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Surface Evidence of Craft Activity at Chanhū-daro,
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Introductory note

With the excavation of the protohistorical site of Chanhū-daro Ernest Mackay concluded the early cycle of extensive excavations of the Harappan centers. One of the three mounds of the Chanhū-daro compound (Mackay's Mound II)¹ was almost completely investigated, giving the published report a character of exhaustivity which is obviously missing in the Moenjodaro and Harappa documentation. Nowadays in the literature Chanhū-daro frequently appears immediately after Moenjodaro and Harappa in the list of the major excavated Harappan towns (e. g. Allchin and Allchin 1968: 145; Wheeler 1968: 26; Fairervis 1975: 241). The size of the site was not particularly impressive nevertheless, the archaeological evidence substantially supported the image of the urban way of life reconstructed after the excavations of Moenjodaro, and contributed to laying the foundations of the model of urban behaviour which, further developed in the light of the data from Lothal and Kalibangan, now dominates our historical perception of the Harappan Civilization.

Chanhū-daro seems to recur in the literature for two further very different but outstanding research themes: its chronological/cultural sequence, embracing Harappa, Jhukar and Janghar levels (Piggot 1950; Casal 1969) and its massive evidence of craft activities in Harappan context (see, for example, Wheeler 1968: 57-60, 98-99). The present preliminary notes collect a first set of systematic observations on the surface of the

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¹ As a rule, in order to avoid confusion, we have preferred to use the topographic terms and names published by Mackay (cfr., for example, "Chanhū-daro"; "Mound II"; similarly, see the transcriptions "Jamal-Kirio" and "Khalil Pir").

site, more specifically monitored to this latter subject. Given the heterogeneous nature of the surface contexts at Chanhu-daro, we shall avoid in discussing the sites on record characterizing them from the chronological point of view through the adoption of terms like "Mature Harappan" or "Late Harappan". In the broadest acceptance, the evidence we shall discuss could be referred to Mackay's "Harappa I" and "Harappa II" levels, although, obviously enough, the main framework of reference in evaluating any craft activity evidence at Chanhu-daro is inescapably determined by the excavated Harappa II settlement of Mound II.

The surface assemblages of Mounds I and II are doubtless Harappan and can be combined with the Mound II one, so forming an enlarged complex which could be considered a single context.

Our visit to the site took place between 25th and 27th March 1984. It was not planned as part of a specific research program; as a matter of fact, the idea of making a private visit to Mackay's excavation had been progressively maturing side by side with the development of the Surface Evaluation Program (SEP) by the Joint RWTH/IsMEO Project on the surface of Moenjodaro, in which both the authors cooperate. Here, since 1983, the surface of the site has been treated as a primary source of archaeological information, selectively exploited for the analysis and the reconstruction of craft production allocations originally operating within the social context of the Harappan capital of Sind (Bondioli, Tosi and Vidale 1984). The more our survey of the SEP fieldwork, was extended, the more we felt the need to compare our preliminary results with analogous available bodies of data. It was not our purpose to proceed to a systematic comparison between the craft activity evidence in the two major sites. Fentress (1976) has brilliantly shown the problems and pitfalls involved in the comparison between Moenjodaro and Harappa, two compounds approximating the same coverage with a similar ratio of excavated/unexcavated areas. Even more care must be taken in comparing Moenjodaro and Chanhu-daro. We arrived with a heavy burden of questions, concerning the nature of the expected surface clusters of archaeological craft indicators, their size, their degree of interrelation and co-occurrence. Could the Activity Areas recorded at Moenjodaro be identified at Chanhu-daro? Or, in a wider perspective, could the «surface approach» experimented at Moenjodaro apply to a presumably very different case?

The following notes are aimed to suggest some answers, which, in their turn, shall generate new, more specific questions.

During the three days we spent on the site, we were the guests of Mr. M. Anwar Kerio, Nawab of the nearby village of Jamal-Kirio. The hospitality and the kindness of Mr. M. Anwar Kerio and Mr. Ali Mohd Kerio, their interest in our work, shared by all the Sindhi people of Jamal-

Kirio, corresponded completely to the surprised remarks of Mackay, written 50 years ago. Without the help of all these friends our work would have been much hindered.

We are deeply indebted to Dr. M. Ishtiaq Khan, Director General of the Department of Archaeology and Museums of Pakistan, for his continual support to our research on the Harappan craft production and technology, as well as for his interest in the present preliminary presentation. Many thanks are due to M. Tosi for his precious technical advice. Identification of shell manufacturing wasters owes a great deal to previous suggestions and patient explanations of Dr. J. M. Kenoyer, who has collaborated to the Moenjodaro Project in 1982–83, although the authors bear responsibility for any misuse.

Conditions of the site: general remarks

It takes about 15 minutes to walk to the site from the «otak» of Jamal–Kirio. The path leading to Chanhū-daro runs beside a small irrigation ditch cutting through the beautiful, rich fields of this part of Sind. As our visit took place at the very end of March, this early morning walk was particularly refreshing and welcome. There was only one problem: the dogs of Jamal–Kirio are very well trained to cope with beggars, and, as we soon realized, archaeologists wearing field suit and carrying bags were evidently judged not to be much different. The site soon becomes visible, as you continue along the path, owing to the presence of a system of small irrigation ditches running around the periphery of the archaeological compound and flanked by a thick ring of trees and bushes strongly contrasting with the regular layout of the fields (Pl. Ia). Immediately above the trees rises the skyline of the largest excavation dump, which forms the most impressive feature of the entire surrounding landscape. This is the north-eastern dump which, underlines Mackay “... by the end of the season ... had reached the height of 26.5 feet above datum level, 3 feet higher than Mound II before we began to excavate it” (1943: 37).

After leaving the path and crossing the narrow waterway, the visitor is virtually compelled to climb the dump mound, on the horizontal head of which was recently installed a stela presenting to the visitor some basic information about the Harappan Civilization and the site itself. Actually, being equipped with only the published maps, we had to climb the mound a great number of times before getting a proper orientation.

Looking south, the observer faces the wide, almost circular elevation, only slightly moved by low reliefs, which represents what remains of the extensive excavations of Mound II. No structure is today visible on the

surface; the plateau, here and there, is enlivened by the presence of bushes (Pl. Ib).

Towards south-south west (Pl. IIa) a winding gully, cutting deeply into the edge of the mound with a system of connected tributaries, apparently marks the site of Mackay's "Cutting" (1943: 12). Erosion is still eating into the massive mudbrick embankment exposed in the thirties.

Immediately to the west, surrounded and partially covered by trees, are visible two minor dumps probably produced by the excavation of the "Cutting" as well as by the earth removed from Mound I (Mackay 1943: 59). This latter is partially visible in the background of Pl. IIa. According to our first-hand evaluations, a system of smaller dumps radiates towards north-north-east from the main dump of Mound II, covering part of Mackay's trenches A-K (1943: Pl. III) (Pl. IIb).

To complete the list of the "positive" disturbances of the site (i.e., disturbances consisting in the addition of secondary deposits) we must not forget the grave of Khalil Pir (Pl. IIIa, b). It is still possible to recognize the earthen circle constructed by Mackay all around it. People were happy to show us the recent restoration of the grave, as well as some fragments of carved architectural elements in yellow sandstone recovered in the surroundings and consecrated to the holy man; the fragments probably come from some old ruined Muslim graves.

The topography of Mound III, the first site of Chanhu-daro to be excavated (Majumdar 1934) is now hardly comparable with that visible in the old photographs (Majumdar 1934: Pl. IV, d; Mackay 1943: Pl. IXe). The walls of the trench have collapsed completely, transforming Mound III into a very irregular, roughly circular low elevation, with rather inconspicuous surviving patches of original surface.

