vitamin C in the diet can enhance the possibility of haemorrhage^{2,3}. Since mother's milk is the primary food source for the infant showing this lesion limited intake of vitamin C is assured. Detailed account of pathological and anomalous lesions is given in individual burial description.

The palaeodemography is relatively a young discipline in India. To have better understanding of the history of the population growth, mortality and morbidity, disease pattern more studies in this field are necessary. Restudy of important museum collections with this new perspective may reveal more interesting and clear biological picture of the ancient populations.

Table 43:

*Distribution of Human skeletons from Daimabad
by age, sex and cultural phase.*

Age Category	Late Harappa	Malwa	Overlap between Malwa and Jorwe	Jorwe	Total
Infant 0 to 1 year Early child	0	1	4	14	19 (54.29)
2 to 6 years Late child	0	3	1	8	12 (34.29)
7 to 11 years Adolescent	0	0	0	3	3 (8.57)
12 to 16 years Young adult	0	0	0	0	0 (—)
17 to 31 years	1	0	0	0	1 (2.86)
Total	1 (2.86)	4 (11.43)	5 (14.29)	25 (71.43)	35

TABLE 44

Comparative metric data for Daimabad and selected prehistoric (male) populations of the Indian sub-continent

	Daima- bad	Inamgaon 39	Inamgaon 145-1	Venkat n = 1	Harappa R-37 n = 7	Har- appa H-77 n = 7
<i>Sample size</i>	n = 1			n = 1	n = 7	n = 7
<i>Measurements</i>						
Cranial length	194	176	181	180	180	189
Cranial breadth	133	137	138	128	138	144
Basion-bregma ht.	(145)	—	137	—	123	154
Auricle-vertex ht.	158	111	123	218	—	—
Auricle-bregma ht.	155	109	119	110	116	119
Minimum frontal diameter	89	101	87	89	95	95
Biogomatic diameter	121	(128)	122	121	131	136
Orbital height	40	—	31	32	34	38
External palatal length	53	—	(38)	—	—	—
External palatal breadth	55	—	—	—	59	59
Bicondylar breadth	114	114	(130)	121.0	103.9	(112.5)
Bigonial breadth	(96)	99	(90)	94.5	89.1	79.0
Symphysal height	39	35	(56)	55.5	55.5	50.5
Height of corpus at M ₂	30	28	31	—	—	—
Ascending ramus height	62	—	58	53.0	58.4	62.0
Minimum breadth ascending ramus	32	35	37	30.0	34.5	35.0
Condyle-symphysal length	108	(98)	105	105.0	81.9	87.0
Mandibular angle	124°	124°	131°	118.5°	120.2°	110.5°
<i>Indices</i>						
Cranial index	88.56	77.86	76.24	87.20	76.40	76.70
Cranial module	137.35	—	152.00	—	150.50	155.70
Cranial capacity	1586.00	1318.64	1444.20	1501.31	—	—
Zygofrontal index	73.55	78.91	71.31	72.95	72.50	68.90
Height (ba-br) length index	74.74	—	79.69	—	75.89	78.90
Height (ba-br) breadth index	109.02	—	99.28	—	96.58	95.10
Height (au-br) length index	69.09	61.35	68.75	59.10	61.50	62.90
Height (au-br) breadth index	101.50	79.16	86.23	88.00	86.20	80.64
Height (au-v) length index	71.15	65.07	66.85	61.80	—	—
Height (au-v) breadth index	105.78	81.02	87.68	92.00	—	—

TABLE 44
continuedComparative metric data for *Uttamabad* and selected prehistoric (male) populations of the Indian sub-continent

<i>Burra- hum</i>	<i>Amrita- nagar</i>	<i>Bellari Bandi Pulastu</i>	<i>Brakman- giri</i>	<i>Chandoli</i>	<i>Langhnaj</i>	<i>Mohanjodaro</i>
n = 2	n = 2	n = 2	n = 5	n = 2	n = 2	n = 2
188.3	185	200	187	197	187	197
135.5	130	147	144	128	137	130
140.0	133	135	138	—	130	132
122.5	117	152	—	—	—	—
—	—	127	112	125	112	—
97.0	95	117	94	81	103	95
142.0	126	164	89	—	138	127
57.0	33	37	33	—	36	31
—	43	61	—	—	—	—
—	—	69	44	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—
—	—	—	—	—	—	—
72.43	69.90	73.30	77.10	64.30	73.30	68.00
155.00	149.33	160.67	156.33	—	151.33	155.33
1491.09	—	1722.18	1460.16	1519.02	1406.64	1471.50
68.30	73.81	71.34	—	—	74.64	74.80
73.70	70.80	67.50	74.80	—	69.40	70.60
105.30	120.00	91.00	94.30	—	94.60	107.50
—	—	65.50	59.30	65.40	59.80	—
—	—	86.50	78.00	98.40	81.70	—
84.38	65.24	65.00	—	—	—	—
89.85	90.00	89.60	—	—	—	—