Mound I, forming the southern part of the compound, although extensively excavated by Mackay (in its northern part and, apparently, only in its upper levels) still presents the largest portion of undisturbed surface today available for the ground inspection. The map presented in Pl. IVa shows all the "negative" and "positive" disturbances we have identified. Doubtless, with the possible exception, as already stated, of Mound I, Chanhu-daro must be considered an almost totally disturbed site. Nevertheless, we could make some very interesting observations not only within the boundary of the old excavation areas, but also, as we shall see, on some undisturbed sections of the site.

Devising a method of approach

We went to Chanhu-daro with the intention to gain a more direct understanding of the nature of the assemblages indicating ancient craft

activities in Harappan contexts. The evidence available on the surface of the compound² was so substantial that, within a few hours, we found ourselves mapping the main surface clusters of Archaeological Indicators of Craft Activity (Tosi 1981; Bondioli, Tosi, Vidale 1984) on the copies of Mackay's maps we had brought with us.

In spite of the obvious differences between the conditions of preservation prevailing at Moenjodaro and Chanhū-daro, the basic concept of the "surface" context underlying the present notes has been substantially the same as the one elaborated after our experience in the former site. This does not mean that we postulate any similarity between the nature of the surface contexts in the two sites. It must be stressed that the areas we have examined and recorded at Chanhū-daro are, in the first place, very dishomogeneous, and, generally speaking, cannot be compared as a whole in toto to the spectrum of Moenjodaro Craft Activity Areas.

Pl. IVb shows the location of the 29 sites on record at Chanhū-daro. Sites 1-12, Mound I, have been regarded as portions of original surface, substantially unaffected by the old works. These sites, spatially concentrated and technologically very homogeneous, may be considered a single complex. Sites 13 and 14 are part of Mackay's dump; sites 15-20, 22, 24 have been located all around the border of Mound II, on the surviving slopes roughly comprehended between the 5 and 10 feet contour lines of the maps. In this case, it is important to recall that, although we decided to interpret these sites as "primary" surface assemblages, the heavy frequentation of the slopes during the excavations and later, as well as the subsequent, increasing erosion originating from the excavation plateau, might have strongly affected outcropping of indicators. Sites 21, 23, 25, 26 have been recorded within the boundaries of the old excavations; part of the associated evidence had already been discussed by Mackay. Lastly,

² We have not removed any object from the site, as they run no danger of being damaged or lost. The chalcedony/carnelian nodules visible in Fig. 21 had been previously collected and assembled by local people. Selective collection of surface material from the archaeological sites is a well-known practice which appears more and more likely to be a major factor to be accounted for in future programs of surface evaluation in Southwestern Asia. Such interference is strongly dependent on local habits, needs and ideas, which should be culturally patterned as integral part of the research methodology. The case of the chalcedony group of stones in Sind may provide a good example: the stone-wasters, in the form of large flakes, lumps and geoids, are collected to be burnt and turned into "akik". In this case such term indicates the powder so obtained, which is considered to be a particularly healthy medicine. Given the massive presence of this types of wasters in various stages of transformation on the surface of Chanhū-daro, after heavy rain, people just walk and look, and, as we were told "nobody goes back with empty hands".

sites 27–29 in Mound III have already been seen to be probable parts of the original surface of the mound, partially disturbed by Majumdar's trench.

In this light, the statement made earlier is specifically intended to stress that, at Chanhu-daro as at Moenjodaro, we could conceive the surface as a three-dimensional, highly dynamical context, continuously reproduced and transformed by the interactive process man—nature (formation of the archaeological deposit), man—nature—man (old excavation of the archaeological deposit), and man—nature—man—nature (new erosion of the old trench). A careful examination of this interplay and its processual evaluation is a necessary pre-requisite for any interpretation of the Chanhu-daro Craft Activity Areas.

In concluding this short methodological note, we would like to remember a further factor of disturbance in the observation of the site. The winter 1983–84 has been a very dry season. Absence of rain at Moenjodaro turned out to be a key variable in lowering the degree of visibility of a wide set of indicators. It is therefore quite possible that, given the very limited amount of time spent at Chanhu-daro (about 30 hours of actual field observation, i.e., no more than 1 hour per area), our data could be biased to the extent of according greater relevance to the most macroscopic assemblages (in first place the kiln-firing complexes). More attention, in future, should be paid to the less visible indicators, such as the copper-bronze smelting or the bead-making ones.

The sites

Tab. 1 gives the presence/relative incidence of the detected classes of craft indicators. The evidence of the single mounds will be discussed separately.

Mound I (Pl. V)

Mound I, investigated by the trenches of Majumdar in 1931 and by Mackay's extensions 5 years later, still presents in its southern part a series of steep slopes deeply intersected by several radially arranged erosion gullies. The majority of these furrows are filled with kiln-wasters. Apparently, the sites marked as 1–11 in Pl. V form a single whole complex, having its core in the southern tip of the mound, and gradually ceasing towards north and north-west (see the series of sites 5–11). The described complex has been ascertained to be morphologically and technologically homogeneous; this correspondence is ascribable to the peculiar behaviour of the kiln-waster assemblages. Since the firing infrastructures were usually half-buried, and, in our case, most probably directly installed by excava-

tion into the underlying anthropic sub-strata, one would expect that such features would convey and deepen erosion along the slopes. With the outcropping of deposits of overfired materials the heaps of wasters themselves, subsequently, favour drainage, and further accelerate erosion. The gullies, according to this genetic model, would behave like self-reproducing sub-systems, progressively expanding. By comparing sites 1 and 2 (Pl. V 1, 2) some idea may be obtained of the described process in its early (Pl. VIa) and advanced (Pl. VIb) stages. Large surface concentrations like the ones marked as sites 7 and 8 (Pl. V 7, 8) may reasonably be considered as the final output of the process. These sites, which cover the strongly eroded south-eastern flanks of Mound I in form of large sloping basins (Pl. VIIa), represent the largest concentrations of kiln-firing indicators so far identified on the surface of Chanhū-daro. Their size, at least in part, appear to be a direct function of the post-depositional dynamics previously outlined.

In describing sites 1-12, we referred to "kiln-wasters" and to "kiln-firing indicators". In fact, the interpretation of such assemblages (Tab. 1) is not problem-free. Overfired bricks, the vast majority of which heavily eaten away by erosion, appeared to be a dominant feature (Pl. VIb-VIIc). Mackay made a similar observation about the surface of Mound II:

It was difficult at first to account for the large number of over-baked bricks lying on the slopes of the mound. Their presence suggested that there had been a brick-kiln near by, but it was later discovered that their preservation was due to the fact that they had not fallen to powder like the bricks of more moderate hardness. (1943: 1).

We could observe a certain degree of co-occurrence of bricks and other types of pyro-technological indicators, in first place overfired sherds (sites 3-12) and ash concentrations (sites 1-3). This would strongly support the alleged presence of firing installations. The three partially melted bricks visible in site 3 (Pl. VIIc) have dimensions which, in spite of warping, still closely correspond to the normal mature Harappan standard. They would appear to have been part of a firing infrastructure rather than discarded products. It is however to be stressed that the presence of sherds was always rather scanty. In no case did we ever find at Chanhū-daro the conspicuous heaps of overfired sherds which are visible at Moenjodaro in the DK-G North area or in other pottery producing-areas of the town. One could hypothesize a multifunctional employment of firing installations, but the described circumstances have still to be satisfactorily explained. Further work, moreover, is needed to account for the presence, within the kiln-waster sites, of a wide range of heterogeneous indicators such as chert debitage, blades and more specialized tools (sites 2, 3, 4, 8) and, in particular, flakes of quartzite, sandstone and other stones (sites 1, 3-8, 12). Disc-shaped quartzite polishers are also on record (sites 6, 7;

cfr. Pl. IXa). Murex shell (*Chicoreus ramosus*) debitage has been detected in sites 7, 8, 9.

Mound I is still the less known part of Chanhu-daro. According to the evidence of the old excavations, in this part of the site specialized stone-cutters produced mace-heads, and faience ornaments were manufactured (Mackay 1943: 63). To this we can only add that, apparently always within the time-span of the Harappan occupation, the southern section of the mound was extensively covered by spreading kiln-wasters, most probably as a consequence of the installation of actual kilns. For the time being, bricks and pottery would appear to be the only possible candidates for the identification of the fired products. Other craft indicators recorded in the assemblages of ceramic wasters could possibly indicate either a certain degree of spatial co-occurrence among the different craft activities, in primary or secondary context, or a chronological overlapping, in form of a primary or secondary deposit, of the same activity.

Mound II (Pl. VIII)

What remains of the concentrations of overfired ceramics observed by Mackay before excavating Mound II has been marked as sites 16, 18, 20, 22, 24. All these surface clusters of indicators stand out, all along the periphery of the mound, as areas of a slightly darker colour; from the geo-morphological point of view, being simply areal outcropping along the low, gently sloping surviving foot of the mound, they appear very different from the kiln-firing sites of Mound I. Site 21 would differ from the other mentioned areas in belonging to the north-eastern corner of the "Cutting." All these sites present the already discussed association between crumbled overfired bricks and potsherds, with the exception of site 18, where we recorded kiln-linings and vitrified pottery drops, indicating the existence of a kiln having collapsed from over-heating. As in the case of Mound I, the ceramic indicators frequently contained also other classes and types of indicators: chert debitage or blades (sites 16, 18, 20, 21, 22); chert drills, identical to the specimens already published (Mackay 1937: Pl. II, 2, 3; Mackay 1943: Pl. XCIII, 6-8) have been recorded in site 21. Sites 18 and 21 presented quartzite flakes; 16 and 18 were extensively covered by chalcedony/carnelian³ waste flakes; again 18, 21, 24 shared

³ In this context, the term "chalcedony/carnelian" is used to mean that, considering chalcedony to be the generic term for the fibrous translucent variety of silica, most of the flakes and lumps we have observed would be rather close to carnelian, in form of the fired, deep red variety, as well as, sometimes, in the form of the unfired or partially fired brownish-olive shadow which at Ratampur is considered to be the best to be fired and turned red (Francis 1982).

the occurrence of *Chicoreus ramosus* debitage, while in site 16 rare manufacturing wasters of the conch shell (*Turbinella pyrum*) were observed.

Three sites with major surface concentrations of shell manufacturing wasters, respectively 13, 14, 15, are mapped in Pl. VIII. In spite of the fact that the former two are doubtless part of the main dump, this very preliminary surface survey further supports previous data in underlining the role of Chanhū-daro in shell-working. Mackay reported the existence of a possible "shell factory" in the Harappa I levels (1943: 28); shell working was carried out in the "bead factory", room 215, in the Harappa II levels (*ib.*: 43, 53) as attested by the discovery of 2 or 3 large unworked specimens of *Chicoreus ramosus*. Furthermore, several unfinished shell items were recovered in various sections of Mound II, particularly in its northern part: bangles (*ib.*: 53, 192, 231), ladles (*ib.*: 53, 232), "dishes" (*ib.*: 53, 231), balls (*ib.*: 53). In two different occasions (*ib.*: 53, 192) the excavator considered shell working at Chanhū-daro as a kind of secondary craft activity. After the Moenjodaro survey, however, we had the impression that in the observable part of Chanhū-daro shell manufacturing wasters were much more common and widespread than in the major site. Dump sites 13 and 14 had concentration of wasters not commonly found on the surface of Moenjodaro. Site 13 presented a large number of *Chicoreus ramosus* wasters discarded during the production of bangles, among which we could easily identify several sawn shell apices (Pl. IXb, right). *Chicoreus ramosus* bangles, accompanied by the relative manufacturing indicators, are a very rare find on the surface of Moenjodaro (Kenoyer 1983). Other types of indicators occurred in the same dump, such as chert blades and chalcedony beads rough-outs (Pl. IXb, under the board). Similarly, the dump area marked as site 14 showed a large amount of shell manufacturing wasters (Pl. Xa), the most frequent of which were again large fragments of *Chicoreus ramosus*. Here we observed a large sawn shell section forming the unworked blank for the manufacture of a large ladle (Pl. Xb, c), identical to the specimens published in the excavation report (Mackay 1943: Pl. XC, 6), as well as to the items recently included by Kenoyer in his study of the Moenjodaro finds (1983: Fig. 7) and by Bhan and Kenoyer in the Nageshwar report (*s.d.*: Fig. 5,5). In site 14 we also recorded some sawn piece of *Lambis* (Fig. 18, under the board; *cfr.* Kenoyer 1983: Fig. 18) as well as one of the rare sawn pieces of *Turbinella pyrum* from bangle manufacture (Pl. Xa, immediately over the board; *cfr.* Kenoyer 1983: Fig. 6 K).

The main core of site 15, which we have considered as a probable original section of the site, was defined by the presence of hundreds of shell fragments, mostly again *Chicoreus ramosus*, densely packed in a very small area (Pl. Xc).

Sites 13, 14, 15 in spite of their very different nature, partially shared the presence of chalcedony/carnelian bead-making indicators (see Tab. 1), such as chalcedony/carnelian debitage (sites 13, 14, 15) and rough-outs (13), phthanite drill-blanks (14). In the case of site 15, we have the impression that the presence of this debitage could be related to the same evidence from sites 16 and 18, thus characterizing the whole south-eastern part of the mound as a single large "activity area". A possible core of this bead-making unit could be represented by the small site 17, in which the chalcedony/carnelian debitage is associated to unworked geoids, chert blades and drills, quartzite quernstones and flakes. This hypothesis should be further field-tested, possibly in a more lengthy season and after some hours of rain.

To date, the most substantial evidence of bead-making comes from site 25, on the eastern side of the Great Cutting. Here the presence of bead-making indicators was registered also by Mackay (1943: 15, 52) in the Harappa II and III levels. The list of indicators includes chert debitage and drills, phthanite debitage and rod-shaped drill-blanks (cf. Mackay 1943: Pl. LXXXVI *b*, 10; these items were apparently undistinguishable from the specimens recovered by the authors in the so-called Moneer South-East Area of Moenjodaro), phthanite cylinder drills (cf. *ib.*: Pl. LXXXVI *b*, 8), unworked chalcedony/carnelian geoids, debitage, and bead rough-outs; we saw also flakes of other semi-precious stones, as plasma and lapislazuli, and grinding tools such as quartzite quernstones. All these materials were excavated and exposed by erosion along the collapsed borders of the old trench. Our first impressions in attempting a comparison between the Chanhu-daro evidence and the materials collected at Moenjodaro (in first place with the mentioned Moneer South-East Area unit) can be thus summarized: *a*) the range of the stones worked in site 25 at Chanhu-daro would appear more restricted than in the Moneer site of Moenjodaro. The quality of the chalcedony/carnelian group appears definitely better at Chanhu-daro, where carnelian seems to be characterized by a more uniform, deep red colour and by a more even crystalline structure, contrasting with the yellowish-reddish, white-banded agate which prevails in the Moenjodaro flake assemblages; *b*) the presence of broken chipped rough-outs, resembling the specimens referred in the reports to the production of the attractive "barrel cylinder beads" well known from the Harappan hoards would appear restricted at Chanhu-daro (cfr. Mackay 1937: Pl. I, 8; Mackay 1943: Pl. XCIII, 14). This would agree with the apparently exclusive occurrence at Chanhu-daro of phthanite drills whose functional part is more than 3-4 cms. long.