TABLE 46

Table 46: Comparison of mean long bone lengths of Daimabad, Inamgaon and Arikara Indian Infants, 0 to 6 months

Bone	Daimabad		Inamgaon		Arikara Indians	
	Mean (n)	Range	Mean (n)	Range	Mean (n)	Range
Humerus	67.88 (4)	65.9 to 73.0	73.03 (9)	63.5 to 91.5	70.5 (49)	63.5 to 89.9
Radius	56.30 (3)	55.2 to 58.3	55.98 (10)	51.3 to 74.0	57.4 (47)	49.0 to 73.5
Ulna	61.20 (1)		71.62 (5)	65.0 to 81.0	66.1 (47)	60.0 to 82.5
Femur	79.26 (11)	73.9 to 89.0	83.80 (5)	70.6 to 109.3	82.2 (51)	62.5 to 106.0
Tibia	67.50 (3)	67.4 to 67.5	66.30 (3)	61.2 to 70.0	71.6 (47)	59.5 to 94.0
Fibula	64.40 (2)	63.4 to 65.4	65.70 (3)	61.1 to 68.0	68.9 (37)	58.0 to 90.5

TABLE 45

Table 45: Comparison of mean stature estimate and post-cranial indices (male populations)

<i>Site</i>	<i>Stature (n)</i>	<i>Platymetric index (n)</i>	<i>Platynecnic index (n)</i>
Daimabad	174.09 (1)	94.99 (1)	72.14 (1)
Inamgaon	172.48 (4)	84.48 (1)	82.54 (1)
Navasa	170.70 (2)	91.15 (2)	89.29 (1)
Harappa R-S7	173.24 (2)	82.24 (7)	—
Harappa H (St II)	170.24 (8)	77.05 (4)	—
Burzahom	175.35 (4)	70.70 (3)	66.50 (4)

Please refer page 474 for text

Table 8

Phase-wise Distribution of Stratified Terracotta objects

Phases	I	II	III	IV	V	Total
Objects						
Cult Image	—	—	—	—	5	5
Animal figurines						
Bull	—	1	1	—	3	5
Rhinoceros	—	—	—	—	1	1
Gamesman	—	—	—	—	3	3
Skin-scrubber	—	—	—	1	1	2
Cake	—	1	—	2	2	5
Dabber	—	—	—	—	1	1
Toy-wheel	—	—	—	—	3	3
Ball (marble)	—	—	—	1	1	2
Reel	—	—	—	—	1	1
Pully	—	—	—	—	1	1
Miscellaneous	—	—	—	1	1	2
Total	—	2	1	5	23	31

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APPENDIX VII

DETERMINATION OF FIRING TEMPERATURES OF POTTERY OF CHALCOLITHIC DAIMABAD

Vishwas D. Gogte and
Bhaskar C. Deotare

Department of Archaeology, Deccan College
Post Graduate and Research Institute,
Pune-411006

It is a wellknown fact that most of the ancient cultures are identified basically on characteristic pottery types evolved during the formation of the cultures. The repeated production of the same type of pottery required the standardization of many parameters such as the selection of clay, its purification, the addition of temper and finally the firing conditions. A slight variation in these parameters could result in production of an entirely different type of pottery. The following are the more important firing conditions which influence the chemical and physical properties of the final product: a) atmosphere of firing b) rate of heating c) maximum temperature reached during firing and d) rate of cooling. In the present study, we have attempted to estimate the firing temperatures of different types of pottery excavated at Daimabad. Earlier, a few experiments were successfully carried out to determine the firing temperatures of Jorwe and Malwa pottery from chalcolithic Inamgaon¹. The method consisted of estimating the ratio of ferric to ferrous states of iron in a potsherd which was fired at successively higher temperatures. In those experiments, reddish potsherds were fired in an electric furnace at controlled temperatures in oxidizing atmosphere. The ancient firing temperature was assigned to that temperature where the ratio of ferric to ferrous started to increase significantly. In order to confirm these results, x-ray diffraction analysis was also undertaken.

The following potsherds, reddish in colour, from different cultural phases at Daimabad were selected for analysis.