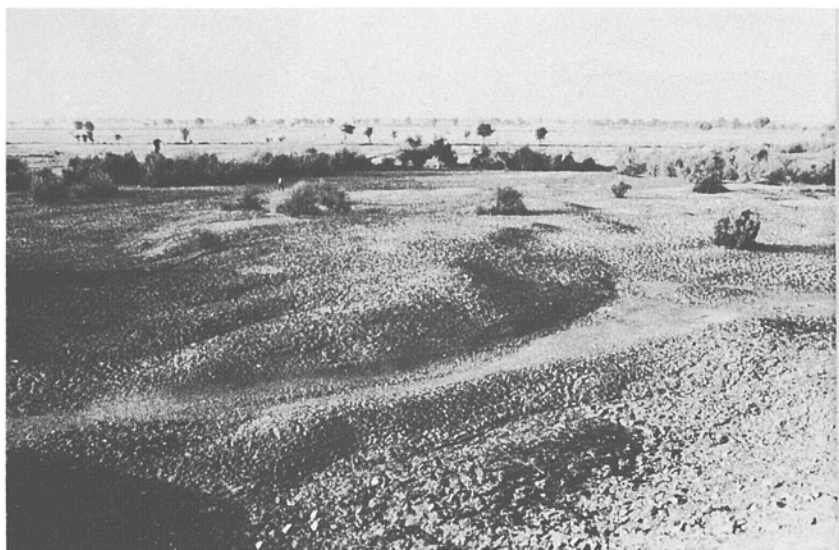
In concluding this rapid overview of the chalcedony/carnelian bead-making evidence gathered at Chanhu-daro we shall mention the find of

I												II														III			mounds sites		CONTEXT	DISTRIBUTION OF AICA PER SITE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29				
•	•	•	•	•	•	•	•	•	•	•	•			•	•	•	•		•		•		•			•	•	•	UNDISTURBED			
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																													QUARTZITE QUERNS			
																													QUARTZITE FLAKES			
																													SANDSTONE FLAKES			
																													OTHER STONES FLAKES			
																													CHICOREUS R.			
																													LAMBIS			
																													TURBINELLA R.			

TAB. 1 - Chanhu-daro 1984: distribution of selected Archaeological Indicators of Craft Activity in the 29 discussed sites. A: absent; B: from rare to present; C: from present to common; D: dominant. *Abbreviations in Tab. 1:* Overfired TC Cakes = Overfired Terracotta cakes; TC Bangles = Terracotta bangles; Ch. Carn. Geoids = Chalcedony/Carnelian Debitage; Ch. Carn. Blocklets = Chalcedony/Carnelian Blocklets; Other S. Stones Deb. = Other Semiprecious Stones Debitage.



a) Chanhú-daro 1984. The archaeological compound seen from north-west; on the left, the big dump from the excavation of Mound II; Mound I, partially excavated in its upper levels, is visible on the extreme right. (Dep. CS. Ng. 15073/11a).



b) Chanhú-daro 1984. View of the south-eastern part of the excavated area of Mound II. (Dep. CS. Ng. 15073/34a).



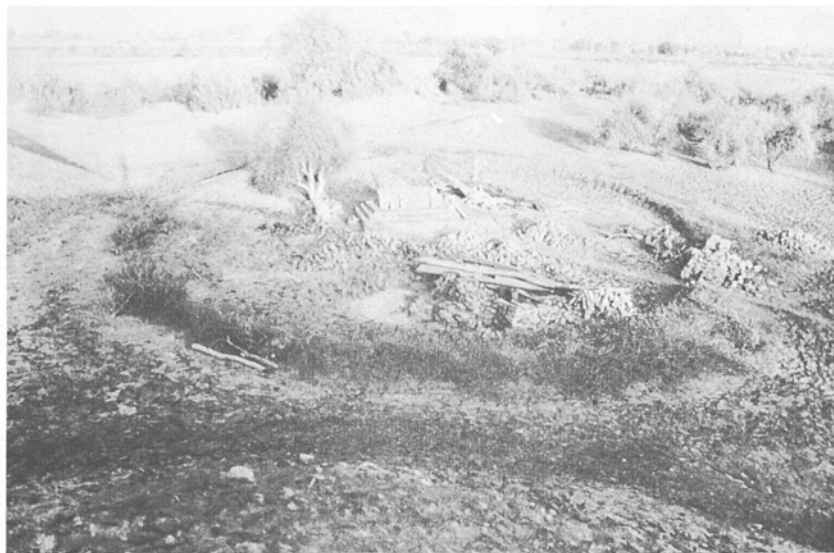
a) Chanhudaro 1984. View of the south-western part of the excavated area of Mound II. The winding gully cutting the plateau marks the location of Mackay's "Cutting". (Dep. CS. Ng. 15073/36a).



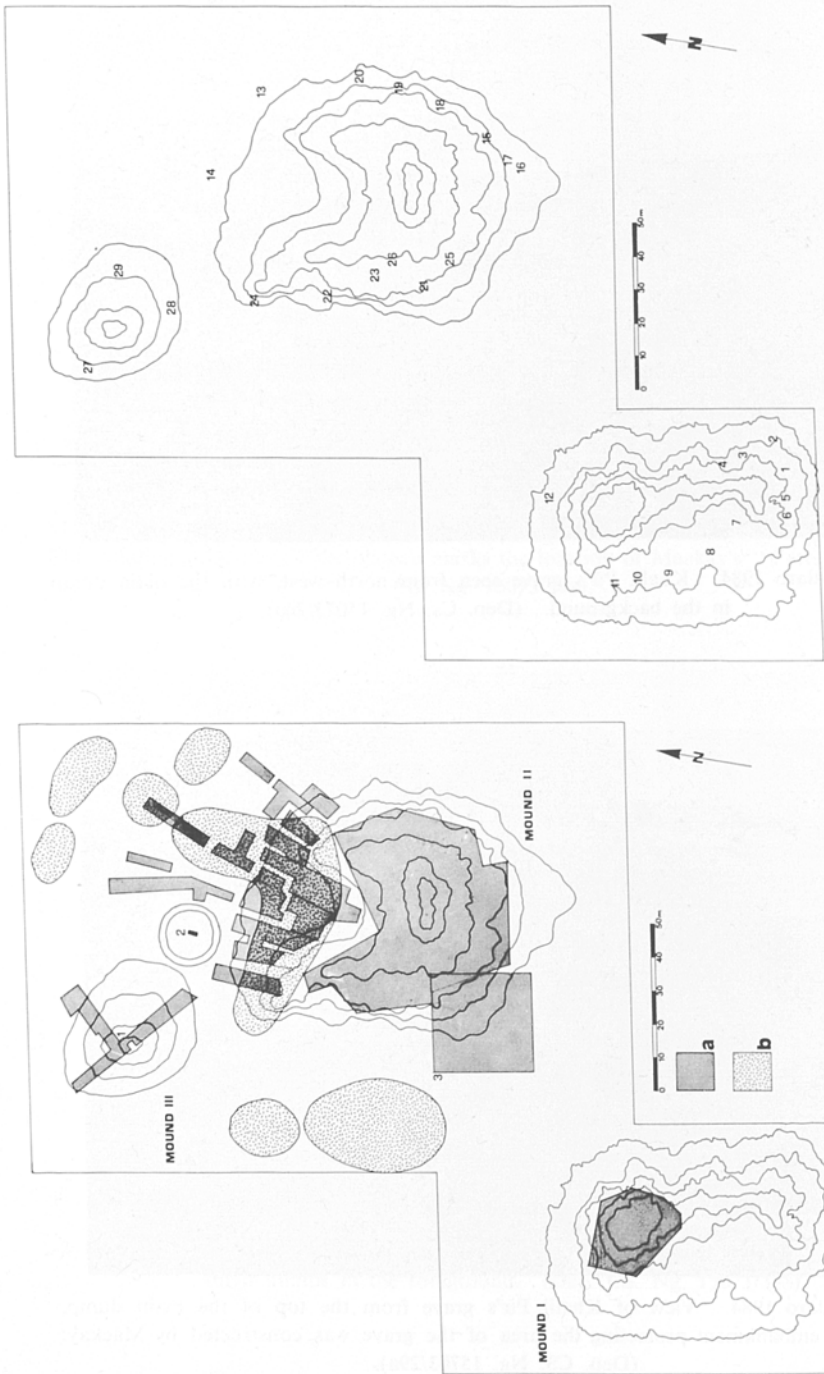
b) Chanhudaro 1984. View of the northern part of the compound with a system of small dumps in the foreground. (Dep. CS. Ng. 15073/35a).



a) Chanhū-daro 1984. Khalil Pir's grave seen from north-west, with the main dump in the background. (Dep. Cs. Ng. 15073/26a).