1. Jorwe-4 (Ca. 1400-1000 B.C.),
2. Malwa-3 (Ca. 1600-1400 B.C.);
3. Daimabad-10 (Ca. 1800-1600 B.C.)

4. Late Harappan-14 (ca. 2000-1800 B.C.)
5. Savaldi -16 (ca. 2200-2000 B.C.)

To determine the total iron content of a potsherd, a small amount (about 100 mg) of powdered sample was accurately weighed and brought into solution by alkali fusion. It was then titrated with standard dichromate solution². Ferrous component was determined spectrophotometrically by the ferrous: 1,10-phenanthroline complex formation method³. Ferric content was determined by the difference of total iron and ferrous contents.

Further, a potsherd was cut into about twelve pieces of approximately equal squarish size (one square cm). Each piece was fired at a particular temperature in a porcelain dish for a duration of 40 minutes, in an electronically controlled furnace (12 x 12 x 30 cm). An oxidizing atmosphere was created by supplying constant amount of air through an electric vibrator. The samples were fired at various temperatures between 300° to 900° C, as shown in the fig. 140. The potsherds were then powdered to 200 mesh size and ferric and ferrous contents were determined as above.

Discussion

When a lump of clay is fired at successively high temperatures, various chemical and physical reactions take place. In the initial stages, physically bound water is lost and then gradually the loss of structural water takes place. In most of the clay minerals water is present in their structures; the loss of this chemically bound water is therefore invariably accompanied by the decomposition of the clay mineral. During the course of the decomposition reactions various dissociation and rearrangement reactions take place in the clay mineral. These reactions usually occur at about 600° C resulting in solid products which are virtually an intimate mixture of the component oxides. Simultaneously, oxidation and reduction reactions of oxides either formed by decomposition of clay minerals or those present in the original clay also take place. We have undertaken the analysis of the oxidation states of iron in the potsherds because iron is present in virtually all clays and also it is most sensitive to oxidation and reduction processes taking place during firing operation. The important reactions of iron may be summarised as follows:

1. $4\text{FeO} + \text{O}_2 \longrightarrow 2\text{Fe}_2\text{O}_3$
2. $4\text{Fe}_3\text{O}_4 + \text{O}_2 \longrightarrow 6\text{Fe}_2\text{O}_3$
3. $\text{Fe}_2\text{O}_3 + \text{O}_2 \longrightarrow 2\text{FeO} + \text{CO}_2$

During the firing operation, the potters employ a certain set of firing conditions and corresponding to this a certain equilibrium between the ferric and ferrous states is attained. If the pottery is now refired with the same firing conditions, the ratio of ferric to ferrous is not expected to change until the earlier firing temperature is crossed. Beyond this temperature, new sets of reactions should take place disturbing the equilibrium of the oxidation states attained earlier. In the present study, oxidizing atmosphere is used for refiring the reddish pottery; the temperature where the first significant oxidation begins has therefore been assigned as the ancient firing temperature of the pottery.

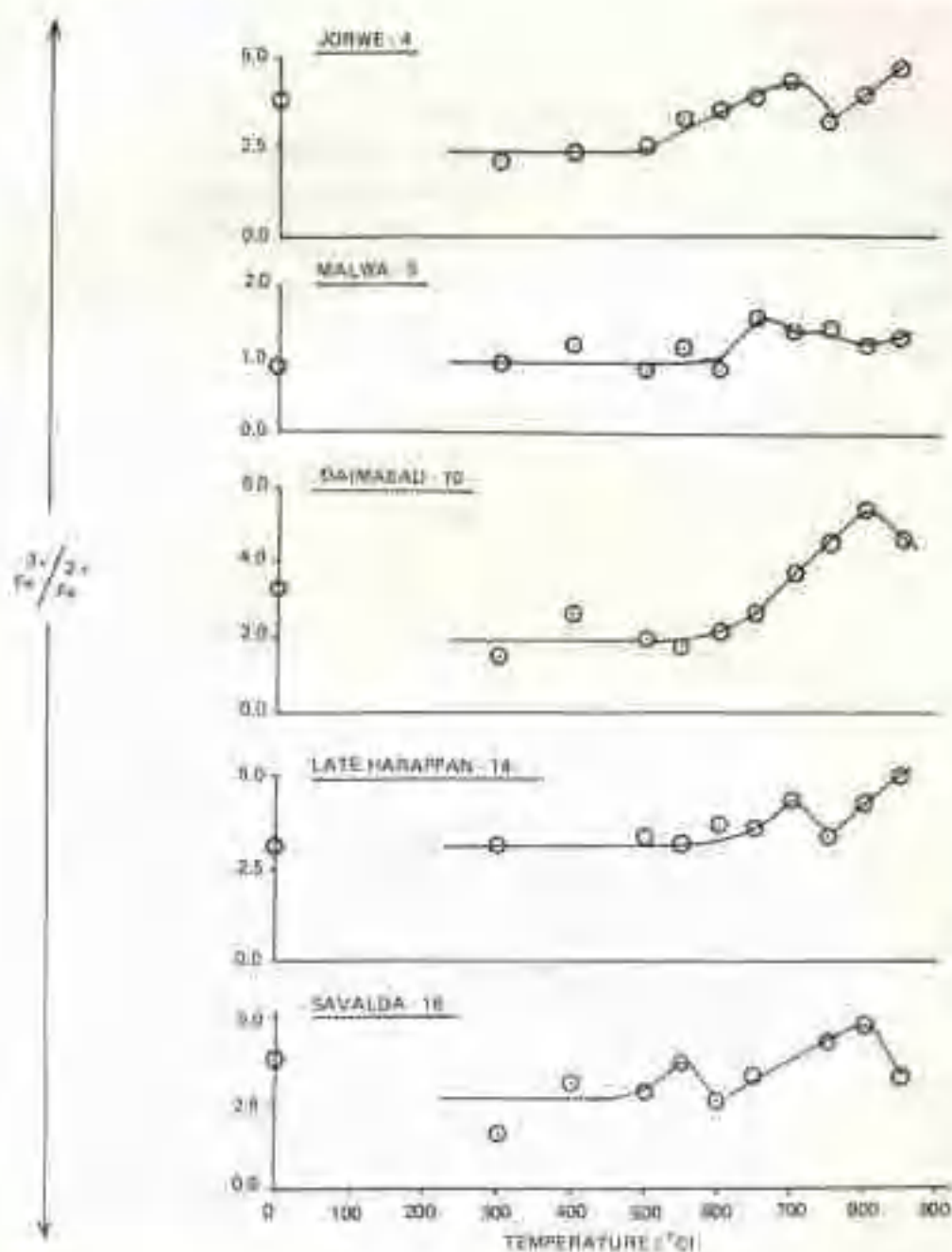


Fig. 146 : Refiring Experiments- the variation of ferric/ferrous ratio with temperature. The ratio remains constant upto a certain temperature and thereafter starts rising. The ancient firing temperature is assigned to the temperature where the rise in the ratio is significant.

In principle, the results should be similar to those obtained in Mossbauer spectroscopic experiments in which the ancient firing temperature was detected at temperatures where a change in the characteristic Mossbauer spectrum was observed in refining operation². However, while the chemical environment can be correctly identified from Mossbauer spectroscopic studies, a more precise estimation of ferric and ferrous states of iron is obtained in the classical chemical analysis used in this study.

From the fig. 140, which represents the variation of the ratio of ferric to ferrous with the refining temperature, it can be seen that ratio remained nearly constant upto a certain temperature and thereafter began to rise. In the potsherd Jorwe-4 the significant rise in the ratio is observed at 750° C; it is therefore the ancient firing temperature of Jorwe pottery. Similarly, the ancient firing temperatures of Malwa, Daimabad, Late Harappan and Savalda pottery types are 600°, 600°, 650° and 500° C respectively. It can be seen that the Jorwe pottery is one of the well-fired types of pottery. We also observed the same trend of results in the experiments on pottery from Inamgaon, where the Jorwe pottery showed the ancient firing temperature around 700° C and the Malwa Pottery, 575° C.

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Annexure - 1

In the season 1976-77 these features were observed in the trenches X'4 and Y'4 but the count was not attempted. In the following season potsherds of the transitional phase from the trenches N'3, N'5, Y'3, Y'5, Z'3, Z'4 and Z'5 were counted. The break up of trench was as follows:

<i>Trench</i>	<i>for ware</i>	<i>% to the total of all trenches</i>	<i>% to the total of each trench.</i>	<i>Mulvan Ware</i>	<i>% to the total of all trenches</i>	<i>% to the total each trench</i>	<i>Total</i>		
X'3	1310	17.7%	70.1	560	16.1%	29.9	1870	17.2%	100%
N'5	920	12.5%	59.4	630	18.1%	40.6	1550	14.3%	100%
Y'3	735	10.0%	78.2	205	5.9%	21.8	940	8.7%	100%
Y'5	1129	15.3%	61.4	710	20.4%	38.6	1839	16.9%	100%
Z'3	1405	19.1%	73.0	519	14.8%	27.0	1924	17.7%	100%
Z'4	1640	22.3%	68.9	739	21.2%	31.1	2379	21.9%	100%
Z'5	230	3.1%	65.5	122	3.5%	34.7	352	3.2%	100%
Total	7369 (67.9%)	100.0%	—	3485 (32.1%)	100.0%	—	10854 (100.0%)		

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