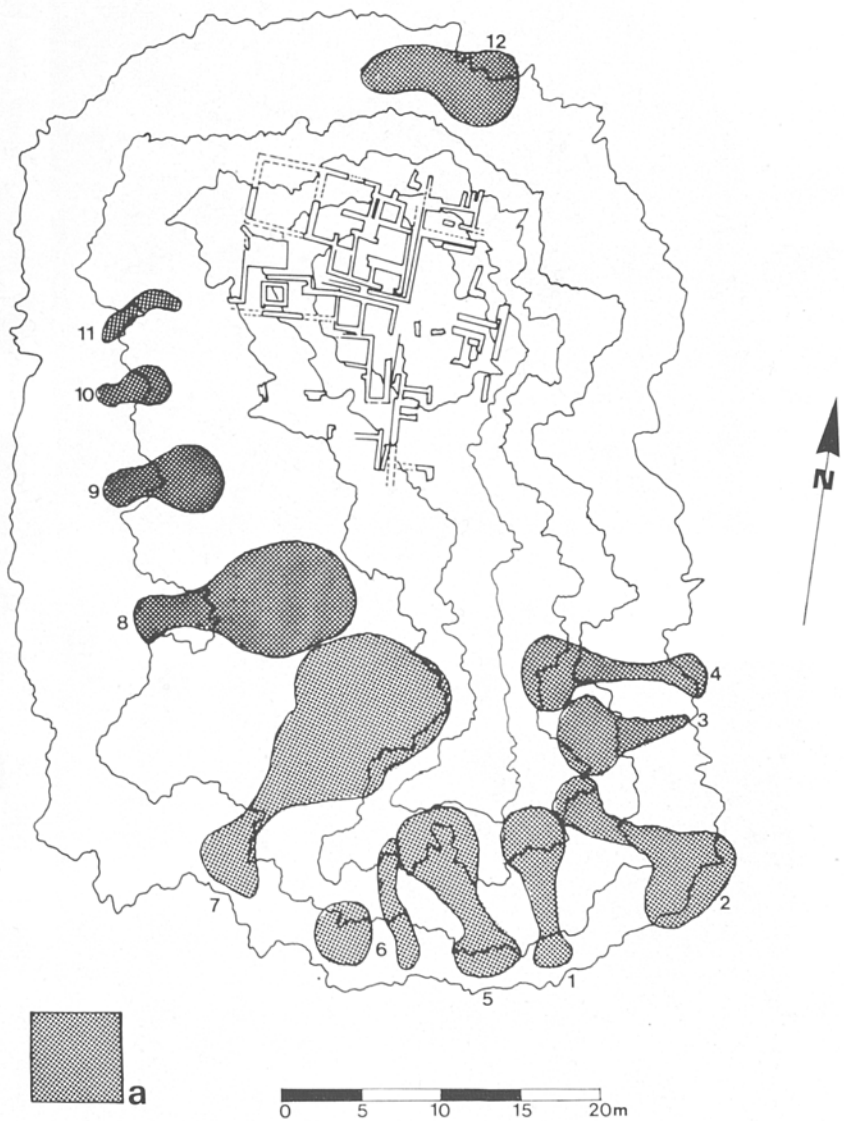


b) Chanhū-daro 1984. View of Khalil Pir's grave from the top of the main dump. The circular embankment protecting the area of the grave was constructed by Mackay. (Dep. CS. Ng. 15703/29a).

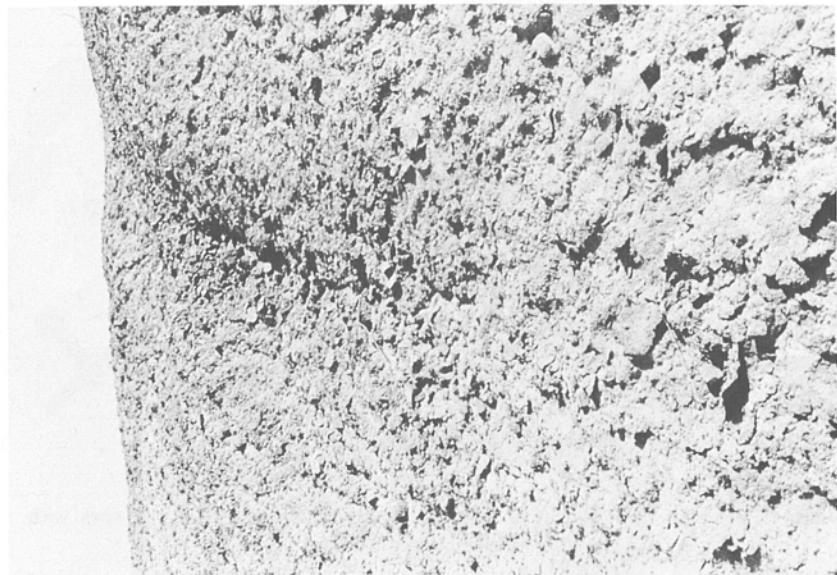


b) Chanhu-daro 1984: the archaeological compound. Location of the 29 observed sites.

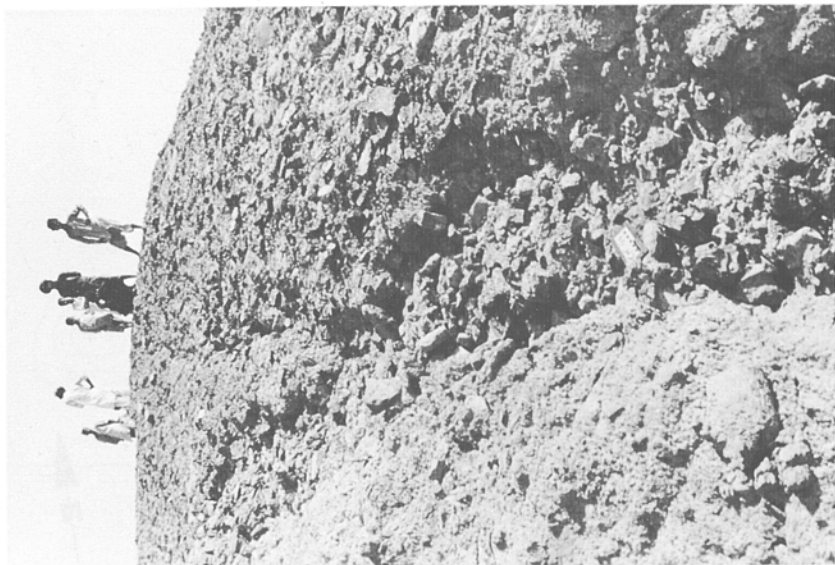
a) Chanhu-daro 1984: the archaeological compound. A: negative disturbances (excavated areas); B: positive disturbances (excavations dumping areas). 1: Majumdar's trenches; 2: Khalil Pir's grave; 3: The "Cutting".



Chanhu-daro 1984: plan of Mound I showing the location of sites 1-12. a: sites with kiln-firing waster concentrations.



a) Chanhu-daro 1984. Site 1. Note the erosive gully in its incipient stage of formation. The buried kiln-firing wasters gradually concentrate in the cut. (Dep. CS. Ng. 15072/14).



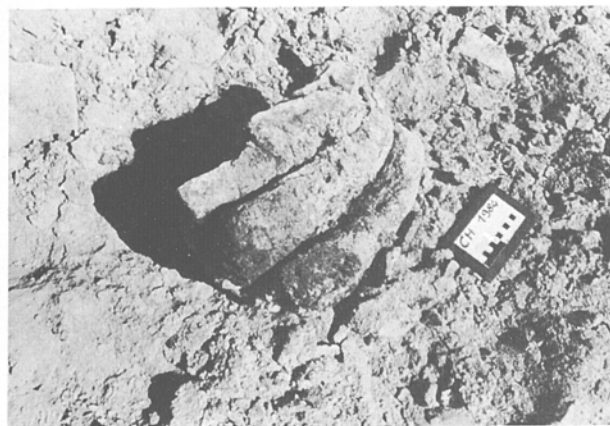
b) Chanhu-daro 1984. Site 2. Erosion gully filled with kiln-firing wasters (mainly overfired broken bricks). (Dep. CS. Ng. 15072/11).



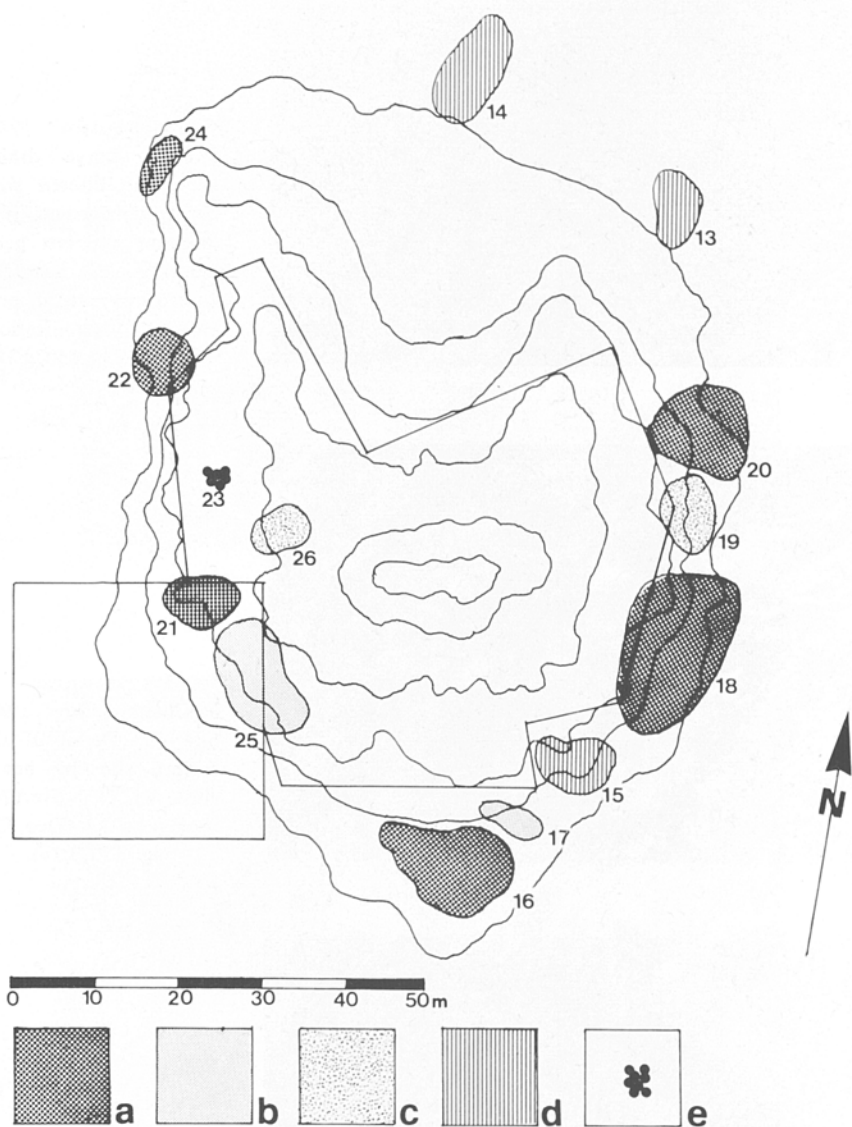
a) Chanhu-daro 1984.
Site 7. Large drainage basin littered with kiln-firing wasters, representing the last geomorphological stage of an erosion gully in progressive stabilization. (Dep. CS. Ng. 15072/18).



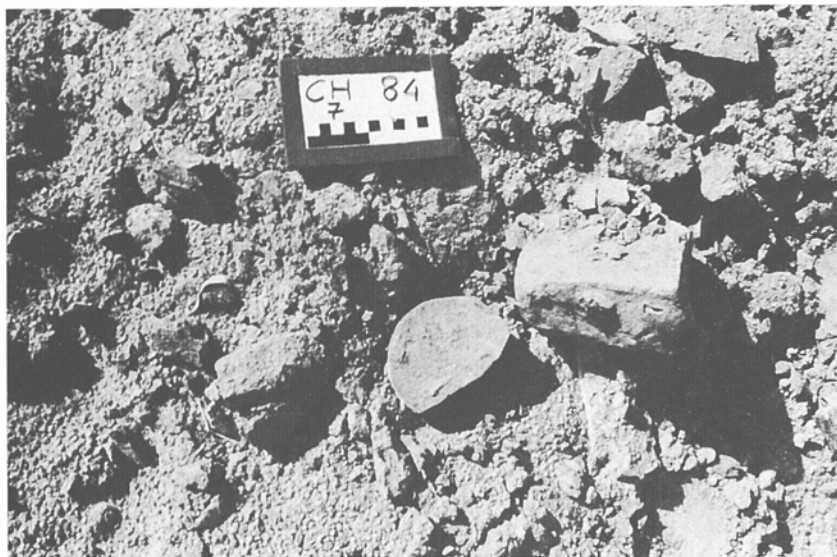
b) Chanhu-daro 1984.
Site 7. Detail of the surface showing heavy clusters of overfired broken bricks. (Dep. CS. Ng. 15072/16).



c) Chanhu-daro 1984.
Site 3. Close-up of three overfired bricks, partially melted together, probably originally belonging to a firing facility. (Dep. CS. Ng. 15072/4).



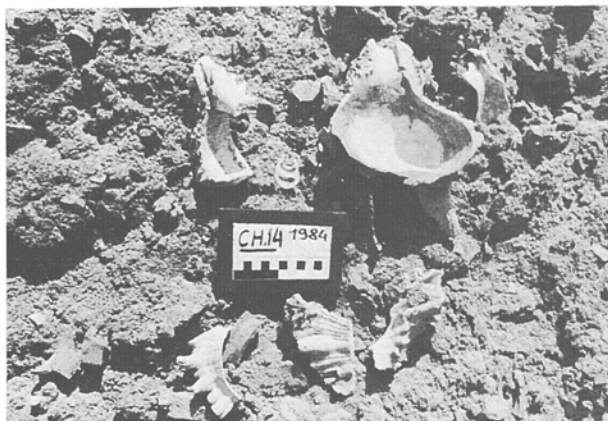
Chanhu-daro 1984: plan of Mound II showing the location of sites 13–26. a: sites with kiln-firing waster concentrations; b: sites with chalcedony/carnelian bead-making waster concentrations; c: sites with “faience smelting” assemblages; d: sites with shell manufacturing waster concentrations; e: sites with chalcedony/carnelian geoid deposits.



a) Chanhú-daro 1984. Site 7. Quartzite disc-shaped polisher observed within the kiln-wasters. (Dep. CS. Ng. 15072/20).



b) Chanhú-daro 1984. Site 13. Shell wasters among which are clearly visible 3 sawn apices of *Chicoreus ramosus*, a distinctive indicator of Murex bangle manufacture. Immediately under the board, some chert blades and a chipped chalcedony bead rough-out. (Dep. CS. Ng. 15072/32).



a) Chanhu-daro 1984.
Site 14. *Chicoreus ramosus*, *Turbinella pyrum*
and *Lambis* manufacturing
wasters. (Dep. CS.
Ng. 15072/30).



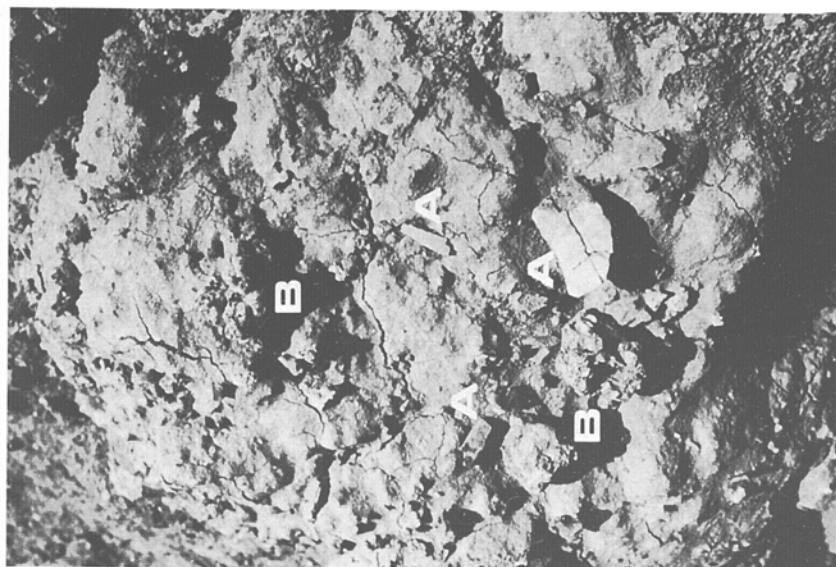
b) Chanhu-daro 1984.
Site 14. Close-up of
a large sawn section
of *Chicoreus ramosus*, a
blank for the manufac-
ture of a ladle. (Dep.
CS. Ng. 15072/32).



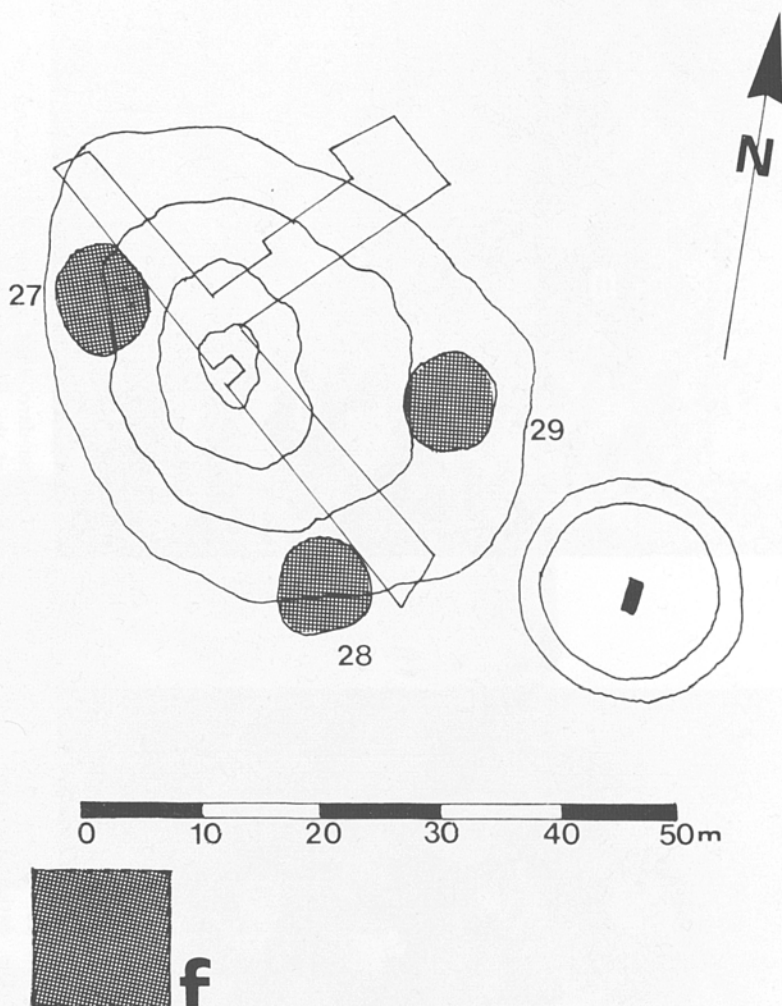
c) Chanhu-daro 1984.
Site 15. Heavy con-
centration of shell
manufacturing wasters.
Note the *Chicoreus ra-
mosus* columella in the
foreground. (Dep. CS.
Ng. 15072/36a).



a) Chanhu-daro 1984, Site 23. Group of chalcedony/carnelian geoids. The darker specimens have been washed. All the geoids were originally flaked in order to observe the inner structure. (Dep. CS. Ng. 15119/22a).



b) Chanhu-daro 1984, Site 19. Close-up of the surface of the site, showing spread of micro-indicators. a: steatite blocklets and splinters; b: faience smelting slags. (Dep. CS. Ng. 15119/23a).



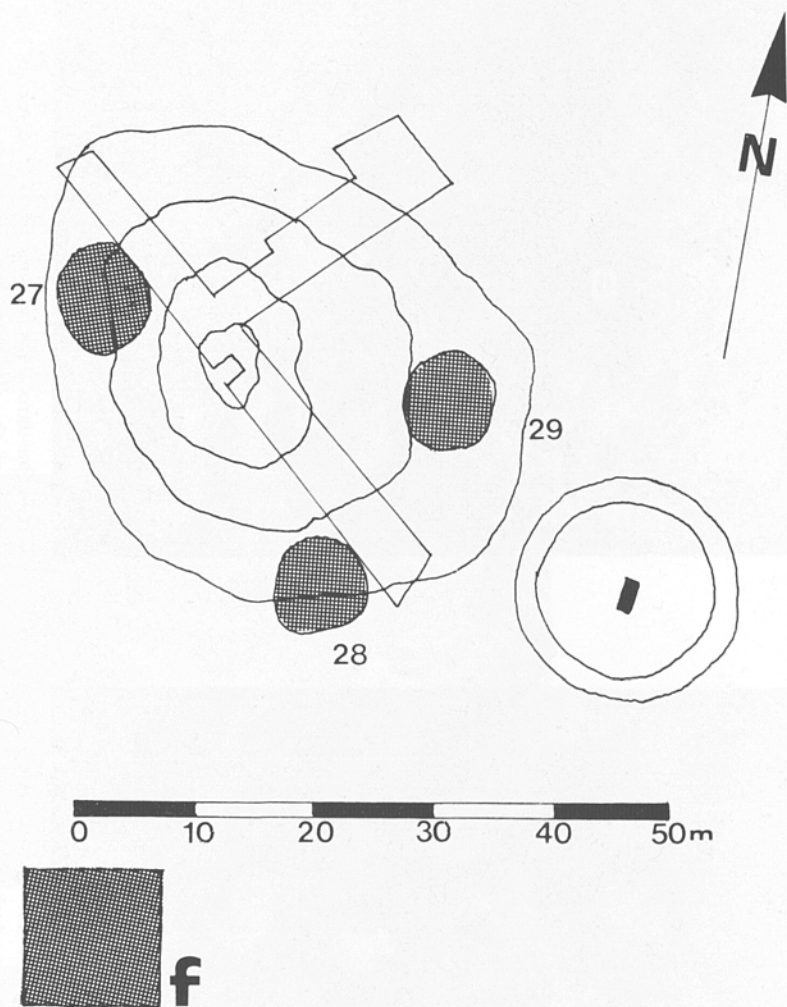
Chanhu-daro 1984: plan of Mound III showing the location of sites 27-29. f: sites with overfired terracotta nodules concentrations.

a large deposit of partially chipped, unworked geoids⁴. The recovery of such indicators was reported by the excavator from several points of Mound II (Mackay 1943: 43, 50, 52, 209). In one case (locus 443) it is specified that the deposit represented "...raw material for another bead-maker whose workshop entirely disappeared" (*ib.*: 50); in a second case (room 215) the deposit of geoids formed clearly a large single hoard (*ib.*: 43, 209). During our visit, villagers presented us with a collection of chalcedony/carnelian geoids (Pl. XIa). To our surprise, they told us that the geoids had all been recovered from the same point (Pl. VIII, site 23). A spot check showed that we were dealing with a very large heap of unworked geoids, strongly reminiscent of the deposits today visible in the ware-houses, workshops and streets of Cambay. Site 23 is not so far from Mackay's locus 443. It is impossible, at this stage, to decide whether the deposit we have seen corresponds to Mackay's find (and we have mapped it incorrectly) or whether it has to be considered a separate one.

The last sites of Mound II to be discussed are 19 and 26, both representing patches of excavated, highly disturbed surface. As seen in Tab. 1, they are characterized by the selective occurrence of four types of indicators, namely: faience⁵ slags; "cylinders and plaques"; steatite debitage; bone splinters. In Tab. 1 such indicators are grouped together and graphically denoted as a single, "dominant" association. This is due to the fact that in the light of the Moenjodaro data, further confirmed by the evidence collected at Chanhudaro sites 19 and 26, the above described indicators apparently tend to recur together very often, suggesting an underlying specific technological association, whose nature is still only a matter of speculation. Pl. XIb is a close-up photograph of a surface detail in site 26 showing the association between steatite debitage and faience slags. The sometimes very large steatite fragments often bear saw-marks; faience slags, like the ones recovered on the surface of Moenjodaro (Bondioli, Tosi, Vidale 1984: Fig. 16) are small and very light, with fracture lines always showing a bubble-netting inner structure. The slags' colour, always strictly corresponding to the shadows of Moenjodaro faience ornaments, ranges from light grey-green or cerulean to (more rarely) pale yellow. The faience/steatite association in primary context of deposition was granted by the observation of steatite blocklets bearing drops of dark-green faience (site 19).

⁴ See footnote 2.

⁵ For sake of simplicity, we have preliminarily adopted the term "faience" for the type of vitreous slags which we met the first time on the surface of Moenjodaro. This term has to be considered as conventional. More proper identification of this ceramic material depends on archaeometrical analysis.



Chanhu-daro 1984: plan of Mound III showing the location of sites 27-29. f: sites with overfired terracotta nodules concentrations.

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“Cylinders” and “plaques” are very distinctive indicators connected with vitreous paste production and were discovered and published by Mackay (1943: 234–235; Pl. XCI, 12, 13, 20–22). “Cylinders”, slightly tapered at the extremities, and “plaques”, flat, sub-rectangular, biscuit-shaped (and sometimes tapering in their turn, as we observed in site 19) were interpreted by the excavator as probably being lumps of refined material conveniently prepared for a ready conversion into paste mixtures. His interpretation was supported by the examination of one object by A. Lucas. However, we have observed that the texture of the “plaques” seems to be partially different from that of the “cylinders”; the heavy “glaze” dropping (to follow Mackay’s terms) visible over part of the “plaques” (cfr. Mackay 1943: Pl. XCI, 20; see also Bondioli, Tosi, Vidale 1984: Fig. 16) and the “cylinders”, together with traces of a fine white, lime-like substance over such items would suggest the need for a proper reassessment of this technological evidence. It was our impression that, in some cases, these elements could easily have been part of the inner structure of small furnaces for faience smelting. The excavation report mentions, for example, that “...a number of these objects were found together in square 9/E, locus 171, in a deposit of ashes...” (Mackay 1943: 235). At Moenjodaro as well as at Chanhū-daro such assemblages would seem to take the shape of small, well defined clusters of indicators, that, at first sight, could conform to the model of dumping sites of small dismantled firing/smelting installations, possibly characterized by a short time-span of utilization. Finally, any interpretation of the scattered bone-splinters observed in the discussed sites can only be speculative.

The almost totally excavated Mound II represents the main body of data on the nature of the Harappan settlement of Chanhū-daro. According to the excavator, the archaeological evidence relative to the Harappa II levels was unequivocal enough to support the conclusion that “...many, if not most, of the inhabitants of the site were artisans” (Mackay 1943: 52). Exploiting the recent work of erosion we could have a first-hand (although very preliminary) experience of some aspects of the surface craft indicators at Chanhū-daro. Running almost without interruption around the border of the mound, with a major gap in the main excavation dump, our sites 15–26 may be considered as a further supporting element of Mackay’s model. Any statement on the dimensions, and ultimately, on the nature of the units of production at Chanhū-daro should in first place take into account the body of the excavation data, the critical re-evaluation of which is clearly beyond our present scope. To hazard some impressions on the “character” of the technological processes we have encountered through the filter of the surface, we could say that, on the basis of technologies often apparently quite similar to what we study on the surface of

Moenjodaro, some interesting divergences may be observed; furthermore, it is possible to point out some specific topics holding much promise for future research.

The kiln-waster sites of Mound II look technologically rather similar to the Mound I assemblages; the observations already made on the technology of such complexes may be considered as referring to Mound II. More difficult to interpret than the analogous Moenjodaro assemblages, these surface concentrations call for a more specific analysis before they can yield reliable information on the nature of the performed firing processes. Our surface observations, in stressing the role held by the site in shell manufacture, seem to point to some interesting phenomena. The amount of *Chicoreus ramosus* debitage would appear clearly to prevail over the debitage of other species; the process of manufacturing ladles from this type of shell is attested by frequent recovery of several indicators which appear to be quite rare at Moenjodaro (Kenoyer 1983). Similarly, bangle manufacture at Chanhū-daro apparently depends specifically on *Chicoreus ramosus* for raw material, while *Turbinella pyrum* would seem much rarer (the relative occurrence of the two species is apparently reversed in bangle manufacture). A re-analysis of shell-working at Chanhū-daro would allow us to confirm or reject such a hypothesis, as well as to further enlarge our understanding of shell-working technology, labour organization and distribution network of shell products among the Harappan centers.

The substantial evidence of chalcedony/carnelian bead-making still available on the surface of the site offers a good opportunity to refresh our knowledge of a technology described by Mackay 40 years ago (particularly of the high technological standards involved in the production of the carnelian "barrel cylinder beads", probably the greatest achievement in silicon oxide transformation during the late 3rd millennium in South-West Asia).

Lastly, a careful documentation and analysis of the described faience/steatite/"cylinders and plaques" assemblages could lay the basis for a vertical growth of our knowledge of Harappan paste/faience production. Such a research perspective could be particularly promising in the light of the possible opportunity to analyse a very distinctive case of the interlacing of quite different transformational activities, resulting in the production of a single class of commodities.

Mound III (Pl. XII)

There is no mention in Majumdar's report (1934) of the features of the surface before excavation. As already stated, we have considered sites 27-28-29 as parts of the original surface of the site, possibly disturbed by the previous interventions. The main feature of these last three sites

is the presence of the so called “overfired terracotta nodules”, indicators which we know very well from Moenjodaro, were they cover wide sections of the site (to the south, north and in the south-western part of the citadel: cf. Bondioli, Tosi, and Vidale 1984). The technological significance of these nodules, roughly hand-modelled lumps of clay exposed to high temperatures in reducing atmosphere, is still a very problematic topic. We should like to stress that at Chanhudaro we encountered two of the most distinctive traits of the nodule formations found at Moenjodaro: their close association with other classes of pyro-technological indicators (vitrified pottery drops: 27, 28, 29; overfired sherds: 27, 28; overfired bricks: 28; overfired pottery “cones” and terracotta cakes: 28) and the extremely selective nature of their location in the settlement area. This is all indicative of the repetition on a smaller scale of the same specific model of production or disposal of wasters which was operating at Moenjodaro.

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